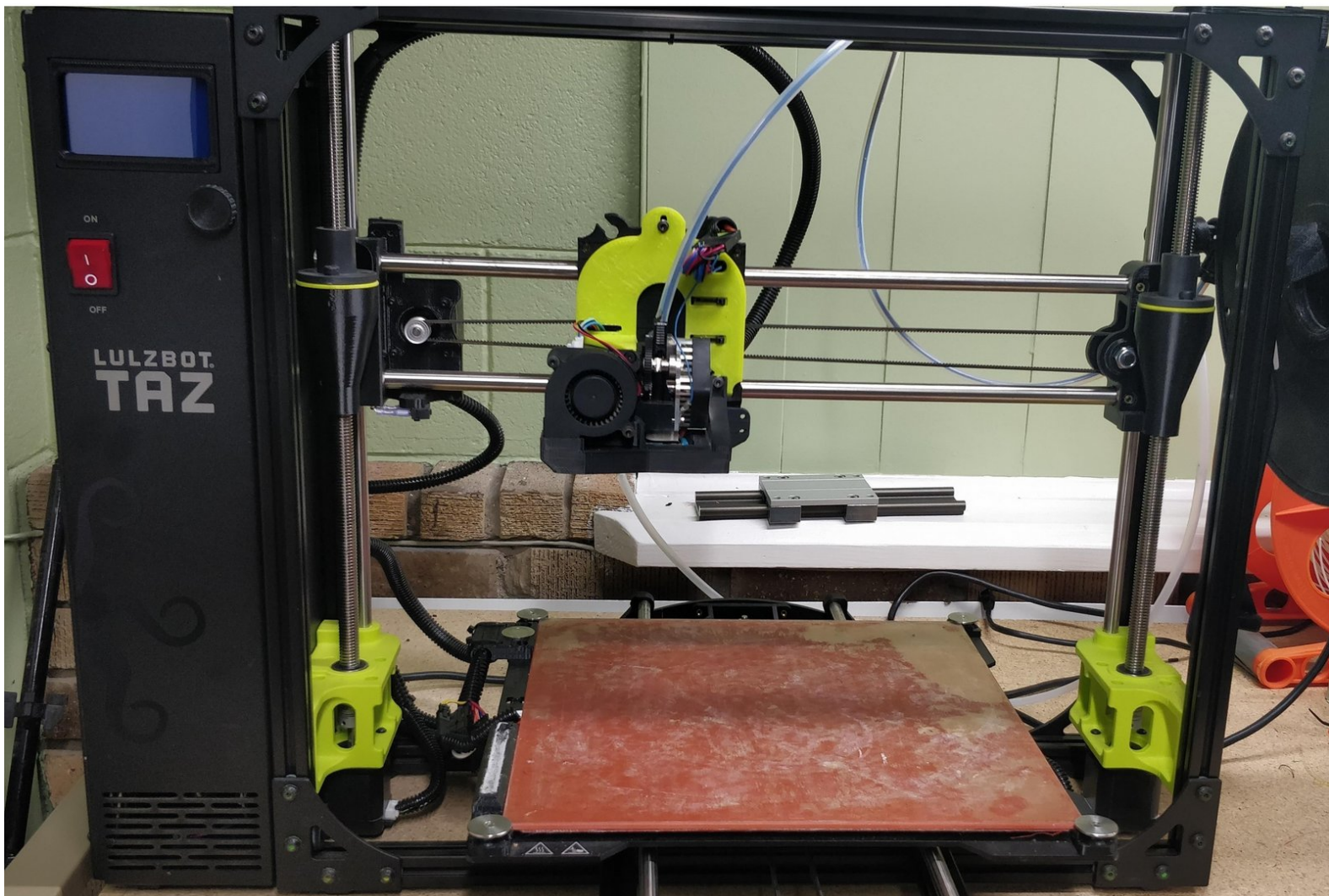




# LulzBot Taz6 Hemera Upgrade

Add a Hemera extruder to your LulzBot Taz6

Written By: Joe Spanier



# INTRODUCTION

Purchase your Hemera here: <https://e3d-online.com/e3d-hemera-175-ki...>

For the printed parts please see:

<https://www.thingiverse.com/thing:400889...>

Please note that this guide is assuming the use of a fully assembled and hot tightened Hemera unit if you have not yet fully assembled and hot tightened your unit please see: Hemera Assembly Guides

Mounting a Hemera to a Lulzbot Taz 6 is easy, and we provide most of the tools you'll need. Please note, though, that you should be very careful of the following safety cautions:

- Be aware of your electronics. Don't work on your printer while it is plugged in or turned on.
- Be aware when you heat up your new hotend not to burn yourself on the heater block nozzle or heater cartridge.
- The standard Hemera is capable of printing up to 285°C, do not exceed these temperatures unless you have replaced the Thermistor cartridge with a PT100, the Aluminium heater block with a Plated copper heater block, and the Brass nozzle for a Plated copper, Hardened steel or Nozzle X.
- Firmware modification is not optional it is a mandatory step,
- Make sure you have ordered and received the correct voltage heater and fan to match the power supply of your printer. All of our current heater cartridges should have the voltage and wattage laser engraved on the cartridge. Taking an ohm reading is the most reliable method of testing what voltage/ wattage you have received.
- Connecting 12v parts to a 24v power supply can result in overheating, component damage, or fire. If you are unsure double check the rating on your power supply.
- Your HotEnd and your printer are your responsibility. We cannot be held responsible for damages caused by the use, misuse or abuse of our products.



## TOOLS:

- [Pin Crimpers](#) (1)
- [2.5mm Allen Key](#) (1)
- [2mm Allen Key](#) (1)



## PARTS:

- [5v 40x10mm 5cfm+ fan](#) (1)  
[5v 40x10mm 5cfm+ fan](#)  
<https://www.digikey.com/product-detail/en/cui-inc/CFM-4010V-070-273/102-4361-ND/7620535>
- [molex sl 24-30 awg crimp-terminal pin x30](#) (1)  
<https://www.lulzbot.com/store/parts/molex-sl-24-30-awg-crimp-terminal-pin-x30>
- [M3 Heat sets](#) (1)  
<https://www.lulzbot.com/store/parts/heat-set-insert-tapered-m3-05mm-internal-thread-38mm-l-x20>
- [16pos Molex terminal](#) (1)  
<https://www.digikey.com/product-detail/en/molex/22-55-2161/WM2525-ND/171969>
- [50x50x15mm centrifugal blower fan](#) (1)  
<https://www.amazon.com/SoundOriginal-50x50x15mm-Humidifier-Aromatherapy-Replacement/dp/B0755BY9RH>
- [M3x12mm Socket Head Cap Screw](#) (6)
- [M3x20mm Socket Head Cap Screw](#) (2)
- [M3x10mm Flat Head Cap Screw](#) (5)
- [M3 washers](#) (4)
- [18g ring terminal with at least 3mm hole](#) (1)
- [Taz 6 Universal adapter](#) (1)  
<https://www.lulzbot.com/store/tool-heads/universal-tool-head-adapter-taz-5-taz-6> you can either buy it or download the source files and print it.
- [Printed Lulzbot Hermes adapter](#) (1)
- [Printed Fan Duct](#) (1)

