



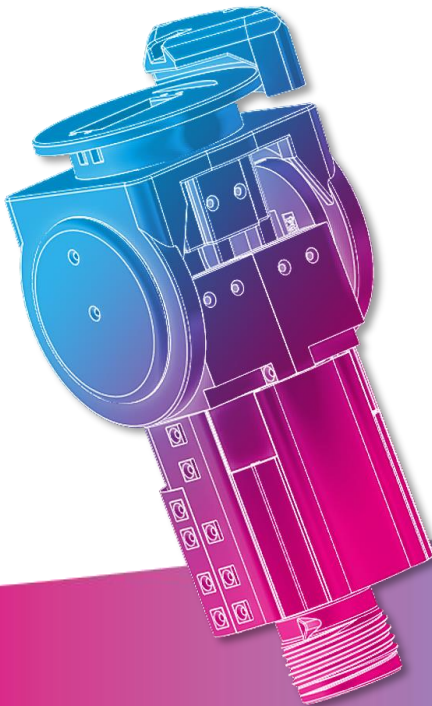
How to build your robot

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assembly instructions for:

SHOULDER JOINT



You
Print
Build
Develop

your own robot!

Printable parts



Pib's shoulder joint consists of **18 printable parts** and is assembled in **23 steps**.

In order to construct the shoulder joint, you will need to print the parts as seen in the table.

Please note: For better readability we use the abbreviations in the tutorial: C01 instead of **C01-Shoulder_head**.

Printable parts

B01-Clavicle_left

B02-Clavicle_right

2 x **C31**-Wire_cover_upper_arm

Printable parts

C01-Shoulder_head

C02-Shoulder_base

C03-Shoulder_rotator

C04-Shoulder_rotator_2

C05-Shoulder_arm_inner_connector

2 x **C08**-Central_rotator_bracket

C09-Central_rotator_connector

C15-Central_rotator_motor_connector

C26-Central_rotator_motor_scaffold_short

C27-Arm_shell_lateral_major

C28-Arm_shell_lateral_minor

C29-Shoulder_horizontal_mount

C30-Shoulder_arm_inner_connector2

Non-printable parts



You will also need the following non-printable parts from our pib.Box Master. If you do not have it yet, you can buy in our shop <https://shop.pib.rocks>.

Non-printable parts

3 x **E09** DS3225 Servo with motor clamps

1 x **E07** MG996R Servo

2 x **M07** Thrust_bearing 70x50x1

2 x **M06** Ballbearing Axial 70x50x3

2 x **M04** Ballbearing 60x78x10

1 x **M05** Thrust_bearing 95x70x6

Non-printable parts

46 x **S01** M3 nuts

16 x **S03** M3 8 mm screws

14 x **S04** M3 10 mm screws

11 x **S05** M3 12 mm screws

4 x **S06** M3 16 mm screws

5 x **S08** M3 20 mm screws

4 x **S09** M3 22 mm screws

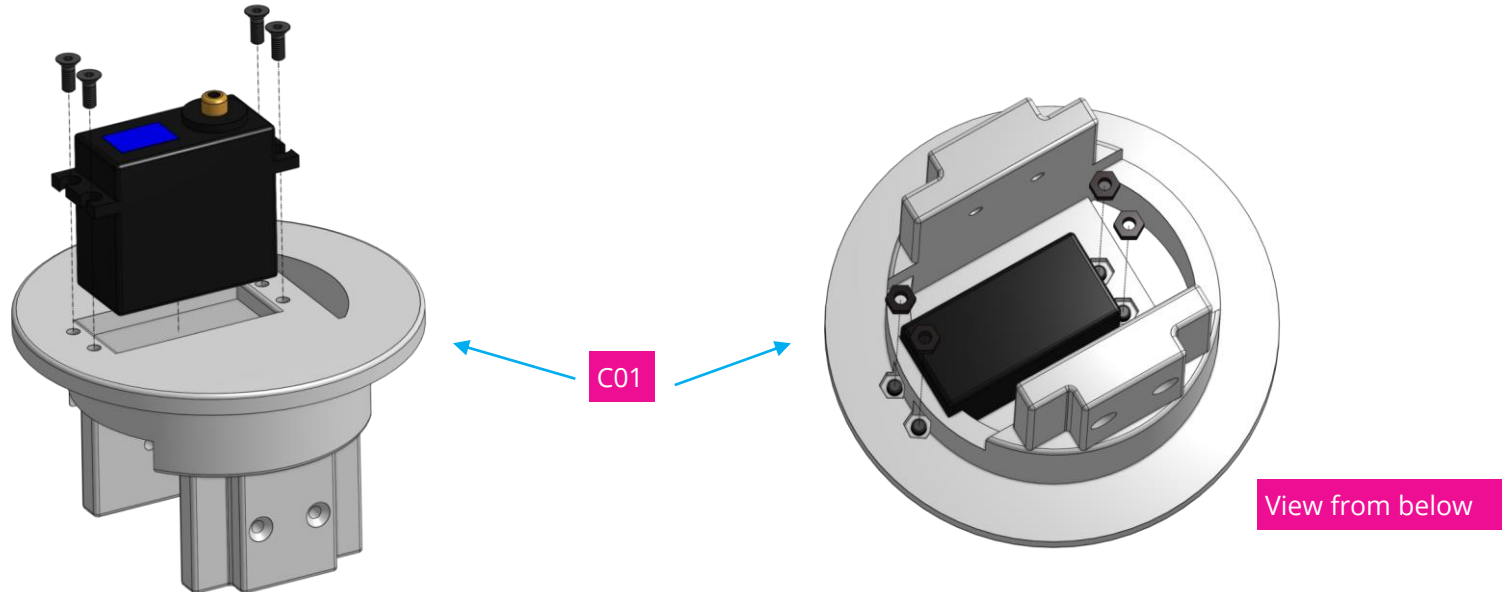
4 x **S10** M3 25 mm screws

3 x **S13** M3 40 mm screws

Step 1



Place 4 x nuts into C01 and attach 1 x E09 Servo using 4 x 8mm screws.

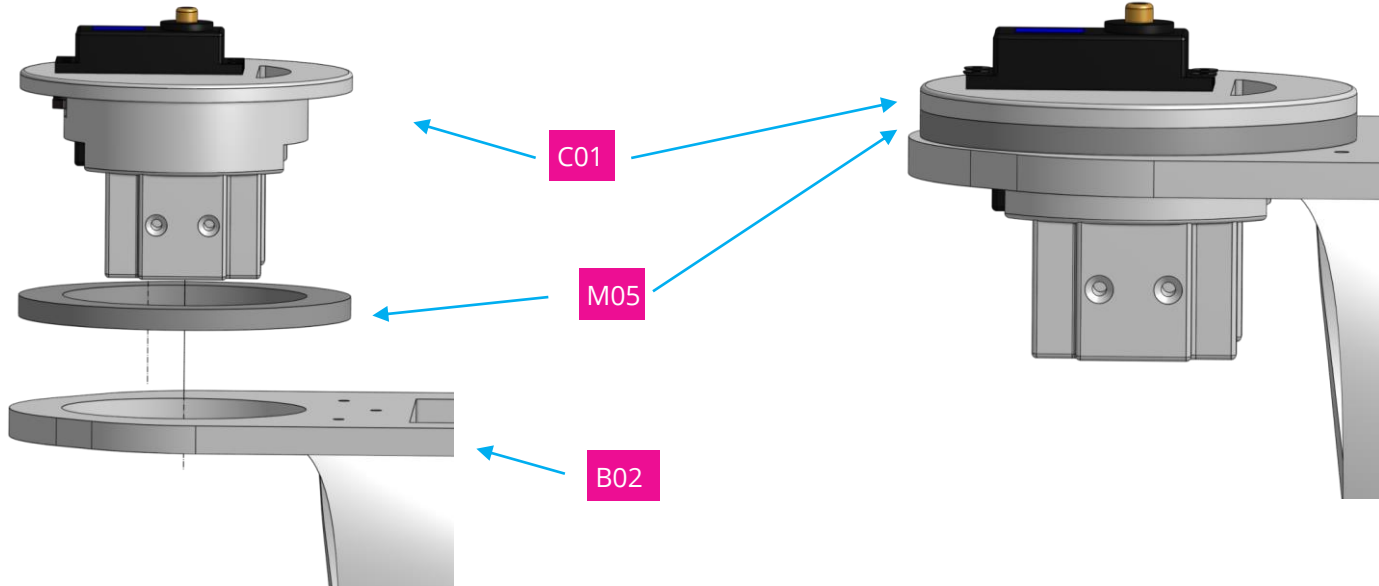


Step 2



Insert C01 into the hole of B02 by putting 1 x M05 thrust bearing in between.

