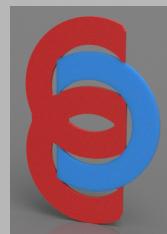


## **Lineux Toolchanger Build Guide**



***Originally Designed and Created by :***

3dfiy My Life & JackBeam

***With Contribution from :***

Armon / art\_v2.5091\_sc0018 | LNX.2



<https://discord.gg/Xwqbjj4VjH>



<https://github.com/Bikin-Creative/Lineux-Toolchanger>

A big thank you to everyone who made this project possible.

**Inspired by Axial Flux Toolchanger / Daksh Toolchanger**

**Credit to [chirpy2605 \(Dragonburner Toolhead\)](#)**



## Important



- Pls take careful precautions with safety in mind when attempting to build Lineux.
- Only attempt the build if you are knowledgeable with 3d printer mechanics and electronics.
- Failure to follow safety precautions may result in things going against you, or even harm you.
- If things start to get confusing or you're stuck at some point during the build, do ask questions on our discord. Learning is always a blessing.
- We try to keep things as simple and as clear as possible for a fun and enjoyable build for everyone.
- Accented Printed Parts has an (a) on the part description.
- Lineux Toolchanger utilises strong magnets. Magnets may interfere with fans therefore it's important to know the polarity of the magnets. If the polarity is unknown, you can use your phone compass to find the polarity of the magnets. Use a permanent marker to mark the North and South pole of the magnets. It makes it easier to keep track of the polarity
- The North pole of the magnets are marked Red in the illustration. The South pole of the magnets are marked Blue.
- We are humans and are prone to mistakes. If you encounter any issues/faults with the build guide, please raise them on our Discord.

Ready? Let's go....

## Page Index

Carriage 4

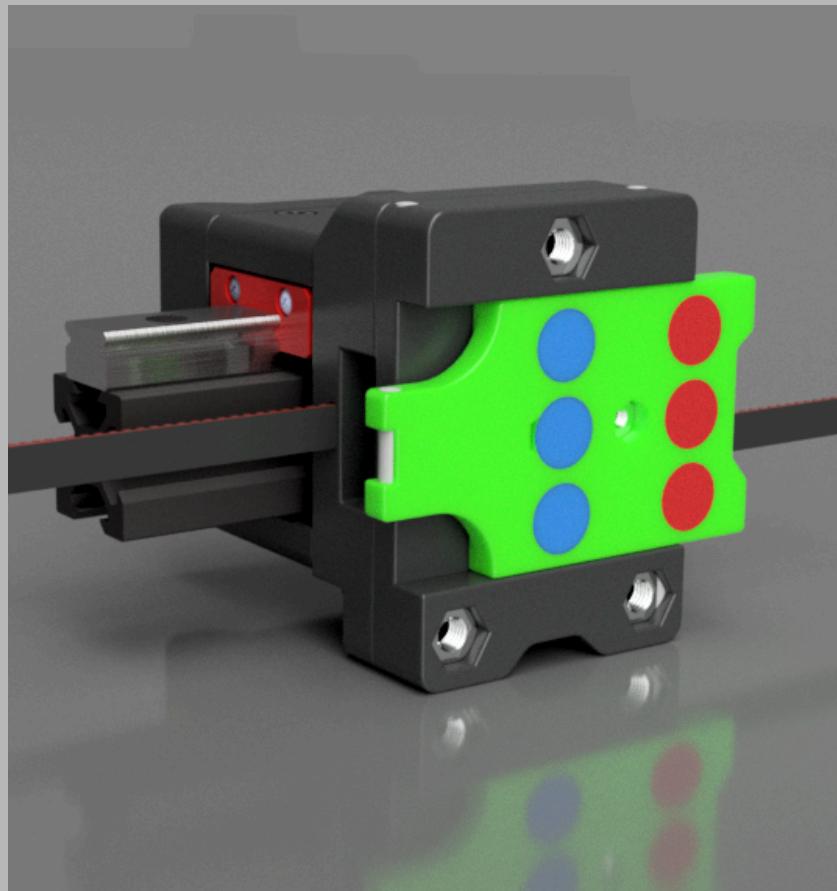
Toolhead 16

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EBB36 Wiring Diagram 42

## Carriage

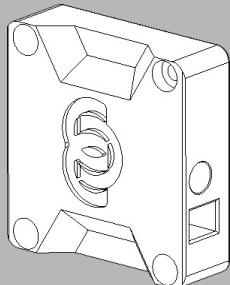
Lineux is adaptable to most printer. Illustration and build guide below shows the carriage assembly for the VZBot 330 Printer.



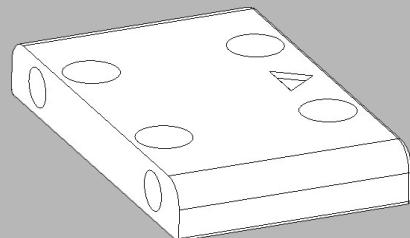
(Fun Facts : Lineux Toolchanger was first developed on the VzBot 330 Printer)

## Carriage

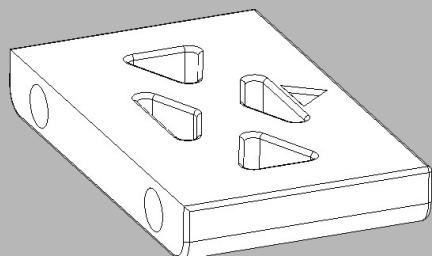
### Printed Parts



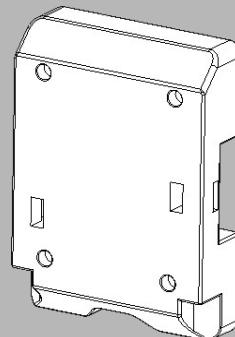
Carriage Body Front x 1



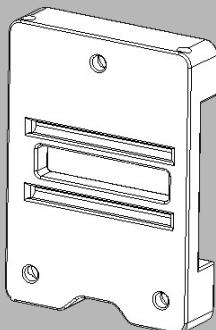
Carriage Body Top x 1



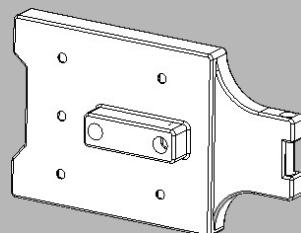
Carriage Body Bottom x 1



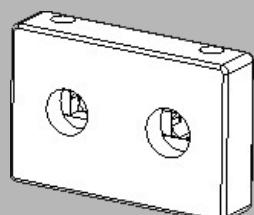
Carriage Body Middle x 1



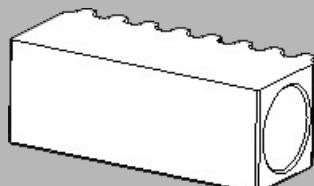
Carriage Body Rear x 1



Locking Plate (a) x 1



Slider (a) x 1



Belt Tensioner (a) x 2

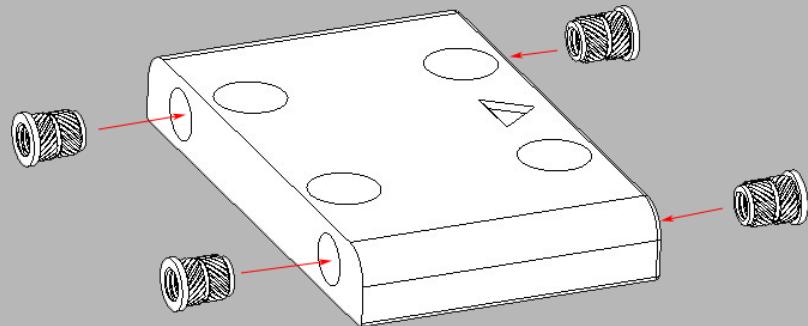
## Carriage

### Hardwares

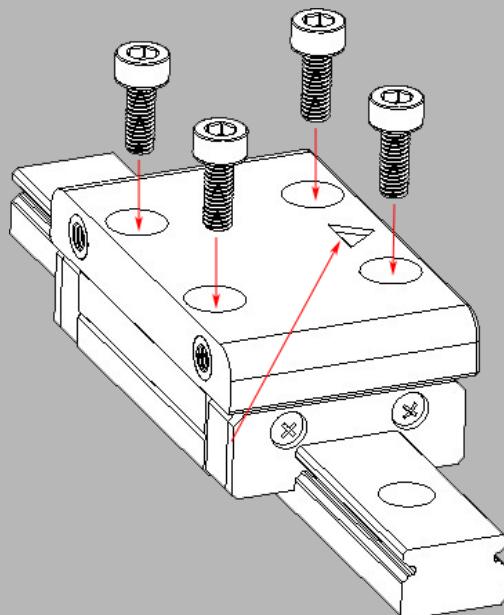
1. m3x6mm shcs (3)
2. m3x8mm bhcs (1)
3. m3x8mm shcs (8)
4. m3x10mm shcs (4)
5. m3x12mm shcs (1)
6. m3x20mm shcs (1)
7. m3x30mm shcs (1)
8. m3x40mm bhcs (2)
9. m3 brass insert (13)
10. m3 hex nut (2)
11. m5 hex nut (3)
12. m3x16mm dowel pin (1)
13. m3x20mm dowel pin (2)
14. m3x35mm dowel pin (2)
15. m3x55mm dowel pin (2)
16. mr63zz bearing (4)
17. 10x5mm N52 magnet (6)

## Carriage

Insert 4 x m3 brass insert to the Carriage Body Top.

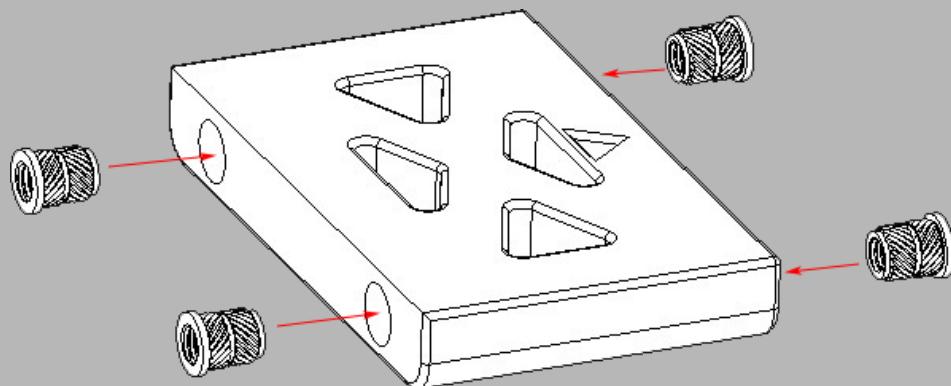


Assemble the Carriage Body Top to the MGN block using 4 x m3x10mm shcs. **Pay attention to the orientation of the Carriage Body Top.** Ensure the arrow on the Carriage Body Top is facing the front.

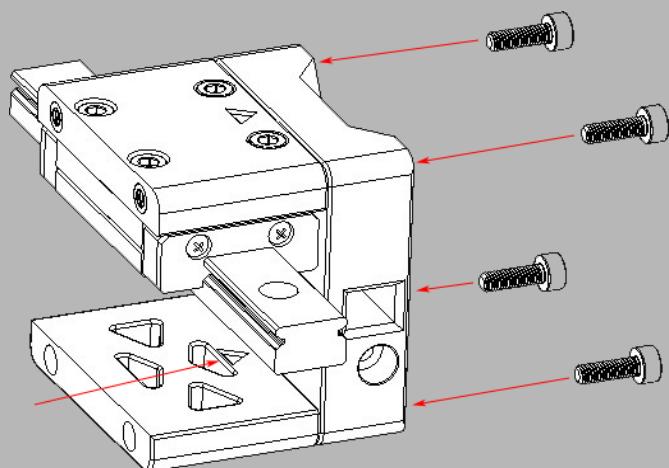


## Carriage

Insert 4 x m3 brass insert into the Carriage Body Bottom.

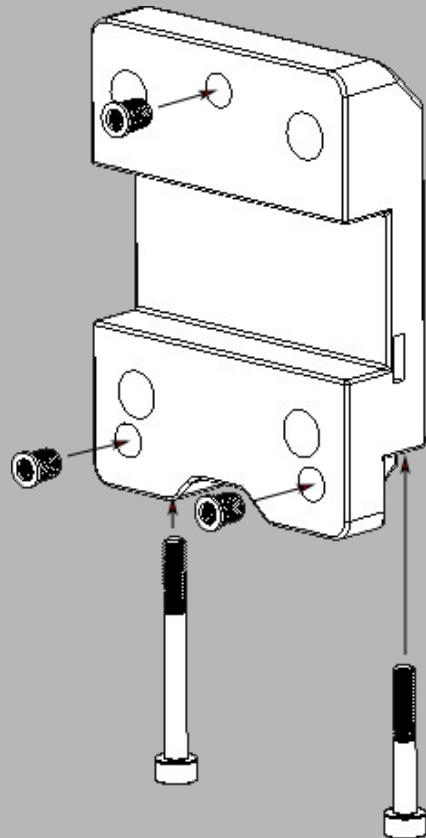


Install the Carriage Body Front and Carriage Body Bottom to the Carriage Assembly using 4 x m3x10mm shcs.  
**Pay attention to the orientation of the Carriage Body Bottom.** Ensure the arrow on the Carriage Body Bottom is facing the front.

