

KwikJet X V2

Build – guide

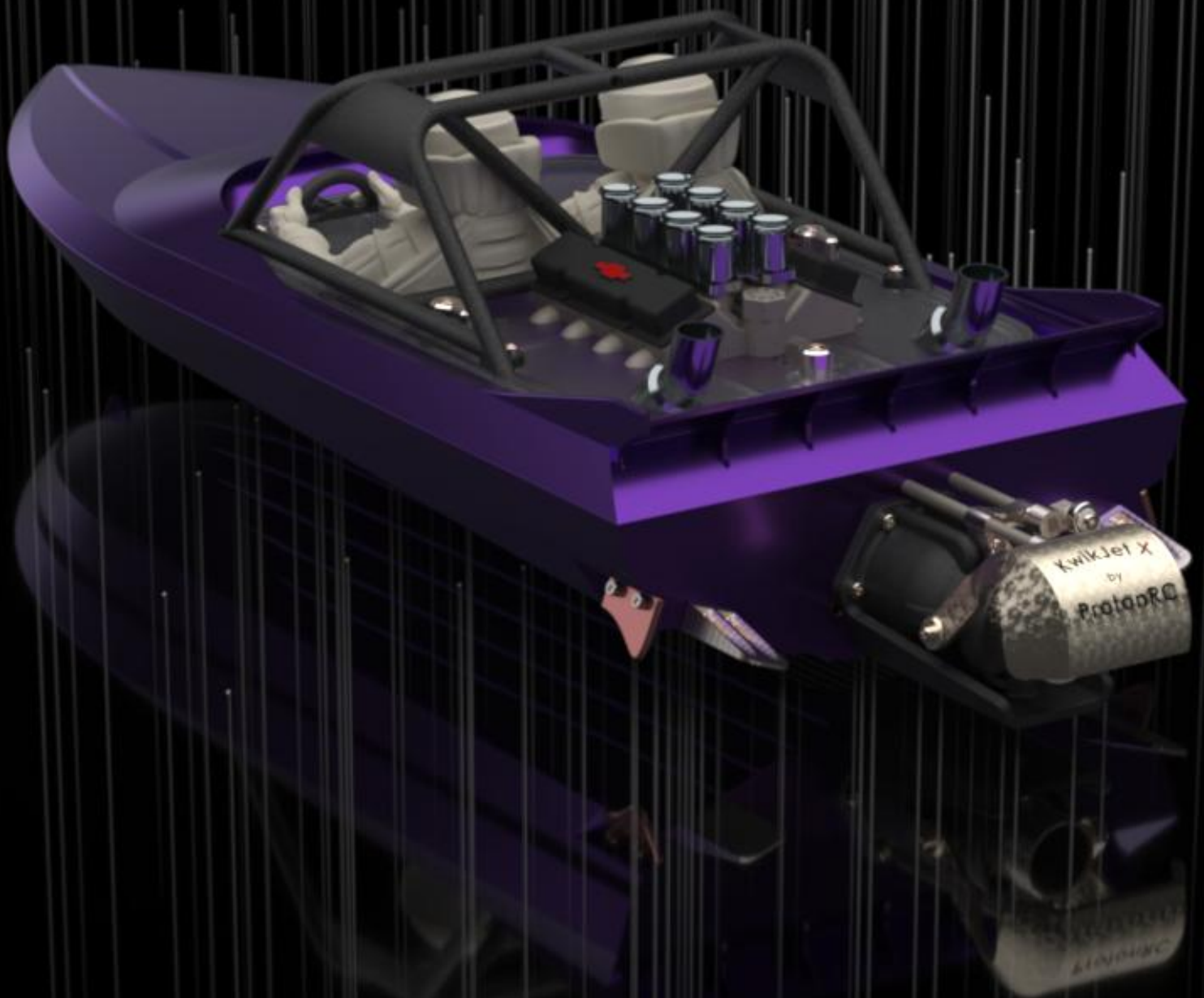


Table of contents

Part – list:.....	3
Hardware:	3
Screws:	3
Bearings:.....	3
Bushings:.....	3
Shaft collars:.....	3
Shafts & rods:	3
Heated inserts:.....	3
Seals:.....	3
Tubing:	3
Tools:.....	3
Electronics:	4
Motor:.....	4
Long-runtime (24 – 20mm nozzle):	4
Performance (20 – 16mm nozzle):.....	4
Ludicrous (coming soon – only working with ludicrous impeller upgrade & performance nozzle or new upcoming pump):	4
Print – settings:.....	5
Specific data:	5
Useful links & tips:.....	5
Tips	6
Links.....	6
Preparation:.....	7
Post processing:.....	7
Jetpump – treatment.....	7
Stator treatment:	7
Pump treatment:	7
Impeller treatment:.....	7
Steering & drive rods.....	8
Assembly:.....	10
Hull assembly:	10
Hull parts	10
Heated inserts & cooling tubes	15
Turning fins & trim tabs.....	18
Bearings.....	19

Pump assembly:.....	23
Pump parts	23
Heated inserts	26
Steering.....	28
Impeller	40
Water-cooling system	41
Servo assembly	42
Deck assembly:	45
Deck plates	45
Locking mechanism.....	46
Drivers, engine, exhaust & roll cage	48
Final check.....	52
Congratulations! You successfully build KwikJet X V2!	53

Part – list:

Hardware:

Screws:

- M3 x 6mm 20x ([buy here](#) (*))
- M3 x 8mm 40x ([buy here](#) (*))
- M3 x 10mm 20x ([buy here](#) (*))
- M3 x 12mm 10x ([buy here](#) (*))
- M3x 20mm 10x ([buy here](#) (*))

Bearings:

- 625 - 5x16x5mm ([buy here](#) (*))
- F5 10M - 5x10x4mm (thrust bearing) ([buy here](#) (*))

Bushings:

- 5x9x6mm (write us an [email](#) if you wish to have a different size) ([buy here](#) (*))

Shaft collars:

- 5mm shaft collars 3x ([buy here](#) (*))

Shafts & rods:

- 5mm x 132mm (driveshaft) ([buy here](#) (*))
- 5mm x 84mm (reverser steering rod)
- 5mm x 111mm (steering rod)
- 2mm x 1000mm (cut 7x to 100mm pieces, rest for roll cage) ([buy here](#) (*))
- 5mm to 5mm coupler ([buy here](#) (*))

Heated inserts:

- M3 x 100 ([buy here](#) (*))

Seals:

- 5x15x6mm oil seal ([buy here](#) (*))
- 9mm wide D-shape foam seal

Tubing:

- 4mm ID 6mm OD silicone tubes (1m is enough) ([buy here](#) (*))

Tools:

- Soldering Iron
- Superglue / Epoxy
- M3 screwdriver with thin & long tip

Electronics:

- Transmitter & receiver setup of your choice
- Electronic speed controller (ESC)
- 2x 9g servo (metal or carbon reinforced gears preferred)

or:

- 2x MG92b servo (offers more torque) ([buy here](#) (*))
- Batteries (high C rate preferred)

Motor:**Long-runtime** (24 – 20mm nozzle):

- 3674 @2200 - 2400KV / 3s-LiPo ([buy here](#) (*))
- 3682 @2200 - 2400KV / 3s-LiPo

Performance (20 – 16mm nozzle):

- 3674 @2000KV / 4s-LiPo
- 3682 @2000KV / 4s-LiPo
- 4076 @1600 - 2000KV / 4s-LiPo ([buy here](#) (*))
- 4082 @1600KV / 6s-LiPo
- 4092 @1600KV / 6s-LiPo

Ludicrous (coming soon – only working with ludicrous impeller upgrade & performance nozzle or new upcoming pump):

- 4074 (or higher) @1400KV / 6s-LiPo

We have different nozzle diameters which determines flow speed and therefore your top speed and acceleration. Please choose the correct nozzle diameter for your setup.

Screws & heated inserts are a few more than you will actually need in case you lose any.

If you have **any questions** while choosing your electronics you can directly **reach out to us**:

Discord: [Link to our Discord server and the #KwikJet-X](#)

E-mail: info.protonrc@gmail.com

Disclaimer: links containing a (*) are affiliate links.

Print – settings:

Specific data:

Choose between the performance and the long runtime version of KwikJet X v2. The difference lays between the nozzle diameter and motor configuration. While the long runtime version will be suitable for normal rides in a river or a lake, the performance option improves handling in rough water as it offers more thrust as well as offering higher speeds on the lake. Keep in mind that higher constant speed needs sufficient electronics to keep up with the power requirements.

Use 3 perimeters for 0.4mm nozzles. For 0.6mm nozzles, 2 perimeters are sufficient.

For the new mixed flow impeller, we recommend you use a 0.2mm nozzle.

Part	Layer height	Infill	Print-speed	Part-cooling fan speed	Supports	Material
All hull parts, jetpump	0,2 – 0,3mm	20%	>60mm/s	0-55%	Not needed	PLA, PETG, ASA, ABS, PC
Jetpump-stator	0,1 – 0,2mm	100%	>40mm/s	35 – 85%	Not needed	PLA, PETG, ASA, ABS, PC
Impeller and Reverser	0,05-0,2mm	100%	>40mm/s	55 – 85%	Yes	PLA, PETG, PC
Deck parts	0,2-0,3mm	20%	>60mm/s	85%	Yes	PLA, PETG, ASA, ABS

*Those settings are only rough suggestions and do not represent the exact settings you should use. We recommend using your own tested printing profiles!

You can buy 3d-printed resin impellers from our partner [realize-3d](#) as well as the 3d-printed parts kit of [KwikJet X](#).

Useful links & tips:

Tips

- Always build on a flat surface
- Make sure that you work on a workbench or table which can get dirty or can be “really used”
- Make sure your parts are clean and fit together before you glue them together
- Check if your printer is well calibrated by printing [this](#) test part. If the 5x13x4mm bearing has a nice fit, your printer works perfect! If not follow [this YouTube guide](#) or message us so we can help you!

Links

- Slicer: https://www.youtube.com/watch?v=yXNZ_2-rHNE
- Calibration: <https://www.youtube.com/watch?v=rp3r921DBGI>
- Acetone smoothing: <https://www.youtube.com/watch?v=6xFUNFG-UKE>
- Heated inserts: <https://www.youtube.com/watch?v=KqSmCHr4fdA>
- Soldering: <https://www.youtube.com/watch?v=82B-aiogwpU>

Preparation:

Post processing:

- Remove support out of parts (when printed with support)

Jetpump – treatment

(only for people who want maximum performance, for new members in the RC niche we recommend just to file the leading edges of the impeller)

Stator treatment:

- Sand the stator vanes

Optional:

- Epoxy smoothening
- Plastic-putty smoothening

Pump treatment:

- Sand the inside of the pump. Try to get rid of all the 3d-Printing – lines

Optional:

- Epoxy – smoothening
- Plastic-putty smoothening

Impeller treatment:

PLA/PETG/PC/PP/PE – print:

- Remove support gently
- Sand the impeller blades till they appear to be smooth, most importantly the leading edges of the impeller need to be sharp.

Optional:

- Once you sanded the impeller smoothly, apply small amount of plastic-putty on the vanes and make sure a thin layer covers the blades. This ensures that all layers of the printing process are getting filled
- Sand the impeller again once the plastic-putty dried out. Make sure you only use fine-grained sandpaper, so you don't add big scratches. The smoother you can sand the impeller blades, the higher the efficiency is!

ABS/ASA - print (not recommended for new users to RC/3D-printing and usage in small rivers/shallows where gravel can be sucked up, as those materials are relatively soft)

- Remove support gently
- Slightly sand the blades if there are blobs or similar printing issues
- Take some acetone and let the impeller get smooth by vaporizing the acetone (chemical treatment, wear PPE!)

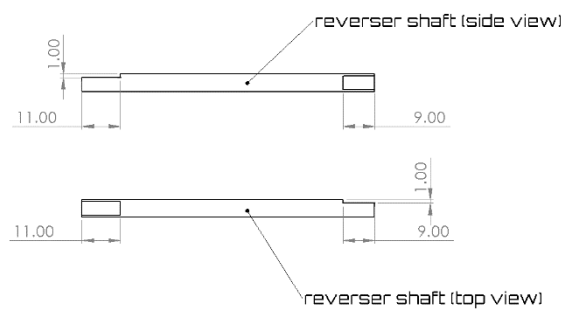
Steering & drive shafts

Steering shaft

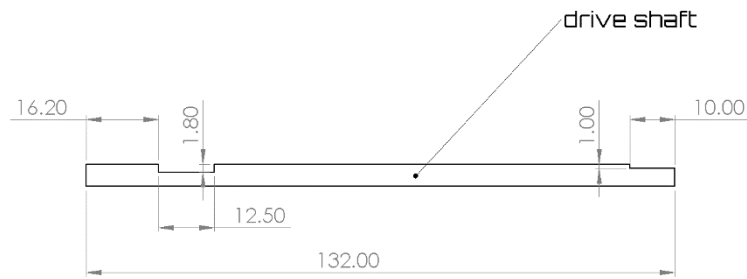


111mm total length

Reverser steering shaft



84mm total length

Drive shaft

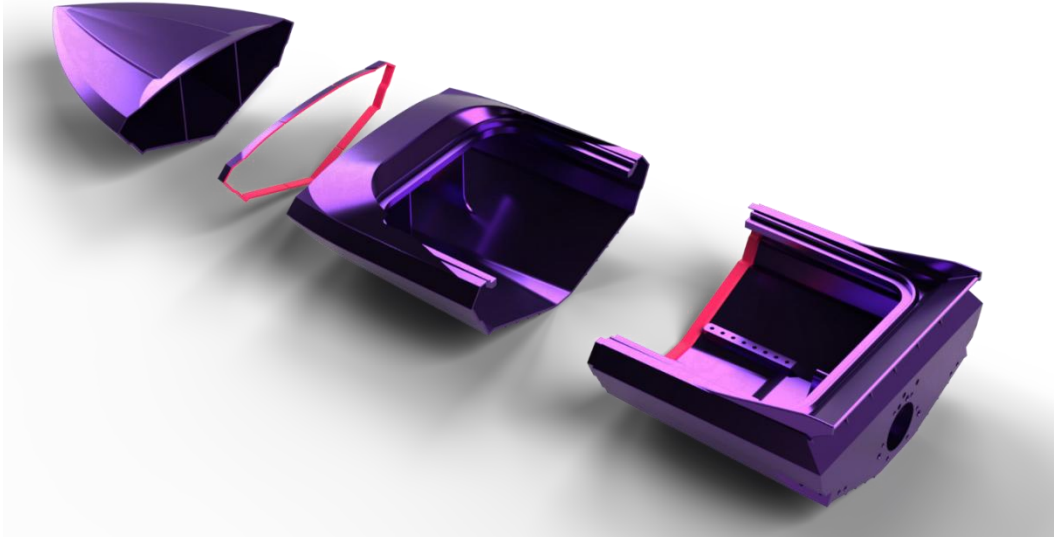
132mm total length

Assembly:

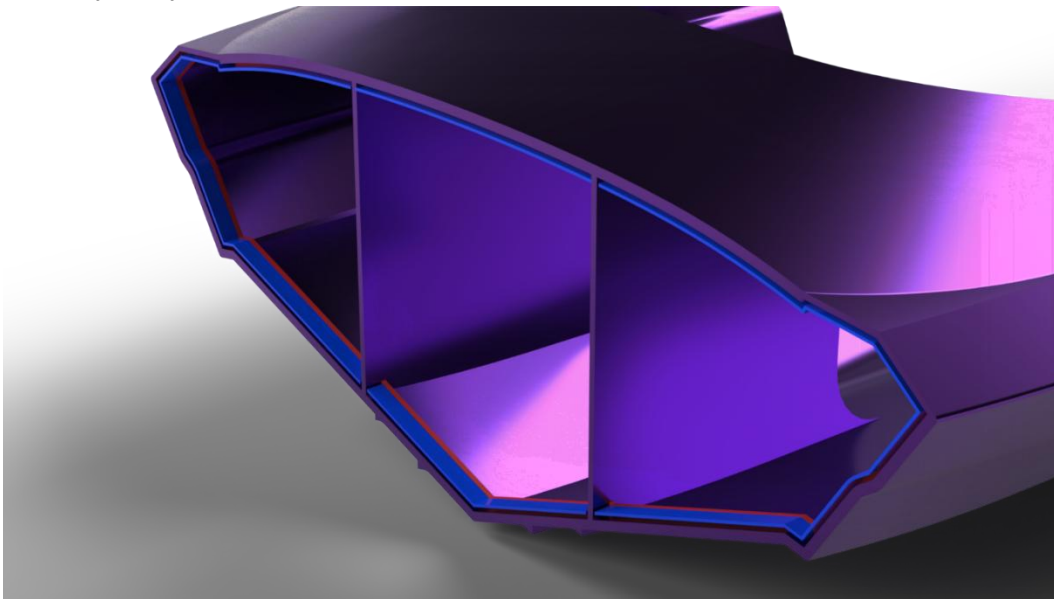
Hull assembly:

Hull parts

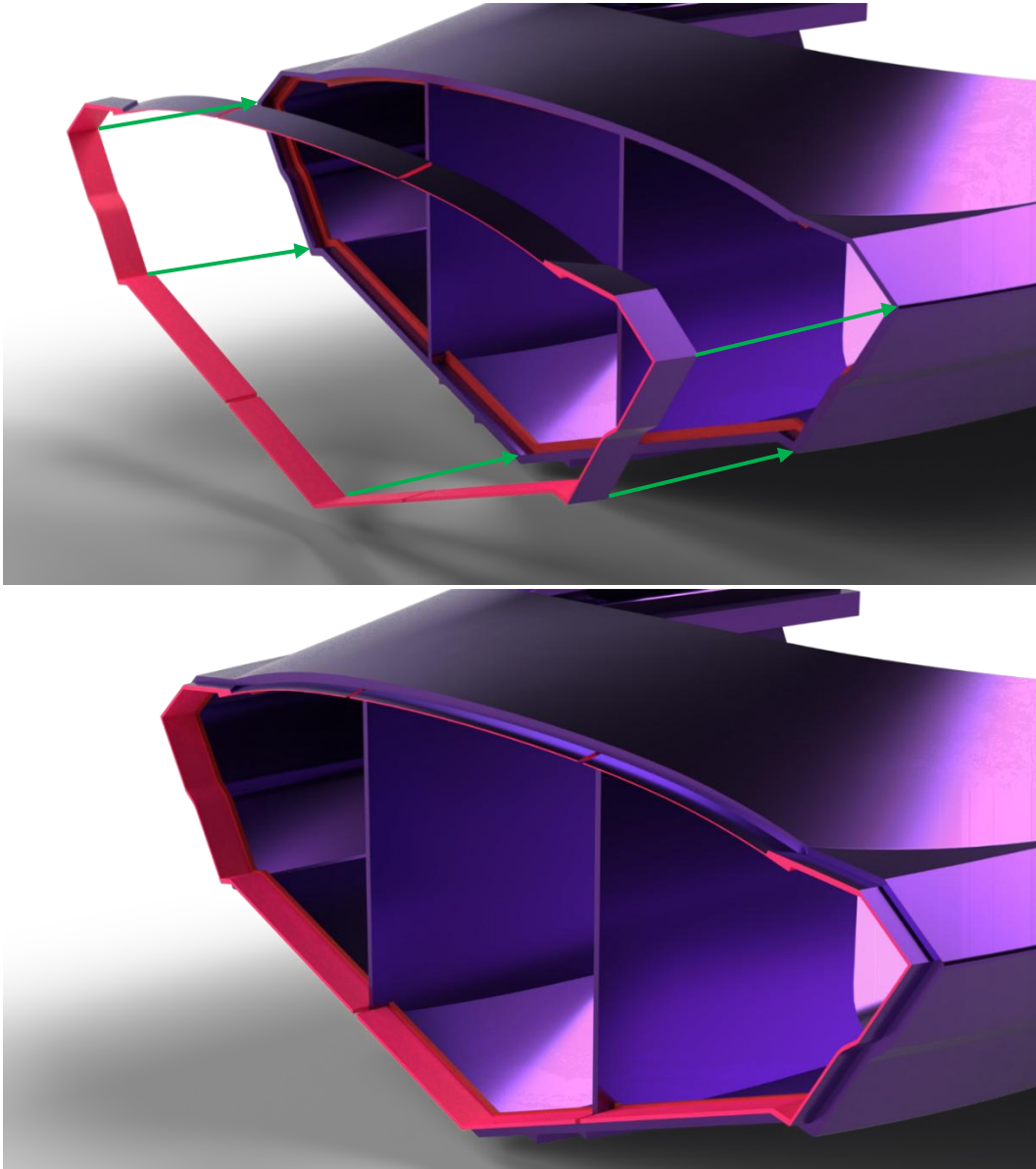
1. Take the three main hull pieces and the printed overlapping tab.



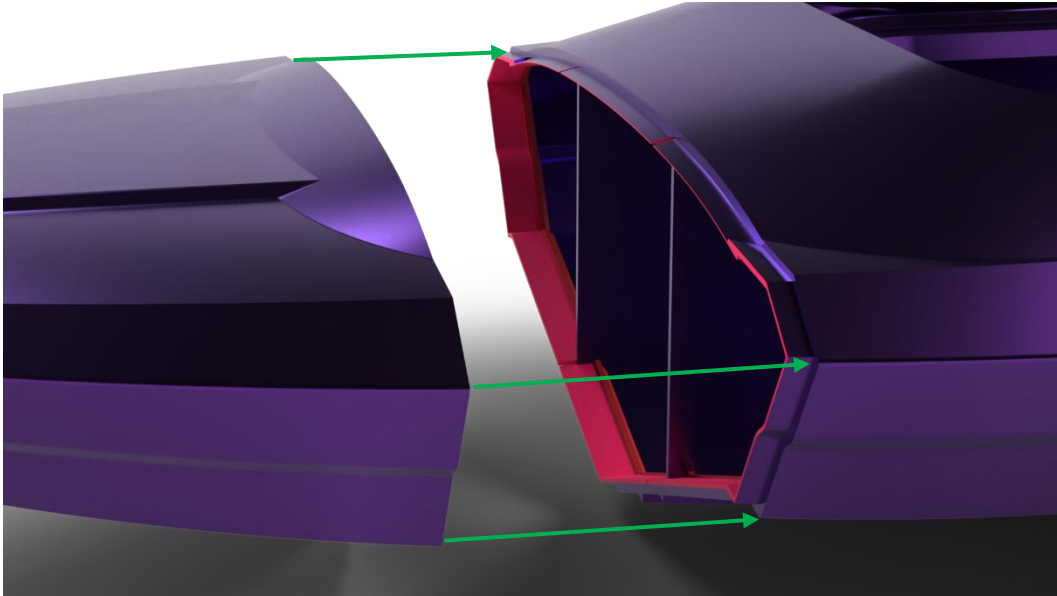
2. Gently remove the built-in support of the middle hull part (marked in blue). It should break off relatively easily.



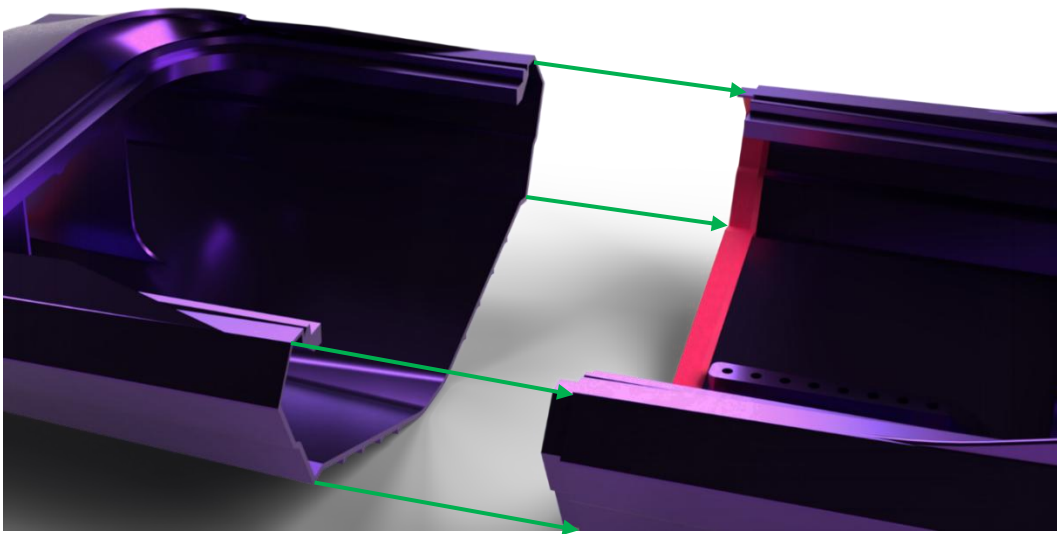
3. Try to insert the printed overlapping tab into the middle hull section. Make sure to make it fitting before glueing! In case it doesn't fit, try to sand the parts. Also see if there are any spots leftover from the previously removed support.



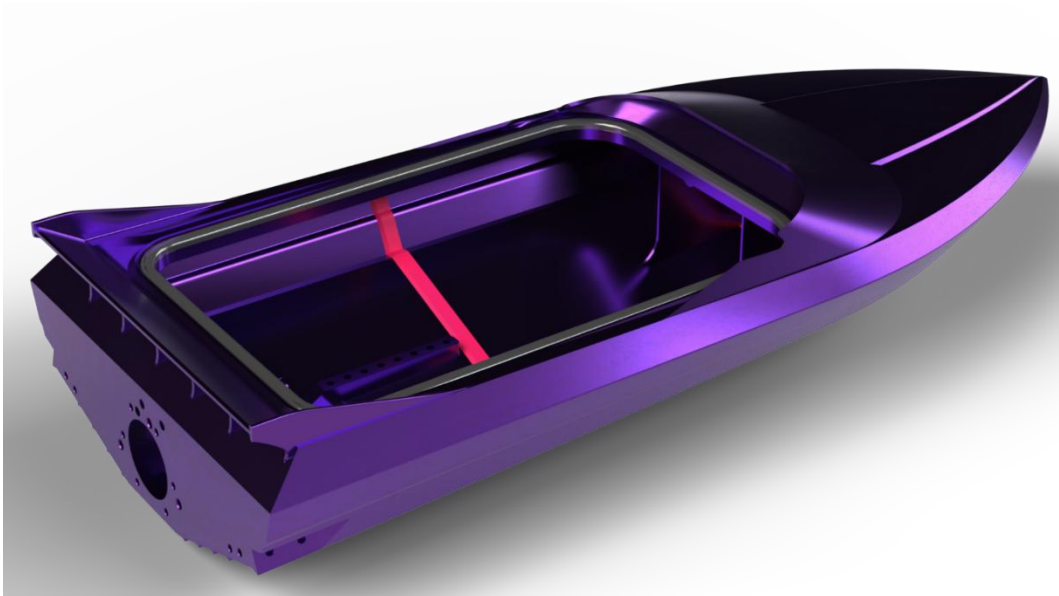
4. Now glue the front and the middle section together. Make sure to apply a firm and even pressure to maximize adhesion.



5. Make sure to let the previously glued middle and front sections of the hull dry before continuing. You can skip to pump assembly while you let the glue/epoxy harden. After the glue hardened, take the rear hull and the glued front and middle section. Align the overlapping tabs and test for a nice fit. Once you ensured a good fit, you can glue the two parts together.



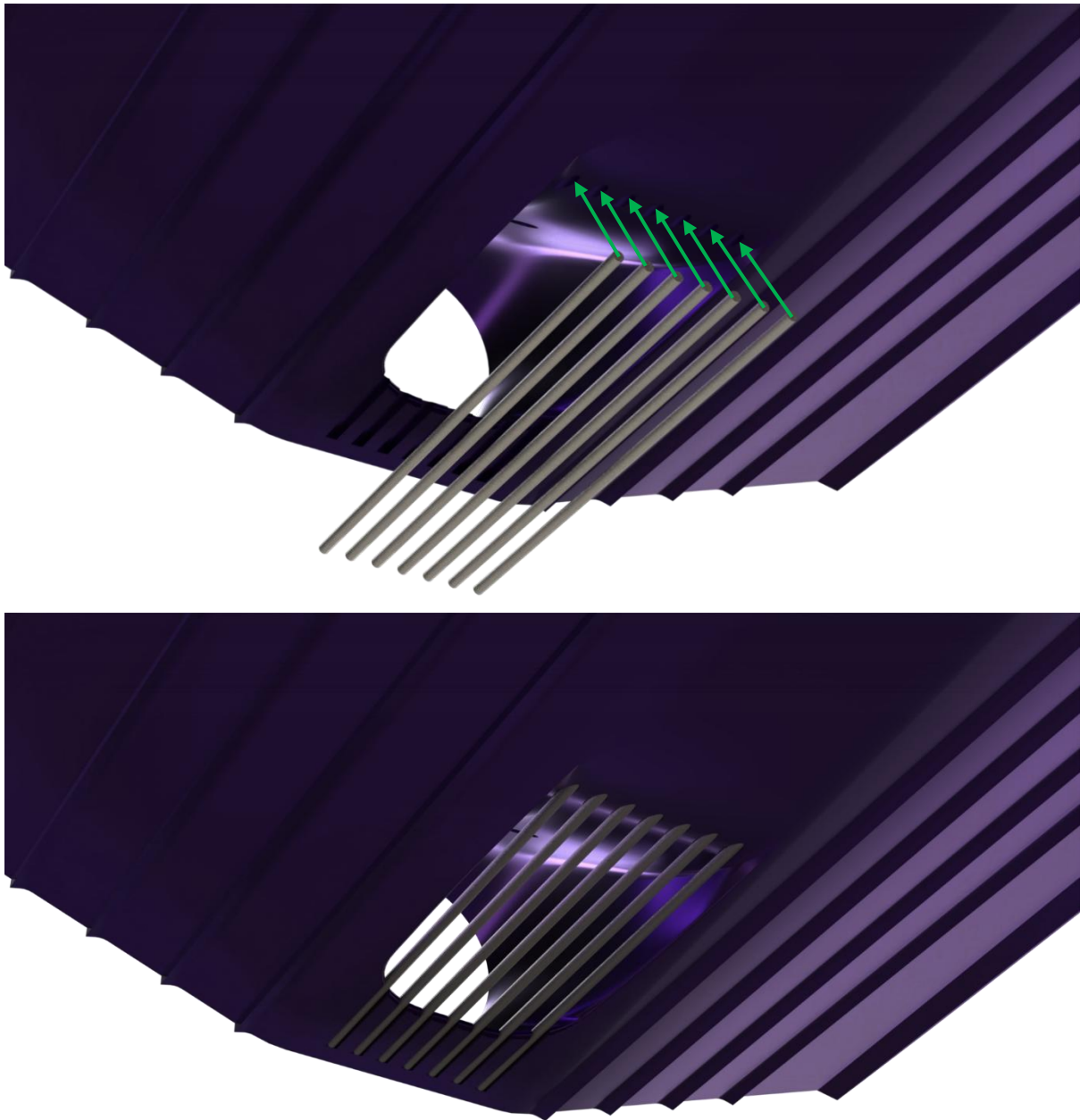
6. You now should hold a complete hull in your hands, this is what your finished hull should look like:



Cutaway view of the overlapping tabs:



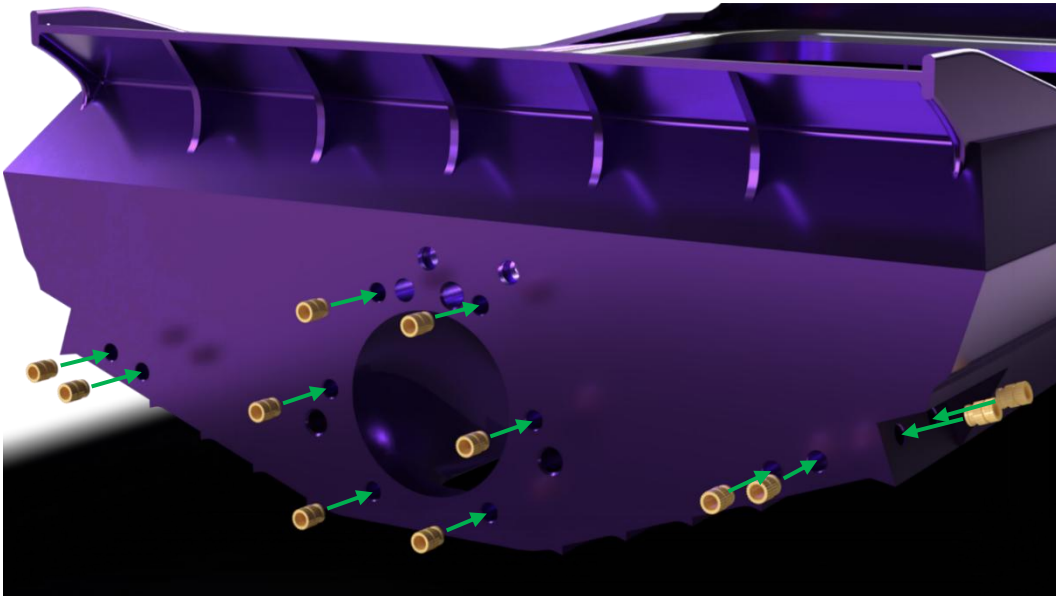
7. To finalize the hull, we will now add the intake grate. Take seven 2mm steel rods cut to ~100mm length and insert them like shown in the picture. Lock them in place by using glue. We recommend using hot glue as it can be easily removed if you need to change one rod.



