pib

How to build your robot

www.pib.rocks/build

assembly instructions for:
UPPER BODY
v2024

Printable parts

Printable parts
4 x **B48**-Hinge
2 x **B49**-Hinge_Plate
B51-Servo_Array_Scaffold
2 x **B52**-Tube_Holder_Side
B53-Tube_Holder_Top
2 x **B60p**-M3-M4.5_Adapter
C60-Flange_Inner-Shoulder
C61-Motor_Bracket_Inner_Shoulder
C62-Ringflange_Inner_Shoulder
C63-Motor_Axis_Inner_Shoulder
C64-Motor_Axis_Cap_Inner_Shoulder

Printable parts
B19-Flat_stand_right
B20-Flat_stand_left
7 x **B25**-Wire_connector
6 x **B26**-Wire_connector_pawl
7 x **B27**-Wire_connector_mount
1 x **B31**-Wire_connector_pawl_forearm
B41-L-Clavicle_left
B41-R-Clavicle_right
B42-L-Ribcage_Left
B42-R-Ribcage_Right
B43-L-Ribcage_Lower_Left
B43-R-Ribcage_Lower_Right
B44-Electronics_back
B45-Electronics_base
B46-Power_back
B47-Power_holder

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 - Electronics
2 x **E03**-TinkerForge ServoBricklet
6 x **E07**-MG996R
1 x **E09**-DS3225
1 x **E15**-DS5180SSG
1 x **E16**-RPi Power Supply
1 x **E17**-GPIO_Header
1 x **E24**-Relay

Non-printable parts
116 x **S01** M3 nuts
8 x **S02** M3 6 mm screws
52 x **S04** M3 10 mm screws
23 x **S05** M3 12 mm screws
11 x **S06** M3 16 mm screws
8 x **S08** M3 20 mm screws
2 x **S09** M3 22 mm screws
7 x **S11** M3 30 mm screw
7 x **S13** M3 40 mm screws
4 x **M08** 20 mm metal rods
1 x **M04** Ballbearing
8 x **M13** Distancer

Printable parts - Overview

B19-Flat_stand_right
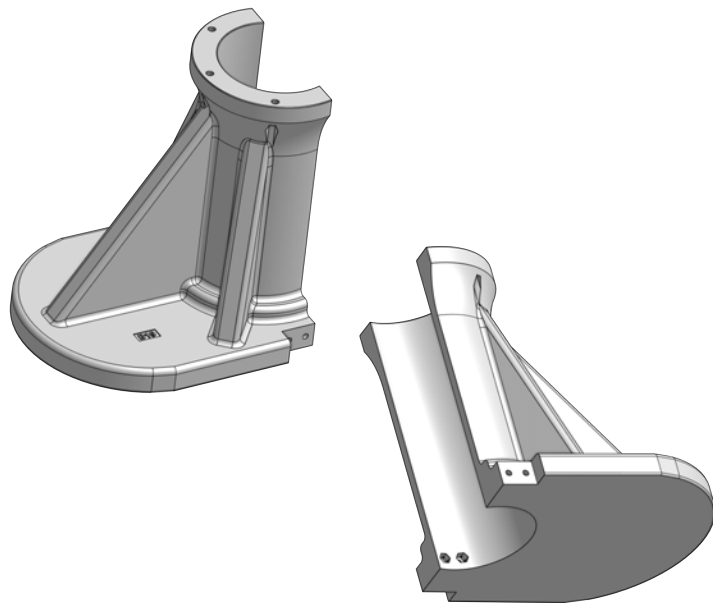
B20-Flat_stand_left
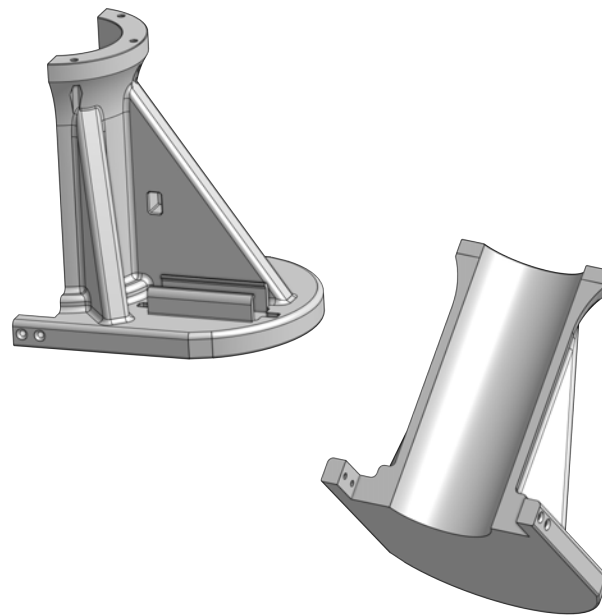
Printable parts - Overview

B41-L/-R-Clavicle_Left/Right
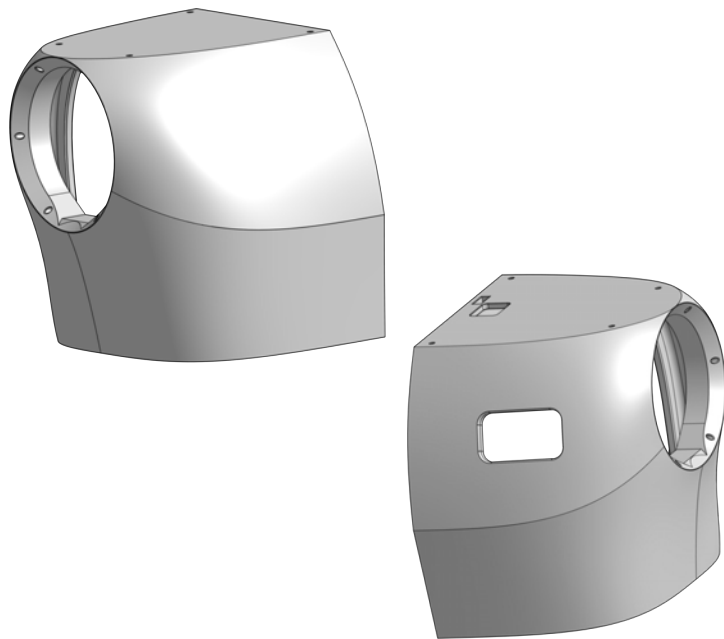
B42-L/-R-Ripcage_Left/Right

