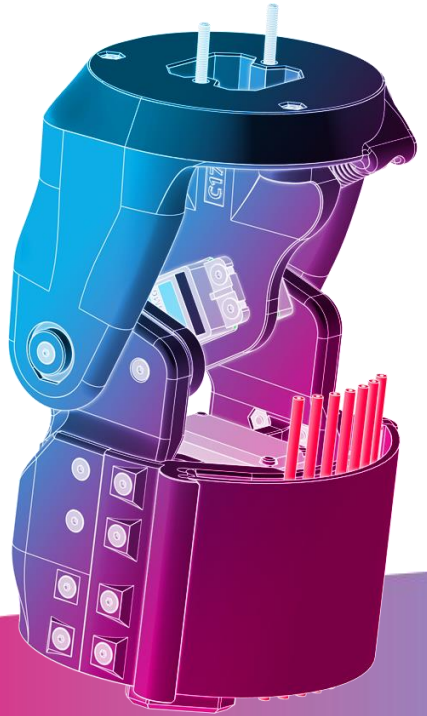
How to build your robot

www.pib.rocks/build

assembly instructions for:

ELBOW



You
Print
Build
Develop

your own robot!

Printable and pre-assembled parts

Pib´s elbow consists of **12 printable parts** and is assembled in **16 steps.**

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

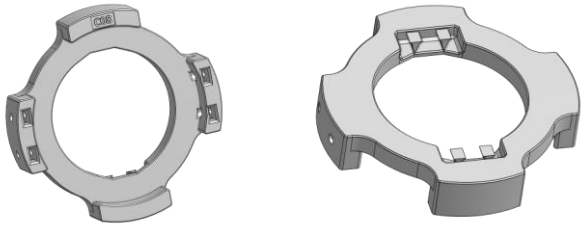
Please note: For better readability we use the abbreviations in the tutorial: C08 instead of C08-Central_rotator_bracket.

Printable parts
2 x **C08**-Central_rotator_bracket
C09-Central_rotator_connector
C10-Elbow
C11-Elbow_servo_scaffold
C12-Elbow_motor_connector
C13-Elbow_shell_lower_dorsal
C14-Elbow_shell_lower_medial
C15-Central_rotator_motor_connector
2 x **C16**-Elbow_joint_connector
C17-Elbow_motor_mount

Printable parts - Overview

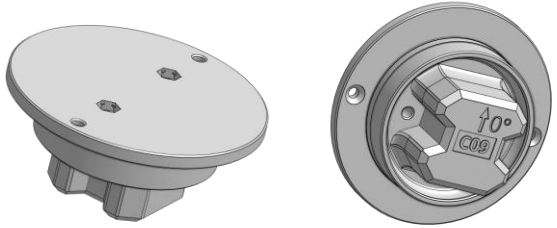
C10-Elbow

C08-Central_rotator_bracket



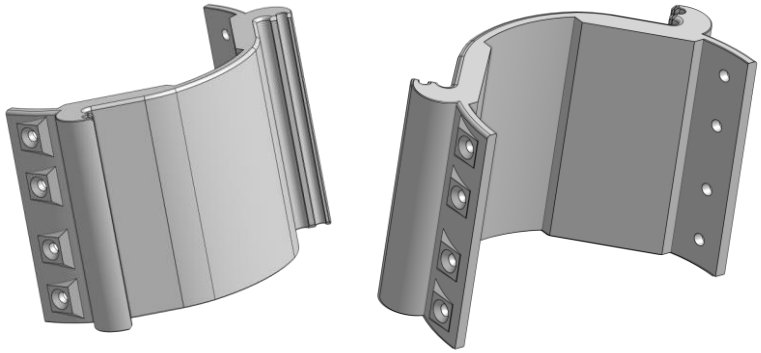
C15-Central_rotator_motor_connector

C09-Central_rotator_connector

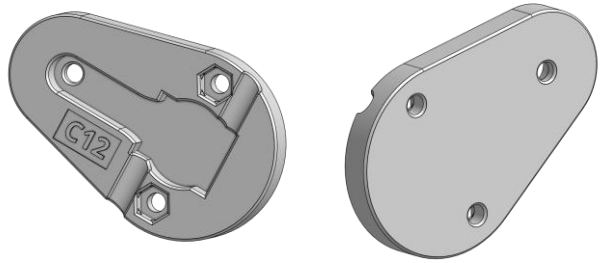


Printable parts - Overview

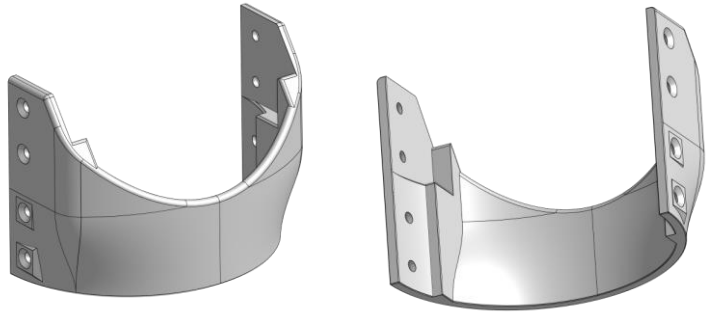
C13-Elbow_shell_lower_dorsal



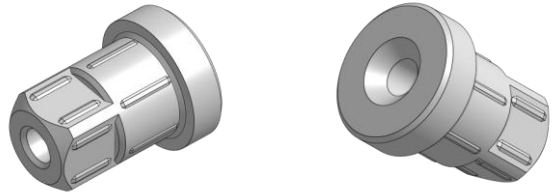
C12-Elbow_motor_connector



C14-Elbow_ shell_lower_medial

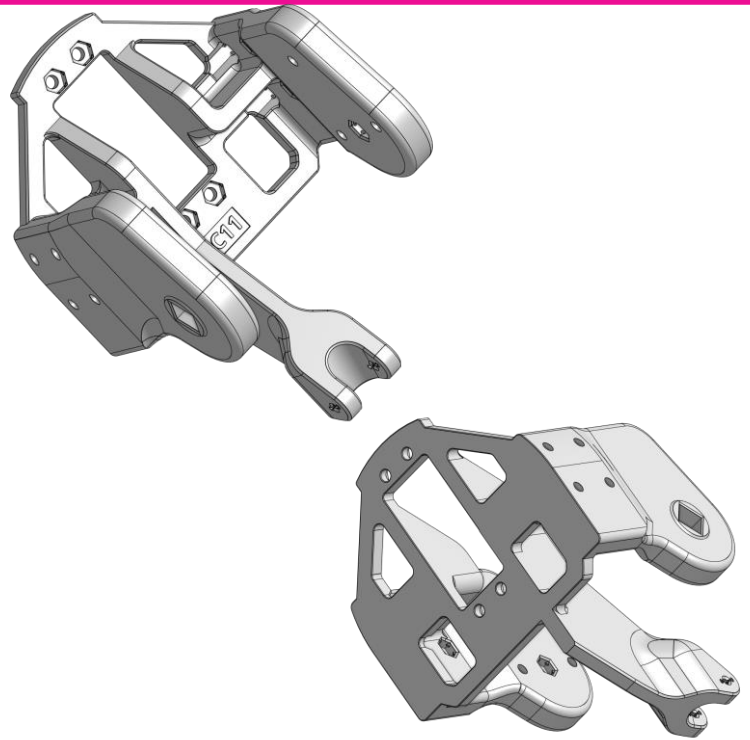


C16-Elbow_joint_connector



Printable parts - Overview

C11-Elbow_servo_scaffold



C17-Elbow_motor_mount

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
1 x **E07** MG996R Servo
1 x **E09** DS3225 Servo
1 x **M09** Motor_clamp
1 x **M15** Nylon-motor-connector

Non-printable parts
34 x **S01** M3 nuts
2 x **S03** M3 8 mm screws
17 x **S04** M3 10 mm screws
8 x **S05** M3 12 mm screws
3x **S05** M3 16 mm screws
4 x **S08** M3 20 mm screws
2 x **M08** 20 mm metal rods
2 x **M03** medium sized ballbearings **(**10 x 19 x 7mm)
2 x **M06** Ballbearing_Axial (70x50x3)
2 x **M07** Thrust_Bearing (70x50x1)
1 x **M12** T700 Spring

Build it better: our suggestion for assembling pib

We recommend **tools** for each step. These are a suggestion, you can of course also use other tools.

