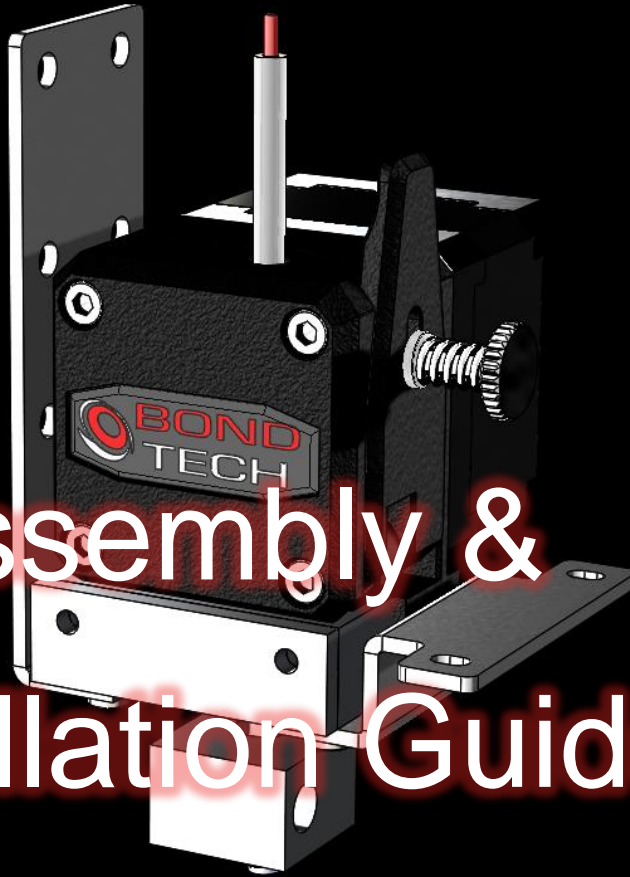




BONDTECH



Assembly & Installation Guide Wanhao I3

The Bondtech Mini Extruder for 1.75 mm filament for use as a direct extruder to replace the existing extruder of a Wanhao I3 3D printer. It has thread inserts to have a strong connection of the fasteners.

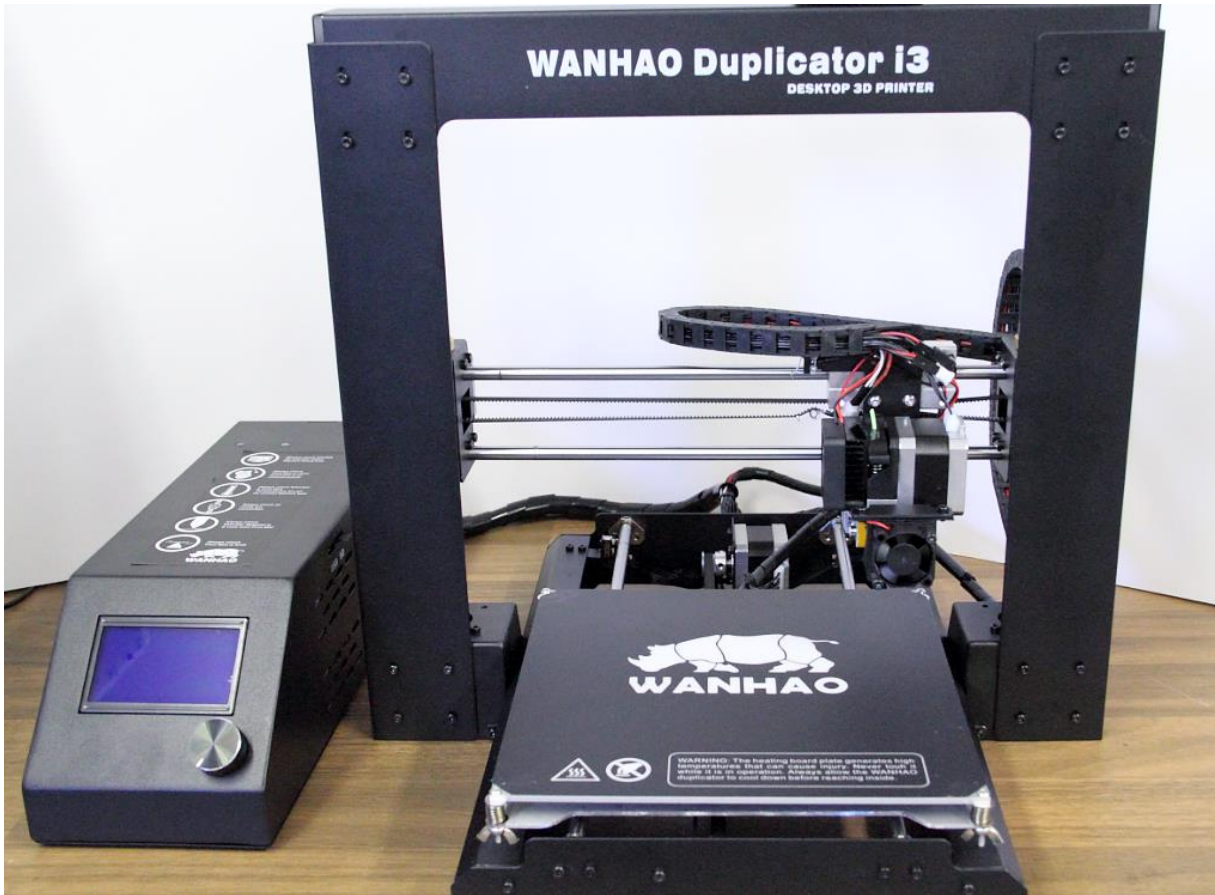
This new revolution in design utilizes the **Bondtech Dual Drive Technology** with precision CNC-manufactured parts which gives the markets best performance and reliability.

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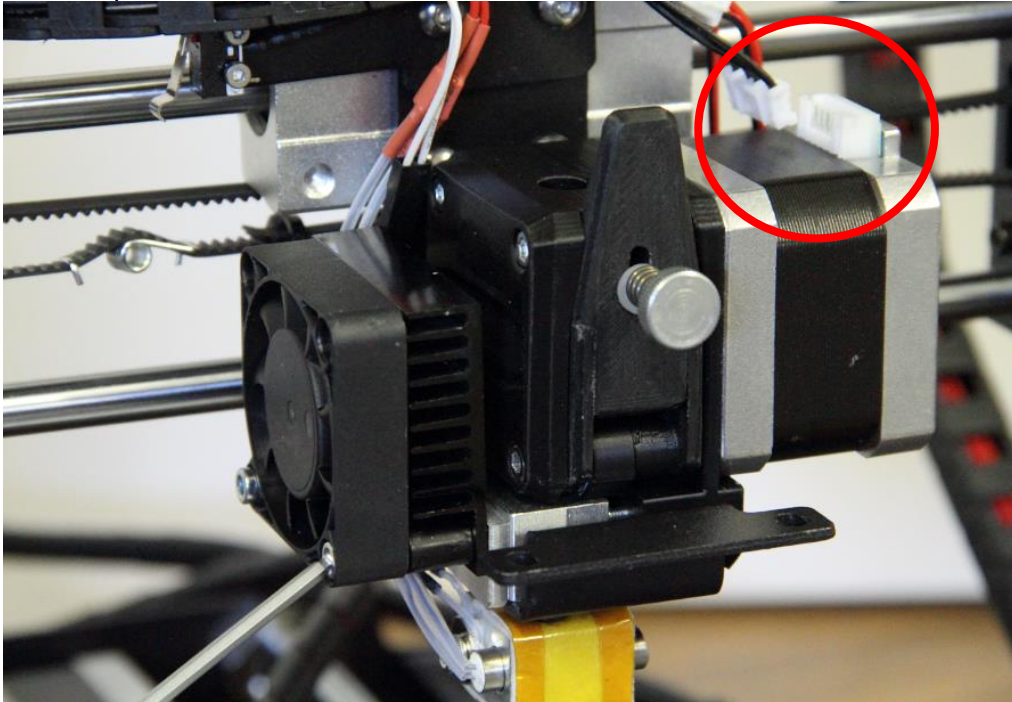
Mechanical & Electrical Installation