Printable parts - Overview

B43-L/-R-Ripcage_Lower_Left/Right
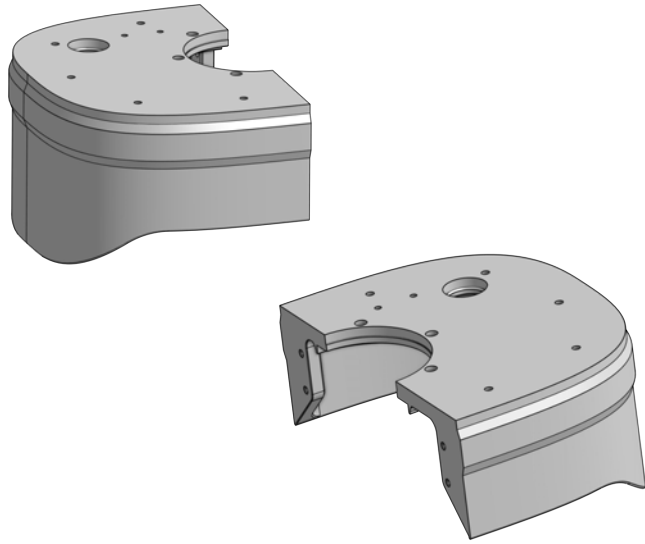
B44-Electronics_back
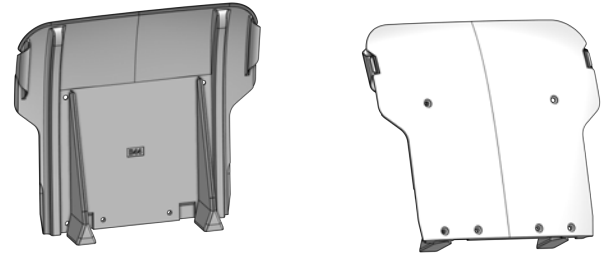
B46-Power_back
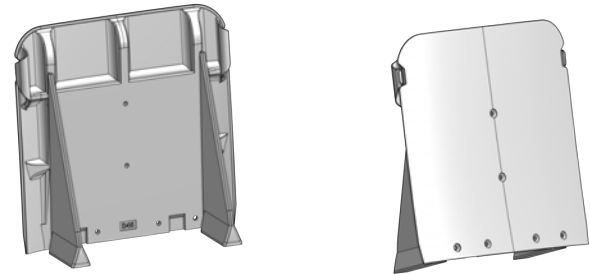
Printable parts - Overview

B47-Power_Holder
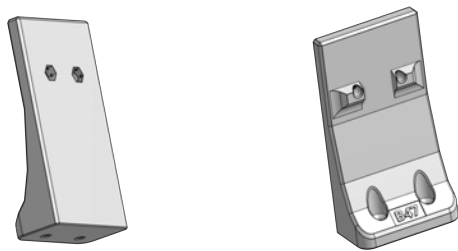
B53-Tube_Holder_Top
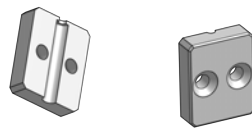
B60p-M3-M4.5_Adapter

B51-Servo_Array_Scaffold
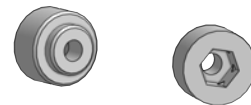
B48-Hinge

B49-Hinge_Plate
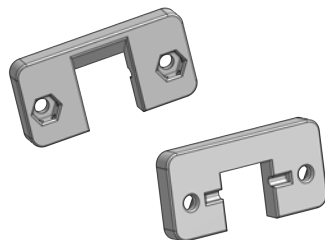
Printable parts - Overview

B45-Electronics_base
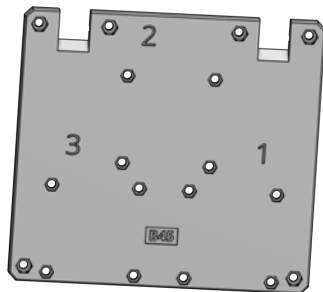
B52-Tube_Holder_Slide
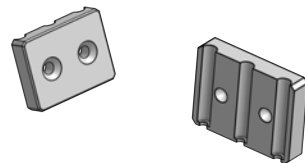
B27-Wire_connector_mount

B31-Wire_connector_pawl_forearm
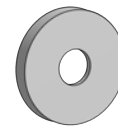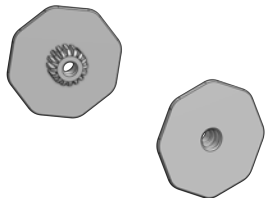
B25-Wire_connector

B26-Wire_connector_pawl
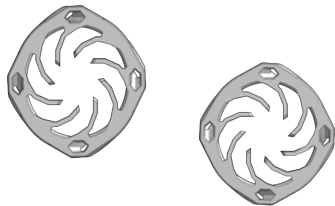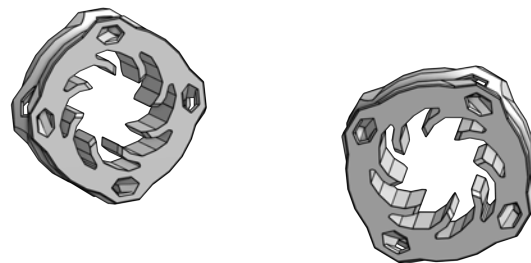
Printable parts - Overview

C61-Motor_Bracket_Inner_Shoulder
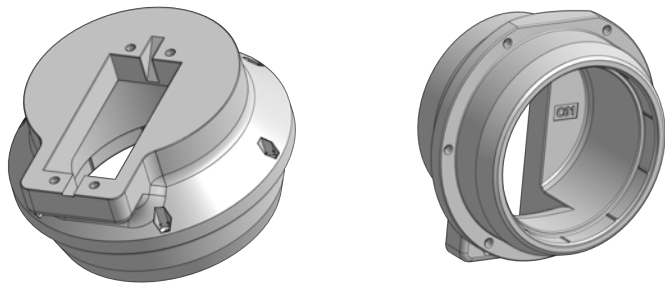
C62-Ringflange_Inner_Shoulder

C60-Flange_Inner_Shoulder
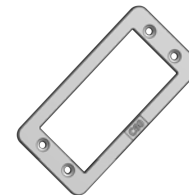
C64-Motor_Axis_Cap_Inner_Shoulder
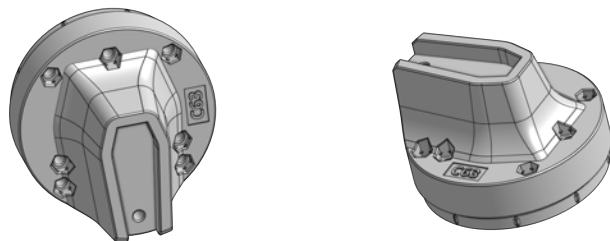
C63-Motor_Axis_Inner_Shoulder
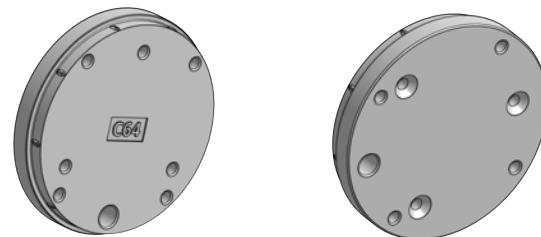
Build it better: our suggestion for assembling pib

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

2   4x   4x

Place **4 x nuts** in the shown spots in **B19**, then use **4 x 30 mm screws** to fix **B20 to B19**.

B19

B20

B19
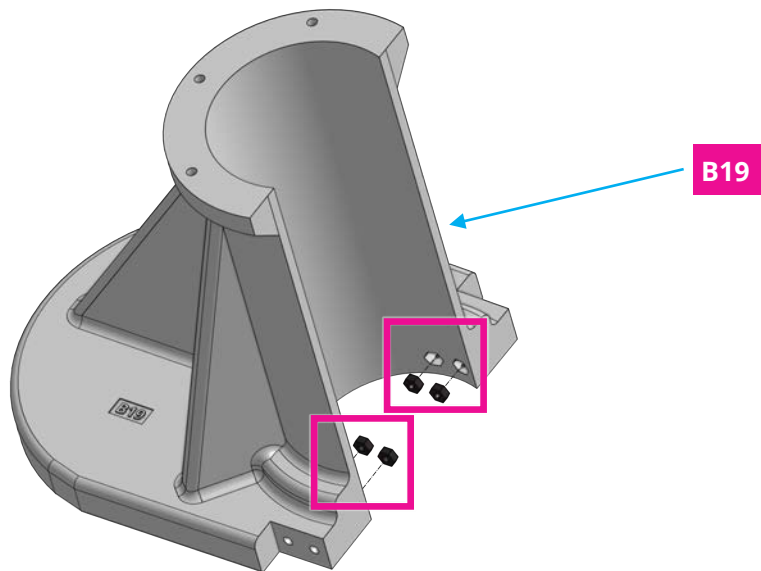
Our tip: use a hammer and gently push the nuts into the holes.

