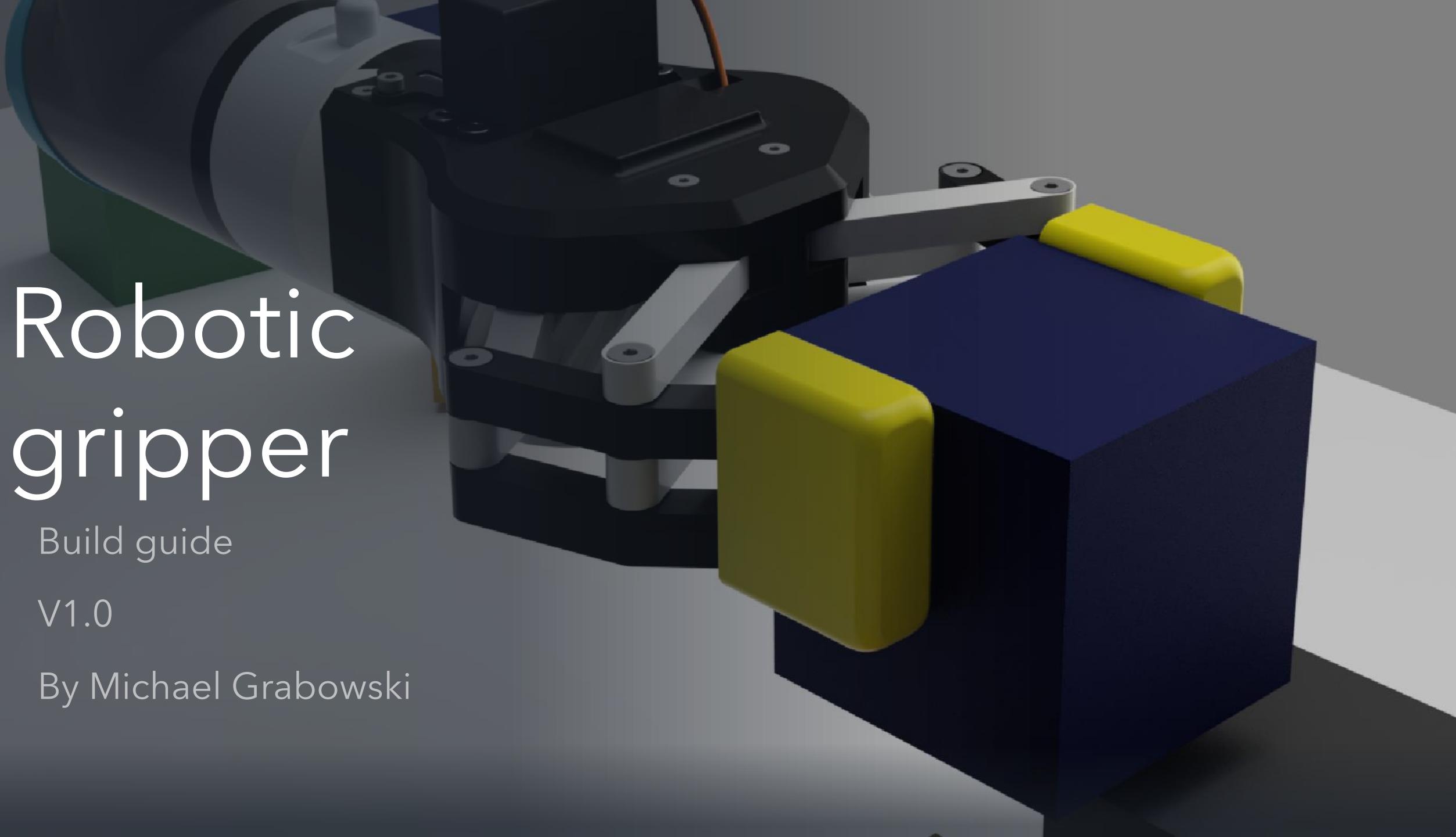


Robotic gripper

Build guide

V1.0

By Michael Grabowski



Before you start

For better results - make sure your printer is calibrated properly

Check if you have the necessary tools
- Allen keys, wallpaper knife, pliers,
small hammer, 4mm drill

Make sure you have all the necessary parts

All printed parts in this guide are marked in **bold**

Check the project page: [LINK](#)

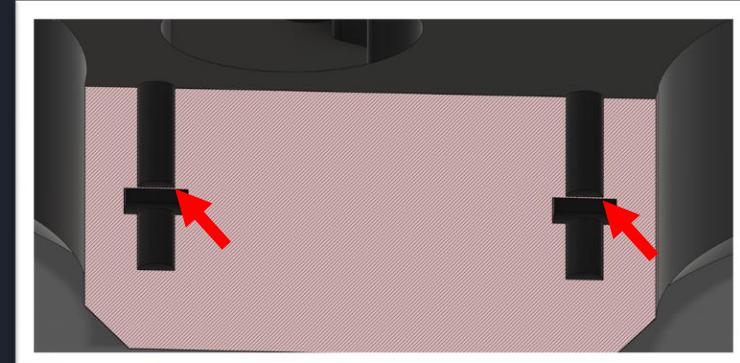
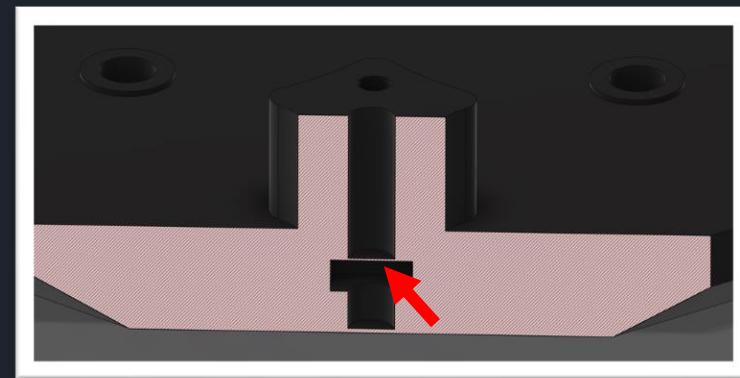
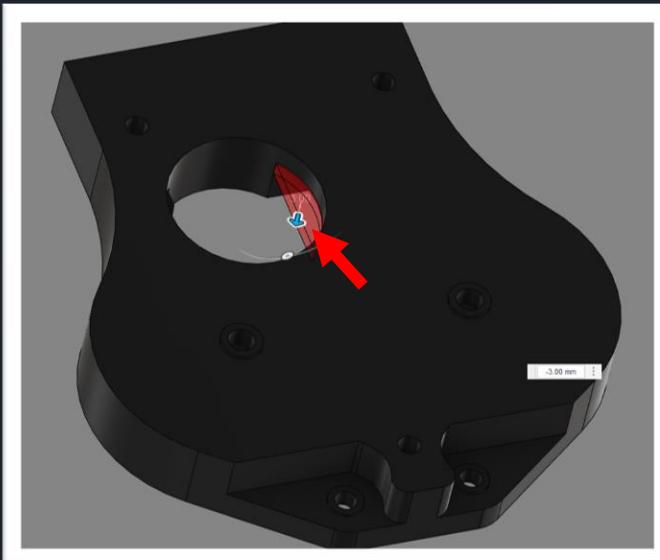
Postprocessing of the 3d printed parts



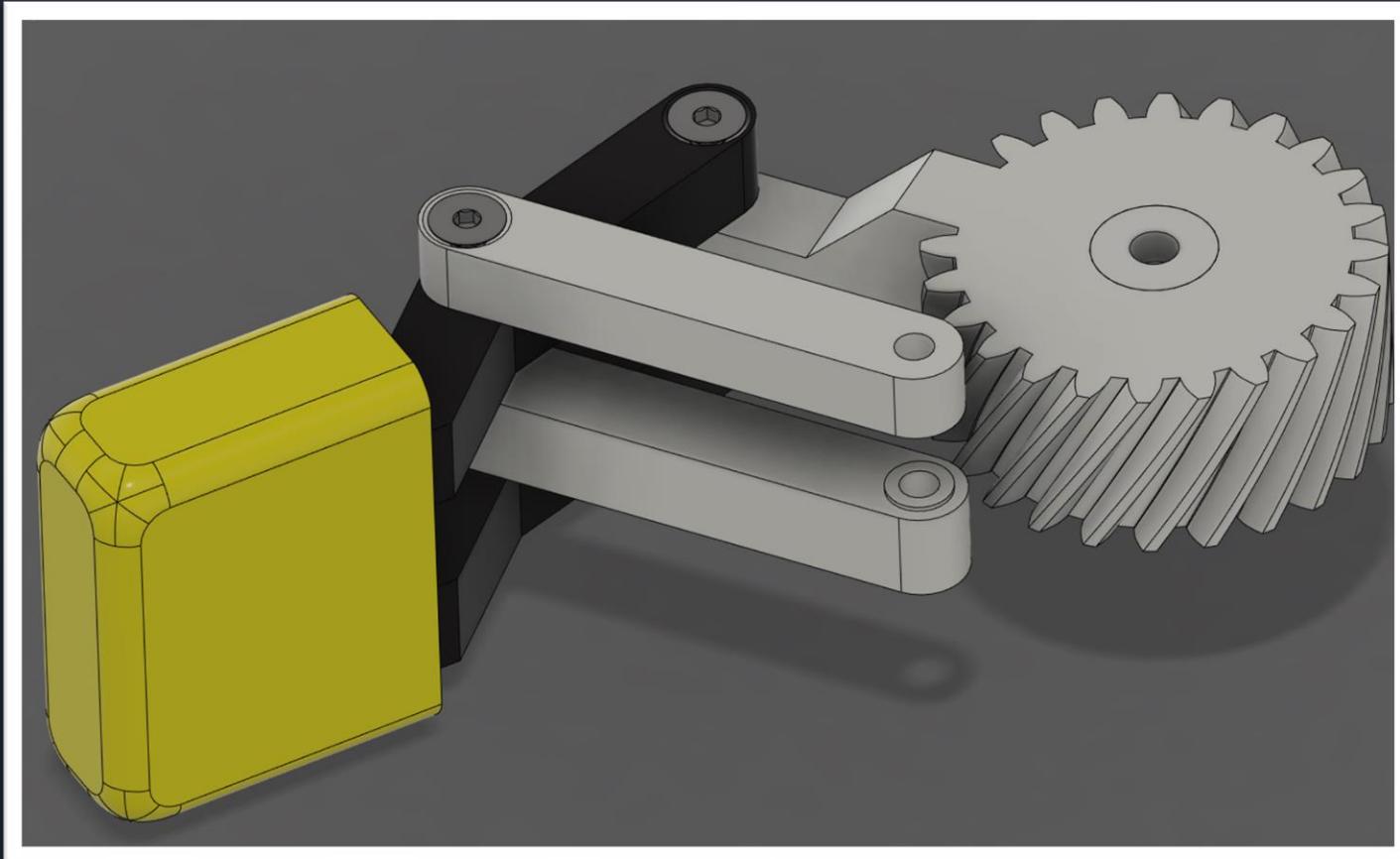
Remove all the supports

Remove integrated support layer on the **Bottom** part right above M4 Square Nut Slots with a 4mm drill

Remove integrated support layer on the **Mid** part inside a servomechanism slot with a wallpaper knife



For right side of
the mechanism you will need:



Also prepare parts for the left side, I believe you
don't need the new list ;)

BottomStick

TopStick

RightArmBot

RightArmTop

RubberSock

RightGear

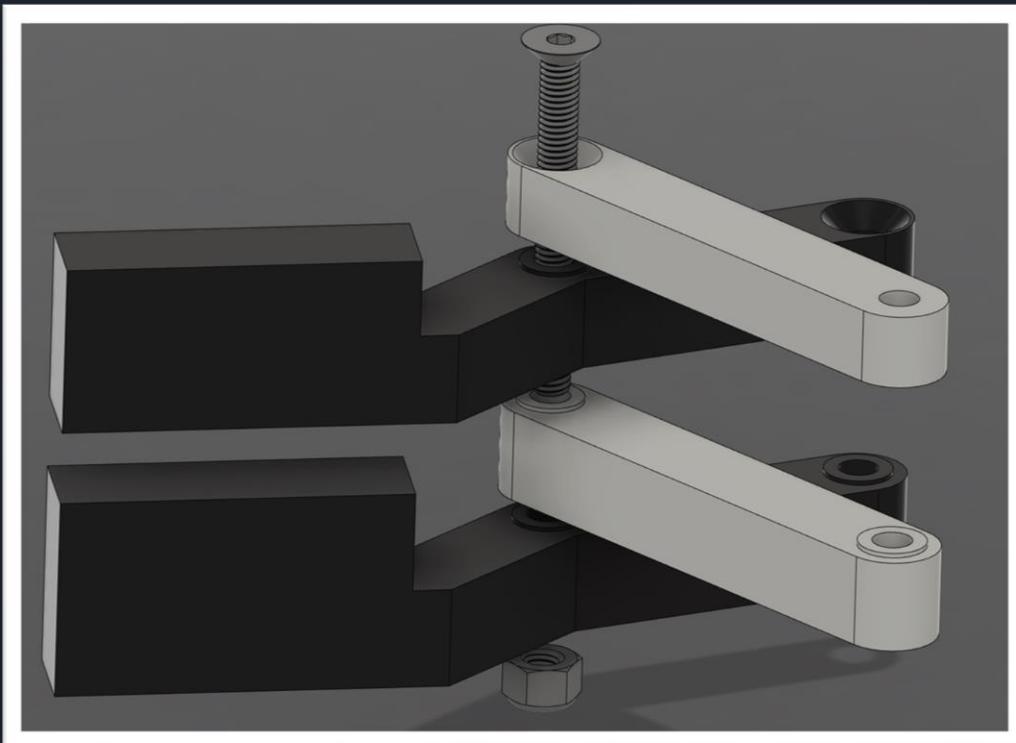
Nylock Nut M4 x2

M4x30mm Flathead

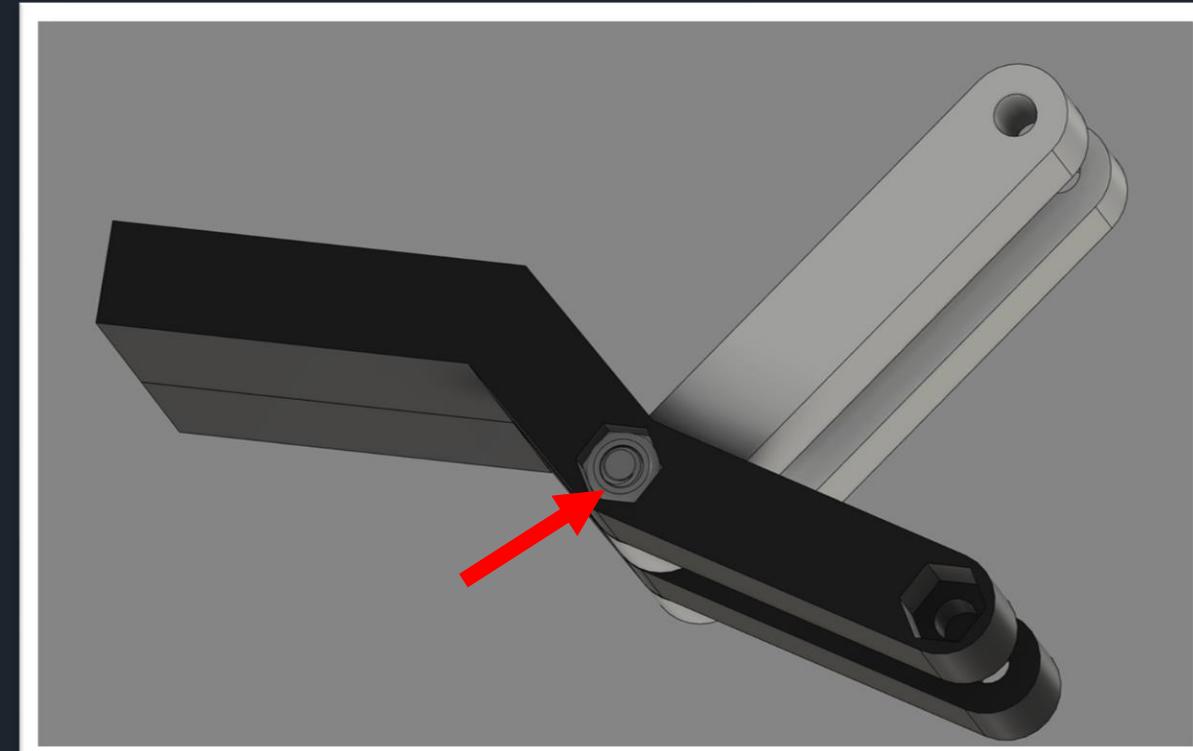
M4x40mm Flathead

Ball-bearing 5x13x4mm x2

Take M4x40mm and pass it through the holes, as shown in the picture. Keep in mind the correct order of the parts.

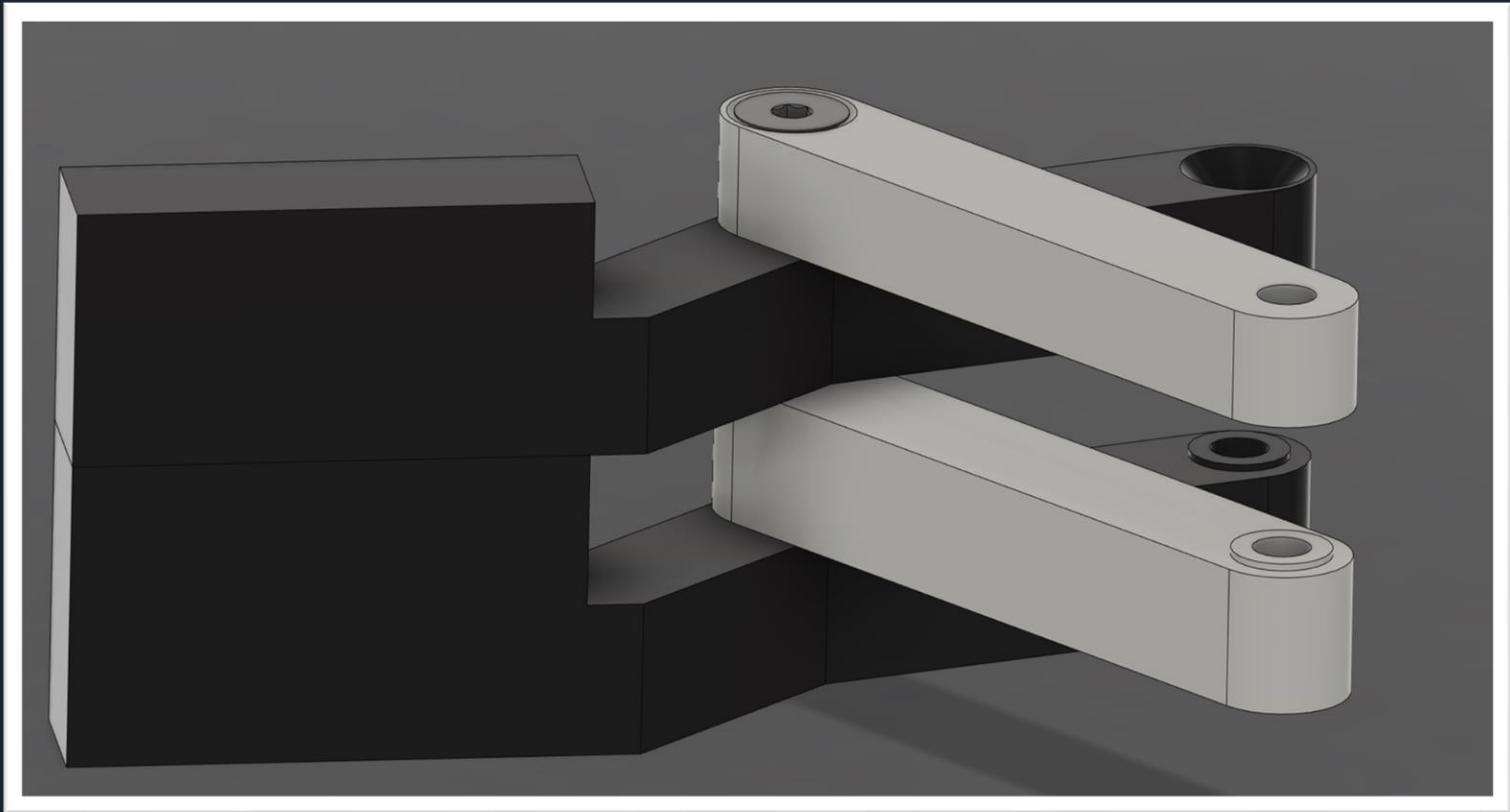


Put M4 Nylock inside the hole located at the bottom of the **RightArmBot**



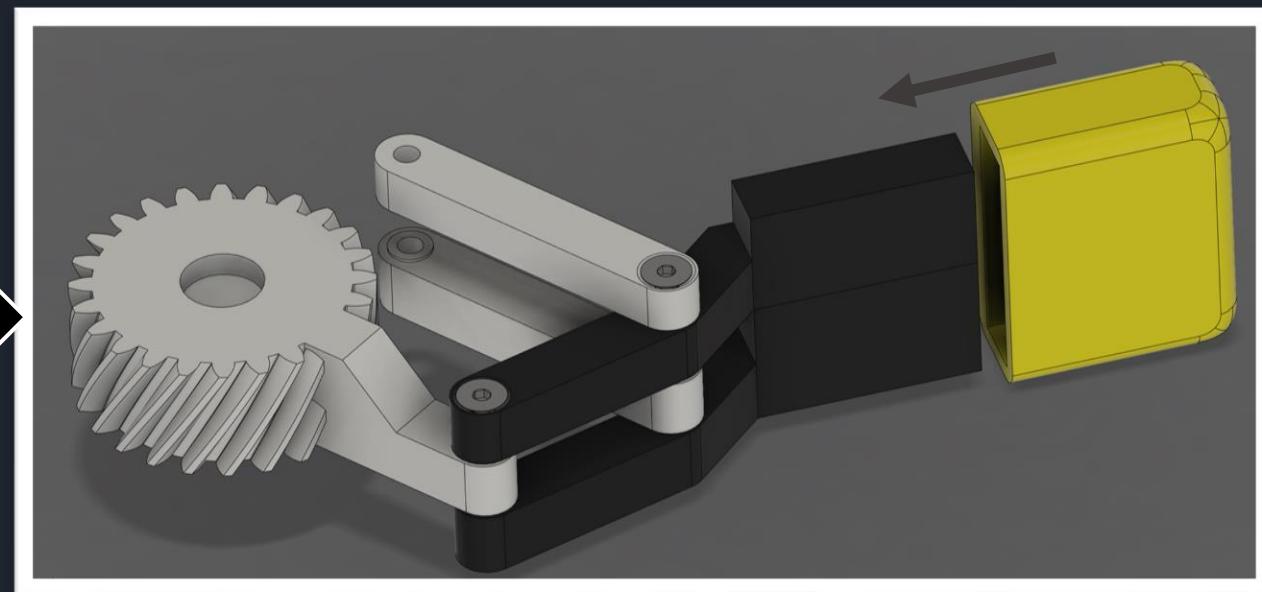
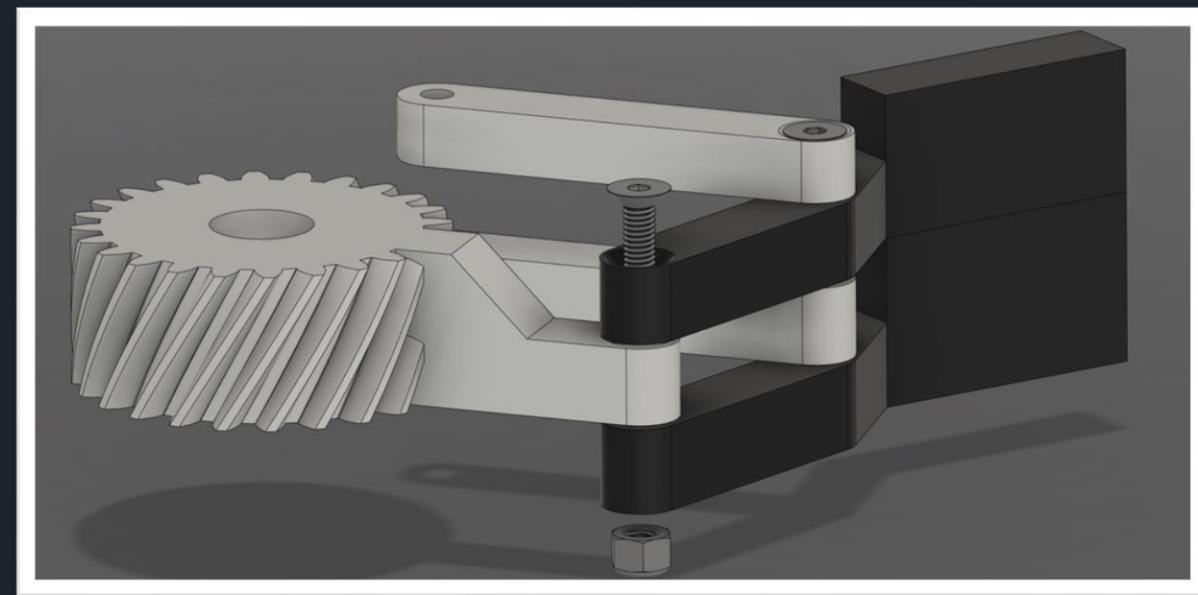


Tighten the screw
GENTLY - we will
adjust that later.

