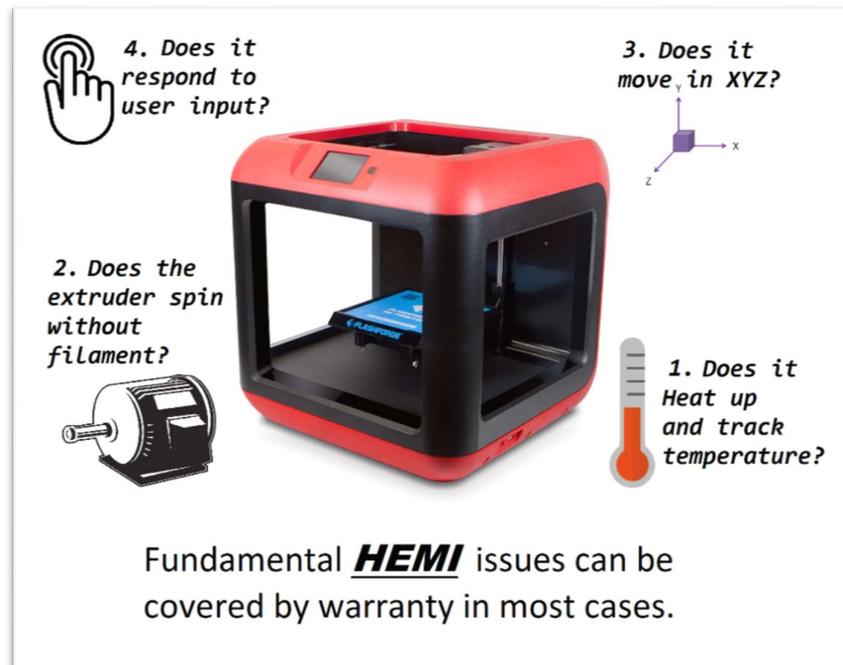# Flashforge Printer Technical Notes

About this document

This document is used for some basic maintenance and repair work for Flashforge 3D Printers. It contains some diagnosing tips and handy information as well as a disassembly for the TL4220 Finder 3D printer. While this document will be primarily Flashforge Finder focused, it could also be easily used as a reference for other printers in the flashforge range, and in some regards, printers from other brands as well.

Issues printing and failure to print

Generally, issues with printing come down to two categories; a *Fundamental* fault and an *Operational* fault. While the symptoms and errors could be shared across multiple faults, an easier way to determine what kind of fault it is, is via the simple "HEMI" method: **H**eat, **E**xtruder, **M**ove, **I**nput:

1. **Heat**: does the unit heat up when you tell it to? is it a lower value when cold and higher value when warm? Does it seem to respond reasonably or is it high as soon as you turn it on? Does it get to around 200°C? These are all issues relating to the *heater and thermocouple*.
2. **Extruder**: can the extruder motor move freely when unloaded? Does it move consistently? Can it pull filament when the nozzle and hot-end are removed? This is related to the *motor* and *cables *(note, this does not mean blocked nozzles)*
3. **Move:** do the rest of the motors move? Can it move in the X-Y-Z directions? does it stop moving when it's reached a limit switch? Can the printer *home* itself correctly? This is again a *motor and cable* issue.
4. **Input:** does the machine respond to user input? Can you touch on the touch screen and press buttons in 4 four corners of the touch screen? Does it behave reasonably? Does it respond to USB or SD card insertion? These are usually related to the *mainboard*.

4. Does it respond to user input?

3. Does it move in XYZ?

2. Does the extruder spin without filament?

1. Does it Heat up and track temperature?

Fundamental ***HEMI*** issues can be covered by warranty in most cases.

Flashforge Printer Technical Notes

These are all issues that could be deemed *Fundamental* issues and can be covered by warranty in most cases. Talk to your store's manager who will then submit the issue in our ticketing system, which we can then action and send out parts needed to diagnose and repair.

Please note the following are not covered by warranty:

- Blocked nozzles that need replacement for **EXTRUDER** issues, purchase:
    - TL4278 for Finder and Guider
    - TL4320 for Adventurer 3
- Thermocouple replacement for **HEAT** issues, purchase:
    - TL4284 for Finder
    - TL4312 for Guider
    - Adventurer 3 thermocouple is located within the TL4320 Nozzle assembly.

If the HEMI check appears to be ok and you still have issues, then the fault can be deemed an *Operational* issue and relates to some way of operating the machine.