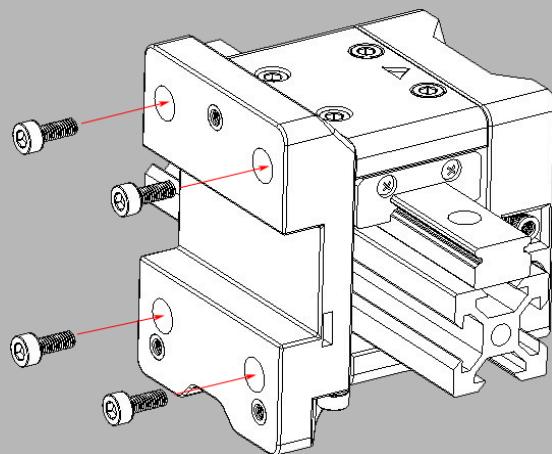


## Carriage

Insert 3 x m3 brass insert into the Carriage Body Middle. Screw in m3x20mm shcs and m3x30mm shcs to the threaded hole from below. **Do not overtighten because you are screwing into plastic.** The m3x30mm shcs will go on the left side and the m3x20mm will go on the right side when viewed from the back as shown below. These 2 screws will provide strength support for the belt.

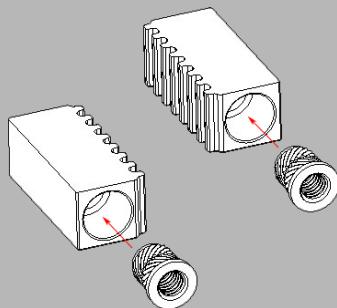


Install the Carriage Body Middle to the Carriage Assembly using 4 x m3x8mm shcs

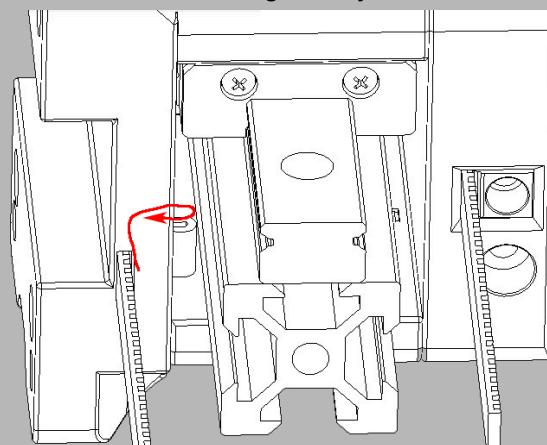


## Carriage

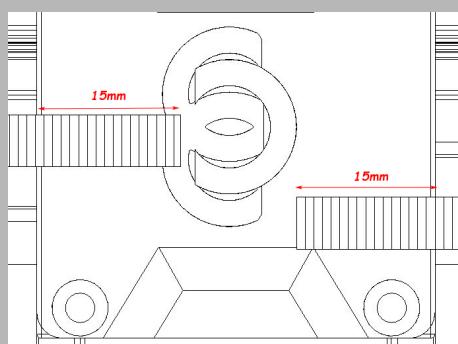
Looks like you're almost there towards completing the Carriage Assembly. Now is the perfect time to install the belts on the carriage. Insert m3 brass insert to both Belt Tensioner.



Run the rear belt in through the belt opening of the Carriage Body Middle and form a loop upon the belt exiting through the back. Slide the belt back in through the rear opening and pull on tight on the belt from the entrance point. This will ensure the belt is fitted snugly and locked in place. Repeat the same procedure for the opposite side. If you encounter difficulty during this procedure, you can remove the Carriage Body Middle first. After installing the belt, you can then reassemble the Carriage Body Middle to the Carriage Assembly.

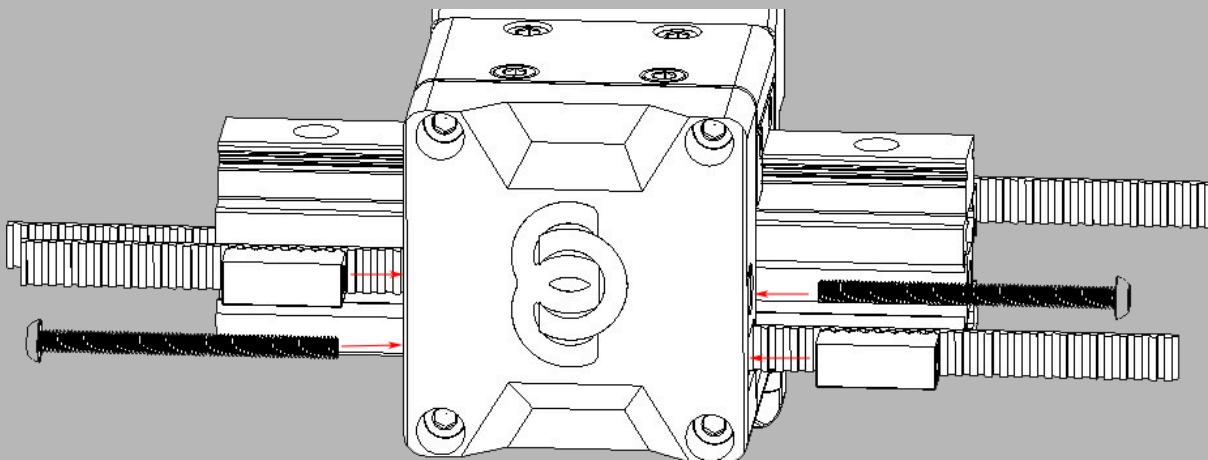


Next, install the front belts. Ensure all belts are riding on the pulleys and idlers properly before committing to cutting the belts to length. Measure and cut the belt at 15mm from the edge of the Carriage Body Front.



## Carriage

Slide in the belt together with the Belt Tensioner in the Carriage Body Front. Screw in the m3x40mm bhcs from the opposite side to grab the Belt Tensioner but keep the belt a bit loose at this point. Once both Belt Tensioner are held in place, you can then adjust the belt tension as per yr printers recommended tension.

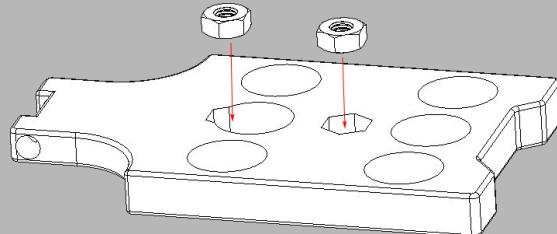


Congratulations, you have the base carriage installed. Your Carriage Assembly should look like this right now. Few more steps to go...

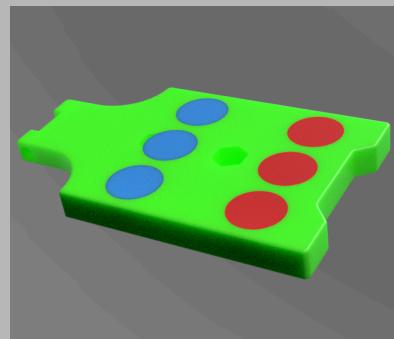
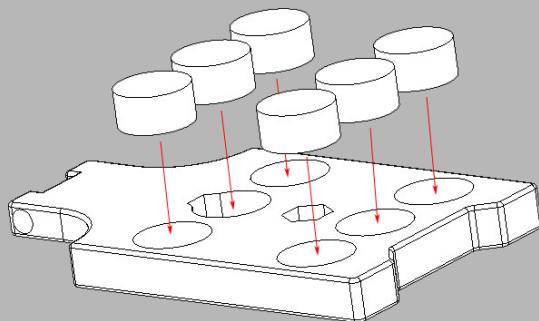


## Carriage

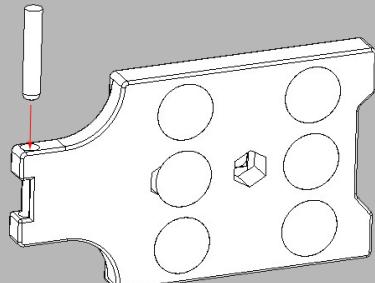
Insert 2 x m3 hex nuts, 1 in one of the magnet slots and 1 on the Locking Plate. Ensure the hex nuts are seated properly in the hex nut cutouts.



Install 6 x 10x5mm magnets on the Locking Plate. Pls ensure the correct orientation is followed. Refer to the colour image for the correct orientation. North is Red, South is Blue. **Having the magnets installed in the wrong orientation may affect the Part Cooling Fans and stop them from working.** The magnets should be a tight fit in the slots. It's recommended to apply a few drops of glue in the slots before pushing the magnets in. A wooden mallet might also be handy to ensure the magnets are seated fully in and properly.

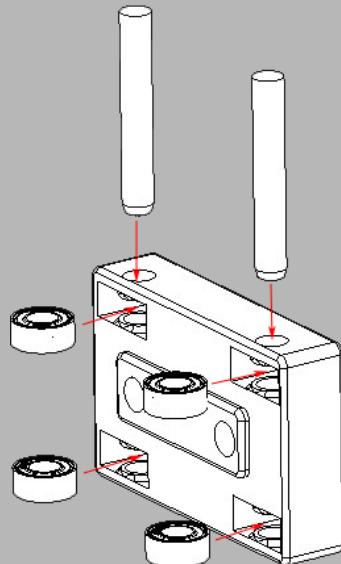


Install the m3x16mm dowel pin on the Locking Plate arm.

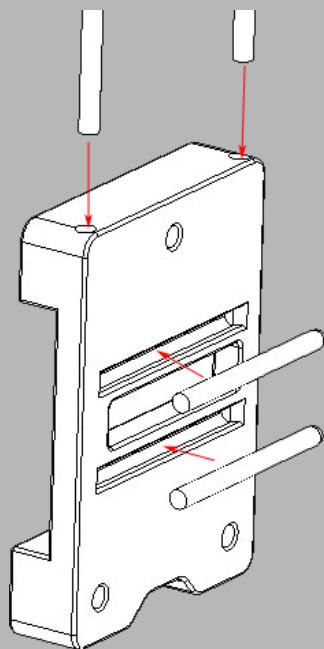


## Carriage

Slide in 4 x mr63zz bearings in the respective slots on the Slider and push in the 2 x m3x20mm dowel pins to hold the bearings in place.

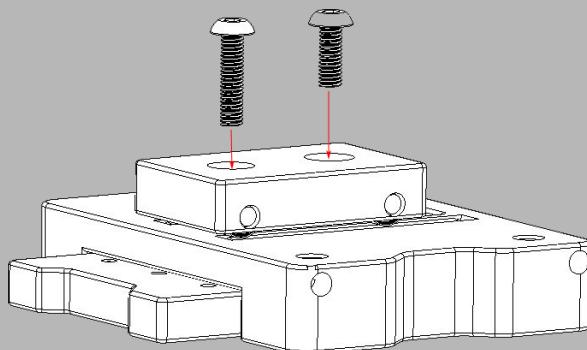


Next, prepare the Carriage Body Rear. Insert 2 x m3x35mm dowel pins in the 2 slots and push in the 2 x m3x55mm dowel pins from the top. Ensure the dowel pins sit flush with the Carriage Body Rear at the top.