## Step 1 — Gather idler parts



- Gather:

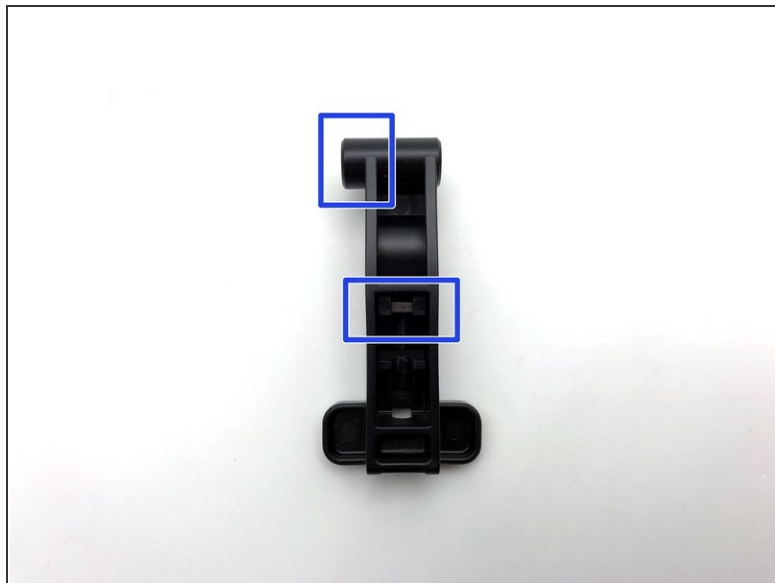
- x1 Hemera idler main body
- x1 Hemera slid block (black)
- x1 Hemera spring block (white)
- x1 Hemera Thumbwheel
- x1 M3 Square nut

## Step 2 — Prepare slide block



- Insert the square nut into the slide block.

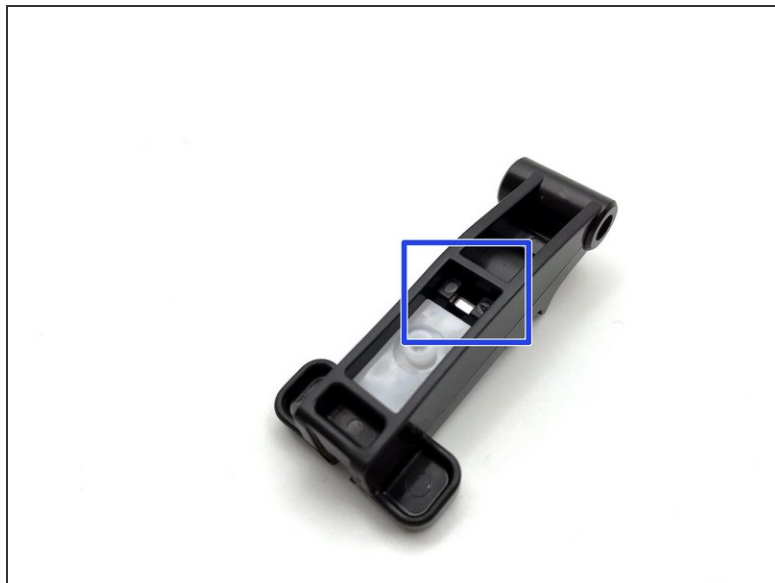
### Step 3 — Assembling the idler lever



- Place the sliding block with the square nut into the idler lever.
  - Check orientation of the inserted slide block before proceeding.
- ① It is easier to do this part with the Idler held "vertically" so that the square nut doesn't fall out in the act.

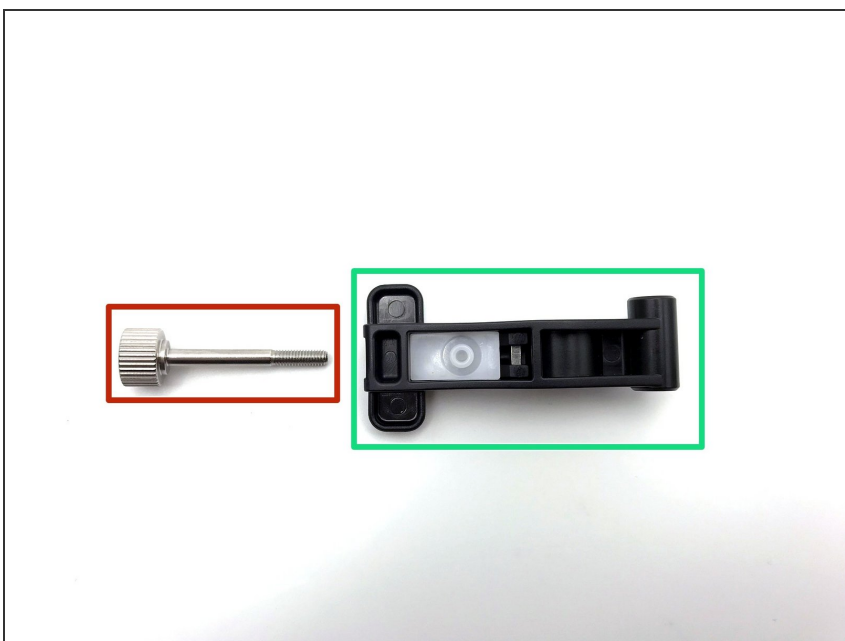


## Step 4 — Preparing idler arm



- Place the spring block into the idler arm.
  - Check orientation before proceeding.
- i** The spring block will fit nicely against the slide block when done right.

## Step 5 — Gather thumbscrew and idler assembly



- Gather the thumbscrew
- Gather idler assembly

## Step 6 — Insert thumbscrew



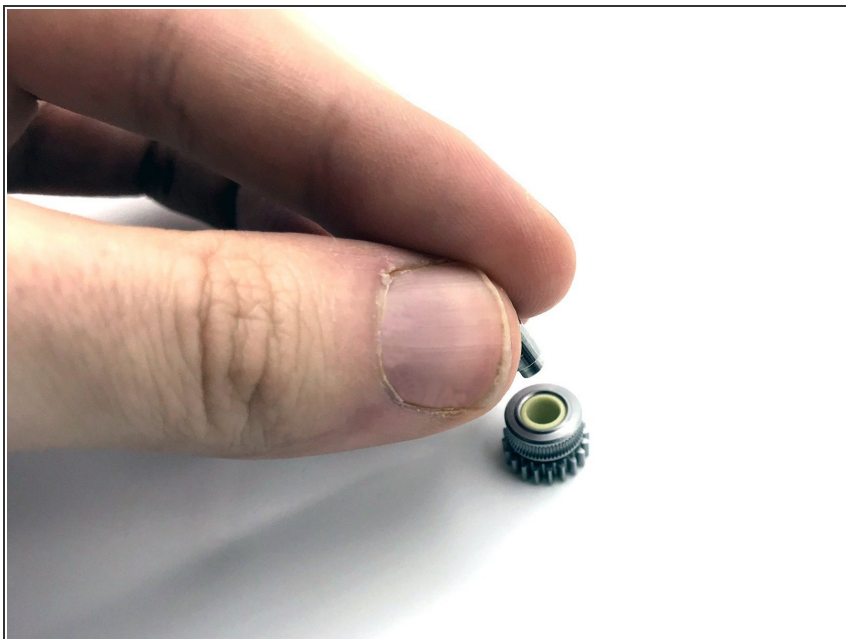
- Insert the thumbscrew into the idler assembly.
- ⓘ Only turn it once or twice when the threads catch. Having low tension will make later assembly easier.