1-5

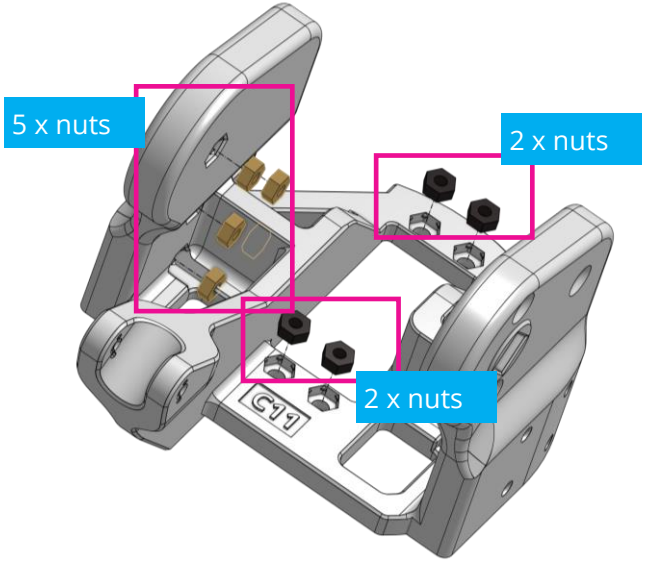
We have categorized each step according to its **difficulty** - from **1-5** (1 being the easiest, 5 the hardest)

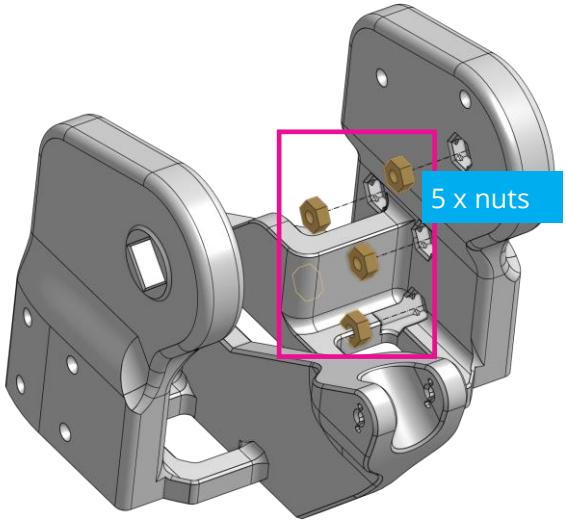
We also show you which **non-printable parts** you need for each step

Step 1

3 14x

Place **14 x nuts** in the shown spots in **C11**.

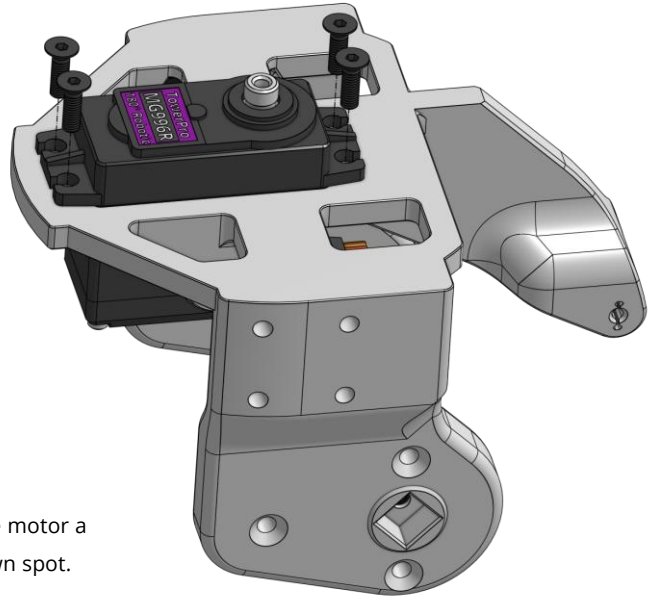




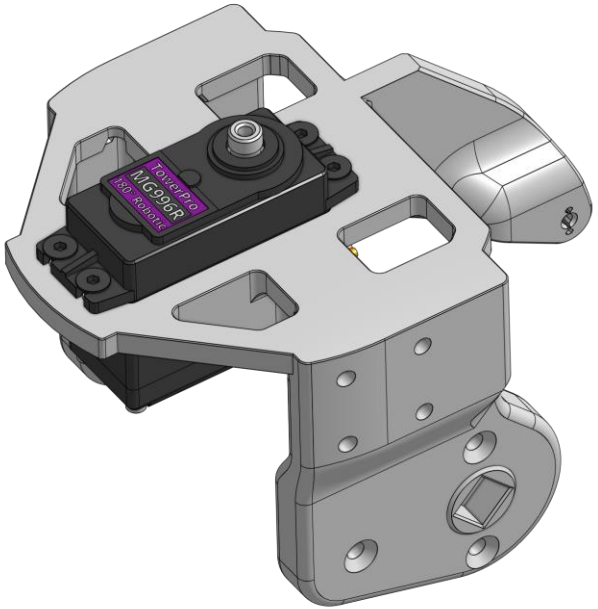
Our tip: use a small screwdriver or a precision tool to put the nuts into the holes and hit it gently with a hammer to place it correctly.

Step 2

Place **1 x E07** inside **C11** and use **4 x 10 mm** screws to hold it.



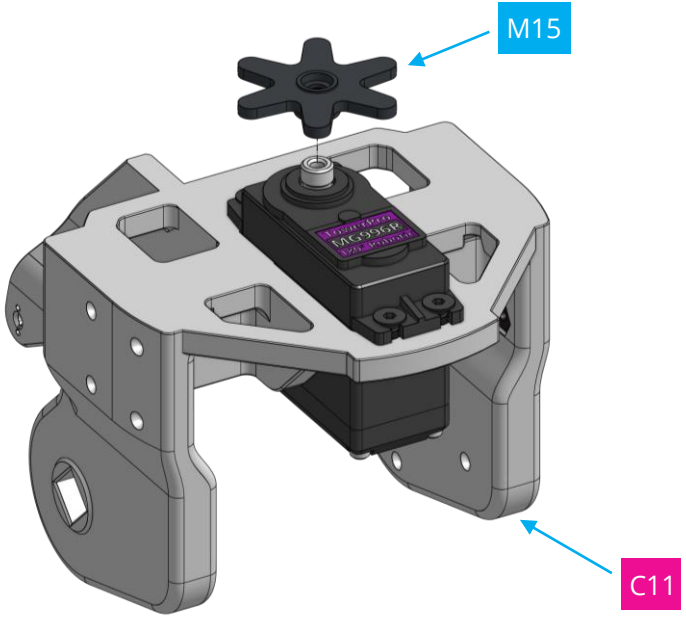
Pull the cable first, then tilt the motor a little bit to put in into the shown spot. You may apply some gently force.



Step 3a

1 1x

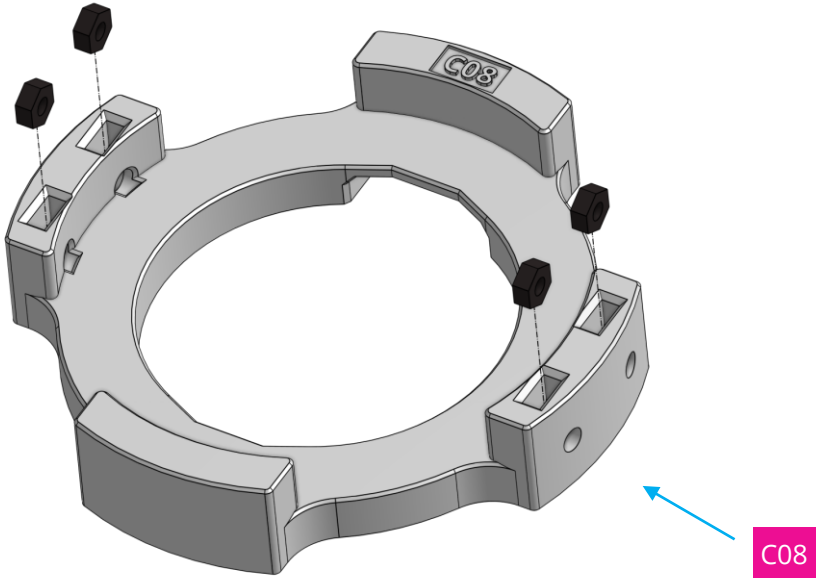
Connect **M15** to **E07.**



Step 3b

2 4x

Insert **4 x nuts** in the shown spot of **C08**.