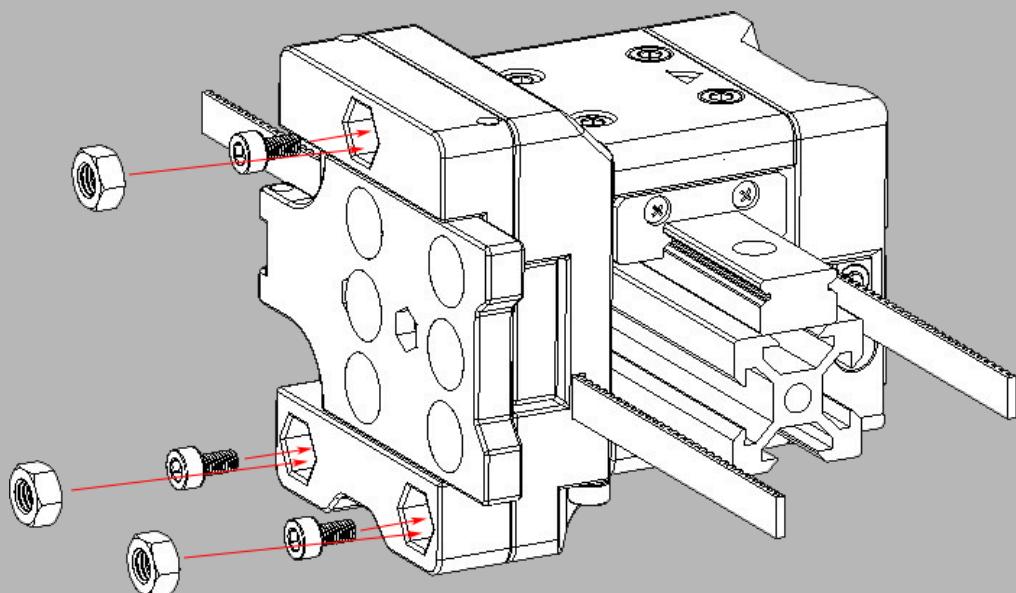


## Carriage

Place the assembled Locking Plate magnets side face down on a flat surface and place the Carriage Body Rear on top. Place the assembled Slider on top of the Locking Plate and screw them down using m3x8mm bhcs and m3x12mm bhcs. The m3x8mm should be on the right (closer to Locking Plate Arm) and the m3x12mm on the left when viewed from the front. **It is advisable to apply threadlocker to the 2 screws to prevent them getting loose.** After completed, slide the Locking Plate back and forth. They should move freely without any resistance.

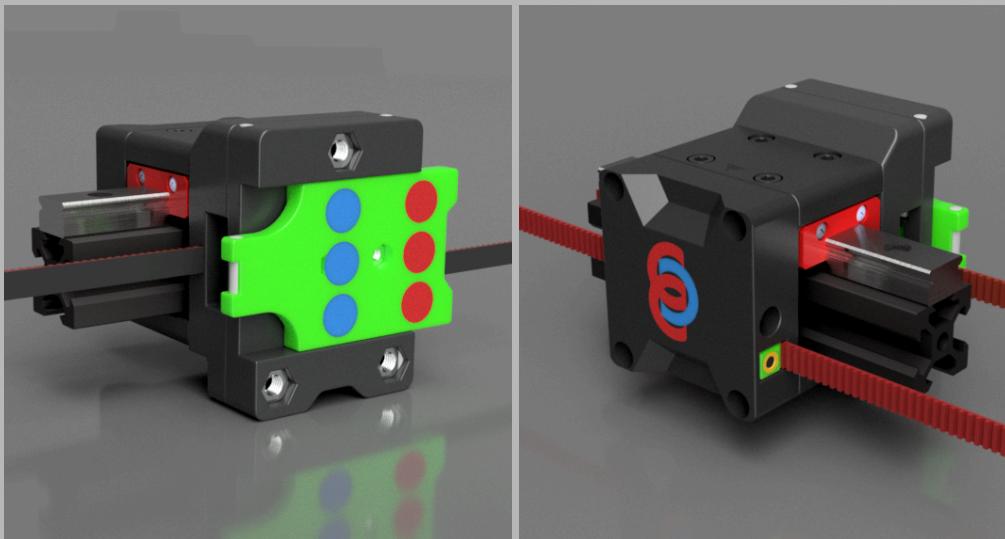


It's time to complete the whole Carriage Assembly. Install the Carriage Body Rear to the Carriage Assembly and screw it down using 3 x m3x6mm shcs. You can then push in 3 x m5 hex nuts on top of the screws. The m5 hex nuts should be a push tight fit to prevent them from accidentally dropping out.



## Carriage

Congrats on completing the Carriage Section. Job well done. Remember to take breaks in between assemblies. Your final Carriage Assembly should look like this.



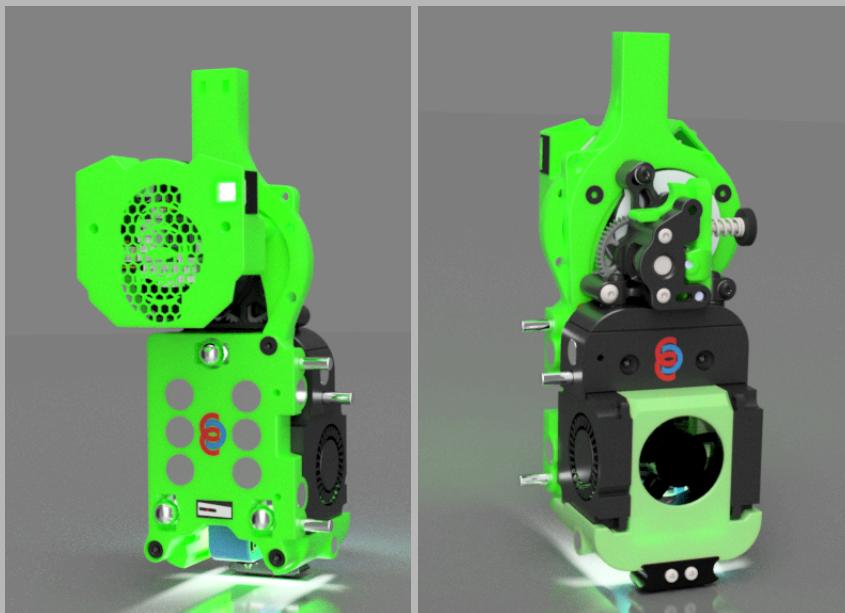
## Checklist

- Ensure the Locking Plate can move freely without resistance.
- Try to move the carriage around. Ensure the m5 hex nuts stay in place.
- Ensure you have the proper belt tension.
- Ensure all screws are tightened.
- Ensure the m5 hex nuts are pushed fully in.

Let's assemble the Toolhead next once you're ready to rock and roll...

## Toolhead

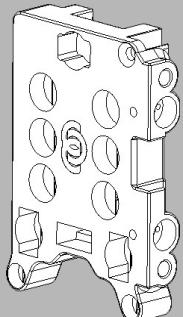
Lineux is utilising a slightly modified DragonBurner Toolhead. The assembly of the DragonBurner is somewhat similar with a few additional steps and parts. The illustration in this build guide is for a toolhead with a Sherpa Micro Extruder, V6 CHP Hotend, EBB36 board and a klicky probe. Parts and hardwares may vary depending on the combination of extruders, toolheads, boards and probe used.



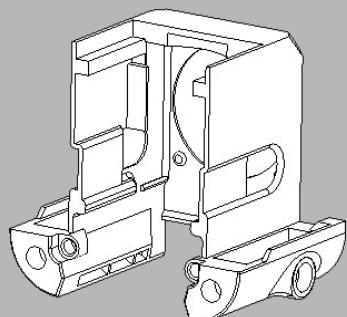
(Fun Facts : Dragonburner was chosen for its versatility, lightweight and ease of build)

## Toolhead

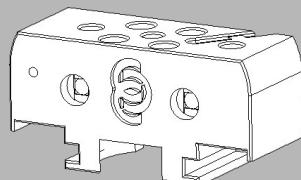
### Printed Parts



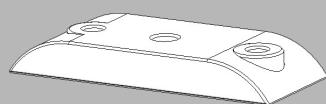
Back Plate (a) x 1



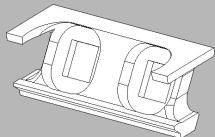
Cowl (a) x 1 (Vary)



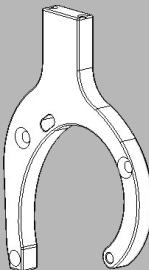
V6 CHP Sherpa Micro Extruder Mount (Vary)



Sherpa Micro Mount x 1 (Vary)



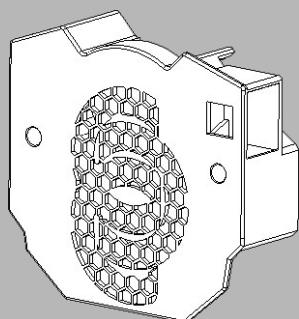
DB LED Carrier x 1 (Vary)



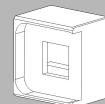
EBB36 Sherpa Micro Mount (a) x 1 (Vary)



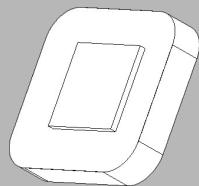
EBB36 Spacer (a) x 2



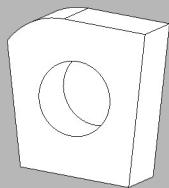
EBB36 Cover w Led Sherpa Micro (a) x 1



Led Carrier x 1(Clear)



Diffuser x 1 (Clear)



EBB36 Mount Spacer (a) x 1 (if required)

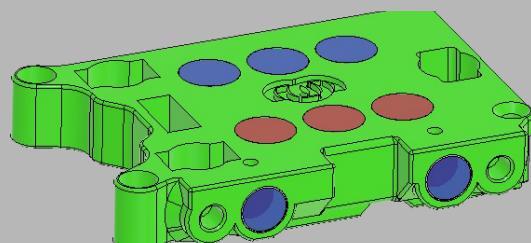
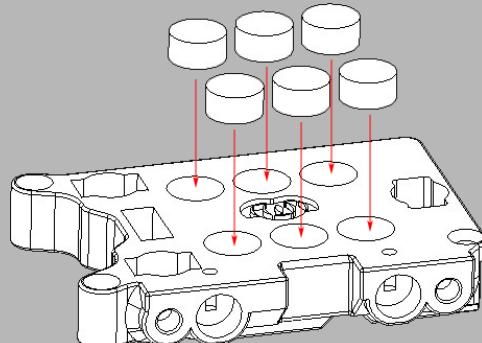
## Toolhead

### Hardwares

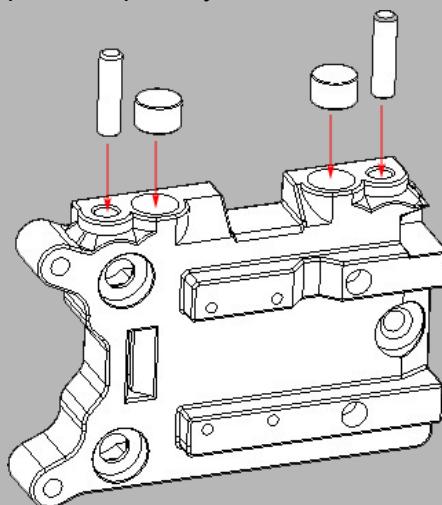
1. m2.5mm shcs (4) - (for V6 CHP Hotend)
2. m3 x 10mm fhcs (3)
3. m3 x 12mm shcs (2)
4. m3 x 20mm shcs (4) - (2 for Sherpa Micro)
5. m3 x 30mm bhcs (1)
6. m3 brass insert (11)
7. m3 hex nut (2)
8. m5 x 6mm bhcs (3)
9. m5 x dome nut (3)
10. m5 washer (3)
11. m4 x 15mm dowel pin (3)
12. 6 x 3mm magnet (3) - (2 for klicky)
13. 8 x 5mm magnet (3)
14. 10 x 5mm magnet (6)
15. V6 CHP Hotend (self preference)
16. Sherpa Micro Extruder (self preference)
17. Nema 14 Round Motor (1)
18. 3010 axial fan (1)
19. 4010 radial fan (2)
20. microswitch (2)
21. Bigtreetech EBB 36 (self preference)
22. Neopixel led (3)

## Toolhead

Install 6 x 10x5mm magnets on the Back Plate. The magnets are supposed to be a tight fit. You can use a wooden mallet to assist in pushing it in and it must sit flushed. Apply a dab of glue for better holding strength if required. Pay attention to the orientation of the magnets. Refer to the coloured image for the polarity orientation. **Wrongly inserted orientation will affect the part cooling fans.**

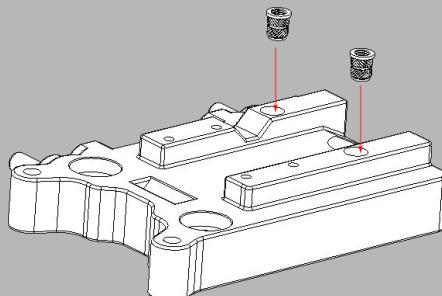


Next, insert 2 x 8x5mm magnets and 2 x m4x15mm dowels in the respective slots. It should be a tight fit as well. A wooden mallet is your friend again for this. Don't forget to apply a dab of glue as well before inserting them. You can refer to the image on top for the polarity orientation.