## Step 7 — Gather parts



- Gather:
  - Idler hob assembly
  - Idler shaft

## Step 8 — Prepare idler



- Place the idler shaft into the idler hobb assembly.
- ⓘ This will be a loose fit so be careful when you pick it up again.

## Step 9 — Hobb placement



- Place the idler hobb assembly on the idler arm.
- Check orientation before proceeding.
- ⓘ Make sure to fully press the idler hobb assembly into the idler arm before proceeding.
- ⓘ It should click into place.



## Step 10 — Prepare heatsink



- Place the dowel into the heatsink

## Step 11 — Place spring



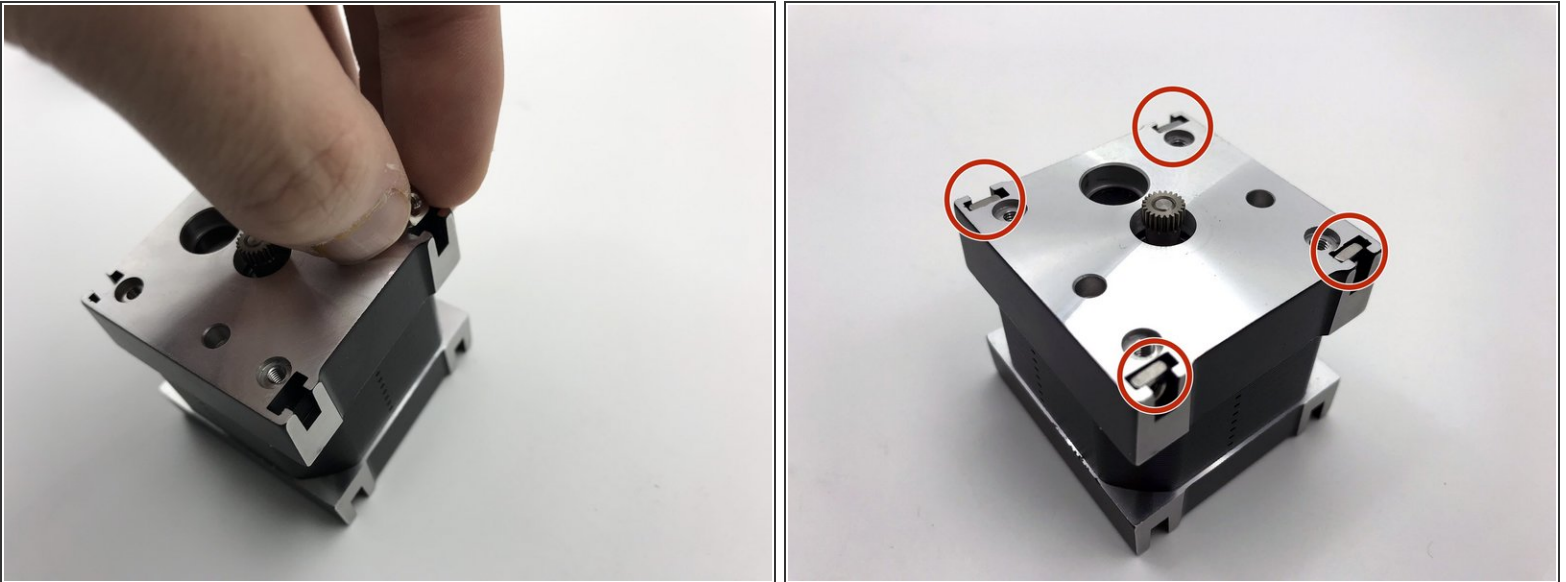
- Place the spring on the spring block.
- Place the Idler arm with spring onto the idler pin.
- ⓘ Holding the spring in place will aid the insertion into the groove on the inside of the heatsink.

## Step 12 — Insert drive train



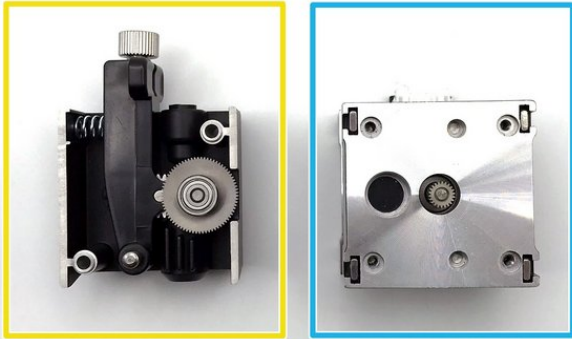
- Place the drive hobb assembly into the bearing pocket in the heatsink.
- ⓘ The drive hobb assembly should line up with the slot in the heatsink.
- ⓘ If the two bearings are not on the hobb shafts at this point place them on.

## Step 13 — Prepare motor



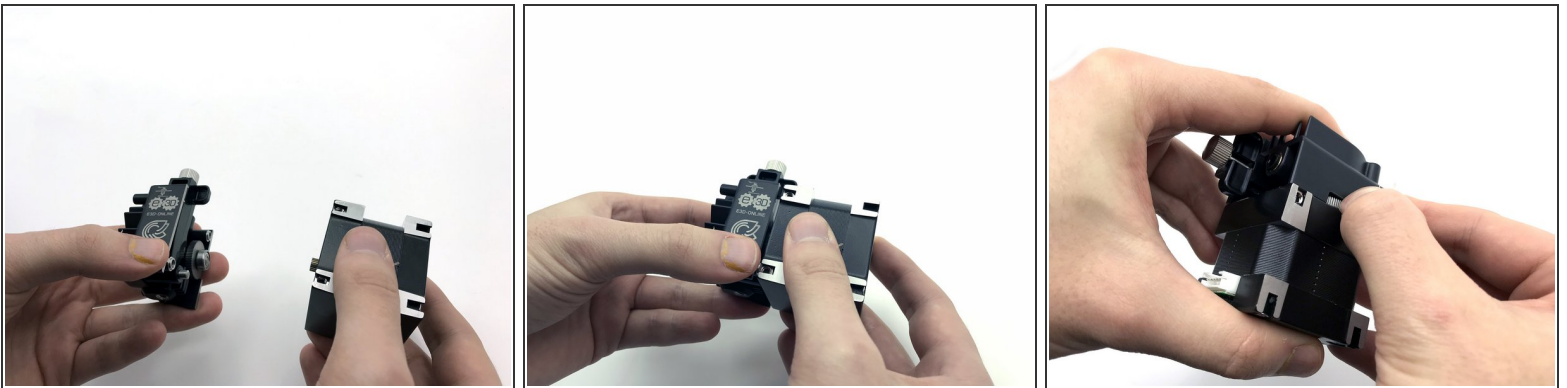
- Place x4 M3 square nuts into the T slots on motor face.