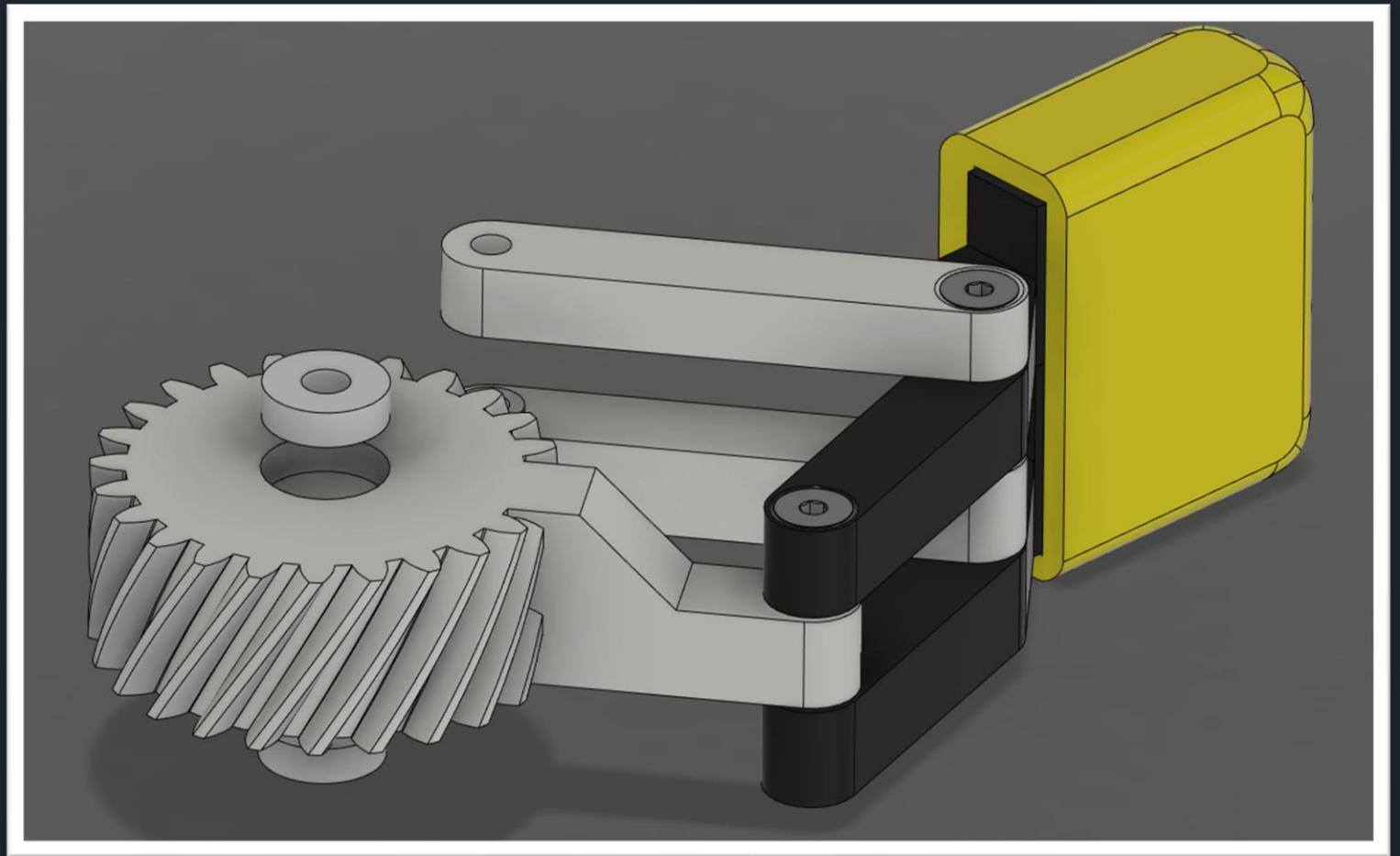


Take the **RightGear** and connect it with the rest of the arm with the M3x30mm Flathead screw and a nylock nut.

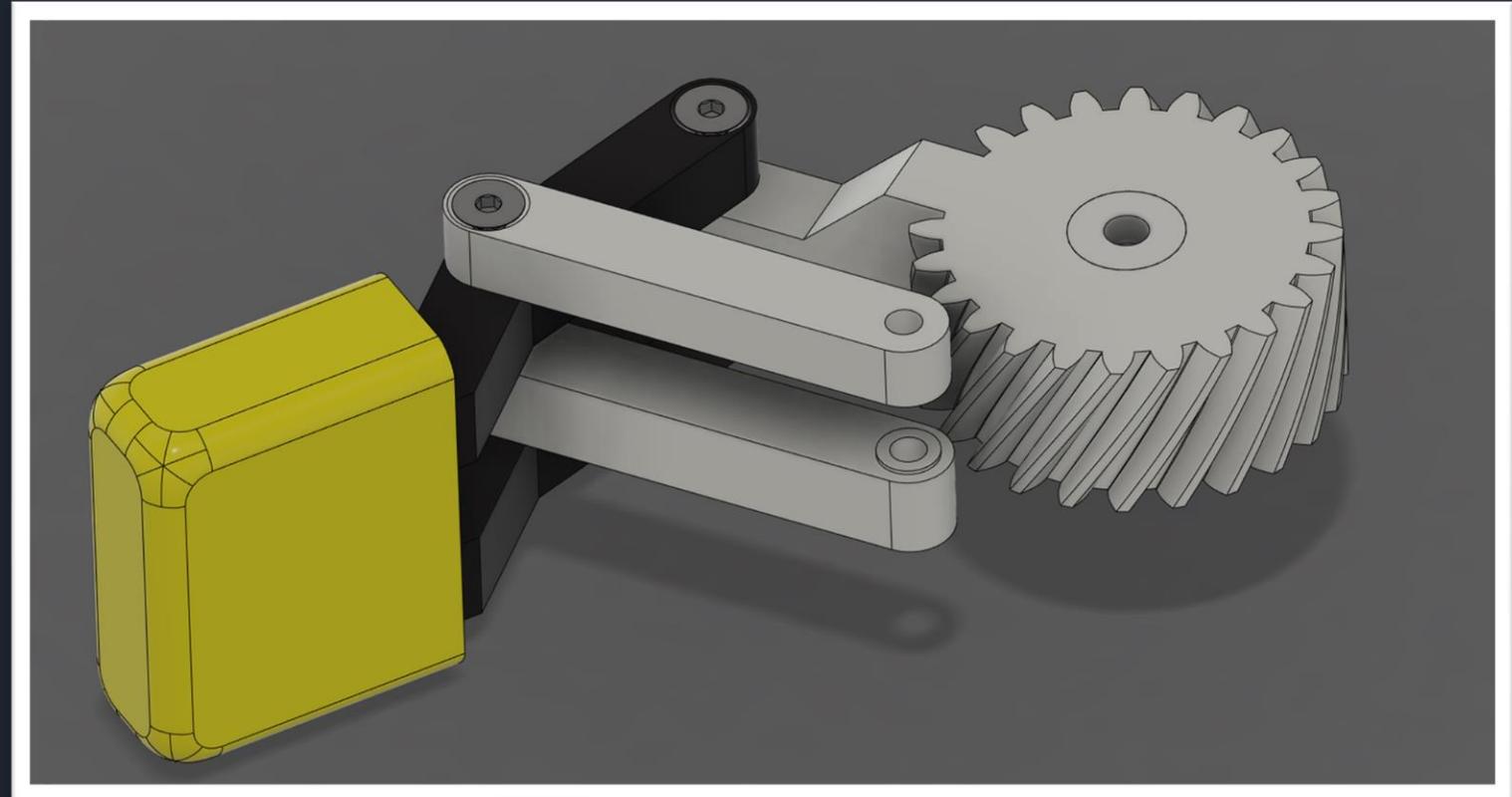
Put the **RubberSock** on



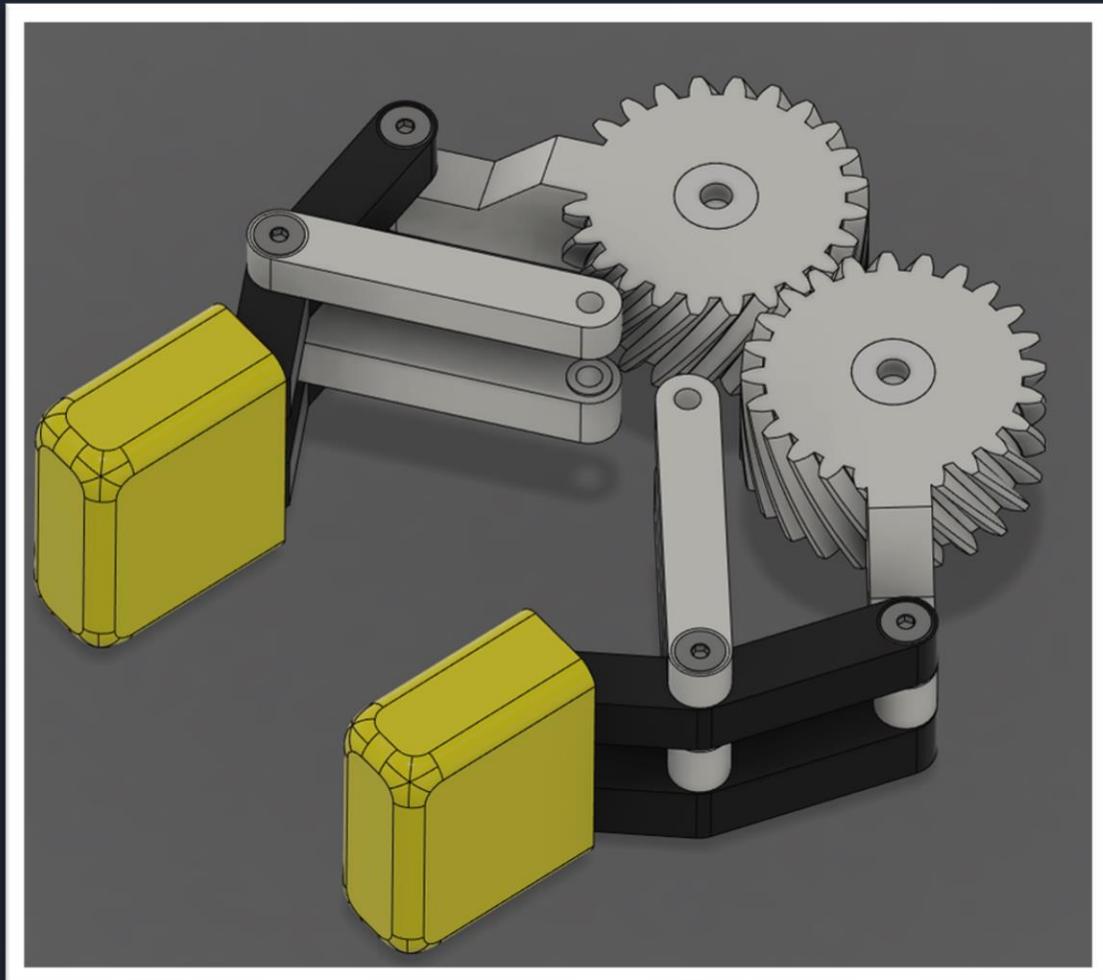
Insert 2 ball
bearings into the
dedicated slots.

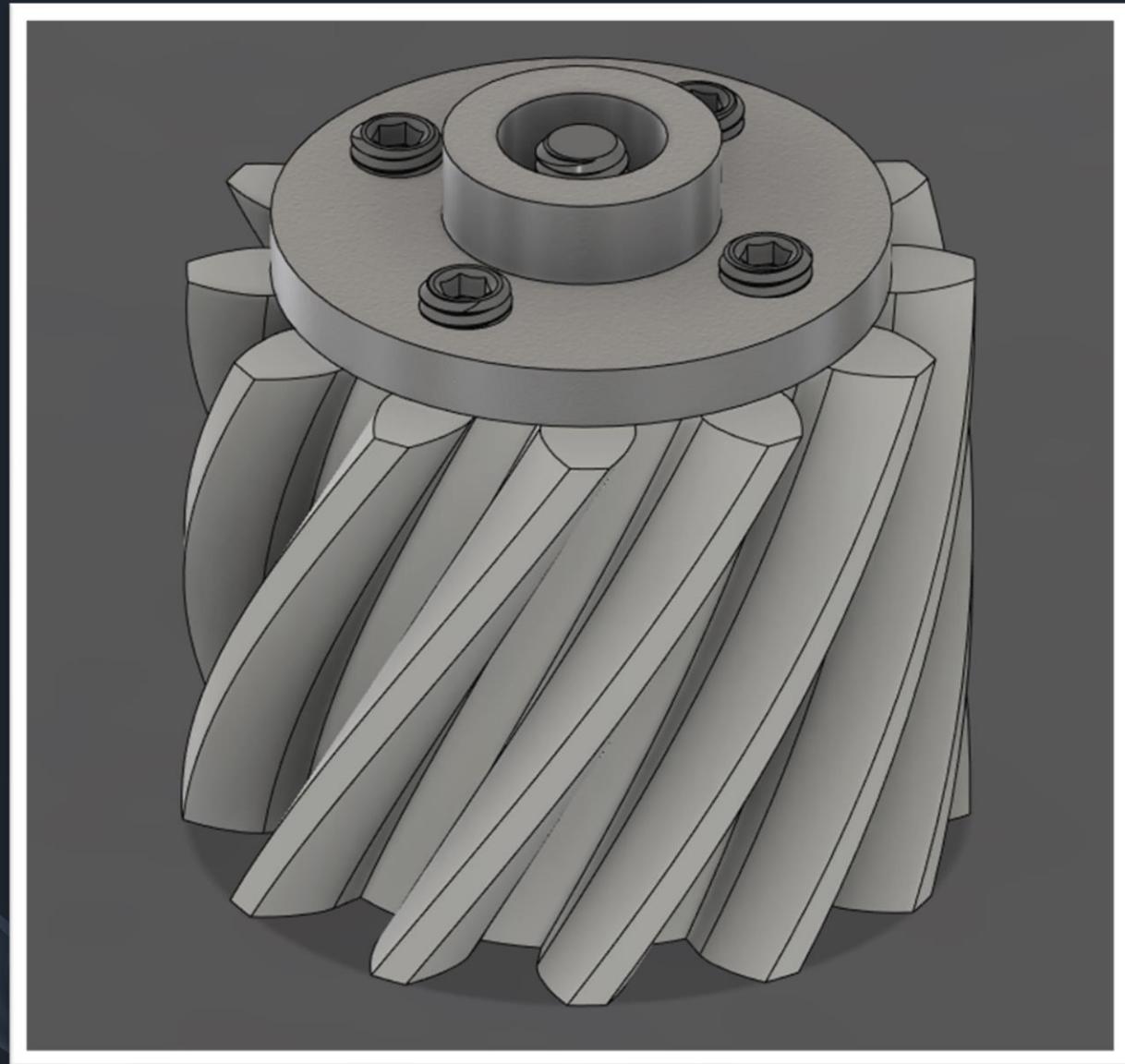


You are done with
that part, now do
the opposite one
on your own!



After this stage you
should have these
two parts





Next, we will prepare servo gear.
For this step you will need:

Aluminium servo horn

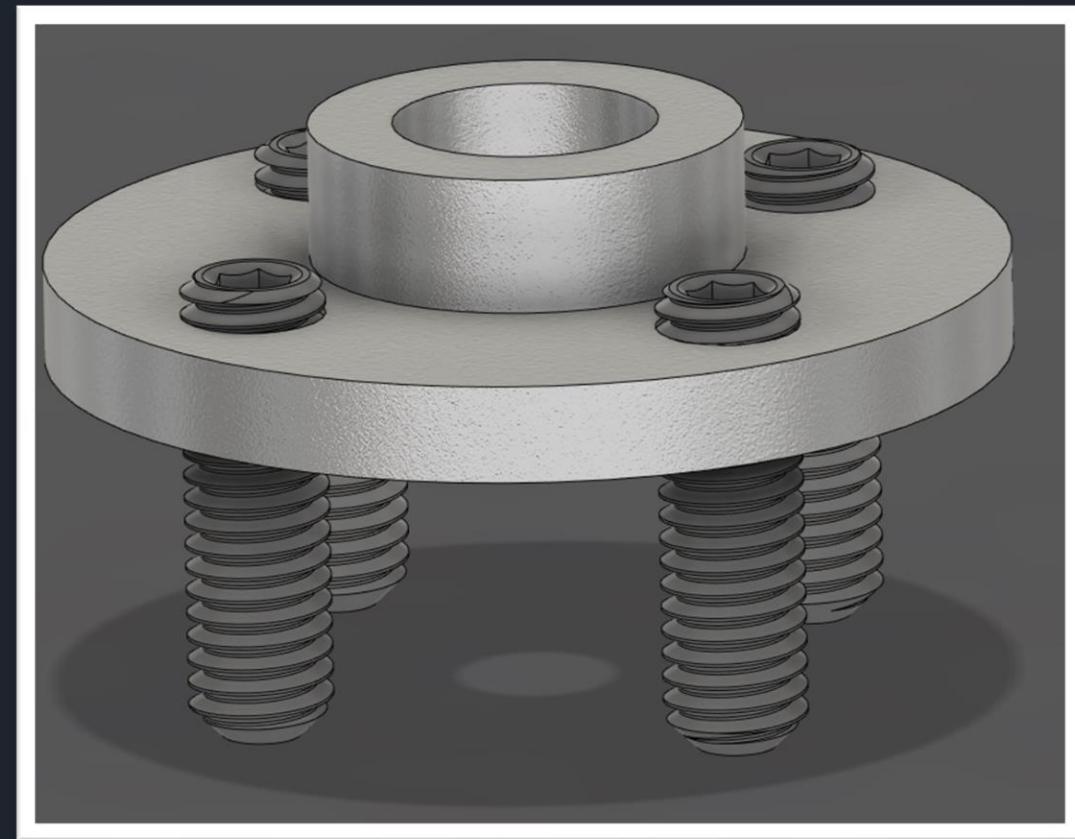
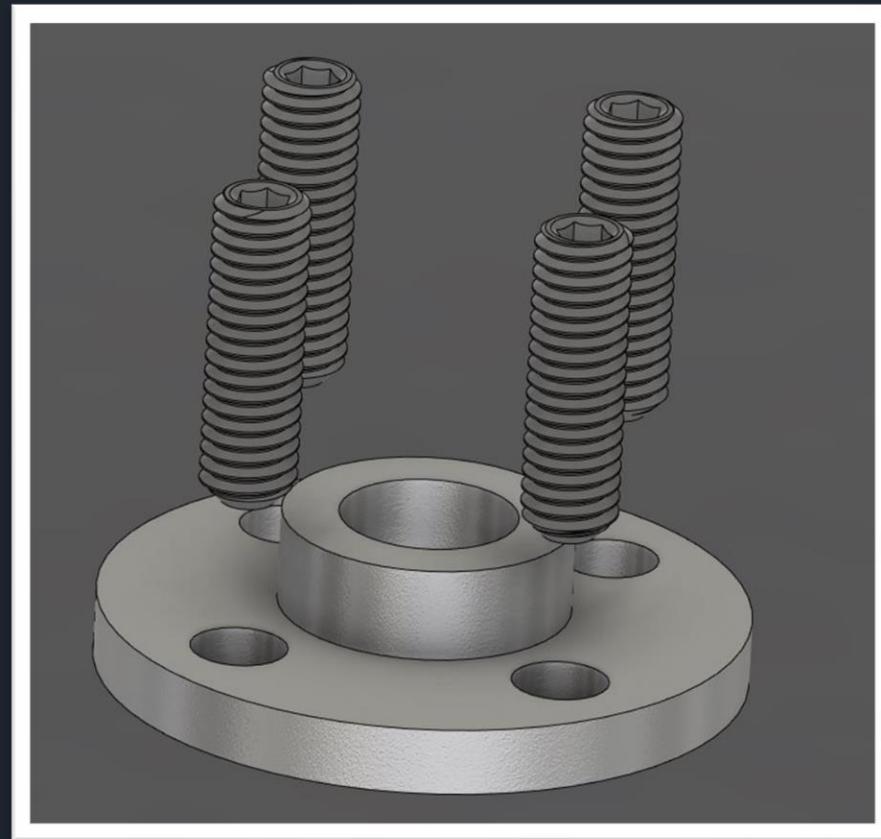
M3x10mm Headless
screw x4