Please ensure that all software is at the latest version, including firmware on the machines, and that the STL file is printed *correctly*. Try simpler files; there is an example "20mm Box" found in `File > Examples` on the Flashprint software for testing.

Flashforge printers will only be supported with Flashprint software. We cannot support issues with files coming from other slicers such as CURA or Simplify3D; If there's further issues, first check that it does work on the latest Flashprint software before trying to fix the other slicer files.

We have some helpful pictures for getting a good print result at the end of this document.

Disassembly of extruder head

In terms of repairing, cleaning or replacing elements of the extruder, you will have to disassemble the extruder.

This is by far one of the most common aspects of 3D printer ownership and you will be hard pressed to find a 3D printer user who has not disassembled their extruder to either unclog, repair, or improve the printer with their own 3D printed parts.

Below is the general process for the TL4220 Finder 3D Printer, but it is also very similar to the TL4240 Guider, and the concepts here can be translated to the Adventurer and CR-X printers as well.

Australia

www.jaycar.com.au

techstore@jaycar.com.au

1800 022 888

New Zealand

www.jaycar.co.nz

techstore@jaycar.co.nz

0800 452 922

jaycar

Page **2** of 7

TL4220 TL4240 TL4256

Remove Extruder cover

- Heat up and unload filament if you are able, otherwise snip it off so that it is out of the way.
- Unloading filament first does a quick *purge* of filament before you pull the filament out, this helps clear out the nozzle and chamber, so that there's no stray plastic that can cause blockages later.
- Remove the 3 screws and use a small knife or scraper to separate the ribbon cable from foam backing.
- **The extruder cover is needed to *home*, as it activates the X-limit switch.**

Remove the air guide

- This is located under the extruder and is easier when the bed is gently pushed to the lowest it can go.
- There are two small screws to remove the bottom air guide. This is used to cool the plastic as it comes out of the nozzle, so that it does not string or move once placed.
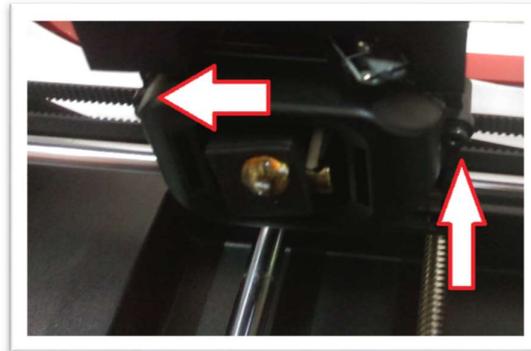
Observe connections

The ribbon cable communicates all aspect of the extruder to the mainboard, including heater, temperature, fan, lightings, servos, switches and the motor (not labelled).
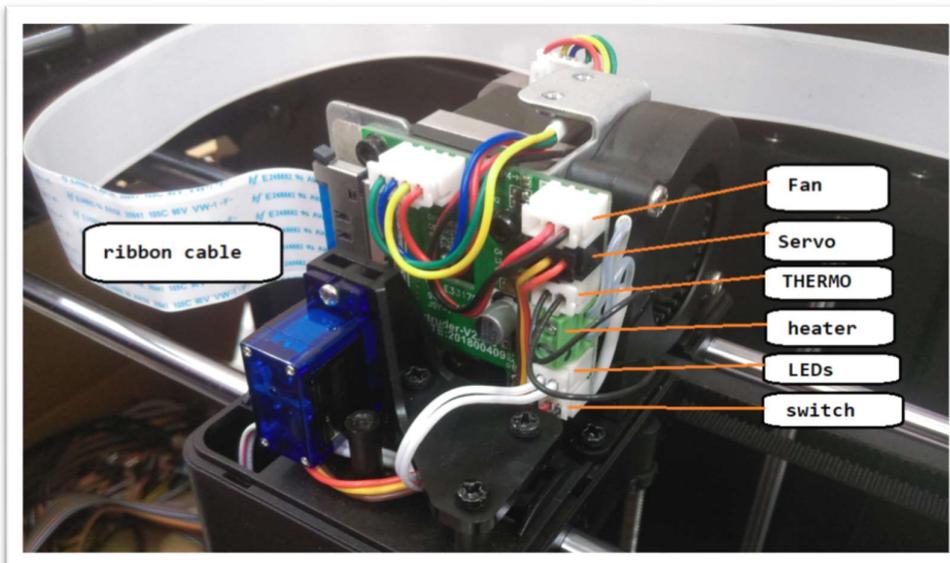
Australia
www.jaycar.com.au
techstore@jaycar.com.au
1800 022 888

New Zealand
www.jaycar.co.nz
techstore@jaycar.co.nz
0800 452 922

jaycar

Page **3** of **7**

# Flashforge Printer Technical Notes

Important notes about Extruder

The extruder is a very important part of the printer and can easily cause catastrophic damage when not used correctly.