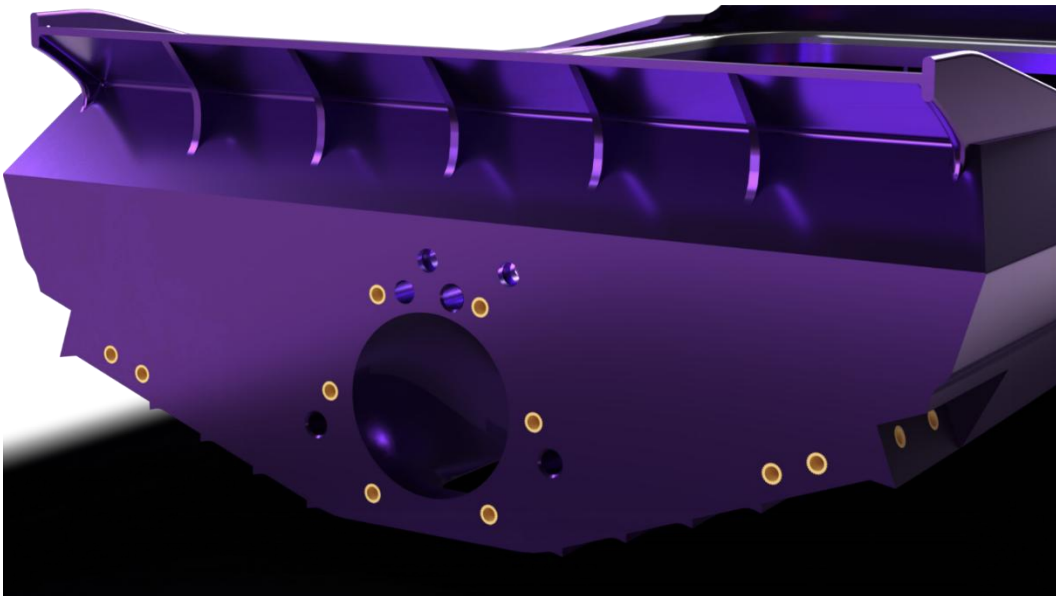
8. Don't forget to add the D-shape foam seal on the lid rail. Before applying it, check for the correct length and cut it accordingly.

Heated inserts & cooling tubes

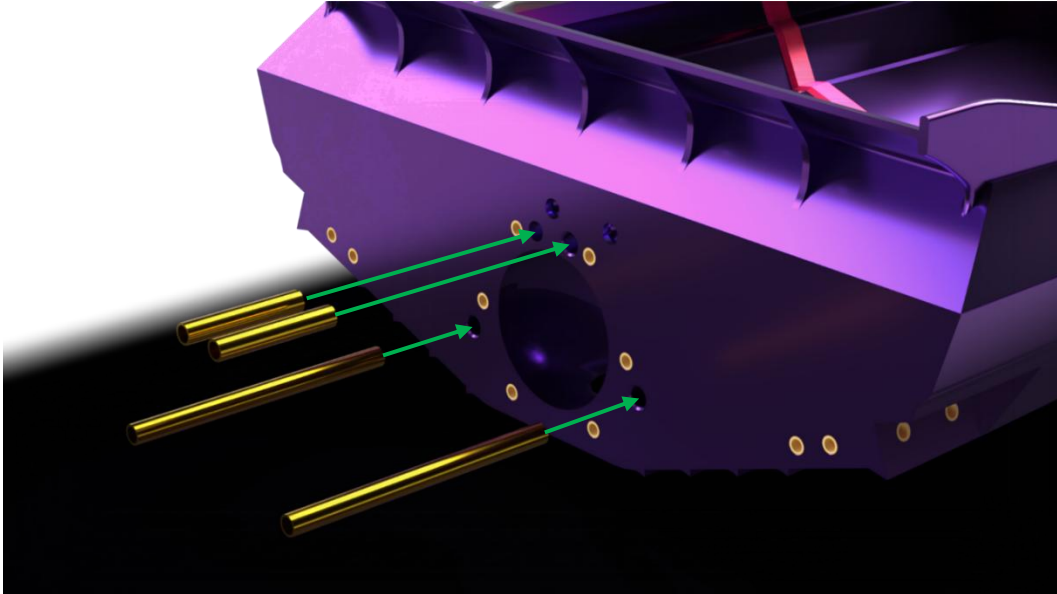
1. Take 14 heated inserts and insert them in the designated spots on the stern of the boats hull according to the following image. Make sure that you insert them straight and they sit flush



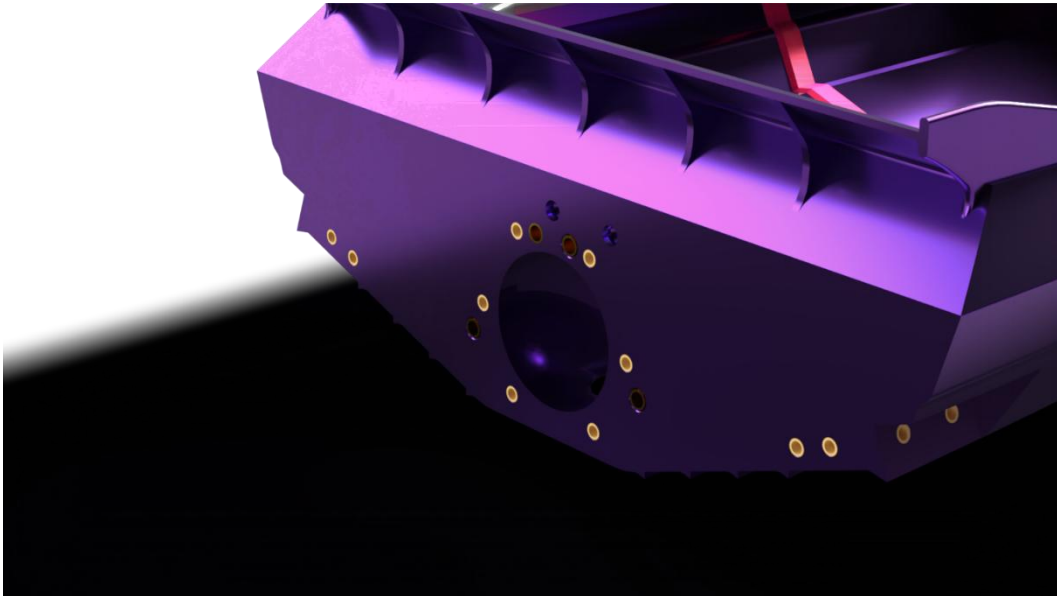
Your hull should now look like this:



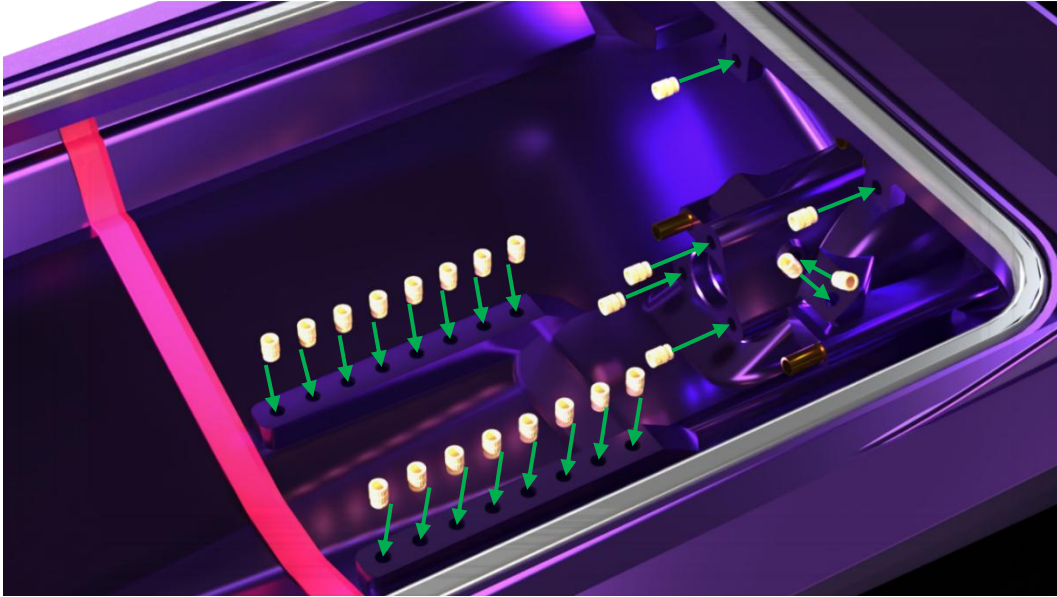
2. If you chose the brass cooling tube variant (otherwise you can skip this step), please take your four cooling tubes (2x 30mm + 2x 70mm) and glue them in the designated holes shown in the following picture:



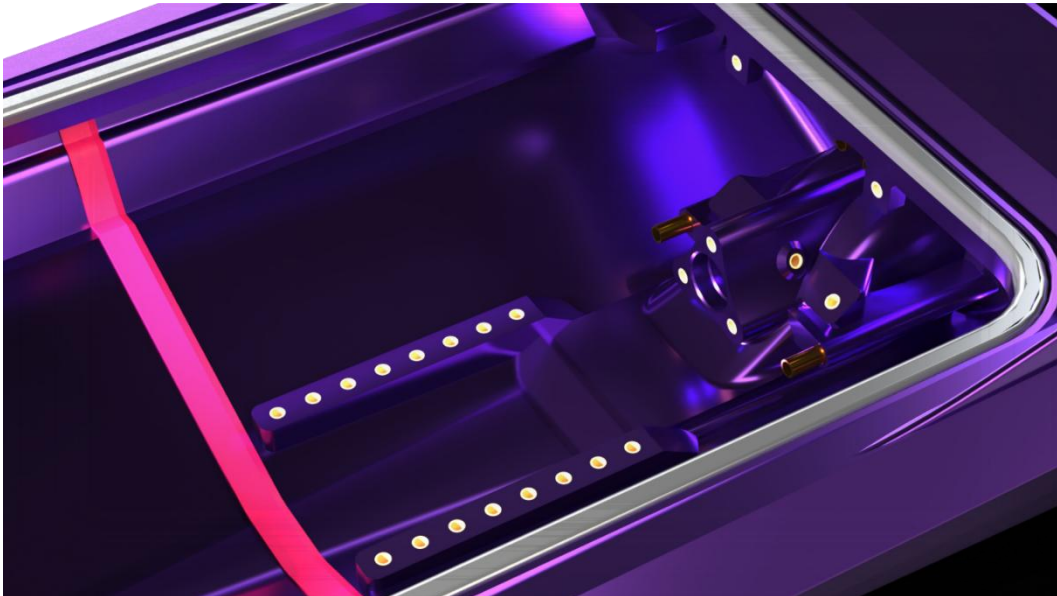
Your hull should look like the following now:



3. Now we will add the internal heated inserts for the motor & servo mount. Take 23 heated inserts (you can reduce the number of heated inserts for the motor rail if you figure your motor placing out beforehand). Insert them in the shown spots:

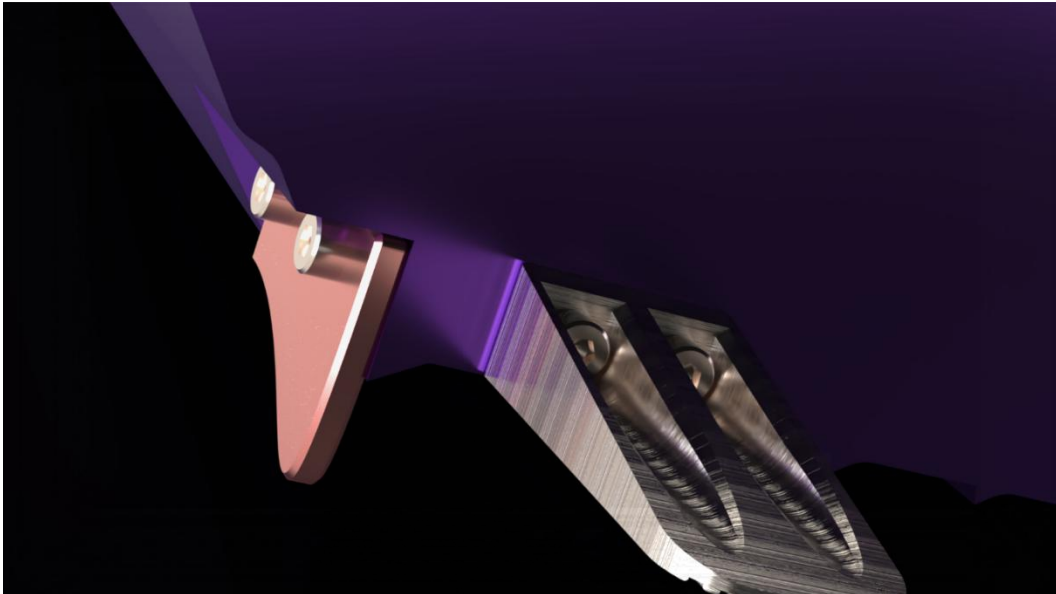


Your hull should now look like the following:



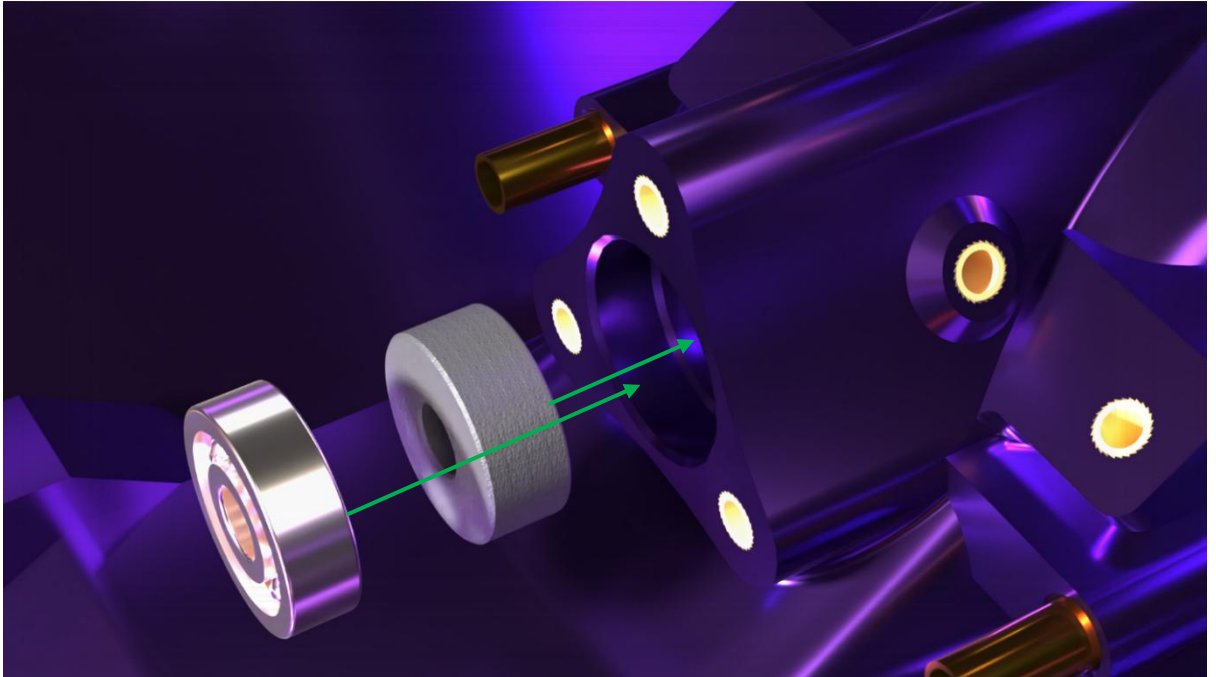
Turning fins & trim tabs

1. Take both the two turn fins as well as the two trim tabs (yours or the one supplied by us) and mount them like shown. Secure the fins with two M3x6mm screws and the trim tabs with two M3x8mm screws.