Step 2a

2 6x
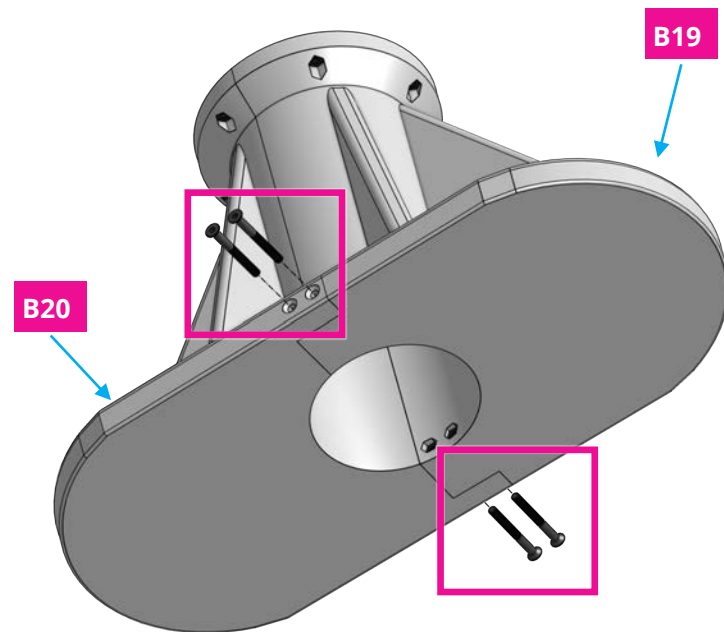
Place **6 x nuts** in shown spots in **B19** and **B20**.

B19

B20
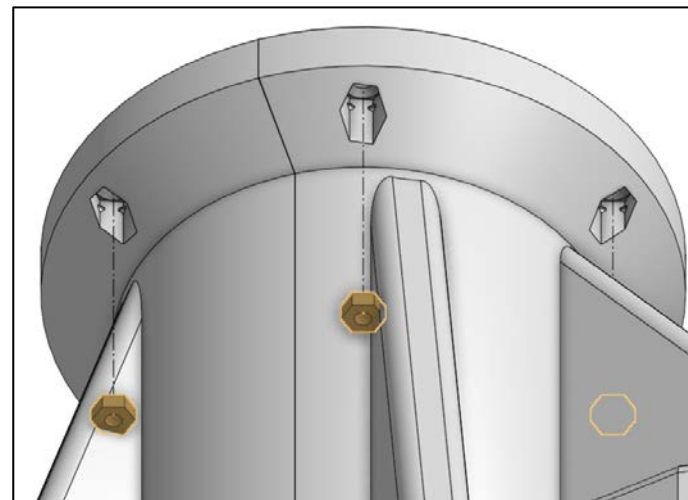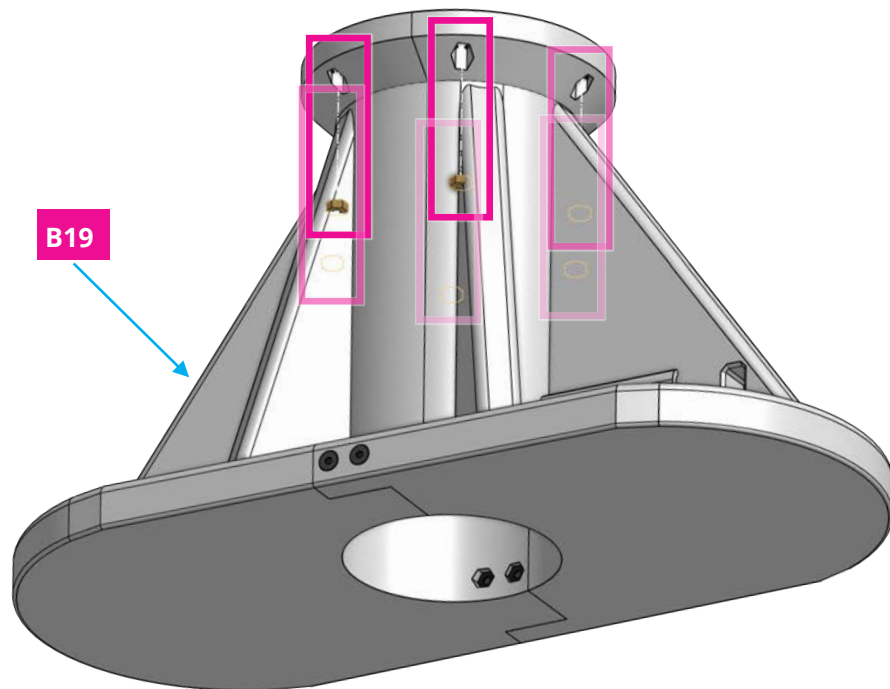
It is easier to put the nuts into place,
when you flip the assembly.

Step 2b

Place **E16** in **B20**.

B20

Step 3a

2   4x   4x
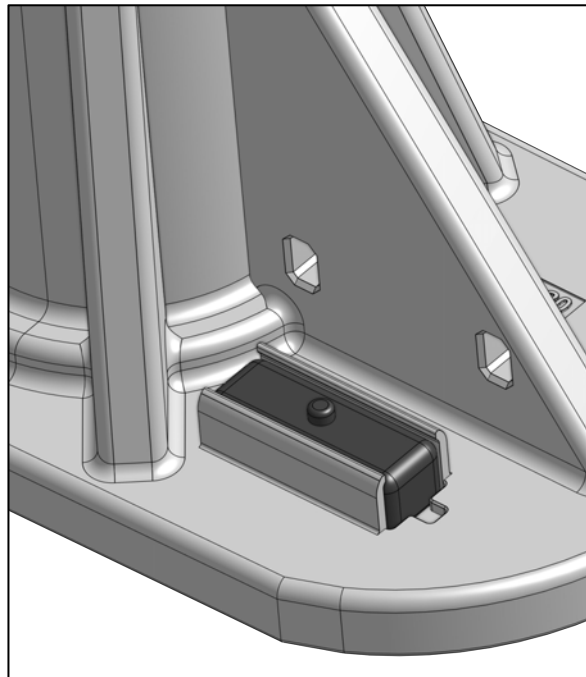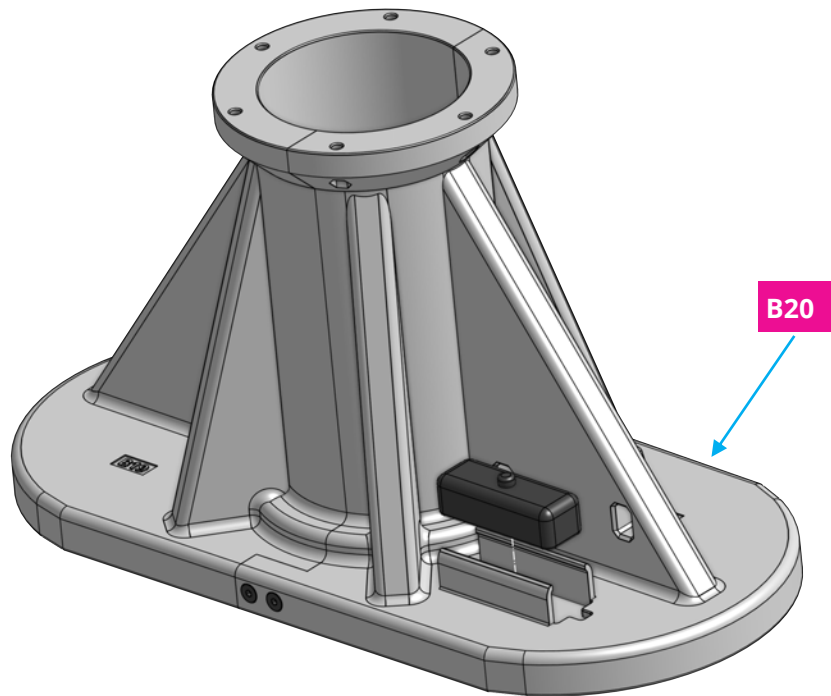
Connect **B43-L** and **B43-R** using **4 x M3 nuts** and **4 x M3 mm screws**.