1. This guide shows the installation of the Bondtech Mini on a Wanhao I3 3Dprinter.

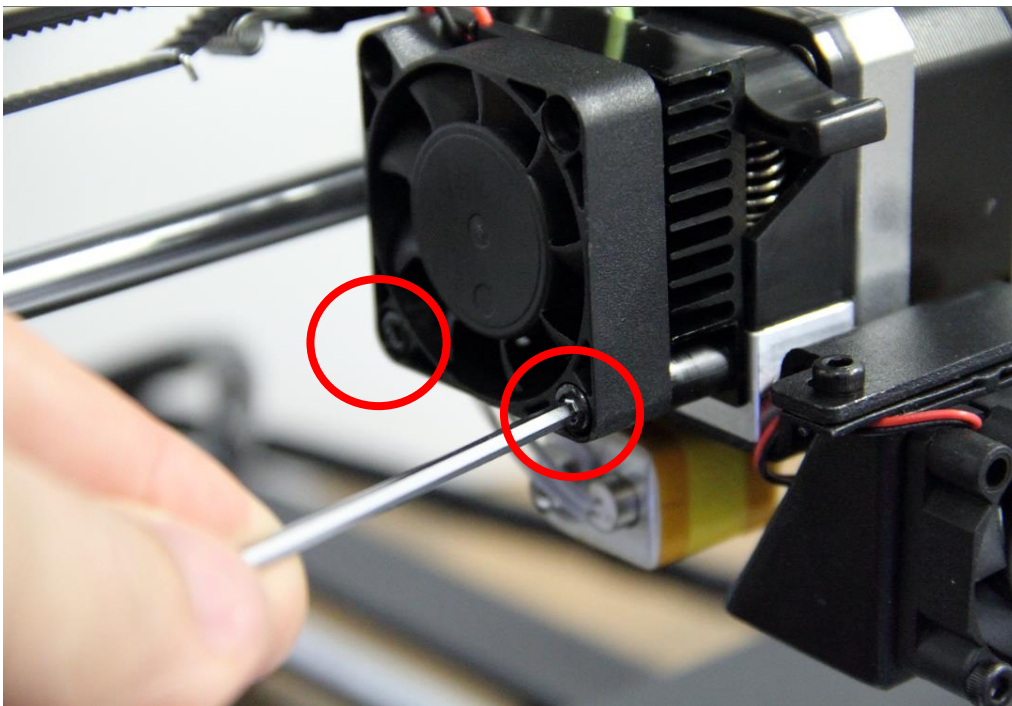
Start by jogging the printhead to about 50 -100 mm over the buildplate to help with access of the extruder. You do this by using the LCD-menu.

2. Switch of your printer and unlug the powercord from the electronics box.

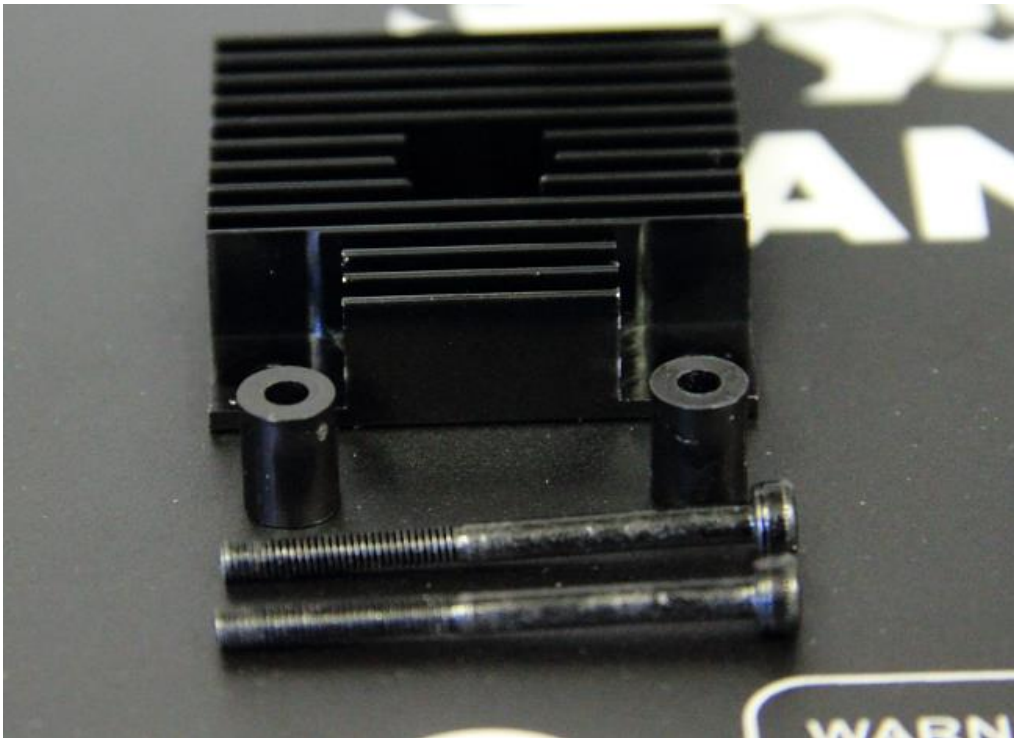
3. Disconnect the cable from the stepper motor by gently pulling in the plastic connector, do NOT pull the cables.



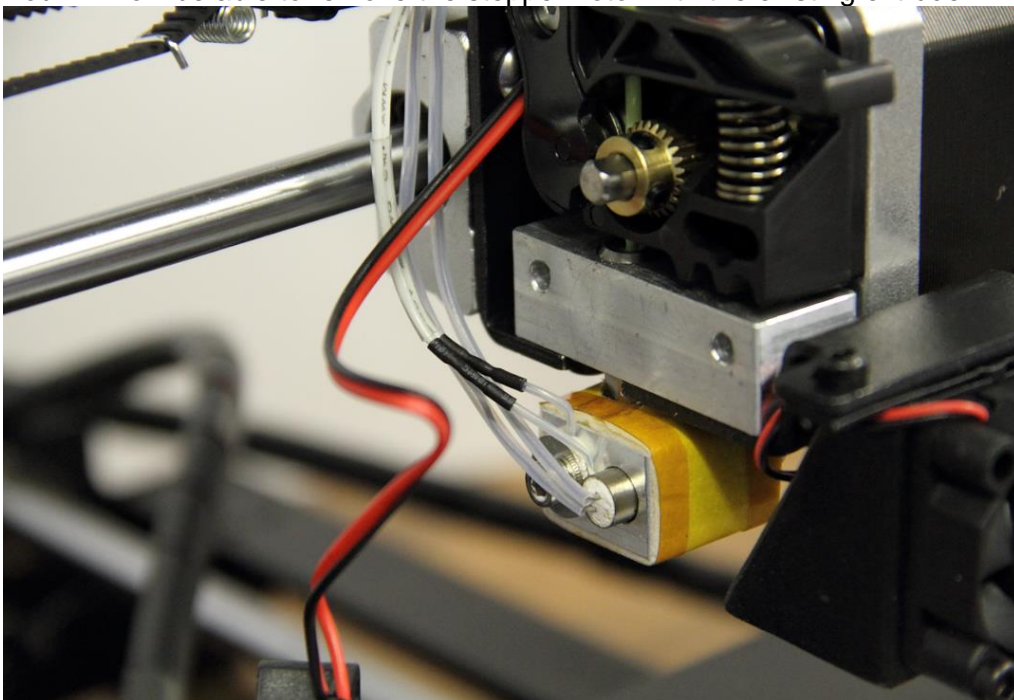
4. Loosen the two M3 bolts that hold the cooling fan, plastic spacers, heatsink and coldblock to the stepper motor.



