

# Micro Swiss NG™ REVO Direct Drive Extruder for Creality Ender 5 / 5 Pro / 5 Plus

## INSTALLATION INSTRUCTIONS

### TOOLS NEEDED

Gather the required tools before starting the installation

- Phillips-Head Screwdriver
- Flat-Head Screwdriver
- 3.0mm Allen Wrench
- 2.5mm Allen Wrench
- 2.0mm Allen Wrench
- 1.5mm Allen Wrench
- 8mm Spanner Wrench
- 10mm Spanner Wrench
- Flush cutters



### WHAT'S IN THE BOX

- 1x Master Extruder Assembly
- 1x Adaptation plate
- 1x LDO Stepper motor
- 1x Fan Shroud (PN: NGR4010A)
- 1x Custom extension cable
- 1x 3D Printed X Endstop Bracket for Ender 5 Plus
- 1x 3D Printed BL-Touch Mounting Bracket
- 1x Revo Hotend assembly
- 1x Revo HeaterCore 24V
- 1x Revo HeaterCore Spring
- 1x 0.40mm Brass Revo Nozzle

#### Hardware:

- 1x Eccentric nut
- 1x M5 x .8 x 30mm CAP SCREW
- 1x 5mm ID 10mm OD Washer
- 1x M5 x .8 Nylon Lock Nut
- 2x M5 x .8 x 20mm Nylon Patch Cap Screw
- 4x M2.2 x 8mm Thread Forming Screw
- 4x M3 x 12mm Thread Forming Screw
- 5x Zip Ties
- 4x Butt Splice Connectors



### PREPARATION

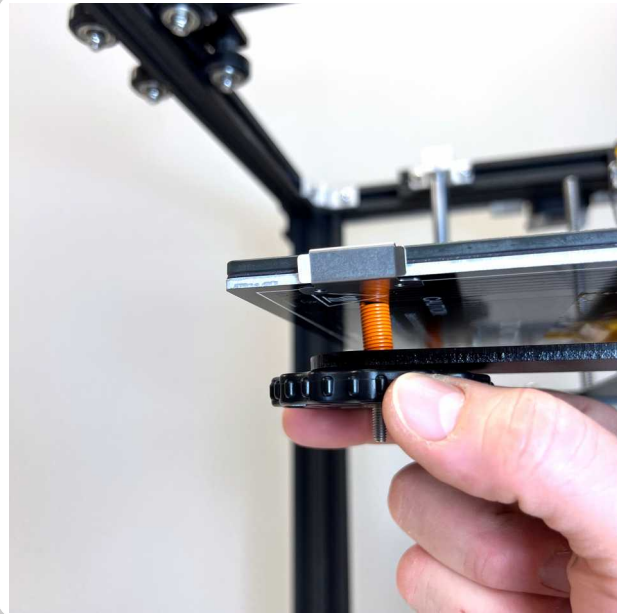
Remove the filament from your original hotend and allow the printer to cool down completely

### STEP 1 - SAFETY

Verify that the hotend and bed have cooled down to room temperature before starting any work on the printer

**⚠ For your safety, turn off and unplug your printer**

## STEP 2 - LOWER THE BED



The position of the nozzle and probe will be at a slightly different height, so doing this step will prevent the nozzle from crashing into the bed.

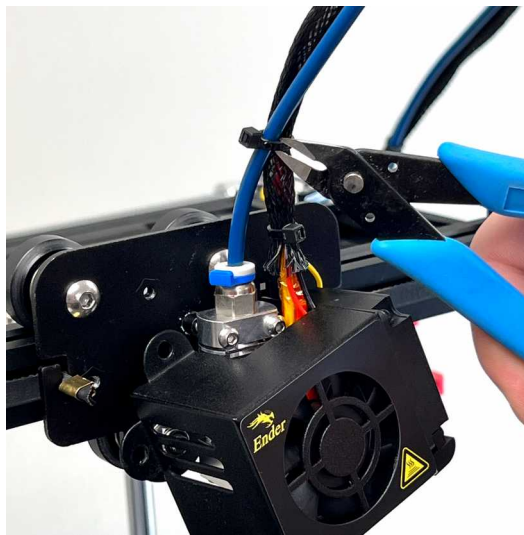
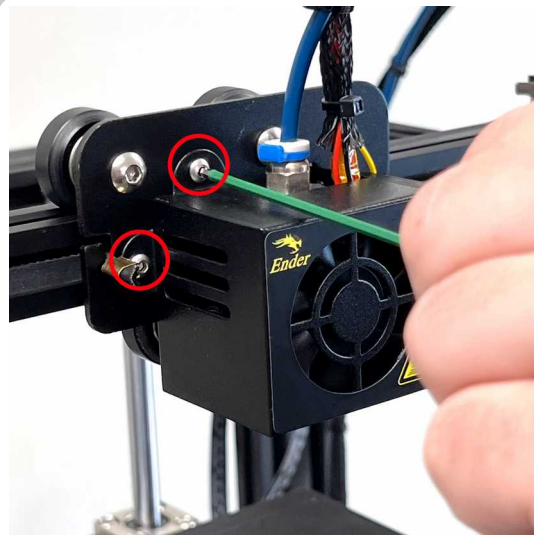
### Printers without Auto Bed Leveling Probe:

- Tighten the four bed leveling knobs to lower the bed because the nozzle will be about 2.5mm lower after installing the new extruder and hotend. After completing the installation, the four corners will need to be leveled.