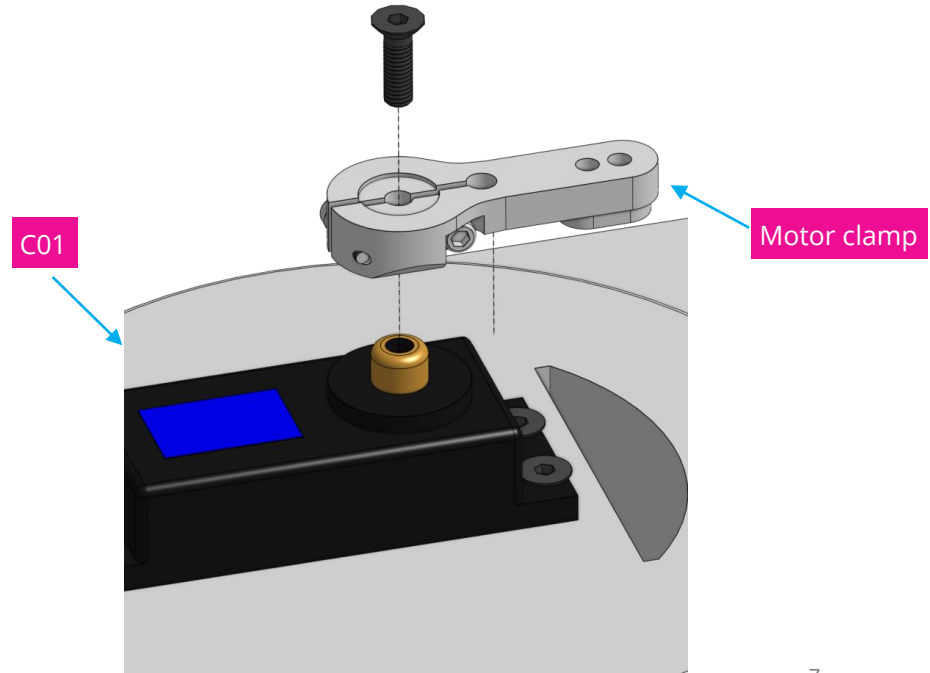
Please note: M05 consists of 1 axial bearing and 2 simple disks.



Step 3



Attach the motor clamp to the servo using 1 x 10 mm screw

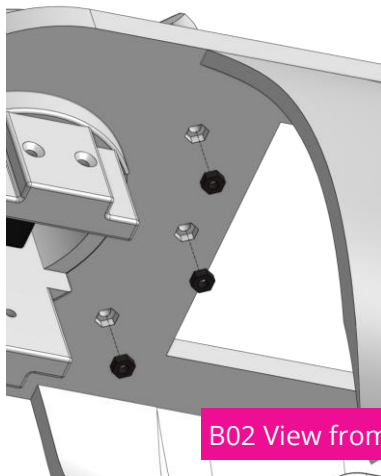


Step 4

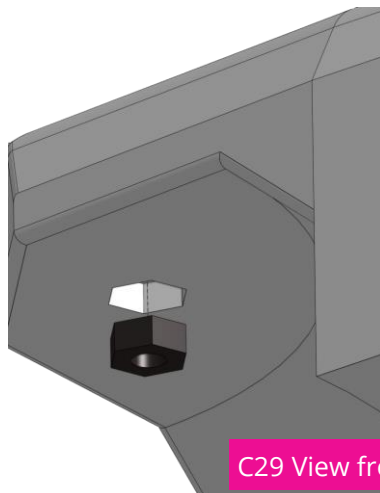


Insert 3 x nuts into the shown spots in B02.

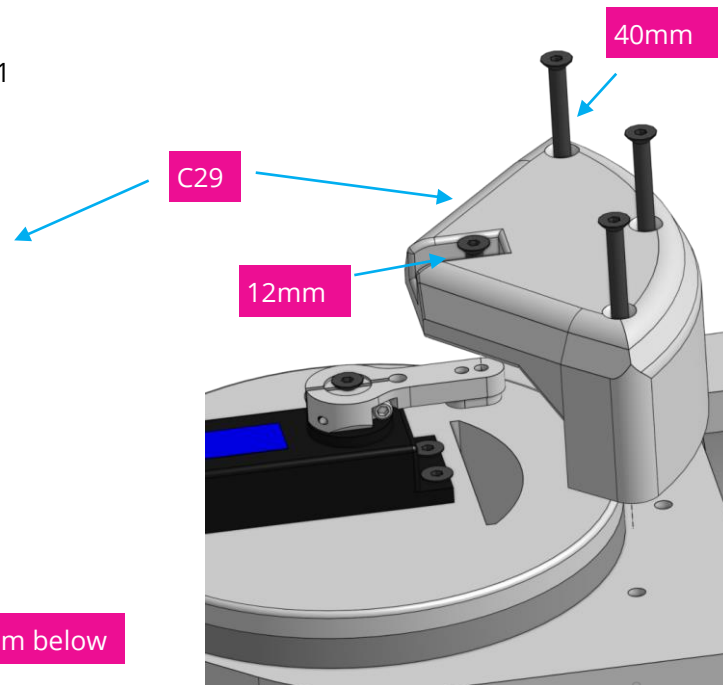
Insert 1 x nut into the shown spot in C29, then attach it with 3 x 40mm screw to B01 and 1 x 12mm screw to the motor clamp.