It is crucial that you isolate the extruder from the metal mounting plate. This is done with the included micra pad, but nylon washers can also work. **Do not short the connections between the extruder circuit board and the metal mounting plate**. This goes for all printers especially the finder and guider who are prone to this mishap. This error is easily detectable (because the main board melts) and is not covered by warranty.

Remove the heat assembly

Whether you are replacing the heat assembly, a nozzle, or a thermocouple, the steps to remove the heat assembly are the same. You must remove the heat assembly in order to replace the thermocouple.

- Disconnect the TEMP and HEAT connections from circuit board, and straighten out those connections
- Use the smaller (2mm) Allen key to slide in next to the servo and begin loosening up the small grub screw next to the neck of the filament tube.
- Once loosened, the entire assembly should be loose enough that it can wiggle out freely.
- While not part of the heat assembly, the motor screws are two screws either side of the motor mount. using the larger hex (2.5mm)
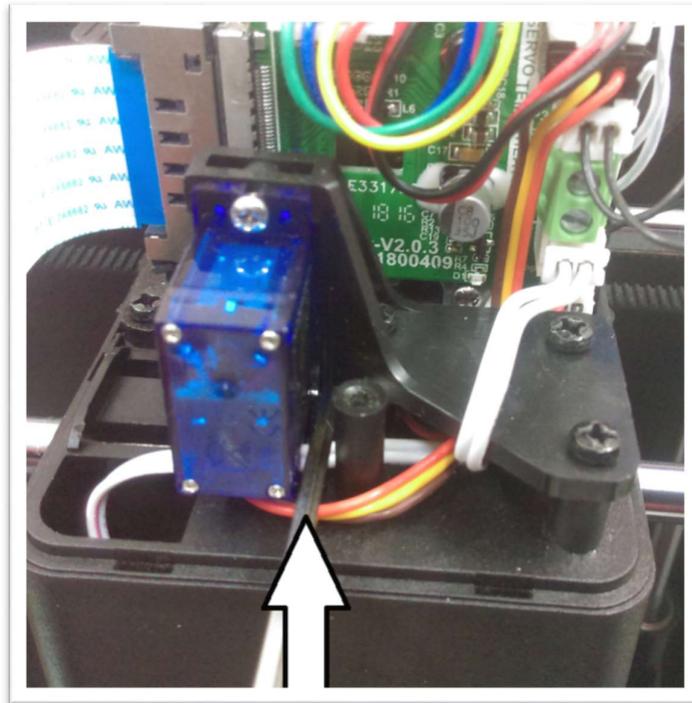
Observe the heat assembly

The most common fault relating to this module is the thermocouple. After that, the Teflon tube would probably need to be replaced; the nozzles are usually hardy and can survive unless there has been any work with metal or abrupt mechanical failures, such as running the nozzle into other parts of the machine.