### Printers with Auto Bed Leveling Probe:

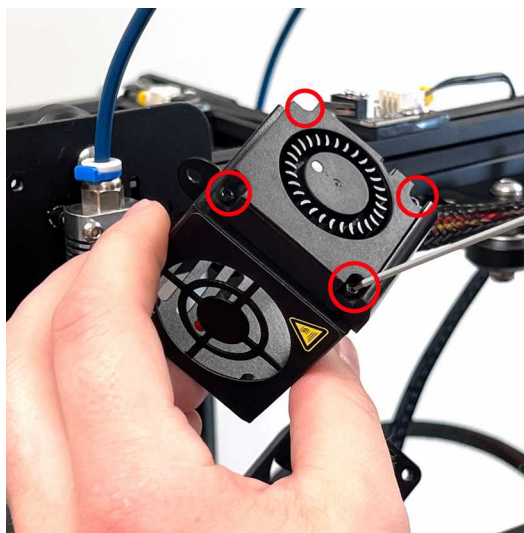
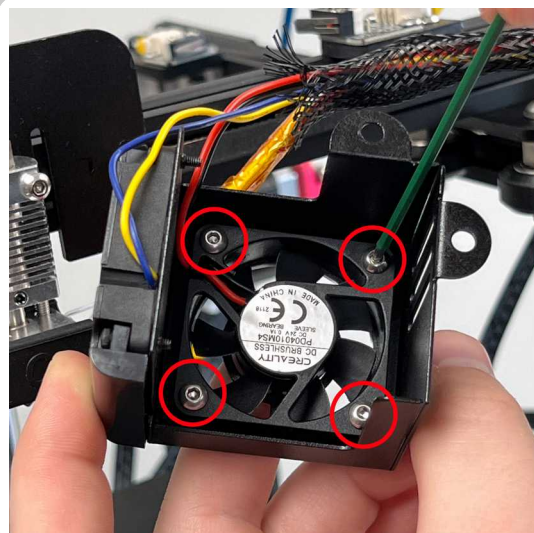
- Reset the Z-Offset back to 0.00. After completing the installation, the Z offset will need to be recalibrated.

## STEP 3 - UNFASTEN THE FAN SHROUD



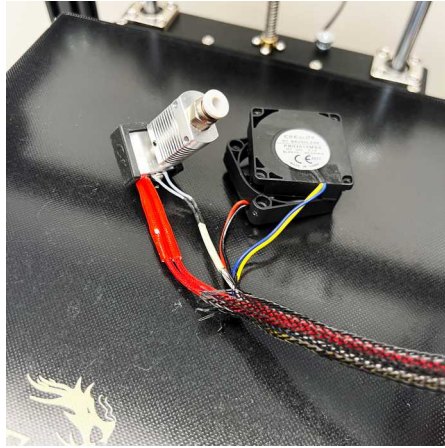
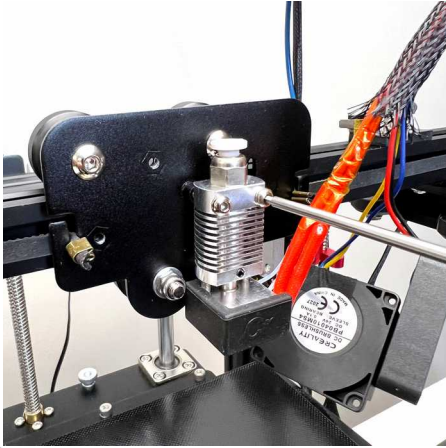
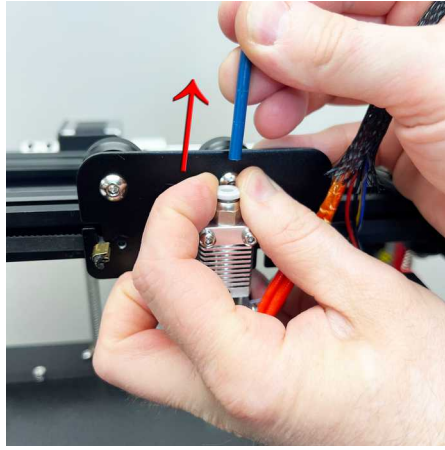
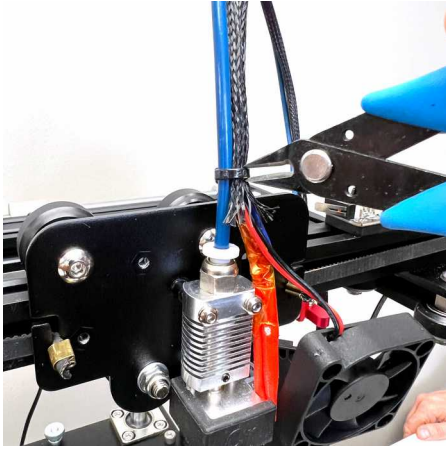
- Remove the fan shroud by unscrewing the two screws holding the shroud to the carriage plate. (2.0mm Allen Wrench)
- Cut the zip ties holding the Bowden Tube and cables together. (Flush Cutters)

## STEP 4 - DETACH THE FANS



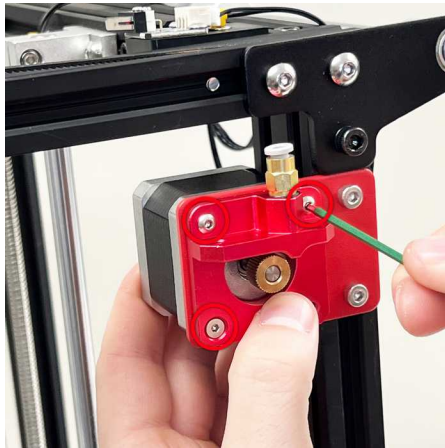
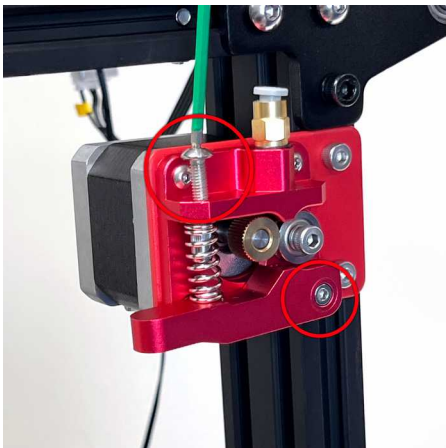
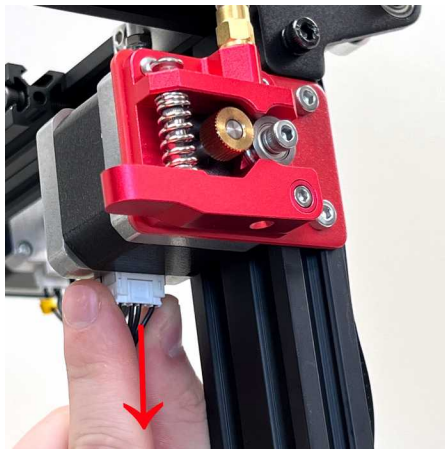
- Remove the screws holding the hotend fan. (2.0mm Allen Wrench)
- Remove the screws holding the part cooling fan. (1.5mm Allen Wrench)