M3x8mm Flathead
screw

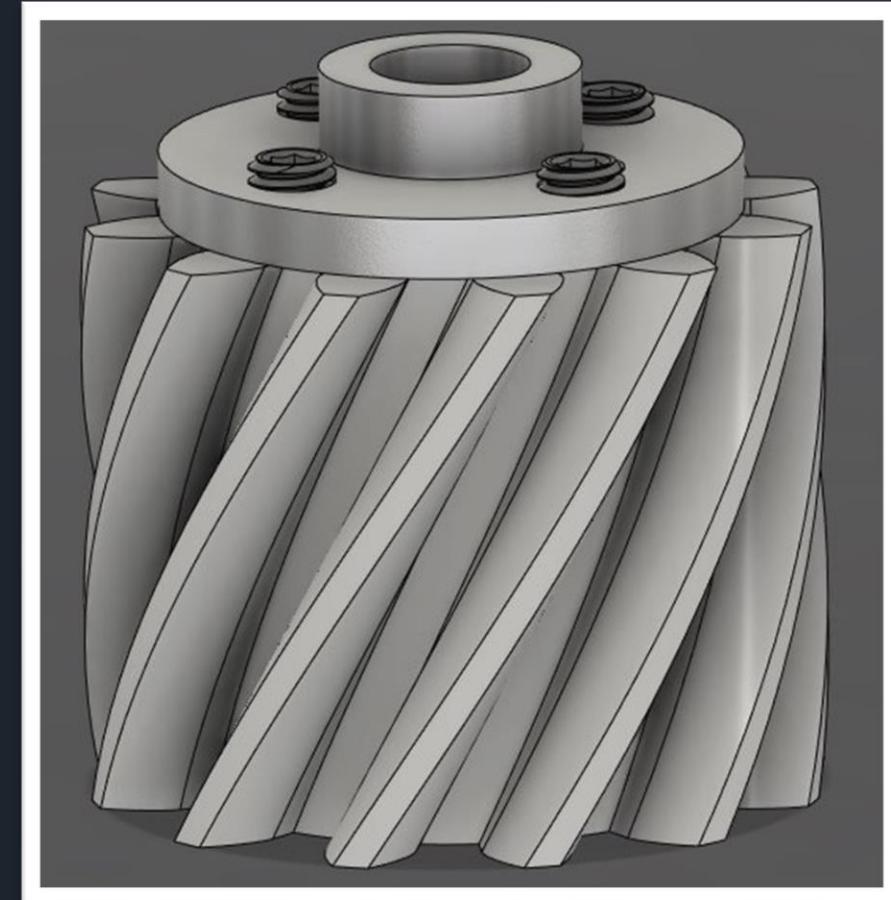
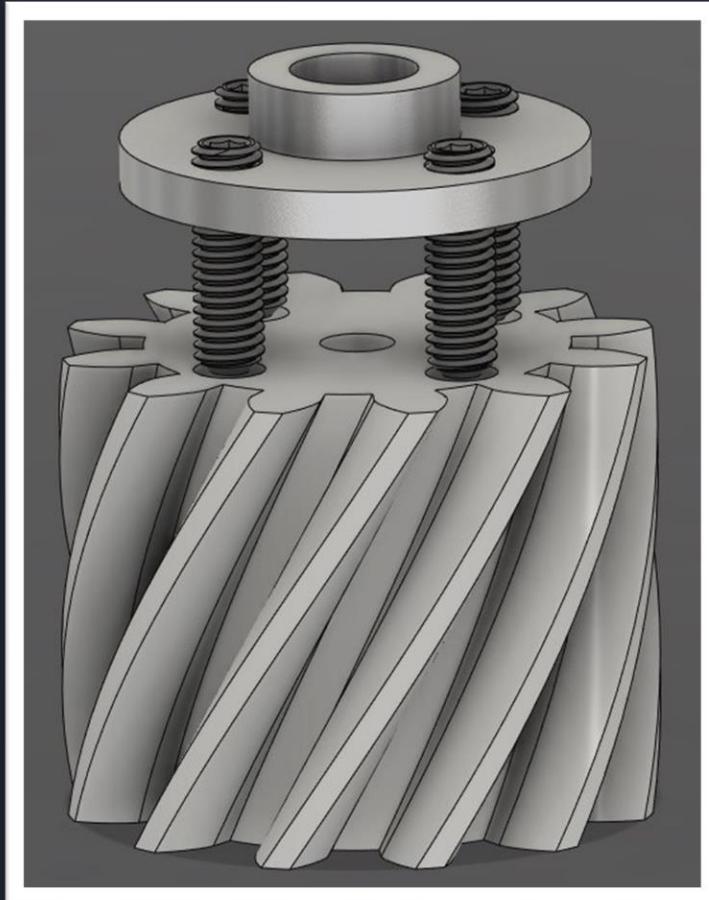
ServoGear

Ball-bearing
5x13x4mm

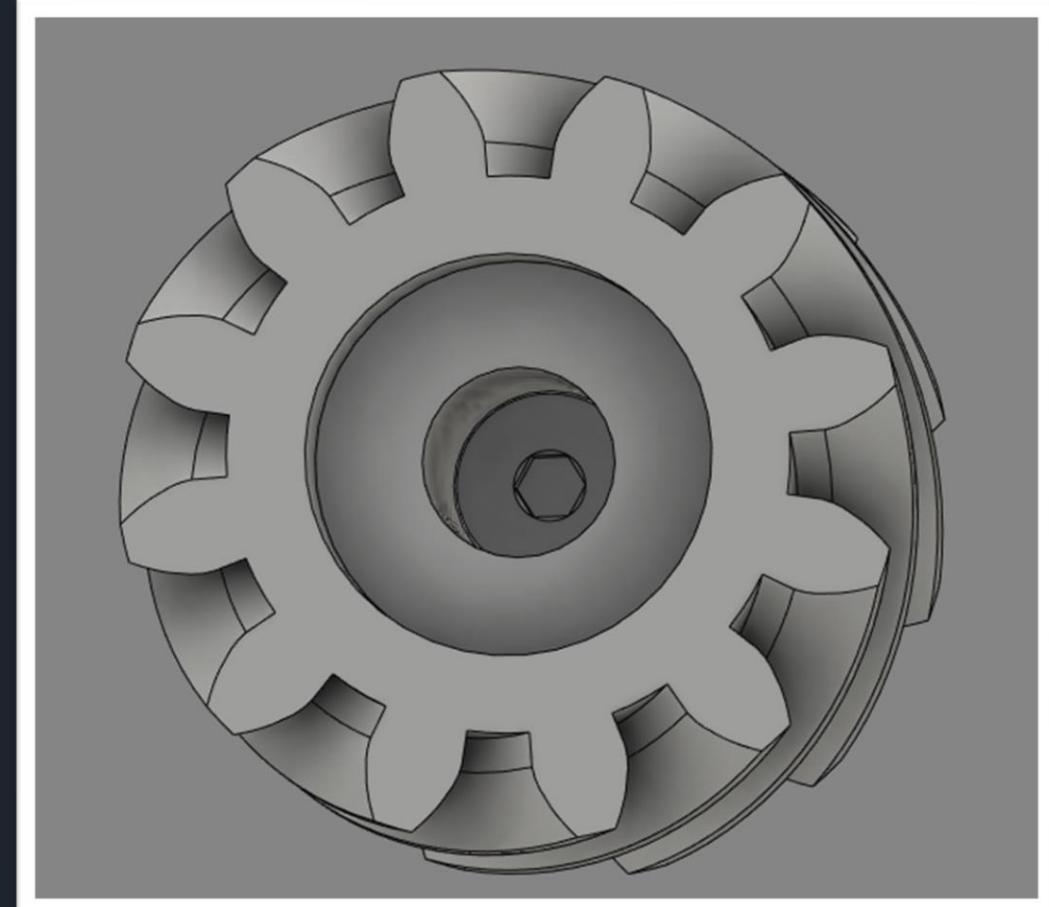
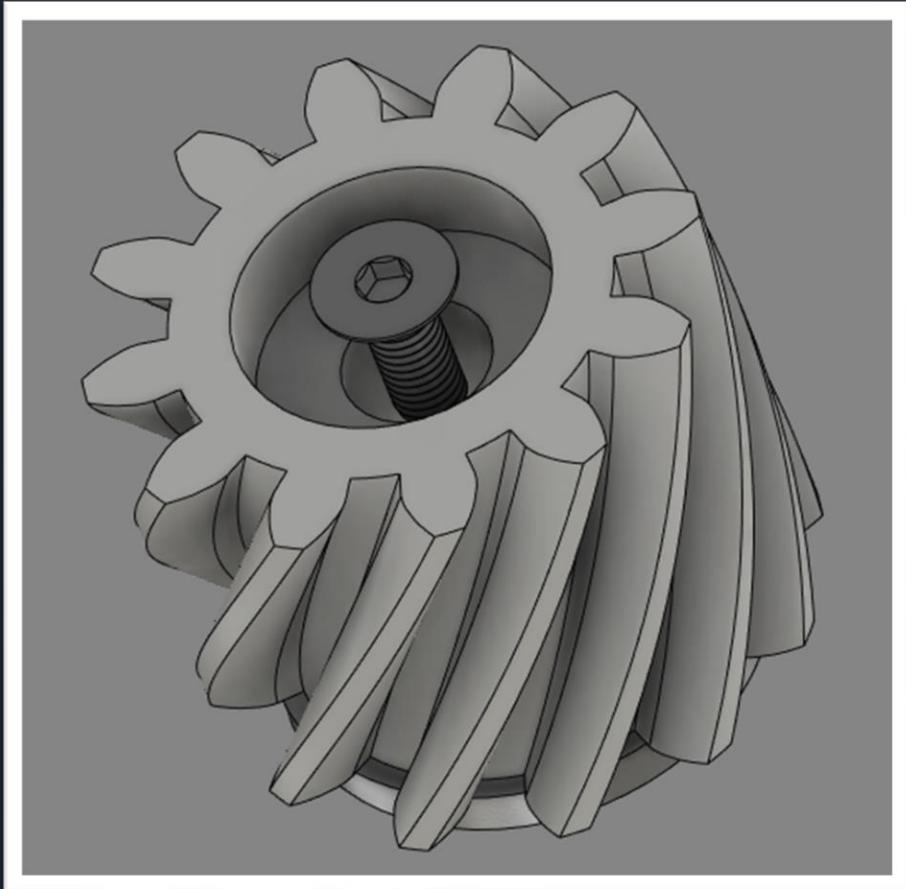
Start with screwing headless screws as shown
in the pictures below.



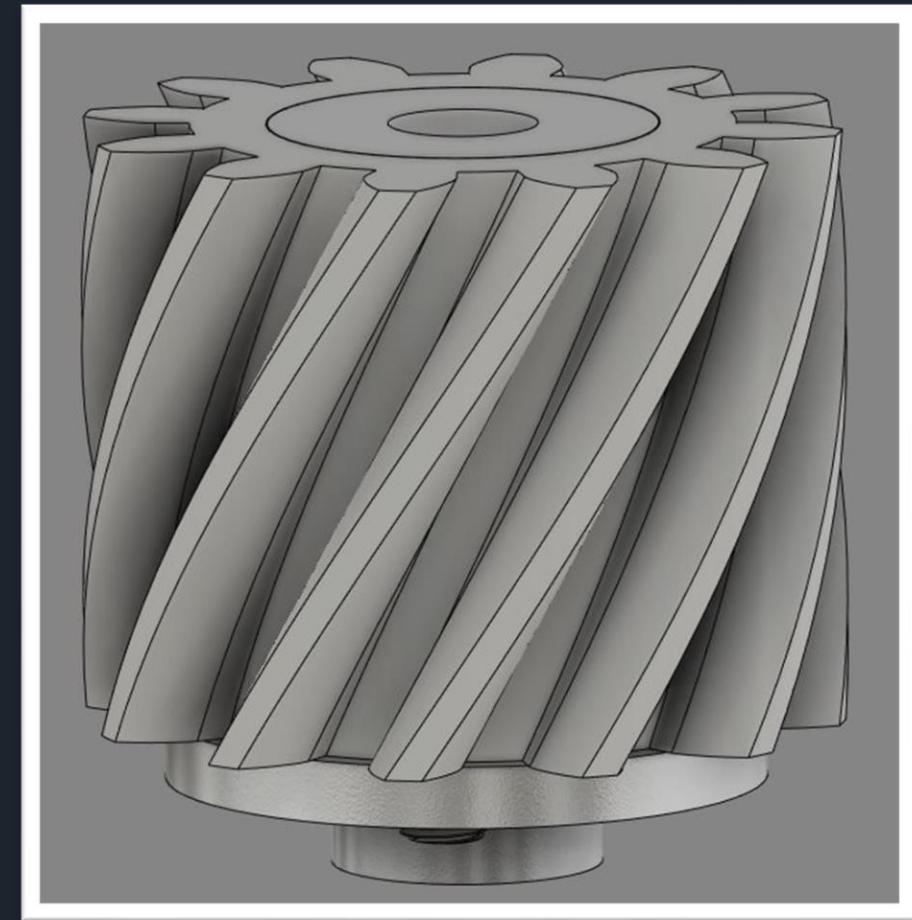
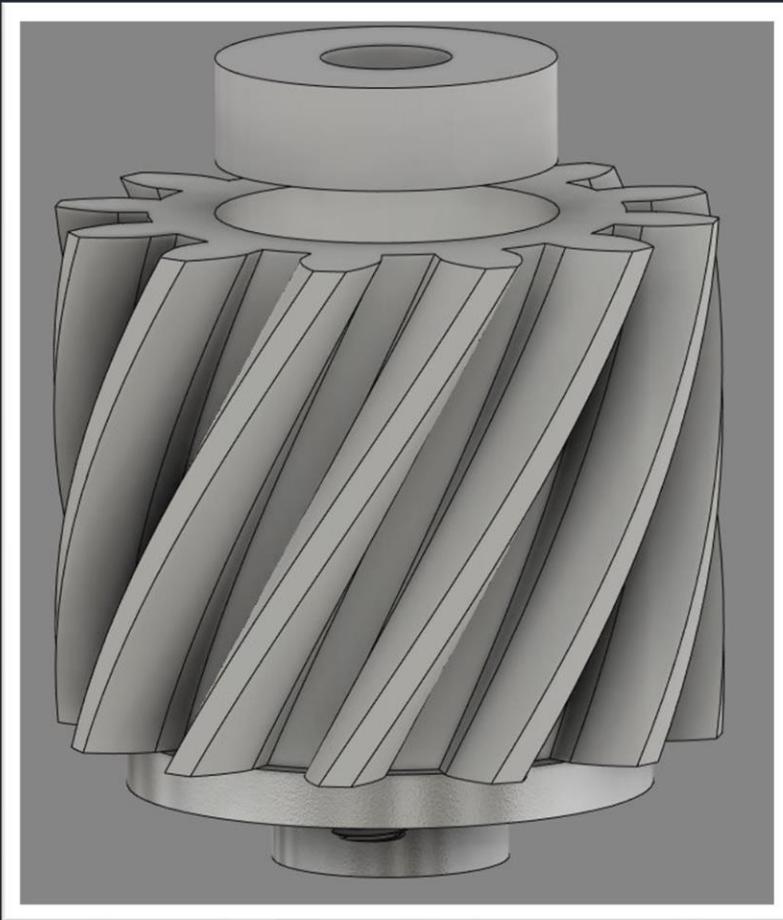
Take previous part and put it on top of the
ServoGear, then push to connect both parts.

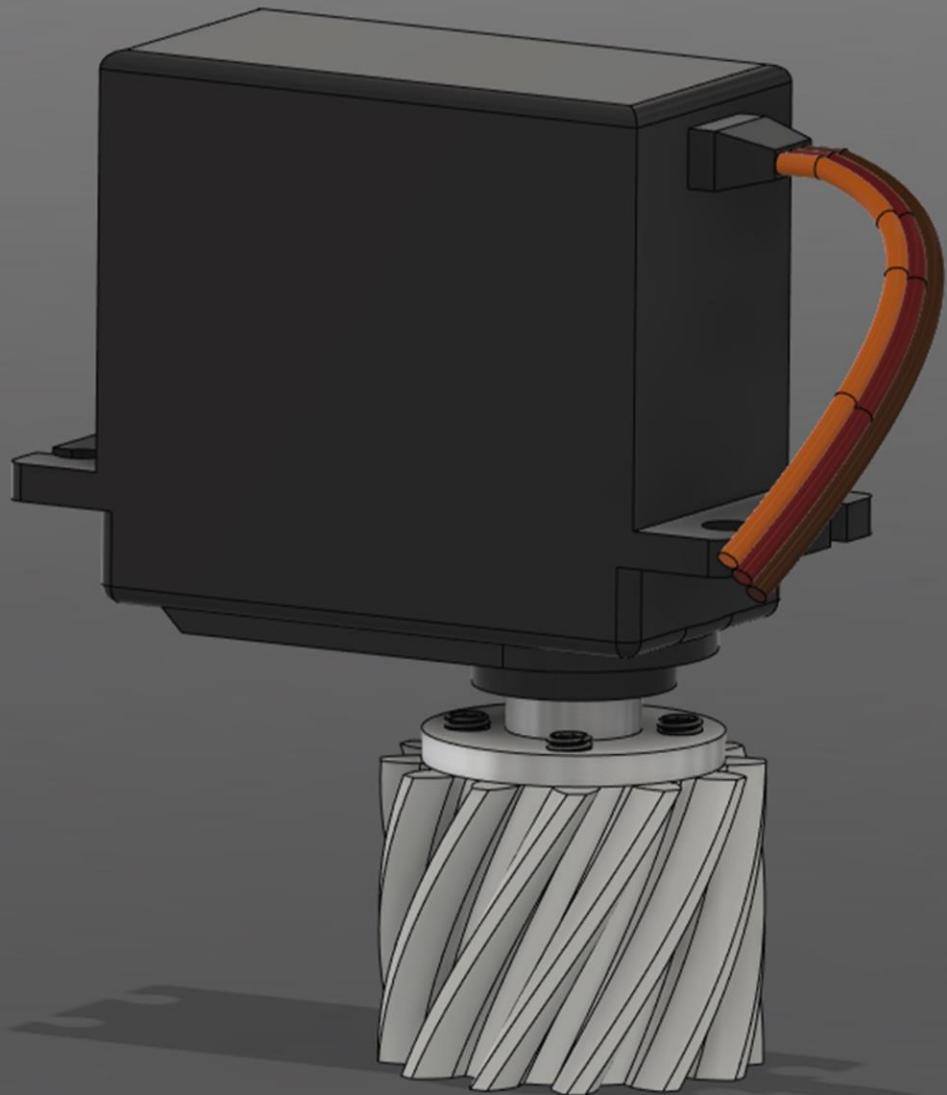


Rotate the part and put M3x8mm Flathead screw in the hole, you may help it with a little push ;)



Finally, insert the ball bearing into the dedicated hole.



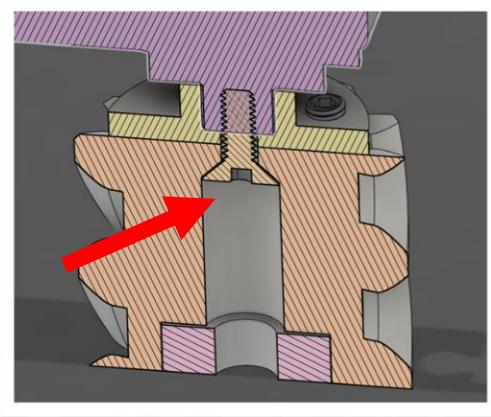
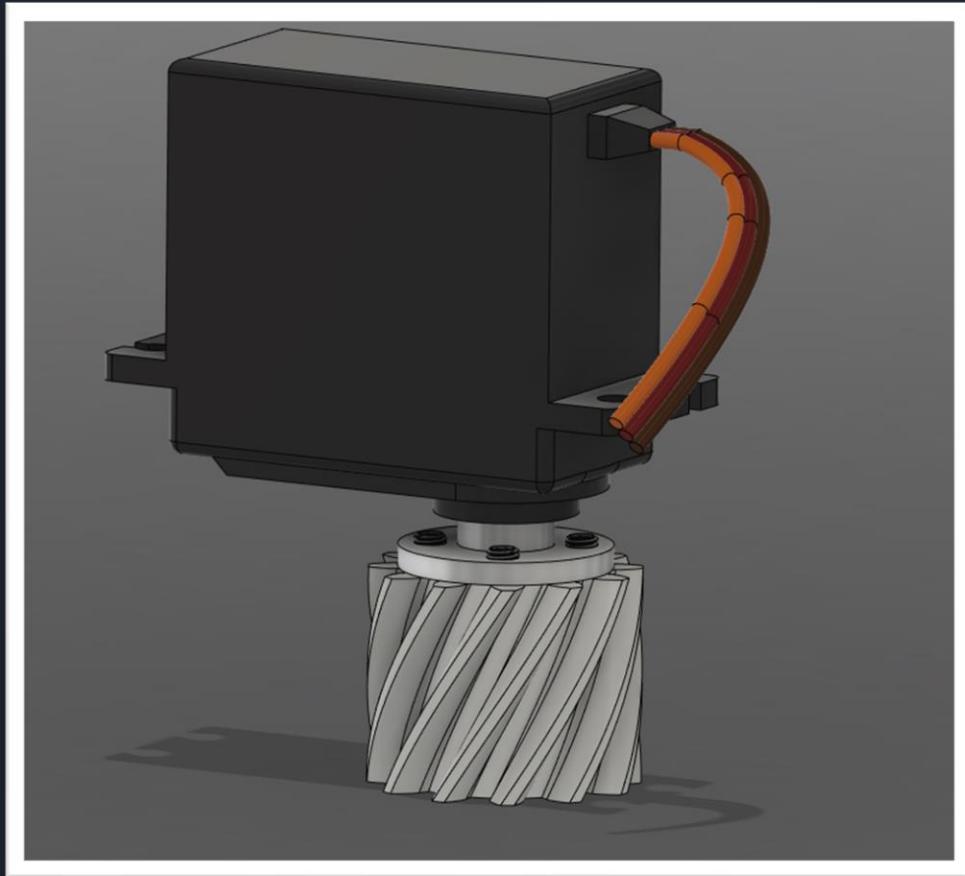
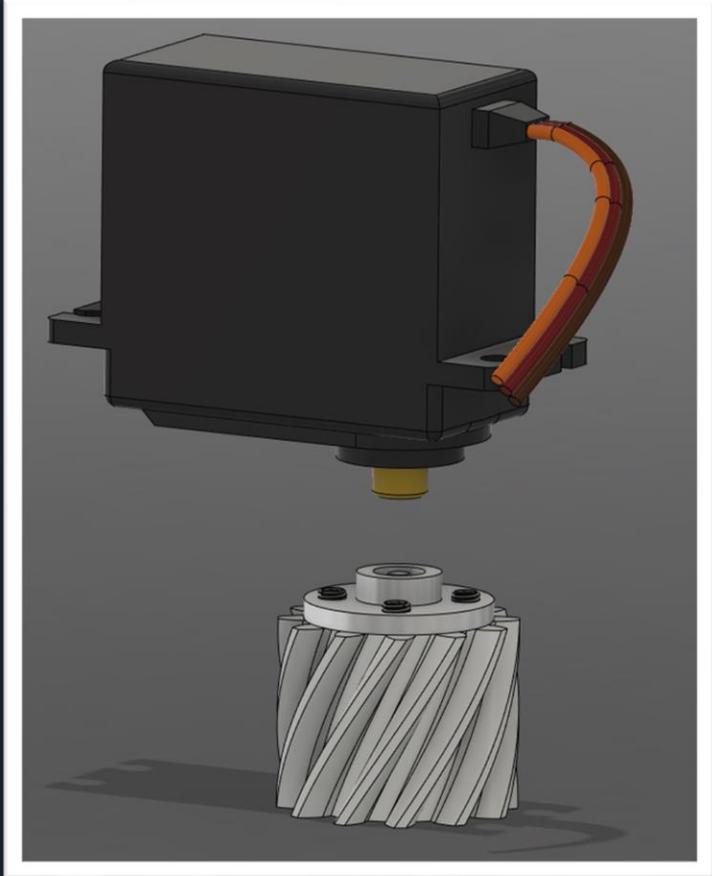


Probably the shortest step in this guide. You will need:

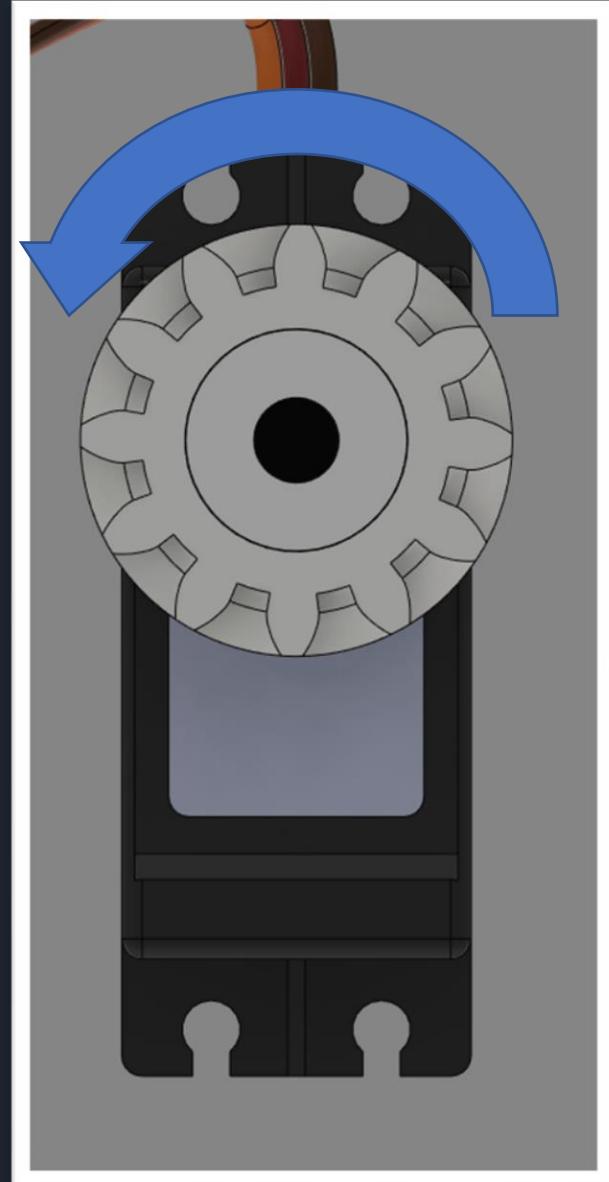
LF20-MG Servo

Previously
assembled servo
gear

Press a servo gear onto a servo shaft and tighten the screw inside.