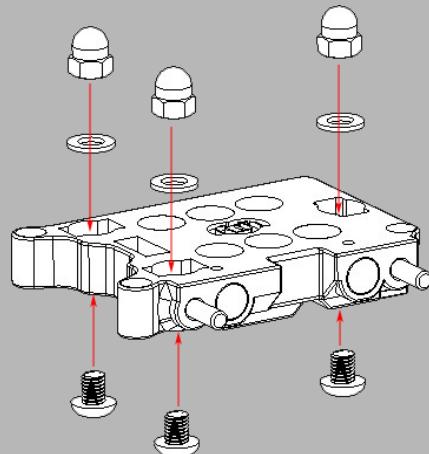


## Toolhead

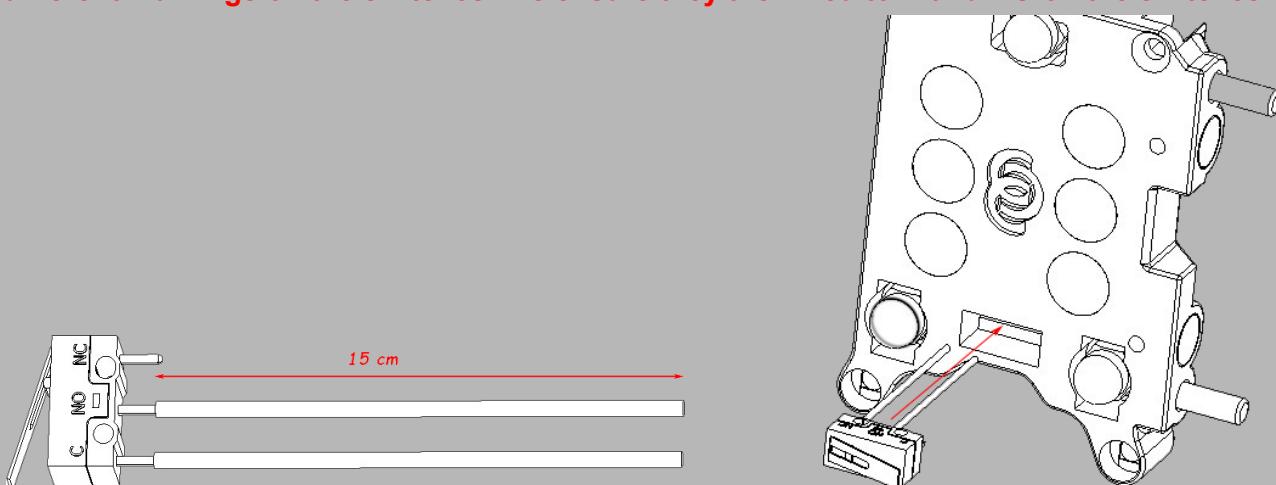
Next, insert 2 x m3 brass insert.



Screw in 3 x m5x6mm bhcs to the 3 x m5 cap nuts with an m5 washer in between each of them. If required, apply a dab of loctite to ensure they stay tightly in place.



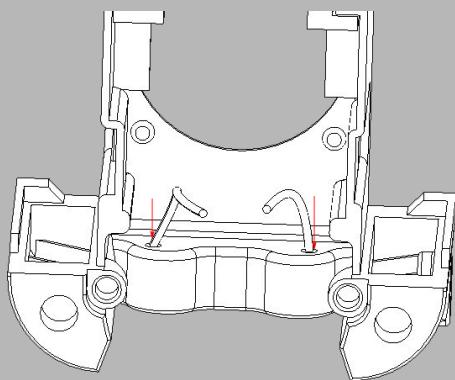
Solder the wiring for the microswitch using roughly 15cm wires as shown and insert them to the Back Plate. Make sure it's seated fully in. You can set the Back Plate aside for now. **Different manufacturers have different markings on the switches. Pls ensure they are wired to C and NO on the switches.**



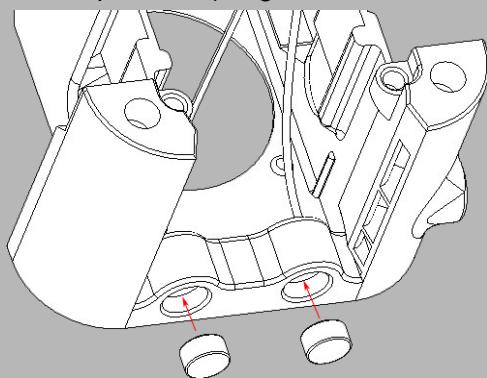
## Toolhead

\*This step is for a klicky probe. You may skip this if you are not using a klicky probe.

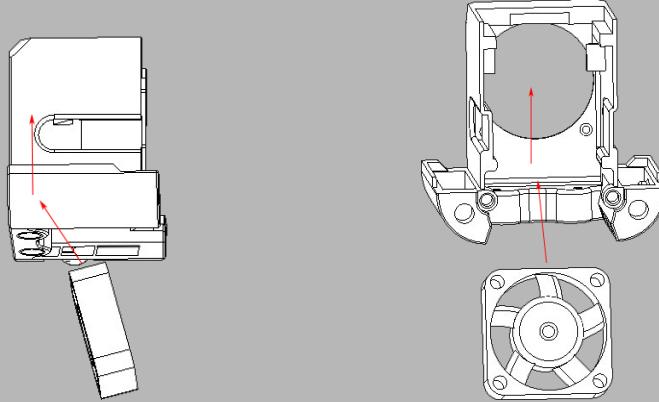
Strip the ends of 2 wires about 20cm each and route the ends through the holes in the Cowl Klicky for the klicky magnets. Ensure the stripped ends of the exposed wires are long enough to enable the magnets to hold onto them.



Next insert 2 x 6x3mm magnets in the respective holes while ensuring they are holding the stripped ends of the wires in place. The magnet should be a push fit. (Magnets orientation should match yr klicky orientation)

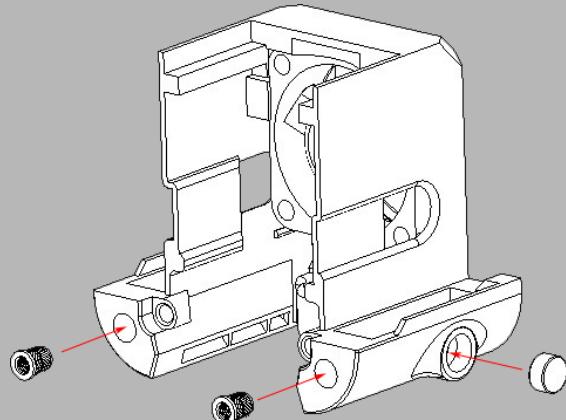


Next, insert the 3010 hotend fan. It's easier to insert it at a slight angle and wiggle it in. It should sit in the slot perfectly in place.

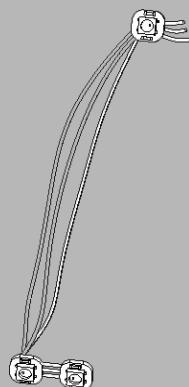


## Toolhead

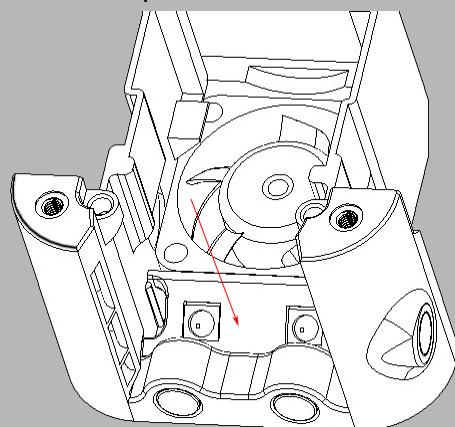
Insert 2 x m3 brass insert and the 6x3mm magnet in their respective holes. The magnet should be a push fit. Insert a dab of glue for added strength. (The magnet orientation doesn't matter but it need to match the magnet on the dock later on)



The Led wiring is the same as Dragonburner wiring. But the wiring from the status led to the nozzle led is about 10cm.

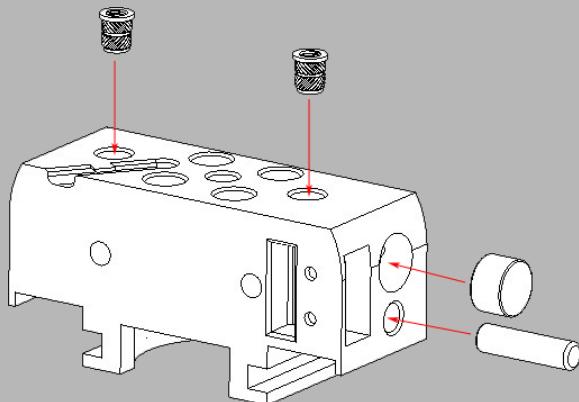


Place the nozzle leds in the DB Led Carrier and push them in on the cowl. Ensure it is seated properly.

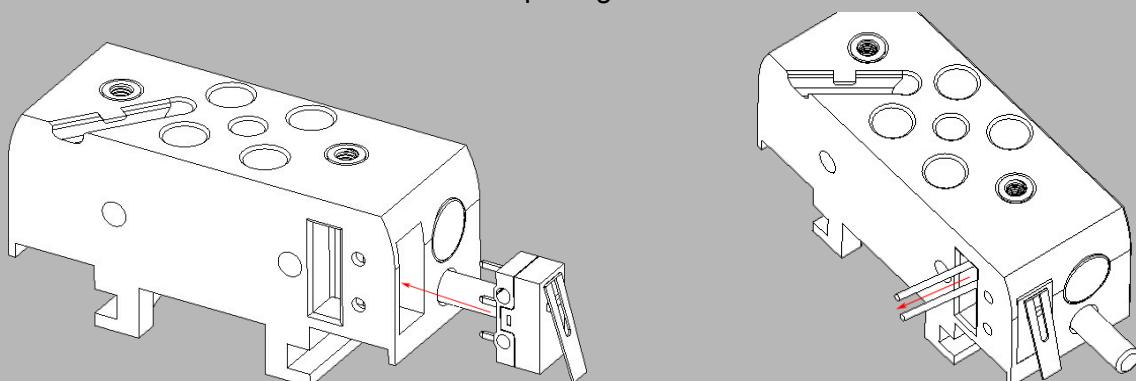


## Toolhead

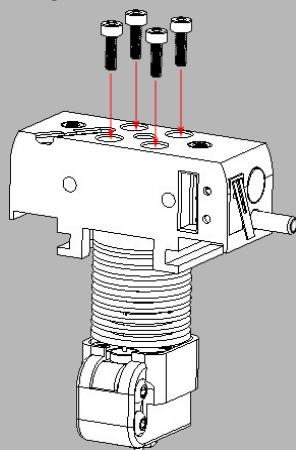
Now let's move on to the hotend mount. Insert 2 x m3 brass insert from the top. Then insert the 8x5mm magnet and the m4x15mm dowel pin. The magnet should be a push fit. Apply a dab of glue in the magnet and dowel slot for added strength before pushing the magnet and dowel pin in. You may use a wooden mallet to assist in pushing the magnet and dowel fully in. (The magnet orientation doesn't matter but it need to match the magnet on the dock later)



Solder another microswitch as before using about 10cm wires and slide it in the slot. The position should be as follows and the wire will be routed out the opening.

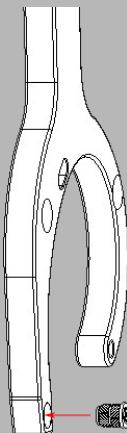


Screw in the V6 CHP Hotend to the mount using 4 x m2.5x8mm shcs.

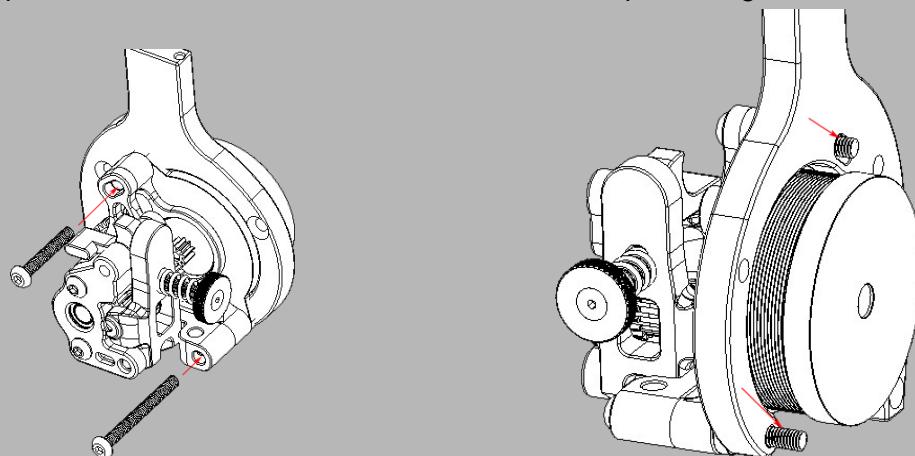


## Toolhead

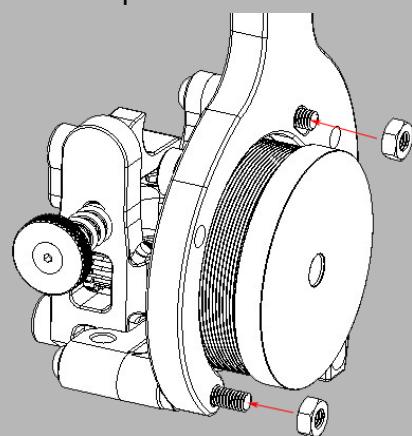
Next, we move to the extruder assembly. Insert m3 brass insert in the EBB 36 Sherpa Micro Mount.