B43-L

B43-R

Step 3b

2   14x
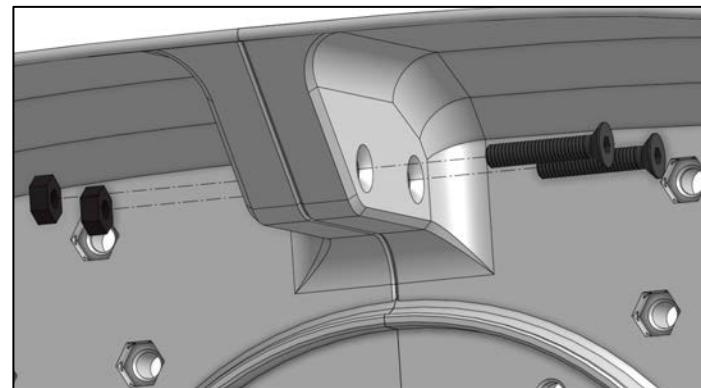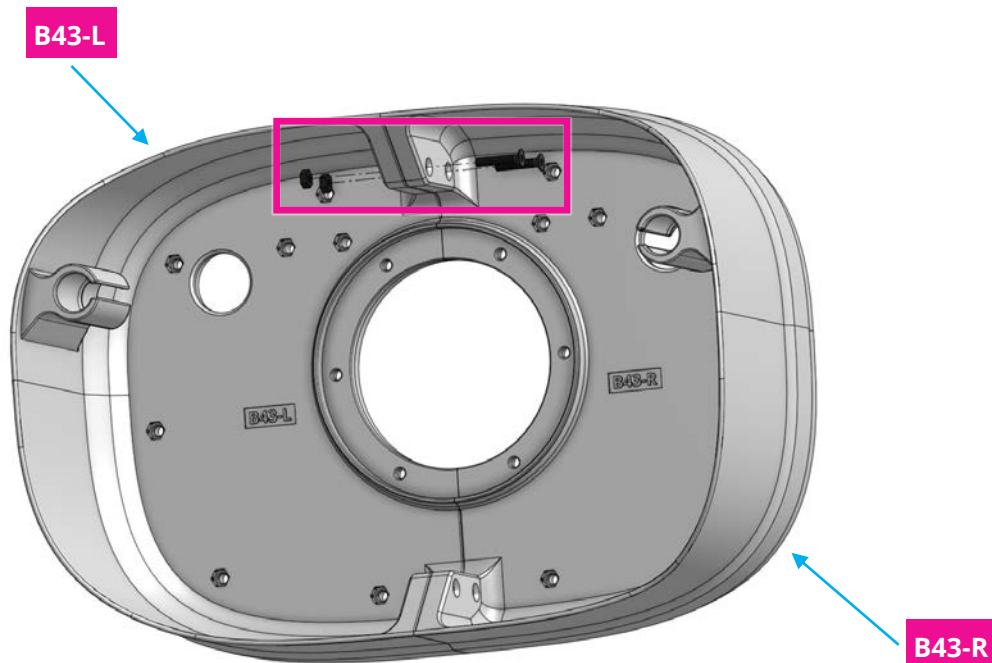
Place **14 x M3** nuts in the assembly.

B43-L

B43-R

Step 4

2

6x
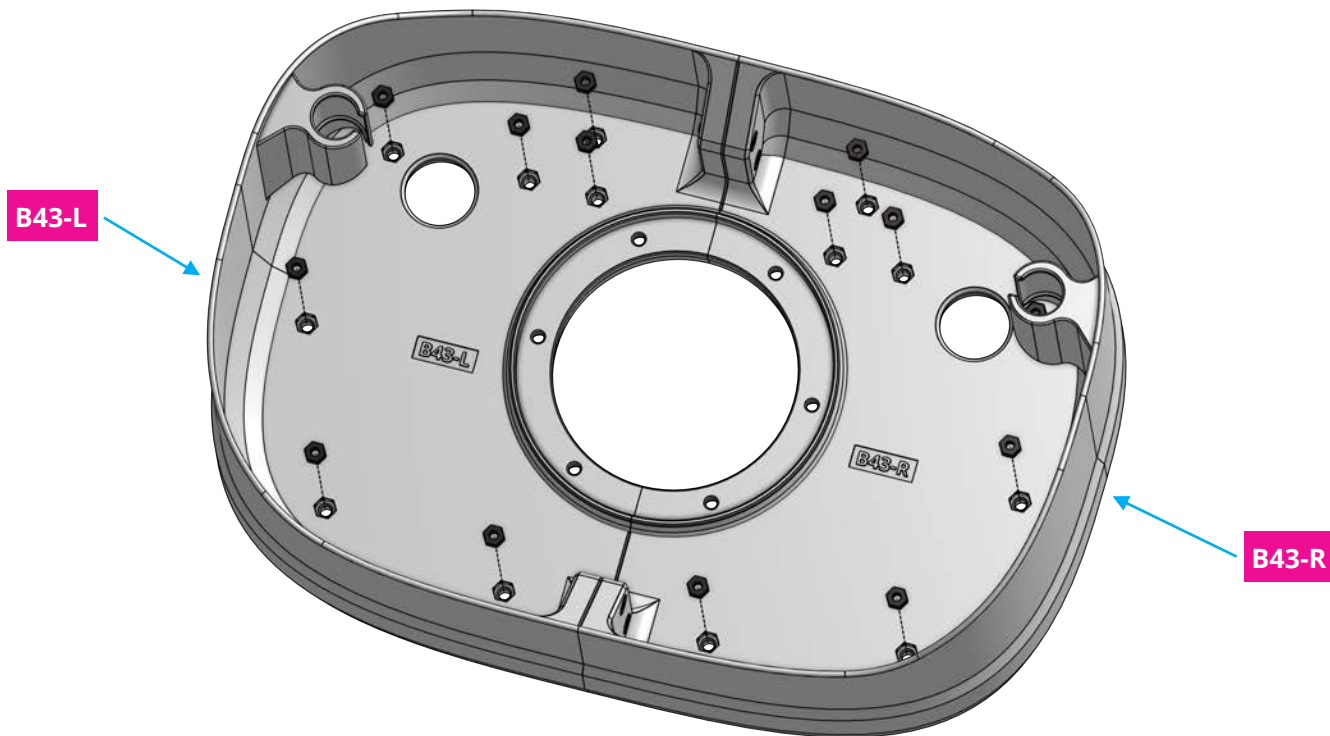
Connect both assemblies using **6 x 16 mm screws**.