Before using this part in the next steps - make sure your servomechanism is fully rotated counter clockwise. I suggest to use dedicated PCB(more info at project page: <https://github.com/Evroc/Robotic-gripper>), any servo controller, or simply create your own with Arduino/Rpi.



In the next steps we will nearly finish the assembly, prepare:

Spacer

Mid

Bottom

M4x45mm Flathead screw x3

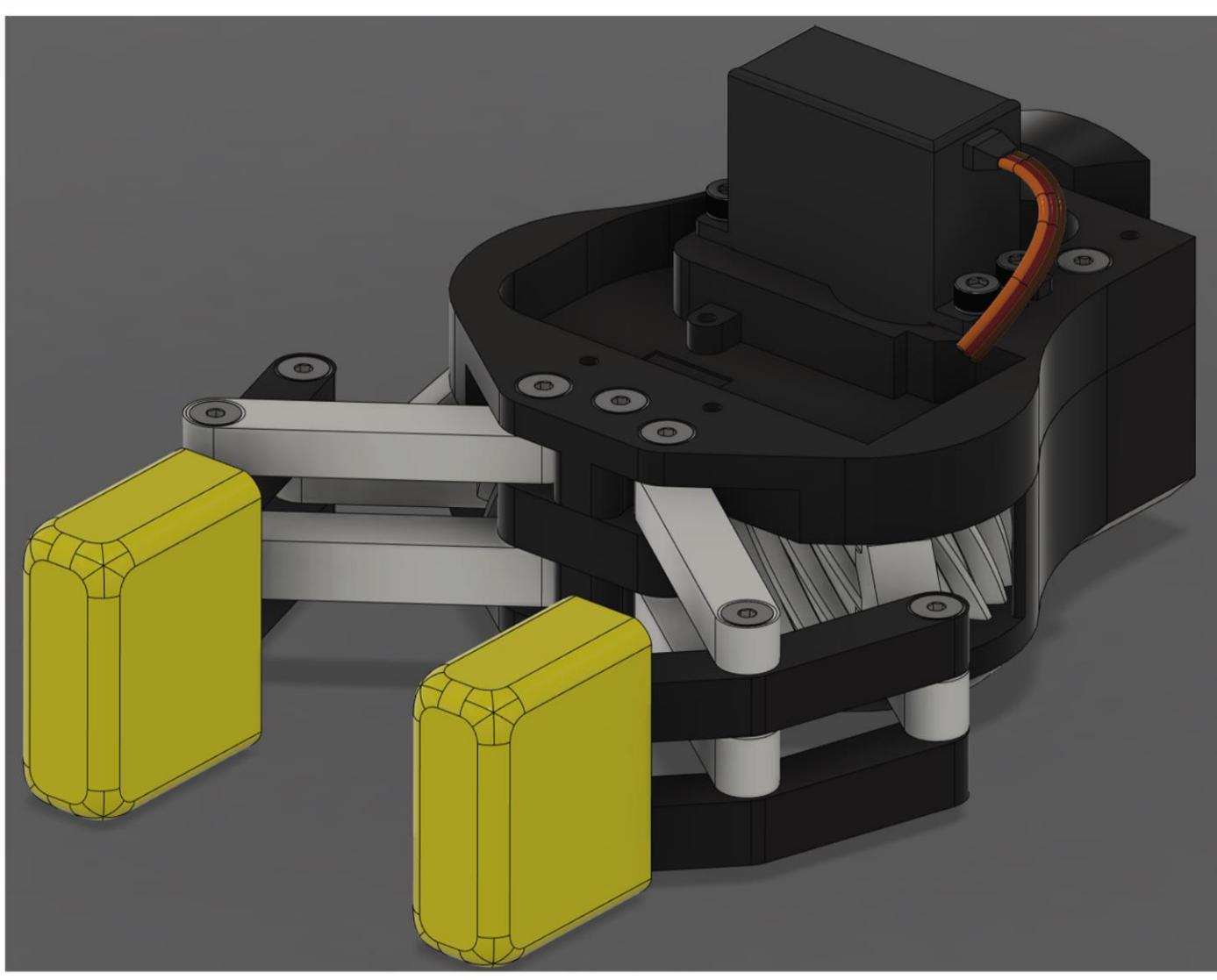
M4x35mm Flathead screw x2

M4x8mm Socket Cap screw x4

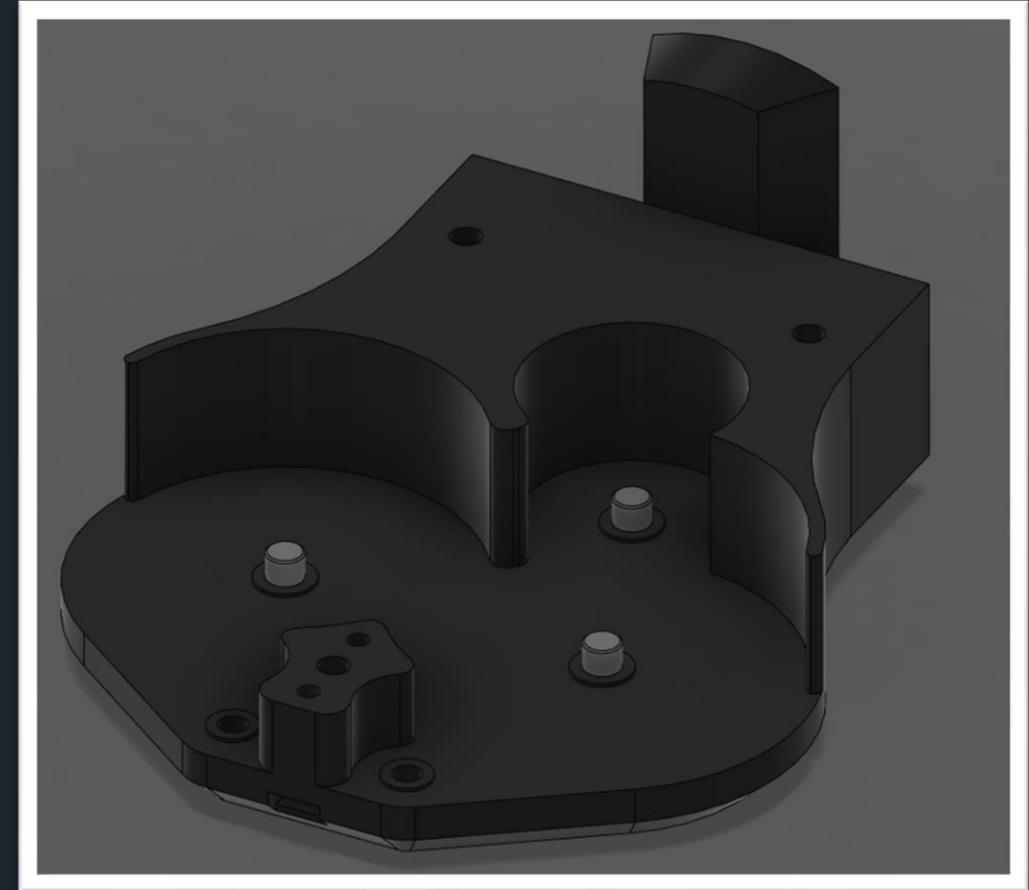
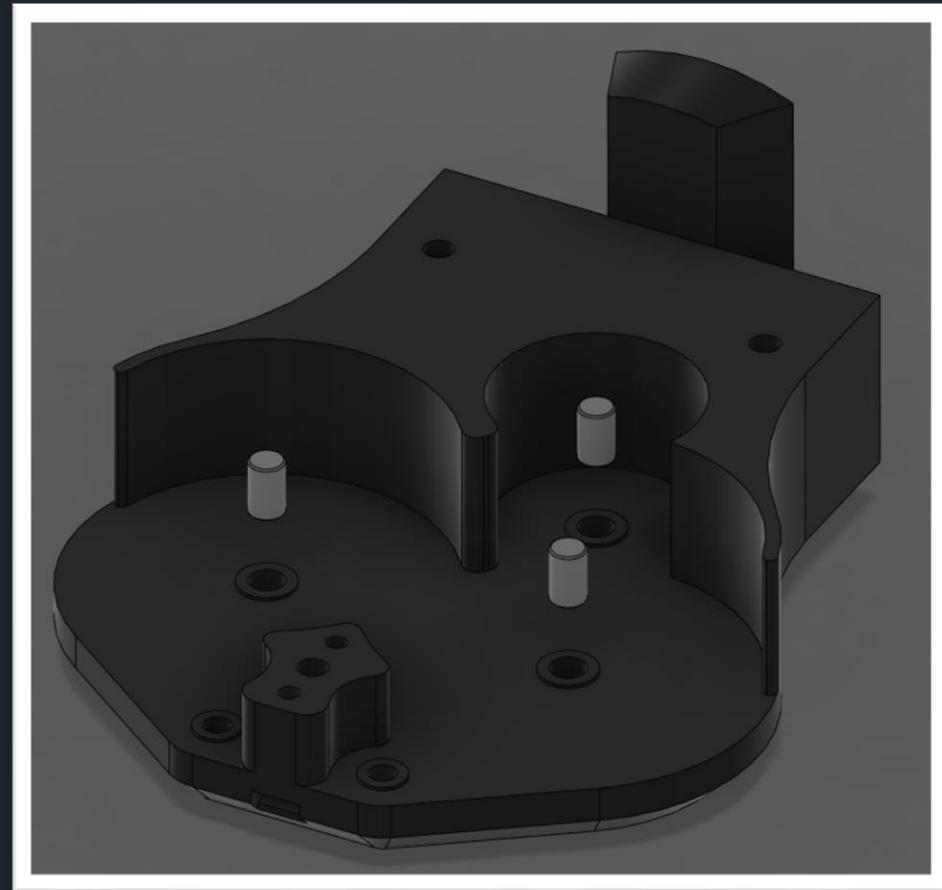
M4 square nut x3

Cylindrical roller x4

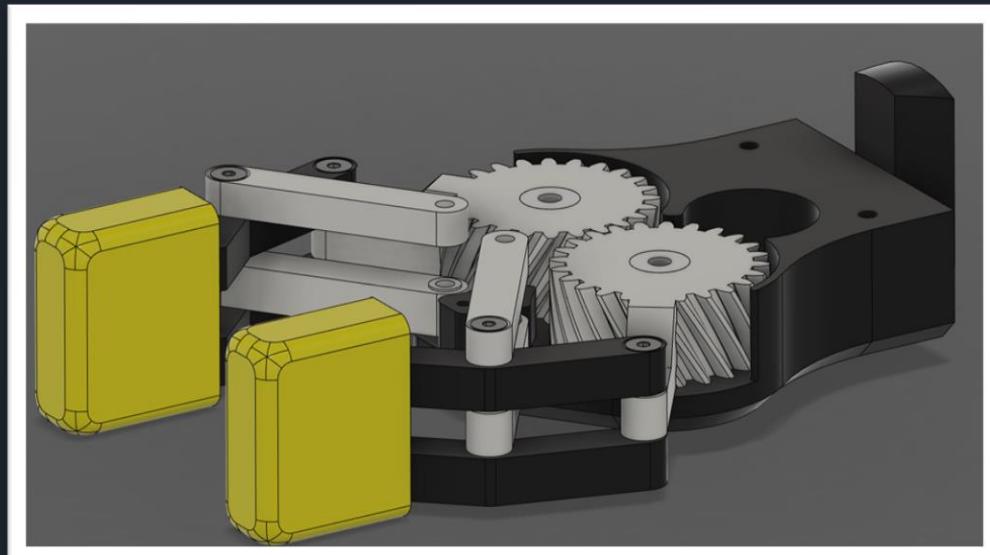
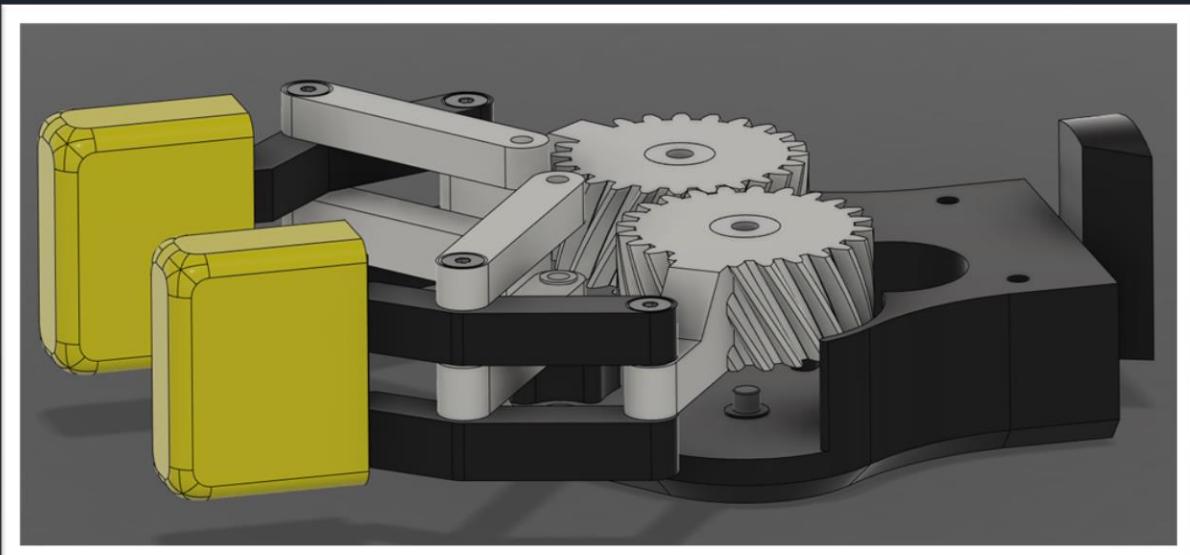
All previously assembled parts



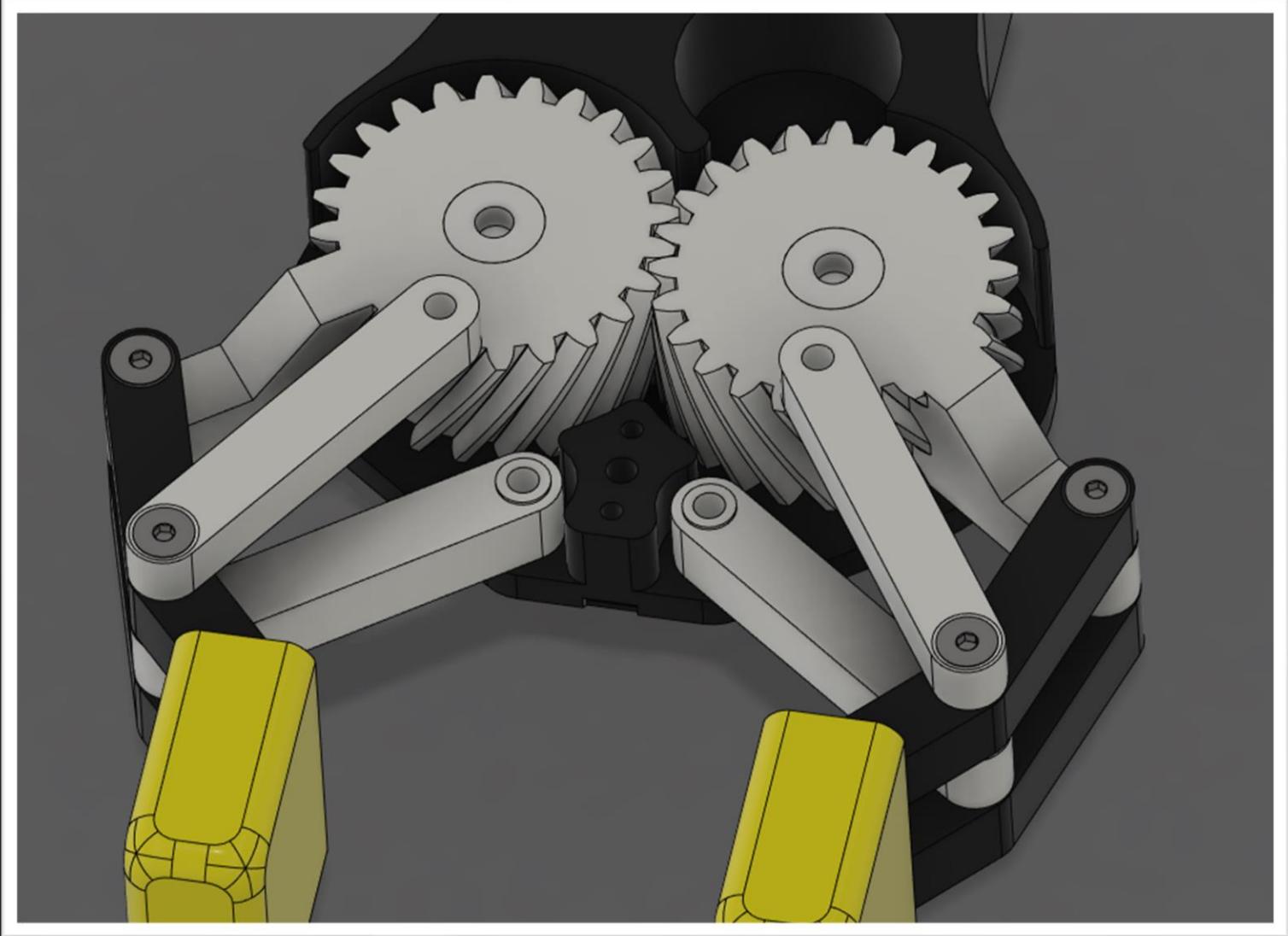
Take the **Bottom** part and 3x Cylindrical rollers. Insert them as shown in the picture (if you encounter problems - use a hammer).



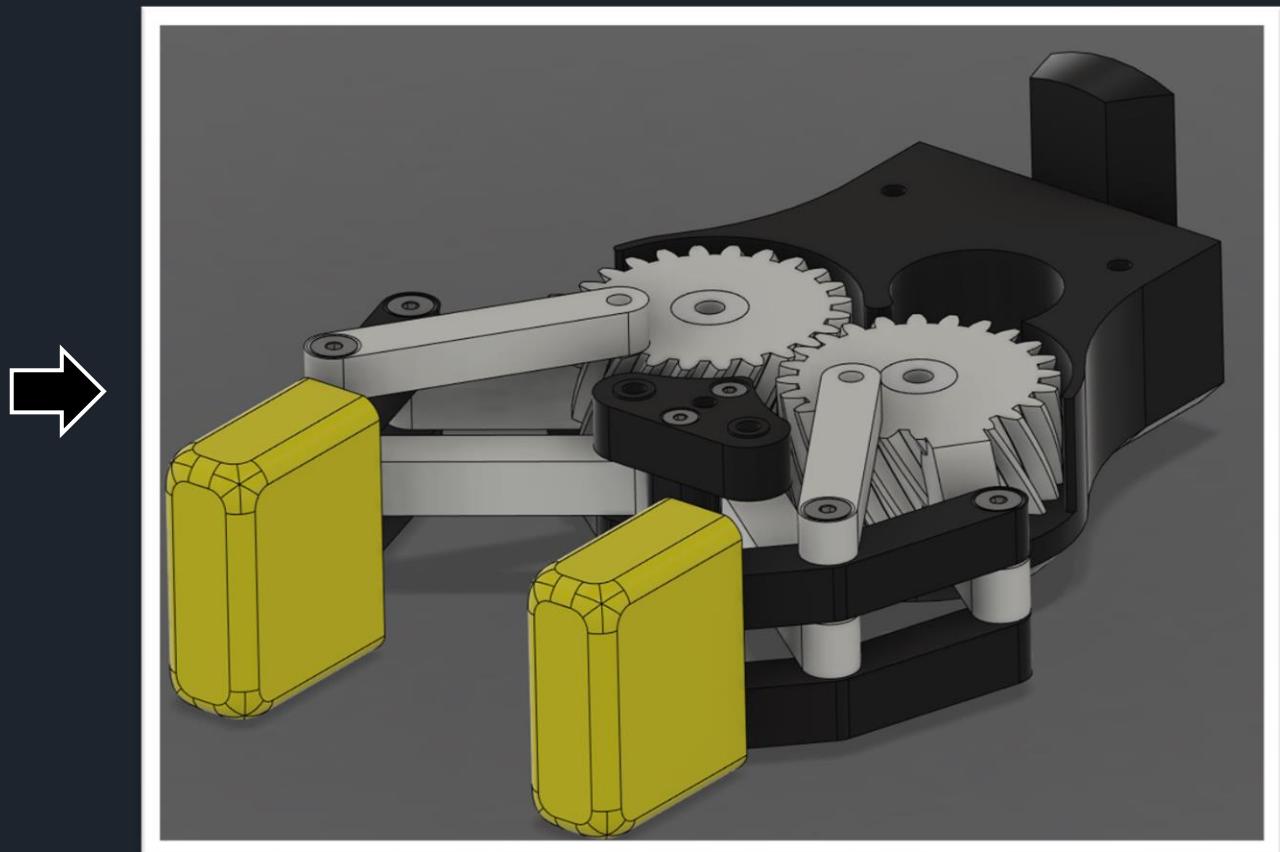
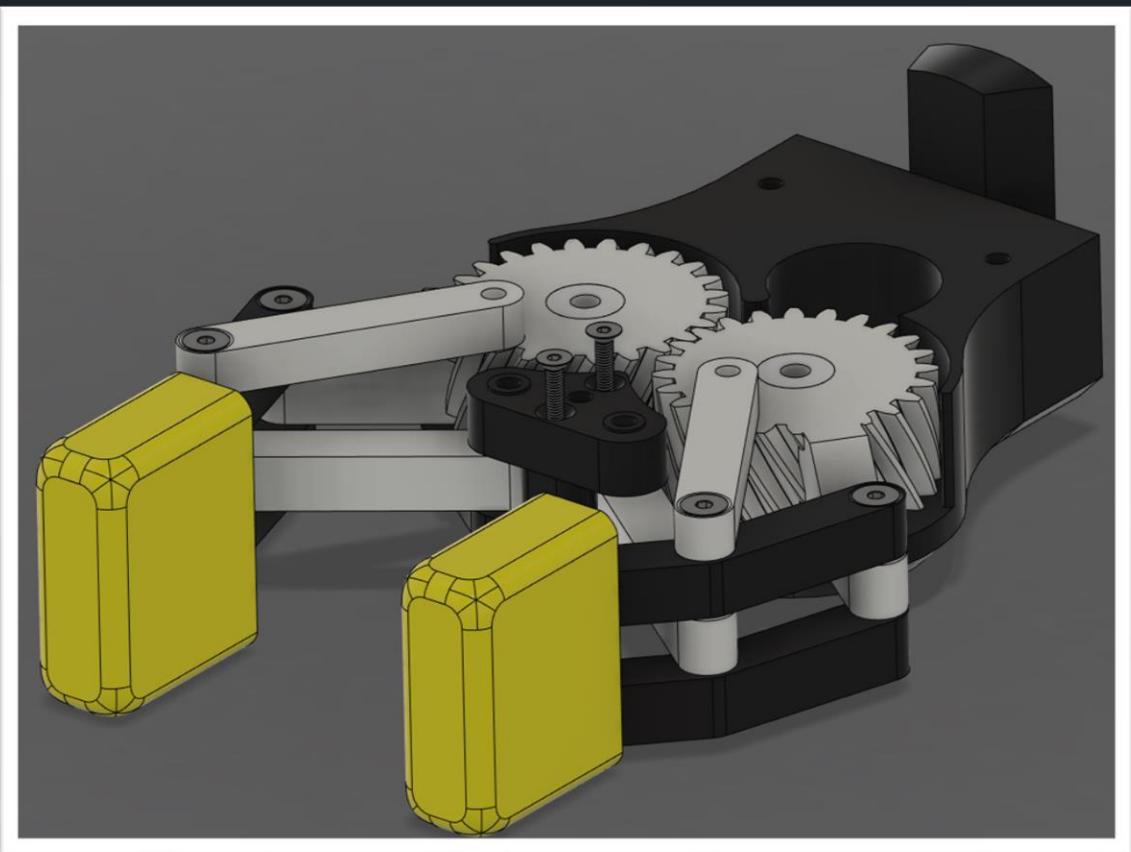
Take the gripper arms we created at the start of our guide. Now be careful - first connect the gears, in a way its outputs are symmetrical (its super important!), then gently put it onto the cylindrical rollers. Try to press both sides simultaneously with your thumbs until it slips to the end of the roller. Proceed to the next step :)