Replace the 2 Sherpa Micro extruder screws with m3x20mm bhcs and m3x30mm bhcs. The position of the m3x20mm bhcs should be at the top and m3x30mm bhcs at the bottom as shown. Thread the screw through the EBB Sherpa Micro Mount. There should be a bit of screw protruding out the EBB Sherpa Micro Mount.

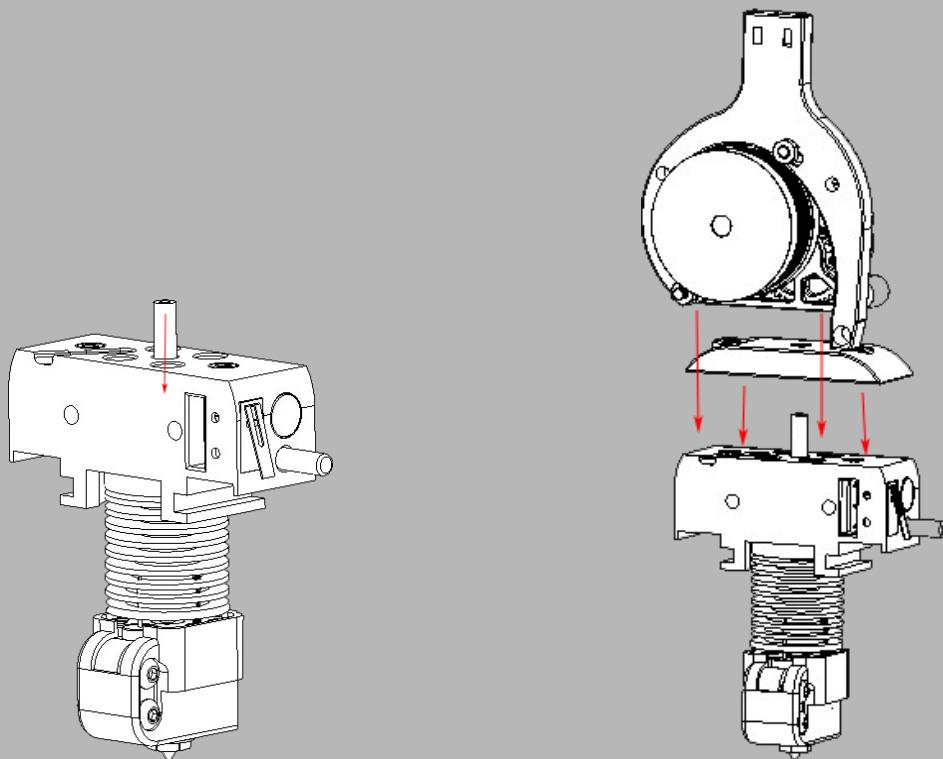


Screw in 2 x m3 hex nut to secure the EBB Sherpa Micro Mount to the extruder.

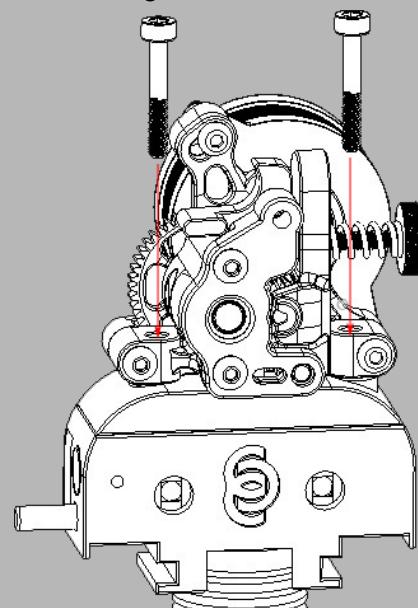


## Toolhead

Cut a PTFE tube to 37mm and insert it all the way in the hotend. Next place the Sherpa Micro Mount and the Sherpa Micro Extruder Assembly on top.

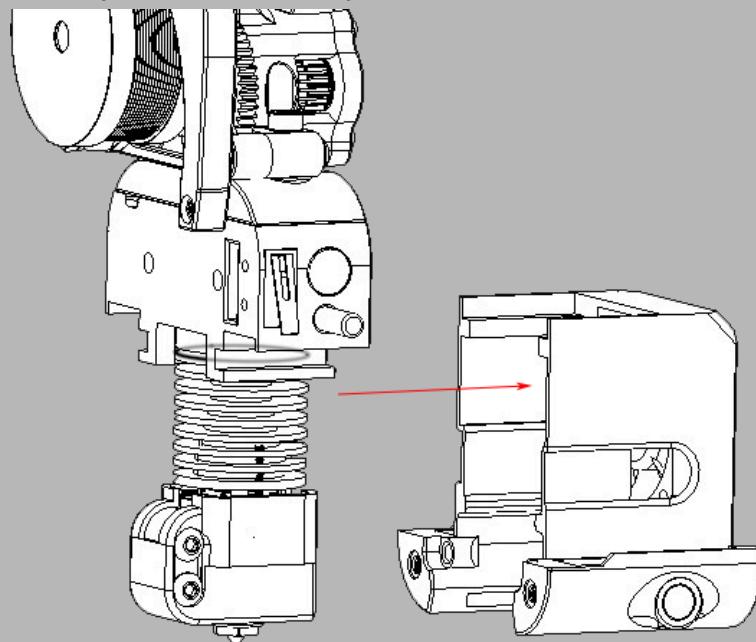


Secure the Extruder Assembly to the Hotend using 2 x m3x20mm shcs.

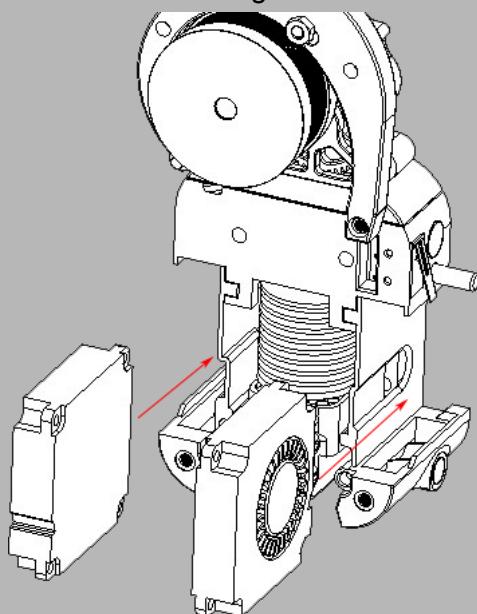


## Toolhead

Assemble the parts together. They should fit perfectly without much resistance or play.



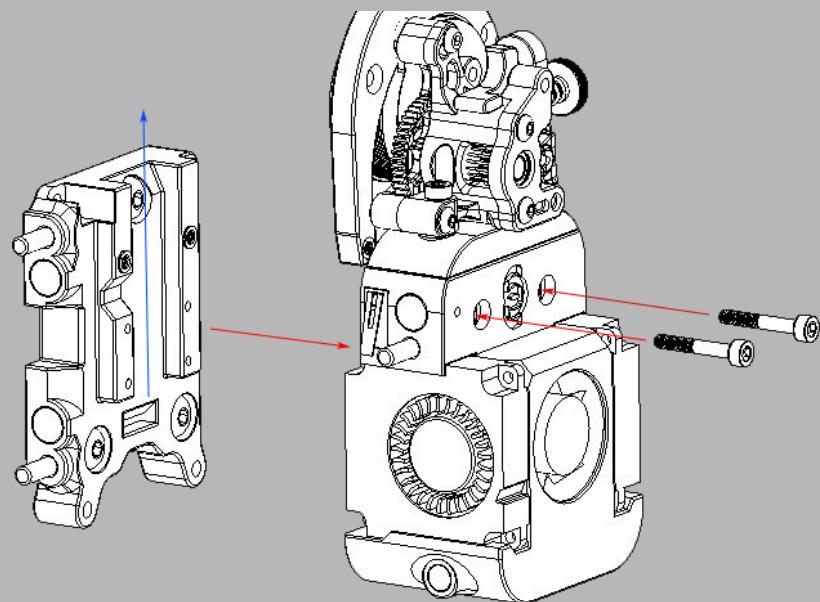
Slide in the 2 x 4010 radial fans on either side of the dragon burner with the outlet facing down.



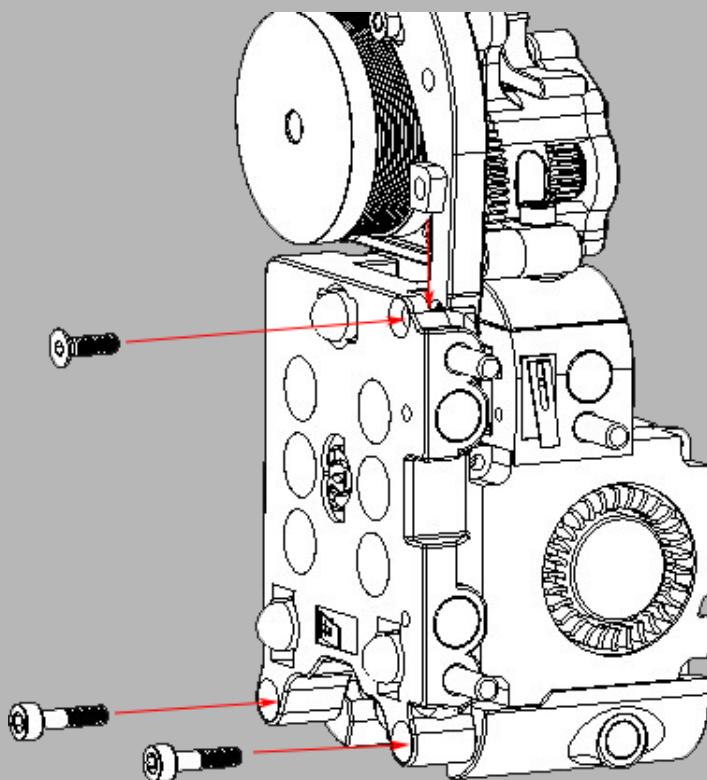
You are almost done with the toolhead. A few more steps to go...

## Toolhead

You can finish the Toolhead Assembly by combining the Back Plate together with the Extruder and Hotend Assembly. Secure them using 2 x m3x20mm shcs. Ensure all the wires are routed in the middle of the Back Plate as shown by the blue arrow.



Next, insert the EBB36 Mount Spacer and secure everything down with 2 x m3x12mm shcs and m3x10mm fhcs.

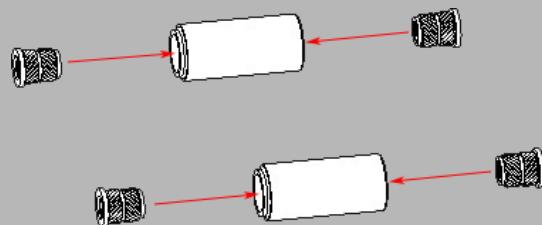


## Toolhead

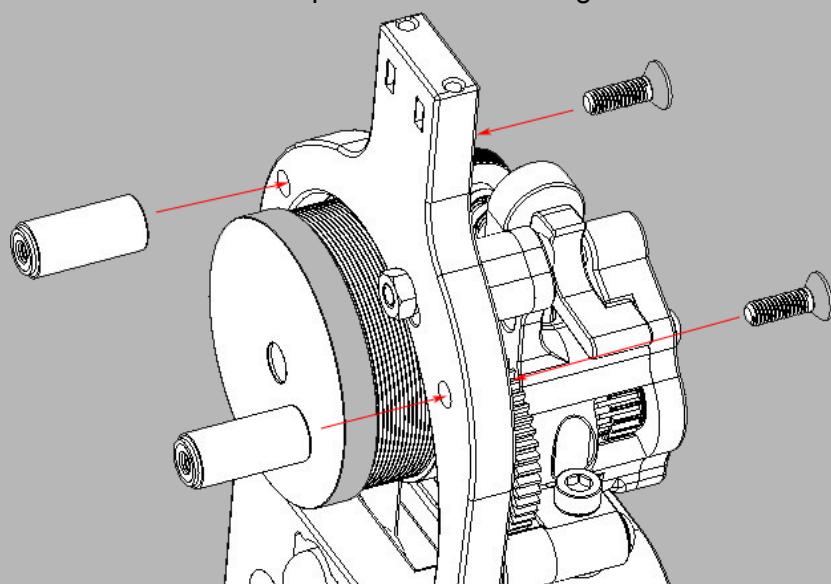
Your toolhead assembly is now complete. It should look like this now. We'll proceed with the EBB36 next. Take a quick break if required.



Ok, let's get the EBB36 finished up now. Insert 4 x m3 brass insert to both EBB36 Spacers.

