

# Work Instruction – Bolt Head PCB Replacement

Model	Bolt	Date	27-10-2017
Prepared by	Maurits Hartman		

Short title	Replace Drag Chains			
Classification	Troubleshooting	Firmware	Version control	
	Software	Part information	Action required	
	X Mechanical	X Electrical	Service manual revision	
	Filament path	Transmit / receive	Retrofit information	
	Product safety	Other ( )	Packaging	

## Prerequisites

- Hex key 3mm
- Long-nose pliers
- Soft brush
- Bolt Head PCB replacement set, containing:
  - 2 Head PCB v3
  - 2 3D-printed black RJ45 guards

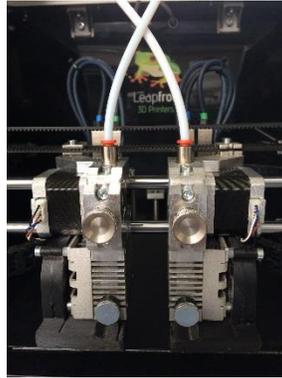
## General information

This document should be used to replace both head PCBs on the extruders in a Leapfrog Bolt 3D Printer. Great care should be taken to **follow these instructions carefully**, as improper installation of the head PCBs can damage other electronic parts of the machine. Installation time should be around 30 minutes.

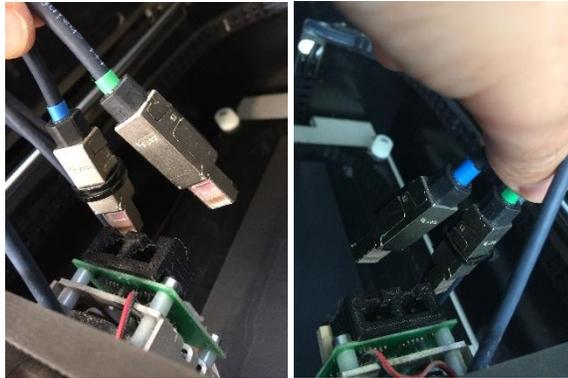
**Note that the new head PCB also requires the use of the new hotend (black connector instead of white). This means that after replacing the old head PCBs, the old hotends can no longer be used with the new head PCB.**

## Instruction Steps

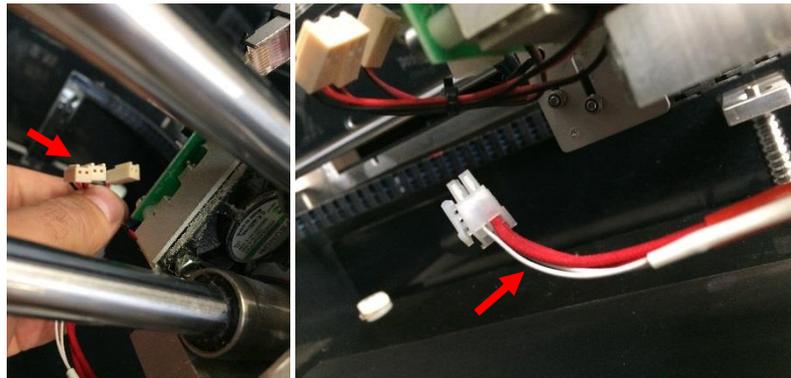
- 1 Remove all power from the Bolt, and unplug the mains cable. Place the Bolt on a firm surface, and then slowly move the extruder carriage to the front of the machine:



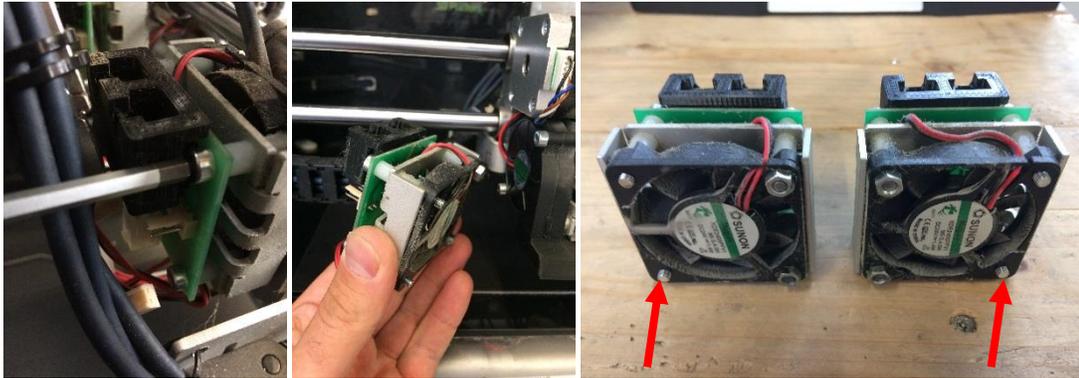
- 2 Disconnect the four RJ45 connectors from the left and right extruder heads:



- 3 Disconnect all fans (three connectors per head) and hotends from the head PCBs:

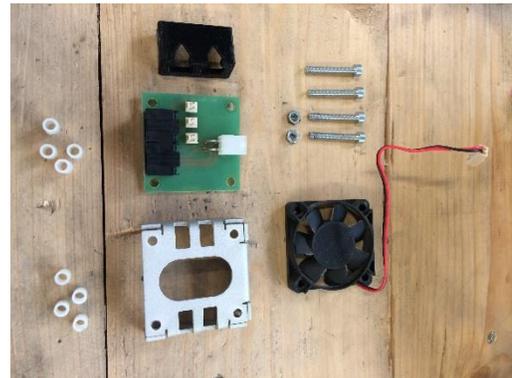


- 4 Using a 3mm hex key, remove the two old head PCBs from the extruders carriages. On the left head PCB, this requires loosening the top and bottom bolts on the left side. On the right head, this requires loosening the top and bottom bolts on the right side:

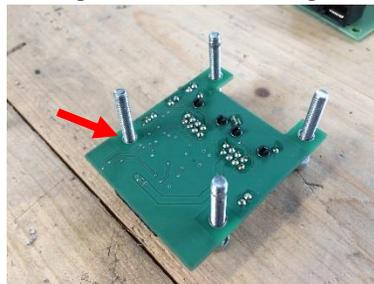


- 5 If needed, clean the fans using a soft brush.
- 6 Using a 3mm hex key and long-nose pliers, loosen the other four bolts and hex nuts on the two head PCB assemblies. Disassemble the head PCB completely. You should have the following components per head PCB assembly:

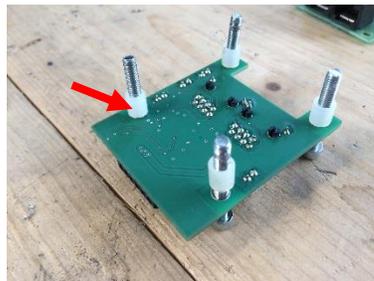
- 1 old head PCB (marked V01-02 or V2)
- 1 fan
- 1 aluminium fan guard
- 4 M4 x 30mm hex bolts
- 2 M4 hex nuts
- 4 long PTFE white spacers
- 4 short PTFE white spacers
- 1 3D-printed RJ45 guard (optionally)



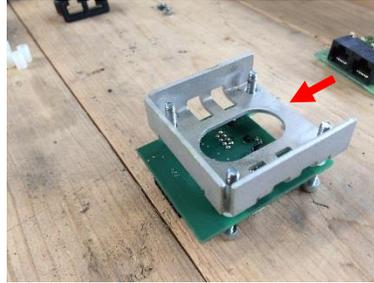
- 7 Put the head PCB back together. Start with inserting the four bolts through the new head PCB:



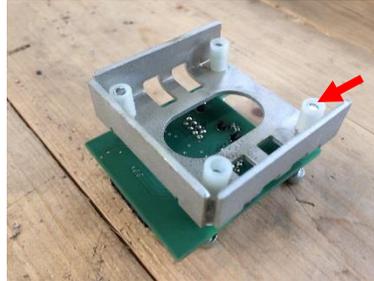
- 8 Then slide the short white PTFE spacers on them:



- 9 Followed by the aluminium fan guard (open side of the fan guard at the same side as the two RJ45 connectors on the head PCB):



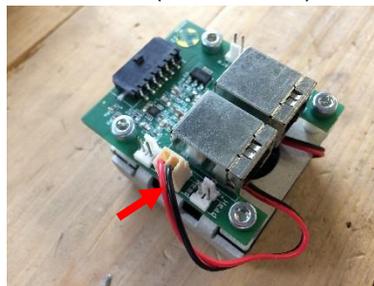
- 10 Slide the longer white PTFE spacers on the bolts:



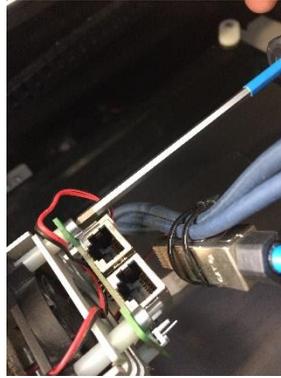
- 11 Slide the fan on the four bolts with the red-black cable protruding from the same side as the opening in the fan guard. Also fasten the two hex nuts (on the right side for the left extruder, and vice versa):