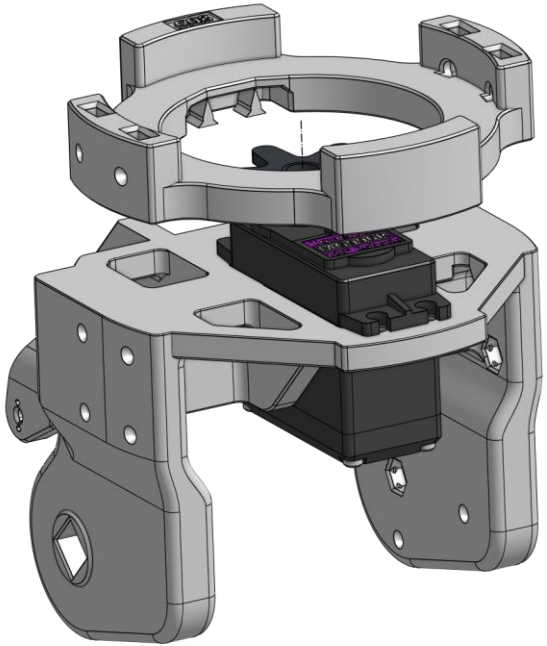


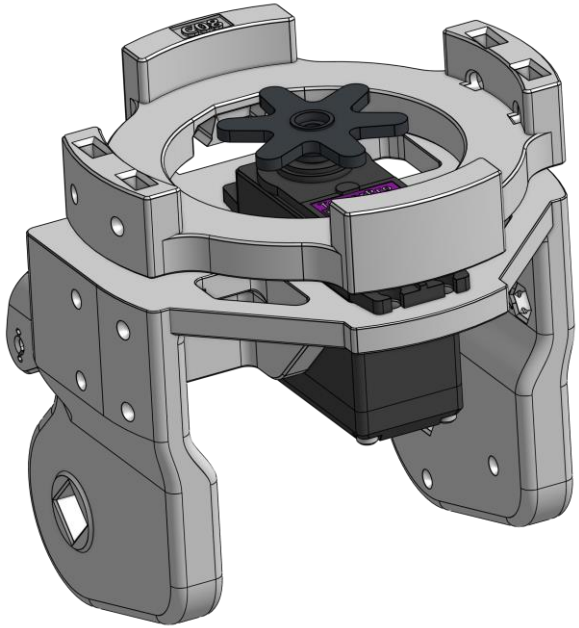
Our tip: use a small screwdriver or a precision tool to put the nuts into the holes and hit it gently with a hammer to place it correctly.

Step 3c

1

Place **C08** on top of **C11.**

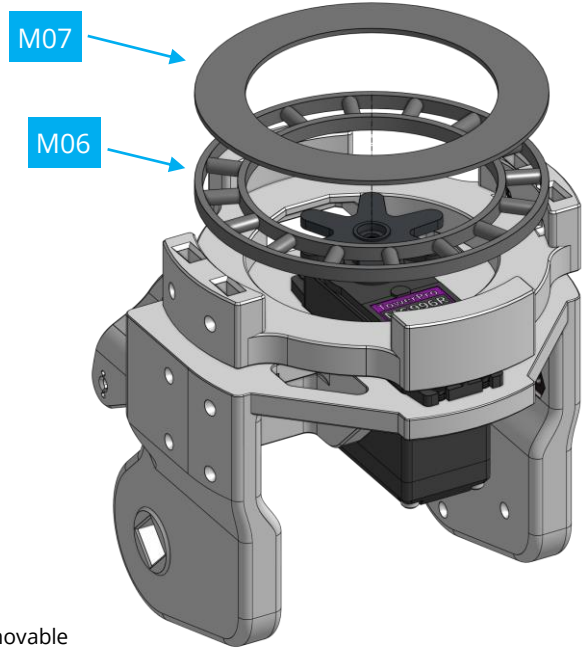


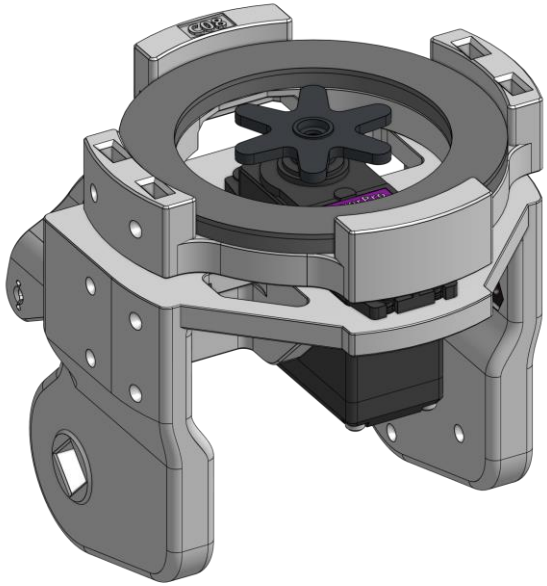


Step 3d

1 1x 1x

Place **M06** and then **M07** on top of **C08**.





Please make sure, that the small movable pieces in M06 face towards M07.

Step 4a

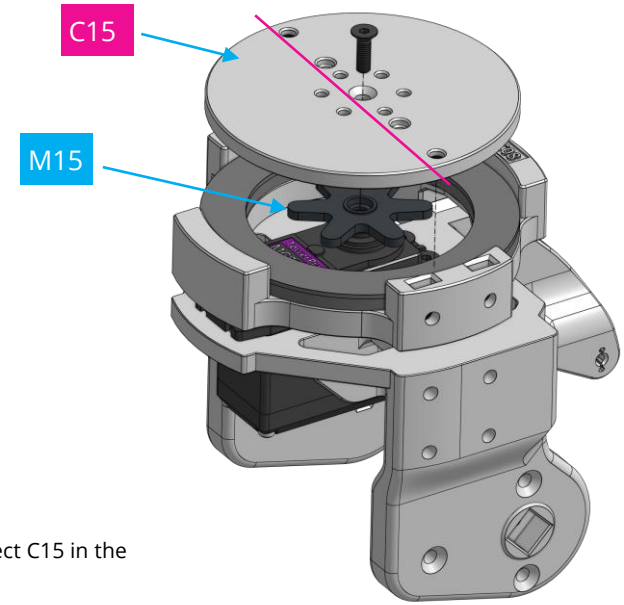
1 2x

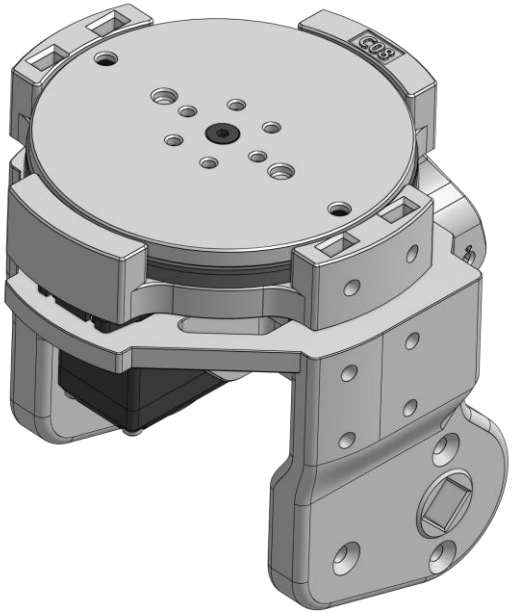
Insert **2 x nuts** in **C15.**

Step 4b

1 1x

Flip **C15** and connect it to **M15** using **1 x 10mm screw**.





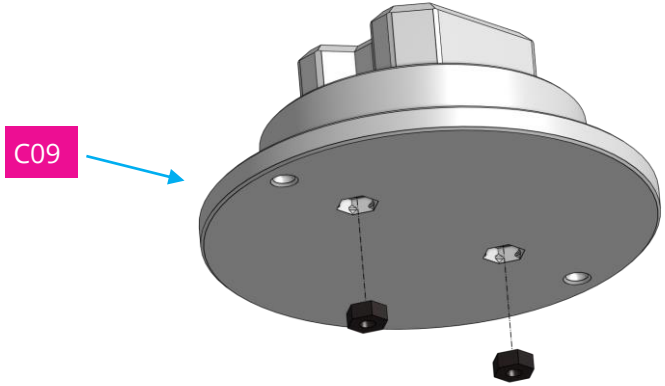
Please make sure, that you connect C15 in the shown orientation.