In order to remove the thermocouple, or indeed pull the unit apart, you must twist the internal coupler as if you're opening a jar. We use a vice (TH1766) and a spanner (from TH1910) to open without hassle.
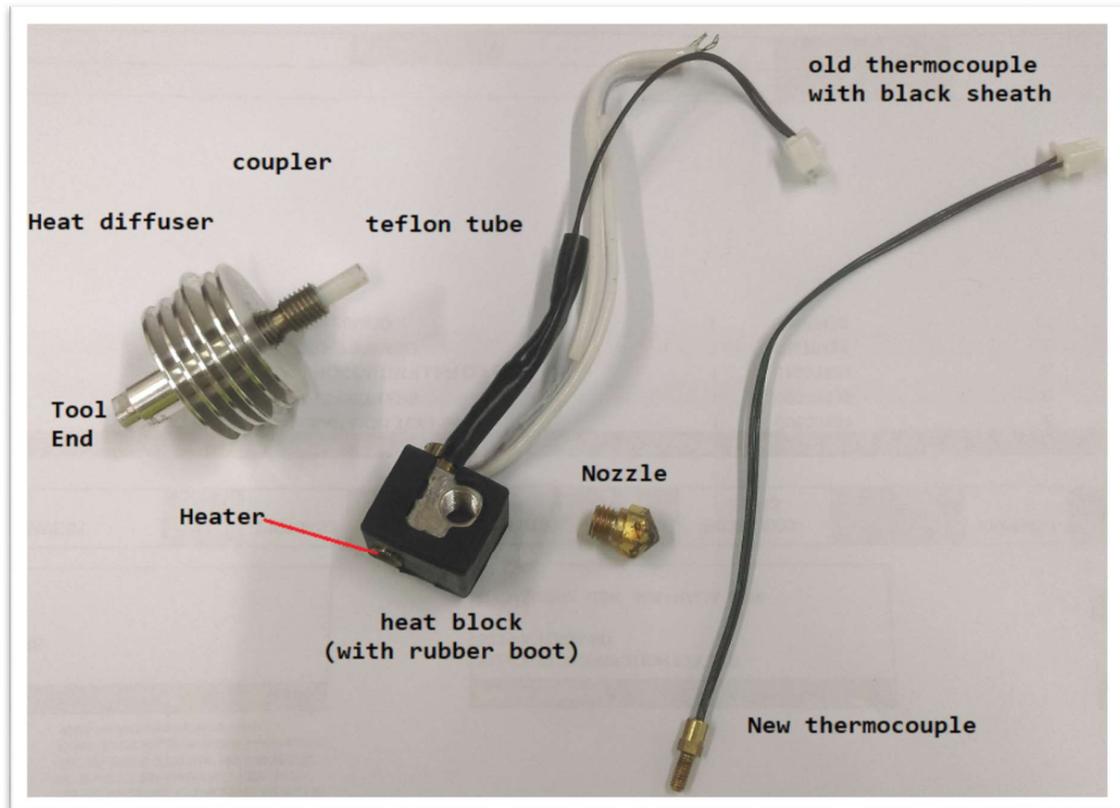
Australia
www.jaycar.com.au
techstore@jaycar.com.au
1800 022 888

New Zealand
www.jaycar.co.nz
techstore@jaycar.co.nz
0800 452 922

jaycar

Page **4** of **7**

TL4220 TL4240 TL4256

If the thermocouple is broken a replacement is needed, however to unscrew the thermocouple from the heat block it is easiest to remove the heat diffuser first so that you can have room to use a 4mm spanner on the thermocouple. (TH1910).

Place the heat block in the vice (TH1766) and use a spanner on the tool end of the heat diffuser to detach. You might get the coupler on either side of the assembly but that does not matter.

If the Teflon tube is damaged, blocked, dirty or in bad shape, We'd recommend replacing it as it is cheap and easy. Nozzles can usually be unblocked if required by burning with a blowtorch and/or using pins (as found in TD2132). The heater is usually never replaced, but it is held in place by a small grub screw.

Reassembly

To reassemble, do everything in reverse and put the cables coming up the heat assembly cavity. Generally, the white heater cables should come up behind the metal PCB mounting plate, then loop back around. Have a look at the pictures above if not sure.

Make sure that the cables are out of the way of the servo arm and tighten up the grub screw. Then put on the air guide, and make sure that the cables are not pinched and are not in the way of the servo arm. Then put the cover back on and test that everything works before screwing into place.

Australia
www.jaycar.com.au
techstore@jaycar.com.au
1800 022 888

New Zealand
www.jaycar.co.nz
techstore@jaycar.co.nz
0800 452 922

jaycar

Page **5** of **7**

Flashforge Printer Technical Notes

Ensuring a good print.

Below is a simple check list to ensure the prints come out as you desire using Flashprint software

