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SKU M3202

Micro Swiss NG™ Direct Drive Extruder for Creality Ender 5 / 5 Pro / 5 Plus
INSTALLATION INSTRUCTIONS

TOOLS NEEDED

Gather the required tools before starting installation.

- Phillips-Head Screwdriver
- Flat Head Screwdriver
- 3mm Allen wrench
- 2.5mm Allen wrench
- 2mm Allen wrench
- 1.5mm Allen wrench (included with the kit)
- 10mm spanner wrench
- 8mm spanner wrench
- Flush cutters

WHAT'S IN THE BOX

1x Master Extruder Assembly
1x Ender 5 Adaptation plate
1x LDO Stepper motor
1x Fan Shroud
1x Custom Extension Cable
1x All Metal Hotend Assembly
1x Printed PTFE Tube bracket
1x Printed BLTouch bracket
1x Printed Endstop switch bracket

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 SCREWs
4x M2.2 x 8mm Thread Forming Screw for Plastic
4x M3 x 12mm Thread Forming Screw for Plastic
1x 7mm spanner wrench
1x 1.5mm Allen wrench

PREPARATION

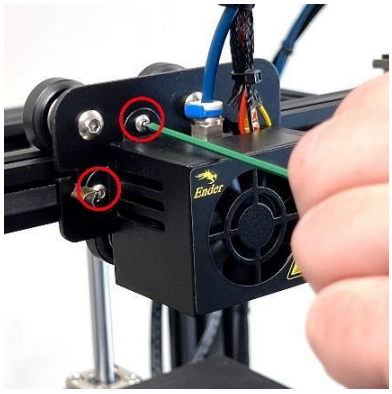
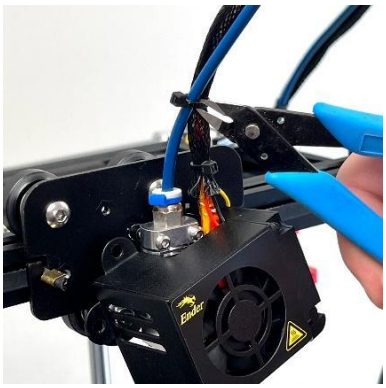
If your printer has a bed leveling probe, print the required probe mounting bracket.
Download here

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

Step 1 - SAFETY

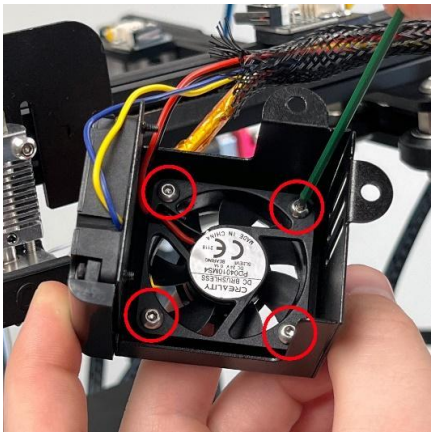
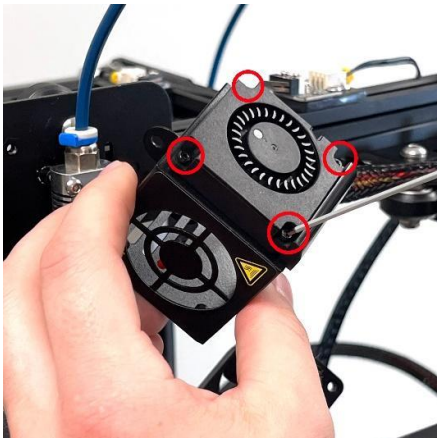
⚠ For your safety, turn off and unplug your printer.

Step 2 - REMOVE THE FAN SHROUD

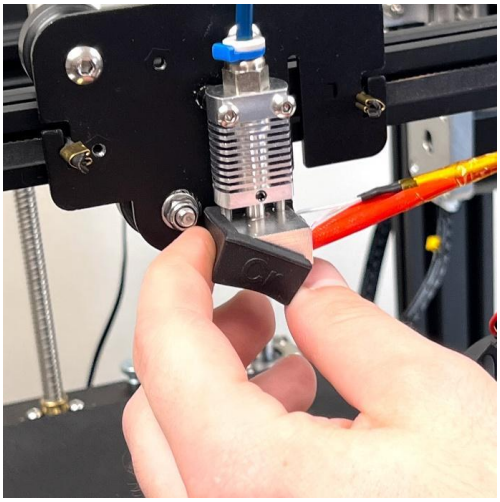
- Remove the fan shroud by unscrewing the two screws holding the shroud to the carriage plate
- Cut the zip ties holding the Bowden Tube and cables together