You may apply some gentle force to connect the assemblies.

Step 5

2   2x
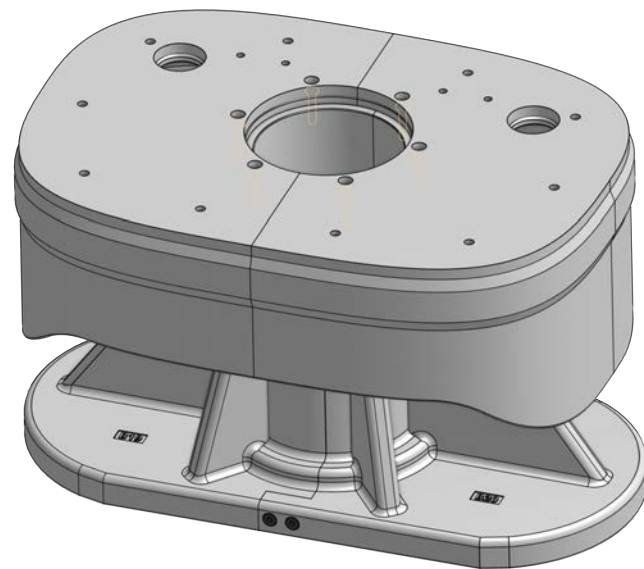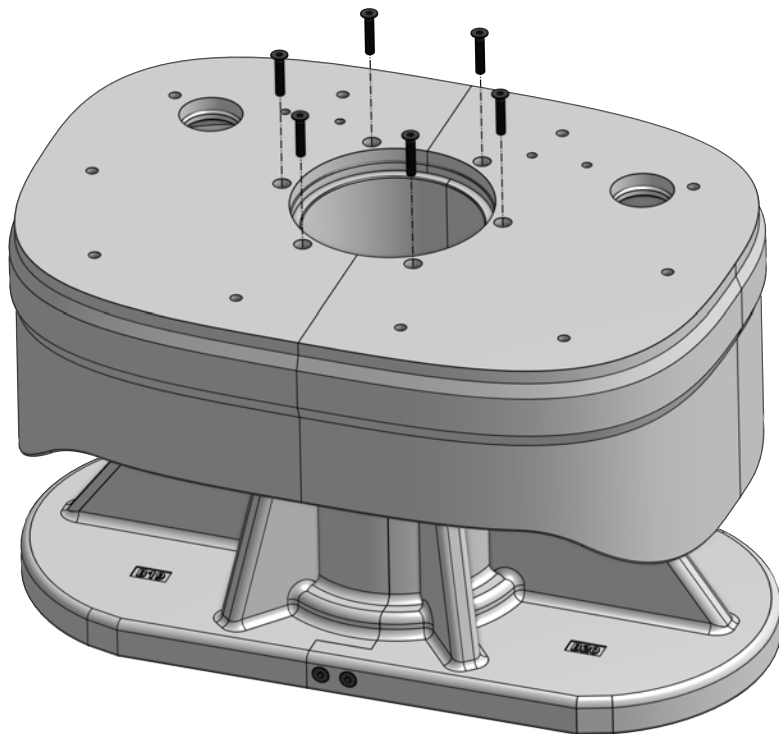
Connect 2 x **B48** to **assembly** using **2 x 20 mm screws.**

B48
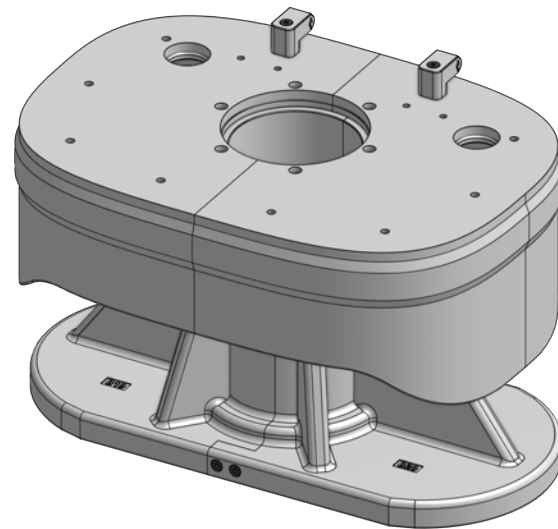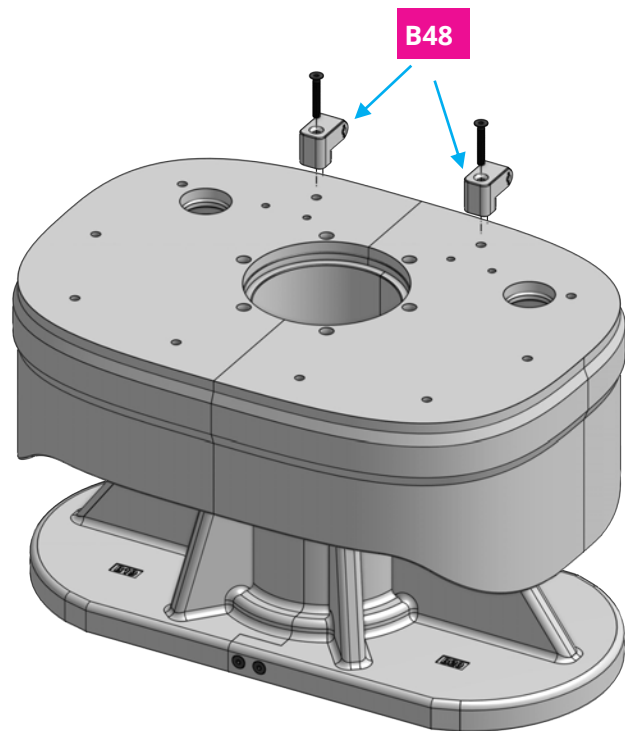
Step 6a