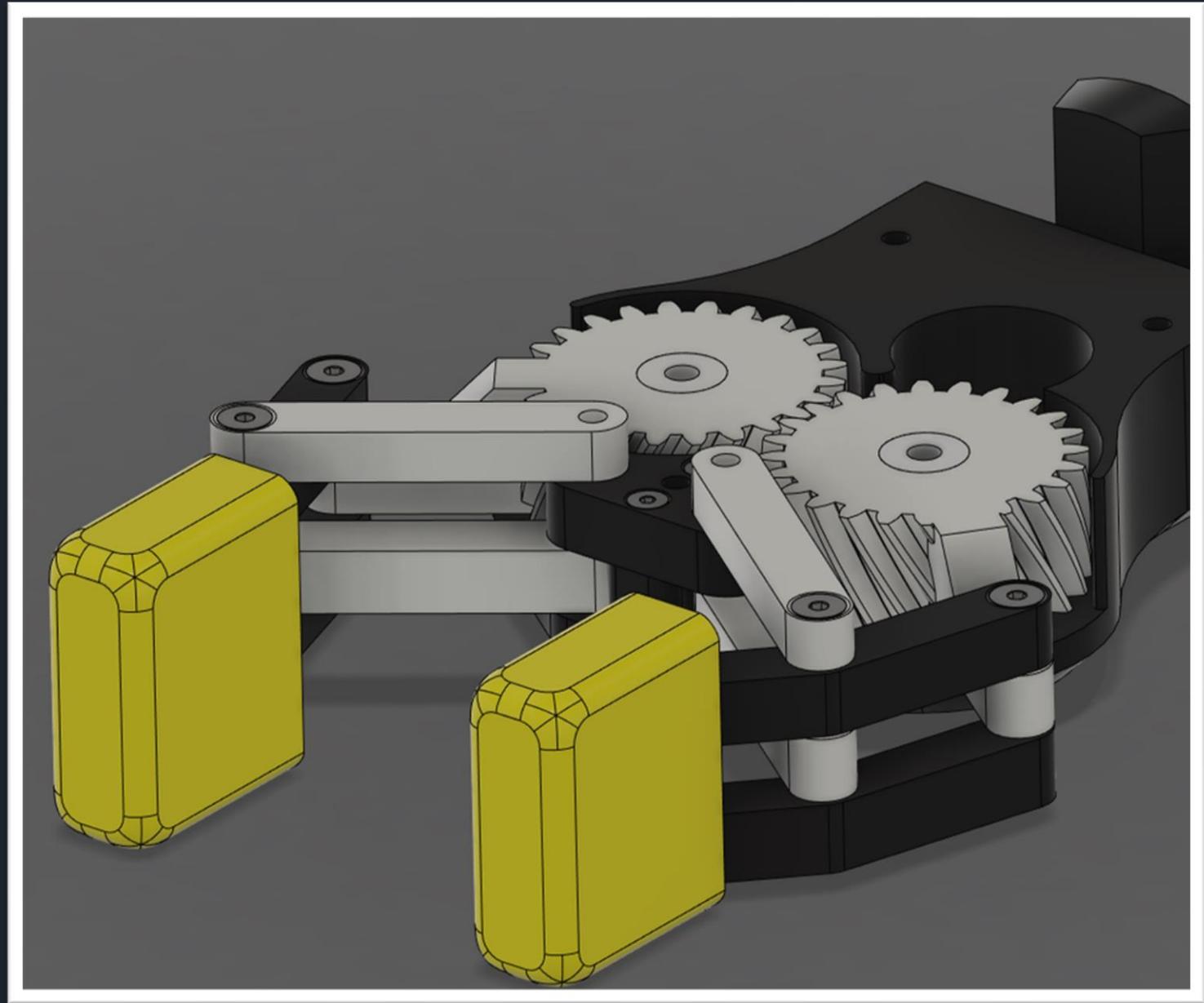
Move top sticks
aside to prepare
some space for the
next part.



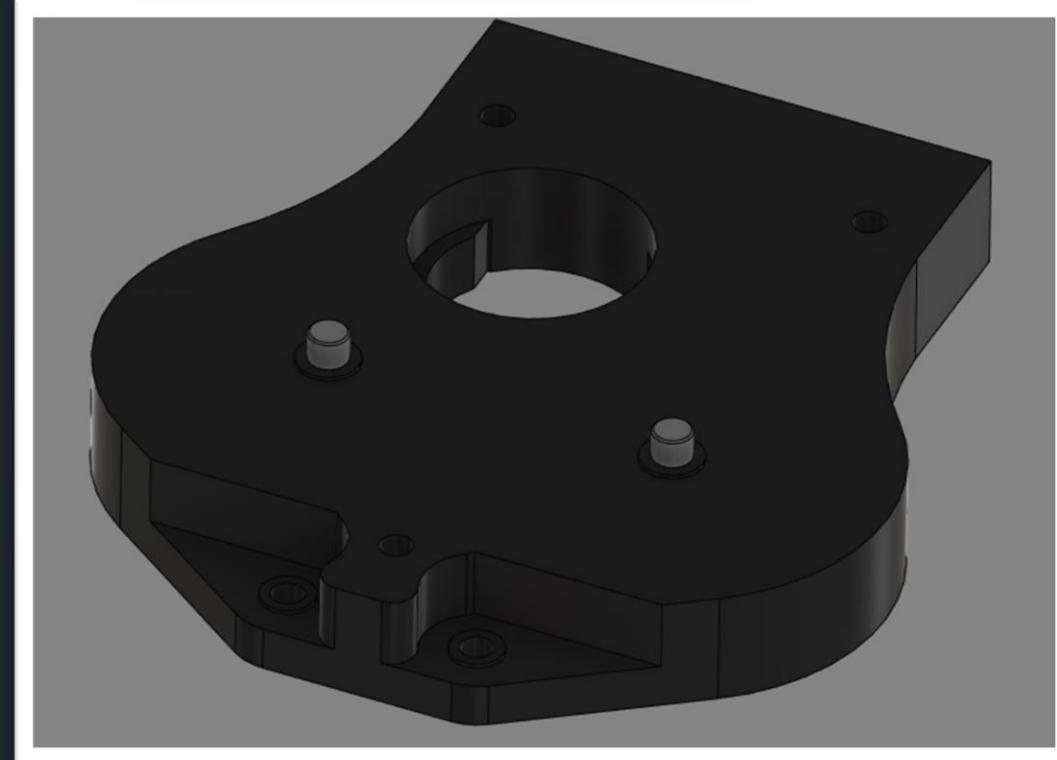
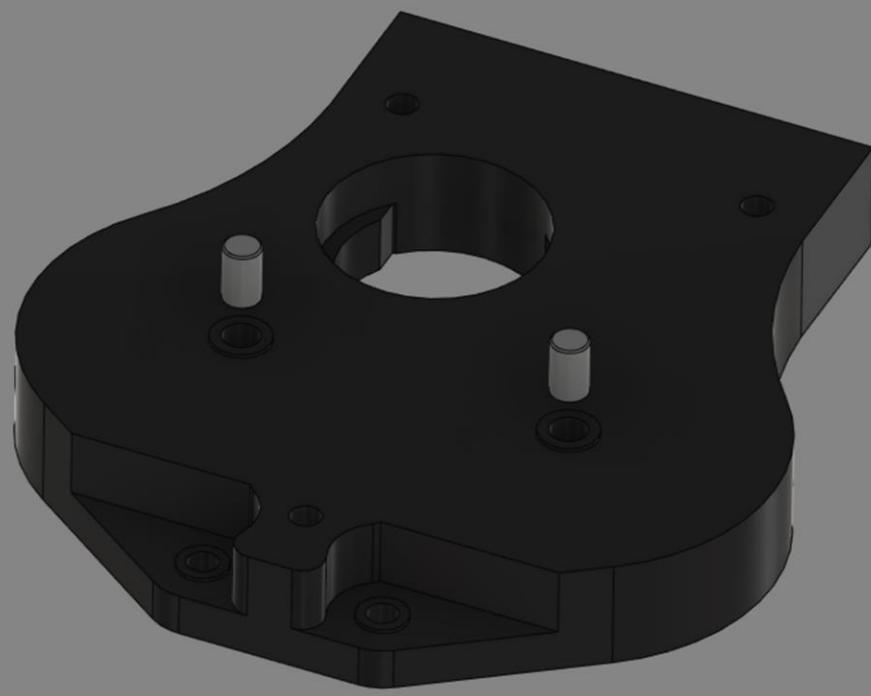
Put the **Spacer** in its place and screw it with M3x16mm Flathead screws. Be gentle, don't overtighten it, it's just a spacer!



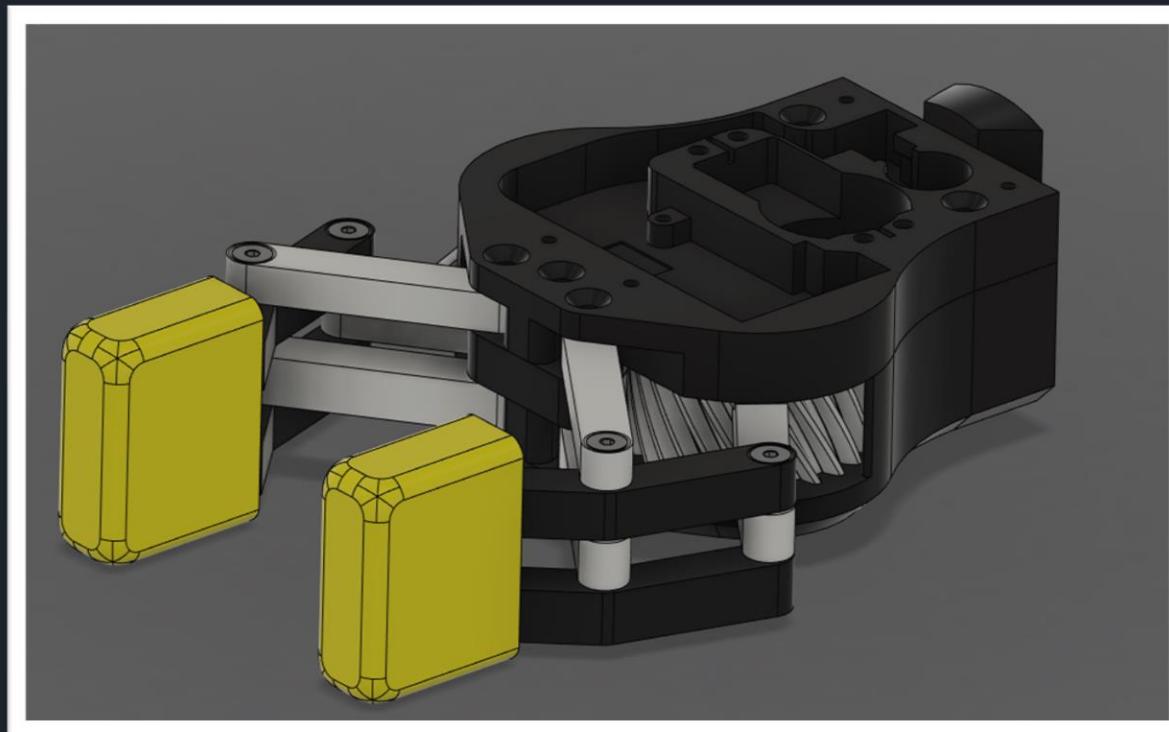
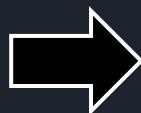
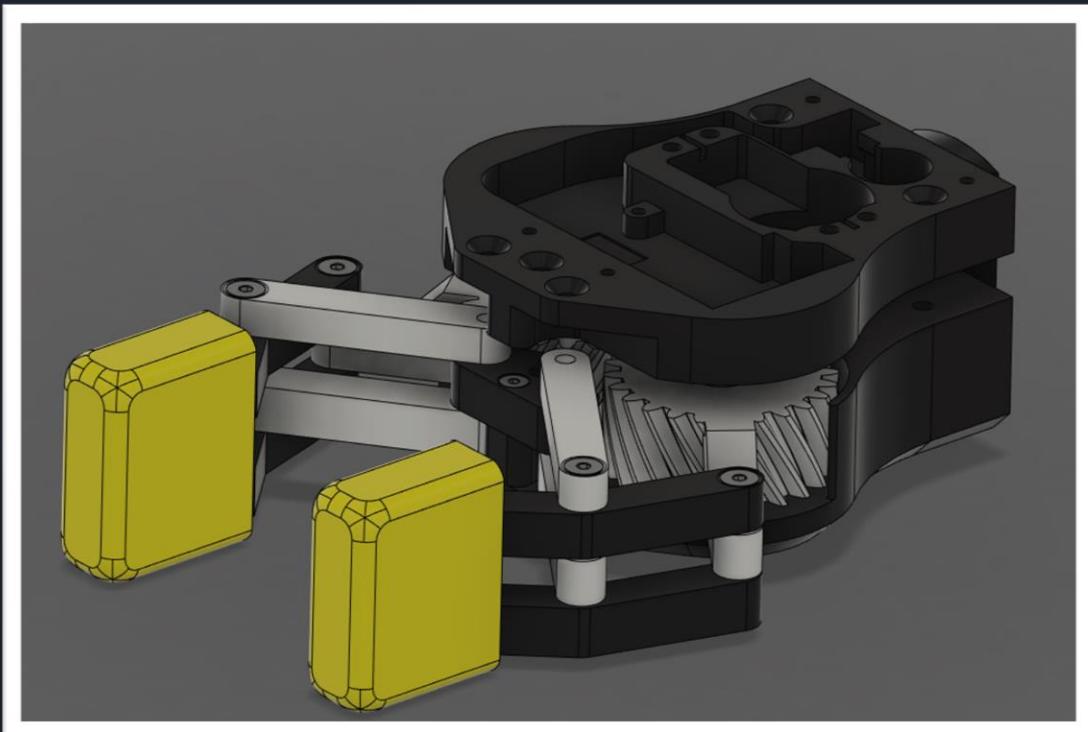
Move the sticks to
the correct position.



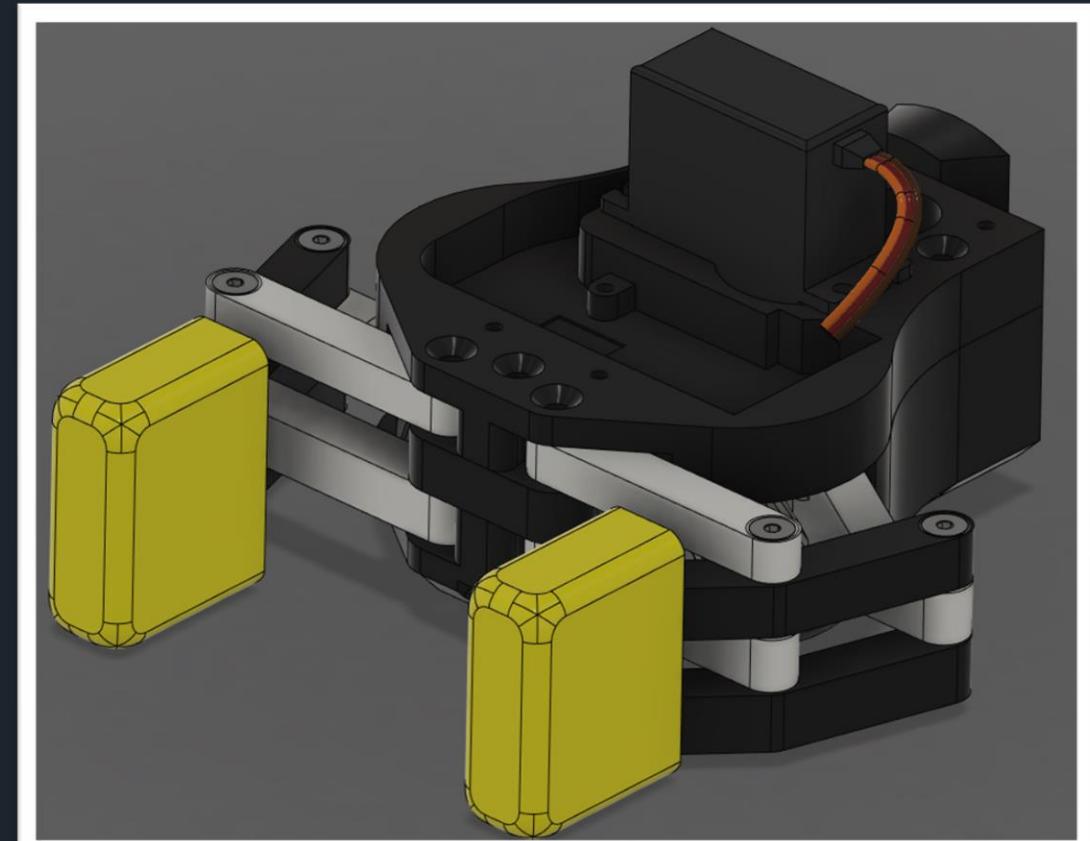
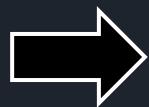
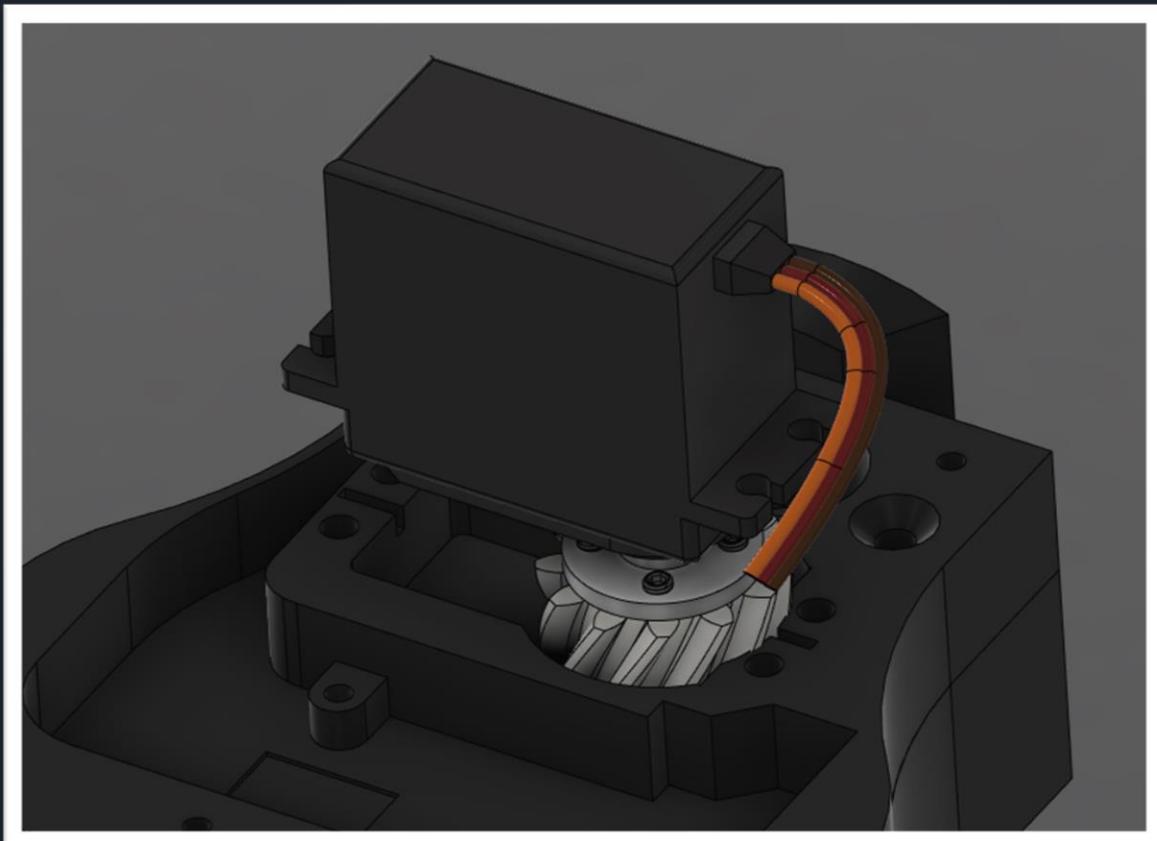
Take the **Mid** part and 2 cylindrical rollers - insert them to the dedicated holes.