## Step 14 — Gather parts



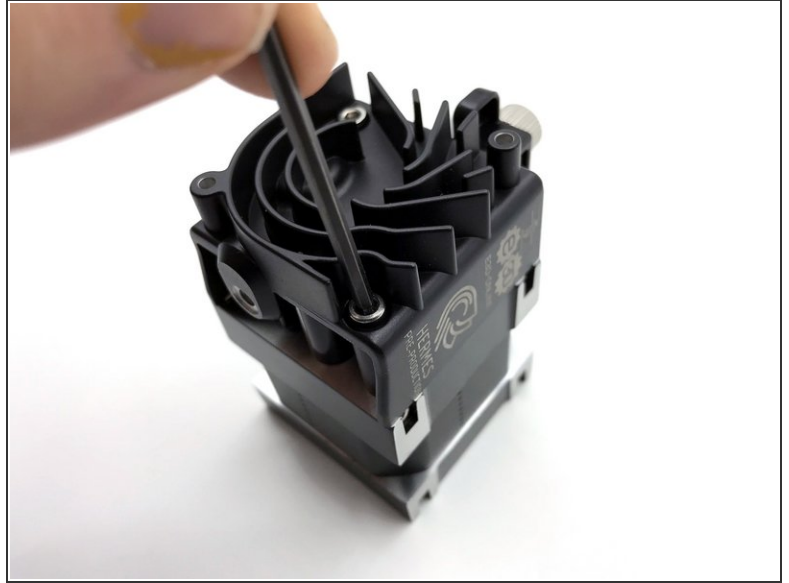
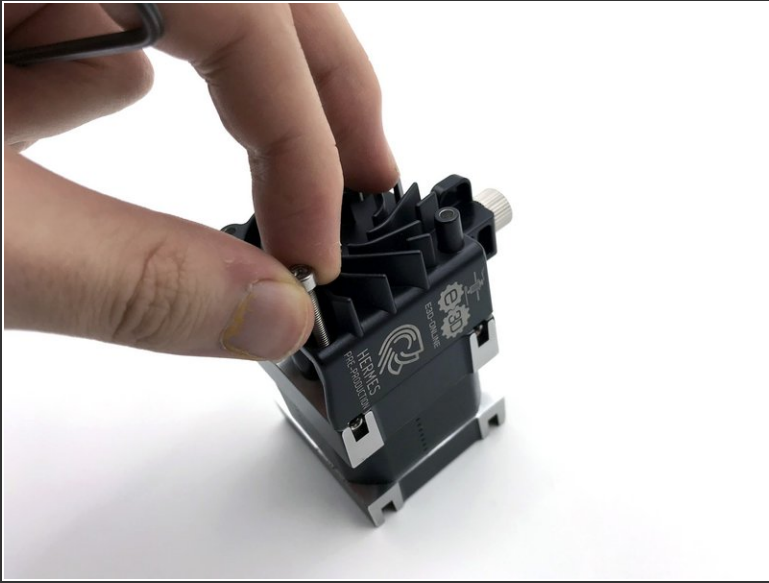
- Gather:
  - Heatsink assembly
  - Motor assembly

## Step 15



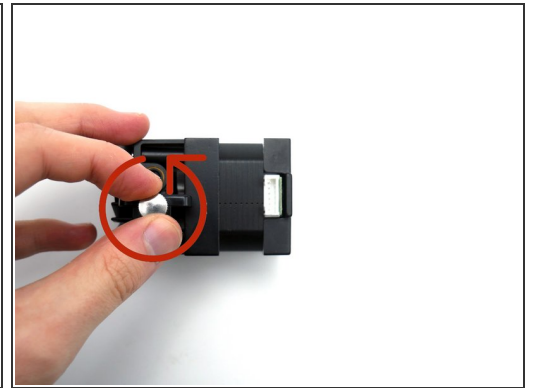
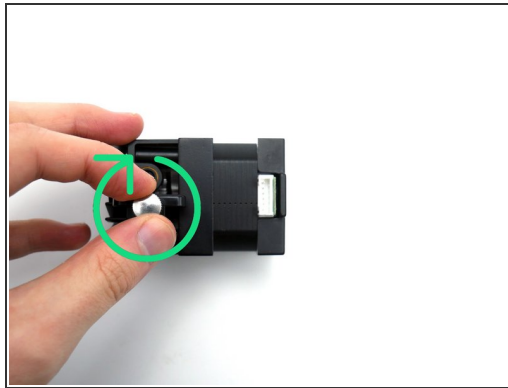
- Place the heatsink onto the motor face.
  - The aim is to line up the bearing on the drive hobb assembly with the bearing pocket on the motor face.
- i** Keep the motor facing upwards to prevent the square nuts falling out.

## Step 16



- Place the M3 screws into the two holes on the heatsink.
- Fasten the M3 screws with a 2.5mm Allen key

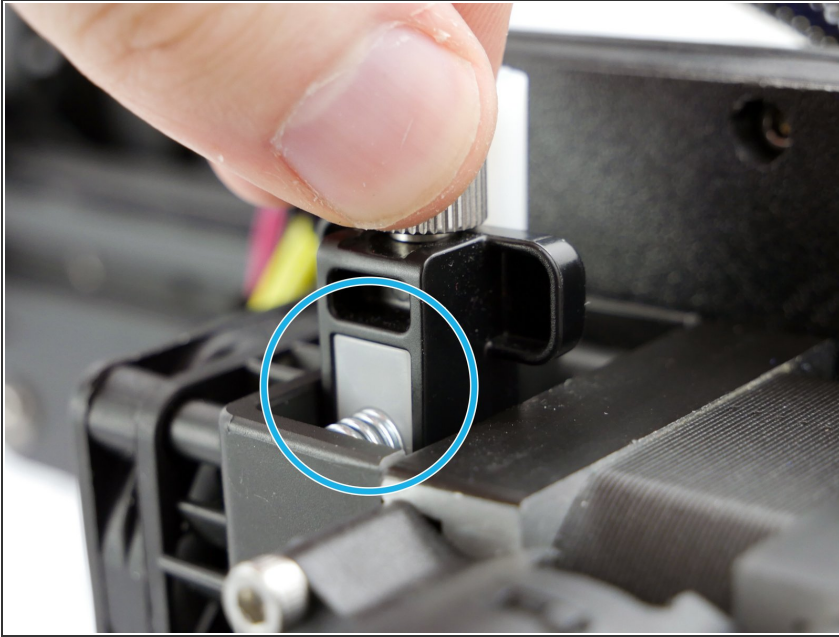
## Step 17 — Idler tension



- To adjust the idler tension, rotate the thumbscrew at the top.
- Rotating clockwise (with the heat sink engraving facing you) increases filament tension.
- Rotating anticlockwise decreases filament tension.



## Step 18



- ① Recommended starting idler lever tension.
- The white spring block should be flush with the front face of the idler lever.
- ① Further adjustment may be required dependant on material being used, for example flexible filaments may require additional tension.