B02 View from below



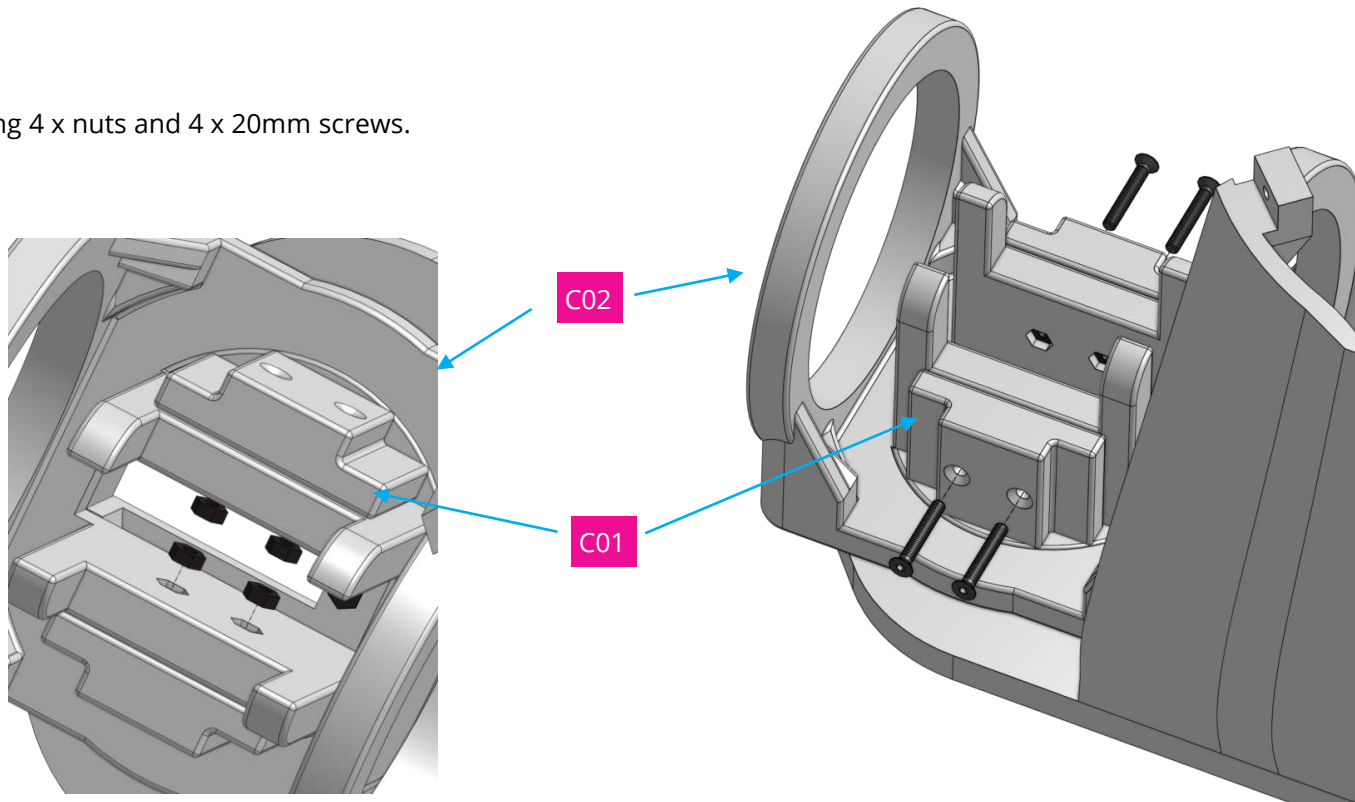
C29 View from below



Step 5



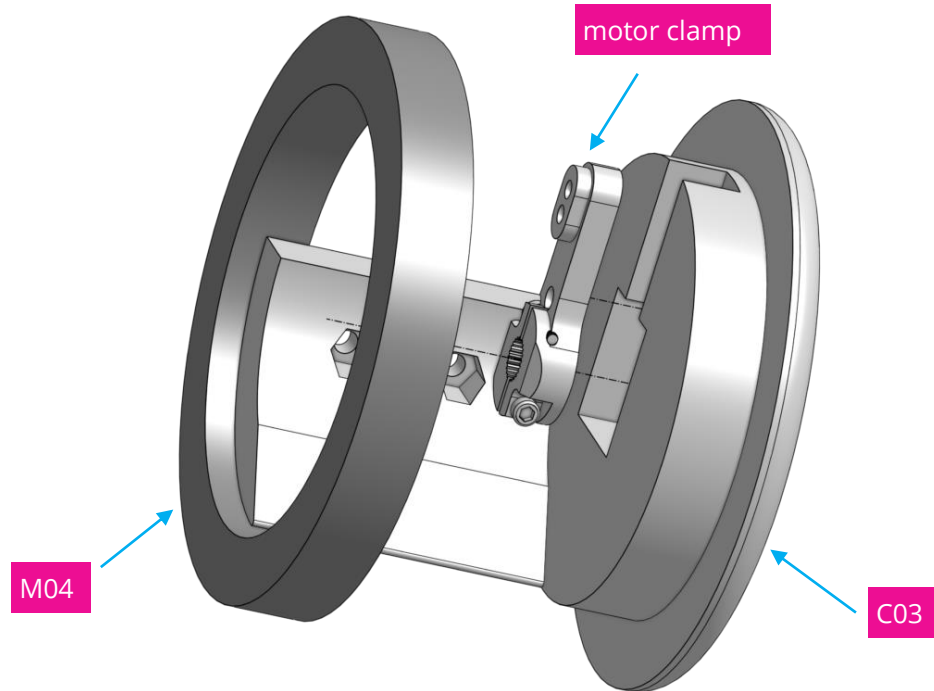
Attach C02 to C01 using 4 x nuts and 4 x 20mm screws.



Step 6



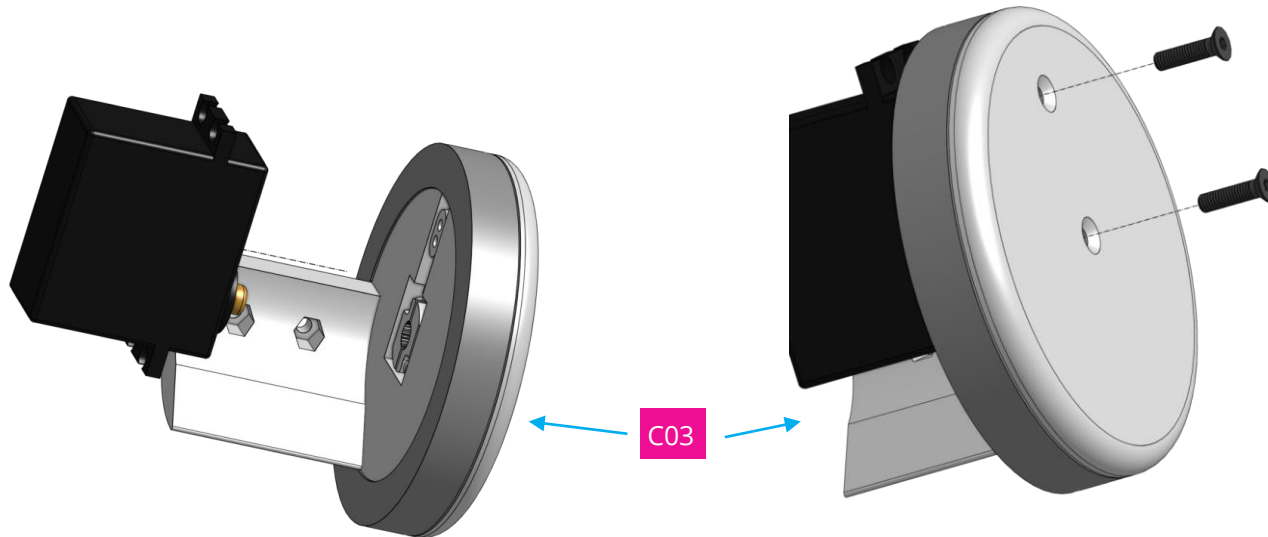
Place 1 x motor clamp and 1 x M04 Ballbearing on C03



Step 7



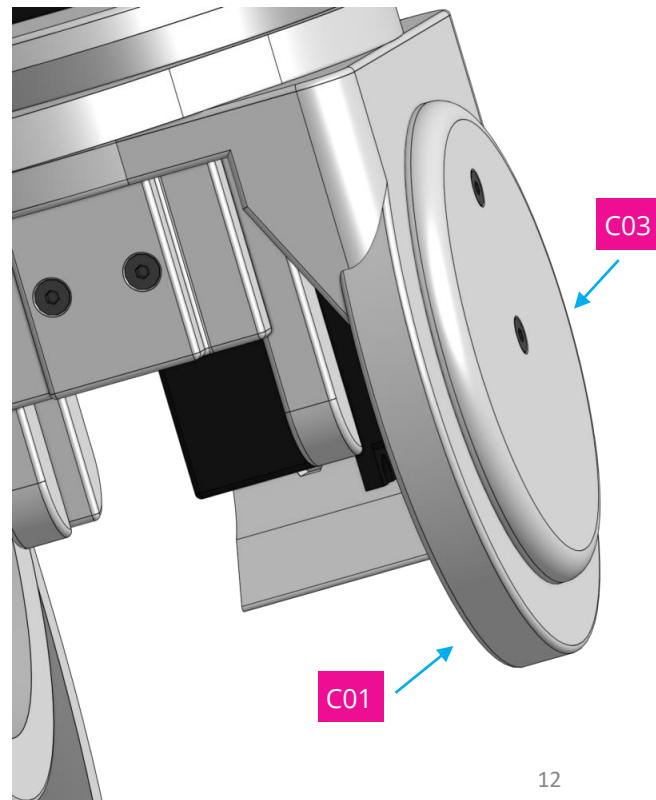
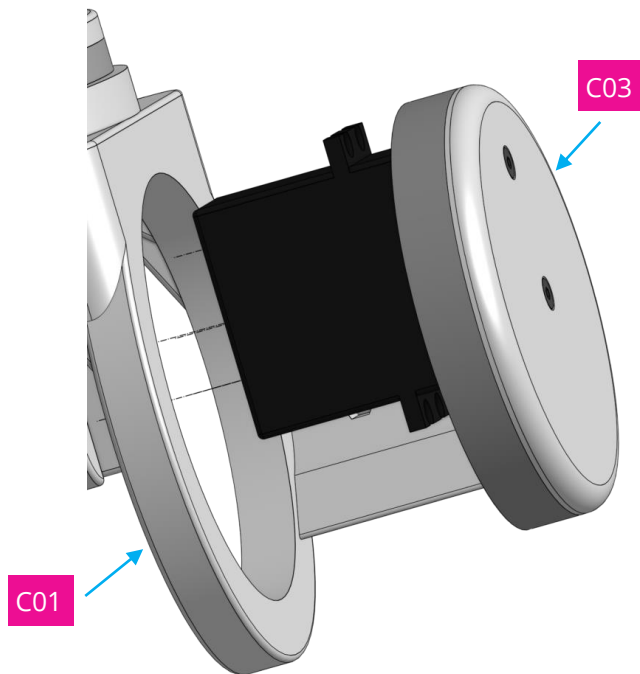
Attach E09 Servo on C03 using 2 x 12mm screws.



Step 8



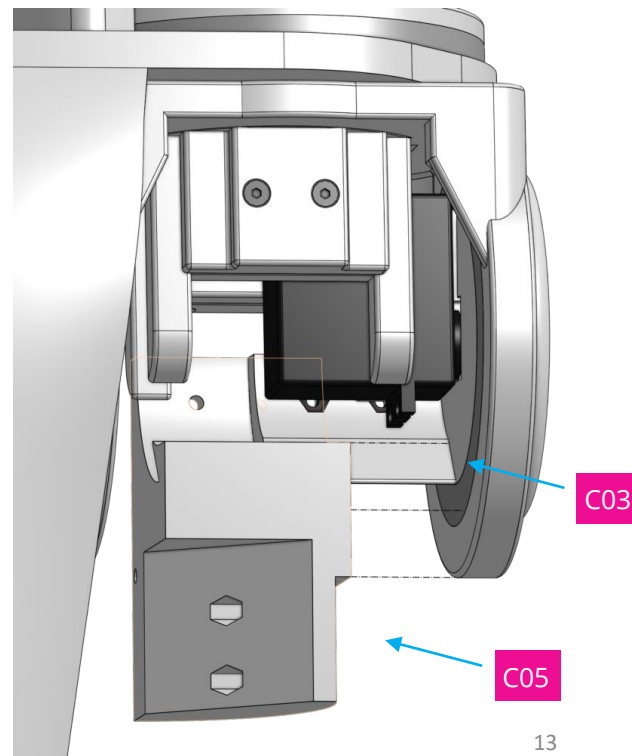
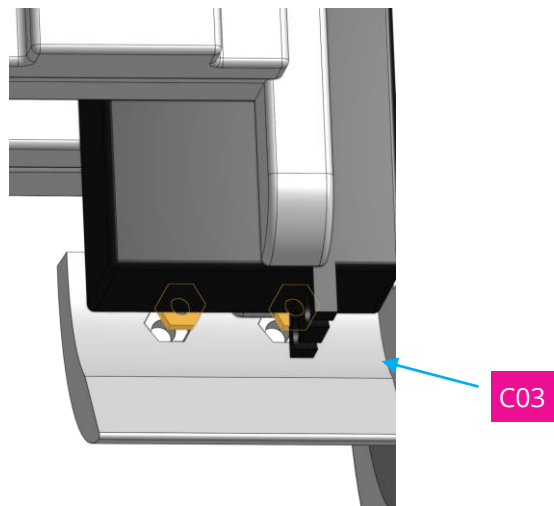
Insert the assembled C03 into C01 as shown.