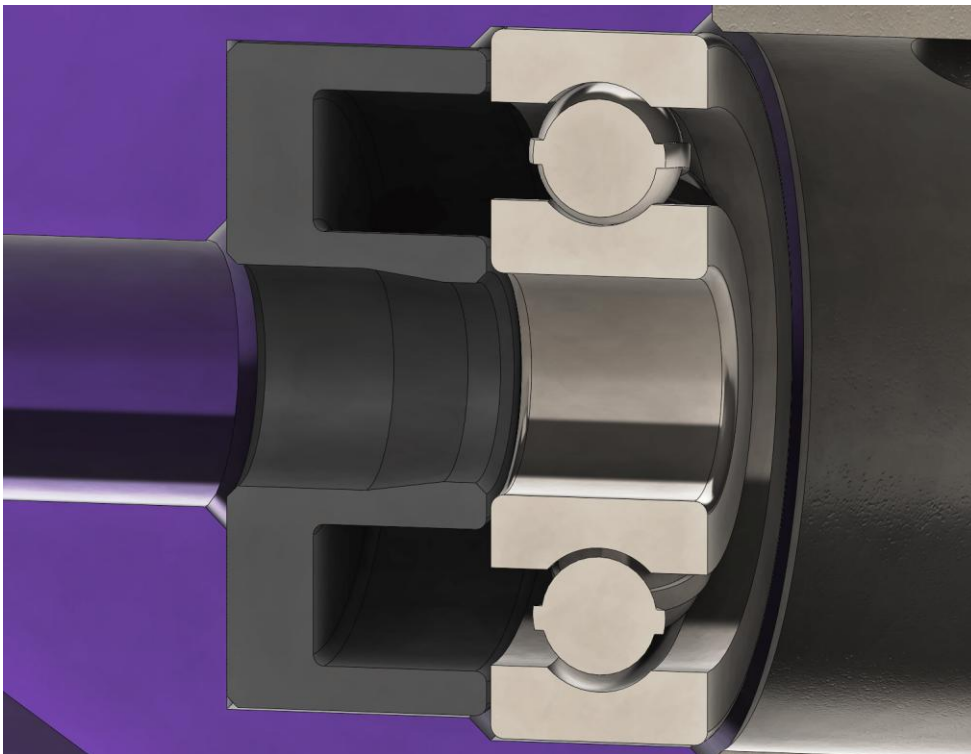


Bearings

1. Depending on your version, you now need to take your main bearing (5x16x5mm or 5x13x4mm) and the according 3d printed or purchased oil seal (5x15x5mm for larger bearing, 5x10x4mm for smaller bearing). Insert the oil seal exactly like shown in the pictures below. The opening must face the inside whilst the closed site must face the water. If the bearing or the seal doesn't fit right away, wrap some fine sandpaper (preferably for wet sanding) around a thin round pin and rotate in the slot until you have a good fit (meaning it slips in with slight pressure and doesn't fall out by itself).

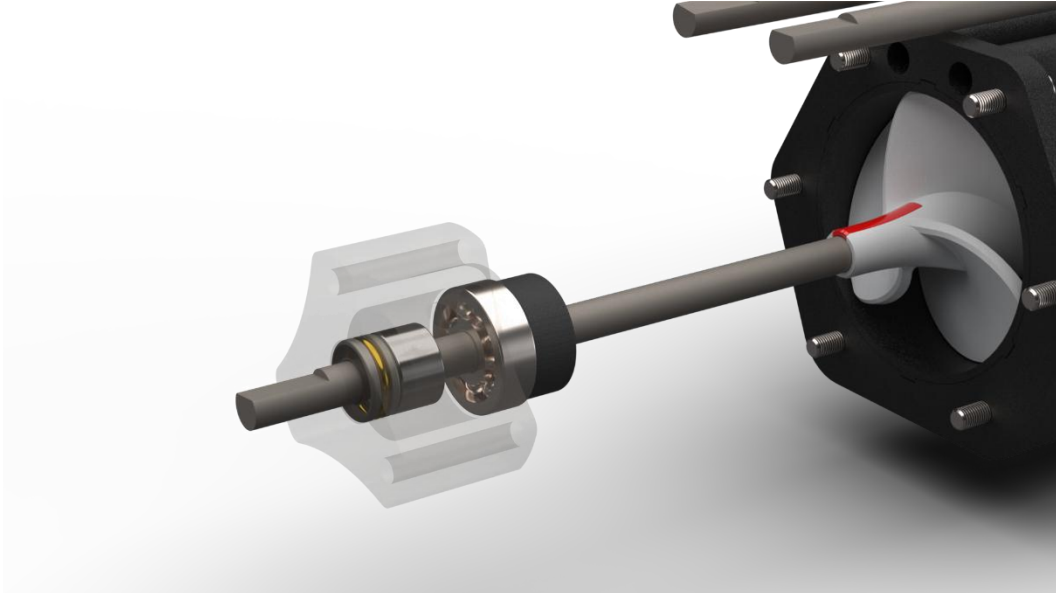


Cutaway view on how the oil seal should be oriented:

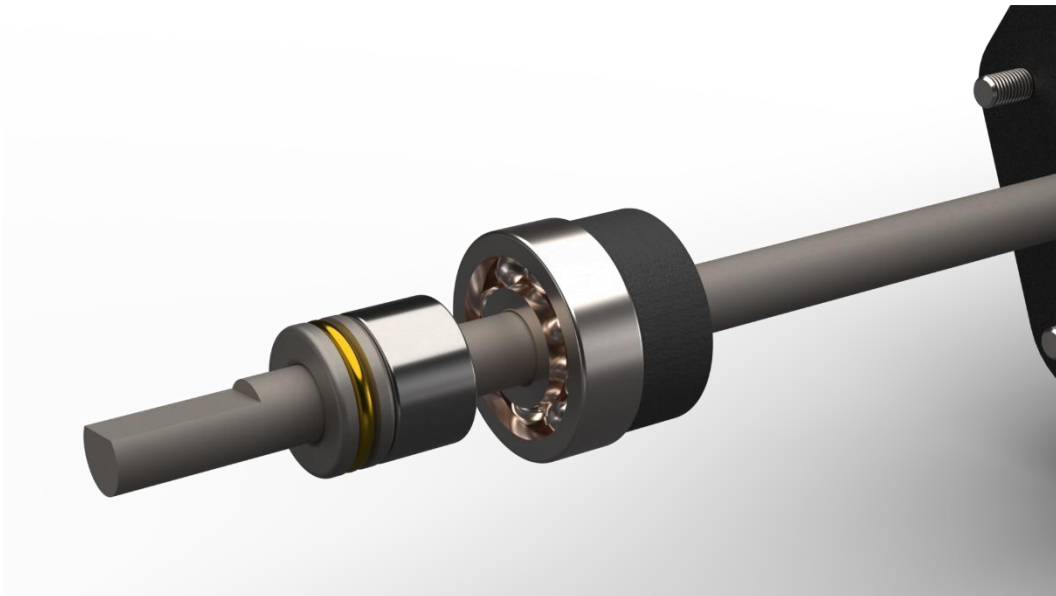


Continue with the jetpump assembly first, so you can directly mount the parts in the correct position.

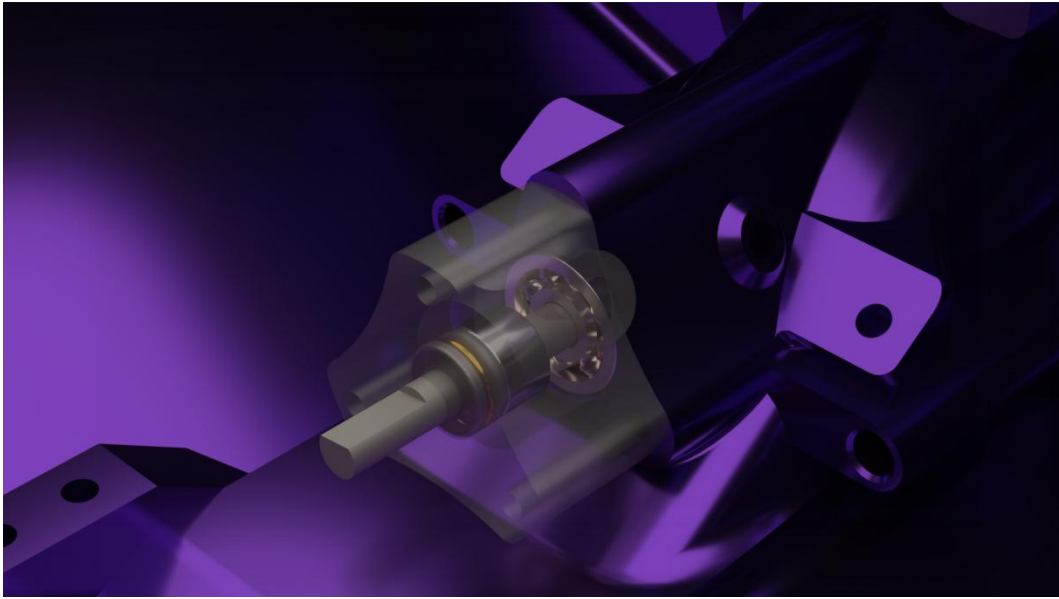
2. Take the bearing housing, your thrust bearing and the shaft collar.
3. Slide the shaft collar and the thrust bearing onto the shaft. Insert the thrust bearing into the cutout in the bearing housing. Test fit everything so the shaft collar sits in the right position. For better visibility, the hull is not visible in this picture.



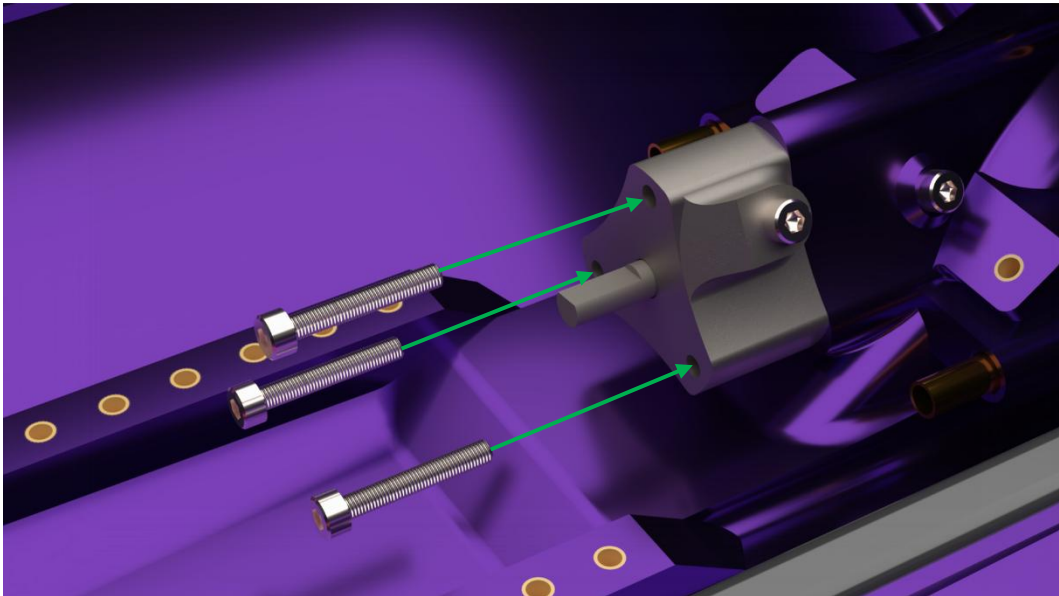
4. Remove the bearing housing from the shaft again and tighten the shaft collar.

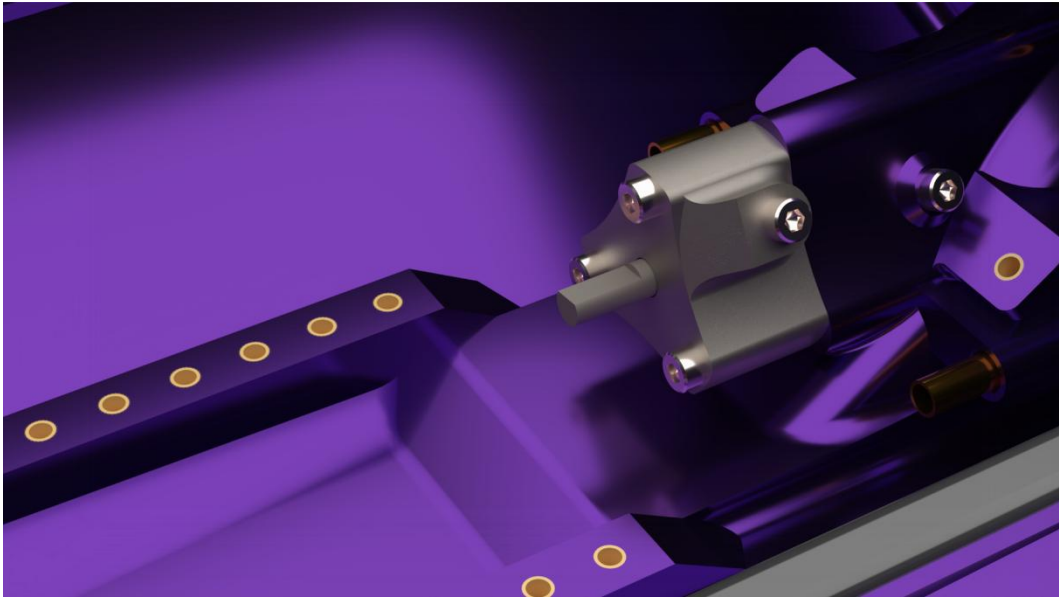


5. Now you can put everything together and mount the bearing housing with three M3x20mm screws.



Also insert a heated insert into the hole on the housings side as well as an M3x6mm screw to close it off. This will be your grease port. We recommend filling the bearing housing with grease to prevent water coming through and to keep everything lubricated. Do the same with the hole / grease port on the pump inlet tunnel.





Pump assembly:**Pump parts**

1. Take all the pump parts



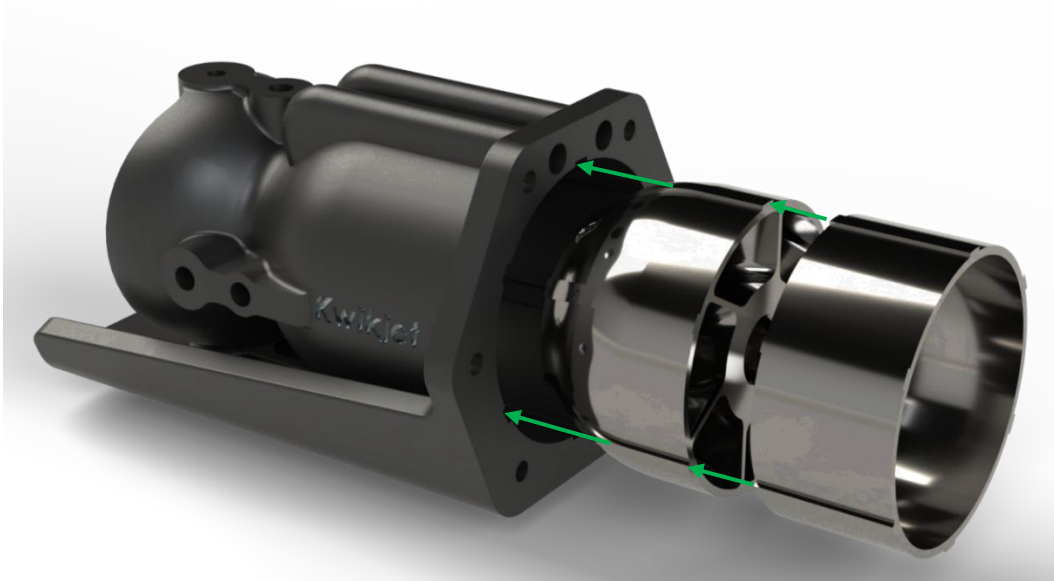
2. Take the pump housing and the corresponding stator & wear ring.



3. Insert the bronze bushing into the stator and ensure a tight fit.

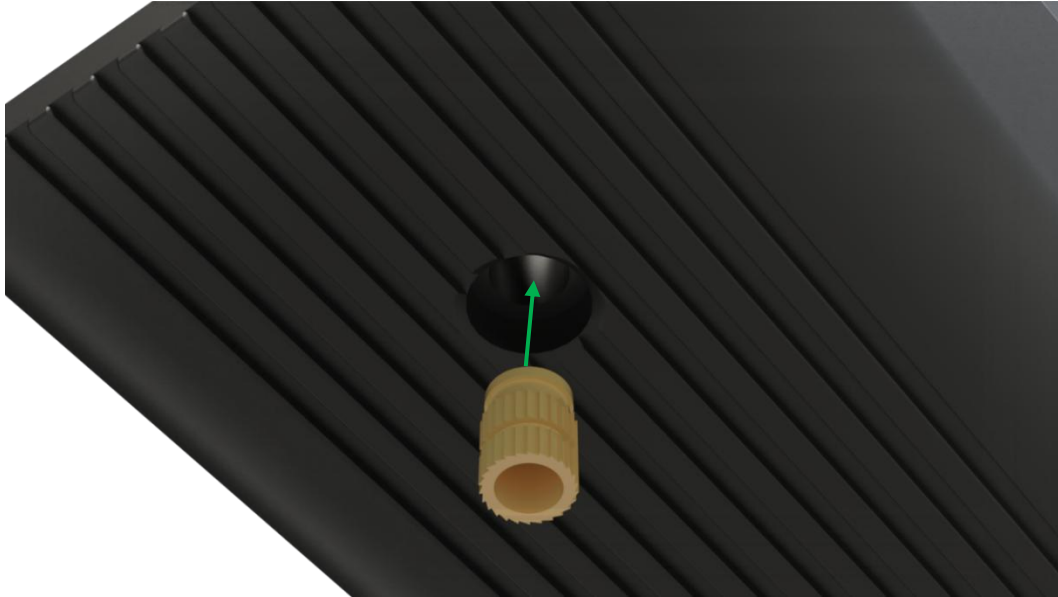


4. Push the stator & the wear ring into the pump housing. Do *not* use glue! The part will hold together by itself. Besides drastically improving print quality, this mechanism lets you change parts quickly incase anything breaks!