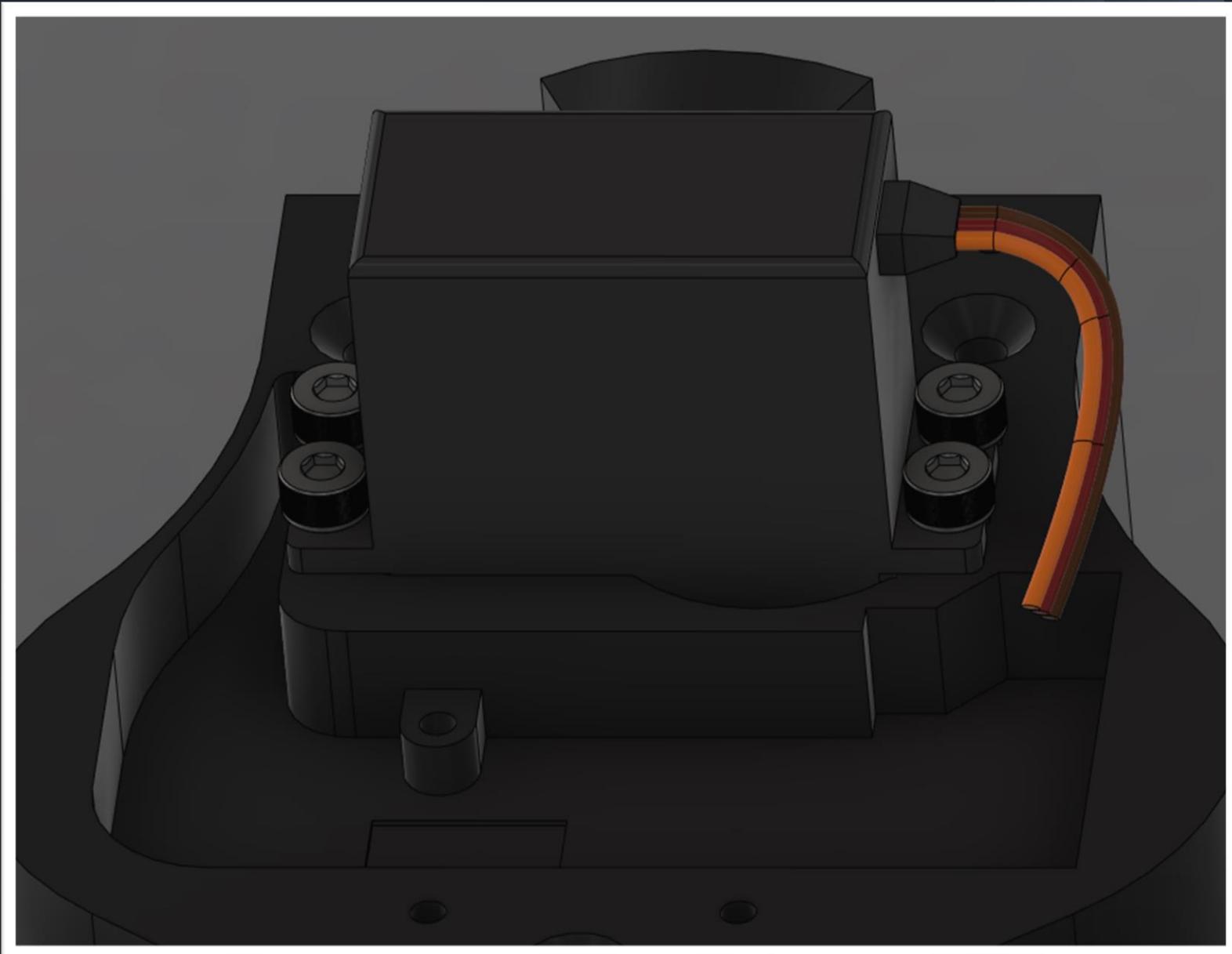
Take the previously assembled part and gently align the cylindrical rollers of the **Mid** part with the gear bearings. Press it till the parts are aligned. You may need to use slightly bigger force there.



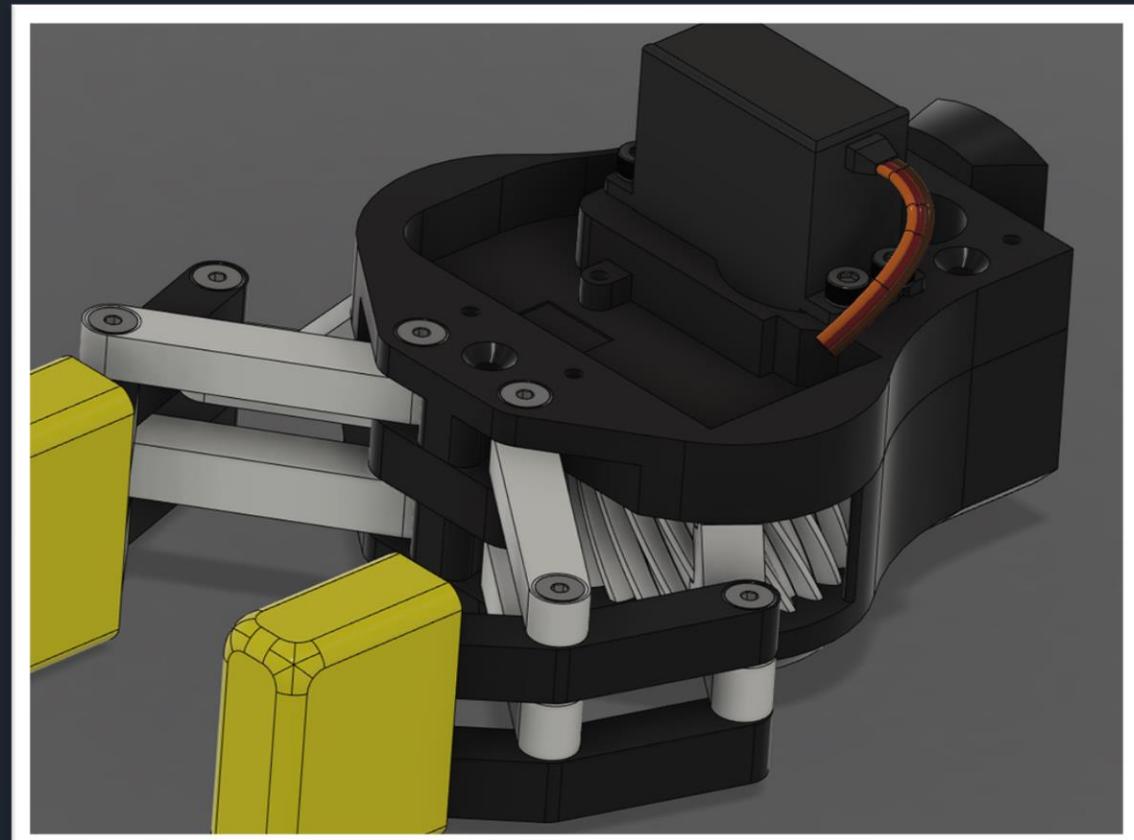
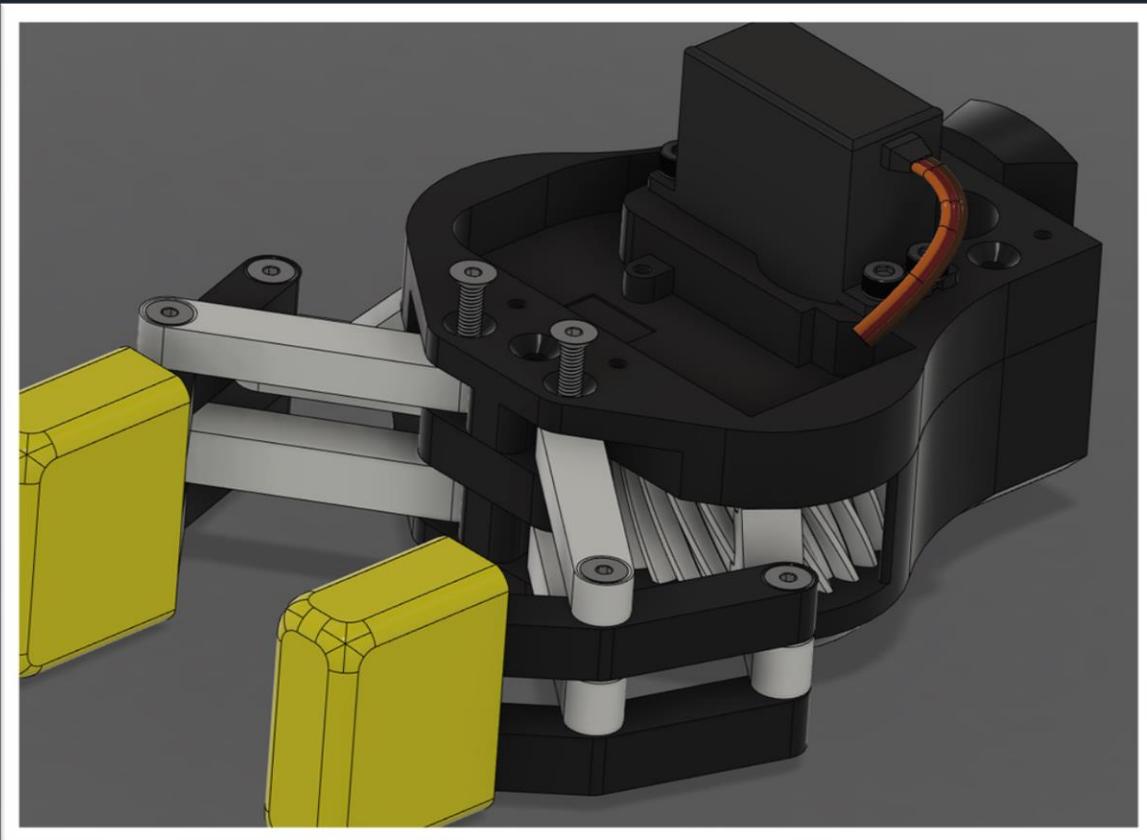
Take servo with connected gear and insert it in a way the gripper is fully open after the action.



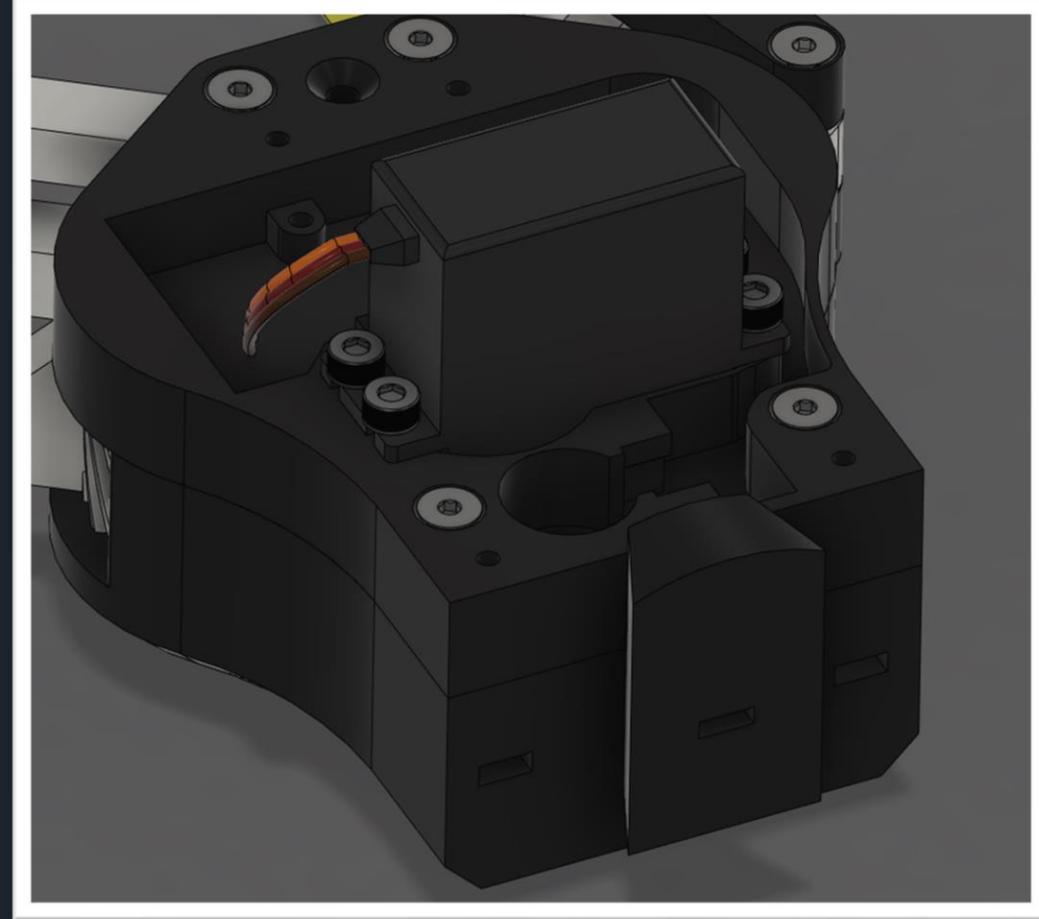
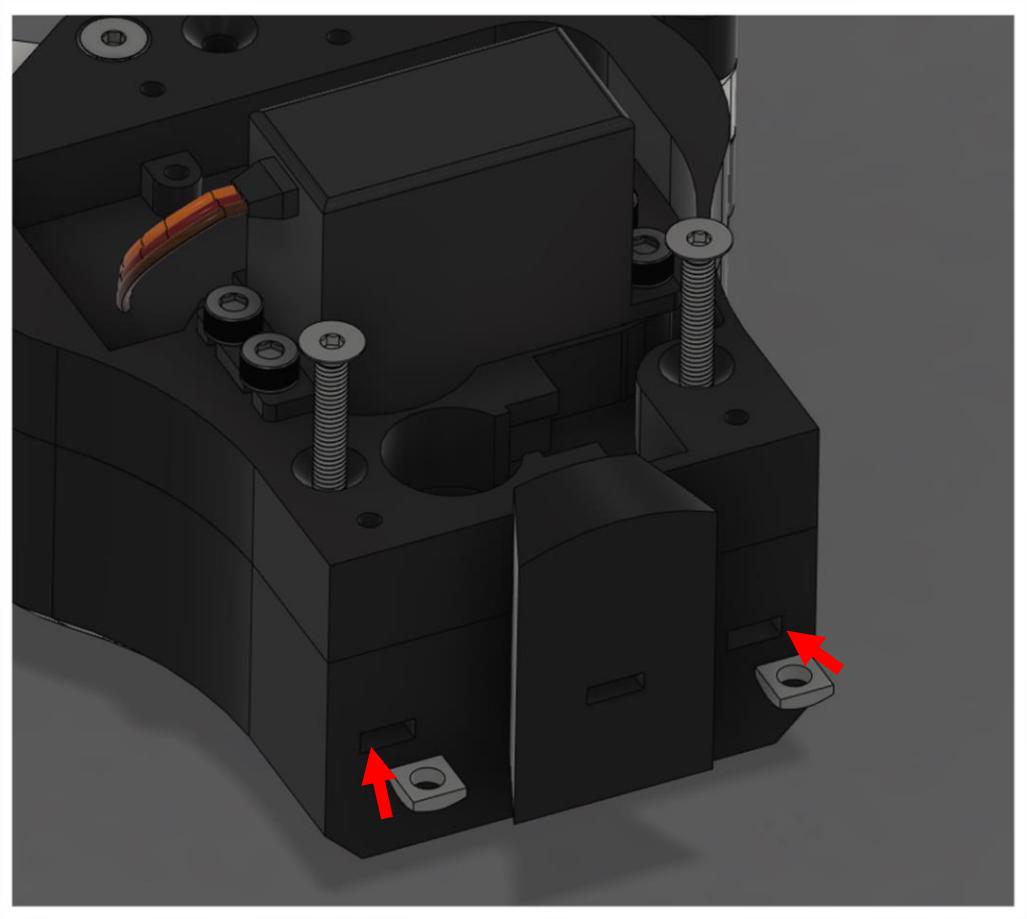
Attach a servo using
4 M4x8mm Socket
cap screws



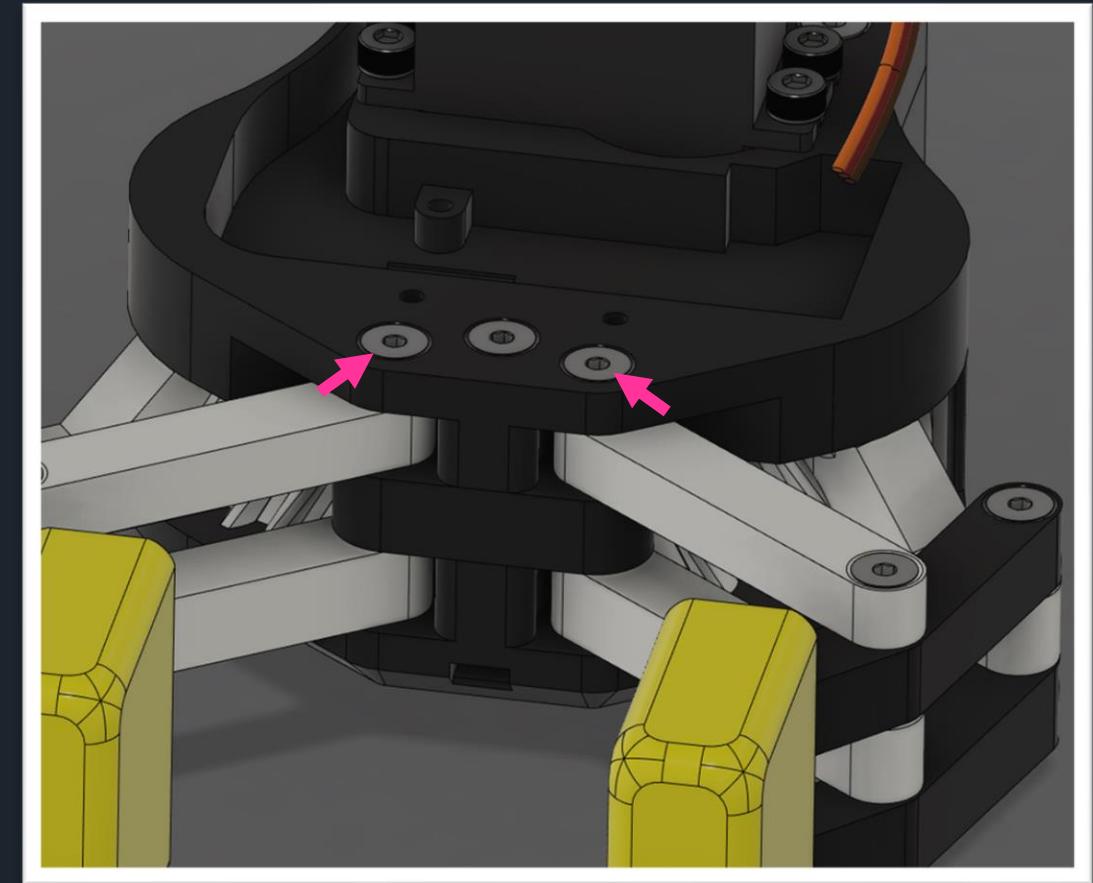
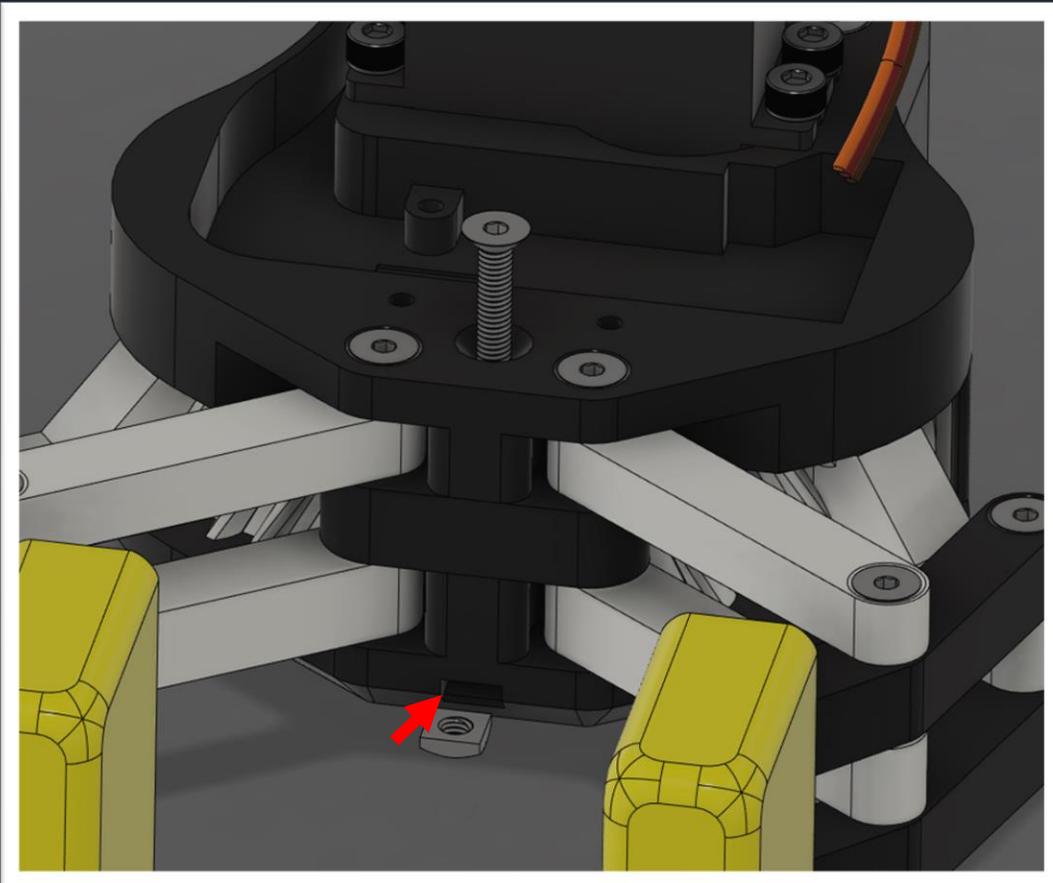
Take 2 M4x45mm Flathead screws and pass each of them through **Mid**, **TopStick**, **Spacer**, **BottomStick** and screw it into the **Bottom** part. Don't fully tighten the screws, just a little bit - do it after you are done with next 3 screws.



Insert M4 Square Nuts into the correct slots first, then screw M4x35mm Flathead screws into them.



Same as before - first insert M4 Square Nut into the correct slot, then screw in M4x35mm Flathead screw. Now you can tighten(but not overtighten them, those are only axis for our arms) these 2 screws I was writing about few steps before(marked with cool pink arrows).



Now we are going to assemble the panel with USB-C and DC socket.