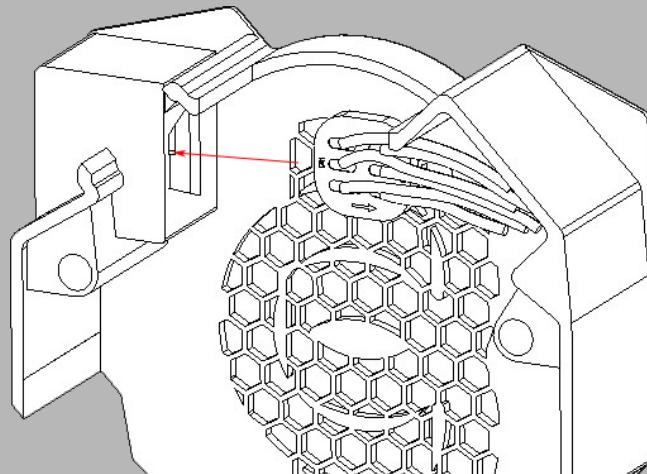


Secure the EBB36 Spacers to the EBB36 Sherpa Micro Mount using 2 x m3x10mm fhcs.

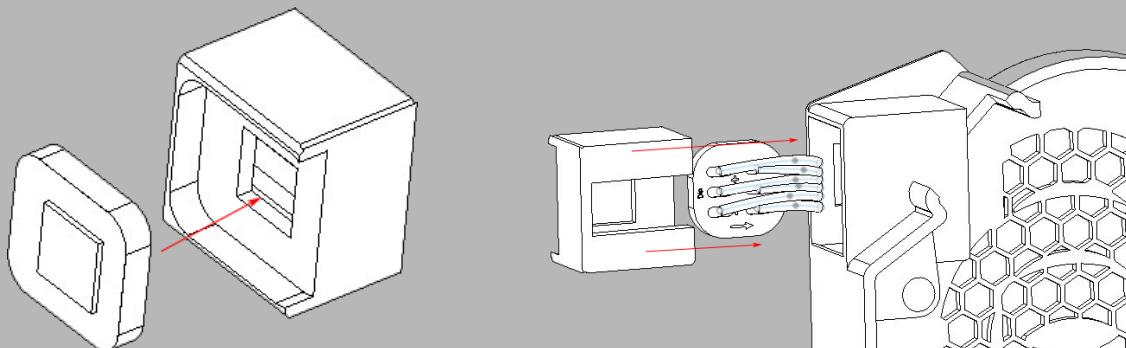


## Toolhead

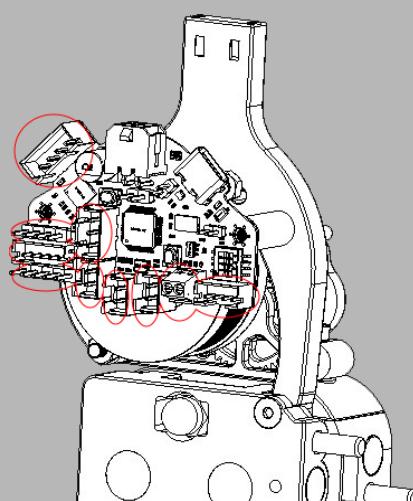
Thread the Status Led through the EBB Cover w Led. Let it hang on the other exit first.



Slide the Led Carrier over the Status Led. Place the Diffuser on top of the Led Carrier and slide the whole assembly in. It should stay in place.

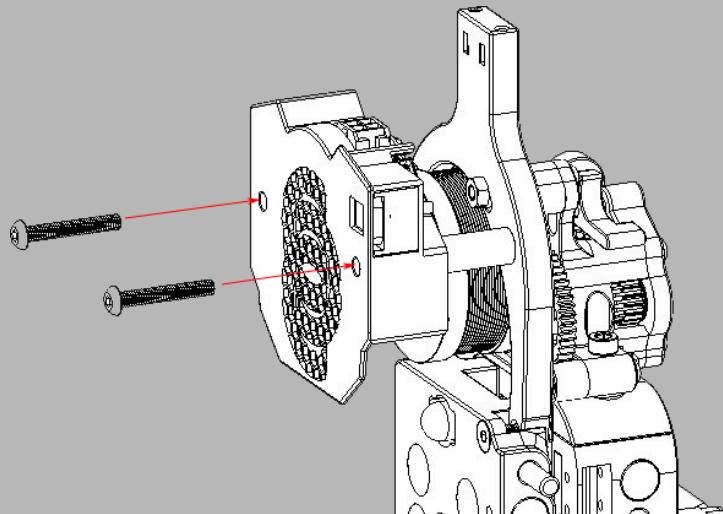


Now, you can go ahead and plug in all the wire connectors to the EBB36 accordingly. (You may refer to the EBB36 wiring diagram if unsure)



## Toolhead

Finally, place the EBB36 Cover w Led and secure it with 2 x m3x20mm bhcs.



Congratulations... You have now completed your 1st Lineux Toolhead. It should now look like this. Take your time to admire it. You deserve a pat on the back for your patience and effort.



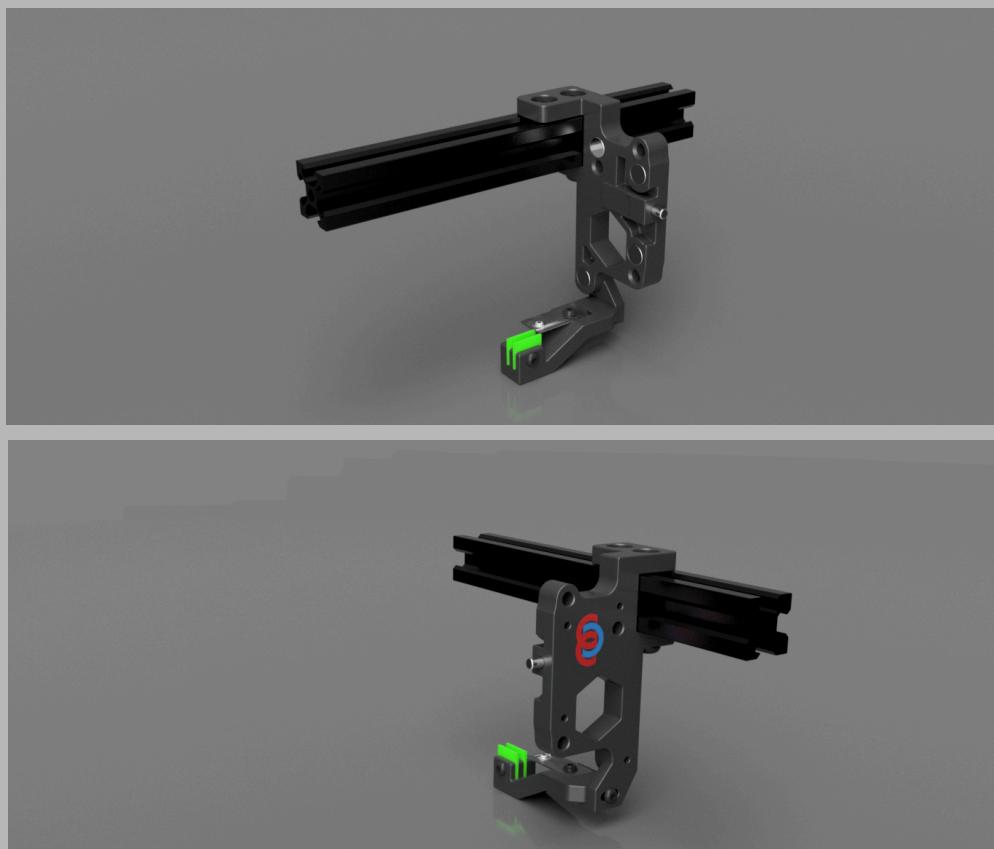
## Checklist

- Check all connections. Ensure they are secure. You may use a multimeter to check for continuity for the microswitches and the klicky.
- Ensure all screws are properly tightened.
- Try attaching the Toolhead to the Carriage. Ensure the Toolhead is firmly attached to the carriage without any movements.

**1 final piece of the puzzle to completing Lineux. Dock will be next in line...**

## Dock

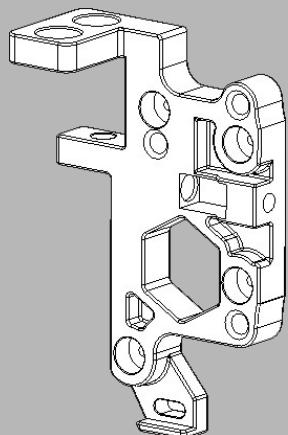
Dock is the simplest component of the entire Lineux Toolchanger yet it plays a very important role. This is basically the home at which your toolheads will spend most of the time at, therefore it's important to ensure that it is printed without any warping for proper alignment during pickup and dropoff of tools.



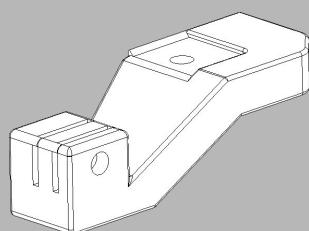
(Fun Facts : Dock has gone through more iterations and testing compared to the other components)

## Dock

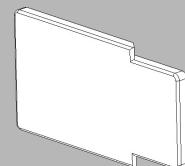
### Printed Parts



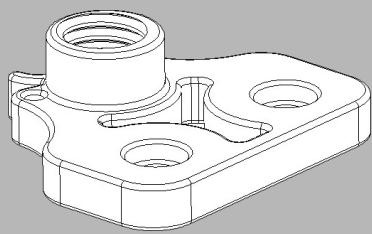
Dock Body



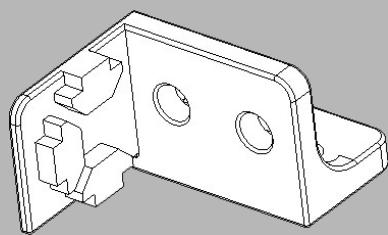
Nozzle Blocker Mount



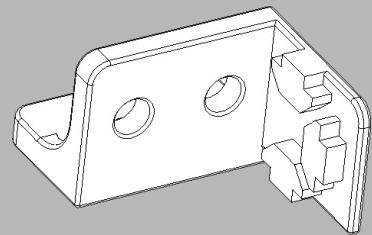
Spring Cover



Umbilical Extrusion Mount



Fixed Dock Extrusion Mount Left



Fixed Dock Extrusion Mount Right

(\*Fixed Dock Extrusion Mount depends on printer used)

## Dock

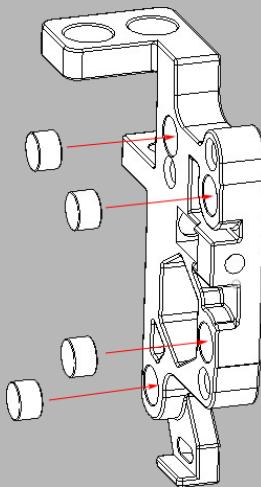
### Hardwares

1. m3 x 6mm bhcs (2)
2. m3 x 8mm shcs (2)
3. m3 x 10mm bhcs (1)
4. m3 x 12mm bhcs (1)
5. m3 brass insert (1)
6. m3 hex nut (2)
7. m3 washer (1)
8. m5 x 8mm bhcs (10) - (8 for Fixed Dock Extrusion Mount)
9. m5 x 10mm bhcs (1)
10. m4 x 15mm threaded dowel pin ID m3 (1)
11. m3 t nut (2)
12. m5 t nut (8) - (Fixed Dock Extrusion Mount)
13. m5 spring t nut (3)
14. 8 x 5mm magnet (4)
15. spring OD6 ID5 17mm (1)
16. AA battery terminal (1)
17. PC4-M10 pneumatic coupling (1)
18. 2020 Extrusion 400mm (length depends on printer)

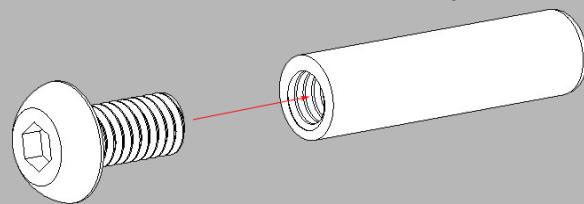
## Dock

Insert 4 x 8x5mm magnets into their respective slots. They should be a tight fit. A wooden mallet may be used to help in ensuring they are fully seated and flushed. Apply a dab of glue if required for added strength.