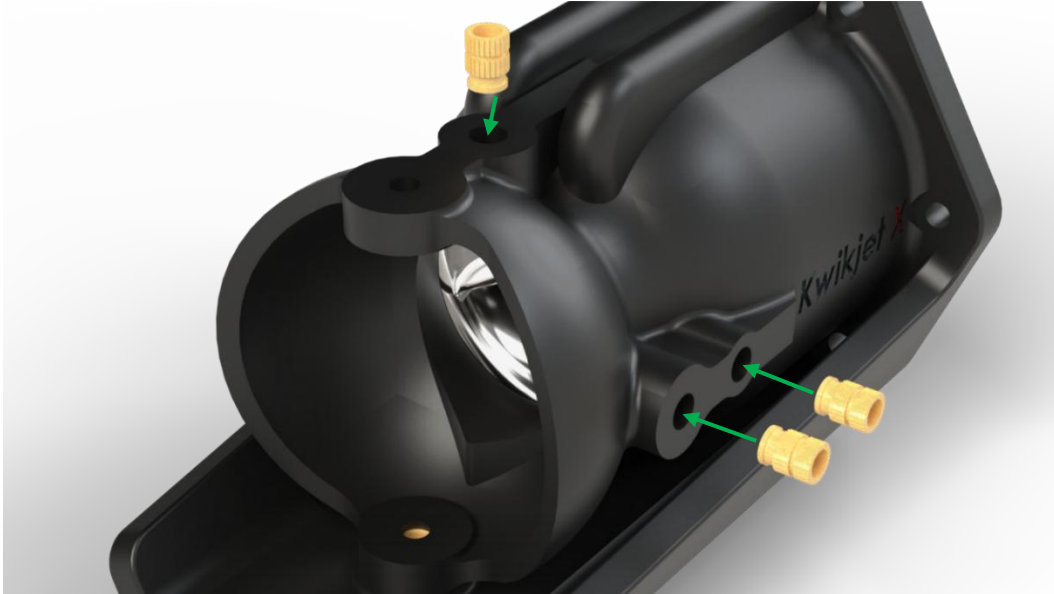


Heated inserts

1. Take one heated insert and melt it into the lower nozzle screw position.

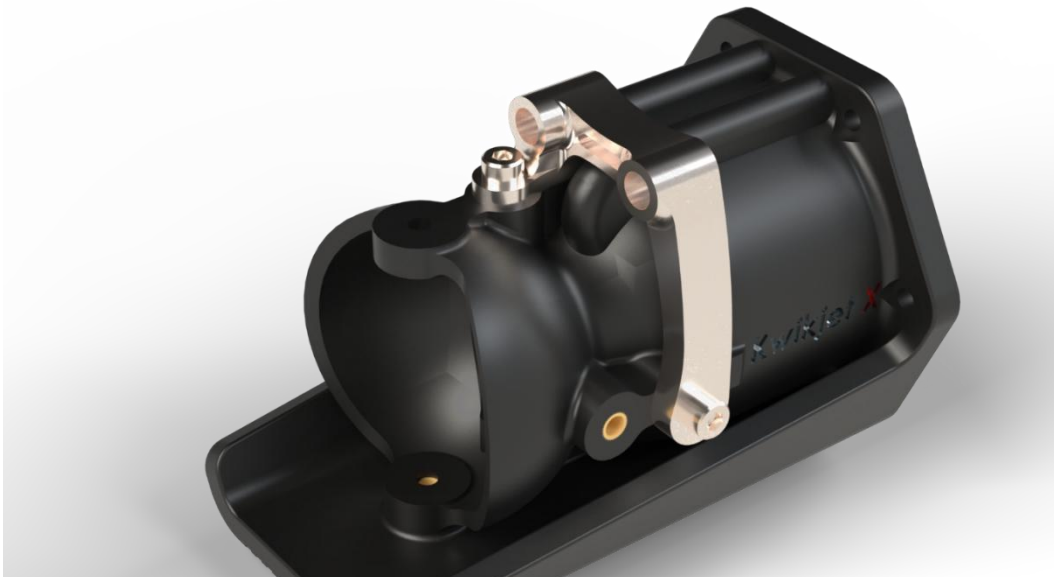


2. Now take four more heated inserts and insert them on the upper steering bridge screw position as well as the lower one and the reverser screw position on both sides (only one side is shown in the picture). Do *not* insert one for the upper nozzle screw!



Steering

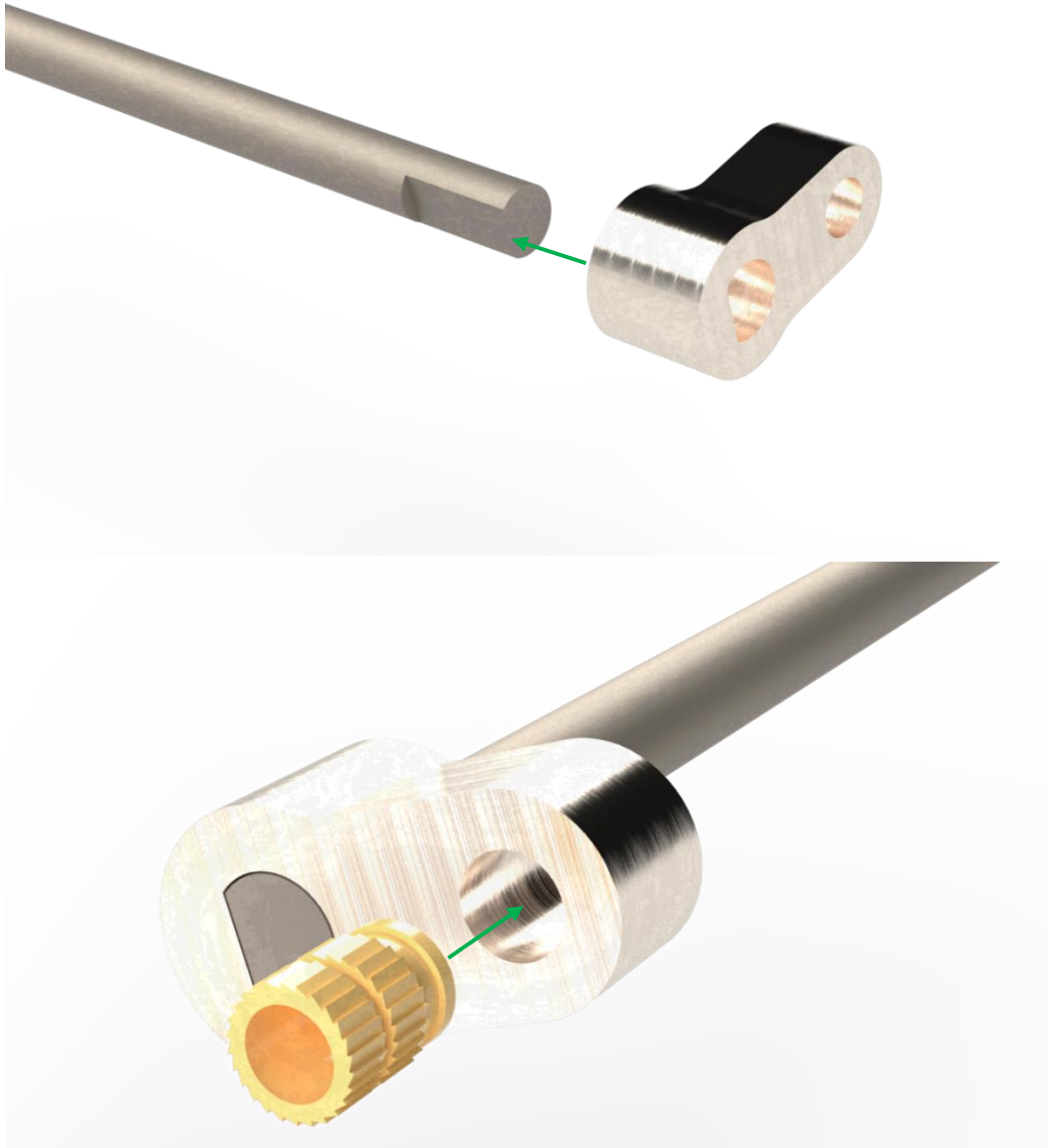
1. Take the steering rod bridge and mount it with 2 M3x6mm screws.

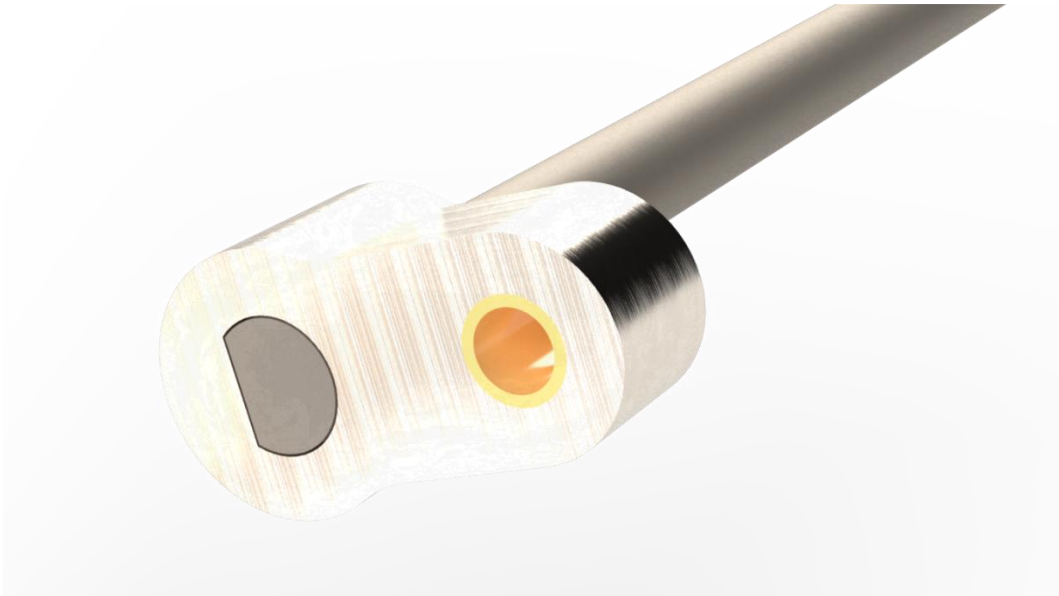


2. Take the two ball steering balls and glue them together. Make sure they are properly aligned. Slide them onto the ball steering shaft and use some glue to fix them in place.

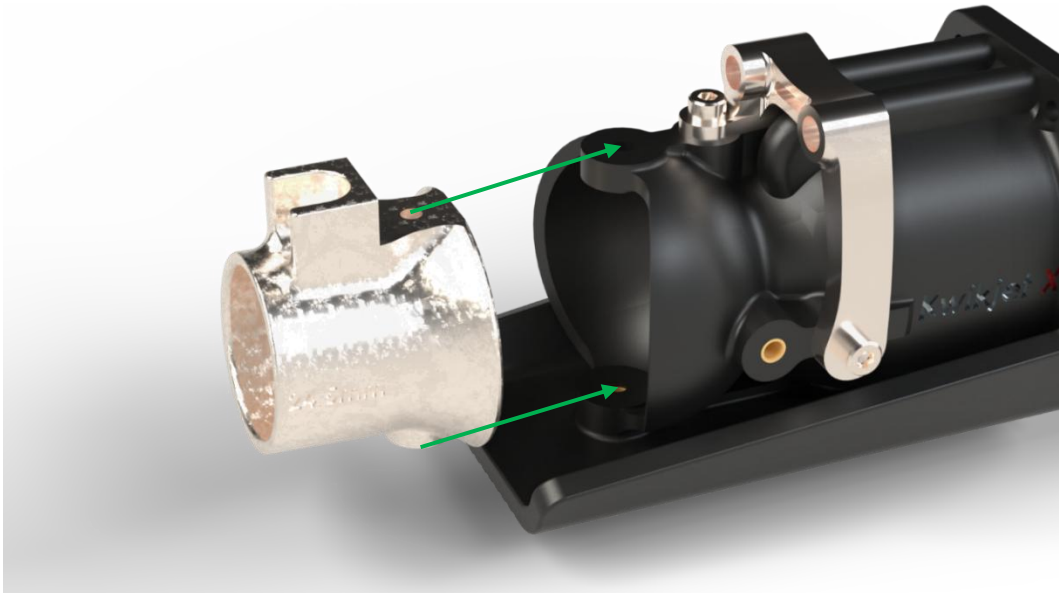


3. Now we will do the same for the reverser steering shaft. Take the reverser linkage as well as one heated insert. Slide the part on the shaft and insert the heated insert into the hole on the reverser linkage.

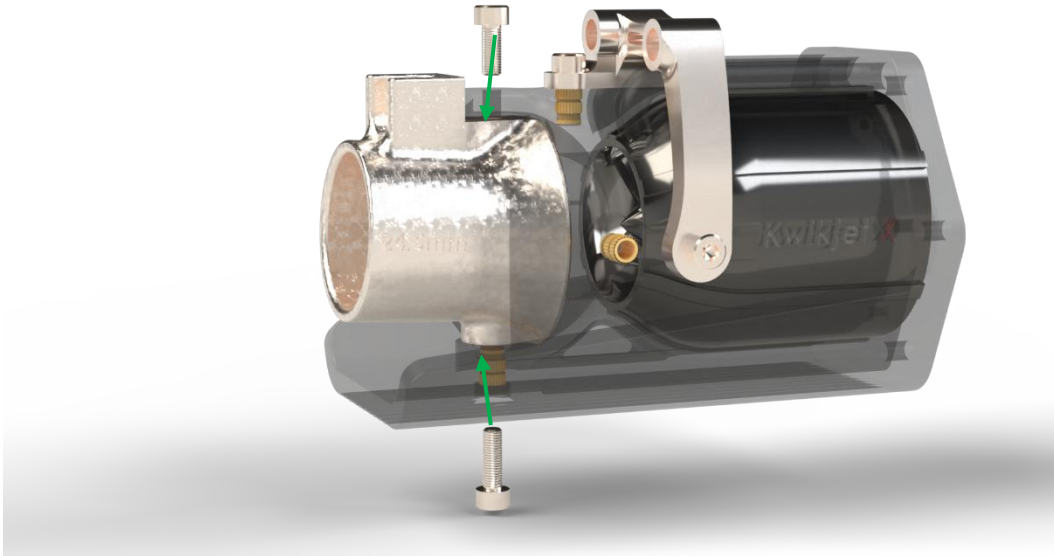




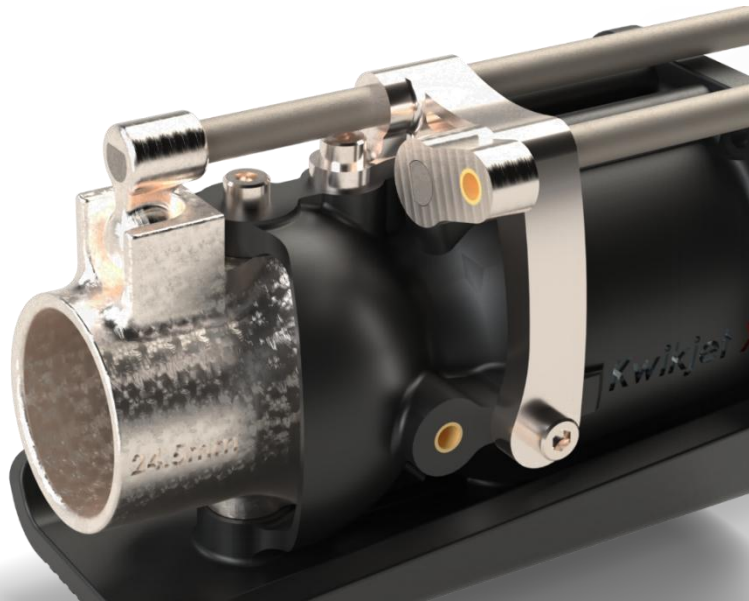
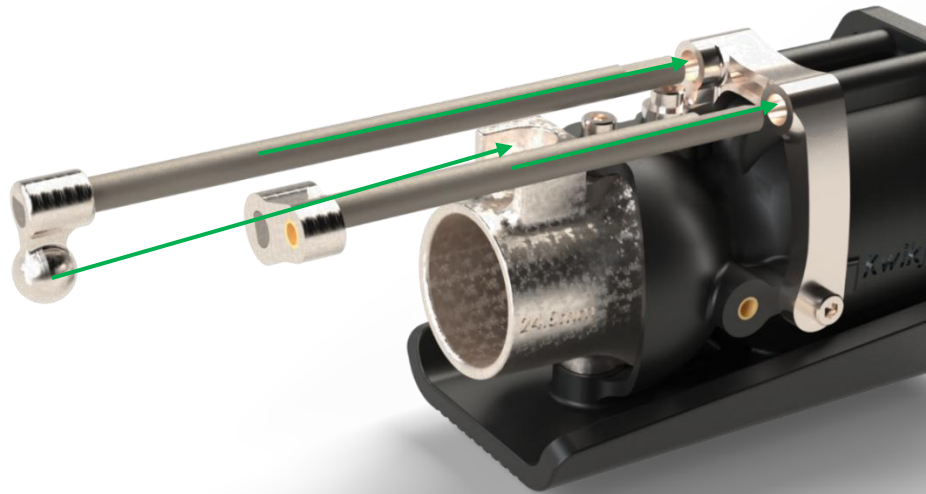
4. Before installing the shafts, we will install the steering nozzle. Take the steering nozzle, one M3x8mm and one M3x10mm screw.