Step 9



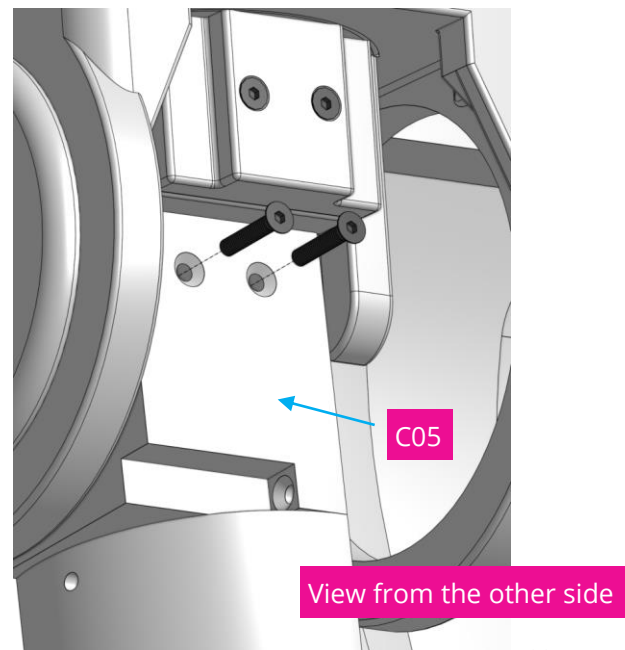
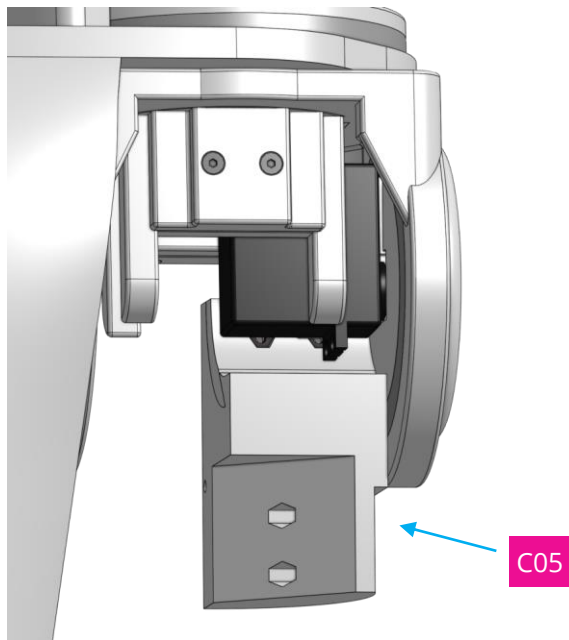
Insert 2 x nuts into the shown spots of C03. Please use a little tool, as this step is a little bit tricky.
Slide then C05 onto C03.



Step 10



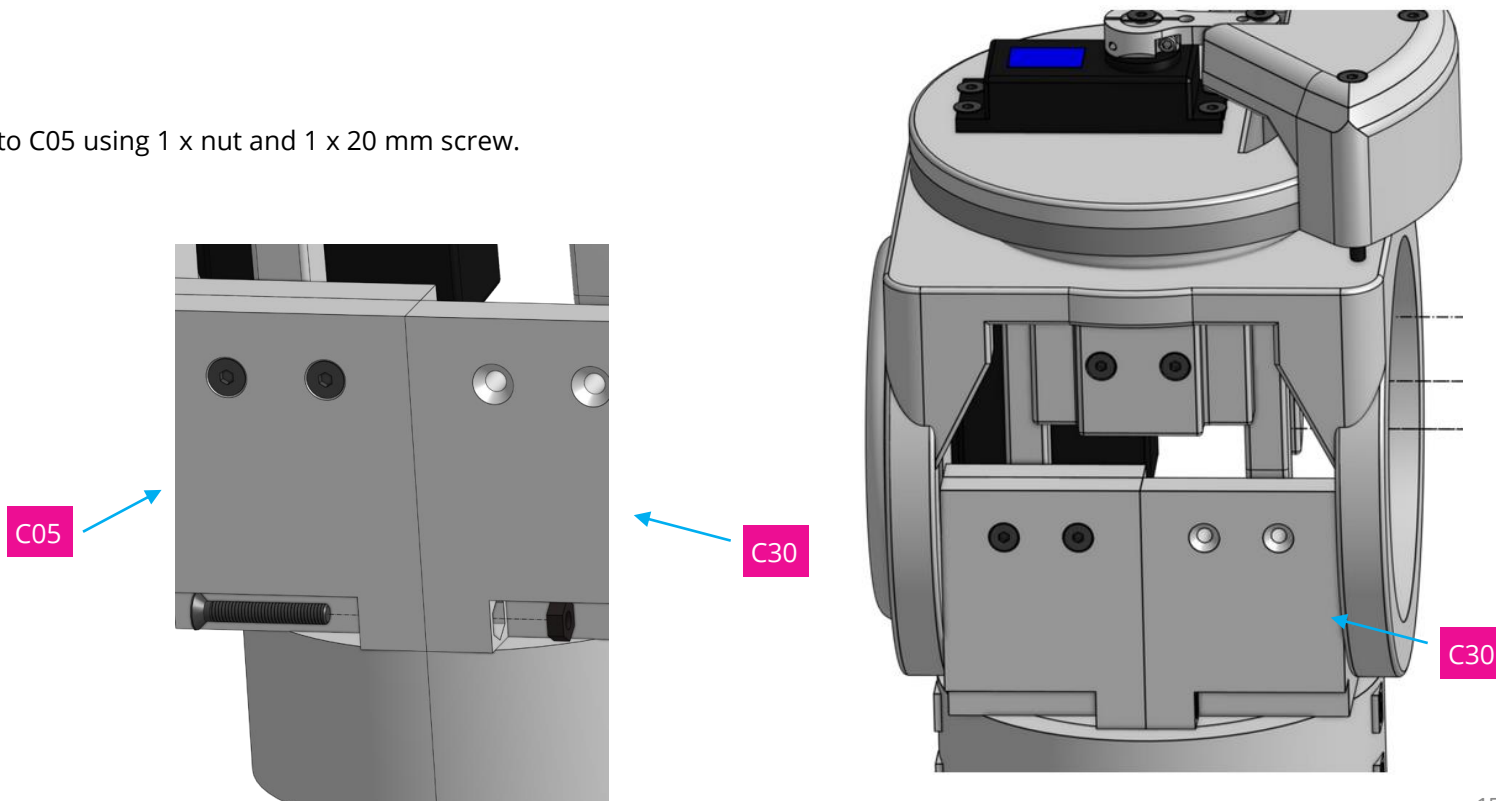
Fix the assembled C03-C05 with 2 x 16mm screws.