Insert 2 x **M08** to both **B48.**

2   2x
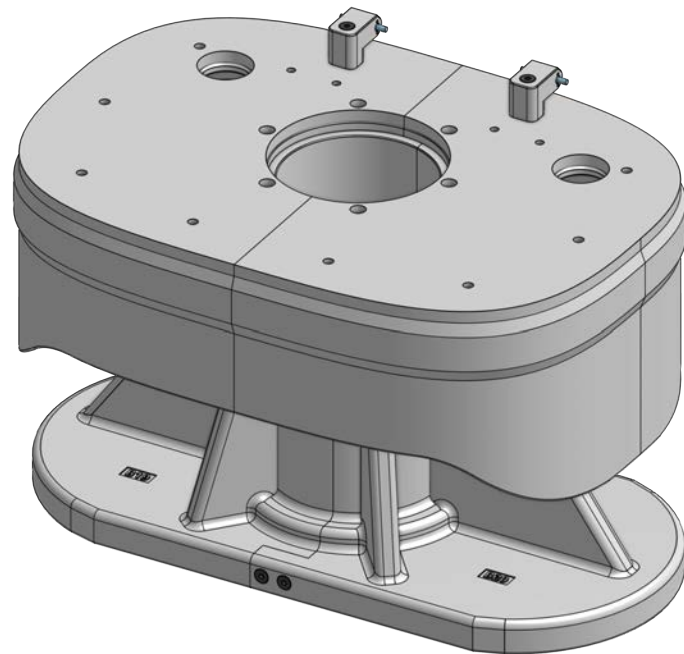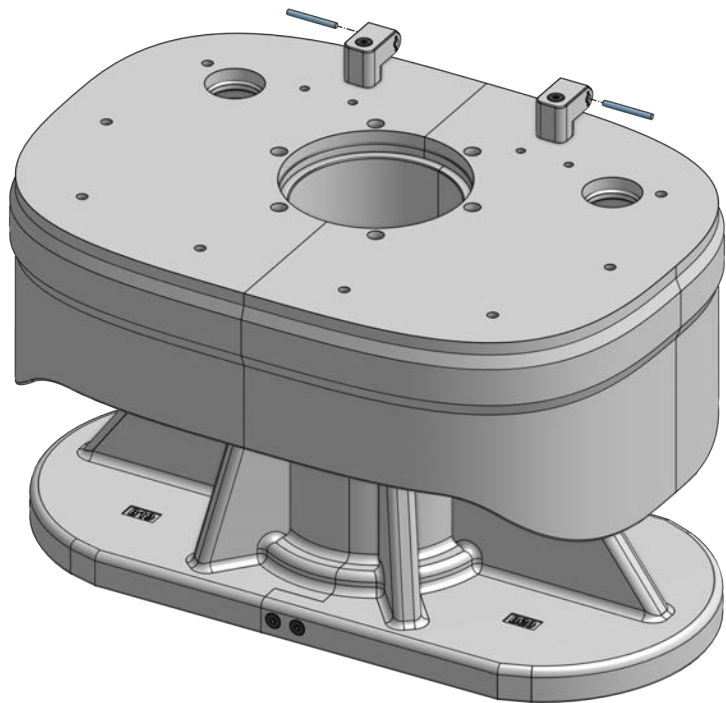
Step 6b

Connect **solid state relay bricklet** and **solid state relay** using 2 screws from the relay. This assembly will be called **E16** from now on.

solid state relay

solid state relay bricklet

Step 6c

2 2x 2x

Connect **E16** to **B46** using **2 x B60p**, **2 x M3 nuts** and **2 x M3 16mm screws**.

2x B60p

E16

B46
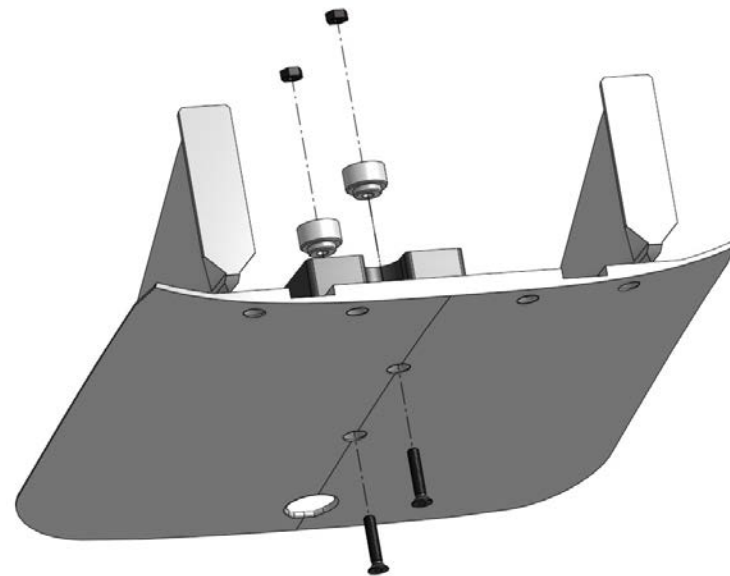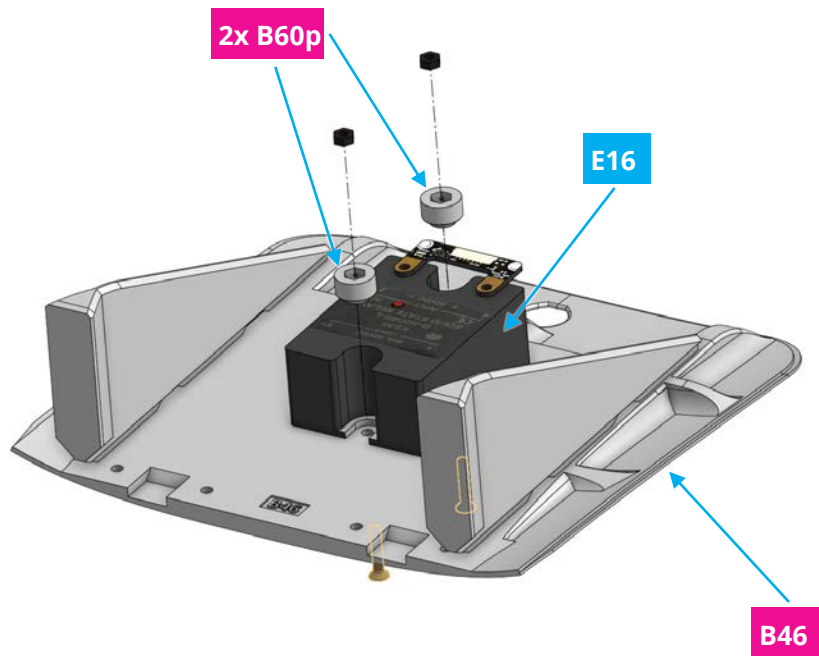
Step 7

 2   4x   4x

Connect **B46** to the previous assembly using **2 x B49**, **4 x M3 nuts** and **4 x M3 10mm screws**.