## STEP 5 - UNFASTEN THE ORIGINAL HOTEND



- Remove the c-clip from the Bowden collet located at the top of the stock hotend.
- While pressing the plastic Bowden collet, pull the PTFE Tube out of the hotend.
- Unfasten the original hotend from the carriage plate by removing the two M3 screws. (2.0mm Allen Wrench)

## STEP 6 - DISASSEMBLE THE ORIGINAL EXTRUDER



- Unplug the cable from the original extruder stepper motor.
- Remove the tensioner screw and extruder arm. (2.5mm Allen wrench)
- Unscrew the remaining 3 screws holding the extruder body attached to the motor. (2.0mm Allen wrench)

## STEP 7 - PREPARE THE NG REVO EXTRUDER FOR INSTALLATION



- Prepare the NG Revo Extruder by removing the two screws holding the fan shroud.

## INFORMATION - HOW TO USE BUTT SPLICE CONNECTORS

When connecting the new heater and thermistor to the printer in the next steps, you can either connect the wires using the provided Butt Splice Connectors, or solder the wires if you have the equipment/experience to do so.

### How to connect two wires using a Butt Splice connector:

Insert the wires into the two holes, and press the button down using pliers.

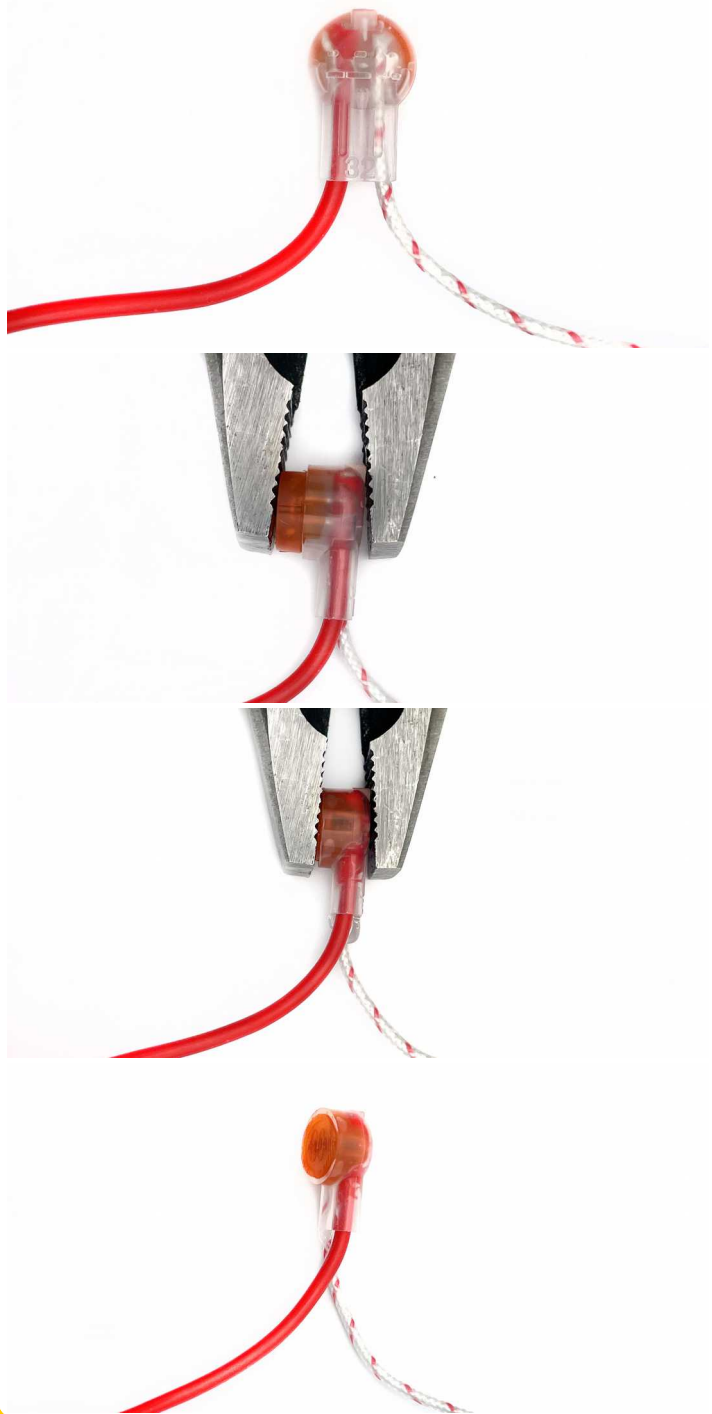
Pressing the button pushes a blade through the wire insulation, which holds the wires in place and provides an electrical connection.

It is not necessary to strip the wire insulation before Butt Splicing.