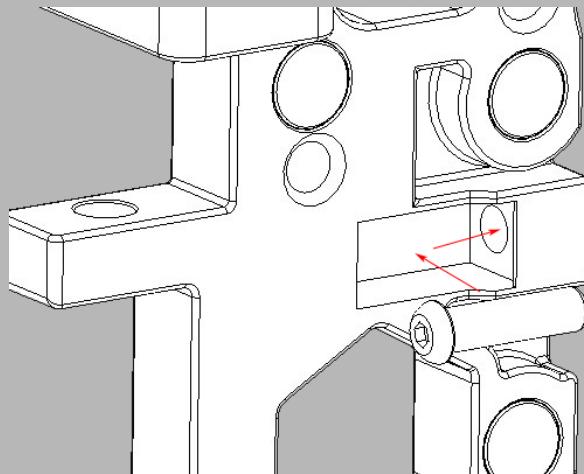
**Ensure the magnets orientation matches the magnets on the Toolhead which you have assembled earlier.**



Screw in m3x6mm bhcs to the m4x15mm threaded dowel pin. Apply loctite and screw in all the way.

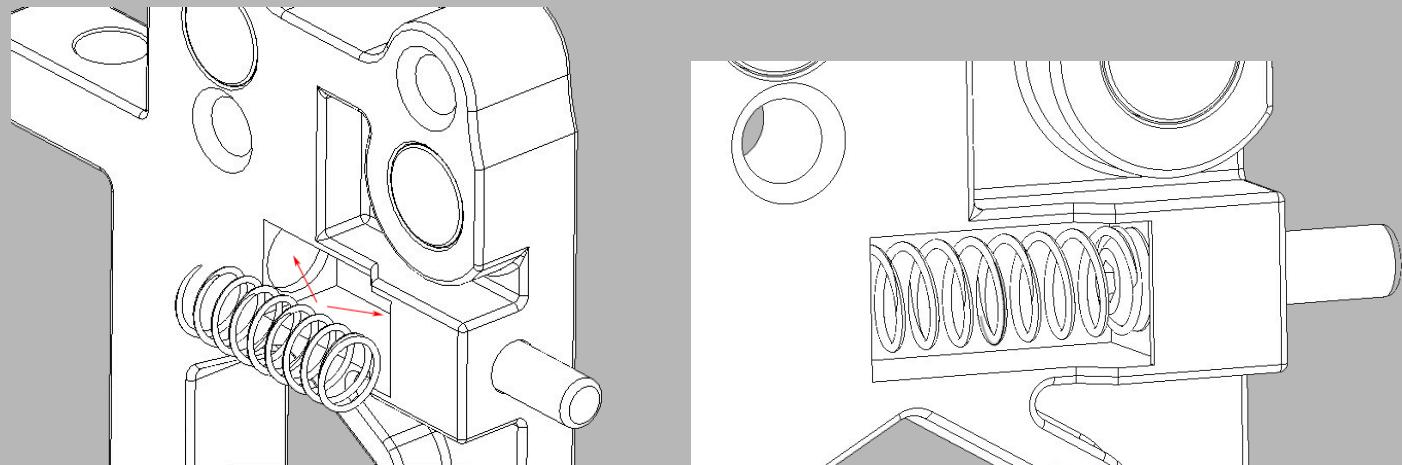


Slide in the dowel pin in the Dock Body and push it in to the front. It should sit all the way in.

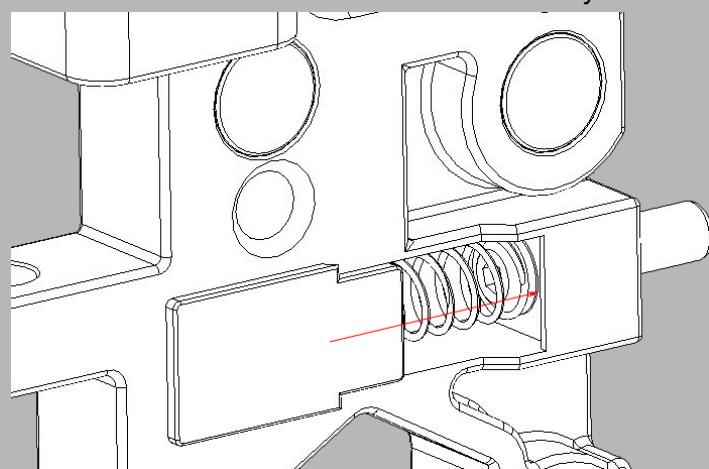


## Dock

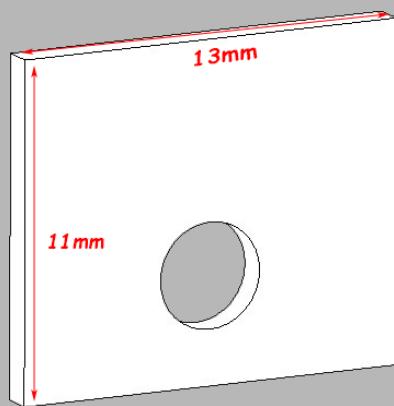
Slide in the spring. Ensure it is seated between the recess and the dowel pin.



Place the spring cover on the dock and slide it in. It should be seated fully in and held in place.

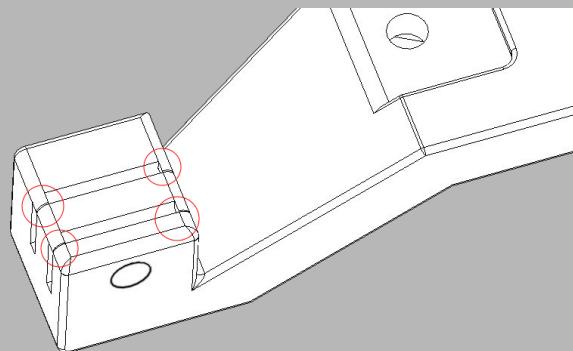


Cut 2 pieces of silicon to size. Cut an m3 hole in the middle.

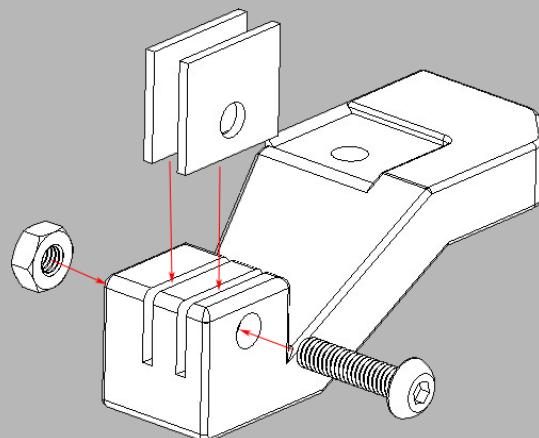


## Dock

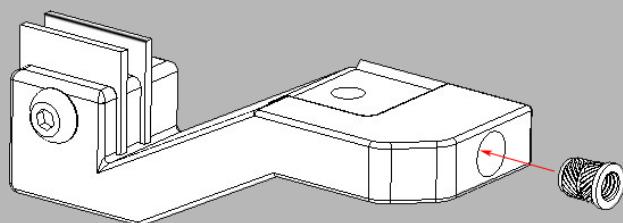
The Nozzle Blocker Mount has the built in support for printing. Cut away the built in support. There's 4 places to cut.



Slide in the Silicone Wall in the respective slots and screw in the m3x12mm bhcs. Use an m3 hex nut from the rear to tighten.

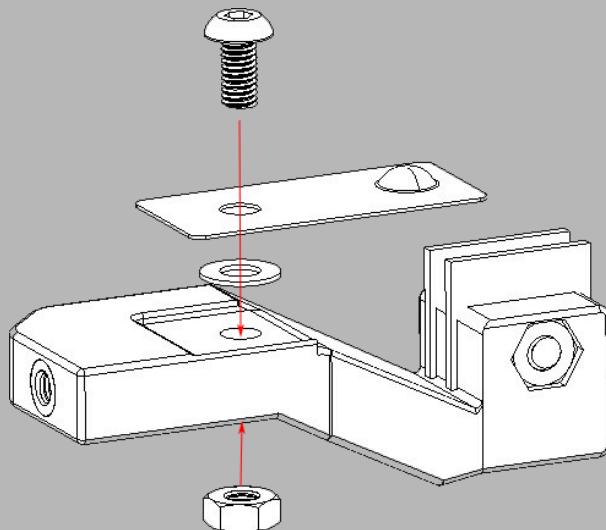


Insert the m3 brass insert to the Nozzle Blocker Mount.

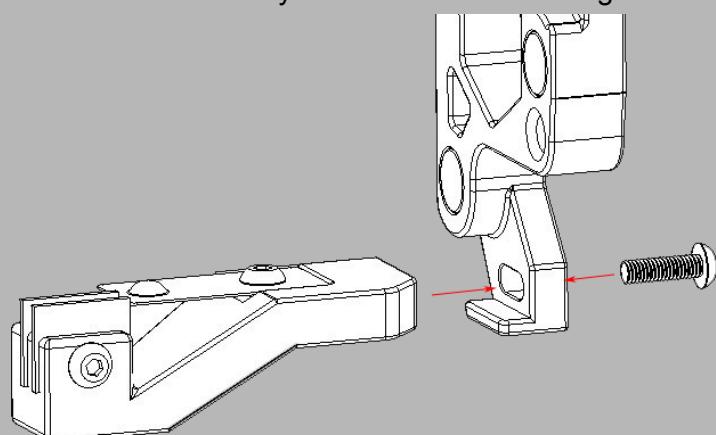


## Dock

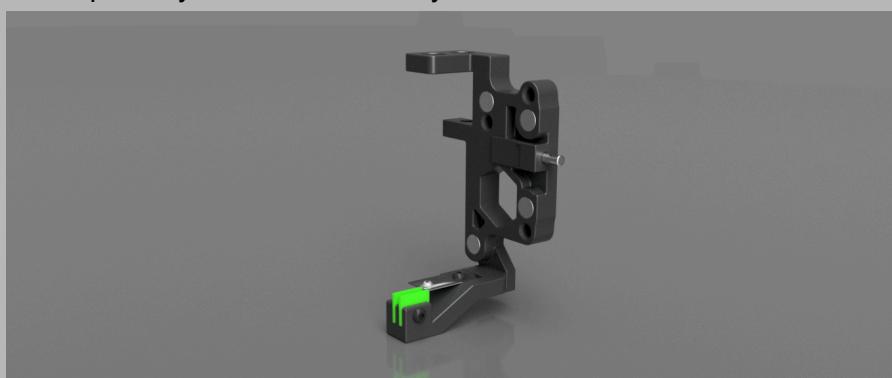
Assemble the nozzle blocker using the AA Battery Terminal, m3x6mm bhcs, m3 washer and m3 hex nut. Secure everything together as follows. Apply loctite to keep the hex nut in place.



Place the Nozzle Blocker Mount to the Dock Body and screw it down using m3x10mm bhcs.



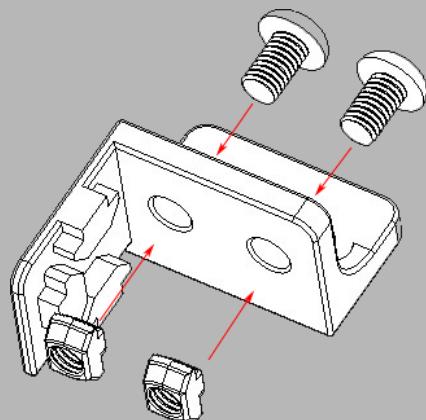
Nicely done. You have completed your Dock Assembly. It should look like this now.



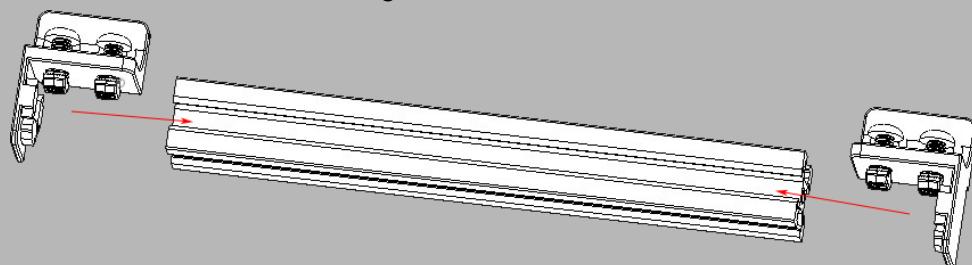
## Dock

(From this point on, all the steps are only for the Vzbot330 printer. Some adjustments or tweaks may be required for a different printer.)