Step 8a

2   2x
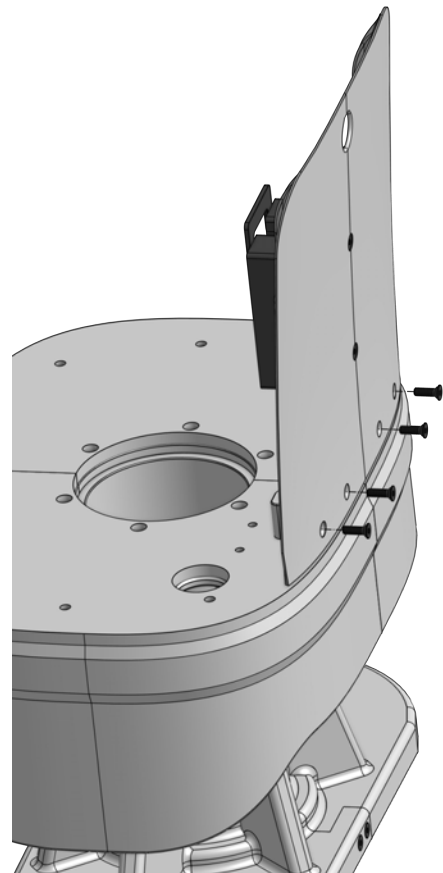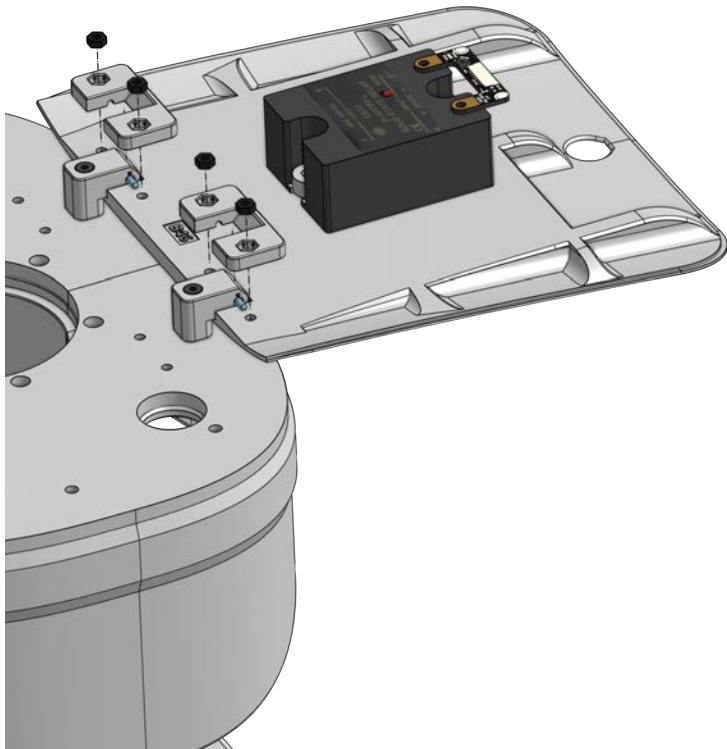
Connect **B47** to assembly using 2 x **M3 16mm** screws.

Step 8b

2   2x   2x
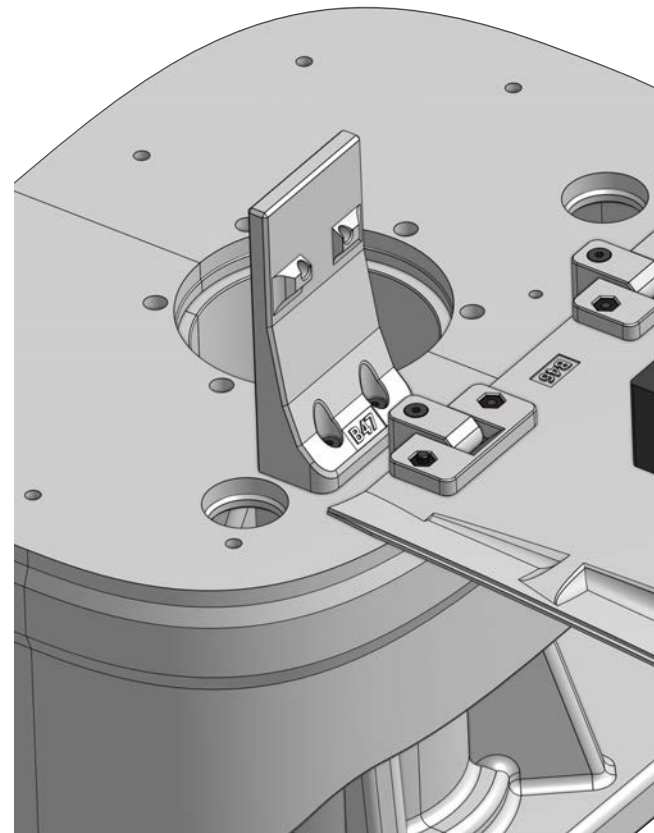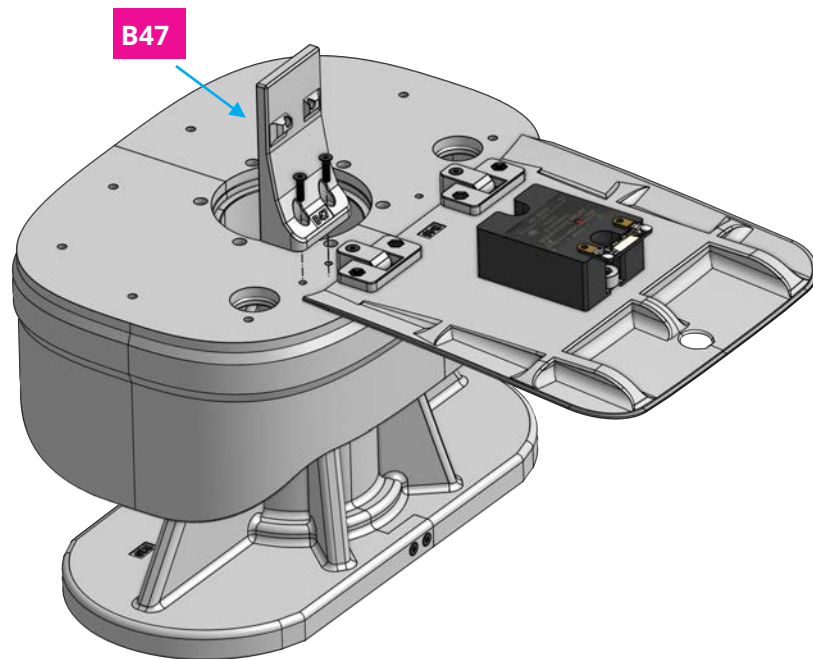
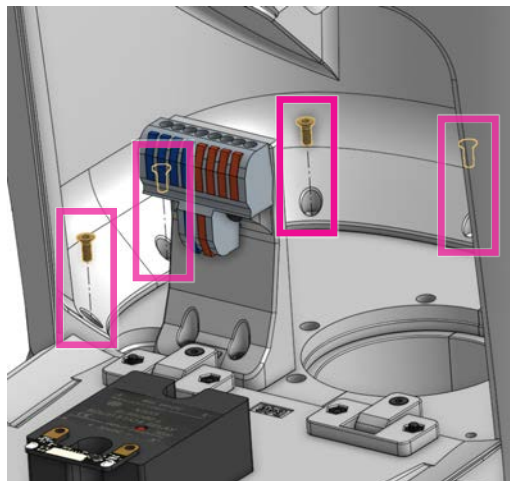Connect **E13** to **B47** using **2 x M3 nuts** and **2 x M3 12mm** screws.