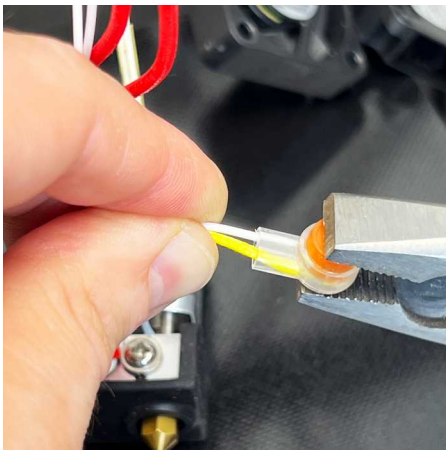
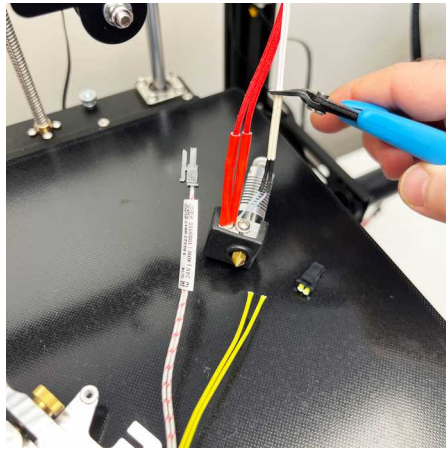
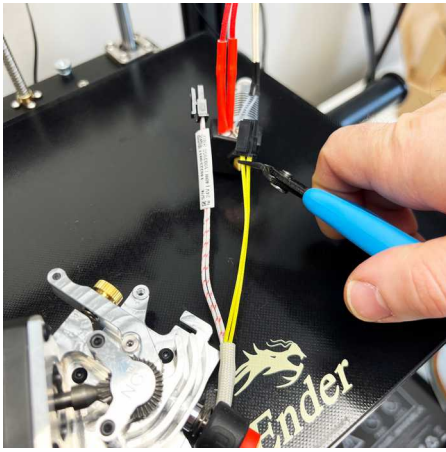
Before pressing the button, check the underside of the translucent Butt Splice connector to make sure the wires are all the way at the end of the holes. Otherwise you risk the wires not being secured by the blade inside the connector. Once the button is pressed, it cannot be raised back up to try again.

Press down reasonably hard using pliers until the button is depressed all the way.

Some of the silicone gel may be forced out of the connector. This is fine and is to be expected. Wipe away any excess with a tissue.



## STEP 8 - CONNECT THE THERMISTOR WIRES

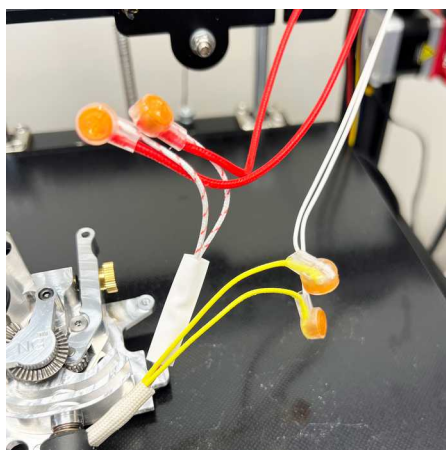
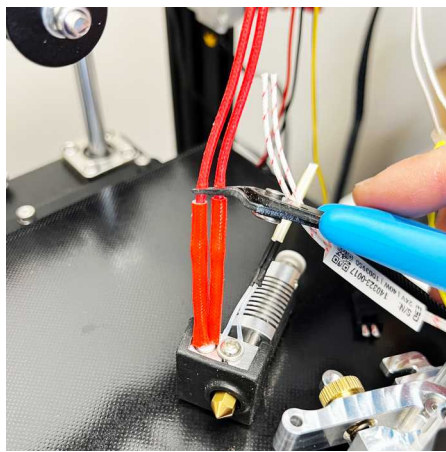
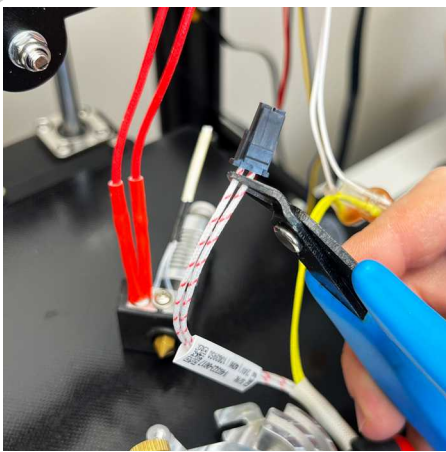


- Cut the connector off of the Revo hotend's thermistor wires (yellow). Do this as close to the connector as possible.
- Cut the printer's original thermistor wires (white). You should do this as close to the hotend as possible, just above the thick translucent wire insulation.
- Butt Splice one of the Revo hotend's thermistor wires (yellow) to one of the printer's thermistor wires (white).

Thermistors do not have polarity, therefore you can connect either one of the Revo hotend's yellow thermistor wires to either one of the printer's white thermistor wires.

- Butt Splice the Revo hotend's remaining yellow thermistor wire to the printer's remaining white thermistor wire.

## STEP 9 - CONNECT THE HEATER WIRES

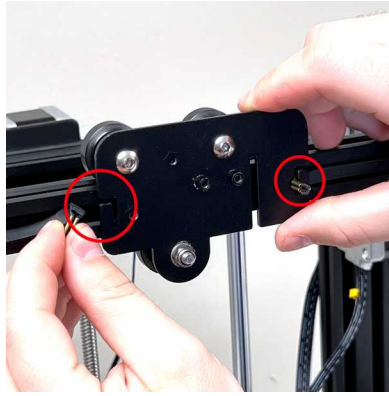
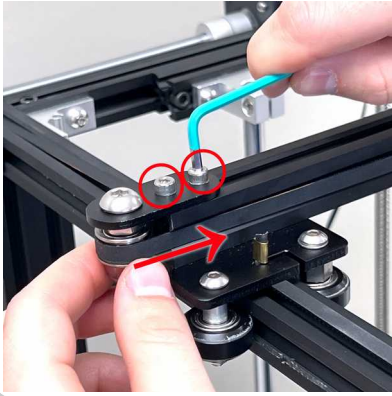


- Cut the printer's original heater wires (red). You should do this as close to the hotend as possible, just above the thick red wire insulation.
- Cut the connector off of the Revo hotend's heater wires (white/red stripes). Do this as close to the connector as possible.
- Butt Splice one of the Revo hotend's heater wires (white/red stripes) to one of the printer's heater wires (red).