Step 5

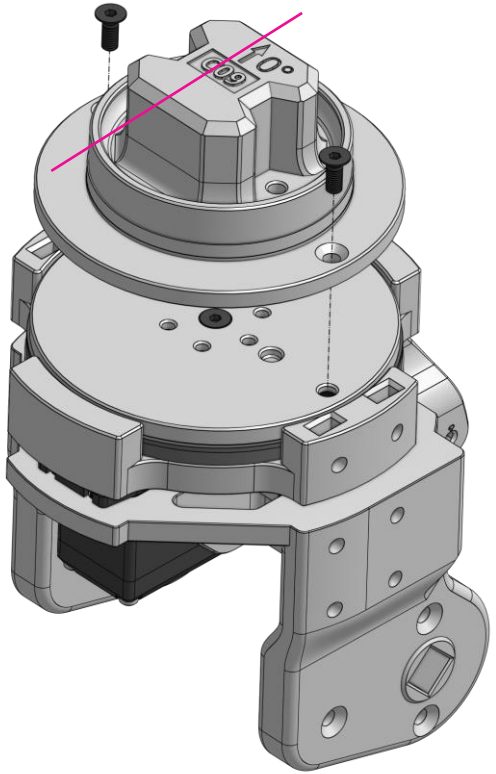
1 2x 2x

Insert **2 x nuts** in **C09**.

Connect **C09 to C15** using **2 x 8 mm screws**.



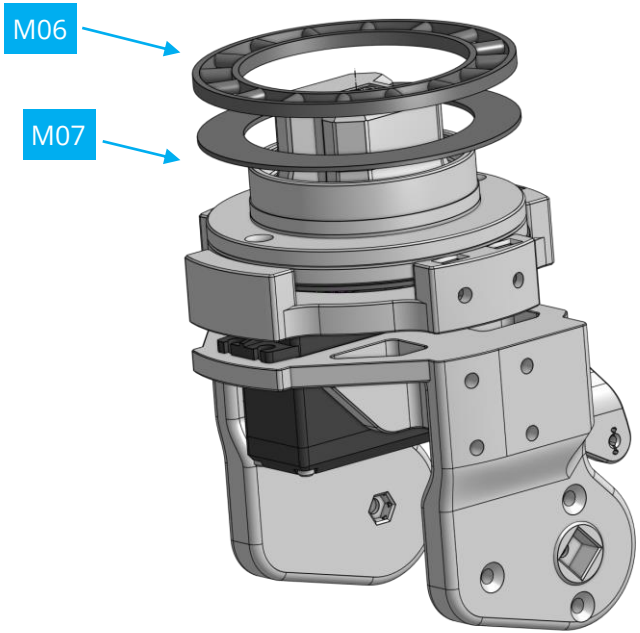
Please make sure, that you connect C09 to C15
in the shown orientation.

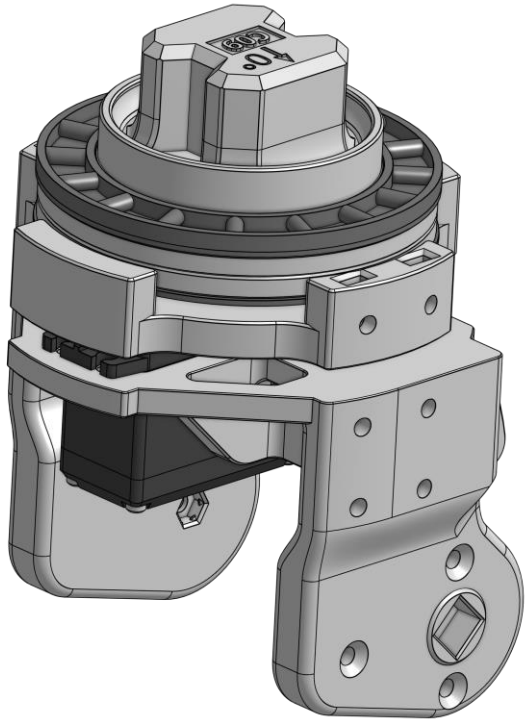


Step 6a

1 1x 1x

Place **M07** and **M06** on top of **C09.**





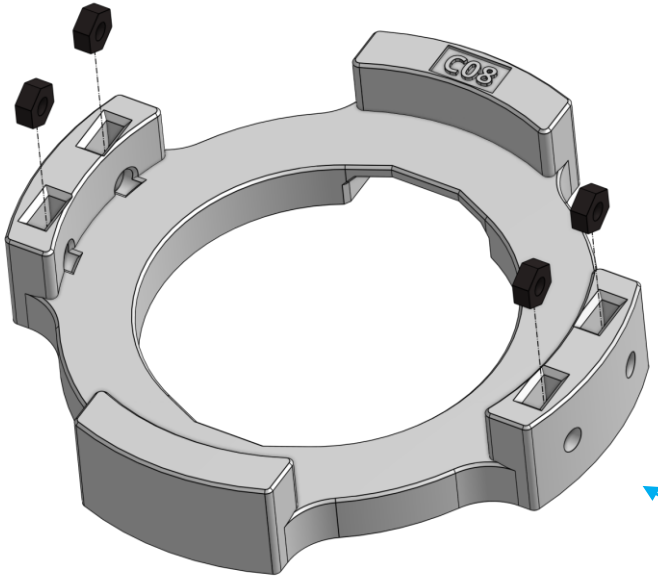
Please make sure, that the small movable pieces in M06 face towards M07.

Step 6b

2 4x

Insert **4 x nuts** in the shown spot of **C08**.

(This step is identical to step 3b – we need the part C08 twice in pib´s elbow.)

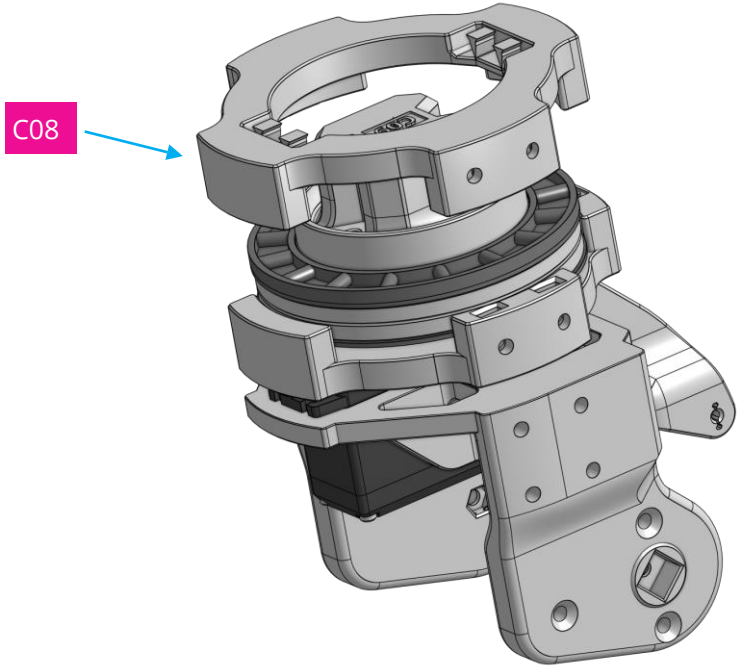


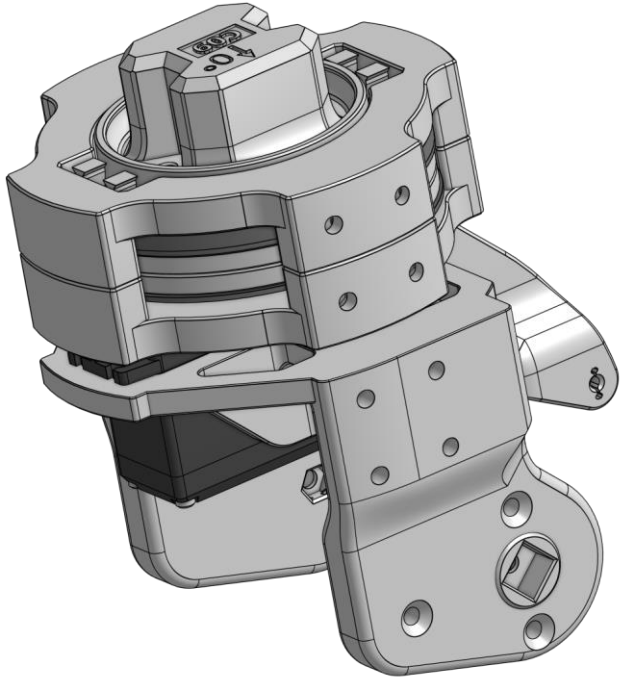
Our tip: use a small screwdriver or a precision tool to put the nuts into the holes and hit it gently with a hammer to place it correctly.