Step 3 – REMOVE THE FANS

- Remove the screws holding the hotend fan
- Remove the fan duct to get access to the part cooling fan screws (some printers)
- Remove the screws holding the part cooling fan

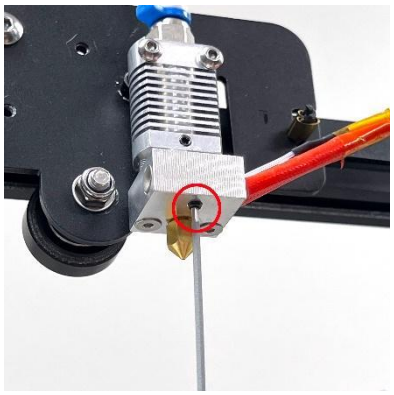
Step 4 – REMOVE THE SILICONE SOCK

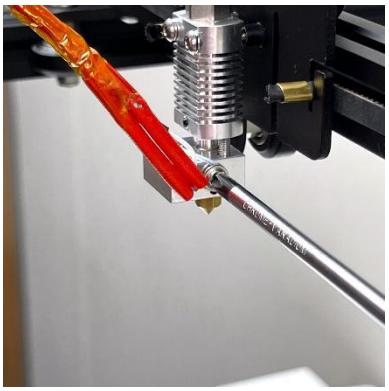


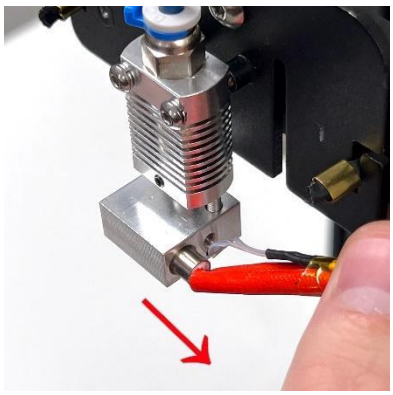
⚠ Make sure the hotend is at room temperature!

- Remove the silicone sock from the heater block

Step 5 – REMOVE THE HEATER CARTRIDGE AND THERMISTOR



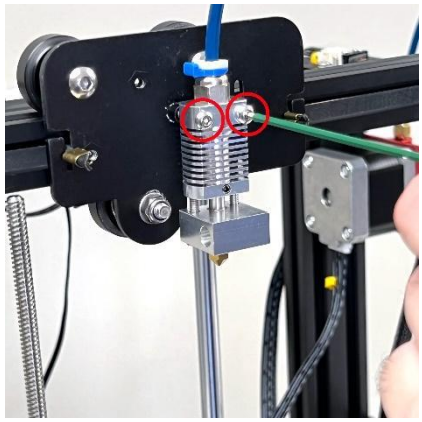


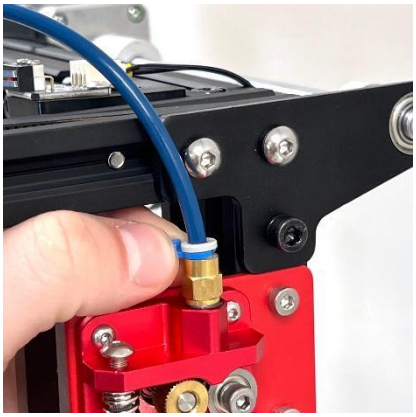


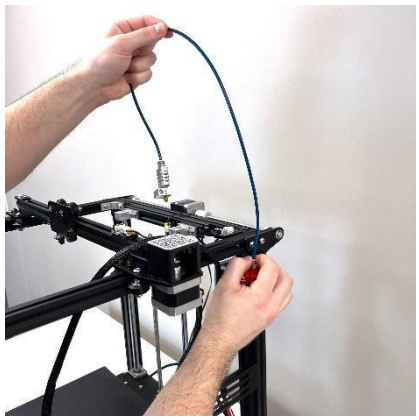
- Remove the heater cartridge set screw using 1.5mm Allen wrench
- Remove the thermistor screw using the Phillips-Head Screwdriver
- Gently pull the thermistor and heater cartridge out of the heater block