Heaters do not have polarity either, therefore you can connect either one of the Revo hotend's white/red striped heater wires to either one of the printer's red heater wires.

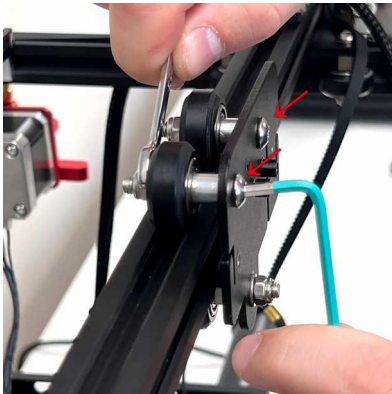
- Butt Splice the Revo hotend's remaining heater wire (white/red stripes) to the printer's remaining heater wire (red).

## STEP 10 - DETACH THE BELT FROM THE CARRIAGE PLATE



- Loosen the X-axis belt tension.  
Depending on your printer's belt tensioner design, either unscrew the tensioning knob or loosen the two bolts holding the tensioner in place.
- Detach the belt from the printer's stock carriage plate.

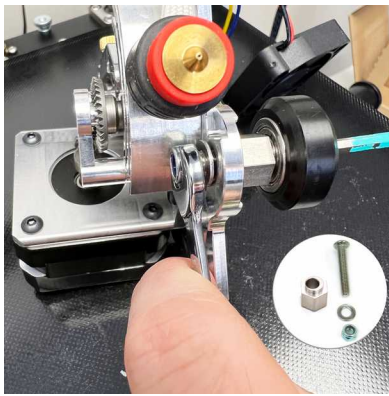
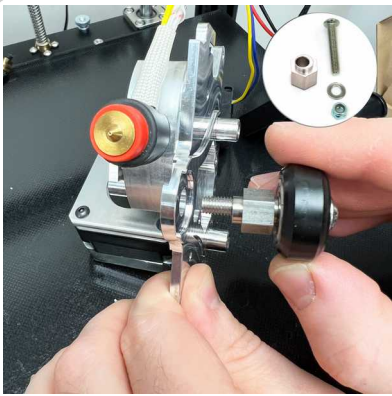
## STEP 11 - REMOVE THE CARRIAGE PLATE AND WHEELS



- Remove the screws/nuts holding the V-Roller wheels. (3.0mm Allen Wrench and 8mm Spanner Wrench)
- Remove the original carriage plate.

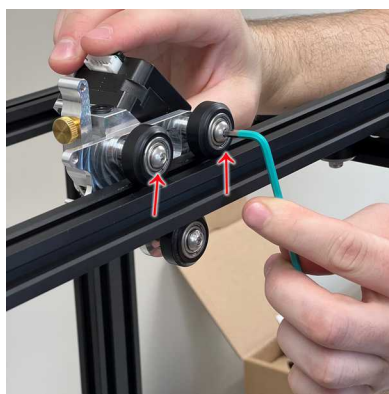
Save the V-Rollers to be reused during the installation of the NG Extruder.

## STEP 12 - INSTALL THE ECCENTRIC NUT AND BOTTOM WHEEL



- Insert the longer M5 screw into one of the V-Roller wheels.
- Place the eccentric nut on the screw as shown in the image.  
**Note the correct orientation – the longer boss facing away from the wheel.**
- Secure the screw and wheel assembly to the bottom hole using the provided washer and a nylon lock nut. (3.0mm Allen Wrench and 8mm Spanner Wrench)

## STEP 13 - INSTALL THE TOP TWO V-ROLLER WHEELS



- Insert the provided shorter M5 screws into the two remaining V-Roller wheels.  
**Be sure to use provided nylon patched screws.**
- Hold the carriage in place on the printer and install the top two V-Roller wheels. (3.0mm Allen Wrench)

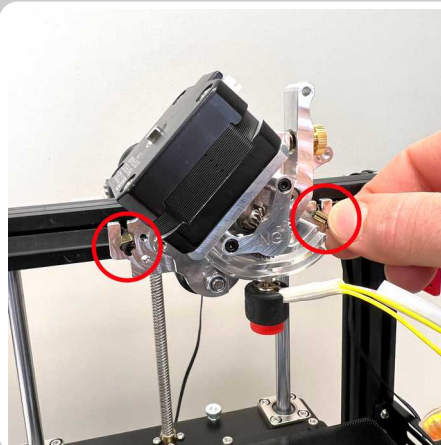
If it is difficult to fit the last V-Roller wheel, adjust the bottom V-Roller position by rotating the eccentric nut. (10mm Spanner Wrench)

## STEP 14 - ADJUST THE ECCENTRIC NUT



- Adjust the bottom V-roller position by rotating the eccentric nut to eliminate any carriage wobble.  
(10mm Spanner Wrench)