Step 6c

1

Flip **C08** and put it on top of the assembly.

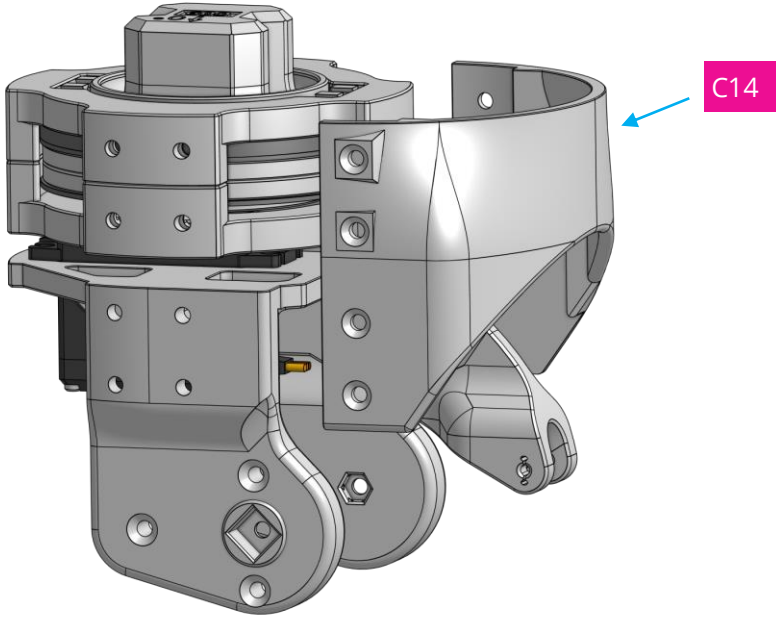


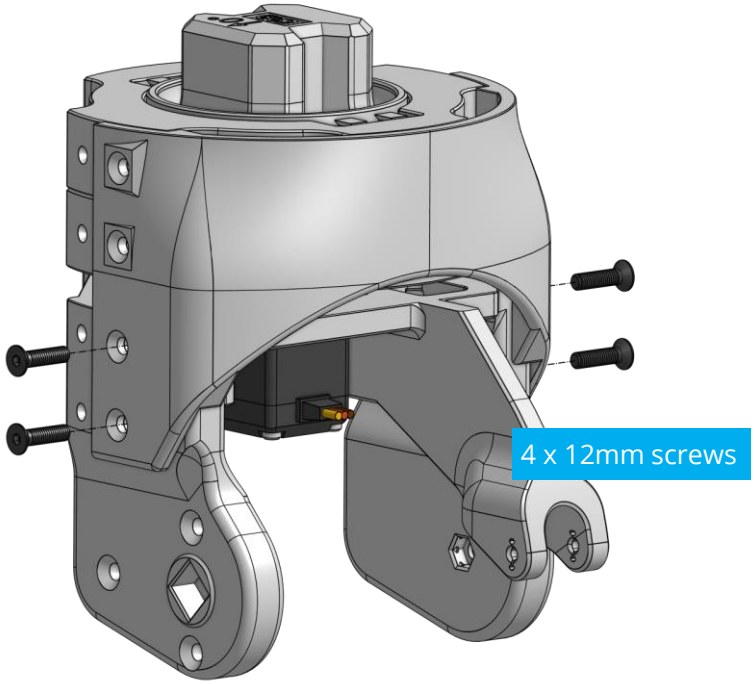


Step 7a

1 4x

Use **4 x 12 mm screws** (for the lower 4 holes of C14) to connect **C14** to the assembly.



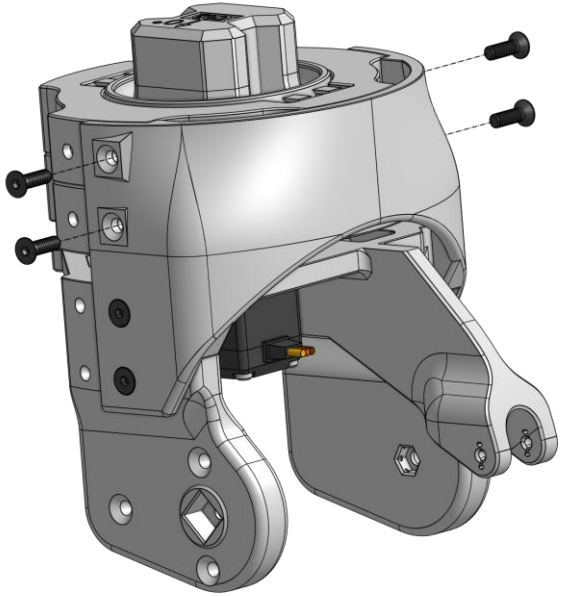


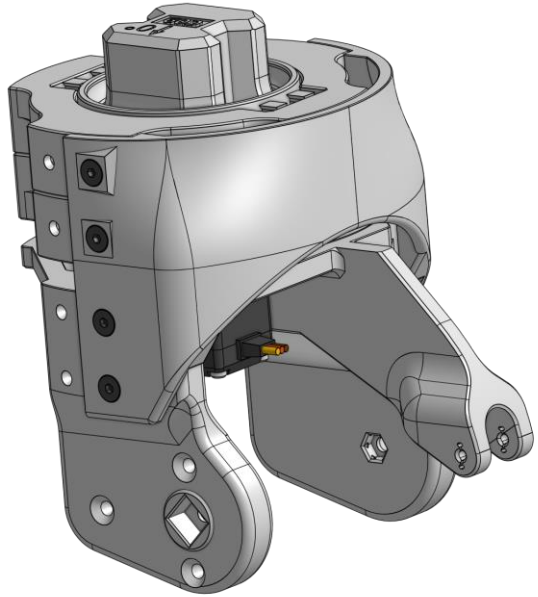
Step 7b

1 4x

Use **4 x 10 mm screws** (for the upper 4 holes of C14) to connect **C14** to the assembly.

4 x 10mm screws

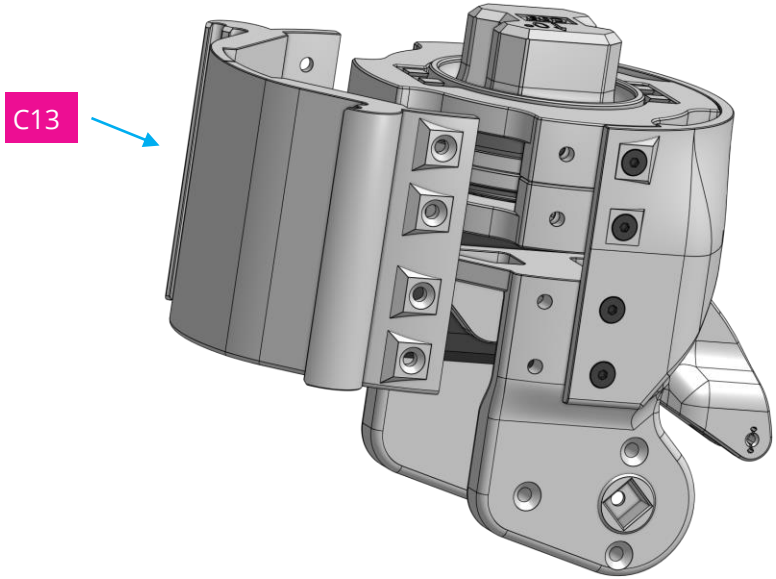


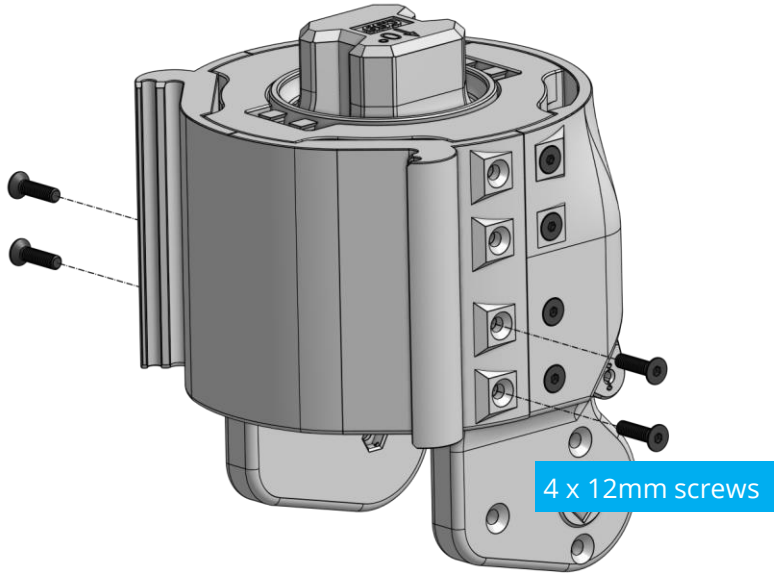


Step 8a

1 4x

Use **4 x 12 mm screws** (for the upper 4 holes of C13) to connect **C13** to the assembly.