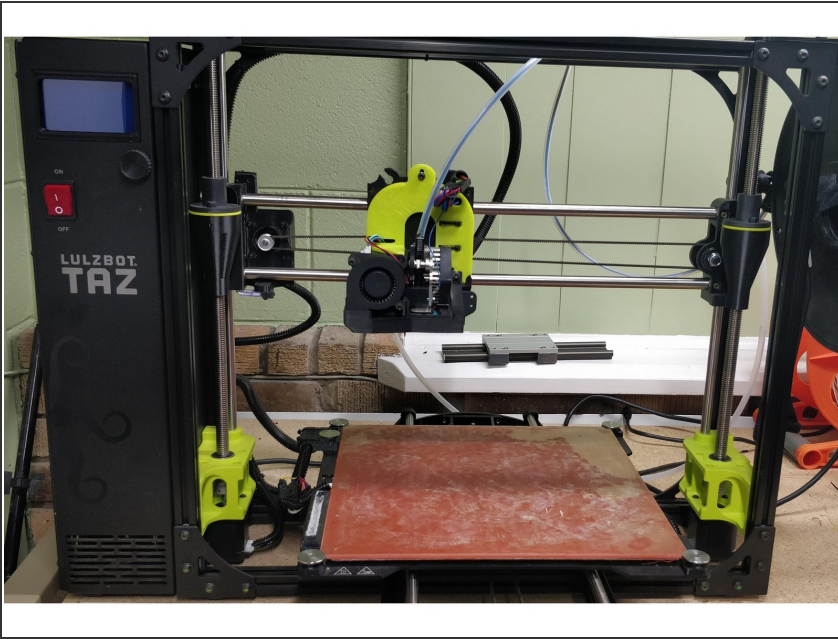
## Step 19



- For Direct assembly instructions. Please see: [02 - E3D Hemera Direct Assembly](#)
- For Bowden assembly instructions please see: [03 - E3D Hemera Bowden Assembly](#)
- For mounting instructions please see: [04 - General E3D Hemera Mounting Guide.](#)
- For Current adjustment instructions please see: [05 - E3D Hemera Current Adjustments \(VREF\)](#)



## Step 20 — Prep Your Machine



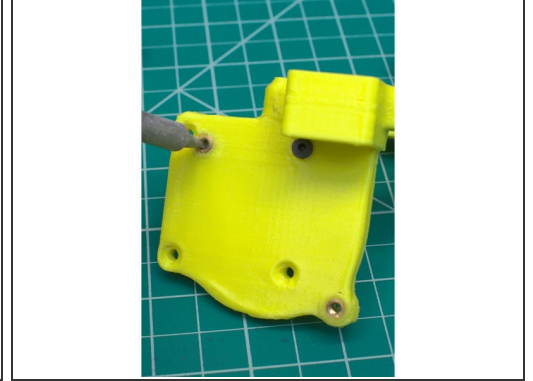
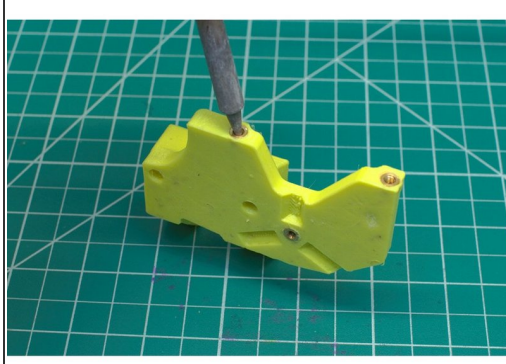
- Raise Gantry to the middle of the machine to give yourself room to work.
- Unload the filament and allow your nozzle to cool
- Once the nozzle is cool, power down and unplug your machine to prevent any damage to the machine.

## Step 21 — Gather



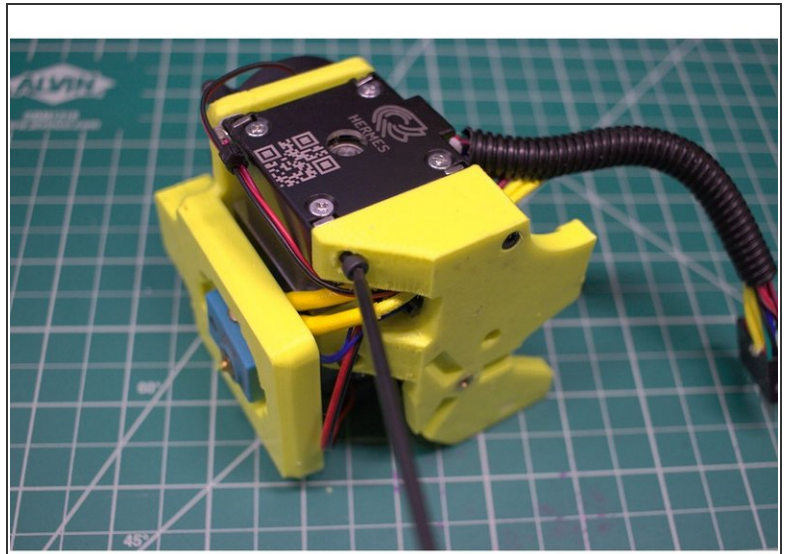
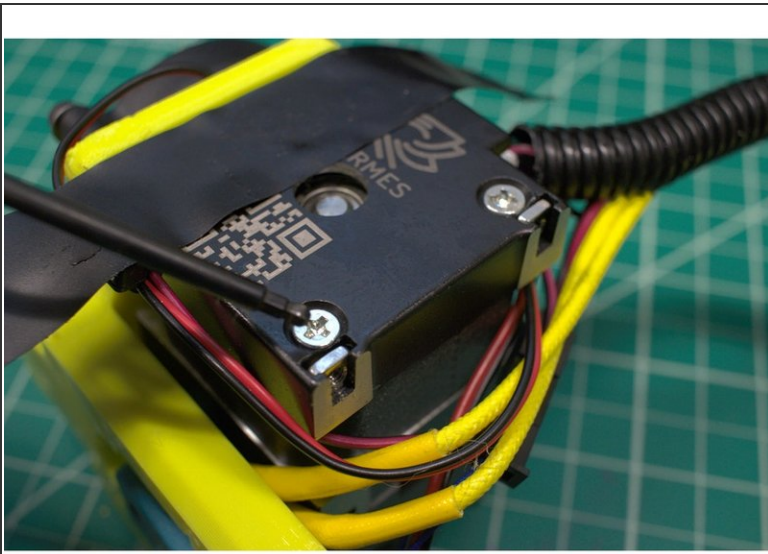
- M3 Heatsets
- Printed LulzBot to Hermes Adapter
- Printed Fan Duct
- Soldering Iron

## Step 22 — Assemble Heatset Inserts



- Insert single heatset into center hole in the back of the LulzBot Hermes Adapter
- Insert 2 heatsets into holes in the top of LulzBot Hermes Adapter
- Insert 2 heatsets into the two large non-chamfered holes in the front fan mount

## Step 23 — Assemble the Hermes to the LulzBot Hermes Mount



- Gather your Hermes Mount
  - Insert 2 T-nuts into the back two slots. If you are looking at the back of the motor insert them into the slots on the right
    - Pro-tip - cover the t-slots with a piece of tape after the nuts are inserted so they can't fall out during assembly
  - Add 4 M3x12mm socket head cap screws in the four holes in the back of the Hermes mount
  - Align Hermes to the bolts and screw them in using a 2.5mm allen key.
- ⚠ Be aware it is possible to crack the t slots if you use screws that are too long and bottoms out. Our recommendation is to use screws that protrude 3mm +/- 0.25mm from the mounting surface to go into the T-Slots. Over tightening also risks snapping the T slot.