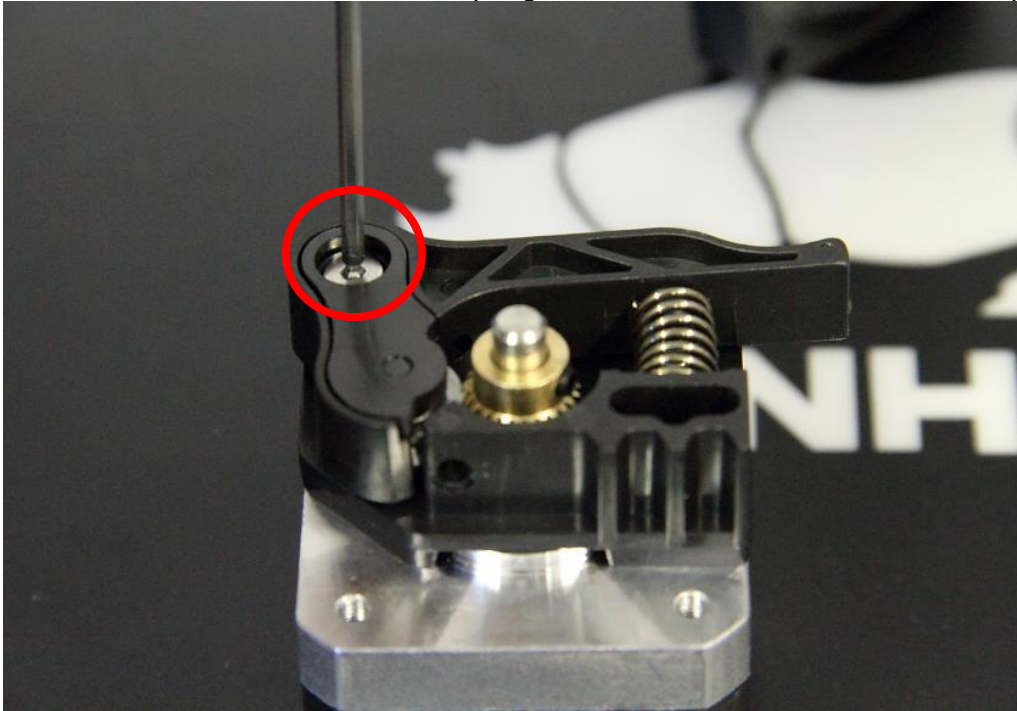
5. Place the heat-sink and the two plastic spacer on a safe place as you will reuse them later.



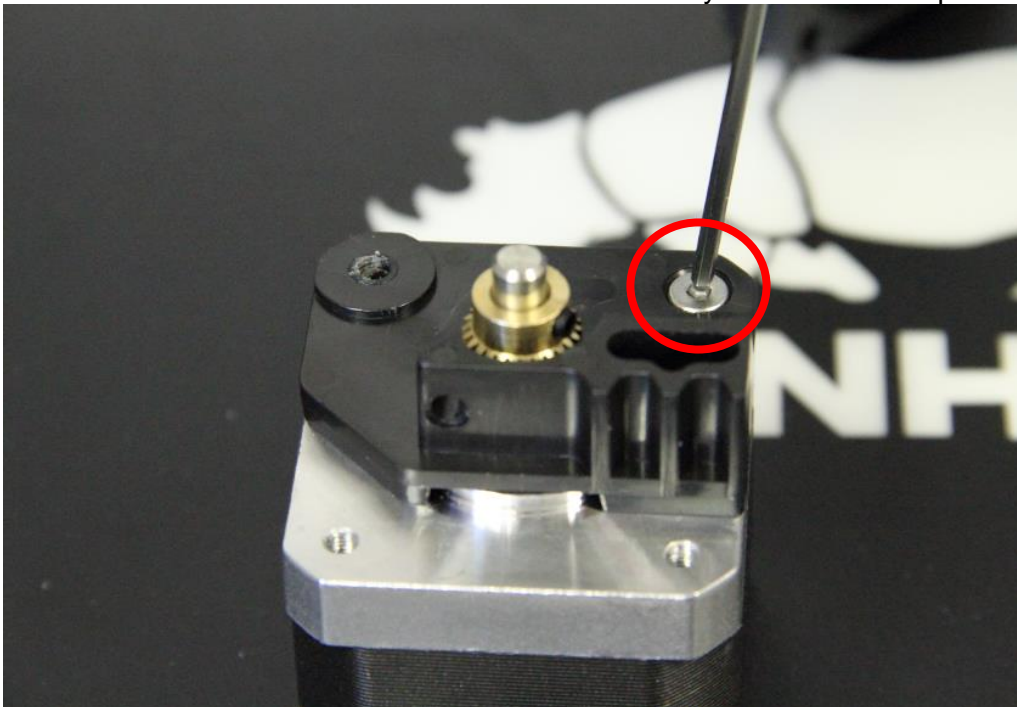
6. You will now be able to remove the stepper motor with the existing extruder.



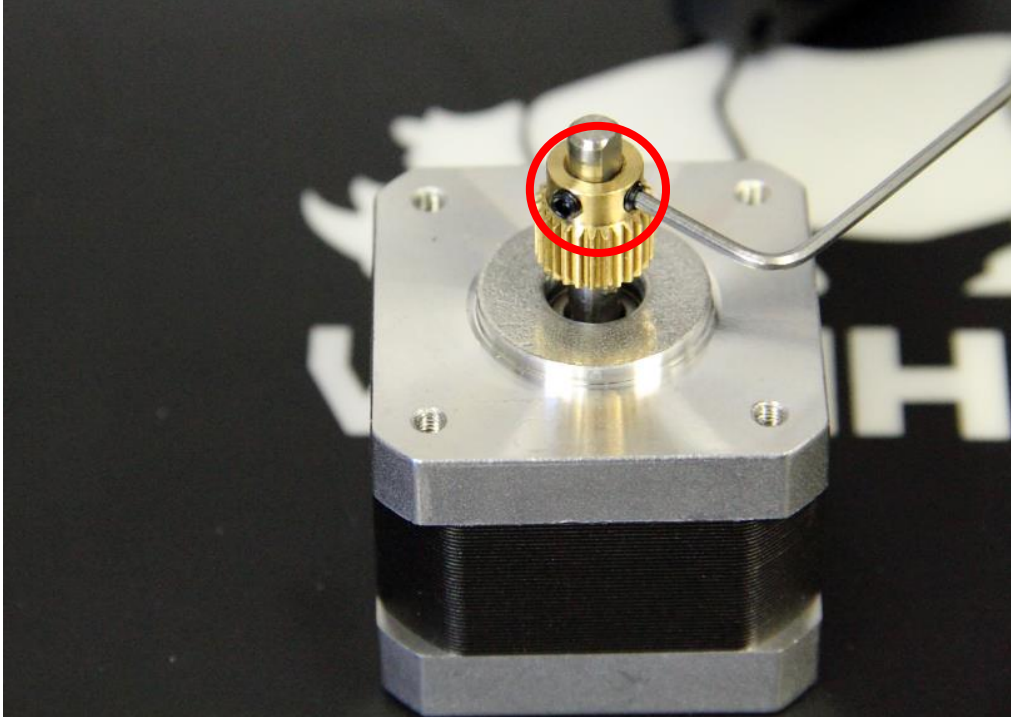
7. Place the extruder with the stepper motor on the rear side of the stepper motor and unbolt the M3 screw that holds the spring-lever and remove the arm and the spring.