1. Make sure the printer is set to the correct type, and you have the most recent version of Flashprint.
2. Import your model, make sure that it is in the most optimal position to print. It is generally better to print with needing as few supports as possible. This can come-down to printer understanding sometimes, so try a few ways and see what works for you.
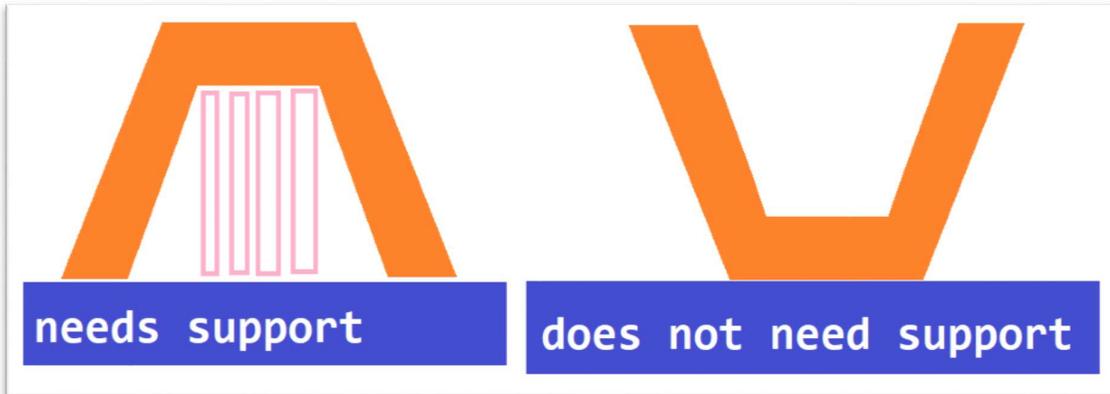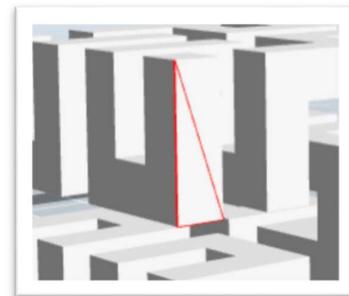

You can use the face to bed method to make it easy to rotate the part properly:

a. Click "rotate" twice, and select "surface to platform":
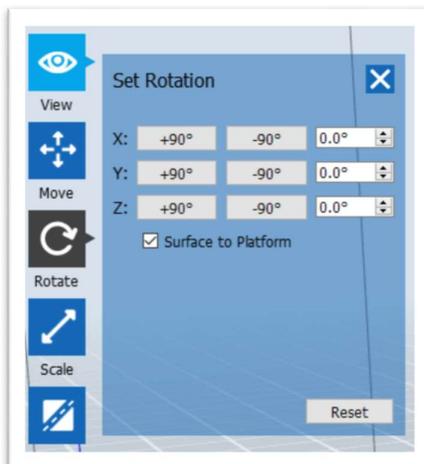
b. Then click on a face on your model, it will show up as a thin red triangle, and usually will not need to be the entire surface. Click again to complete the rotation.

Australia
www.jaycar.com.au
techstore@jaycar.com.au
1800 022 888

New Zealand
www.jaycar.co.nz
techstore@jaycar.co.nz
0800 452 922

jaycar

Page **6** of 7

TL4220 TL4240 TL4256

3. After positioning your model, make sure that it is touching the ground as much as possible. Anything not touching the ground could generate supports or just not print at all. You can tell this by the dark blue when you use the right mouse button to rotate the camera into the ground. The more blue when expected, the better.
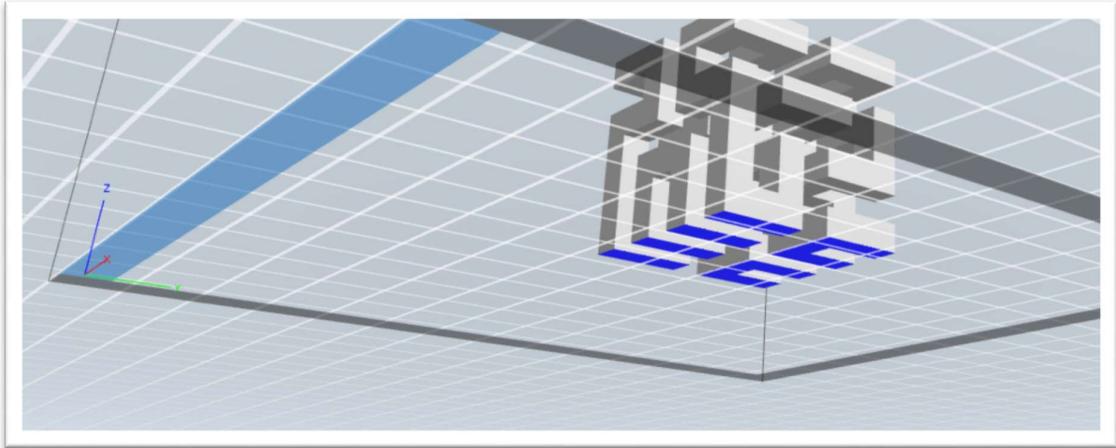
These simple steps should be enough to solve issues with your 3D printer and print jobs.

Australia
www.jaycar.com.au
techstore@jaycar.com.au
1800 022 888

New Zealand
www.jaycar.co.nz
techstore@jaycar.co.nz
0800 452 922

jaycar

Page **7** of **7**