## Step 24 — Assemble Hermes to Taz6 Universal Mount



- Gather Taz6 Universal Mount
- Align Hermes mount to the Taz 6 Universal Mount and insert 1 M3x10mm Flat head cap screw in the center hole in the back of the Universal Mount into the center M3 Heat set in the Hermes Mount
- Add 2 M3x12 socket head cap screws with M3 Washers to the two holes in the top of the Hermes Mount to fully mount it to the Universal Taz 6 mount

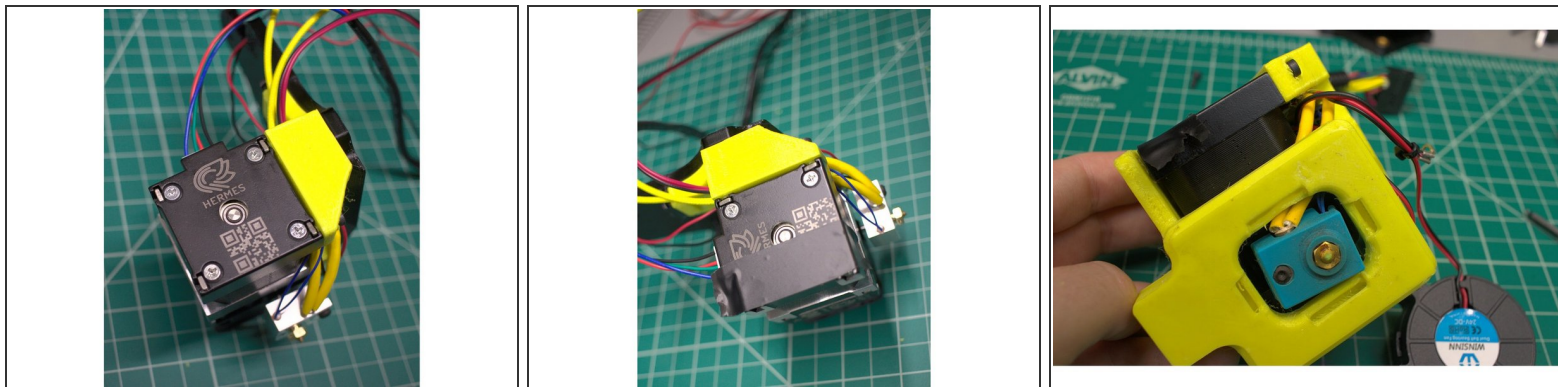
## Step 25 — Add Part Cooling Fan - Gather



- 4 M3x10mm Flat head cap screws
- 2 M3x20 Socket Head Cap Screws
- 2- M3 washers
- Printed Fan Duct
- 50mm Fan (You will need to purchase this separately)
- 2 - M3 T-nuts

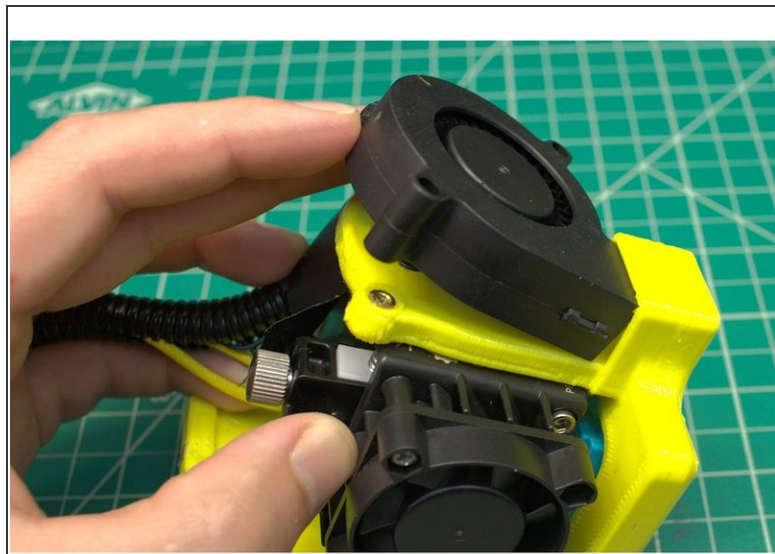
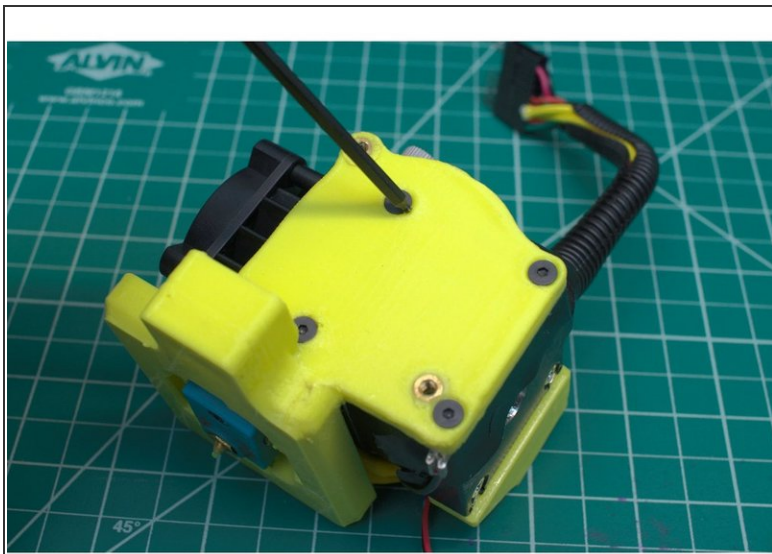