⚠ Be careful not to damage the delicate wires

Step 6 – REMOVE THE HOTEND



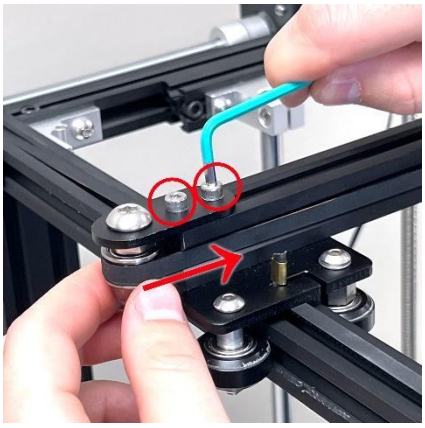


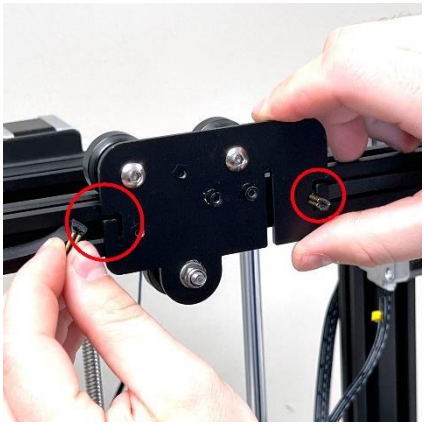


- Remove the two screws holding the hotend using a 2mm Allen wrench
- Remove the retaining C-clip from the Bowden extruder
- Press the plastic Bowden Coupler lip down and pull the PTFE tube out of the original extruder
- Take the hotend and PTFE tube out of the printer together

Save the PTFE tube to be reused during the installation of the NG Extruder

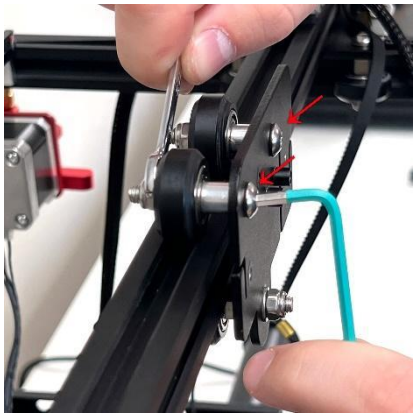
Step 7 – UNCLIP THE BELT





- Loosen the two screws holding the X-axis belt tensioner by unscrewing the two screws using a 3mm Allen wrench
- Unclip the belt from both sides of the original carriage plate

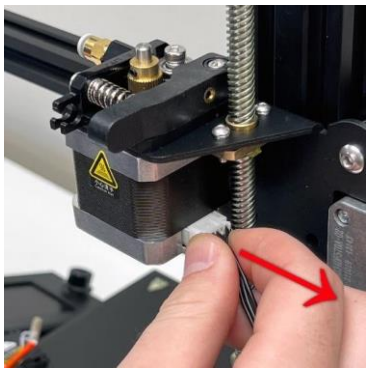
Step 8 – REMOVE THE CARRIAGE PLATE

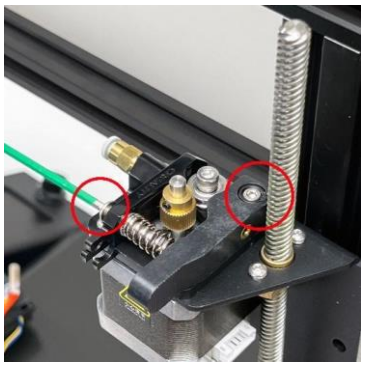


- Unscrew the roller wheels using a 3mm Allen wrench on the screw head and an 8mm spanner wrench to turn the lock nut
- Remove the original carriage plate

Save the V-roller wheels to be reused during the installation of the NG Extruder

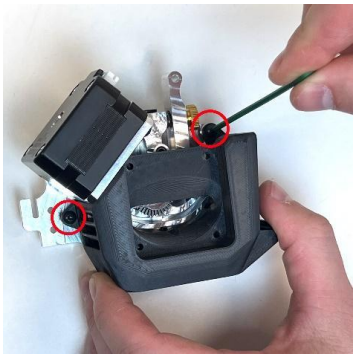
Step 9 – REMOVE THE ORIGINAL EXTRUDER





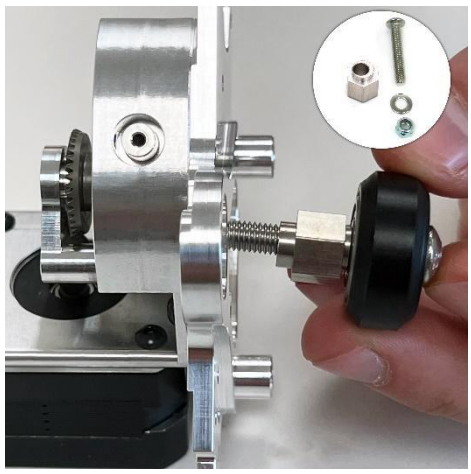
- Unplug the cable from the stepper motor
- Use the 2.5mm Allen wrench to remove the tension screw and then the plastic extruder arm
- Use the 2mm Allen wrench to unscrew the Bowden extruder from and stepper motor