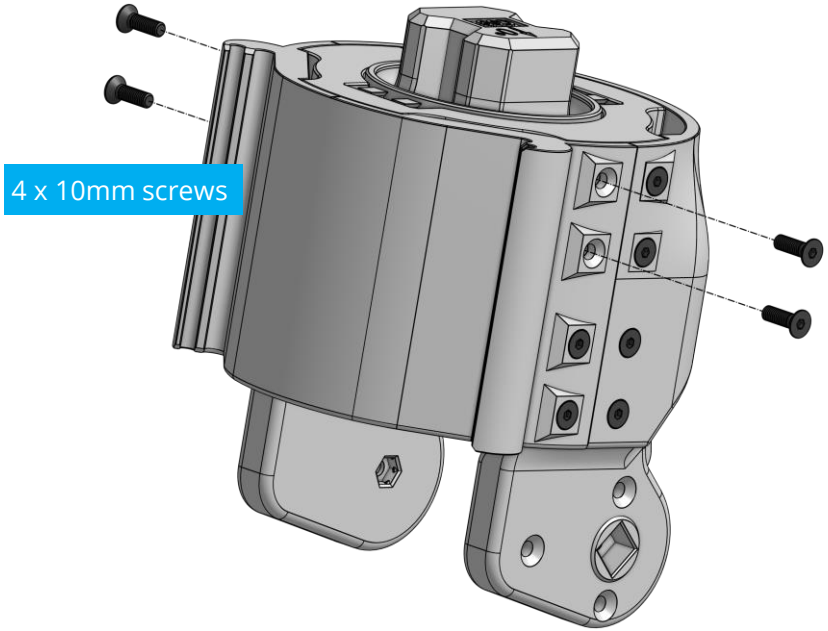


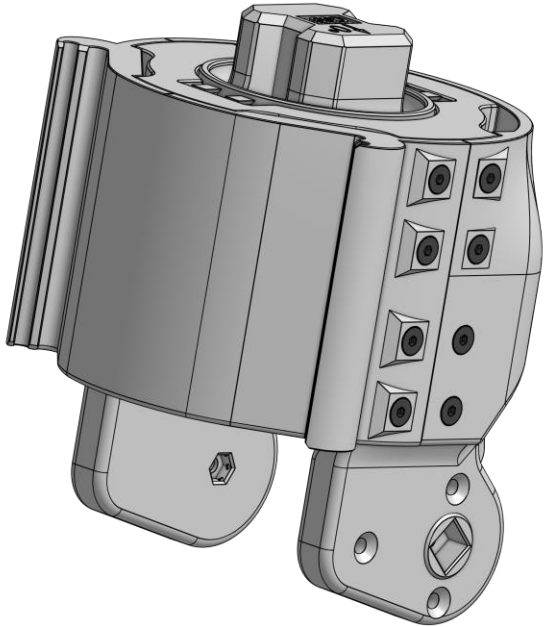


Step 8b

1 4x

Use **4 x 10 mm screws** (for the upper 4 holes of C13) to connect **C13** to the assembly.



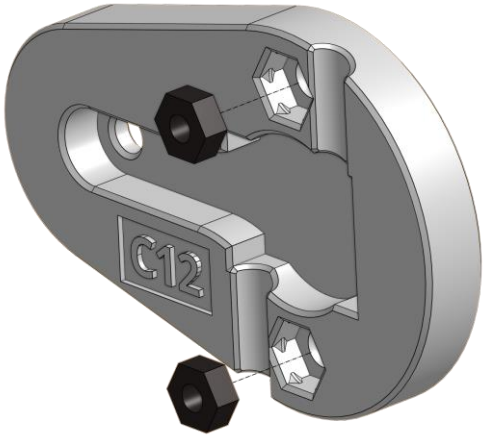


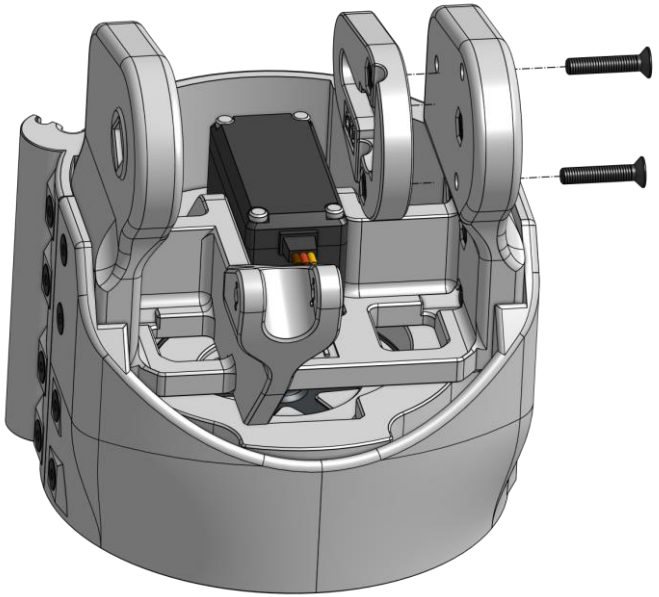
Step 9

1 2x 2x

Place **2 x nuts** in **C12.**

Flip the previous assembly and then connect **C12 to C11** using **2 x 16 mm screws.**

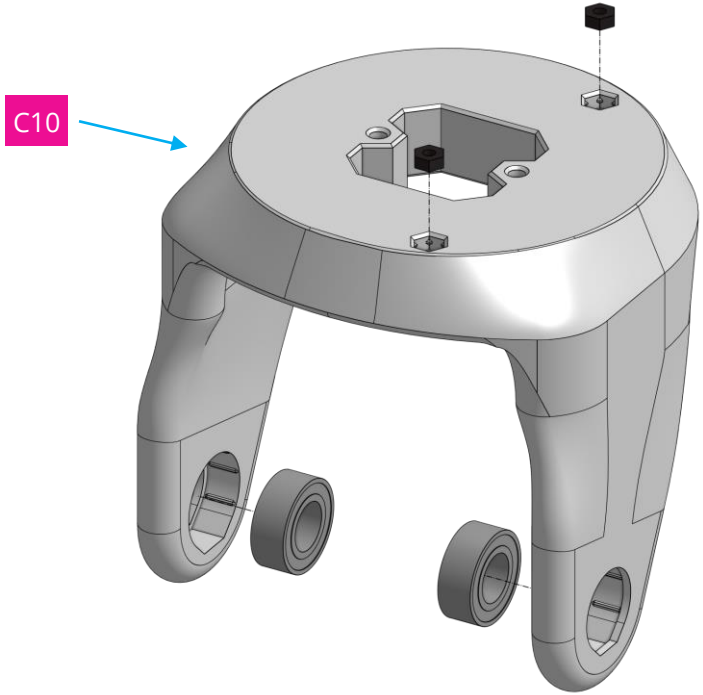




Step 10

1 2x 2x

Insert **2 x nuts** and **2 x M03 ball bearings** in the shown spots in **C10**.