## STEP 15 - ATTACH THE BELT



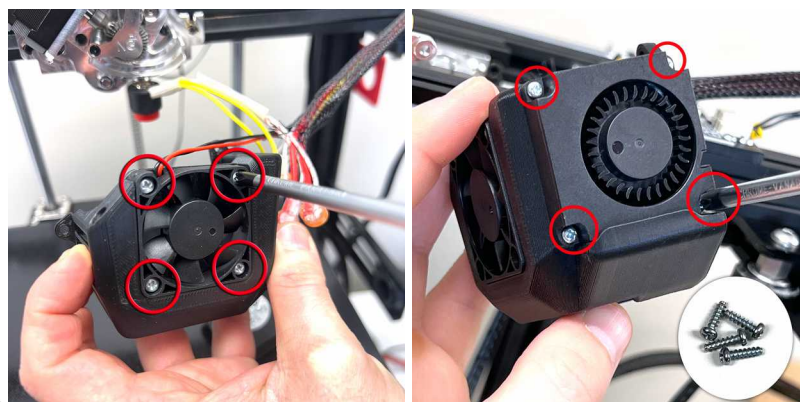
- Insert the ends of the X-axis belt into the carriage plate slots.
- Tighten the X-axis belt.

Move the carriage side to side to verify the belt is seated properly.

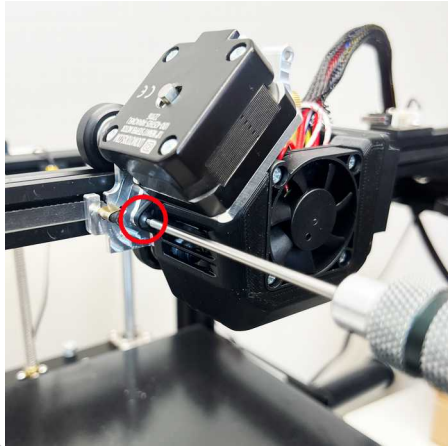
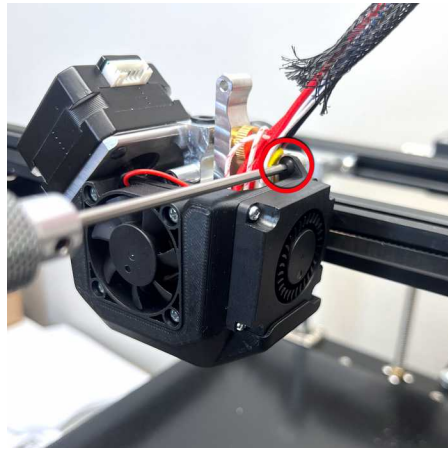
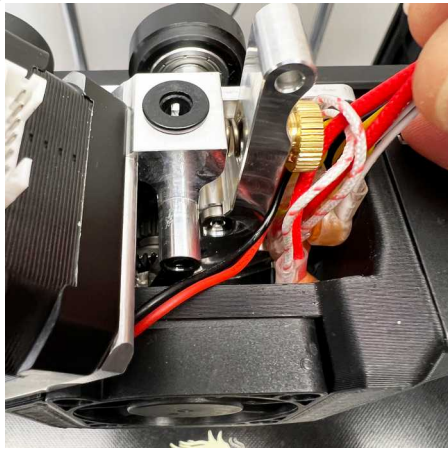
## STEP 16 - ATTACH THE FANS TO THE FAN SHROUD



- Install the hotend cooling fan onto the fan shroud using the larger self tapping screws provided with the kit.  
(Phillips-Head Screwdriver)
- Install the part cooling fan onto the fan shroud using the smaller self-tapping screws provided with the kit.  
(Phillips-Head Screwdriver)

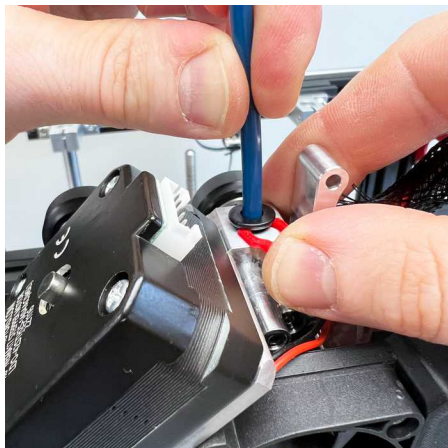
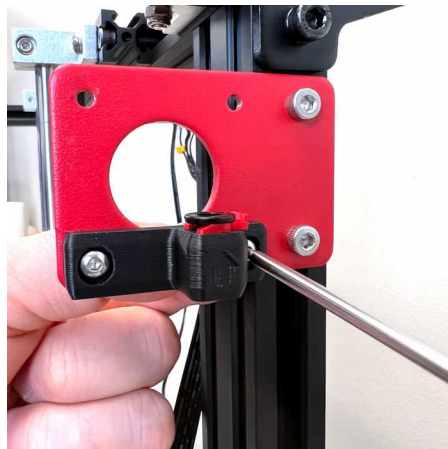


## STEP 17 - INSTALL THE FAN SHROUD



- Install the assembled fan shroud back onto the extruder using two M3 screws. (2.0mm Allen Wrench)

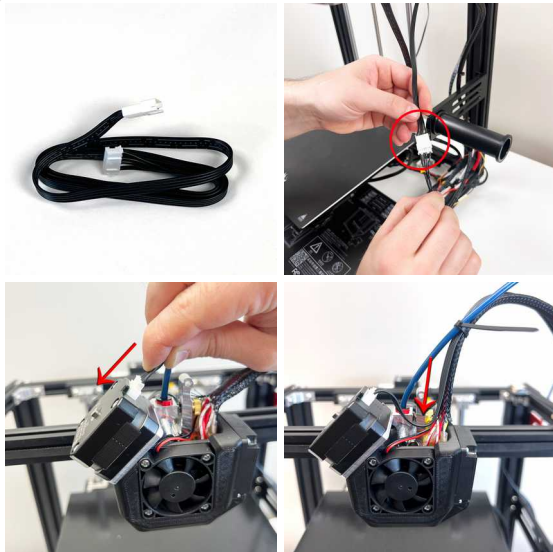
## STEP 18 - INSTALL THE FILAMENT GUIDE BRACKET AND TUBE



- Attach the 3D printed PTFE bracket to the printer where the original Bowden extruder used to sit, using the provided M3 screws and nuts. (2.0mm Allen Wrench)
- Insert one end of your PTFE tube (printer's original Bowden tube) into the 3D printed bracket's Collet.
- Secure the PTFE tube inside the bracket by inserting the c-clip under the Collet lip.
- Insert the other end of the PTFE tube into the Collet on top of the NG Extruder.
- Secure the PTFE tube to the top of the extruder by inserting a c-clip under the Collet lip.