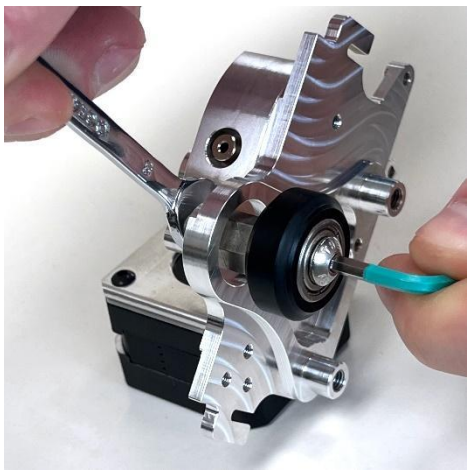
Step 10 – PREPARE THE NG ASSEMBLY



- Prepare the NG extruder for assembly by removing the fan shroud

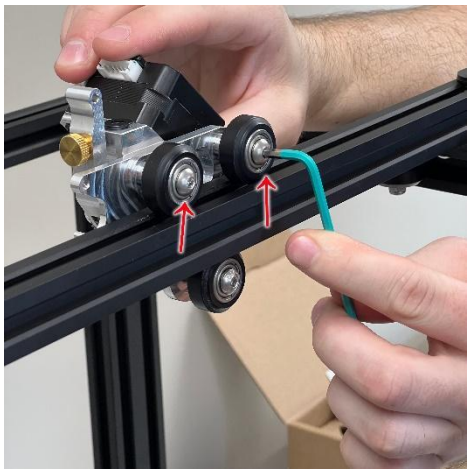
Step 11 – INSTALL THE BOTTOM WHEEL AND ECCENTRIC NUT





- Place one of the original V-Roller wheels onto the longer M5 screw provided with the kit
- Place the eccentric nut onto that M5 screw, on top of the V-Roller
  Note the correct orientation of the eccentric nut – the longer lip facing away from the V-Roller
- Insert the M5 screw/V-Roller assembly into the bottom hole of extruder main body
- Install the washer and then secure the M5 screw/V-Roller assembly using the nylon lock nut
- Verify that the V-Roller still spins after tightening the nylon lock nut

Step 12 – INSTALL THE TOP TWO WHEELS



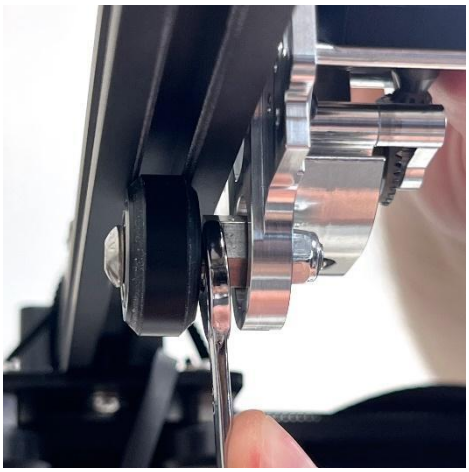
- Insert the provided shorter M5 screws into the two remaining V-Roller wheels

Be sure to use provided nylon patched screws!

- Install the two M5 screw/V-rollers onto the carriage

If it is difficult to fit the last V-Roller wheel, adjust the bottom V-Roller position by rotating the eccentric nut using a 10mm wrench

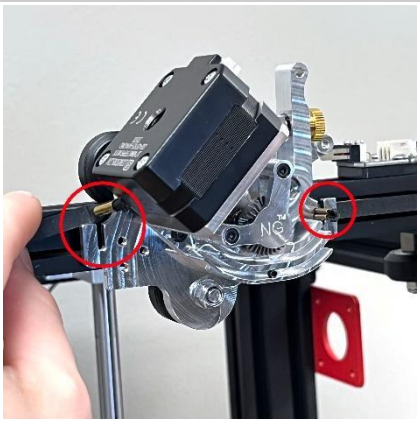
Step 13 – ADJUST THE WHEEL TENSION

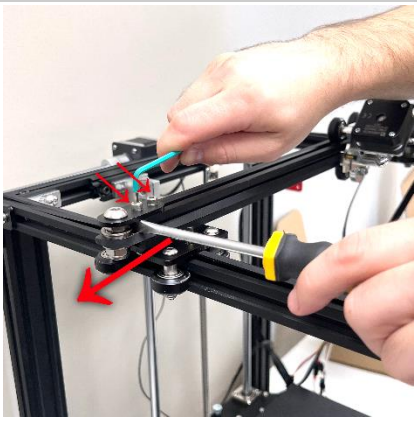


- To eliminate any wobble from the carriage, adjust the tension of the V-Roller wheels by rotating the eccentric nut using a 10mm wrench