## Step 26 — Part Cooling Fan- Assemble



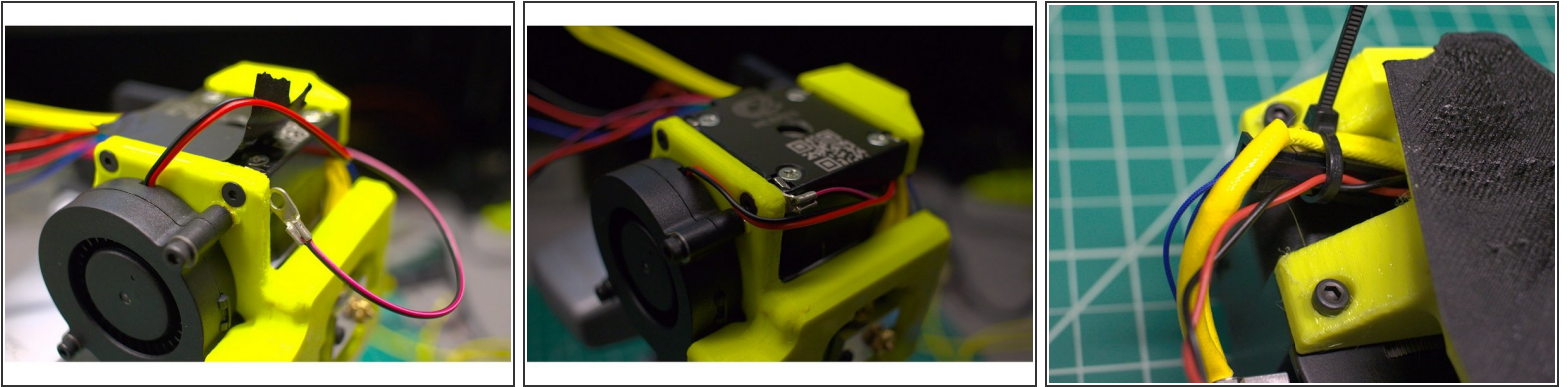
- Add 2 t-nuts to the t-nut slots on the front of the motor. Add tape to hold them while working
  - Carefully fit fan duct into place. Make sure it doesn't crush heater cartridge wires and everything is routed nicely
- ⚠ Be aware it is possible to crack the t slots if you use screws that are too long and bottoms out. Our recommendation is to use screws that protrude 3mm +/- 0.25mm from the mounting surface to go into the T-Slots. Over tightening also risks snapping the T slot.

## Step 27 — Add bolts and Fan



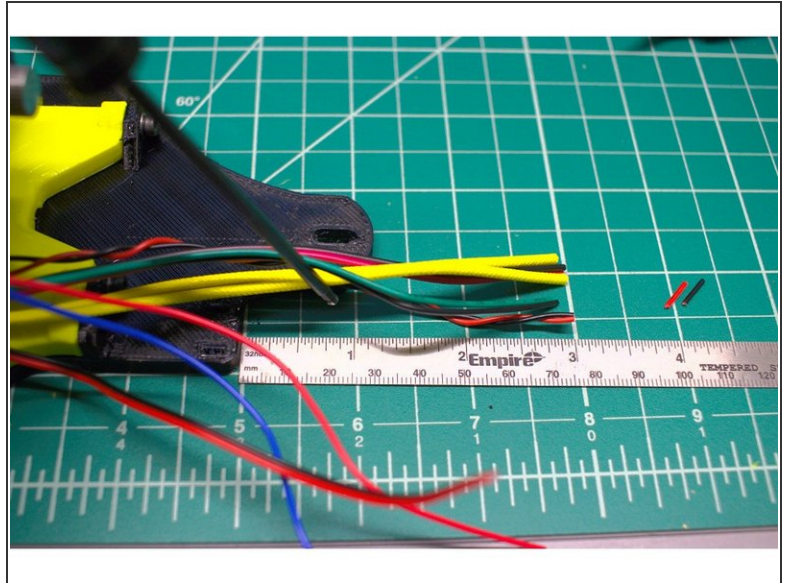
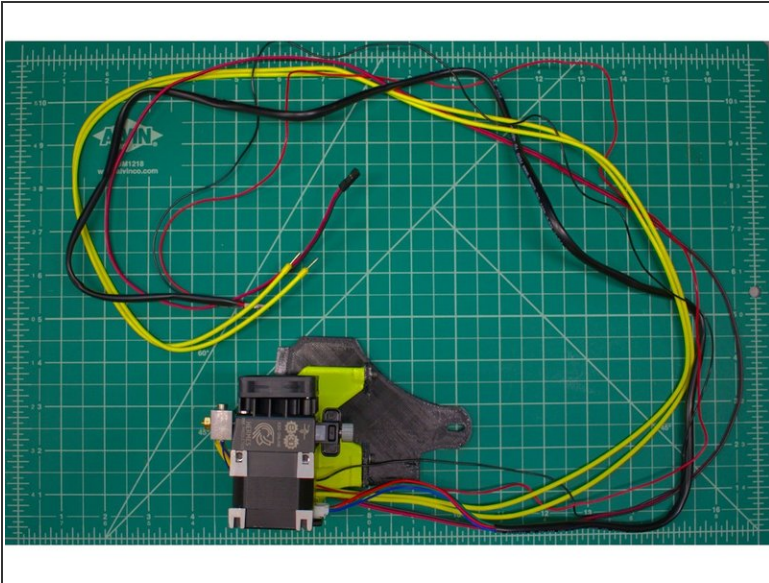
- Add 4 M3x10 flat head cap screws into countersunk holes
- Fit fan into place. The duct is fairly tight, I found it was easiest to tilt the fan up and slip it in as I fit it to the mounting holes
- Add two M3x20 socket head cap screws to mount the fan in place.

## Step 28 — Wiring and Routing



- Add sense wire - This mounts to the bare metal on the stepper motor between the cooling duct and the motor. I used the extra wire from my thermistor harness to make this wire.
  - Strip off 4mm of insulation and crimp the ring terminal on a piece of 300mm wire
  - Put the ring terminal in between the fan duct and the stepper at the lower right t-nut on the front. We will sandwich it here using this bolt
- Slip the heater, thermistor, sense pin, 24v cooling fan and 5v heatsink fan wires through the channel in the between the Hermes mounting points
  - Once through add a zip tie near the thermistor molex connector to the full bundle to help retain the wires and keep strain off the thermistor. Feed the wires the rest of the way into the channel.

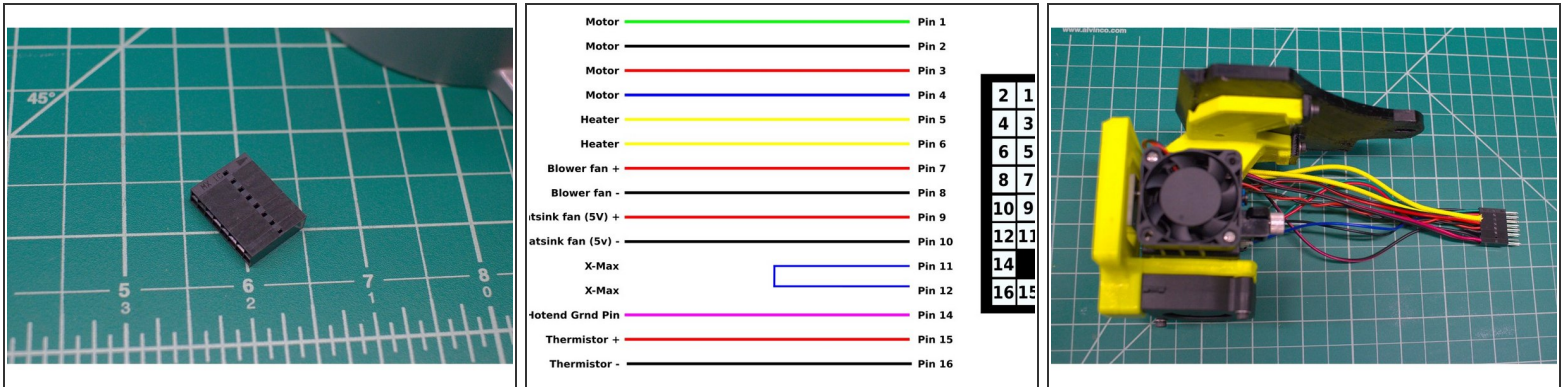
## Step 29 — Trim Wires



- Trim wires 50-75mm longer than the top of the mount. This gives freedom to manage the wire connector for the TAZ 6.