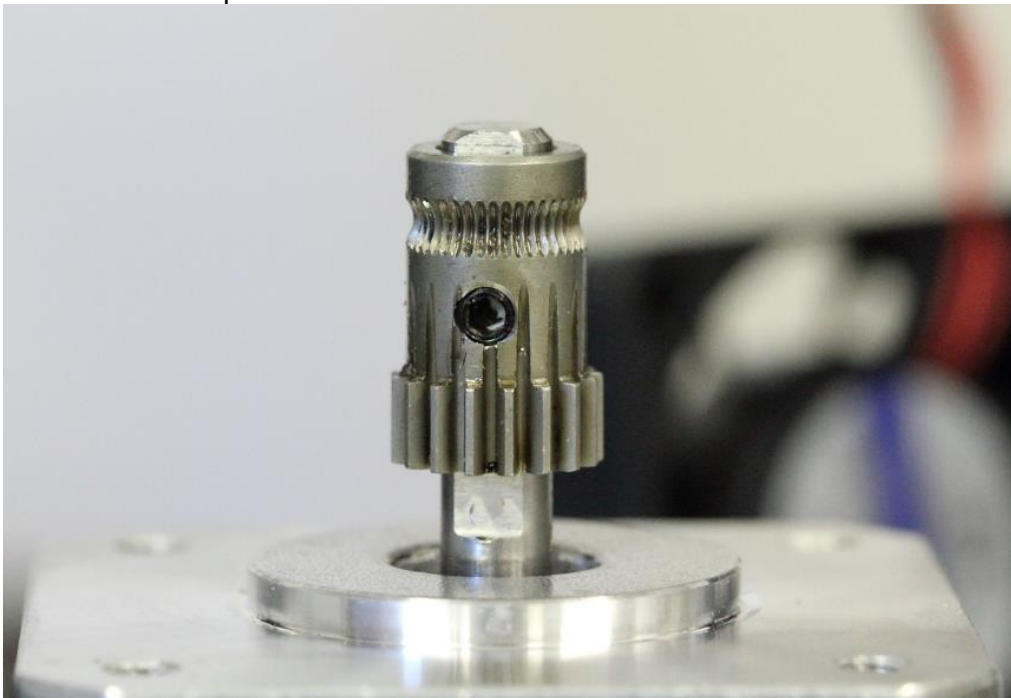
8. Unbolt the other M3 screw that holds the extruder body and remove the part.



9. Loosen the two set-screws that hold the extruder gear in place and remove the gear.



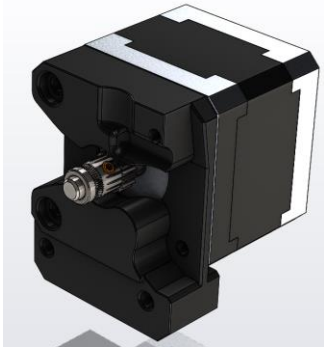
10. Place the primary Bondtech Mini gear on the motorshaft and align the set-screw with the flat section of the shaft, just tighten lightly. You will have to align the drivegear with the filament position later.



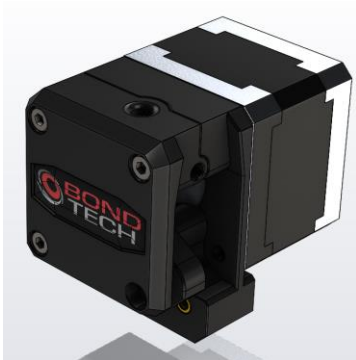
1. Install the secondary drivegear with the needle bushings into the Hinge part. Notice that the gear-section of the gear fits into the recess of the hinged part. Press the shaft into the hinge from one side and into the needle bearings. Continue to press it until it is flush with the other end of the hinge.



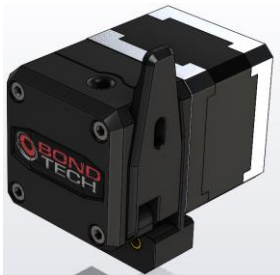
2. Place the rear housing onto the stepper motor



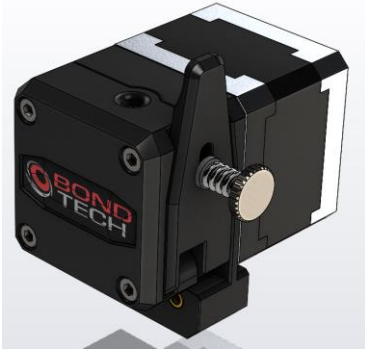
3. Place the front housing onto the rear housing and use 3 M3x30 screws to tighten it to the motor.



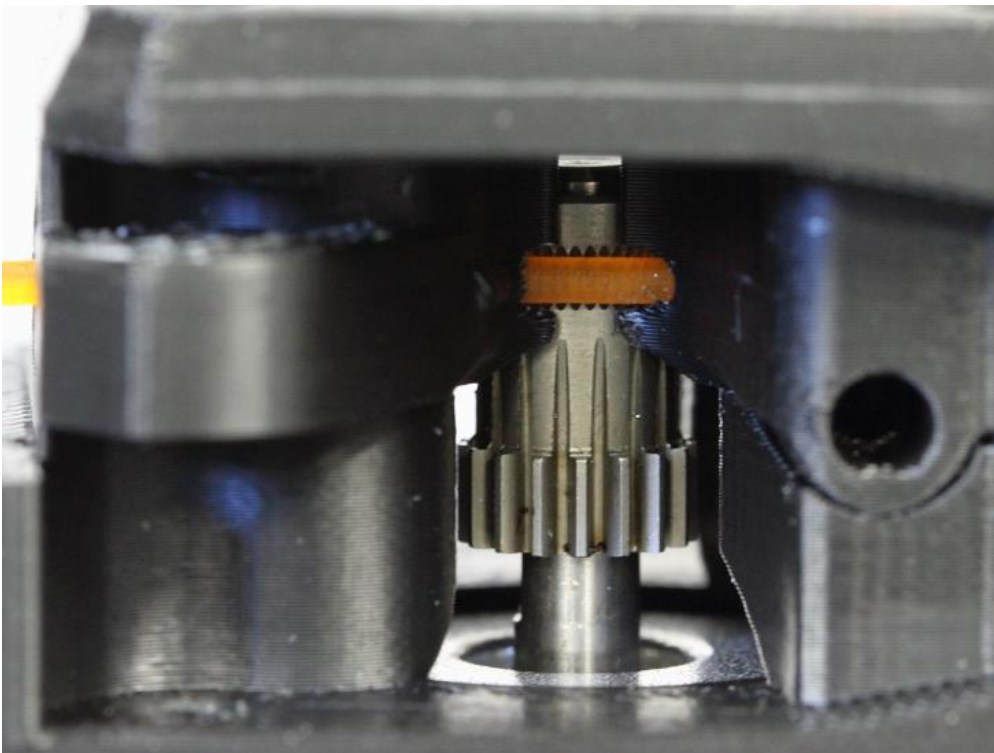
4. Insert the hinge with the secondary drivegear in the cutout for the hinge-part. Insert a M3x30 screw gently into the housing and into the hinge-part to the motor.



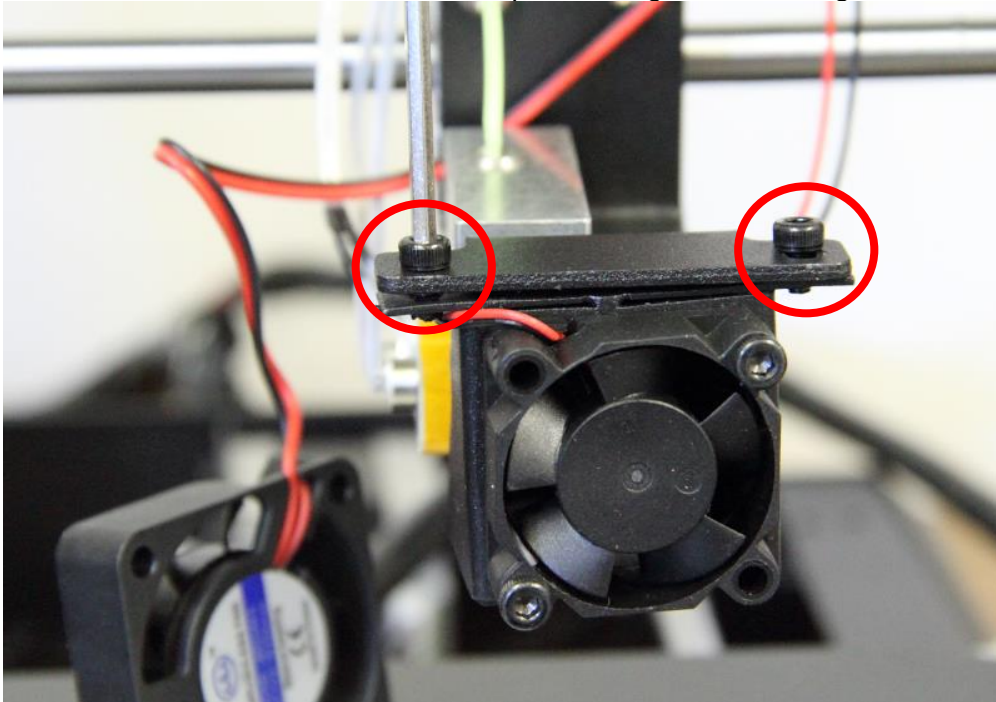
5. Assemble the thumb-screw, spring, lock-washer and screw it into the housing through the opening in the hinge-part.