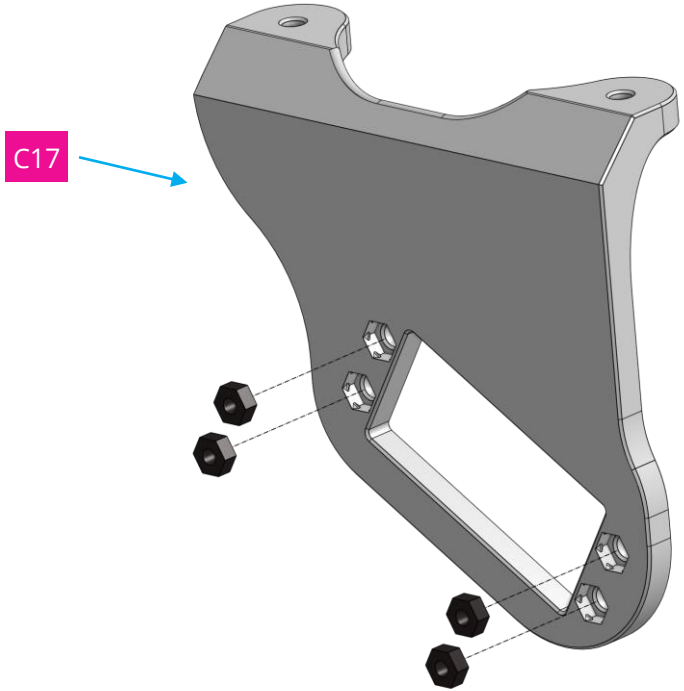


You may need to apply gentle force to put the ballbearings in the shown spots.

Step 11a

1 4x

Insert **4 x nuts** in **C17**.



Step 11b

2 4x 1x

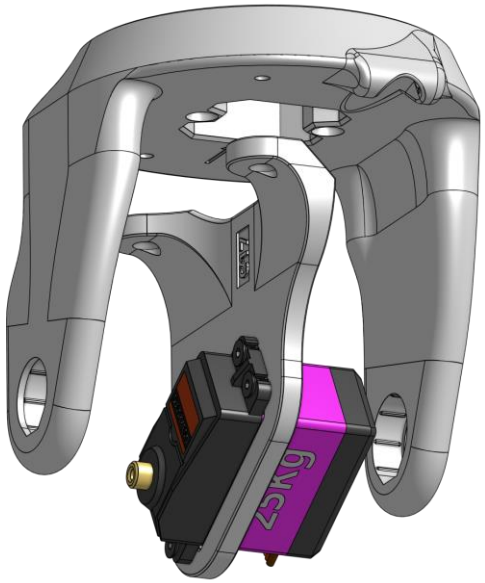
Place **1 x E09 servo** in the shown spot of **C17** and fix it using **4 x 10 mm screws**.

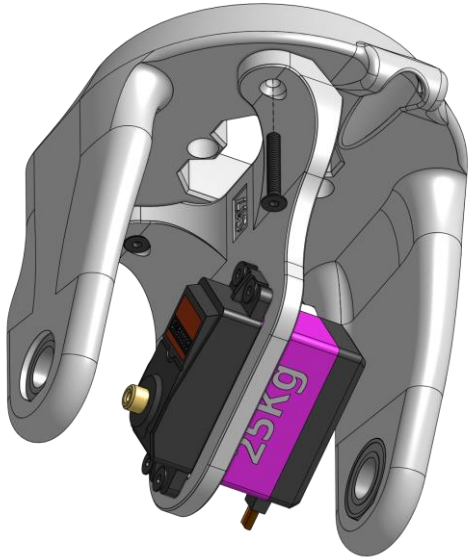
Pull the cable first, then tilt the motor a little bit to put in into the shown spot.
You may apply some gently force.

Step 12

2 2x

Connect **C17 to C10** with **2 x 20 mm screws**.

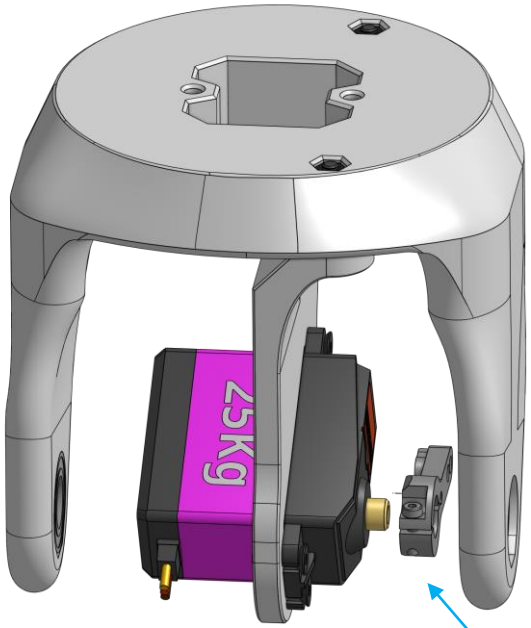




Step 13

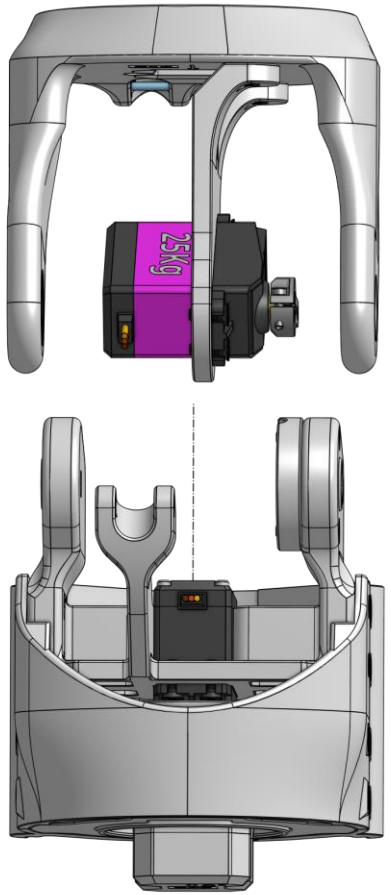
2 1x

Attach **1 x M09 motorclamp** to the E09 servo and tighten it using the 2 small screws in the clamp.



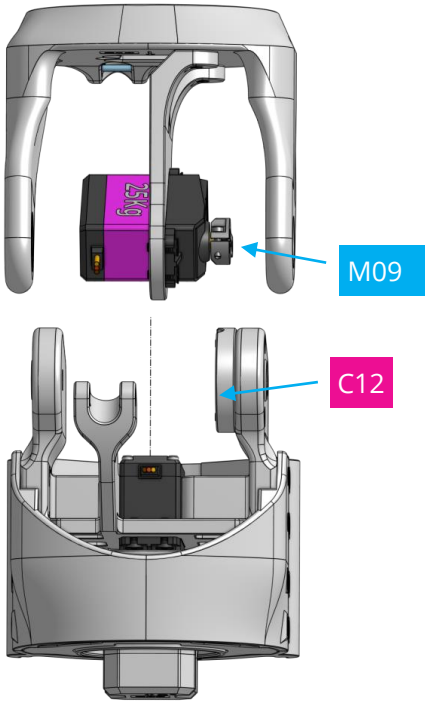
Step 14 - note

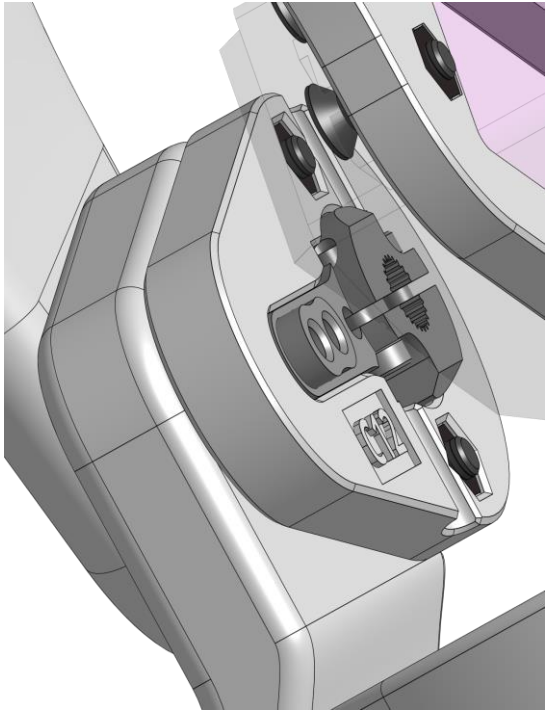
Now we can connect both previous assemblies together.



Step 14a

Connect the lower part of the elbow to the upper part of the elbow by sliding **M09 motorclamp** into **C12**.