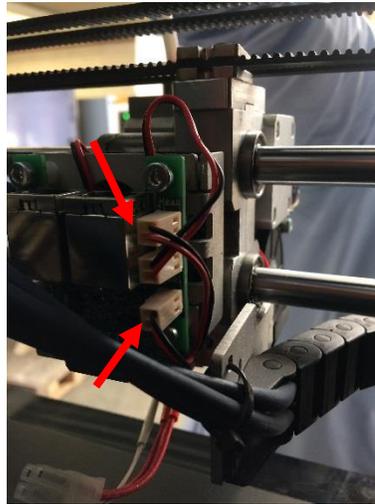
- 12 Connect the fan connector to the head PCB fan connector (marked head):



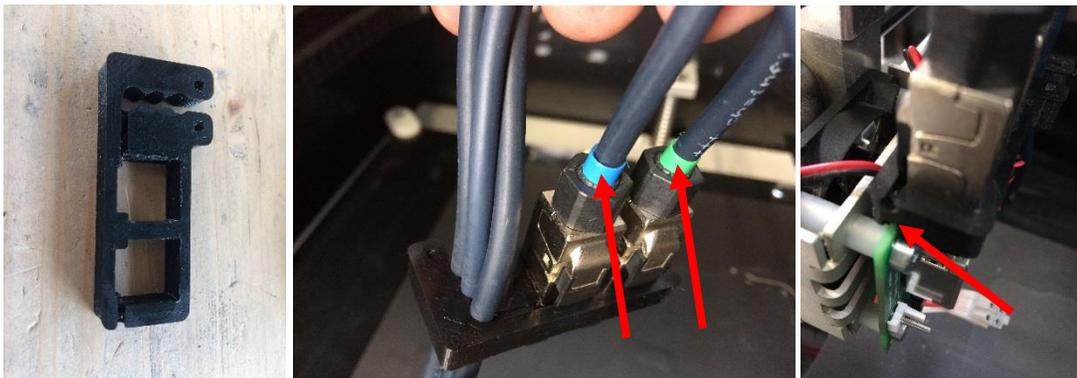
- 13 Mount the head PCB assembly back onto the extruder carriage:



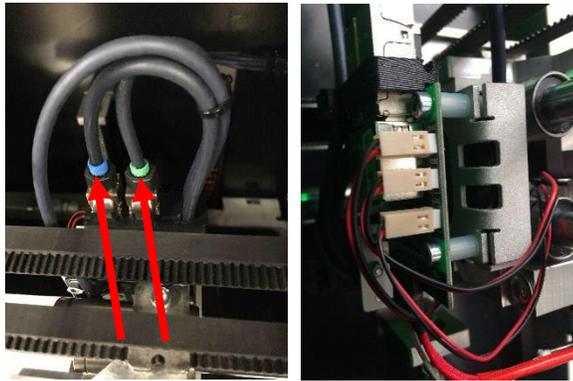
- 14 Identify the cooling block fan, and print cooling fan and their connectors. The print cooling fan is the radial fan connected to the fan duct close to the nozzle. Connect the cooling block fan to the top fan connector on the head PCB (the one marked 'head'). Connect the print cooling fan to the bottom fan connector on the head PCB:



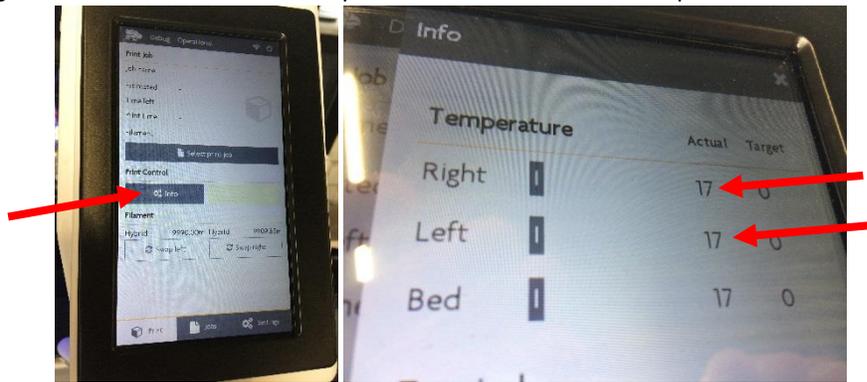
- 15 Slide the two RJ45 connectors into the RJ45 guard and then into the head PCB. **When viewed from the front, the cable with the blue marking should go on the left, while the cable with the green marking goes on the right.** Make sure they snap securely. The edge of the black RJ45 guard should slide 1-2mm over the side of the green PCB:



- 16 Apply steps 7 – 15 for the right extruder head. The only difference being that the blue cables make a loop to the right (which means the cable guard is flipped). **As with the left extruder, the cable with the blue marking should go on the left, while the cable with the green marking goes on the right.**



- 17 Replace the hotends with a new type (black connector instead of white). *Hotend calibration can be done later.*
- 18 Connect the Bolt to the mains power supply and switch it on. Verify that the head PCBs work by checking for the temperature reading in the 'Info' screen after startup. It should show a normal temperature:



## Appendix

### Overview of the Head PCB