Step 11



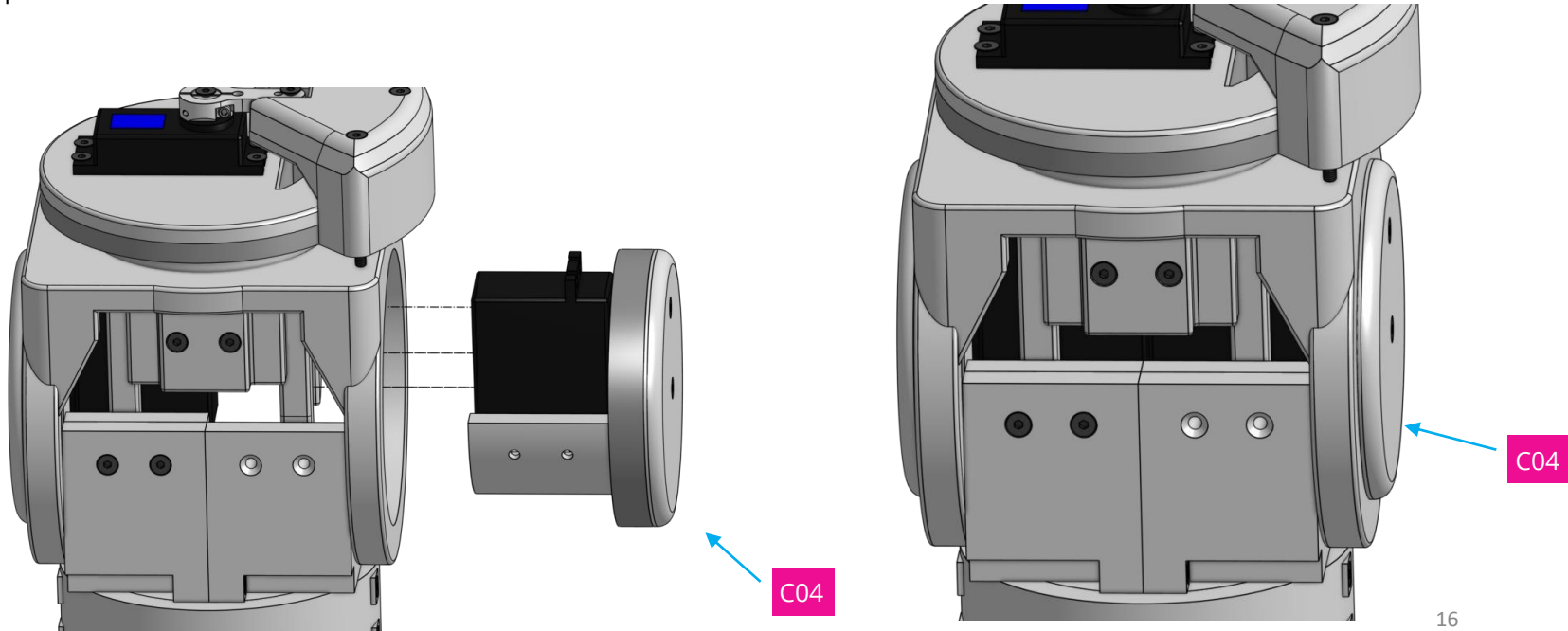
Connect C30 to C05 using 1 x nut and 1 x 20 mm screw.



Step 12



Repeat Step 6+7 with C04 to have an assembled C02 with shoulder rotators.

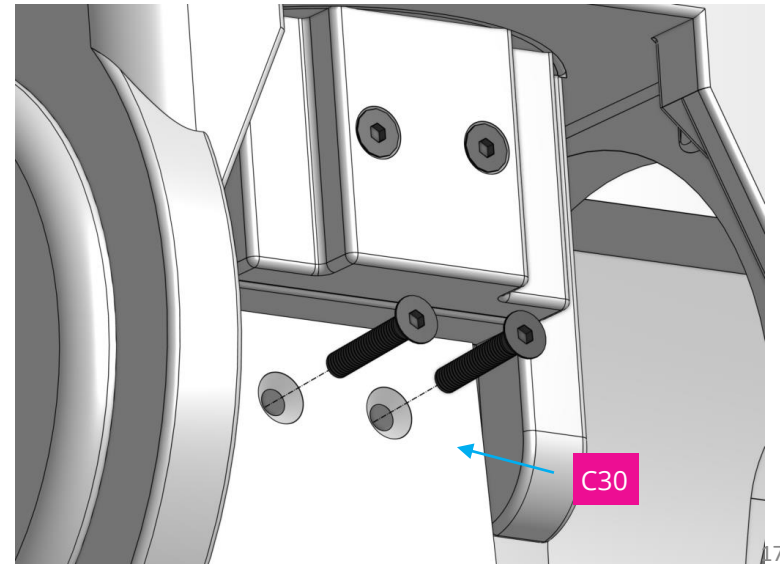
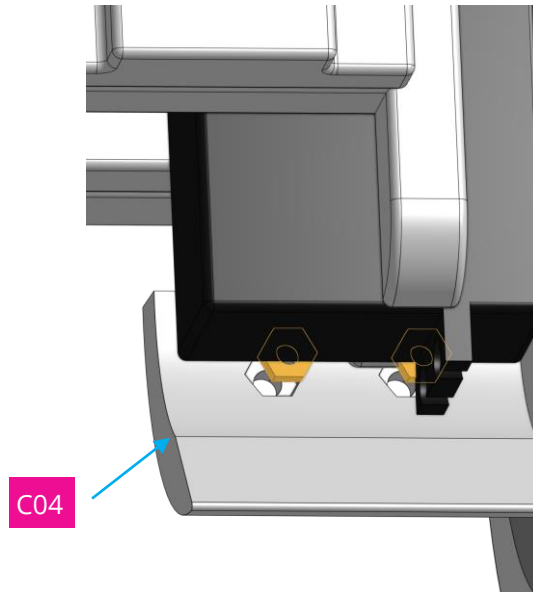


Step 13



Connect C30 to C04 using 2 x nuts and 2 x 16mm screws.

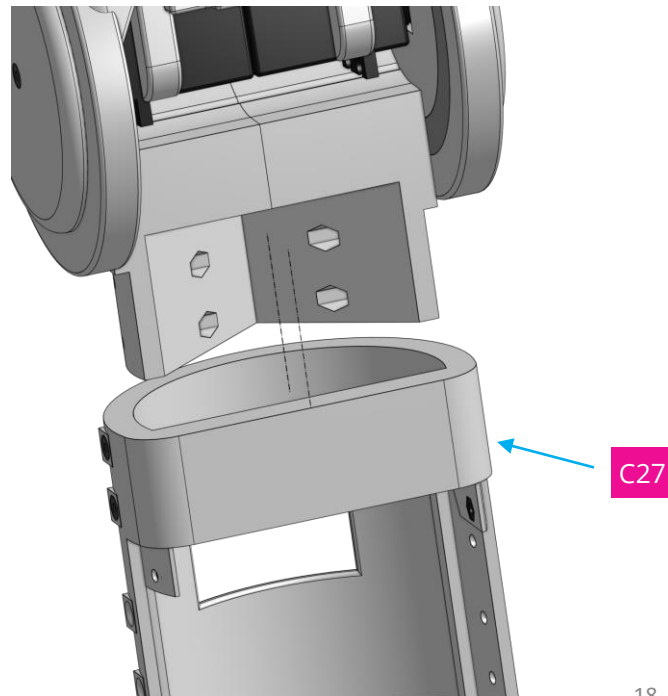
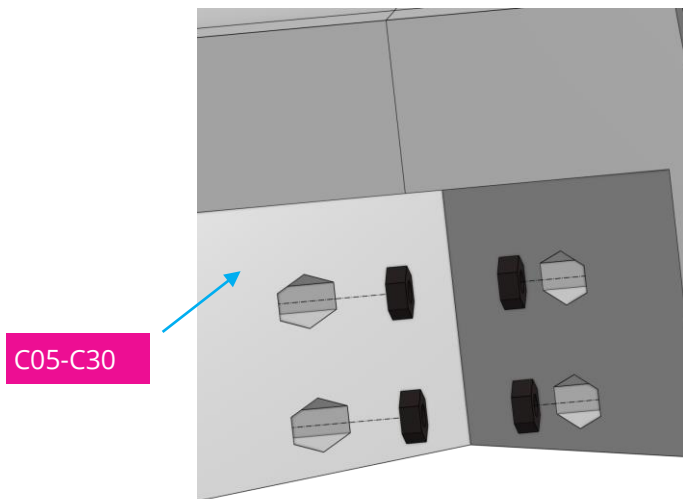
Please note: this step is a little bit tricky. You may need to use a small tool to get the nuts into the shown spots.