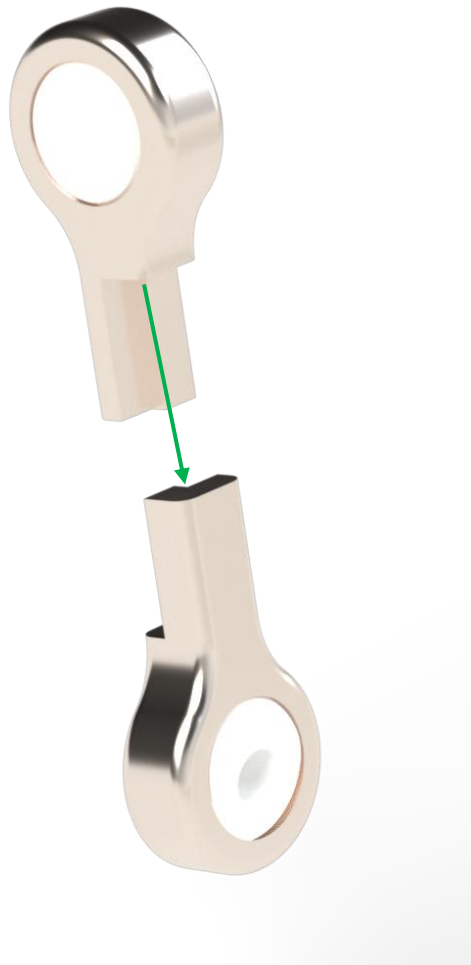
5. Screw the M3x10mm screw in tight from the lower nozzle receiver. Screw the M3x8mm screw in from above but make sure to not overtighten it and therefore causing wear on the plastic part.



6. Slide the assembled ball steering shaft and the reverser shaft into the two opening of the steering bridge. To fix the shafts, we recommend installing two shaft collars behind the bridge.

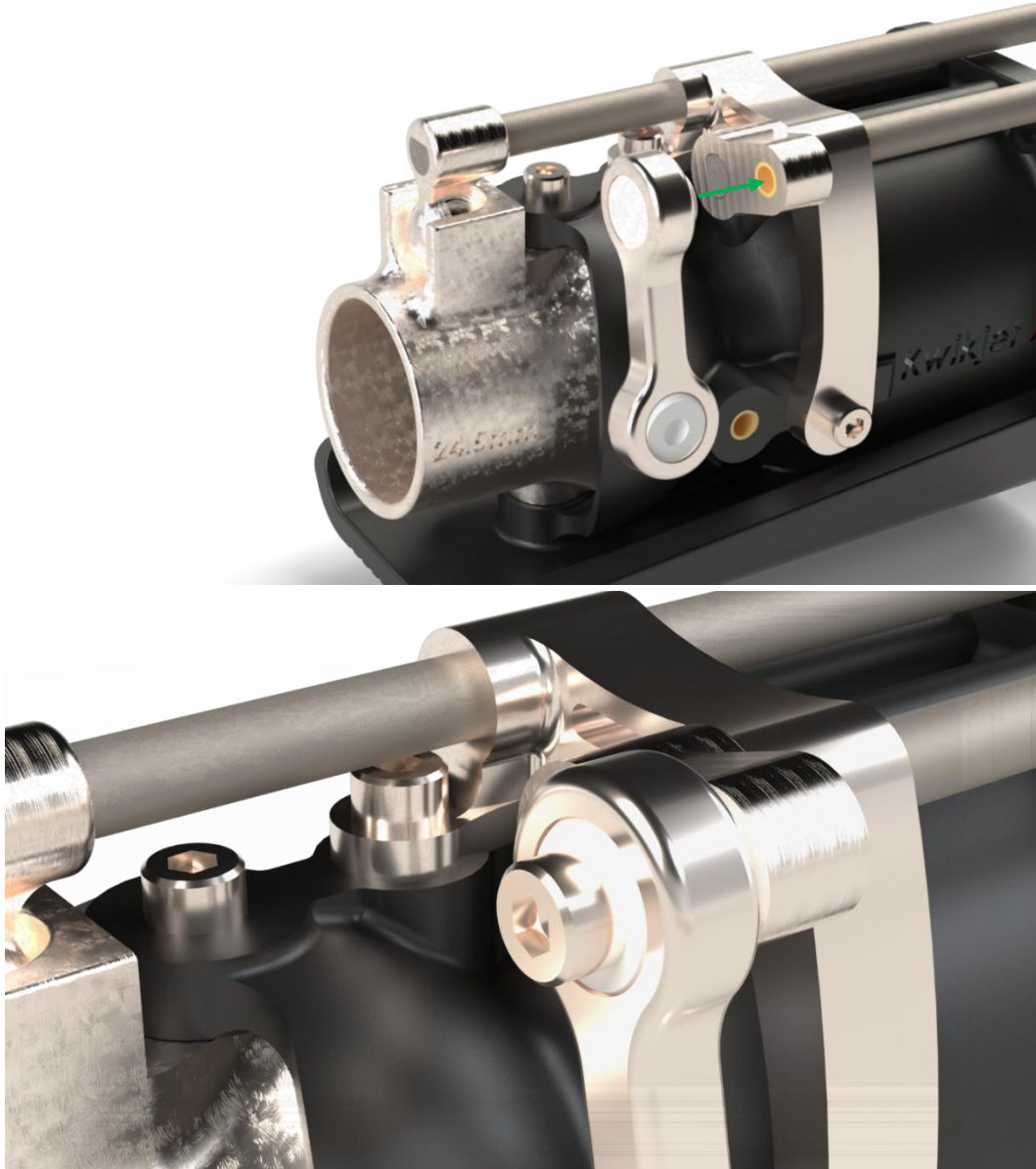


7. Grab the two reverser swivel parts and glue them together. Ensure that the two balls inside the swivel can move around.

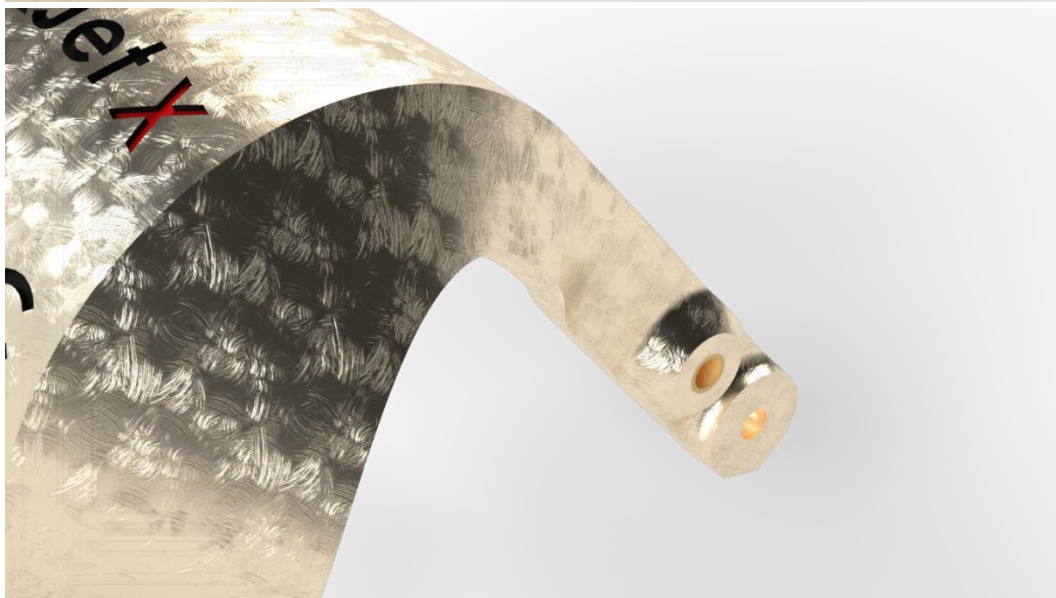
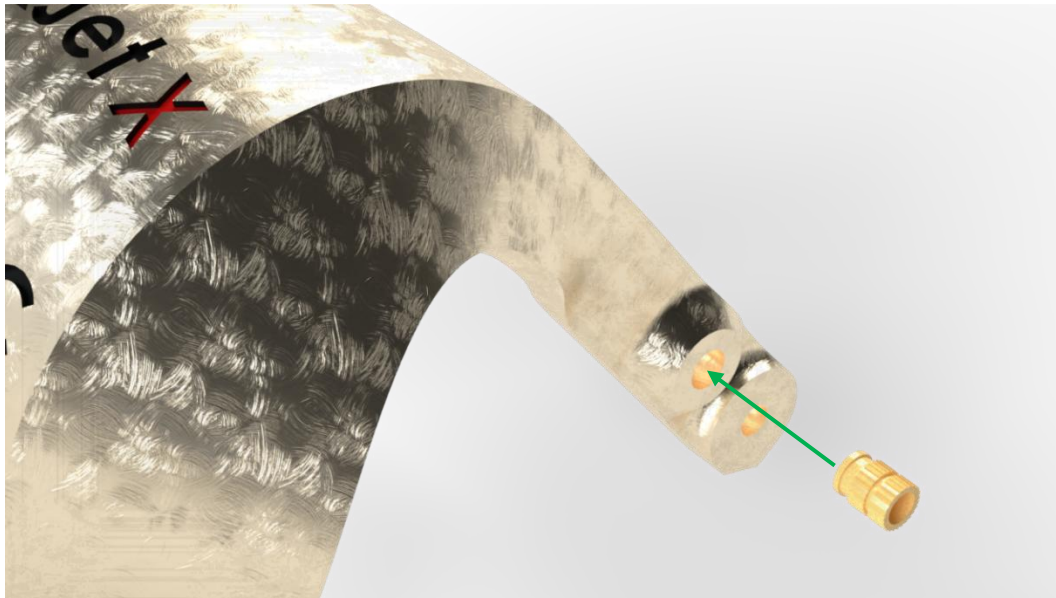




8. We now will screw the swivel assembly onto the linkage arm. Therefore, take one M3x12mm screw and screw it into the heated insert on the linkage arm. Make sure that the small knob extending from the ball is facing the linkage arm.



9. Take the reverser and one heated insert. Insert the insert into the reverser. Make sure to put in in the right hole!



10. We now will finish the reverser by screwing it onto the pump housing and coupling it with the steering mechanism. Take one M3x12mm and two M3x10mm screws. Insert the longer one through the swivel ball and fix it on the heated insert on the reverser. Use the other two M3x10mm screws to fix the reverser onto the pump housing.

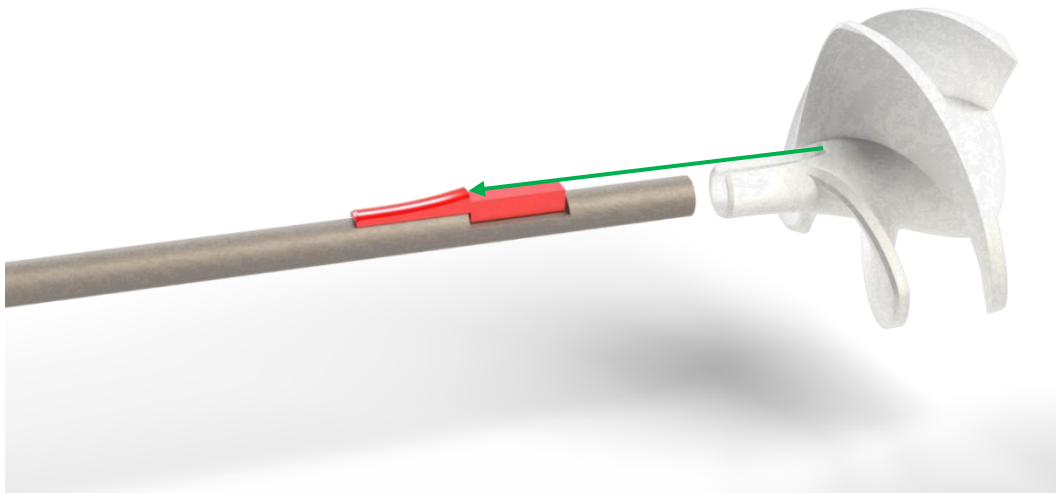
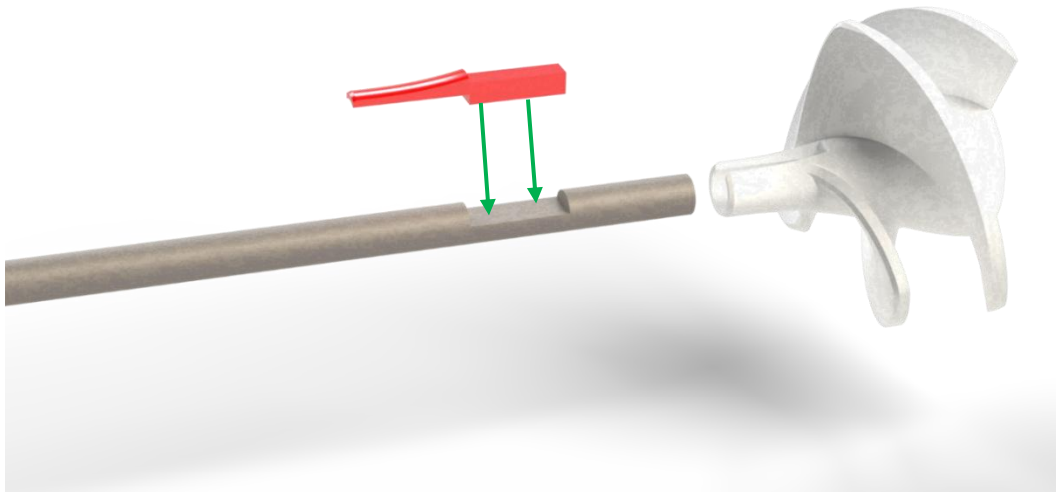




Keep in mind that the picture only shows one side as reference. Don't forget the other side.

Impeller

1. We now come to the final stage of the pump assembly, the impeller. Therefore, take the drive shaft and the impeller as well as the impeller key. Put the impeller key in the cutout keyway on your shaft and slide the impeller over the shaft from the back. Your impeller is now locked itself. Don't apply any glue! In operation, the resulting forces will keep the impeller locked as it gets pushed forward.