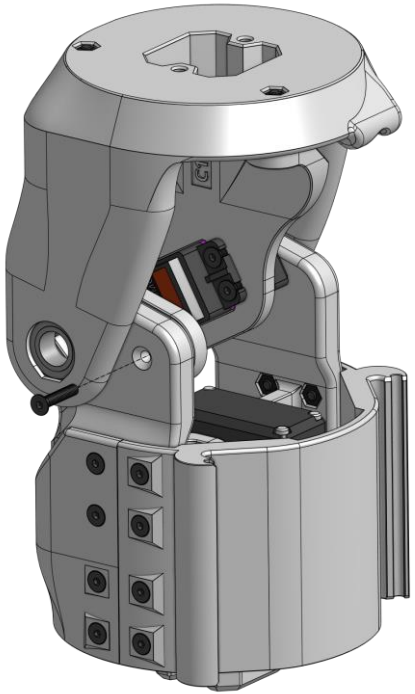


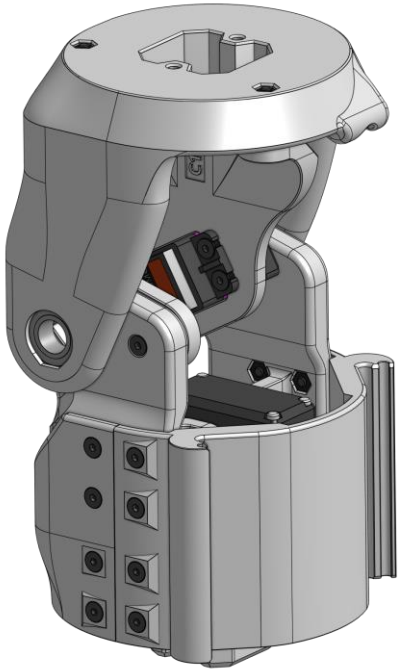
Please note: the motor is hidden in the second picture for better visibility.
You may need to apply some gentle force to put M09 into C12.

Step 14b

1 1x

Connect **C12 and C11** by using **1 x 16mm screw**.

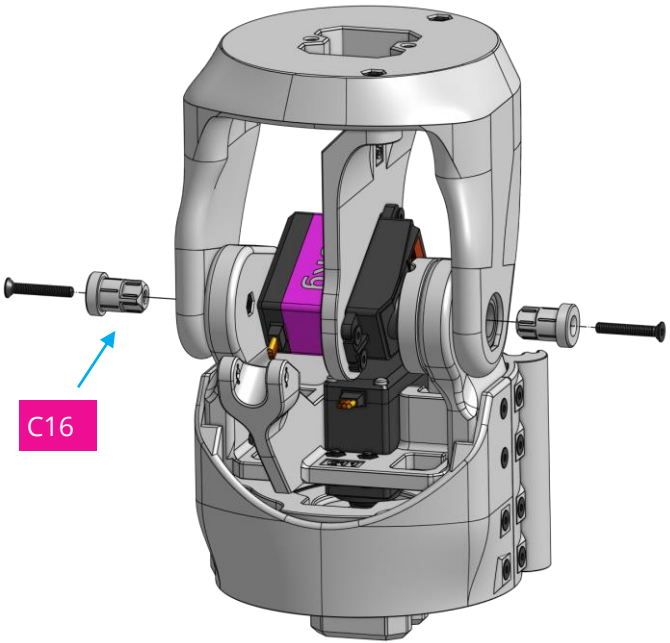


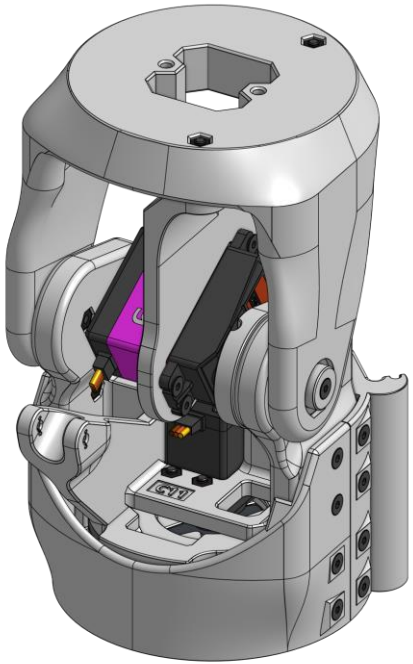


Step 15

2 2x

Use **2 x C16** and **2 x 20mm screws** to connect the lower and upper part of the elbow.

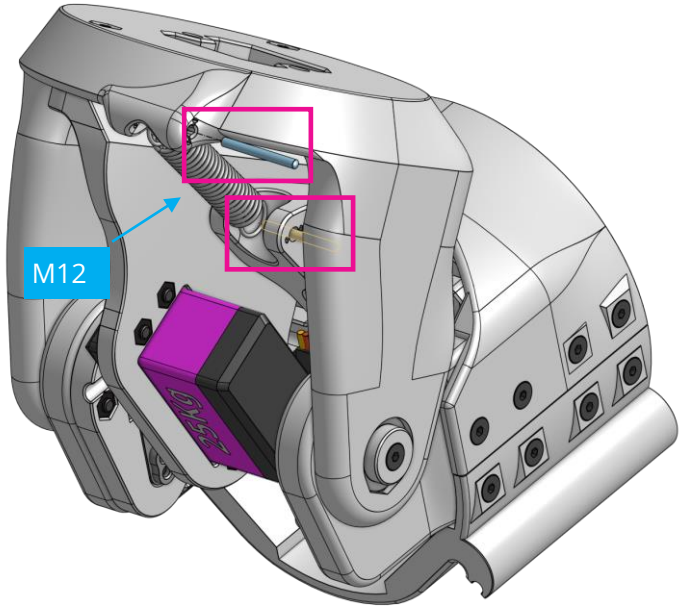


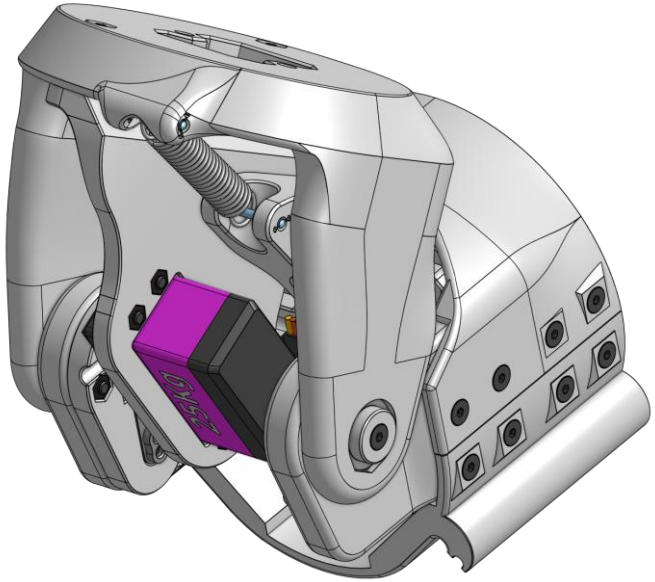


Step 16

2 2x 1x

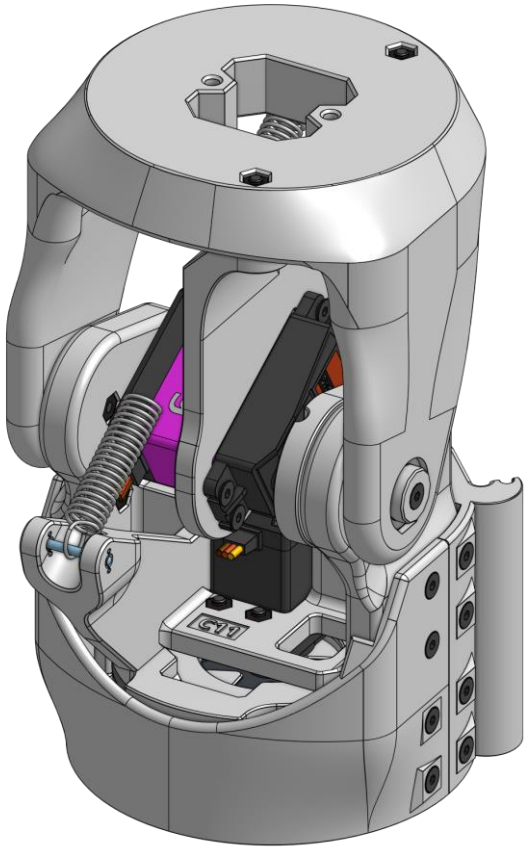
Attach **1 x M12 spring** to C10 and C11 and use **2 x M08 rods** to fix it.





Congratulations

You did a great job, pib´s elbow is assembled!



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