  While holding the carriage to prevent it from moving, try rotating one of V-Roller wheels to make it slip. Ideally you should feel some resistance, but not so much that you cannot make the wheel rotate on its own when turned by hand

Step 14 – CONNECT THE BELT





- Insert the original X-axis belt into the slots on both sides of the extruder
- Tighten the X-axis belt
- Move the carriage side to side to verify the belt is seated properly and wheels are rotating smoothly

Step 15 – PREPARE THE HOTEND

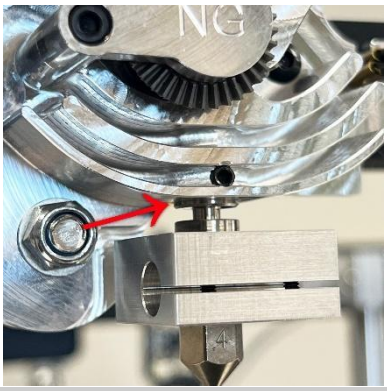
- Remove the silicone sock from the all metal hotend
- The included hotend has already been preheated and the nozzle has been tightened to spec at the factory

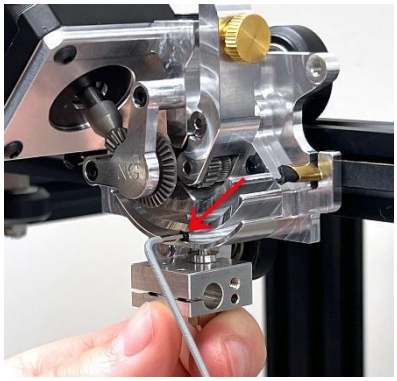
  There is no need to do the nozzle tightening procedure on the new hotend unless you are replacing the nozzle

  When replacing nozzles in the future, the hotend will need to be preheated to exactly 220C and the new nozzle should be torqued to 30-inch pounds

  The thermal break needs to be fully seated before the nozzle is tightened down

Step 16 – INSTLL THE HOTEND



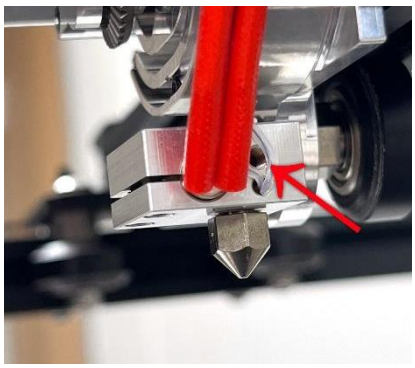


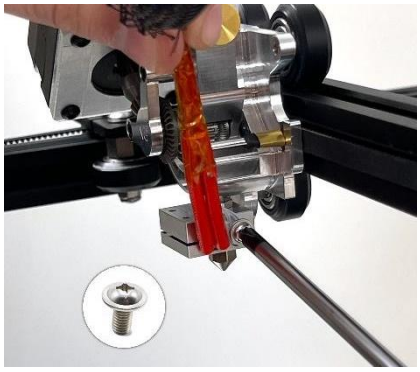
- Insert the hotend assembly into the extruder

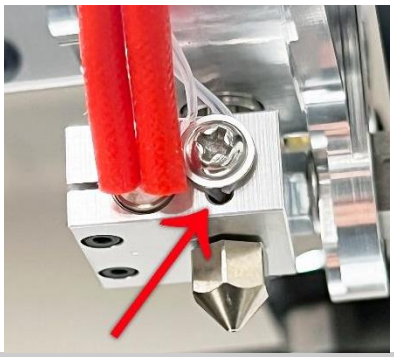
Verify the thermal break is seated as deep as possible in the extruder (compare with reference image on the left)

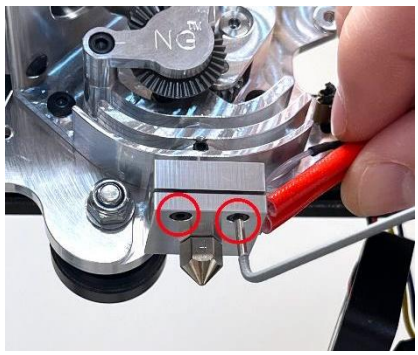
- Tighten the grub screw using a 1.5mm Allen wrench

Step 17 – INSTALL THE THERMISTOR AND HEATER CARTRIDGE









- Install the heater cartridge and the thermistor

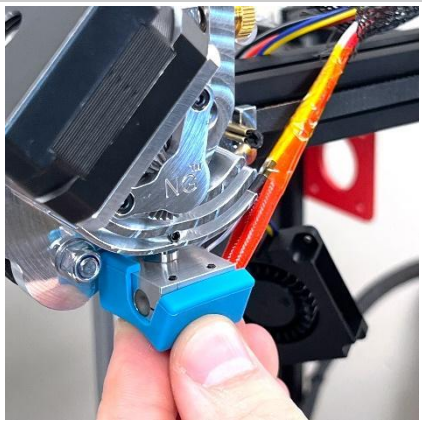
- Secure the thermistor

Be careful not to overtighten the screw as this can damage delicate wires

Make sure the thermistor sits all the way inside the thermistor hole. The glass bead of the thermistor should not be visible from the outside