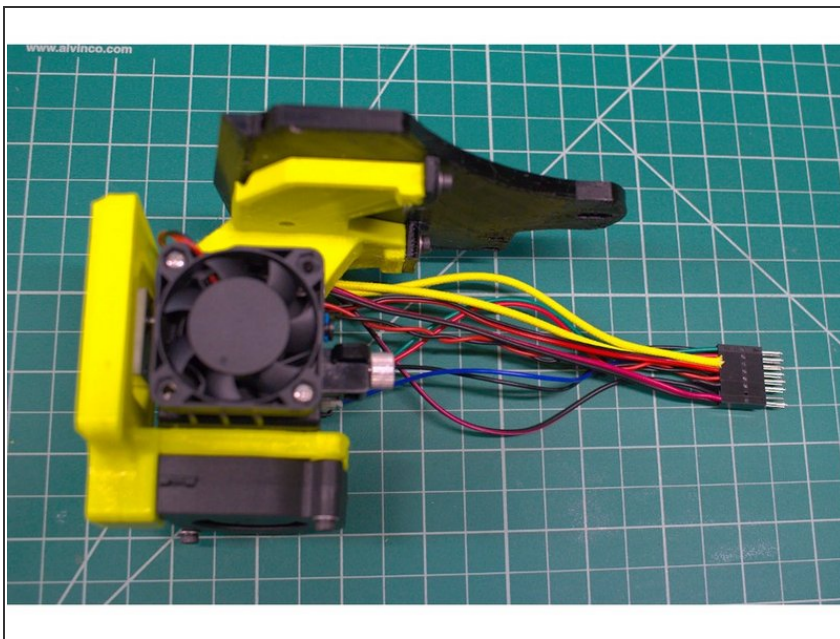


## Step 30 — Pin wires for Molex Connection



- Strip about 3-4mm of insulation off each wire to prep for adding pins
- Crimp the pins onto the wires using the appropriate crimpers and then add them to the 16 position socket following the wiring diagram
  - Pin 1 is the one shown here with the arrow at the top right. The diagram is numbered from the back so the pins will be facing away from you if you are looking at the numbers in the top left of the diagram.
- ① We are jumping out the Xmax limit switch. This switch is not needed for normal operation and was not added in the Universal Adapter mount by Lulzbot.

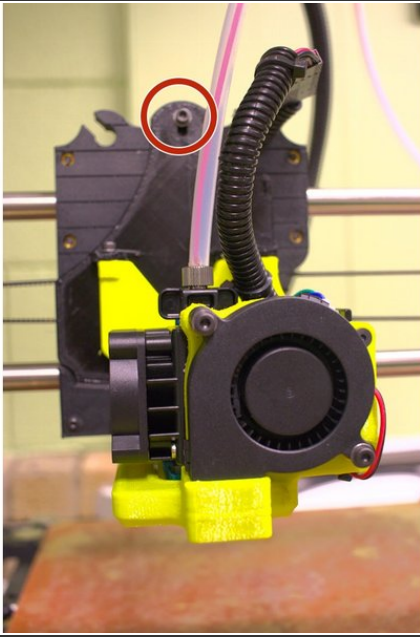
## Step 31 — Wiring is complete!



- Once all the wiring is complete we can move to the machine

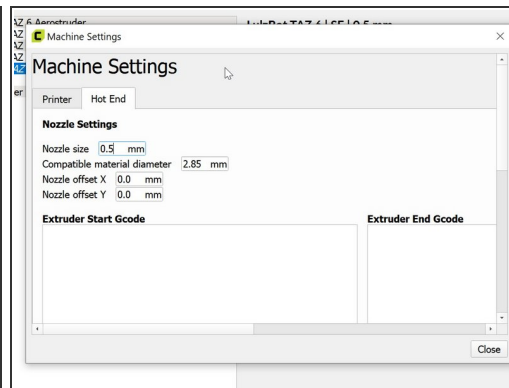
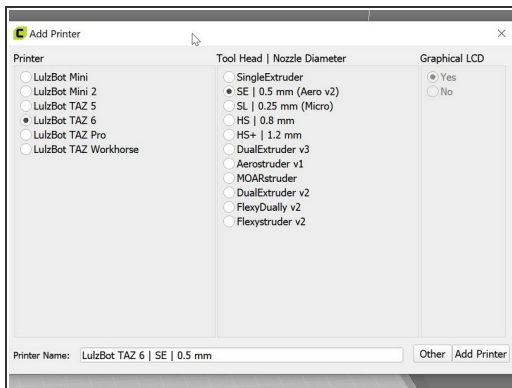


## Step 32 — Mount To The Machine



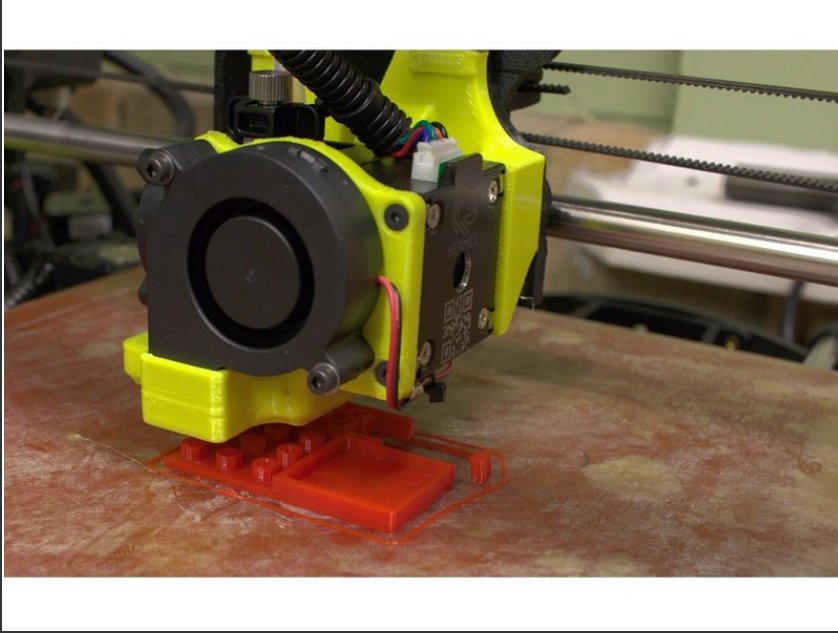
- Mount to the machine with the M3 bolt with from your old tool head
- Connect the Molex connector to the machine paying attention to match the pin orientation from the old tool head.
- If you forget, match the empty pin on the machine and tool head Molex connectors.

## Step 33 — Flash Firmware



- Flash new Firmware through Lulzbot Cura.
  - Choose the Taz 6 Aero 2|SE firmware
- Make sure you set your nozzle size correctly in machine settings.
- You will need to set your Esteps properly around 409.

## Step 34 — Time To Print!!



- Get printing!!