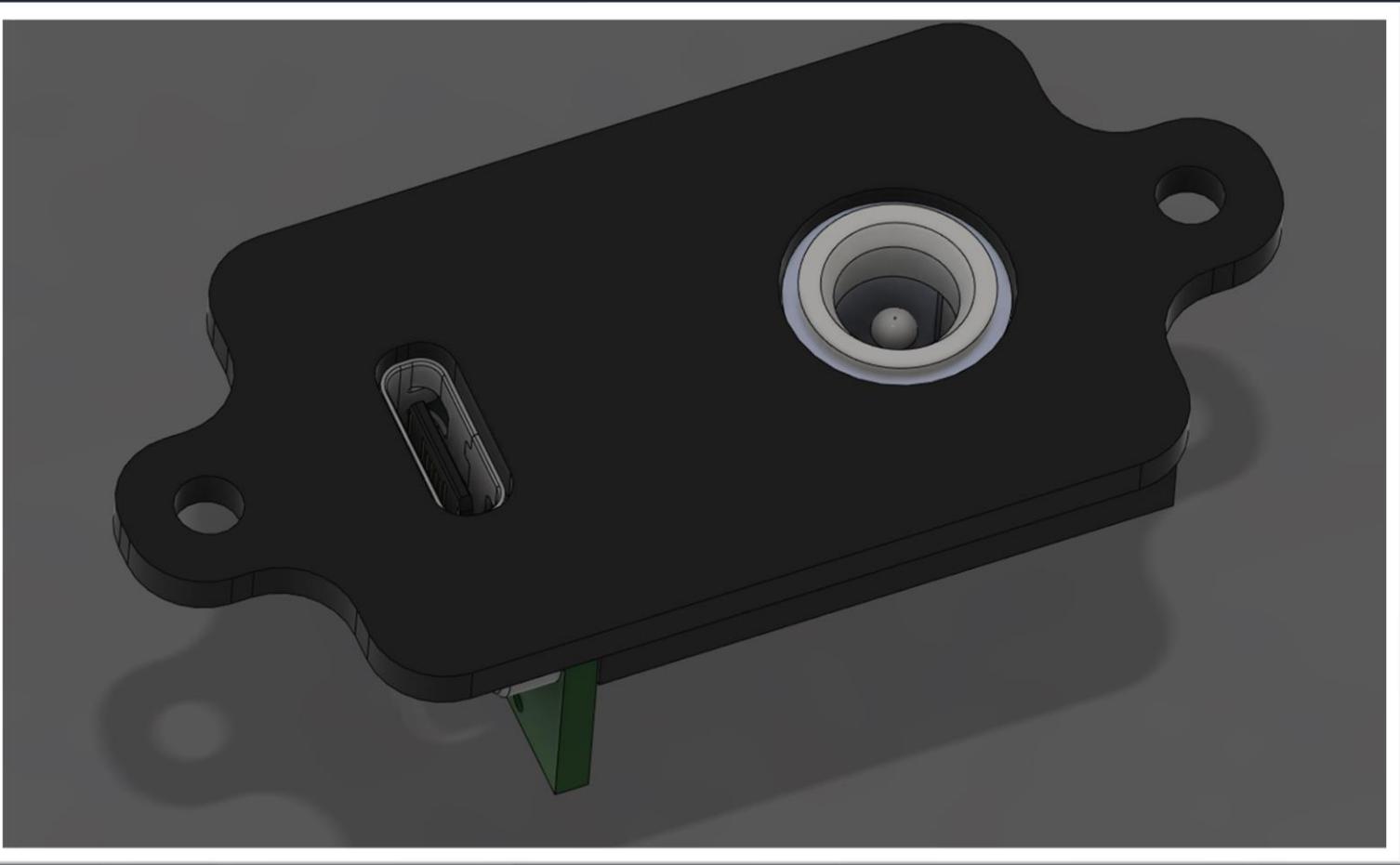
Prepare:

Panel

SparkFun USB-C
Breakout

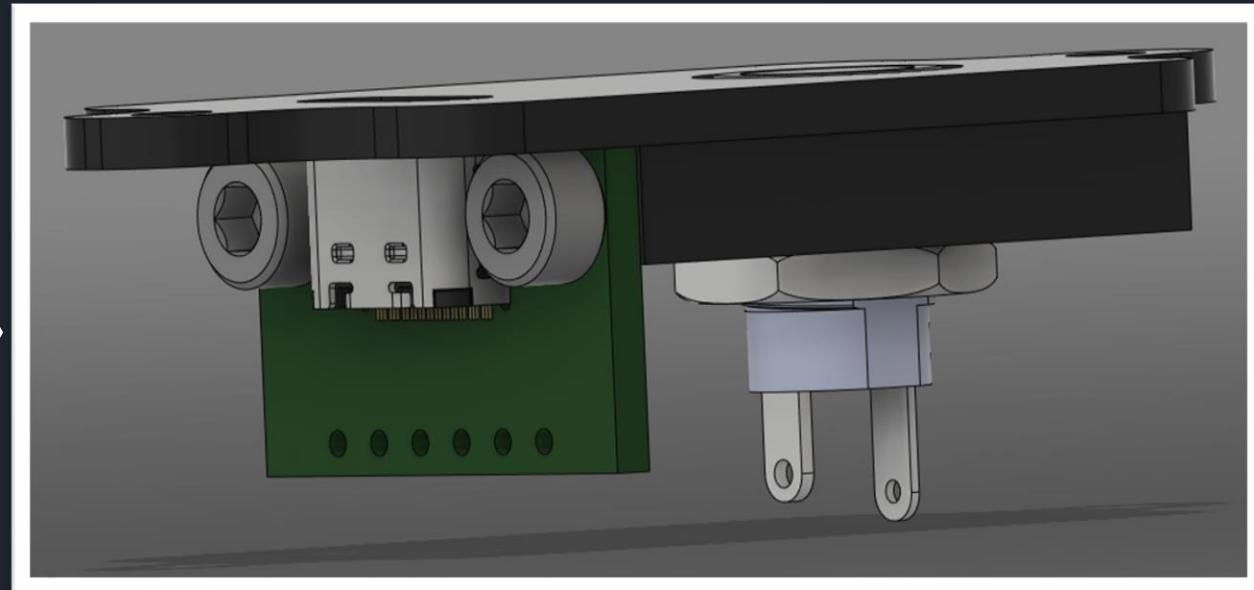
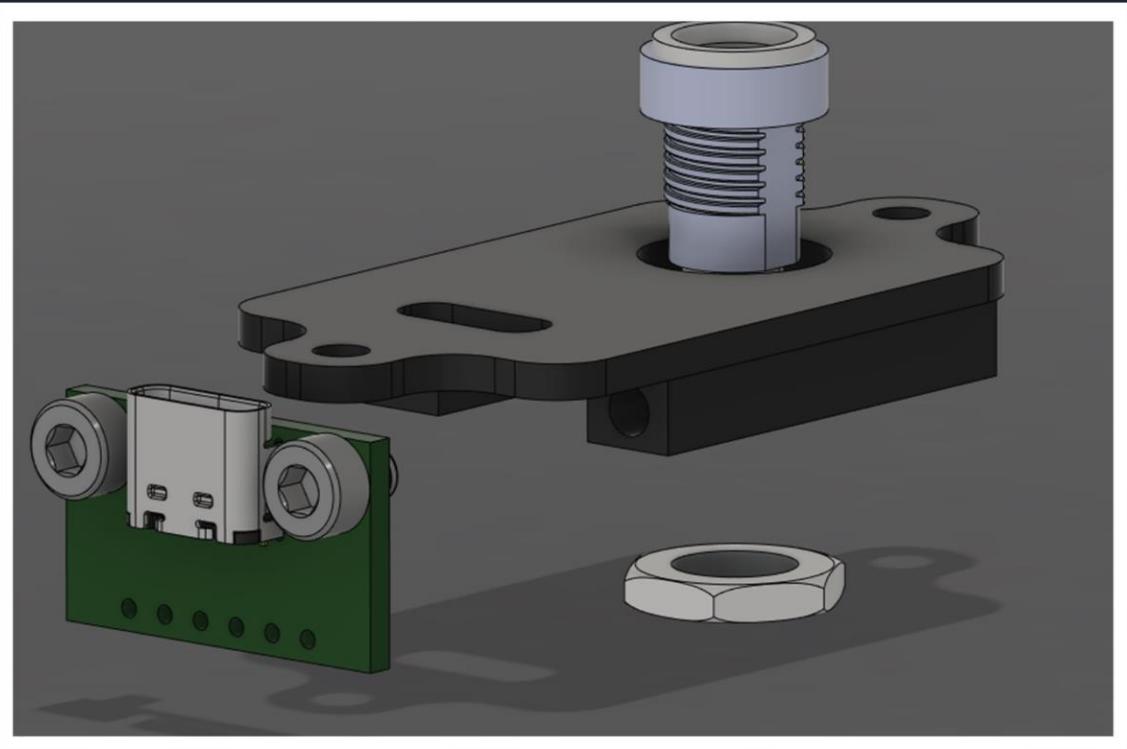
DC socket 2,1/5,5mm

M3x4mm Socket Cap
screw x2



This step is optional, you may use different electronic circuit (f.e. without these sockets)- its on you!

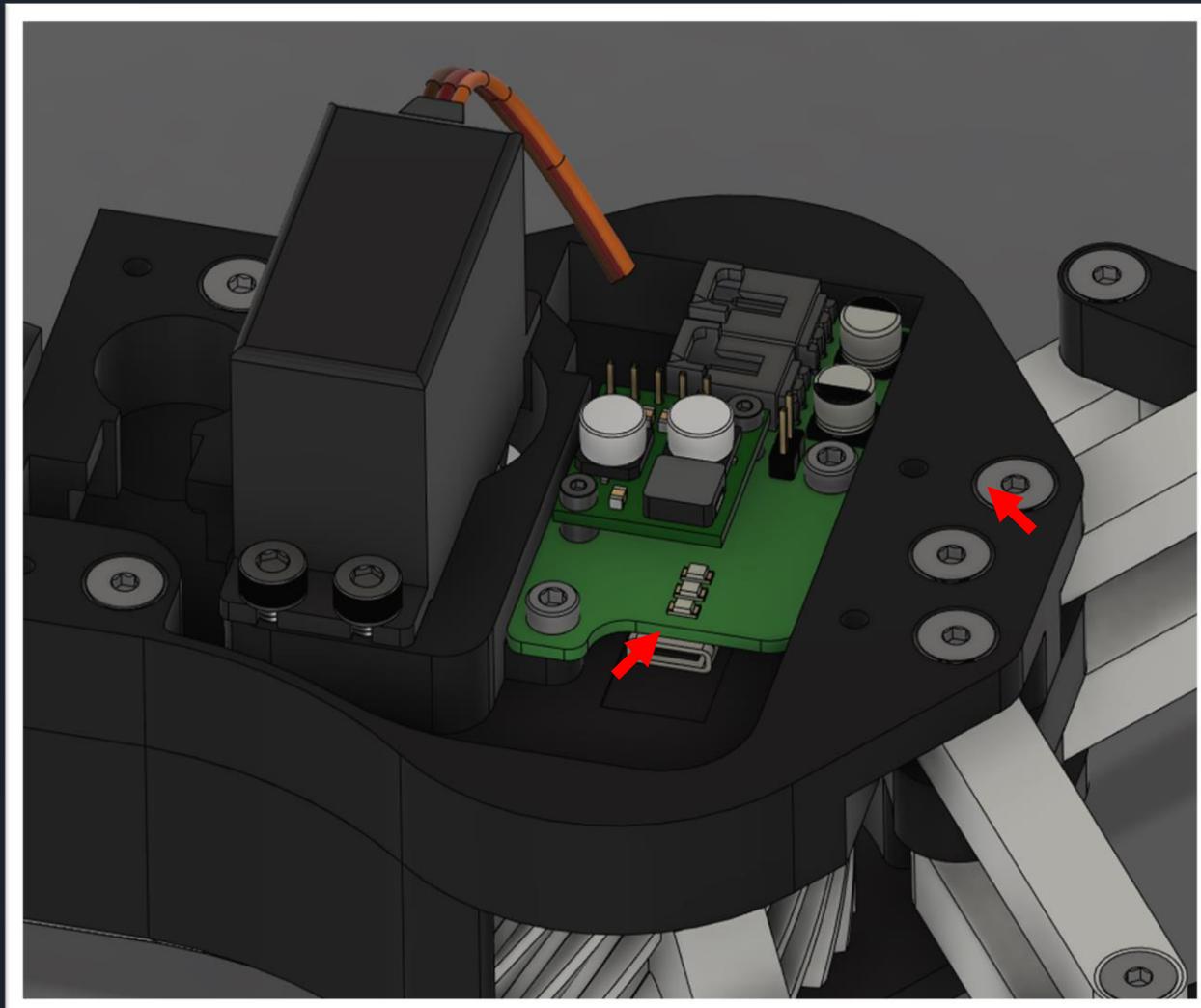
Insert the DC socket from the top and dedicated nut from the bottom, screw it together. Use 2x M3x8mm Socket Cap screws to mount USB-C socket.



Ok, I lied before - THIS is the shortest step. I'm not even trying to guide you. Prepare:

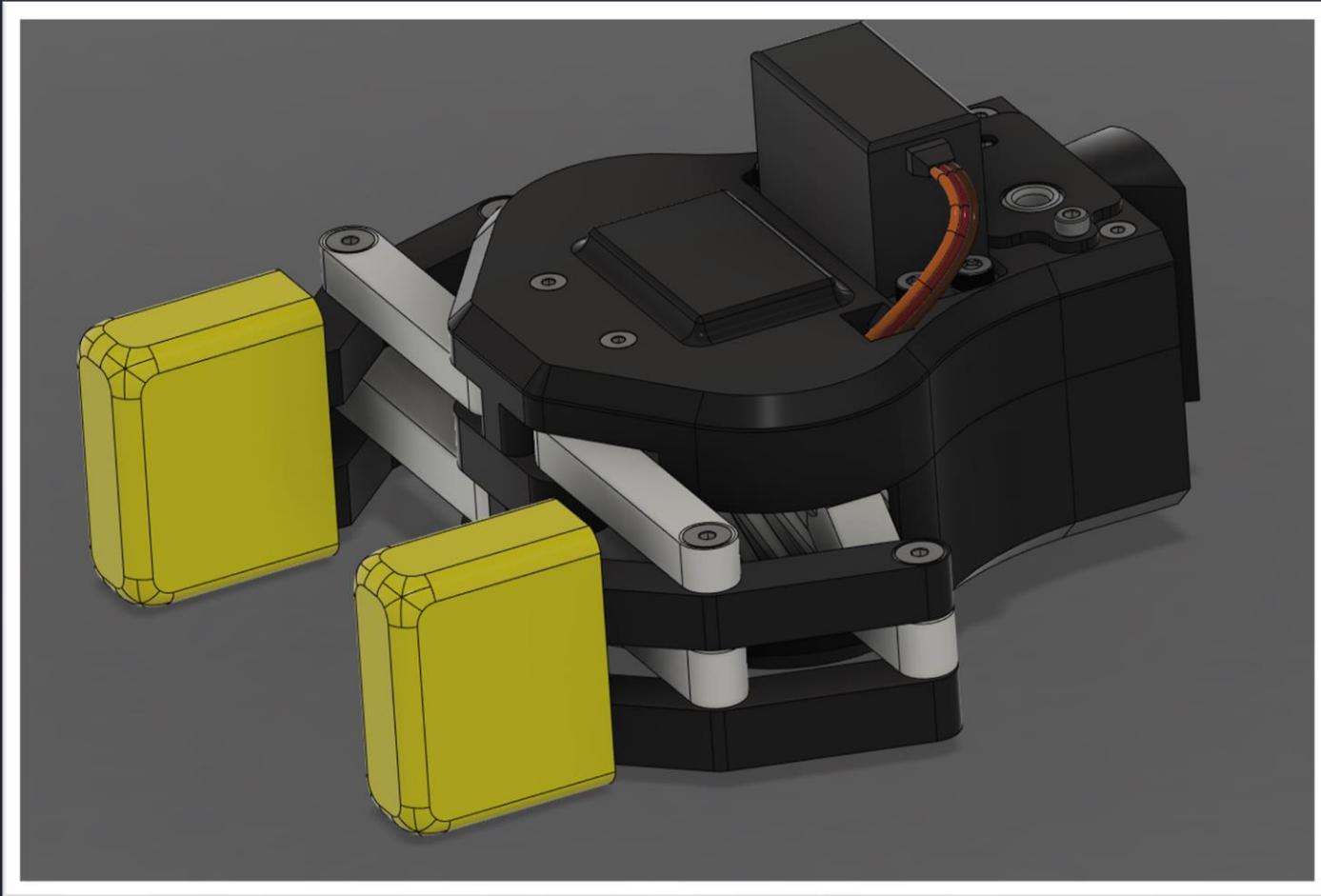
Dedicated PCB

M3x4mm Socket
Cap screw x2



Okay, again - this step is optional, you may use different electronic circuit (f.e. your own PCB), however this one works, so give it a try. All necessary files are on the project page on Github.

Last step, lets finish YOUR gripper! You will need:



Top

M3x10mm Flathead
Screw x4

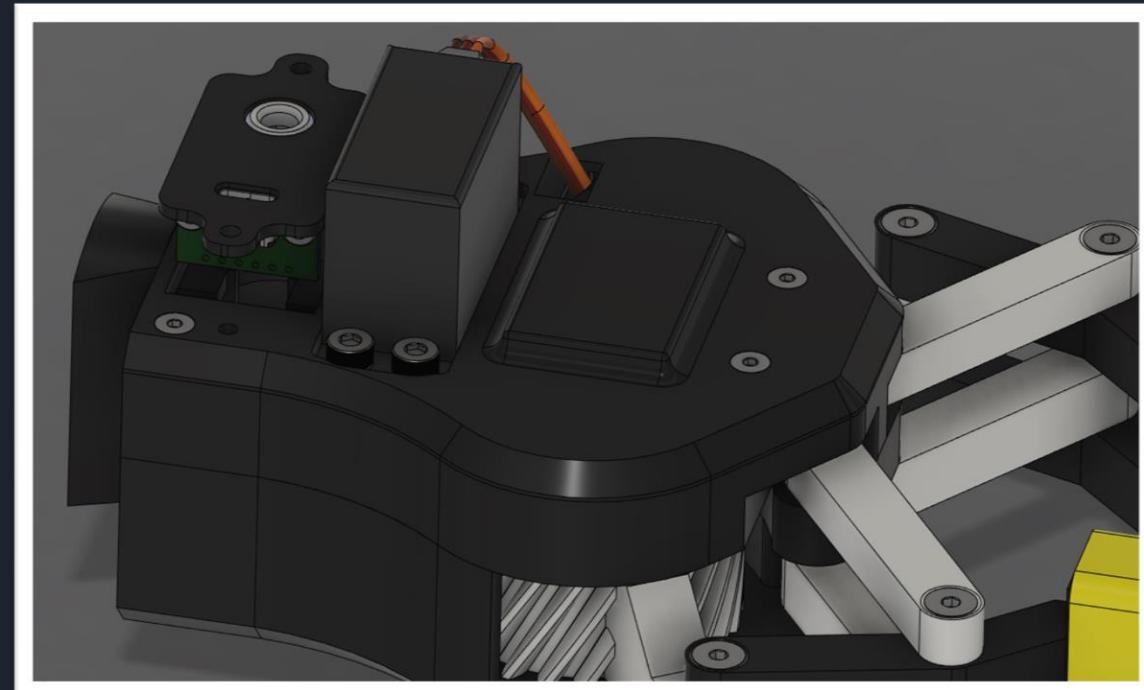
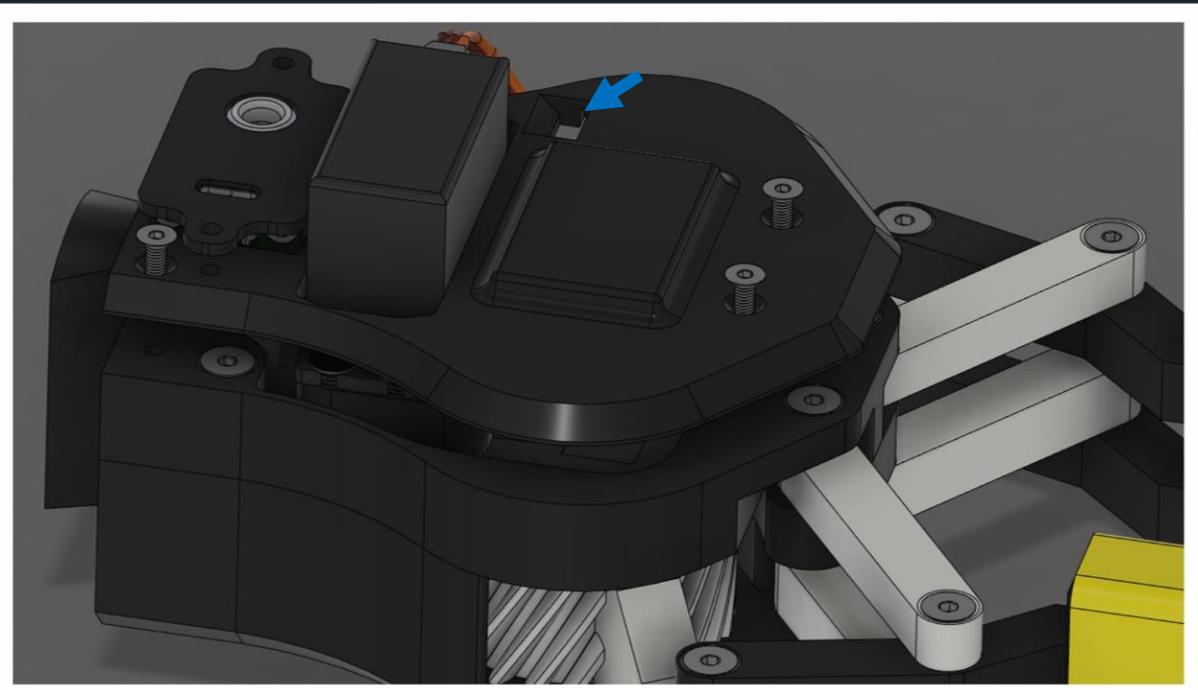
M3x4mm Socket Cap
Screw x2

Previously mounted
Panel

Wiring is a little bit tricky there and you have to do it on your own, however I added few photos at the end of this guide, I hope it will help. Good luck!

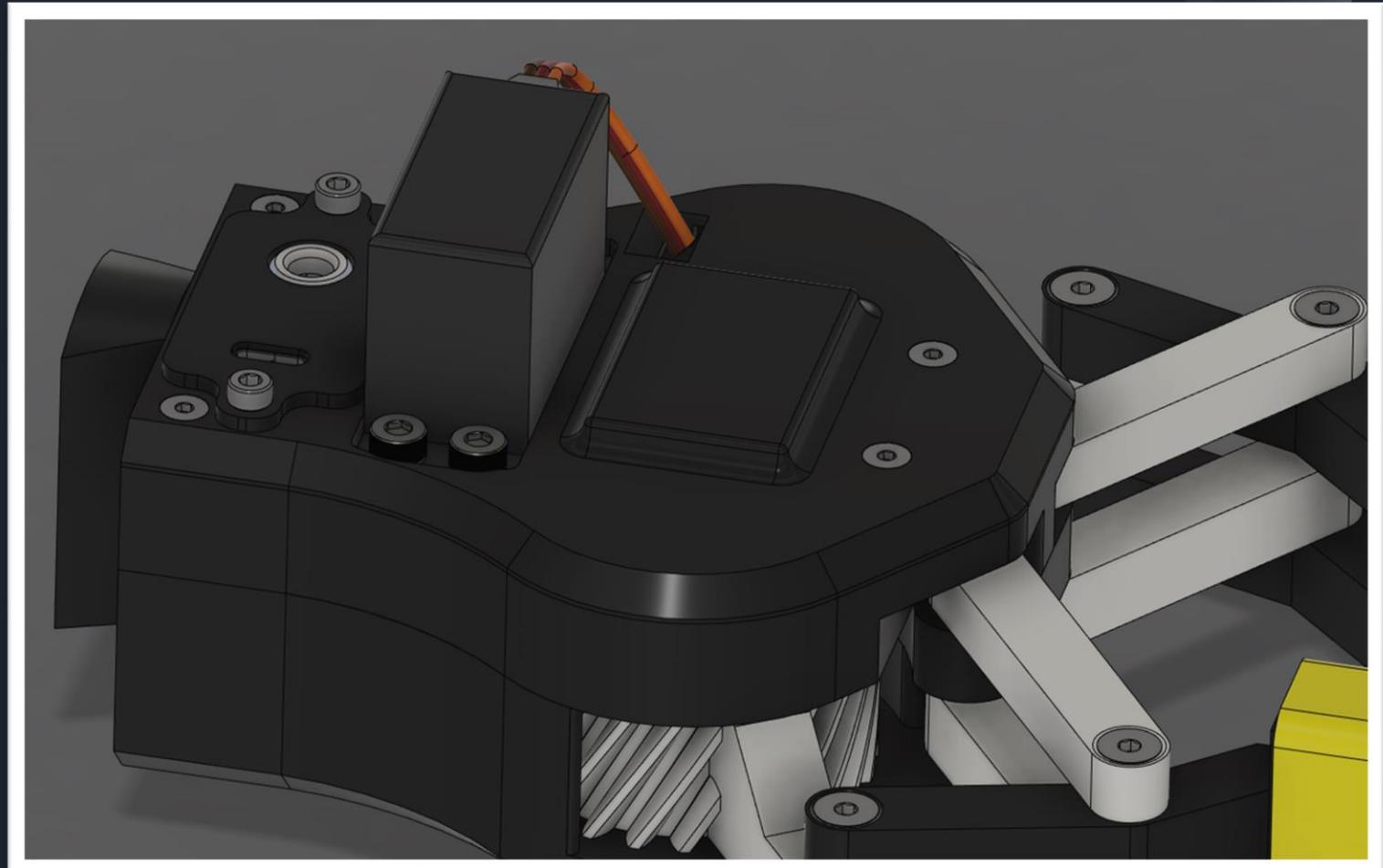
Start with pulling servo connector through the servo hole(in **Top** part), then pull it through the hole marked with blue arrow and connect it to the PCB. Connect our USB-C* and DC socket too(power supply connector should go under the PCB THEN to the PCB socket.