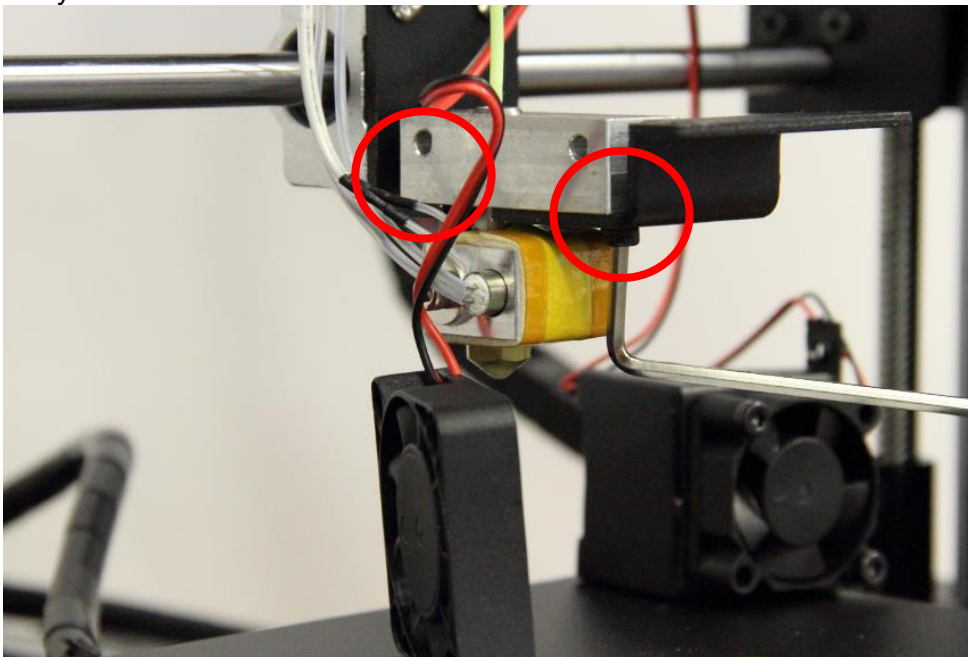
6. Place the front and rear housing on the extruder and insert two M3x30 bolts temporary in order to make sure that the housings are flush, insert a piece of filament through the filamentchannel in the front housing and align the filament drive teeth with the filament as on the picture below, tighten the setscrew to make sure the gear is securely fastened.



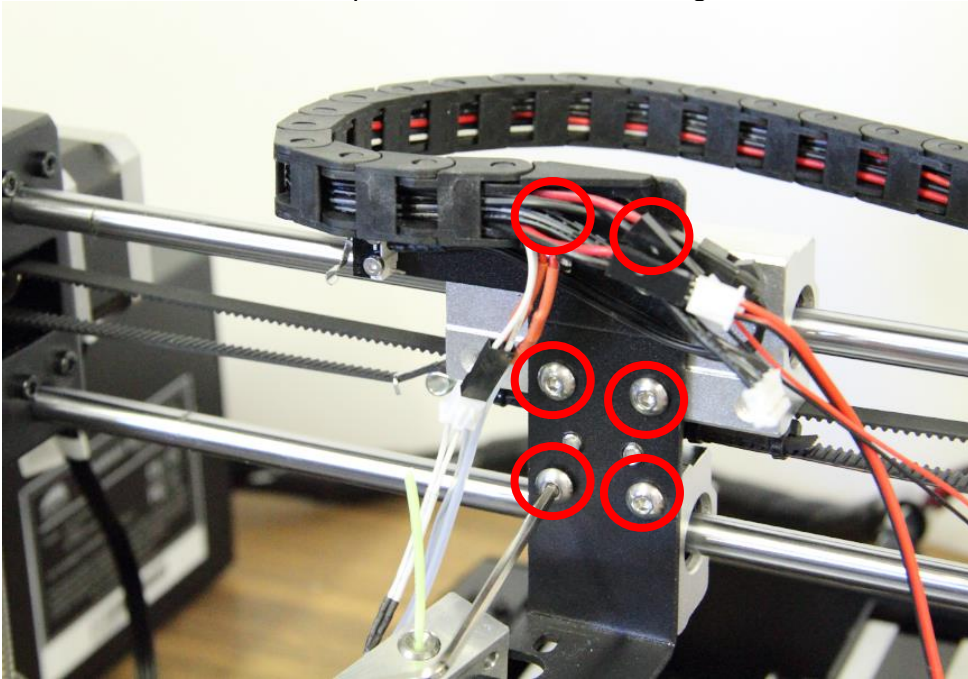
7. Remove the two M3 bolts that hold the part cooling fan & housing and move it away.



8. Remove the two M3 bolts that holds the coldblock to the extruder bracket and move it away from the bracket.



9. Remove the 6 M4 bolts that holds the extruder bracket to the bearing blocks and remove the bracket. The top two bolts are also holding the cable-chain.

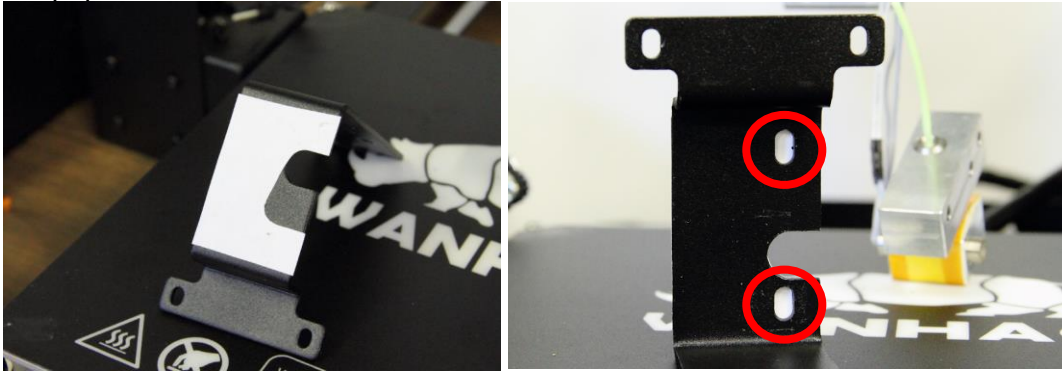


!!! If you have purchased the custom Wanhao bracket continue to step 15 !!!!

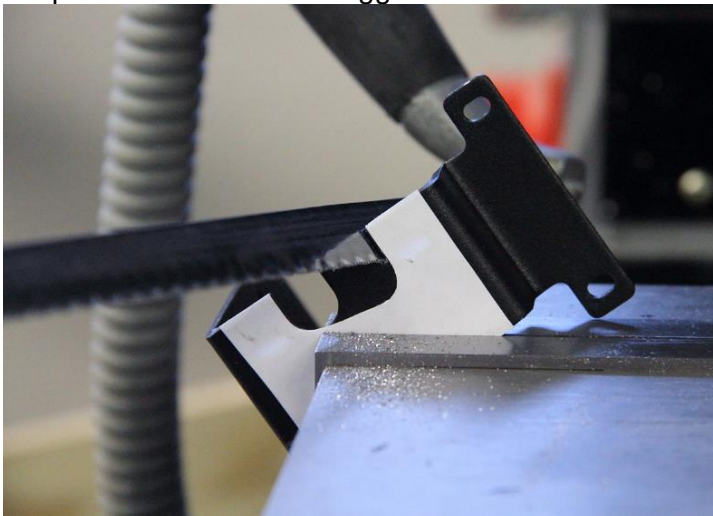
10. Print the template that is on the last page on this guide, cut it out with scissors and use some glue to place it on the extruder bracket.