## STEP 19 - CONNECT THE LDO STEPPER MOTOR

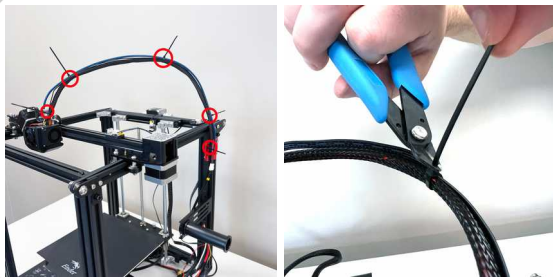


It is very important to use the provided extension cable. This cable has a special pinout that is required to use the NG Extruder motor on a Creality printer.

Connect one end of the extension cable to the printer's original E cable and the other end to the LDO stepper motor.

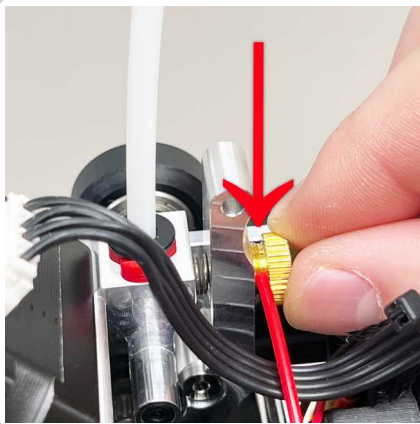
Make sure to give the cable some slack near the stepper motor.

## STEP 20 - CABLE MANAGEMENT



- Use the provided zip ties to manage your cables neatly.

## STEP 21 - ADJUST THE GEAR TENSION



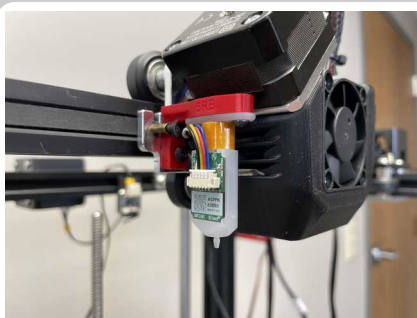
- Adjust the gear tension by rotating the brass knob.

The gear tension can be gauged by measuring how much of the brass knob's threads are exposed. (Distance from the head of the brass knob to the aluminum extruder arm.)

The good starting point for stiff filaments such as PLA, PTEG, ABS is 1.75mm of exposed threads (use a piece of 1.75mm filament as a gauge as shown in the image on the left).

For flexible filaments such as TPU, loosen the knob until about 2.75mm of the threads are exposed. (Loosen the knob two full turns, if starting from 1.75mm.)

## STEP 22 - INSTALL THE PROBE

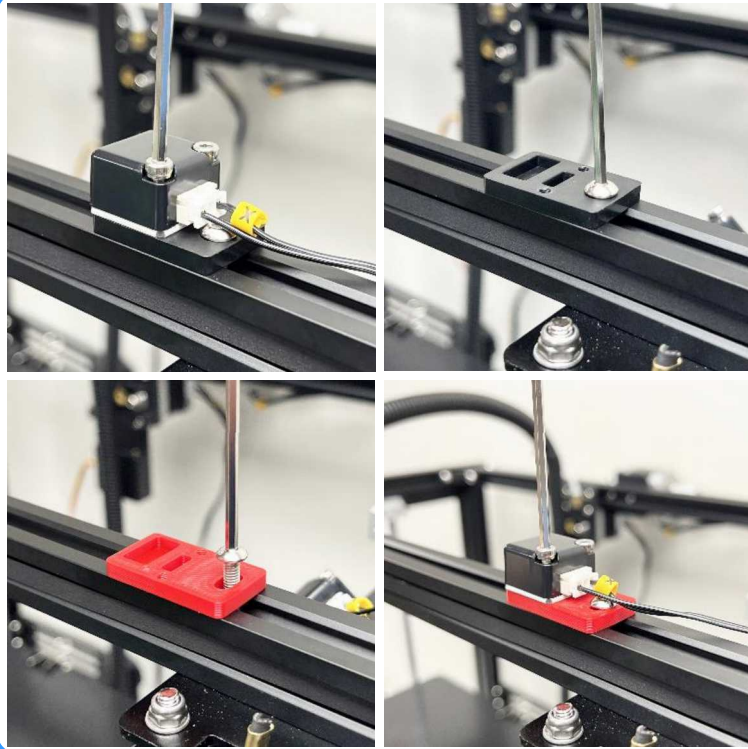


This step is only for printers that have an Auto Bed Leveling probe.

- Attach the 3D printed bracket to the NG Extruder carriage plate using the printer's original M3 screws.  
(2.0mm Allen Wrench)
- Attach the BL-Touch to the 3D printed bracket using two M3 screws.  
(2.0mm Allen Wrench)

## STEP 23 - INSTALL THE ENDSTOP SWITCH BRACKET

ENDER 5 PLUS ONLY



The Ender 5 Plus requires the X-axis endstop switch to be installed onto the provided 3D printed bracket. This will prevent the NG fan shroud from touching the gantry wheel when Homing the printer.

Only use this printed bracket on the Ender 5 Plus, it is not needed on the Ender 5 or Ender 5 Pro.