Connect the **Top** part with the **Middle** using 4 M3x10mm Flathead screws, be aware - try to not crush the wires. ☺

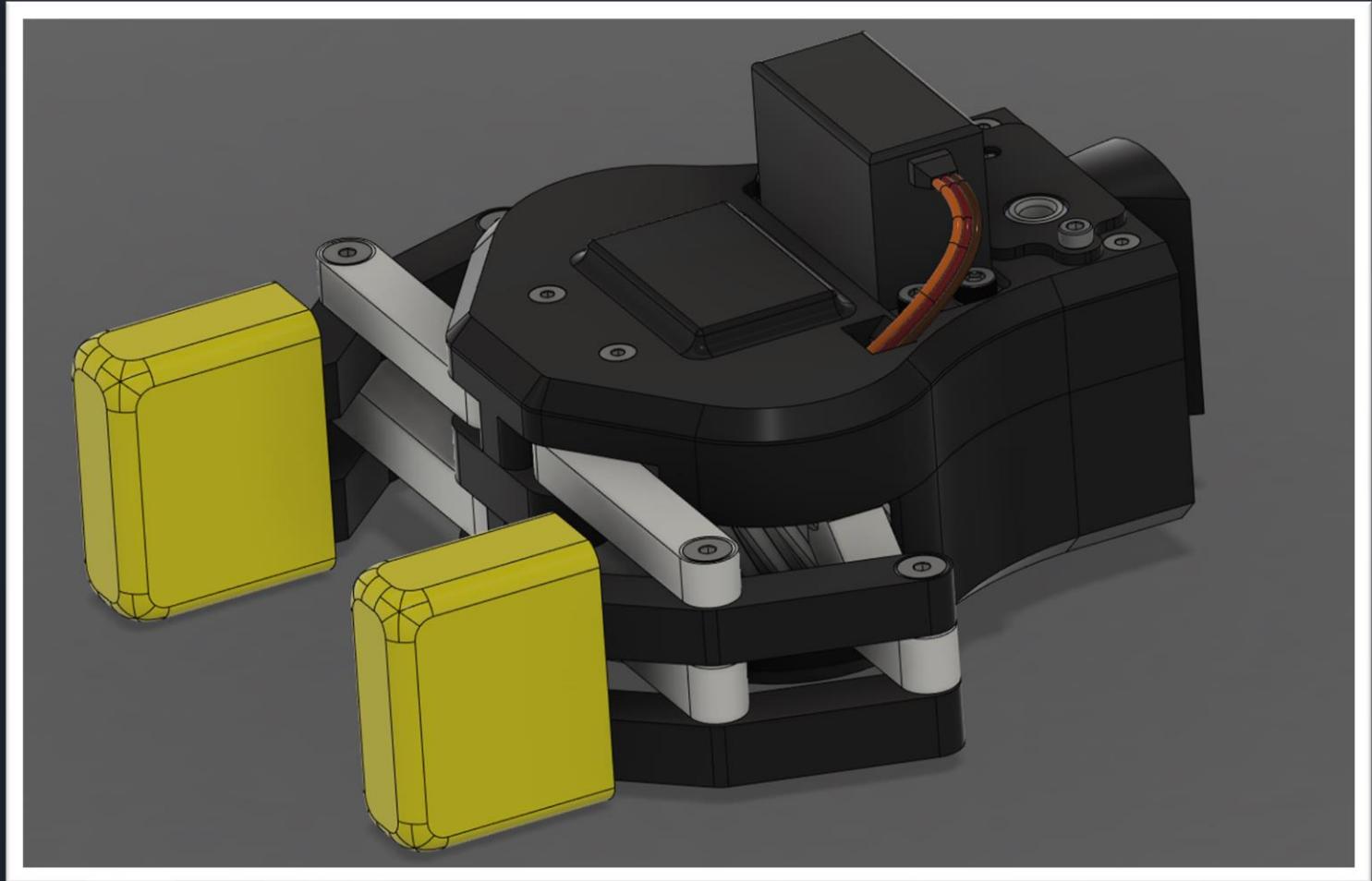


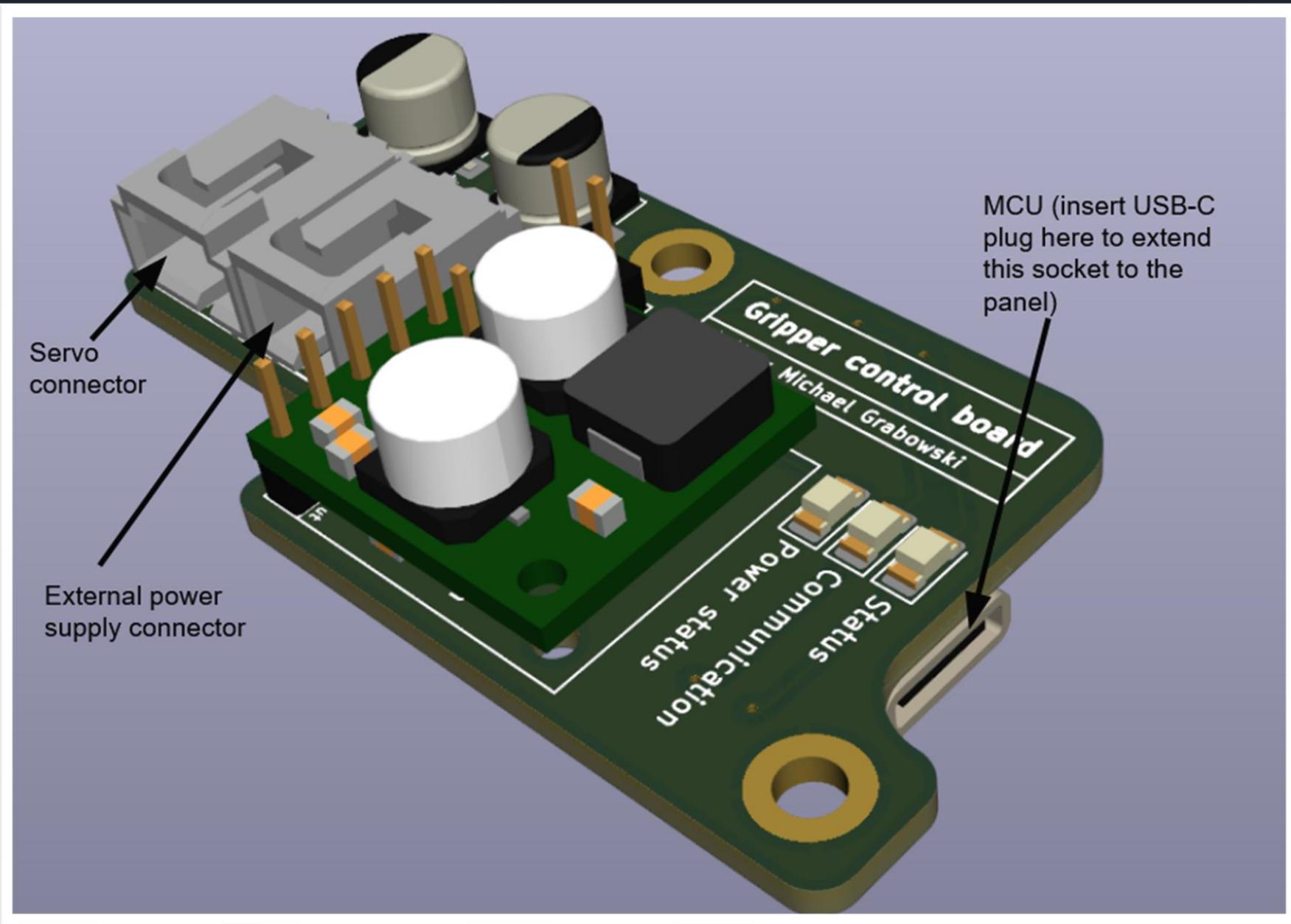
*if you are following my design - you need to solder wires to the USB-C male plug and USB-C Breakout - it becomes our extension system :D

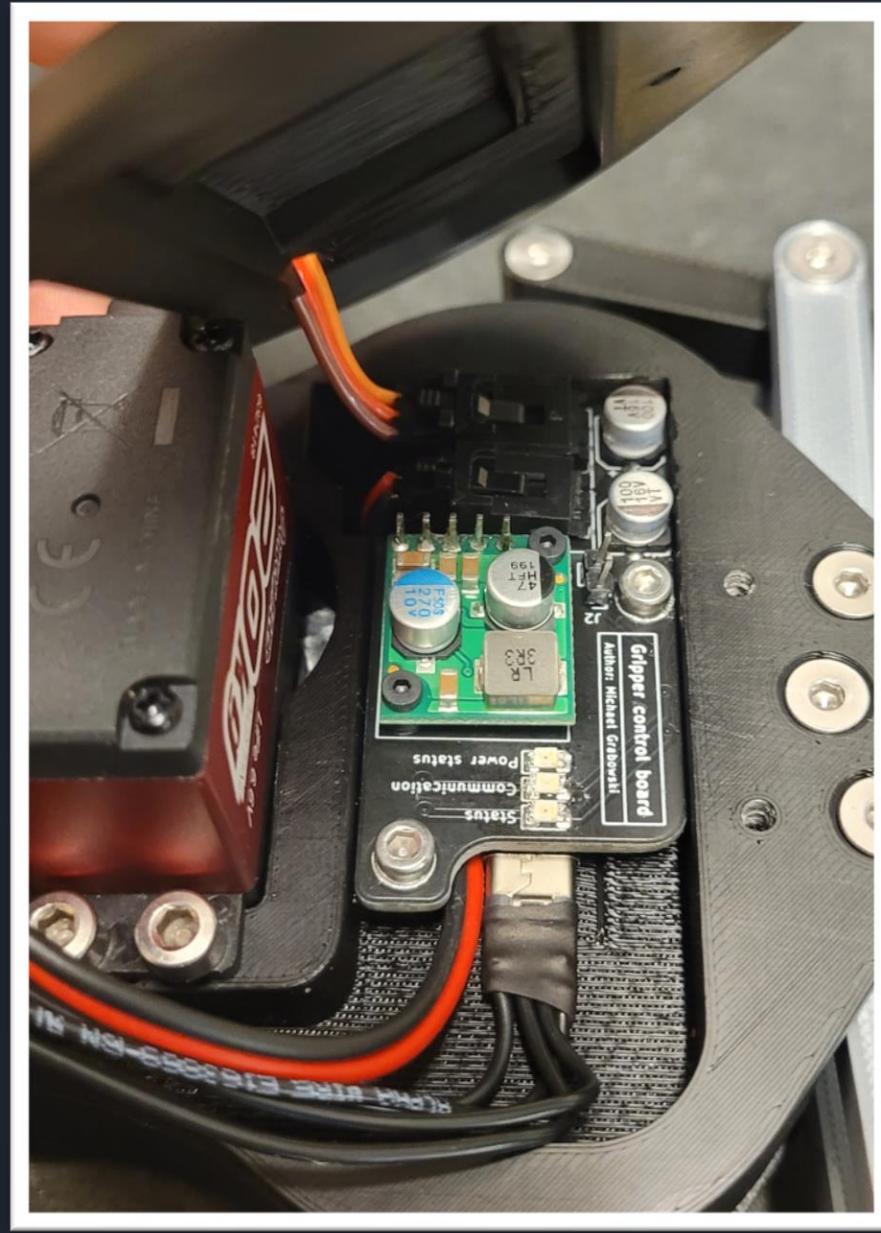
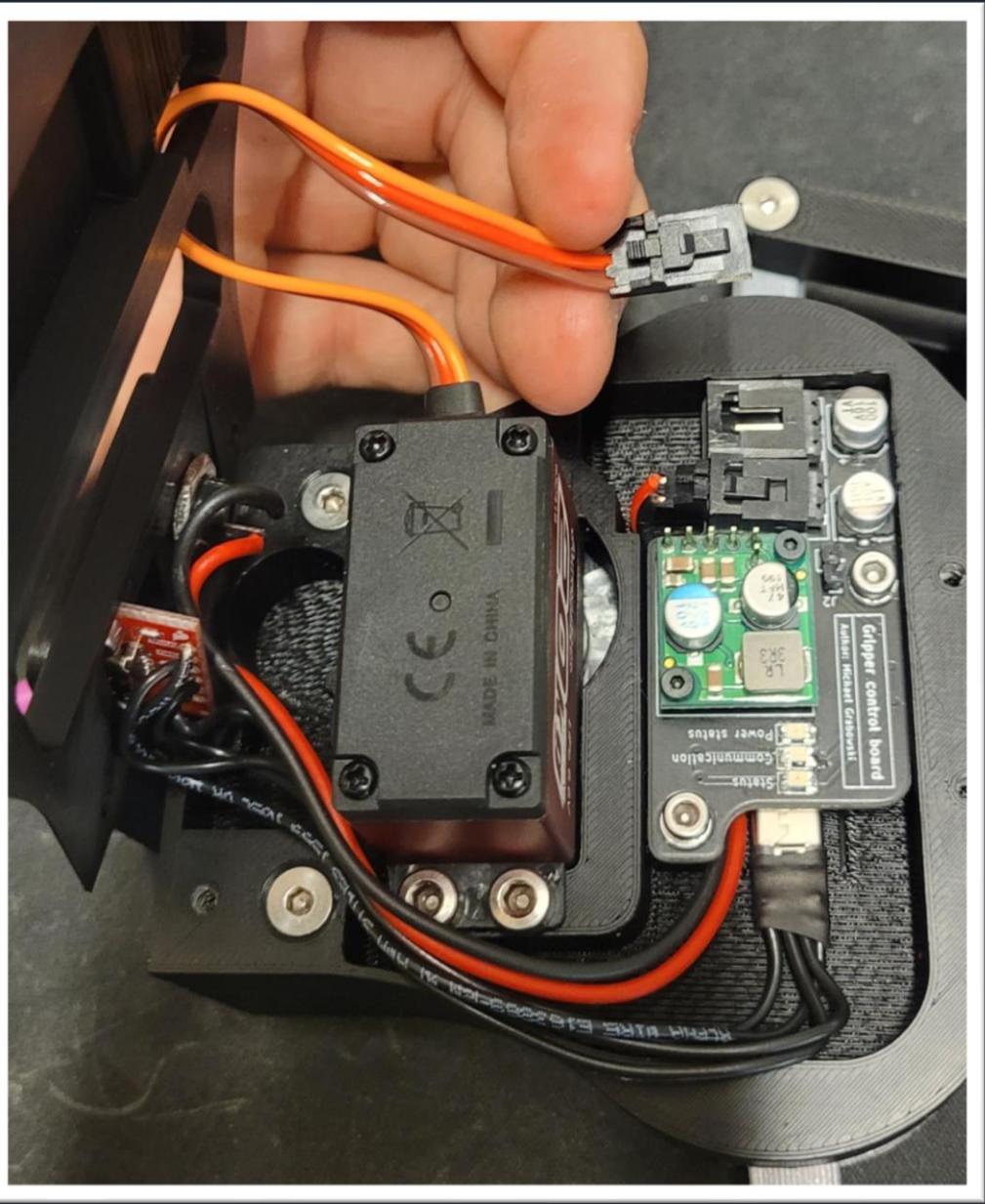
Lastly mount our Panel part with 2 M3x4mm Socket Cap screws.

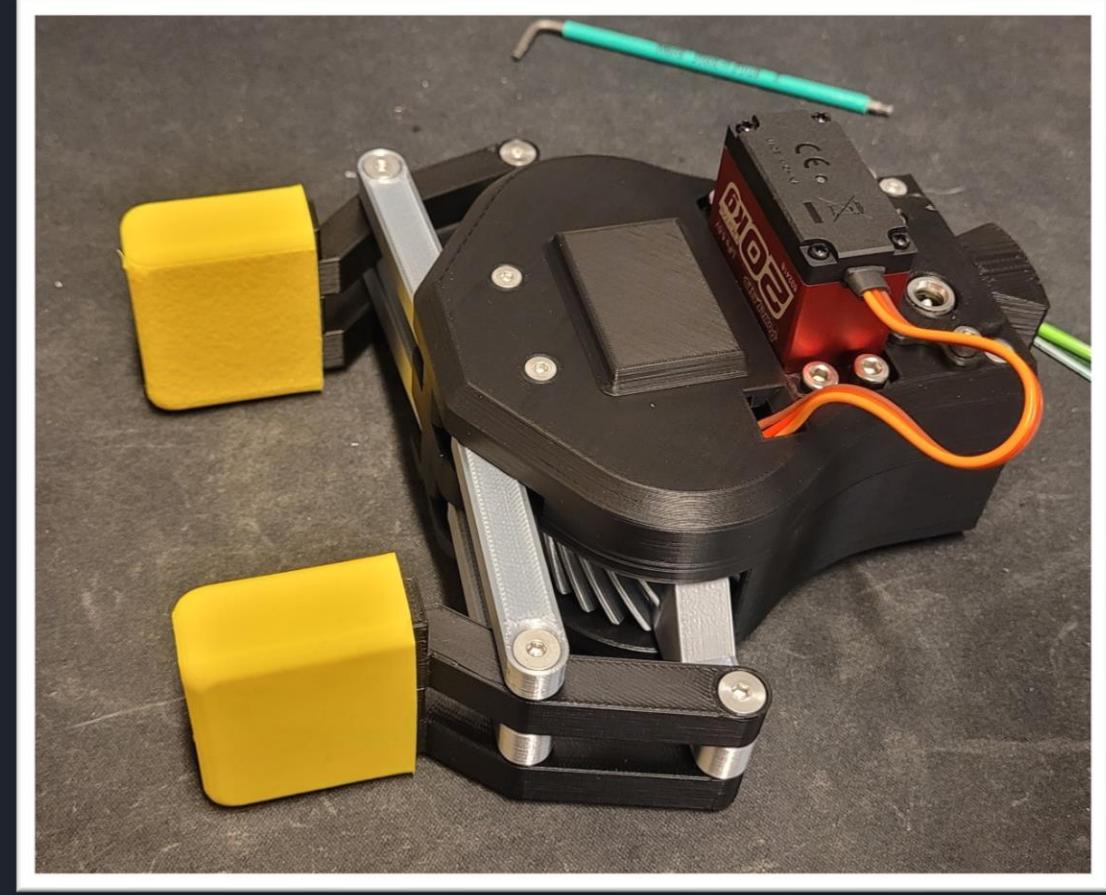
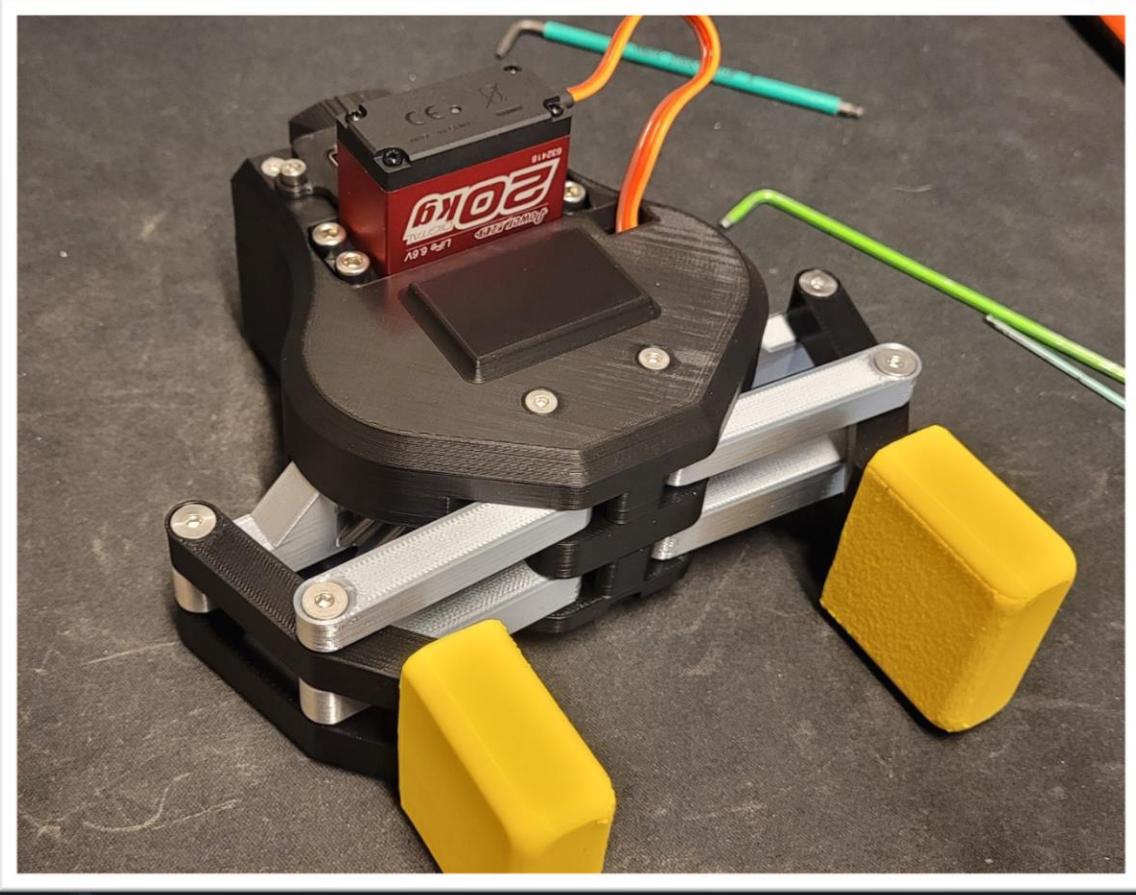


That's all! Good job
and have fun with your
newly built gripper!









Used filaments: Rosa3D - PLA SILK Steel, PLA PLUS ProSpeed Black, Print-Me - TPU 20D Lemon Drop