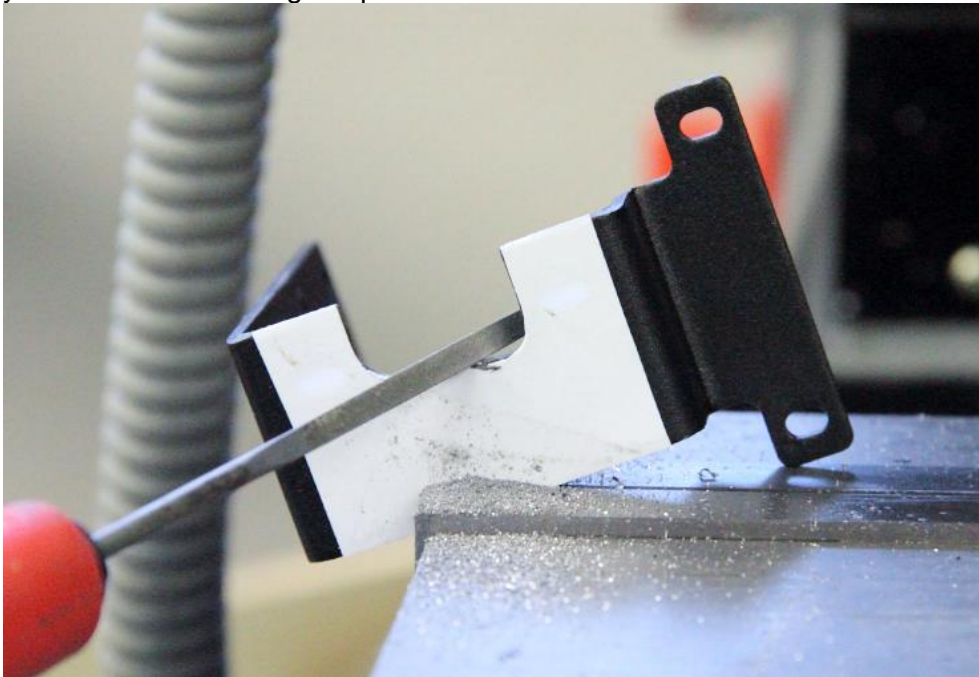
11. Attach the template to the bottom side of the bracket and align the holes printed on the paper with the holes in the bracket.



12. Place the bracket in a vice and use a hacksaw to cut out the rough shape, follow the template but leave some wiggle room.



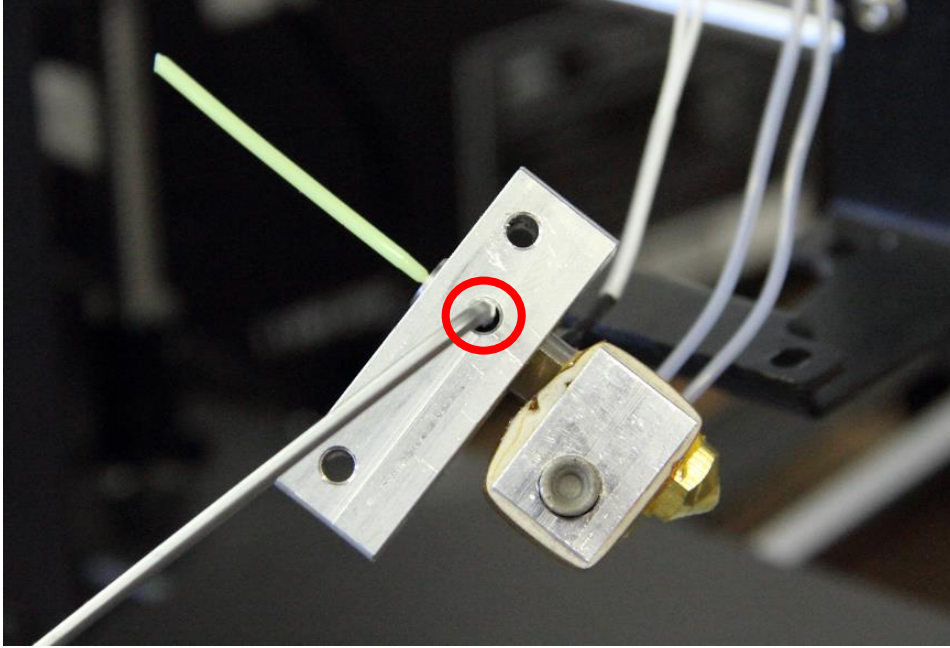
13. Use a metal file to complete the cutout. Also de-burr the edges to avoid to cut yourself when handling the part later.



14. Cut-out completed. Mount the bracket to the printer again, take care not to pinch any cable with the top two M4 screws.



15. Loosen the set-screw that holds the heat-break in the coldblock so it can be rotated.

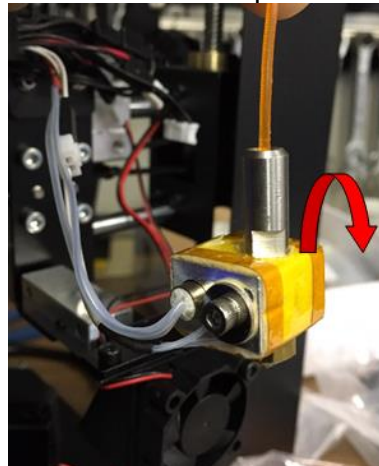


16. Due to the changed position of the nozzle the heatblock needs to be rotated 180 degrees, heat the heatblock up to 200 degrees and unscrew the nozzle and the heatbreak, rotate the heatblock upside down and screw back the nozzle where the heatbreak was and the heatbreak where the nozzle was. This allows free space for the front M3 bold holding the coldblock on the bracket. Take care so you do not burn yourself and also make sure that the wires for the heat cartridge and the thermistor not get bent too much as they can break.