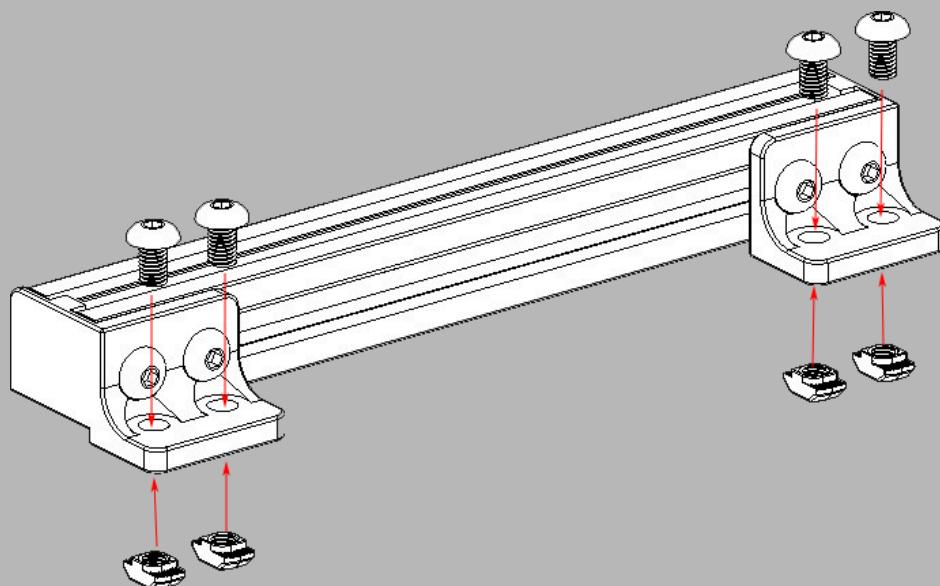
Screw in 2 x m5x8mm bhcs to 2 x m5 T Nuts to the Fixed Dock Extrusion Mount for both the Left and Right pieces. You may keep them loose for now.



Slide both Mounts towards the Extrusion and tighten all the screws.

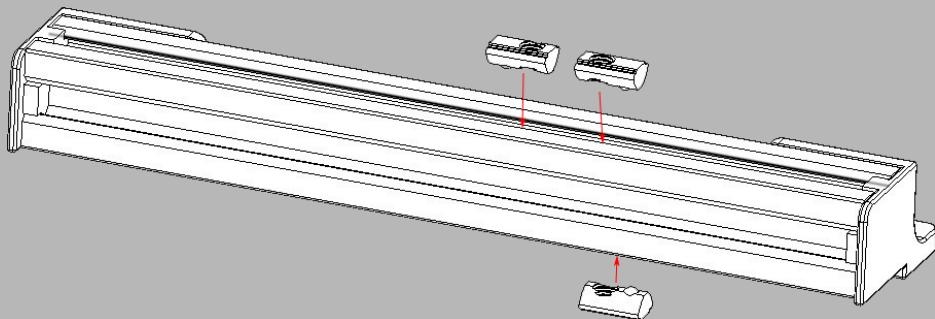


Next, screw in 4 x m5x8mm bhcs to 4 x m5 T Nuts to the Fixed Dock Extrusion Mounts. Keep them loose for the time being.

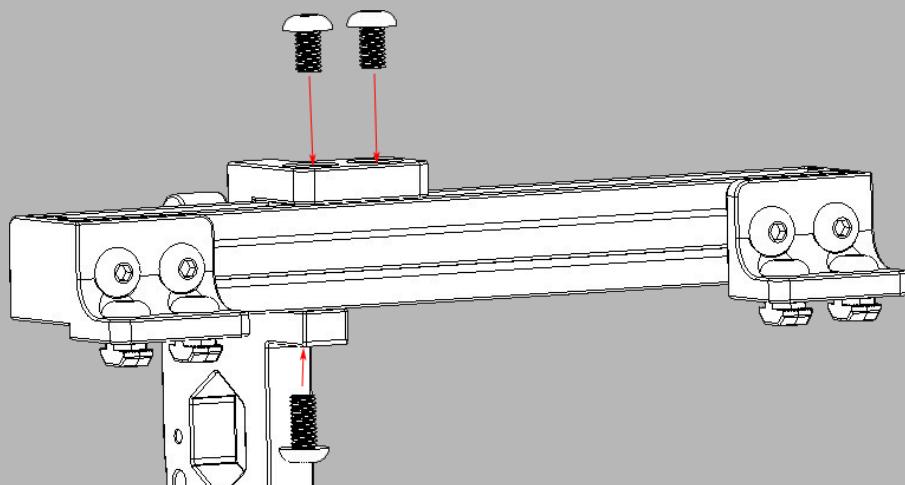


## Dock

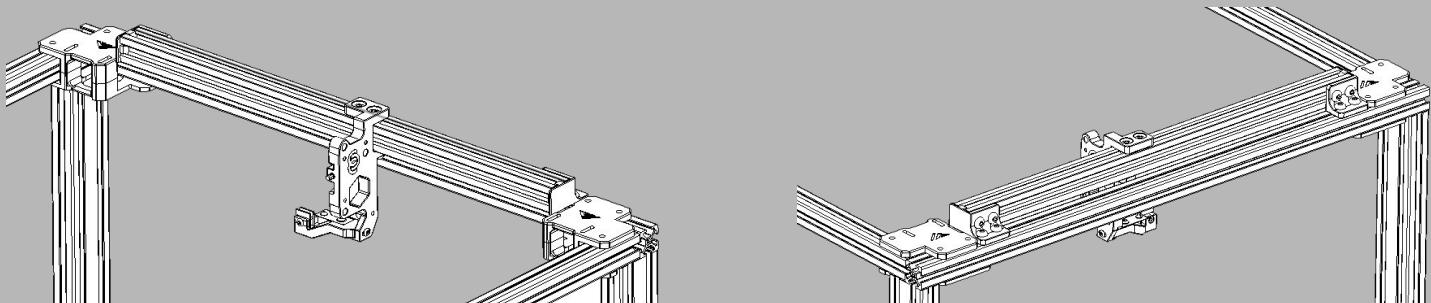
Place 2 x m5 spring t nuts at the top of the Fixed Dock Extrusion and 1 x m5 spring t nut at the bottom. Their location will be where you intend to have the Dock at.



Slide the Dock Assembly on the Fixed Dock Extrusion and screw in 2 x m5x8mm bhcs at the top and 1 x m5x10mm bhcs on the bottom of the Extrusion. Once you have confirmed your Dock location, you can tighten them down.

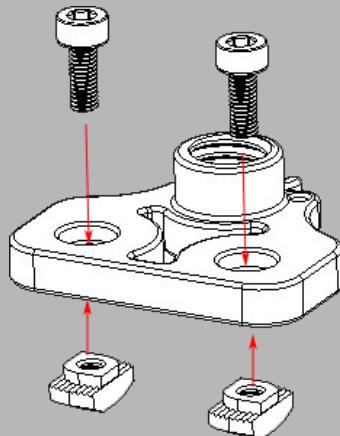


Finally, place the whole Fixed Dock Extrusion Assembly on the rear of the Vzbot330 top frame and fasten all the screws tightly.

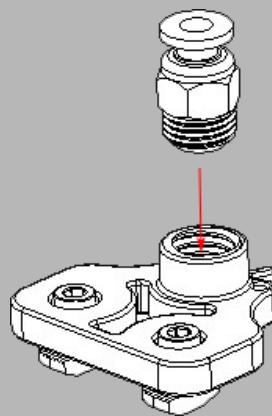


## Dock

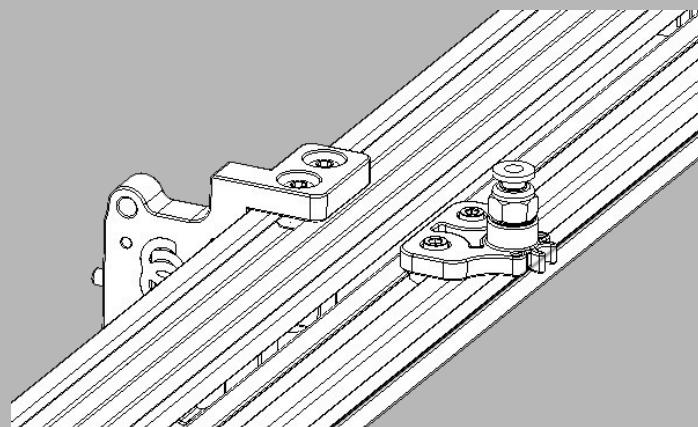
Screw 2 x m3x8mm shcs and 2 x m3 t nuts to the Umbilical Extrusion Mount. Keep them loose at the moment.



Screw in the PC4 connector to the Umbilical Extrusion Mount.

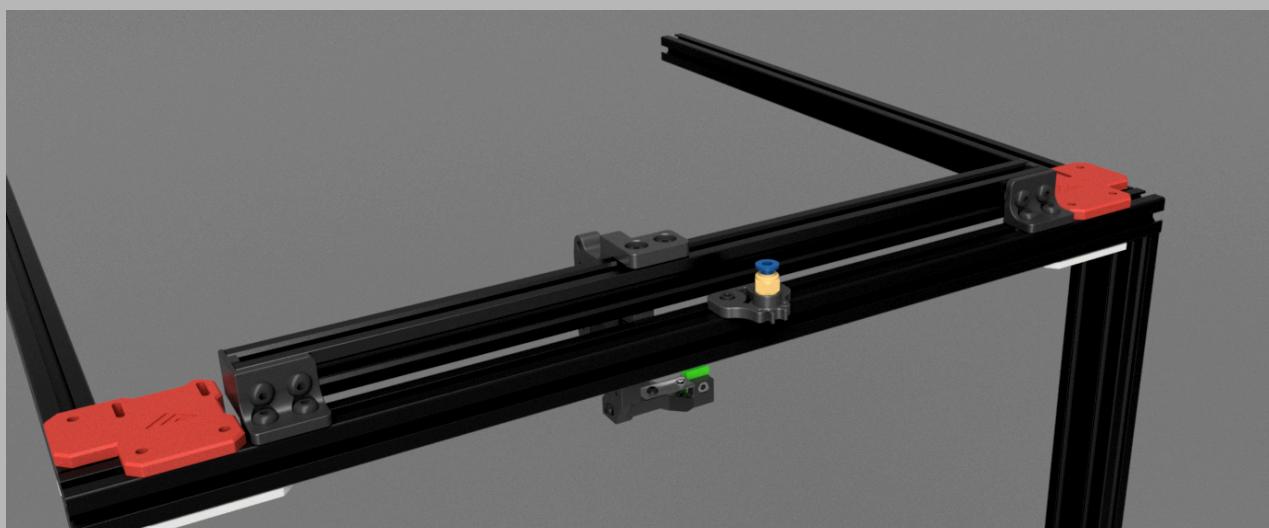
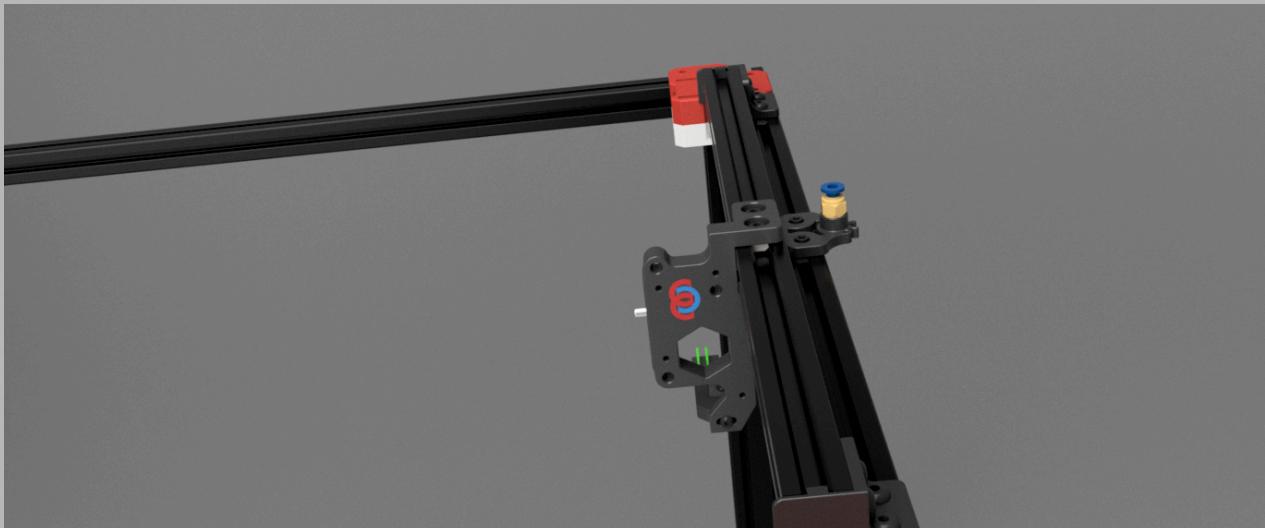


Place the Umbilical Extrusion Mount on the Vzb330 frame and screw it down tight. Keep the location close to the Dock Assembly.



## Dock

That's it. Your final Dock Assembly should look like this now.



**Congratulations on successfully completing the final step. You are now a proud owner of Lineux Toolchanger. That is an achievement you can be proud of. Things will only get more enjoyable from here on. Go ahead and get your printer serialised once you have the second toolhead up and running... Welcome to the family.**

BigTreeTech EBB36 Wiring Diagram