Hull mounting

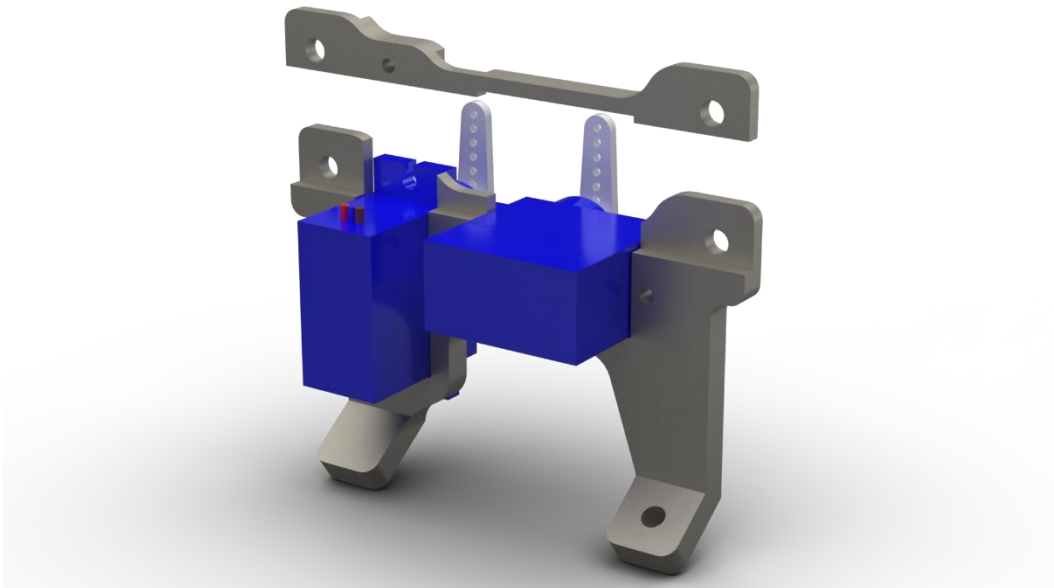
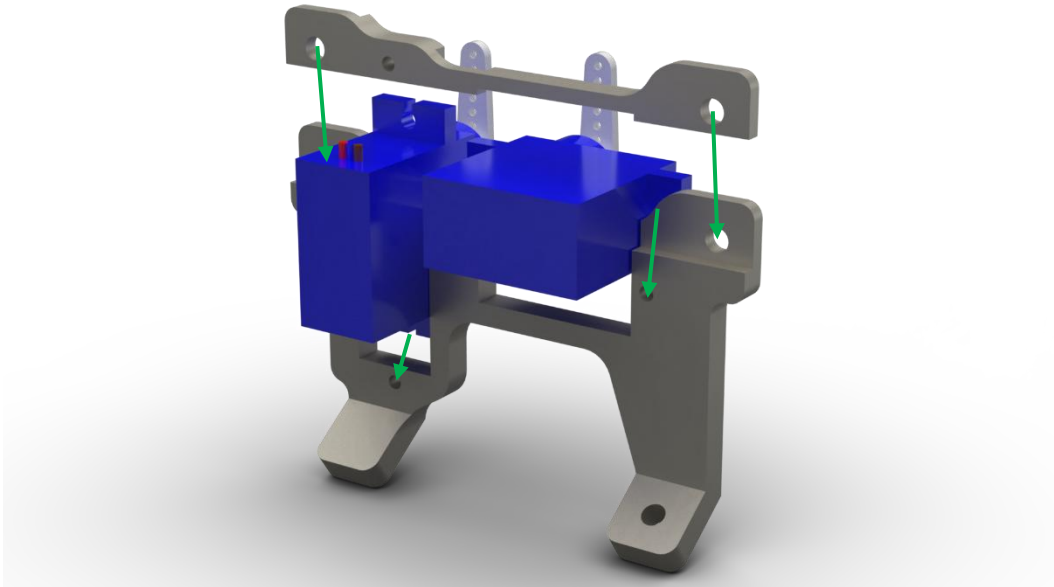
1. Take six M3x10mm screws and screw the jetpump unit into the hull.
2. Mount the motor with the max number of screws your motor can accept onto the motor mount. Screw the motor mount onto the motor rail in the hull by using four M3x6mm screws.
3. Take the motor bracket and insert two M3 heated insert in the two holes.
4. Screw the lower motor bracket part onto the rail so that the motor sits on it.
5. Now screw down the top bracket part to fix the motor in place.
6. Take your 5mm coupler and connect the driveshaft with the motor shaft.

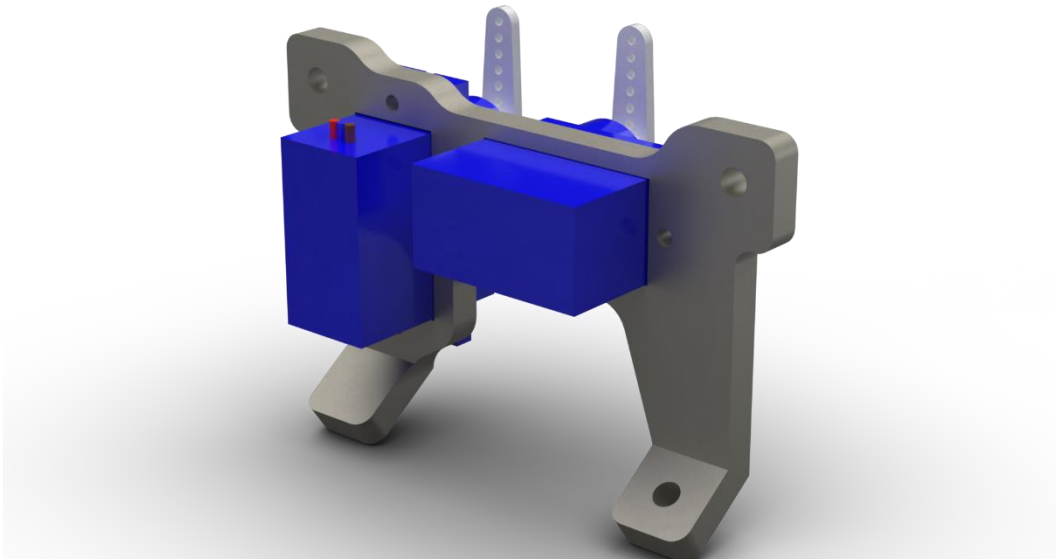
Water-cooling system

Take the silicone tube and cut it to your needed length. The bottom water-cooling loop nipples are the outlet while the top ones are the inlet. Make sure to connect the motor as well as the ESC to the water-cooling system. We recommend cooling the ESC and motor with two different cooling loops, so the ESC doesn't receive the already heated water from the motor and vice versa.

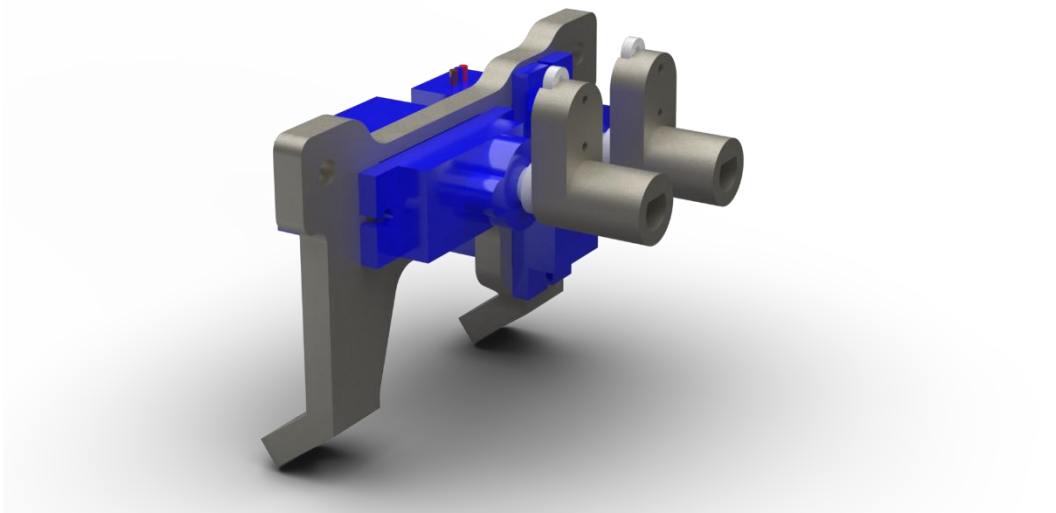
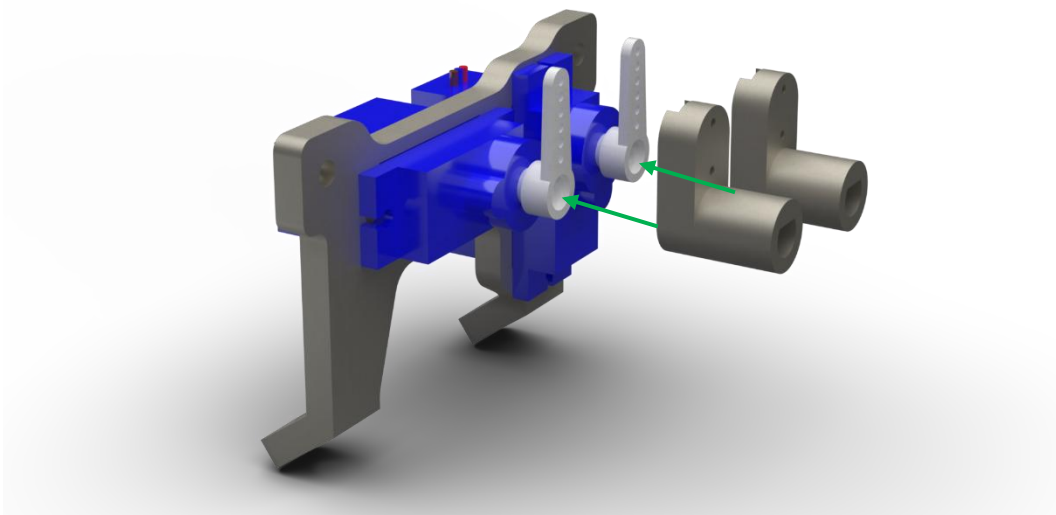
Servo assembly

1. Take the two servo bracket parts. Place the servos in the bracket and secure them with the screws supplied with your servo. Slide the top part over it.

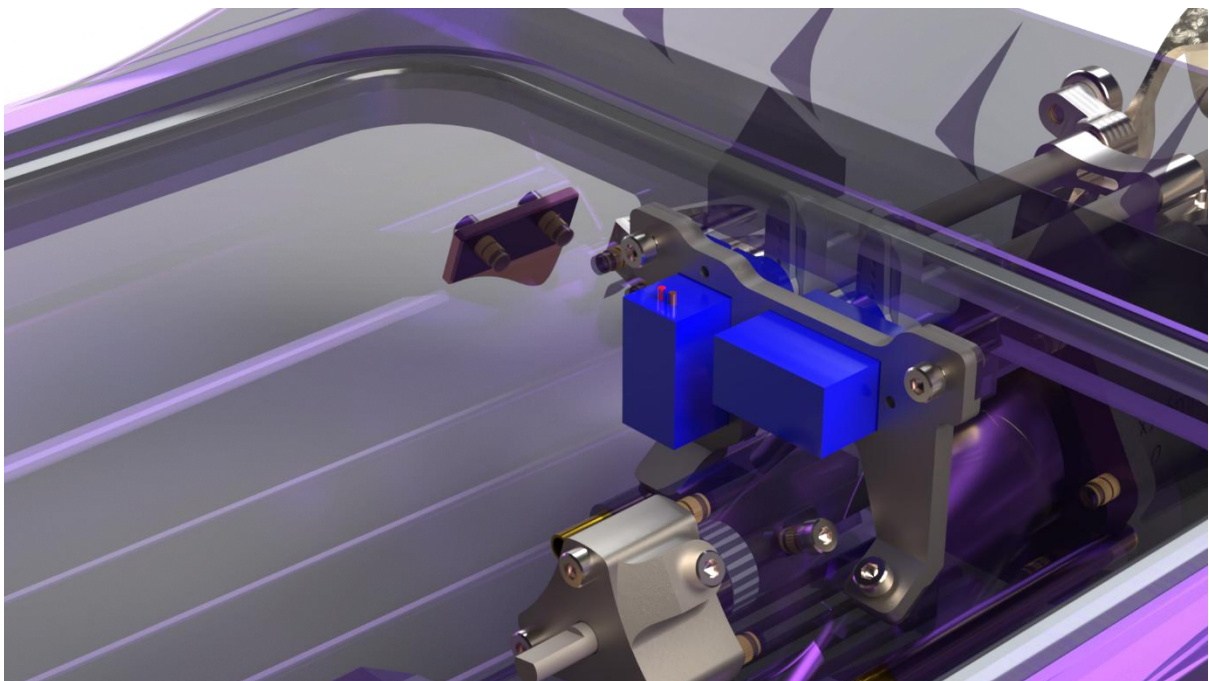
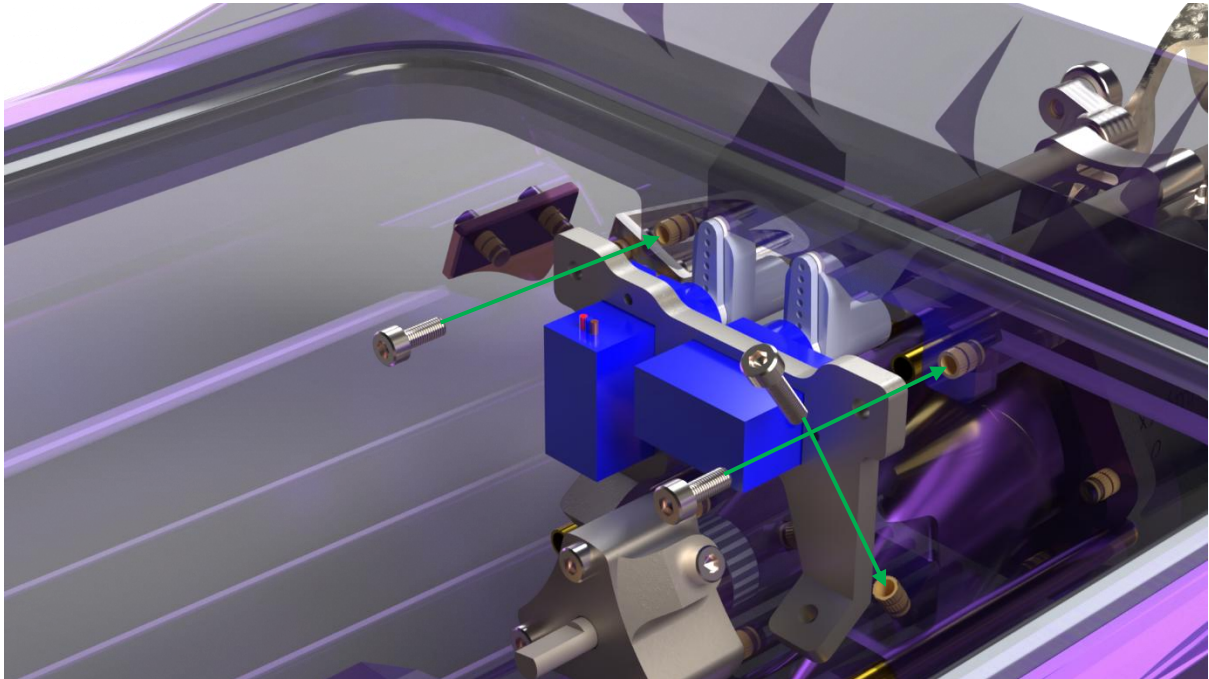




2. Attach our rod to servo horn adapter also using the supplied screws.

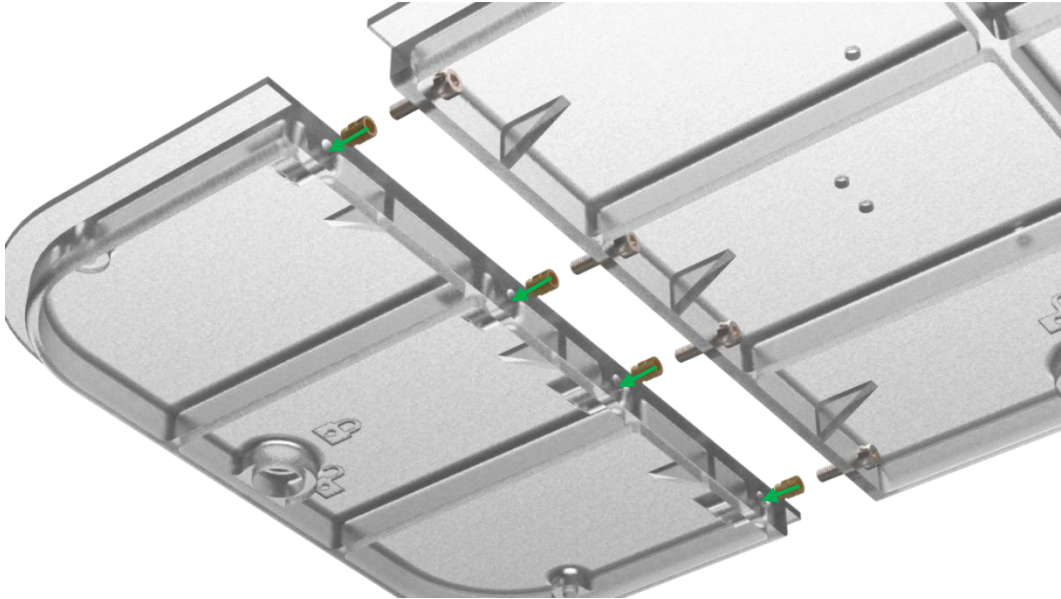


3. Mount the servo assembly with three M3x6mm screws in the hull. Make sure to attach the servo horn to rod adapter with the steering rods.