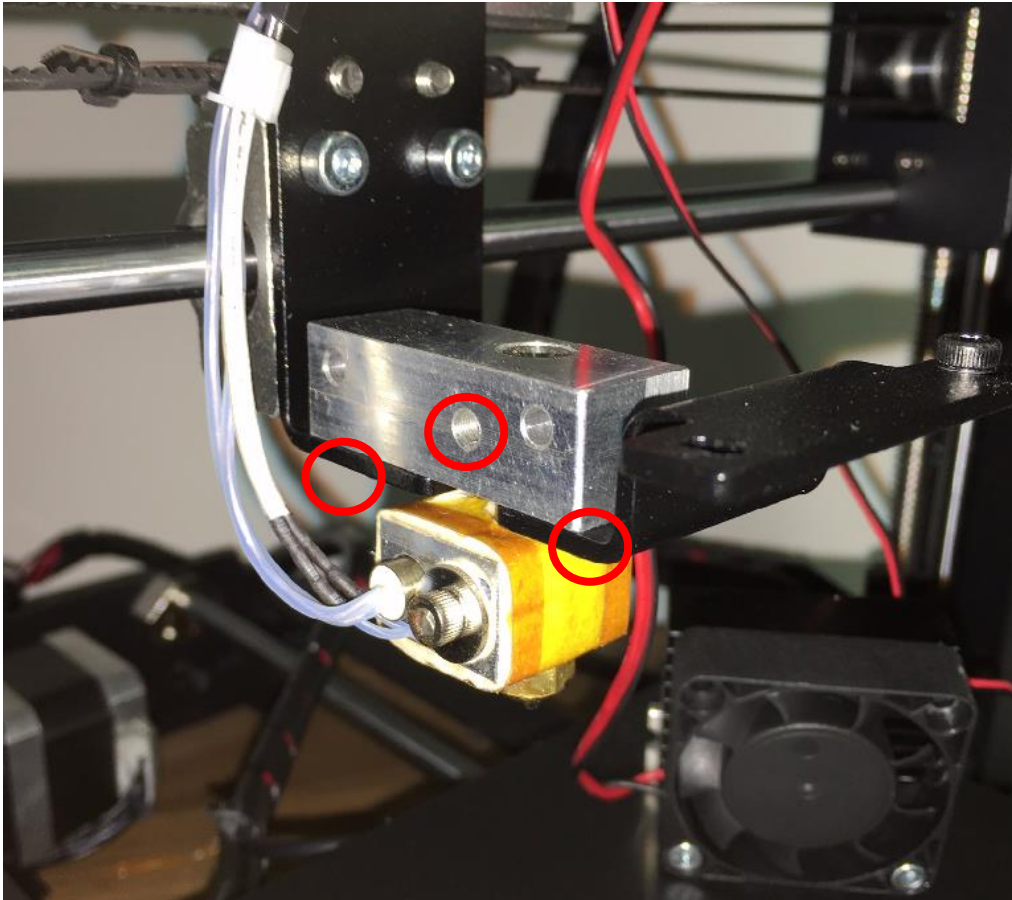
Original orientation of heat block



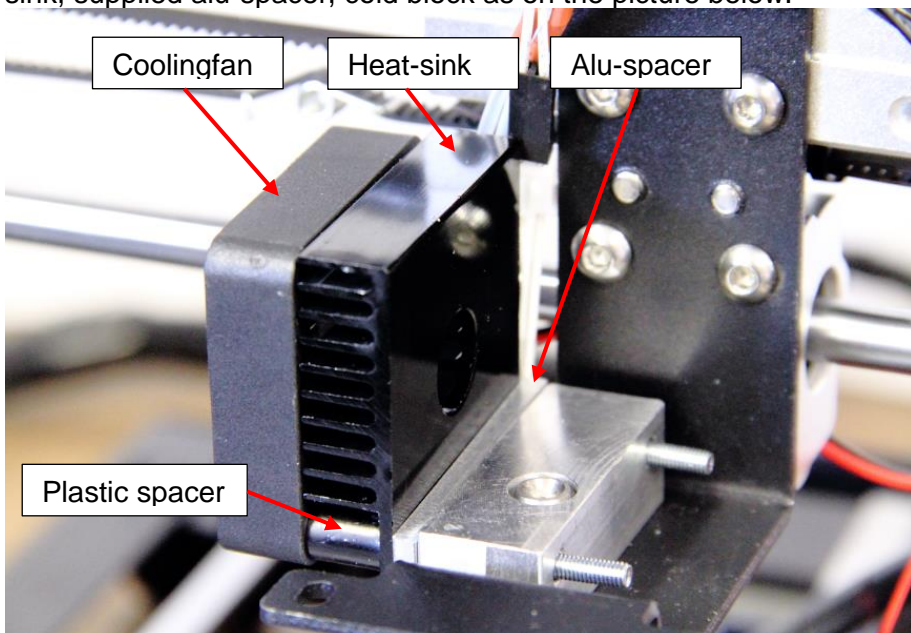
Heatblock turned upside down



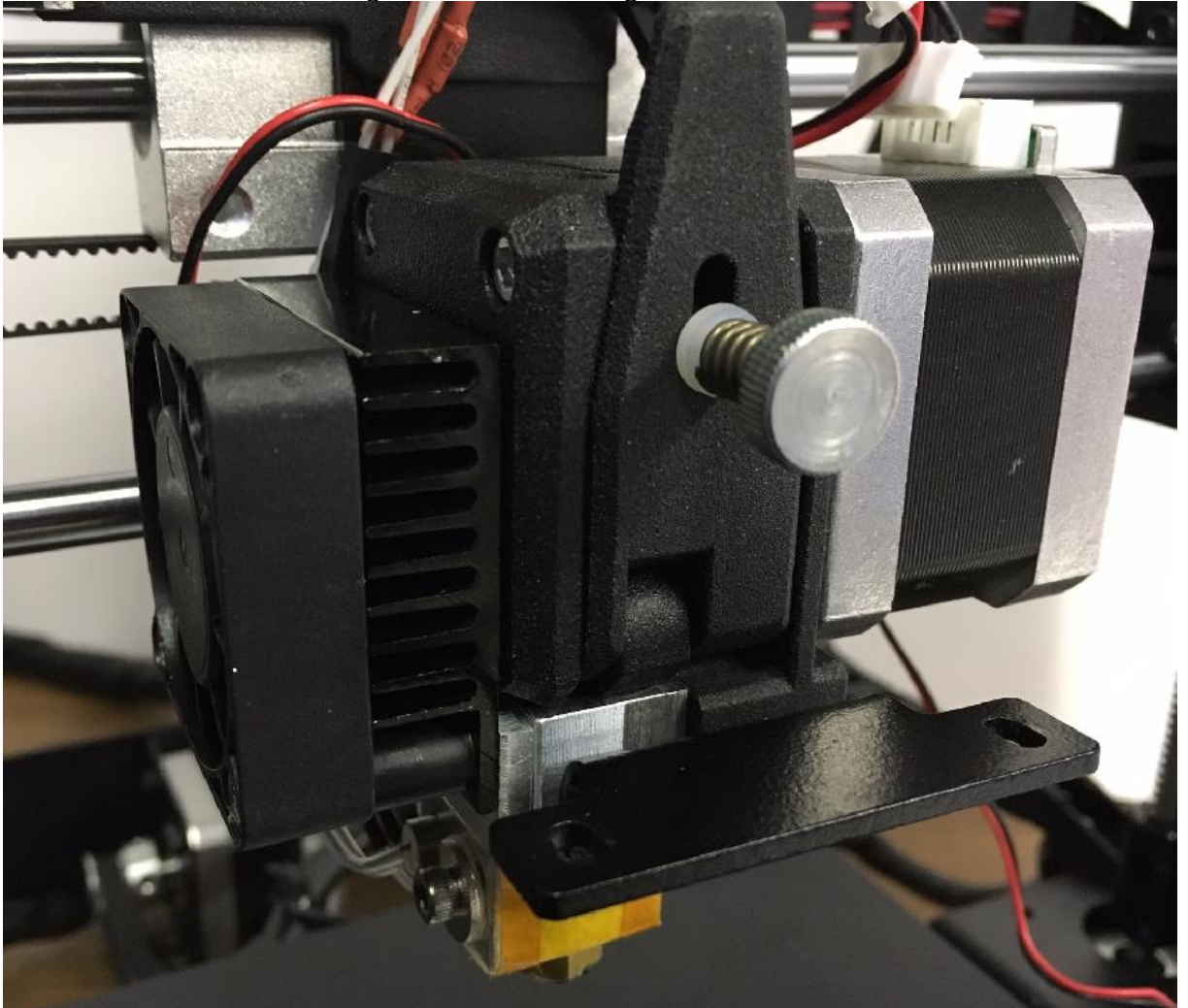
17. Install the cold-block so the set-screw for the heat-break is facing outwards, also rotate the heat-block so it is in the position below. Install the two M3 bolts from the underside that holds the coldblock to the extruder bracket.



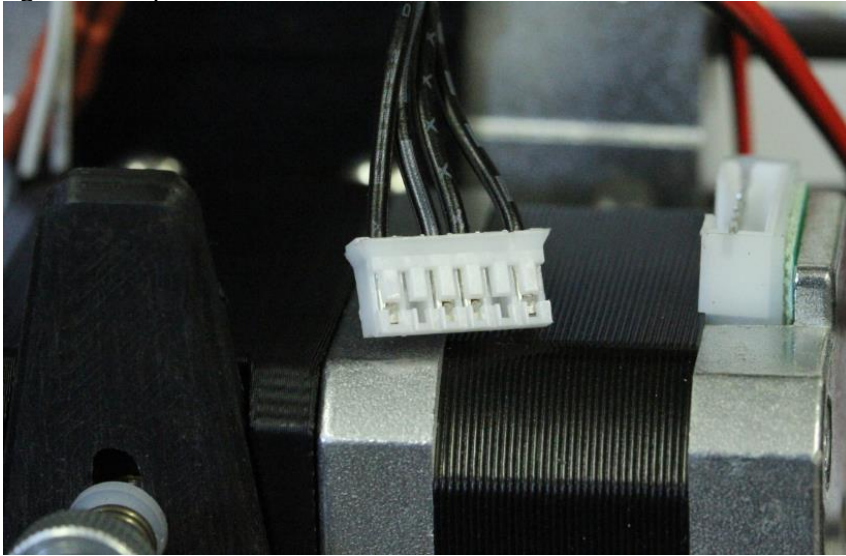
18. Use the supplied M3x45 screw and assemble the cooling fan, plastic spacer, heat-sink, supplied alu-spacer, cold block as on the picture below.