Step 14a



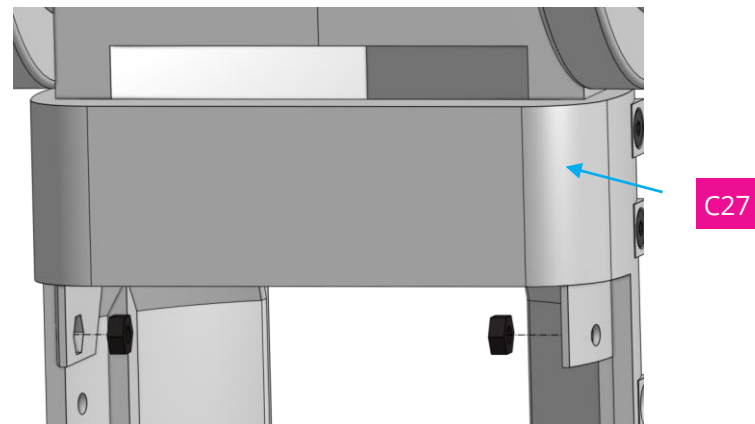
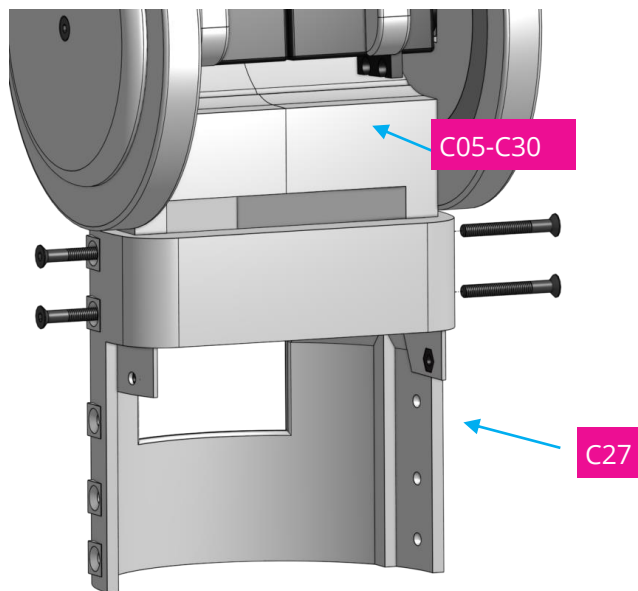
Attach C27 to C5_C30 using 4 x nuts and 4 x 25mm screws.



Step 14b



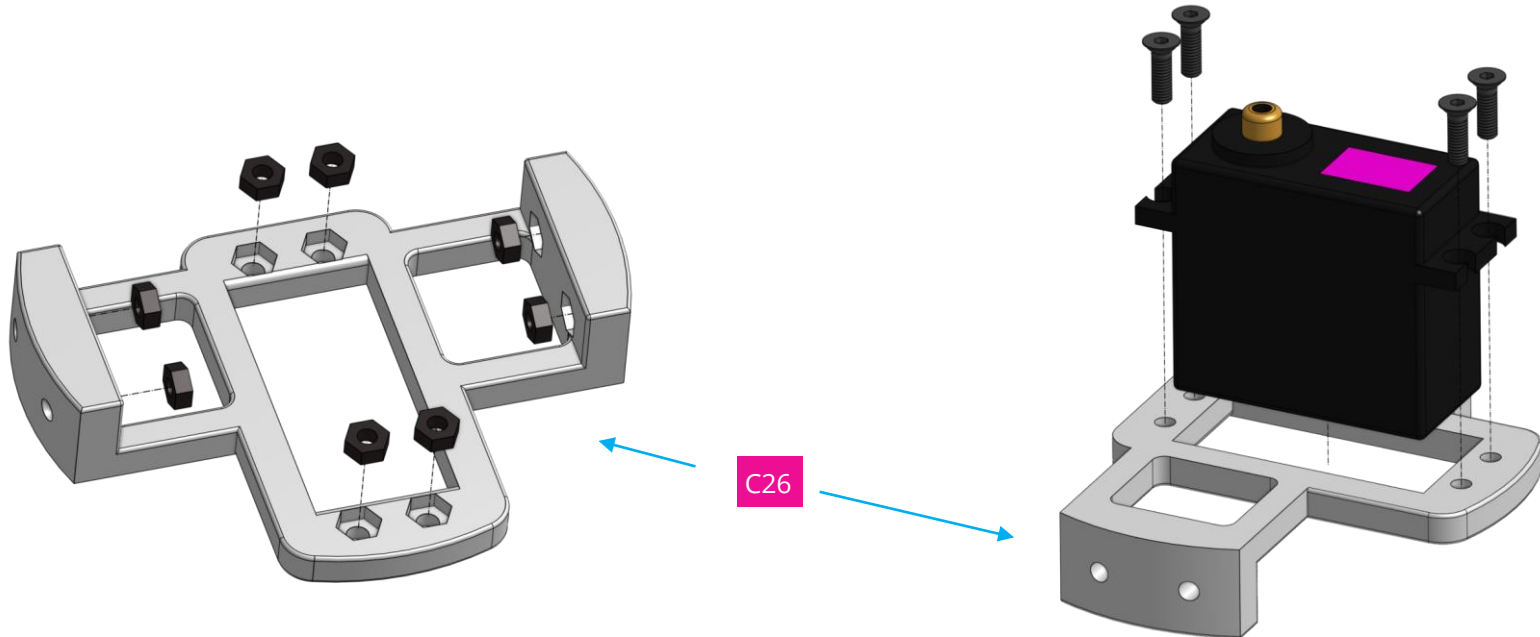
Attach C27 to C5_C30 using 4 x nuts and 4 x 25mm screws. Place then 2 x nuts in C27.



Step 15



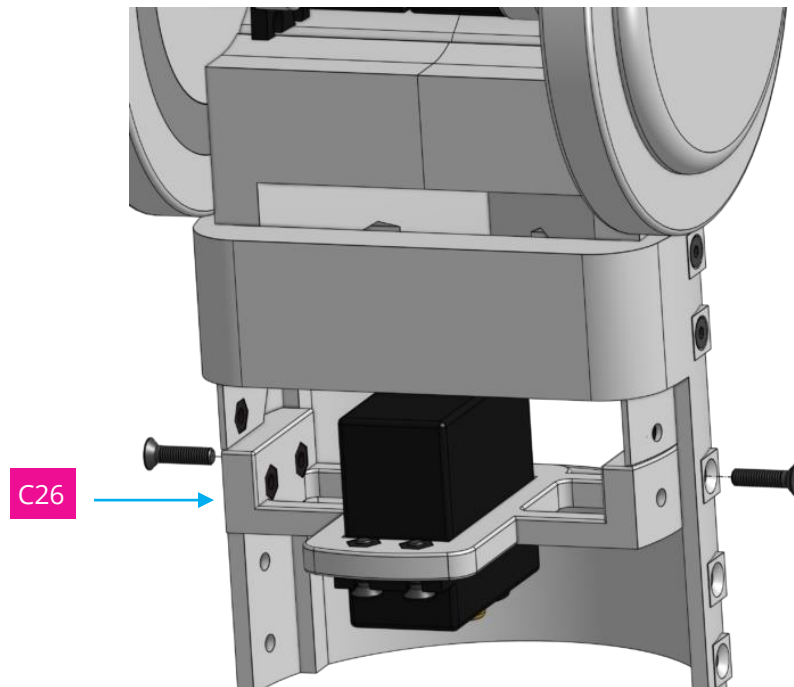
Connect 1 x E07 servo to C26 using 4 x nuts and 4 x 10mm screws. Add another 4 x nuts in the shown spots.



Step 16



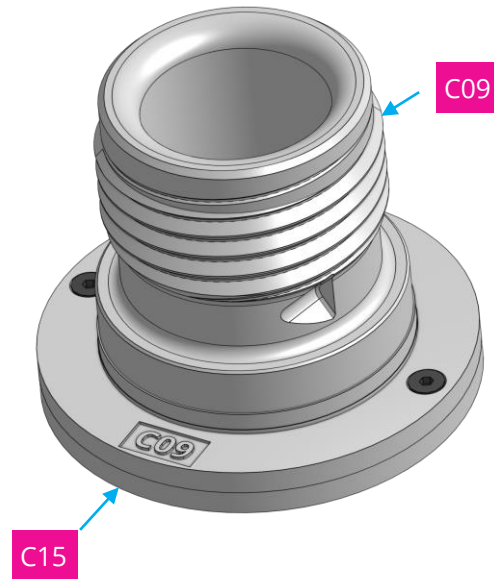
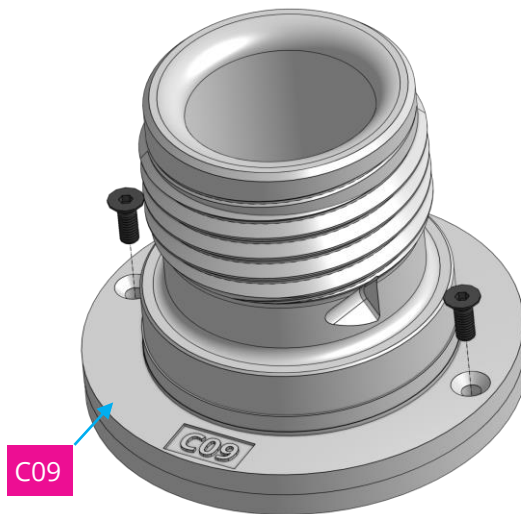
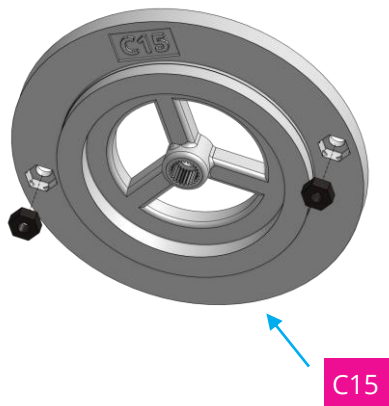
Connect C26 to the assembly using 2 x 12 mm screw in the shown spots.