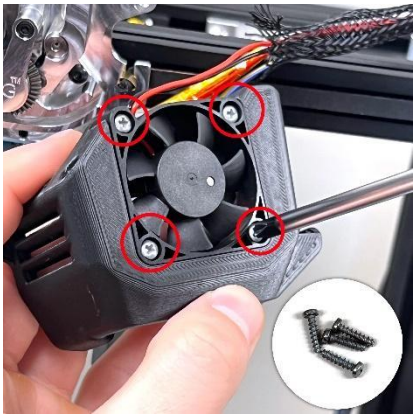
- Tighten the two heater cartridge screws using the 1.5mm Allen wrench

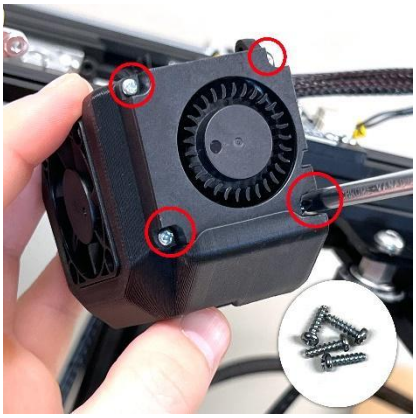
Step 18 – INSTALL THE SILICONE SOCK



- Install the silicone sock

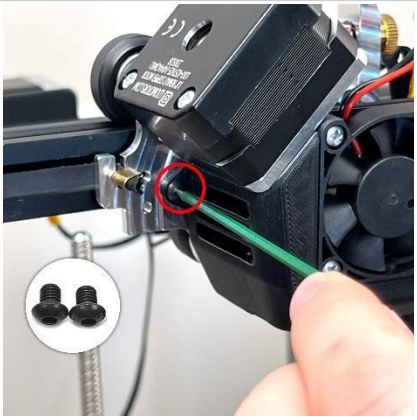
Step 19 – ATTACH THE FANS TO THE FAN SHROUD

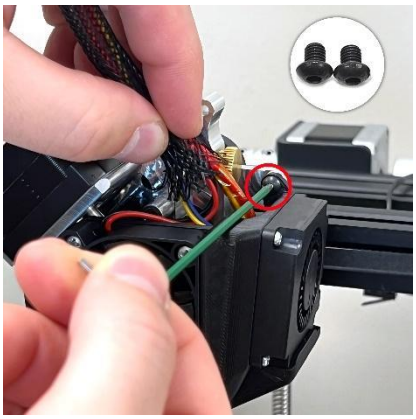




- Install the part cooling fan onto the fan shroud using the smaller of the four provided self-tapping screws
- Install the hotend cooling fan onto the fan shroud using the larger of the four provided self-tapping screws

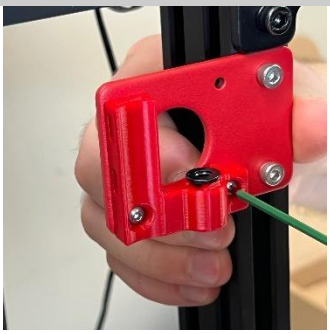
Step 20 – INSTALL THE FAN SHROUD





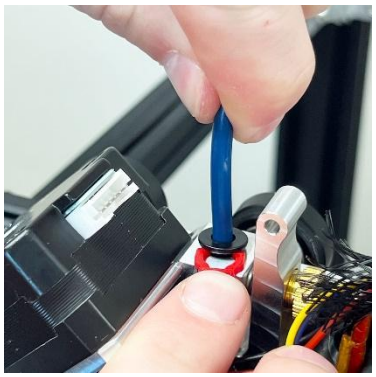
- Install the assembled fan shroud back on the extruder

Step 21 – INSTALL THE FILAMENT GUIDE BRACKET



- Install the filament guide bracket where the original Bowden extruder used to sit, using provided M3 nuts and bolts

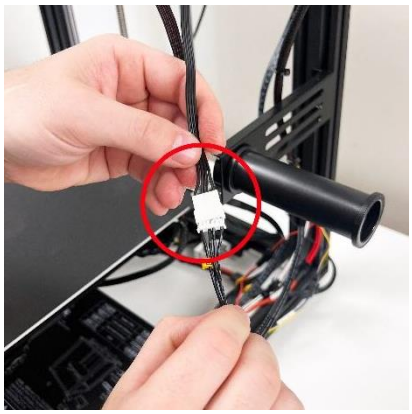
Step 22 – INSTALL THE FILAMENT GUIDE TUBE