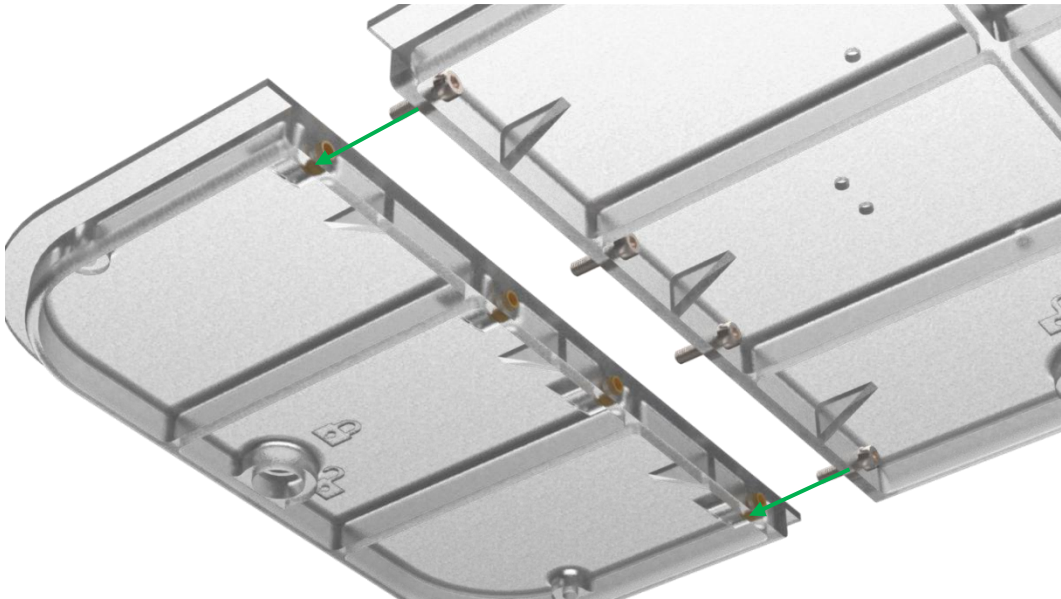


Deck assembly:**Deck plates**

1. Take the two deck plates. Insert the heated inserts in the designated spots.



2. Screw the two parts together using 4 M3x12mm screws.

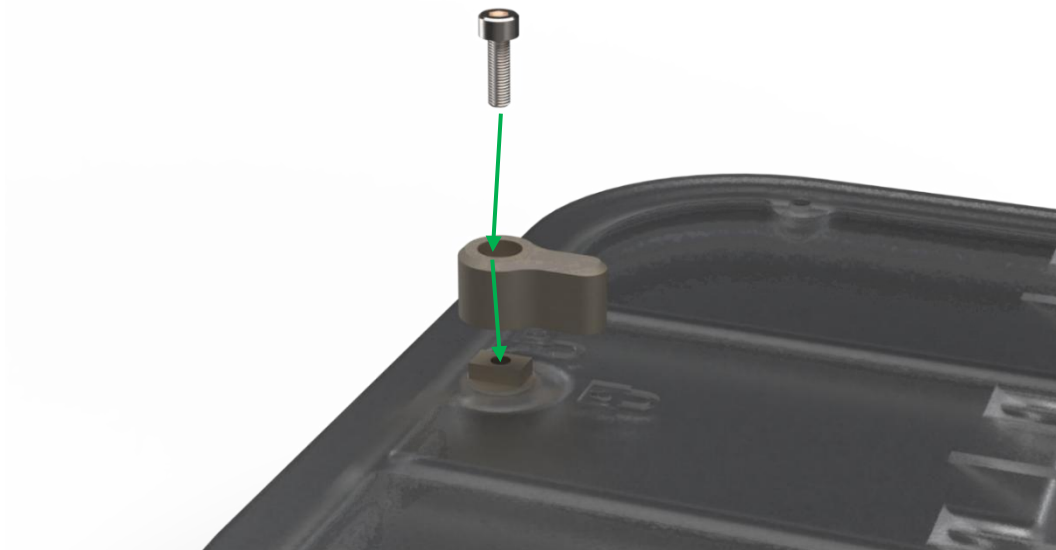


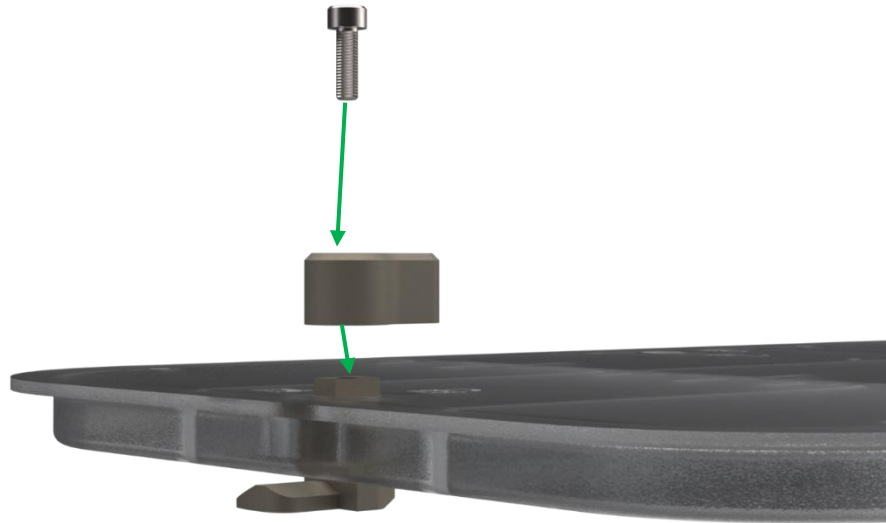
Locking mechanism

1. Insert the heated inserts into the bottom of the lower locking mechanism part.



2. Put the lower locking mechanism part through the hole in the deck plate.

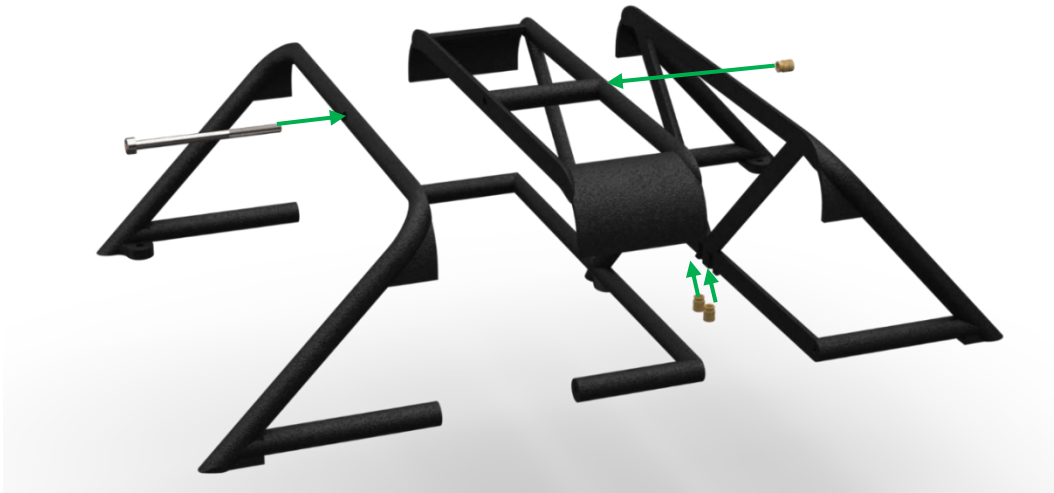




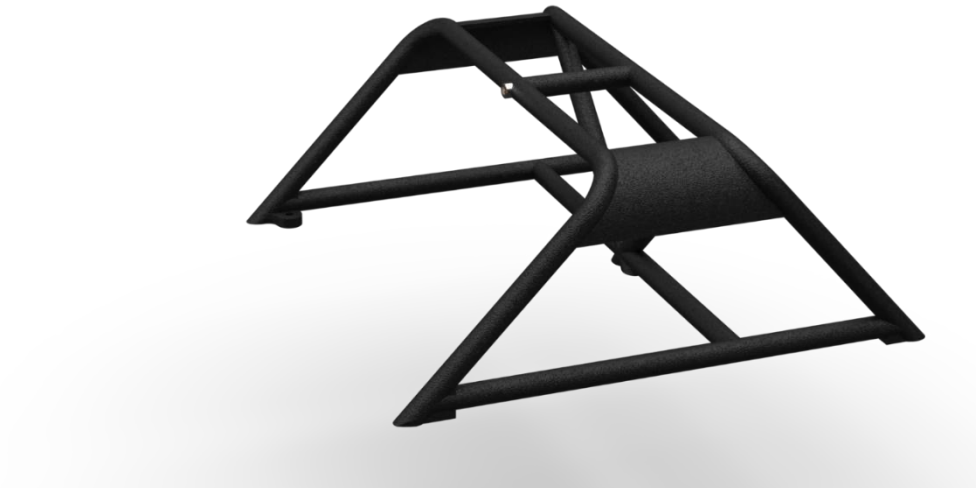
3. Attach the top part and secure it by using one M3x20mm screw. Repeat this for all four holes.

Drivers, engine, exhaust & roll cage

1. Take your three roll cage parts and glue them together. In case you have leftover steel wire from the intake grate, we advise to insert it in the hole for added stability and ease of assembly.



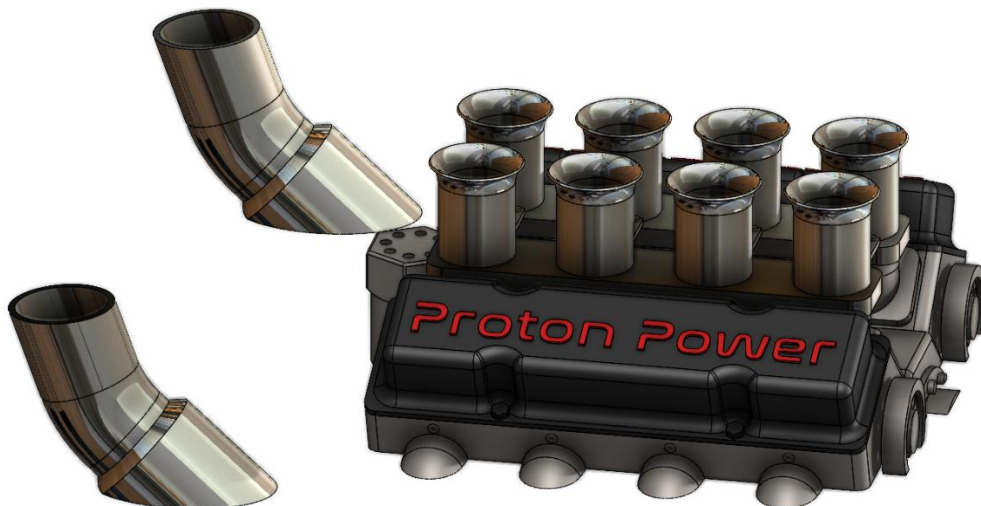
2. Once the glue dried, insert one heated insert on the backside of the roll cage and two heated inserts in the slots on the bottom.
3. Screw the roll cage together through the top screw slot by using one M3x50mm screw.



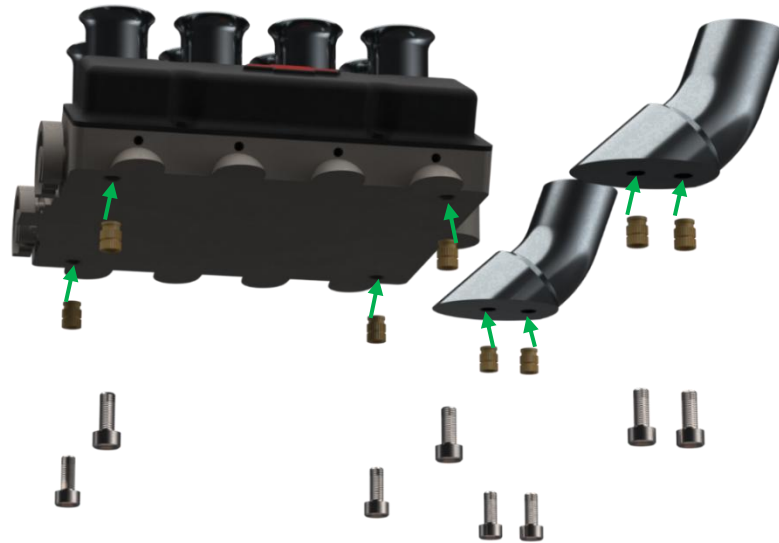
4. Screw the roll cage onto the deck plate by using four M3x10mm screws.



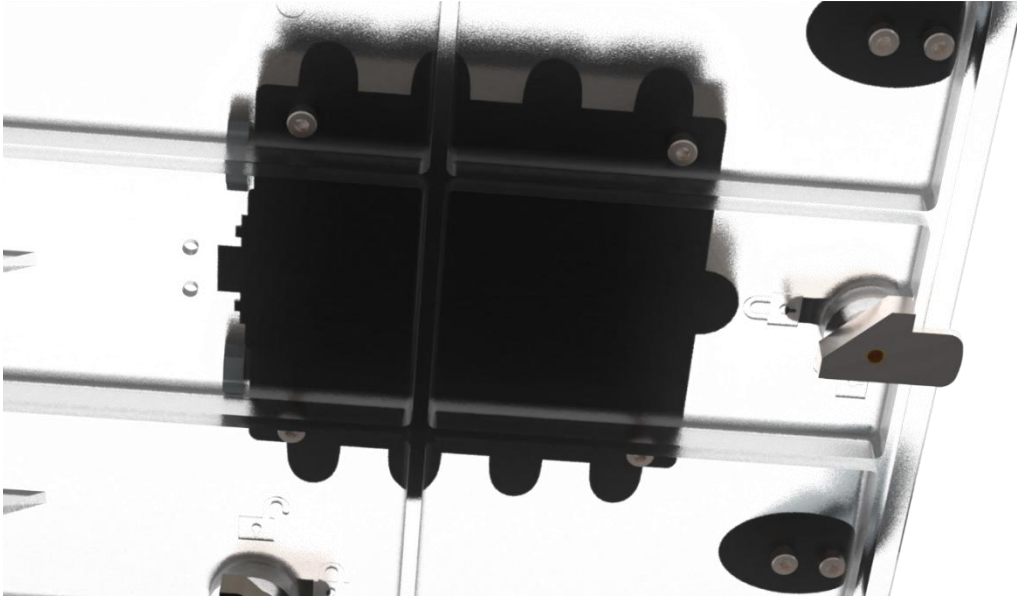
5. Assemble the engine by using CA glue (superglue). It should look like this:



6. Insert heated inserts on the bottom of the engine and exhaust.



7. Use M3x8mm screws to fix the parts under the deck plate.



8. Now add the drivers onto the plate. We did not include any mounting spots so you can adapt their position to your likings!



Final check

We recommend testing every mechanic of the boat before any real water testing. Ensure that the servos move the steering nozzle and the reversing bucket correctly.

Continue by testing your boat preferably in a bathtub or a small pond in case anything isn't working as intended. Check that the phases (3 cables of your BLDC motor) are connected correctly and the motor spins in the right direction. If that's not the case, you need to swap to connectors. Please do not run the motor dry for extended periods as this will damage the motor and the bushing due to potential overheating.

Test for any leaks by letting the boat sit for a few minutes in the water. It is possible that some water manages to come through the seals while driving. As long as it's only a few drops you don't need to worry about it.

To extend your boats lifespan, we recommend inspecting the impeller and intake grate for damage after each run. Although KwikJet X is designed to run in any conditions, we advise to wash it with normal (tap) water after each run, especially when running in salt water. We also recommend refilling some grease from time to time through the grease ports to keep the bearings lubricated and protected from hostile environments.

To improve your boats electronics lifespan, we recommend using decent sized connectors for the motor/esc and the battery/esc. Usually, a 30% higher current rating than you intend to put through. We also advise to only discharge to 15-20% SoC and not charge up to 100% SoC as this will put immense stress on your battery pack.

Congratulations! You successfully build KwikJet X V2!

Thank *you* for building **KwikJet X V2**! Your support ensures that we can keep up our work and bring you more exciting projects like this updated version of our loved KwikJet X!

Feel free to message us or rate KwikJet X on our web shop at

<https://protonrc.com/product/kwikjet-x-full-set/> !

Happy boating!

Louis & Jotham