Step 17



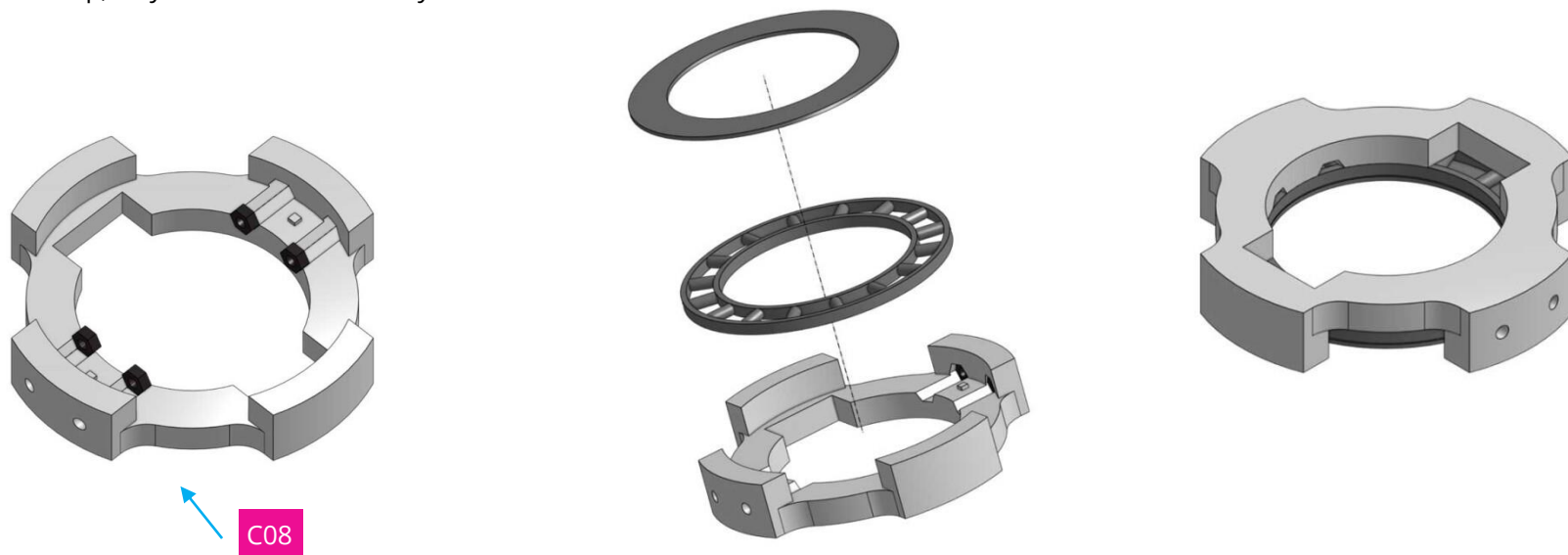
Place 2 x nuts in C15 and 2 x nuts in C09, then use 2 x 8mm screws to connect them.



Step 18



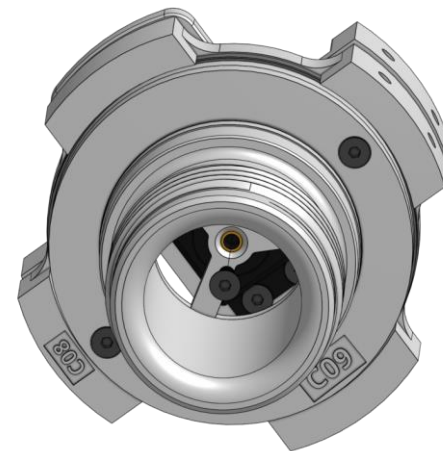
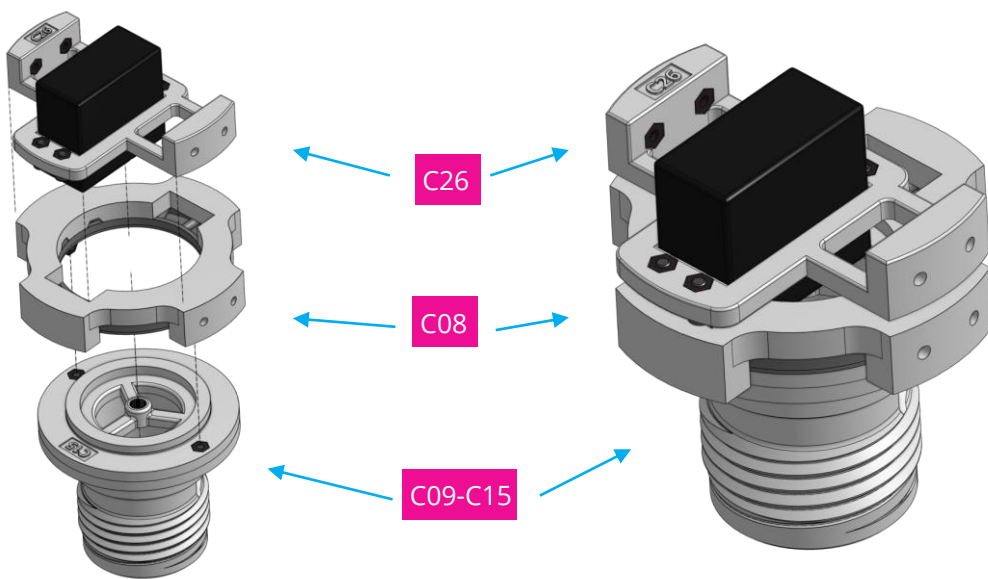
Place 4 x nuts in C08, then place M06 and M07 in the shown orientation inside C08.
Repeat this step, so you have this assembly twice.



Step 19



Connect C26 with C08 and C09-C15 using 1 x 10mm screw for assembling to the servo.
You may need to press everything together while doing this.