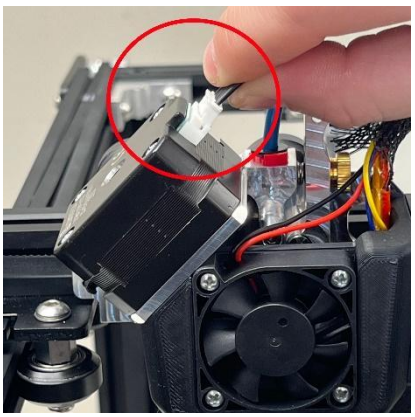


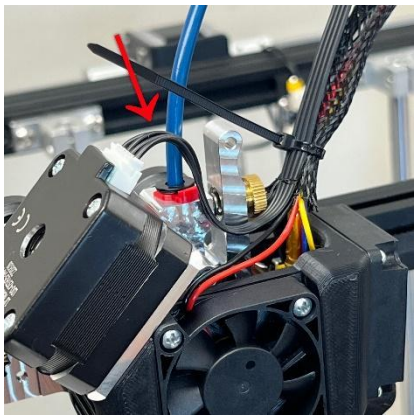
The printers original Bowden tube will be reused to help guide filament from the spool into the Extruder

- Insert the filament guide tube into the Filament Guide Bracket and secure it using one of the provided retaining clips
- Insert the other end of the filament guide tube into the top of the Extruder and secure it using one of the provided retaining clips

Step 23 – INSTALL THE EXTENSION CABLE



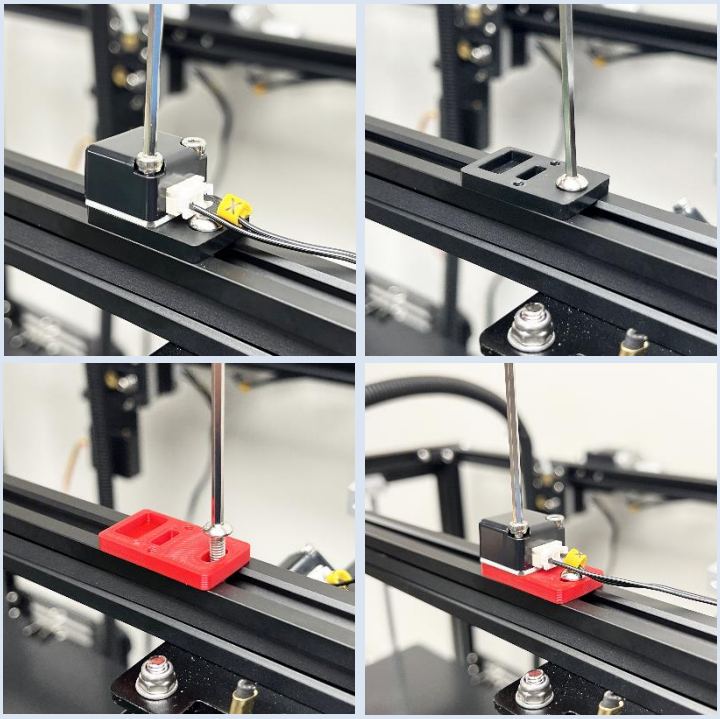




⚠ **It is very important to use the provided extension cable.**
This cable has a special pinout to use the NG Extruder's LDO motor

- Connect on end of the extension cable to the original E cable and the other end to the LDO stepper motor
- Make sure to give the extension cable some slack near the stepper motor

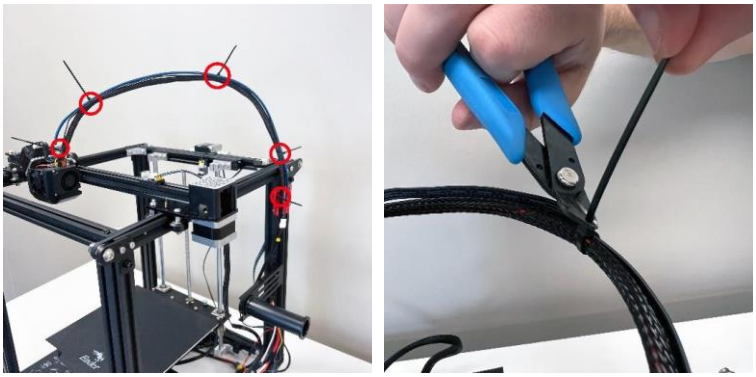
ENDSTOP SWITCH (ENDER 5 PLUS ONLY)