- Unfasten the X-axis endstop switch.
- Remove the stock endstop bracket.
- Install provided endstop bracket.
- Reinstall the x-axis endstop switch.

## STEP 24 - POWER ON THE PRINTER



- Connect the power cable and turn the printer on.

## STEP 25 - UPDATE THE E-STEPS



The E-steps will need to be set to 400 in the printer settings. This can be done by printing a g-code file.

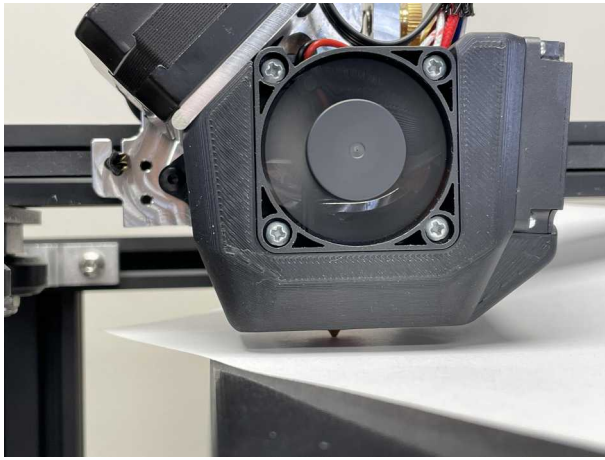
- Download the E-steps G-code from the link below.

[Download](#)

- Save the G-code file onto your SD card.
- “Print” the E-steps G-code file on your printer.

The g-code should take about 15 seconds to finish printing. It will not produce a printed object and will not give a confirmation that it was successful so just give it time to complete before moving on.

## STEP 26 - RELEVEL THE BED



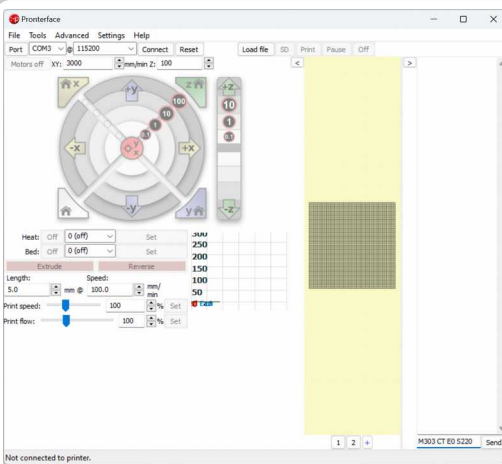
### Printers without Auto Bed Leveling Probe:

- Level the four corners of the bed.  
(Same way as before the upgrade)

### Printers with Auto Bed Leveling Probe:

- Configure the Z Offset for the new print head configuration.  
(Same process as before the upgrade)

## STEP 27 - PID TUNE

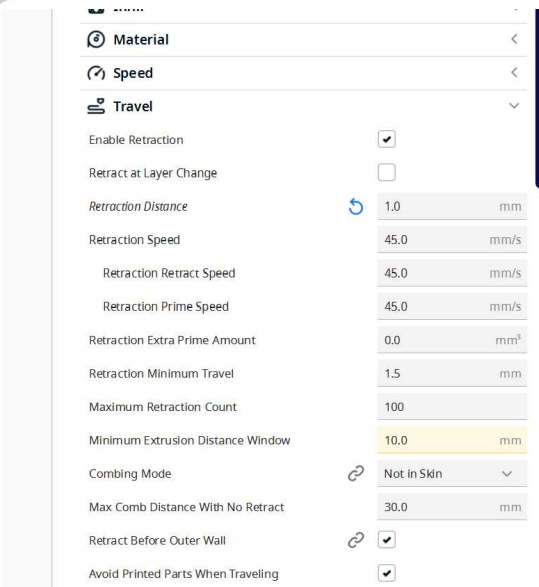


- We recommend PID tuning the new E3D Revo hotend before running your first print.

You may have the option of PID tuning through your 3D printer's menu, if not, E3D has a guide for Marlin firmware [here](https://e3d-online.zendesk.com/hc/en-us/articles/4408957427729-Revo-Micro-PID-Tuning-Marlin-Firmware-):

<https://e3d-online.zendesk.com/hc/en-us/articles/4408957427729-Revo-Micro-PID-Tuning-Marlin-Firmware->

## STEP 28 - CONFIGURE RETRACTION DISTANCE IN THE SLICER SOFTWARE



- Set the Retraction Distance to **1.0mm** in your slicer software.

**⚠ Do not use any g-codes that were sliced with a Retraction Distance higher than 1.5mm.**

If you are using Cura slicer and cannot find the Retraction Distance setting under the Travel settings tab - make sure that setting visibility is enabled by clicking **Settings** in the top menu bar, then **Configure setting visibility** and click the **Check All** box in the window that opens up.

# INSTALLATION COMPLETE!

# SERVICE TIPS

## REMOVING FILAMENT

- Preheat the hotend to printing temperature.
- Press the extruder arm to release the gear tension.
- Push the filament down about 10mm to extrude any melted plastic from the hotend.
- Quickly pull the filament out of the extruder.

## LOADING FILAMENT

- Preheat the hotend to printing temperature.
- Cut the tip of the filament at a 45-degree angle.
- Straighten the tip of the filament out.
- Using the printer menu issue an Extrude command.
- Insert the filament into the extruder as the gears are rotating.

When loading filament do not press the extruder arm until the filament has made it into the tube below the extruder drive gears.

## REVO NOZZLE REPLACEMENT PROCEDURE

- Remove any filament from the hotend.
- Allow the hotend to cool down below 50C.
- Unscrew the nozzle using your fingers.
- Screw in the new nozzle using your fingers.

The new nozzle can be finger tightened while the hotend is at room temperature - There is no need to preheat or use tools when tightening the nozzle.