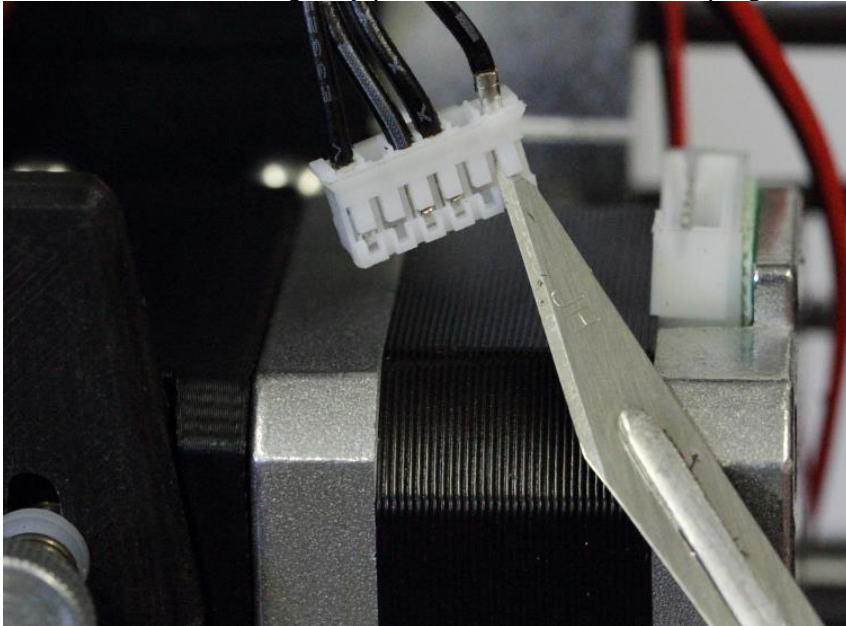
19. Place the extruder onto the extruder bracket and make sure the M3x45 bolts starts to thread into the thread bushings in the rear housing of the extruder.



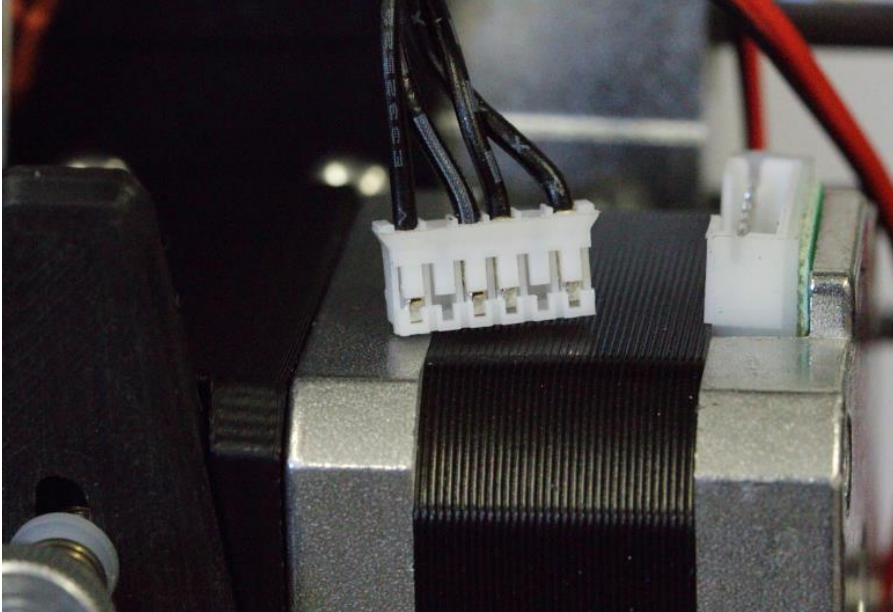
20. The stepper motor for the Bondtech Mini needs to have its default direction reversed when compared to the standard Wanhao I3 extruder. In order to achieve this one of the coils for the motor needs to be reversed. We will reverse the two cables to the right in this picture.



21. Use a sharp object like a knife or a small flat screwdriver to gently lift the small plastic tab on the connector, gently pull the cable with its crimping contact out of the housing.

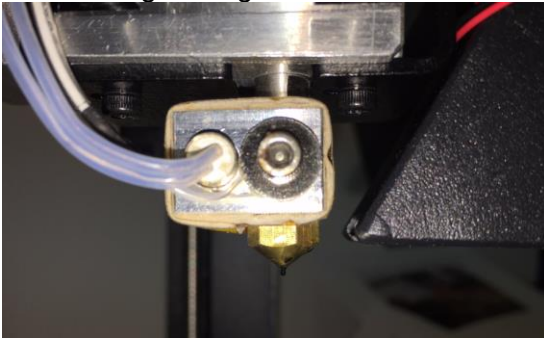


22. Repeat for the cable second from the right and then put the cable that was in the position furthest to the right in the second from the right position so the cables is switched, this will now make the motor to switch direction.

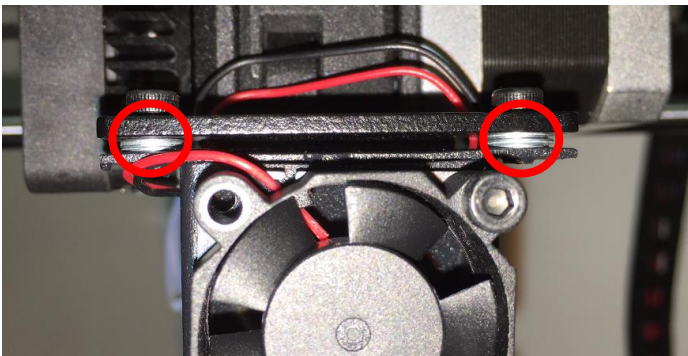
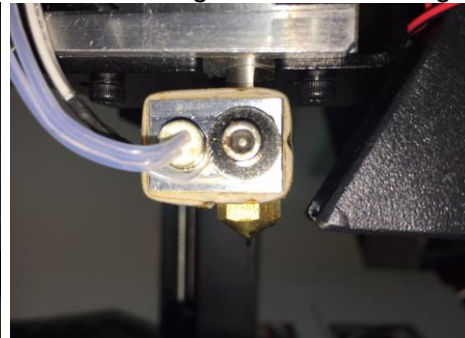


23. Install the part-cooling fan and shroud. Depending of the height of the nozzle the vertical position of the part cooling fan needs to be adjusted in order to have the flow of air to be directed at the print. If the flow of air is directed to the nozzle instead of the extruded plastic it will decrease the print quality and the performance as the nozzle is cooled. Adjust the vertical position by placing washers between the part cooling fan housing and the extruder bracket.

Part cooling too high



Part cooling fan at correct height



Washers placed between the part cooling fan and extruder bracket to adjust vertical position

Wanhao i3 V2.1

The extruder bracket and also the part cooling fan height is changed on version 2.1 of the printer. This means that if you bought the Bondtech Extruder bracket the original part cooling fan housing will not fit as it will be lower than the nozzle when installed. We are working with a solution in order to correct this.

Relevel Z-bed

The nozzle position is changed during the rebuild and this will require to relevel the build plate. Follow the instructions that followed with the printer to relevel the buildplate.

Steps / millimeter

Use 140 steps/mm as the E-step value, the standard Wanhao I3 uses 96.

In order to set the steps/mm value in your printer you can use the following method. Connect to your printer with your favorite program that lets you send G-codes to your printer.

Send the following commands to your printer controller:

M92 E140 (to set e-step to 140 steps/mm)

M500 (to store new value in Eprom of the controller)

Or use the LCD-controller to set the new E-step value by navigating as below.

Good luck with your Bondtech Extruder!

If you have any questions please contact me by mail or telephone.



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Template

Print this page and cut the template out with scissors, use some gluestick to make the template adhere to the sheet-metal bracket. Align the template with the existing holes in the bracket, remove material according to the line.