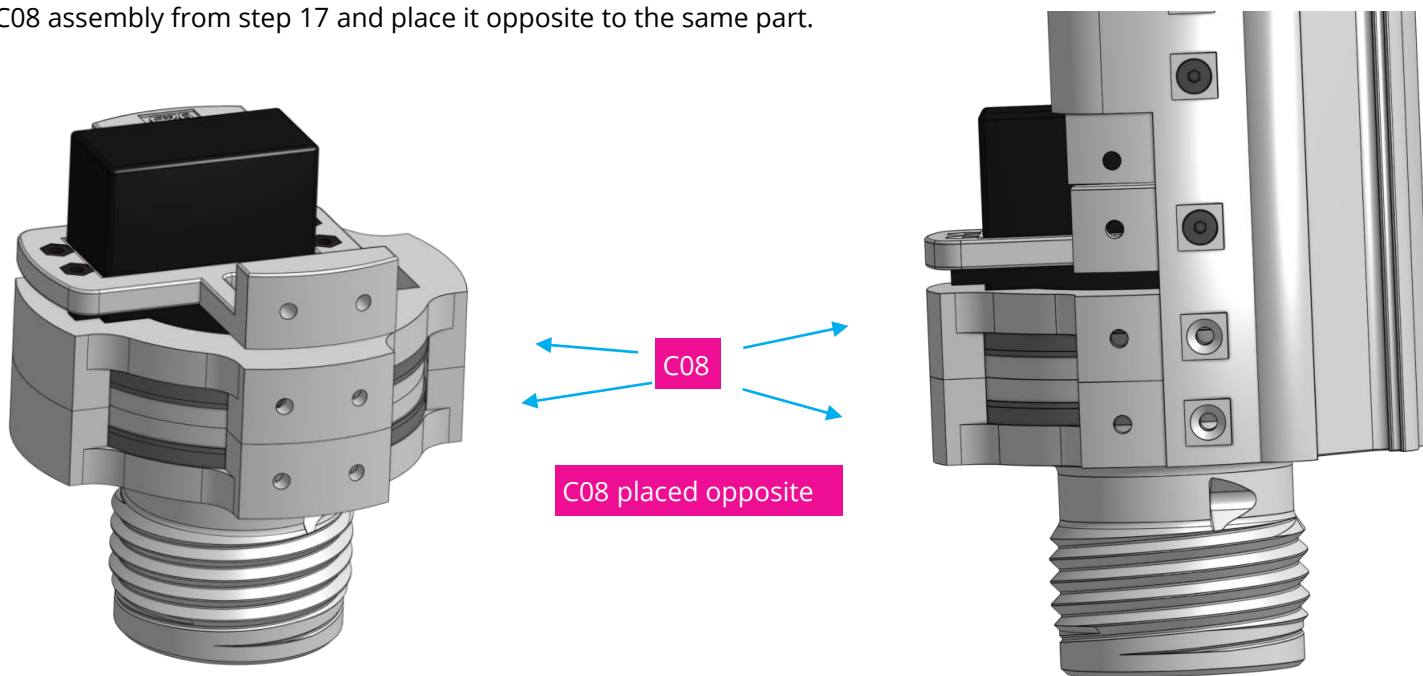


View from below

Step 20



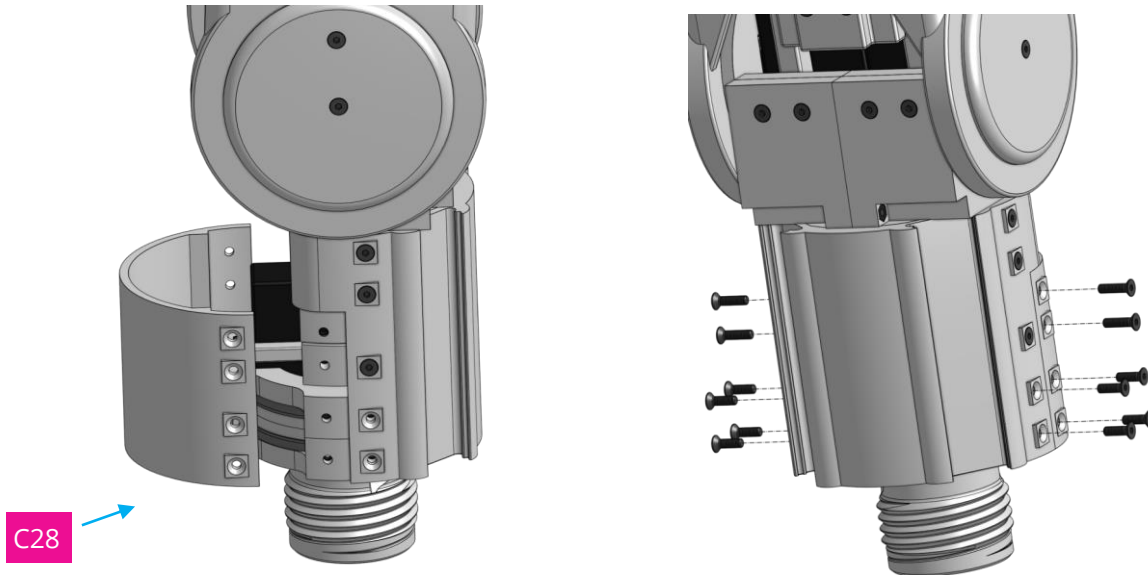
Use the second C08 assembly from step 17 and place it opposite to the same part.



Step 21



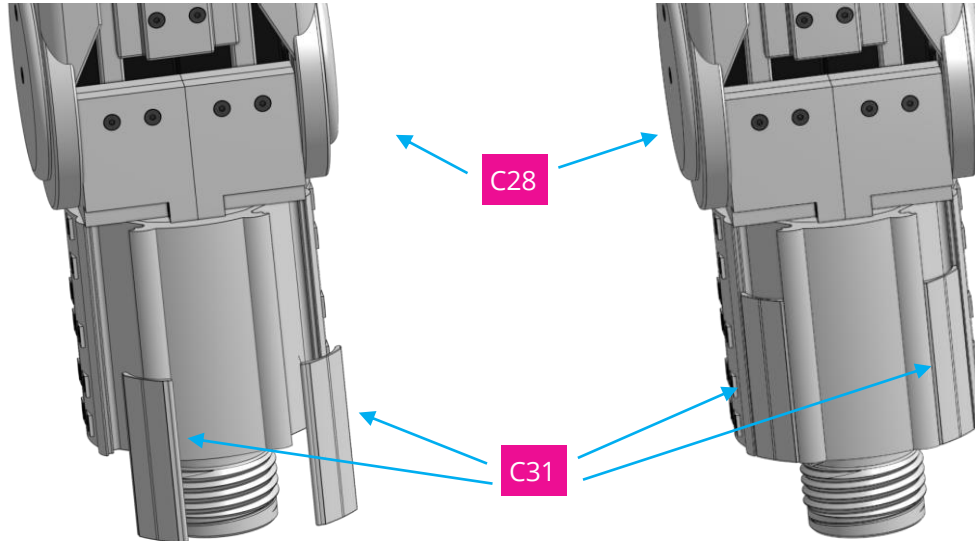
Attach C28 to the previous assembly using 8 x 10mm screws to the bottom and 6 x 12mm screws to the top.



Step 22



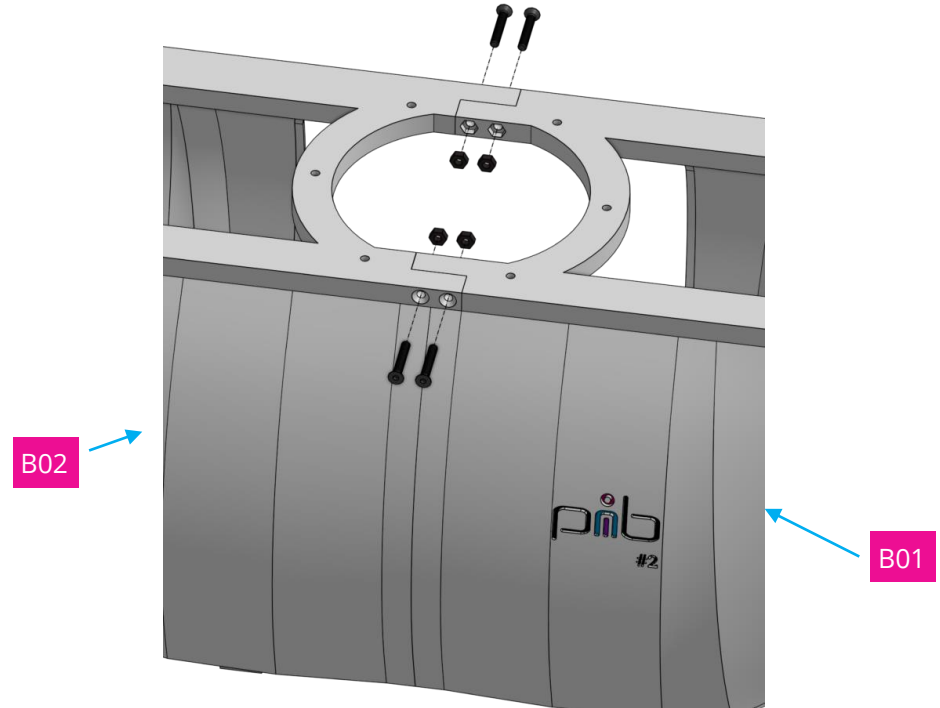
Add 2 x C31 to the assembly that will be used to encapsulate the teflon tubes later.



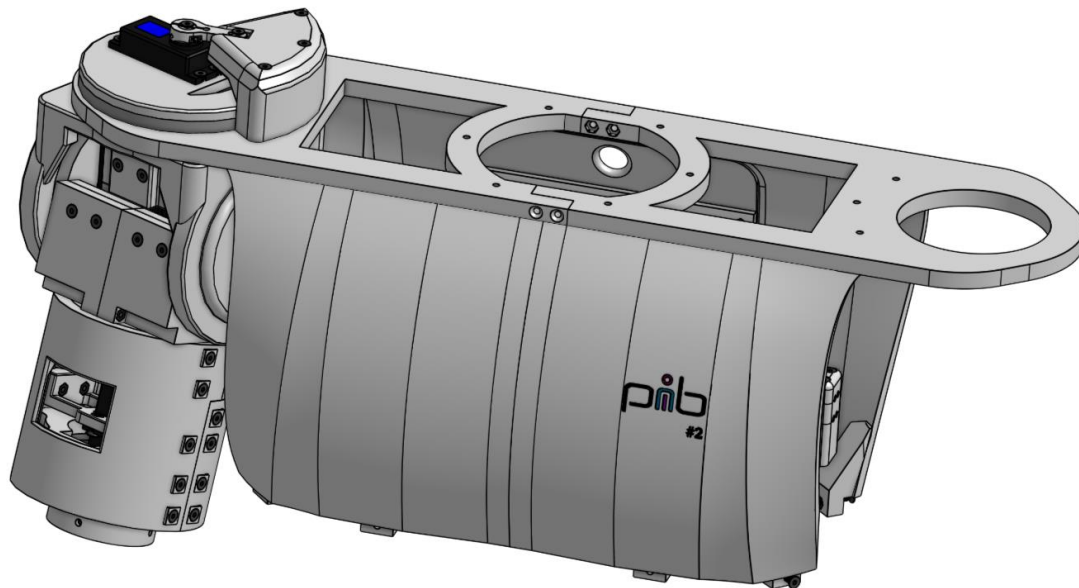
Step 23



Attach B01 to B02 using 4 x nuts and 4 x 20mm screws.



Congratulations



Congratulations, you did a great job, the shoulder joint is assembled!

Please repeat this tutorial for other shoulder if needed.

Do you need support?



Or do you need our pib.Box with all non-printable parts?

Or maybe you have some new ideas and improvements?

Please contact us.



team@pib.rocks

Send us an email.



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