The Ender 5 Plus requires the X-axis endstop switch to be installed onto the provided bracket. This will prevent the NG fan shroud from touching the gantry wheel when Auto Homing the printer.
(Only use this bracket on the Ender 5 Plus, it is not needed on the Ender 5 or Ender 5 Pro)

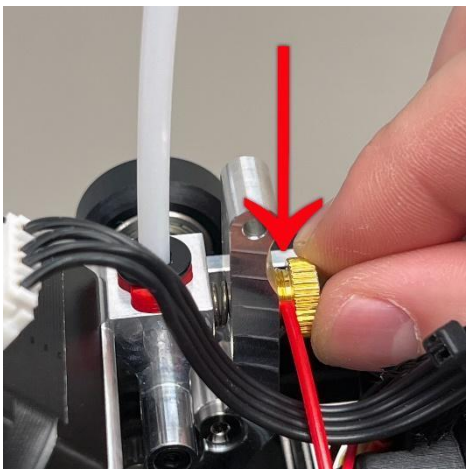
- Unfasten the X-axis endstop switch
- Remove the stock endstop bracket
- Install provided endstop bracket
- Reinstall the x-axis endstop switch

Step 24 – CABLE MANAGEMENT



- Use provided zip ties to managed your cables neatly

Step 25 – 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)

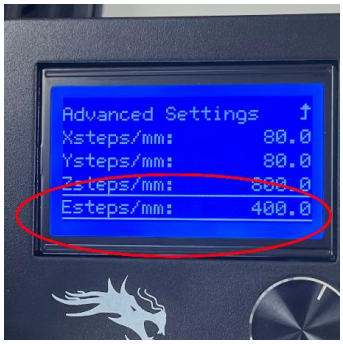
  The good starting point for stiff filaments such as PLA, PTEG, ABS is 1.75mm of exposed threads (use a piece of 1.75mm filament as a gauge as shown in the image on the left)

  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 26 – POWER ON THE PRINTER

- Plug the power cable in and turn the printer on

Step 27 – UPDATE E-STEPS

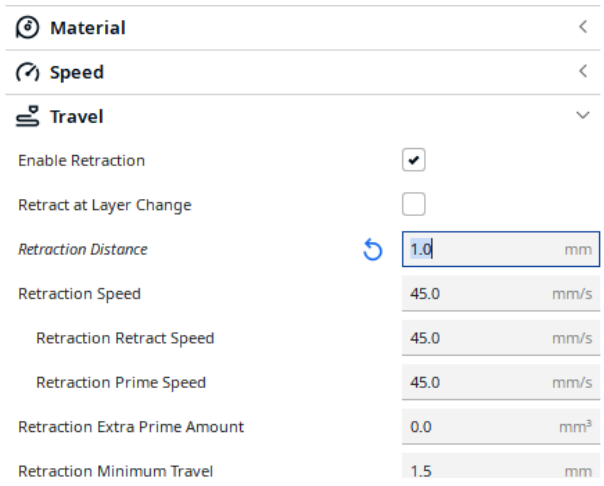


The E-steps will need to be set to 400 in the printer settings

- Download the Esteps G-code
- Copy the Esteps G-code file onto your Micro CD card
- "Print" the Esteps G-code using the printer menus, as you would with a regular G-code that was made using a slicer

Some printers will save the printer settings to a file on the MicroSD card.
For those printers, the MicroSD card has to be inside of the printer when the printer is being turned on, otherwise the new settings will not be loaded

Step 28 – CONFIGURE SLICER SETTINGS



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

Do not use any gcodes that were sliced with a Retraction Distance higher than 1.5mm.

INSTALLATION COMPLETE

Service Tips

Removing Filament

- Preheat the hotend to printing temperature
- Press the extruder arm to release the gear tension
- Purge the nozzle by manually pushing the filament down about 10mm to extrude any melted plastic
- 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 menus issue an Extrude command
- Insert the filament into the extruder as the gears are rotating

When loading filament initially do not press the extruder arm until after the filament has made it into the tube below the extruder gears. After that you can then either continue to issue more Extrude commands using the printer menu or press the extruder arm back and push the filament down manually until you see melted filament coming out of the hot nozzle.

Nozzle Replacement Procedure

- Preheat the hotend to exactly **220C**
- Remove the filament from the hotend
- Unscrew the old nozzle, while holding the heater block in position using an adjustable wrench
- Screw in the new **MK8** nozzle and torque it to 30-inch pounds, while holding the heater block in position using an adjustable wrench

  Verify that the thermal break is still seated flush on top of the heater block after installation