Step 9a

2   3x   3x
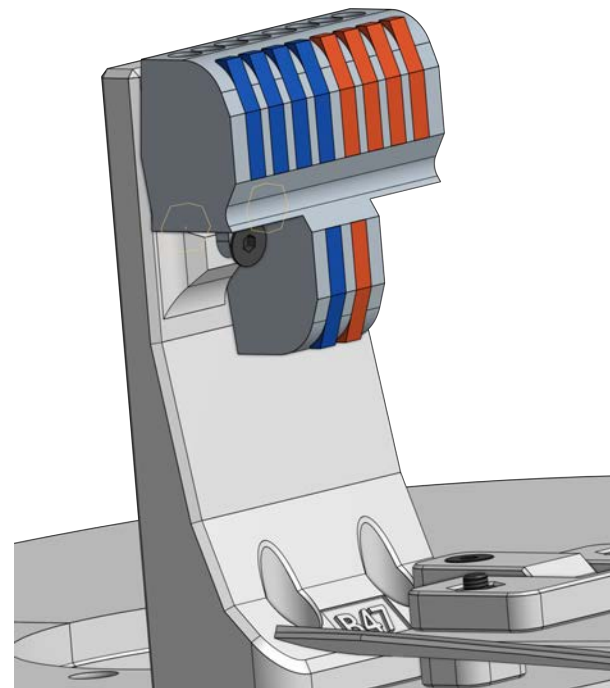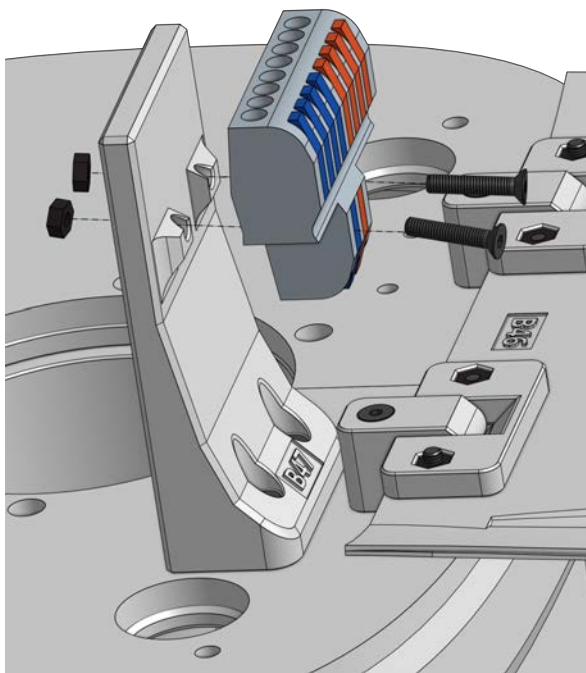
Connect **B42-L** and **B42-R** using **3 x M3 nuts** and **3 x M3 10mm screws**.

B42-L

B42-R

Step 9b

2   11x   1x
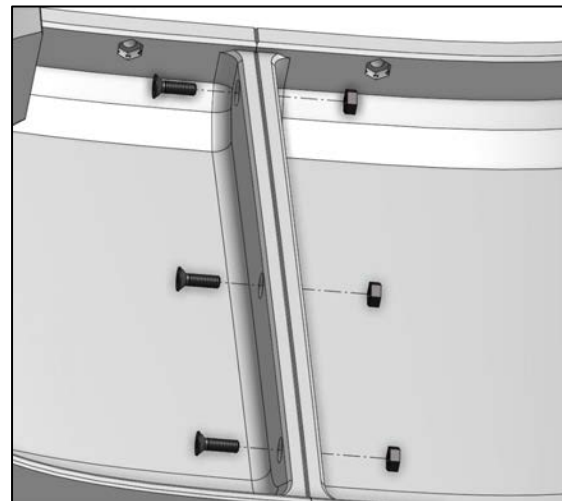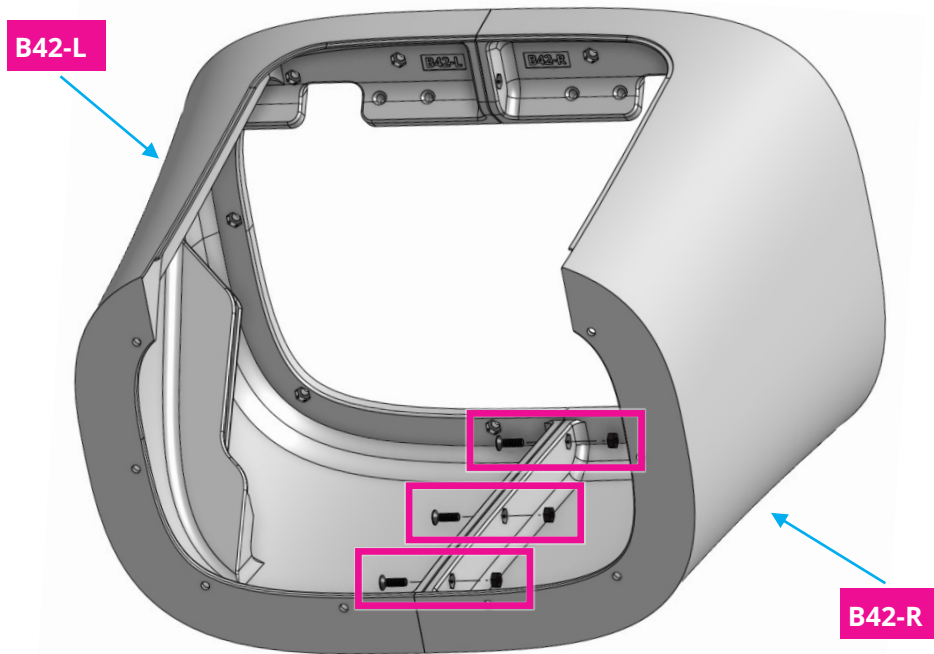
Place **10 x M3 nuts** in **B42** and improve connection between **L** and **R** using **1 x M3 nut** and **1 x M3 10mm screw**.
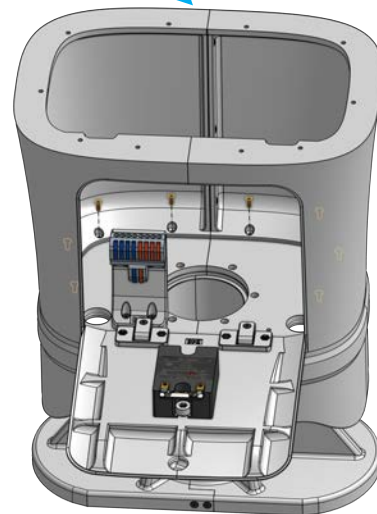
B42-L

B42-R

Step 9c

2   8x
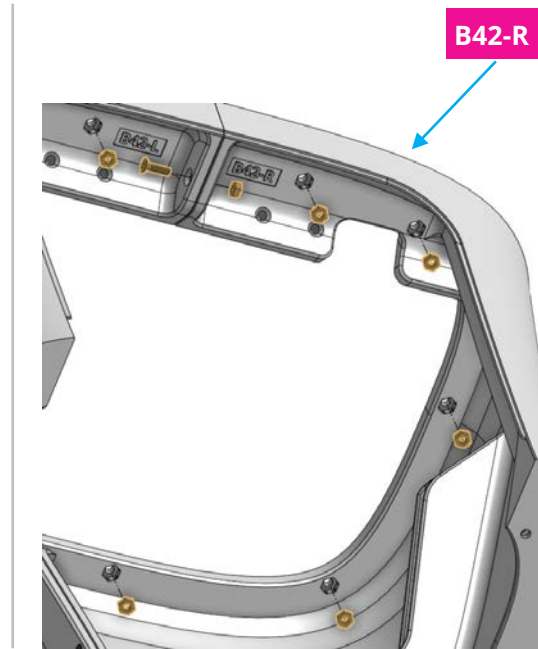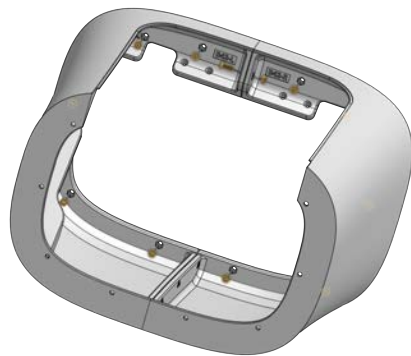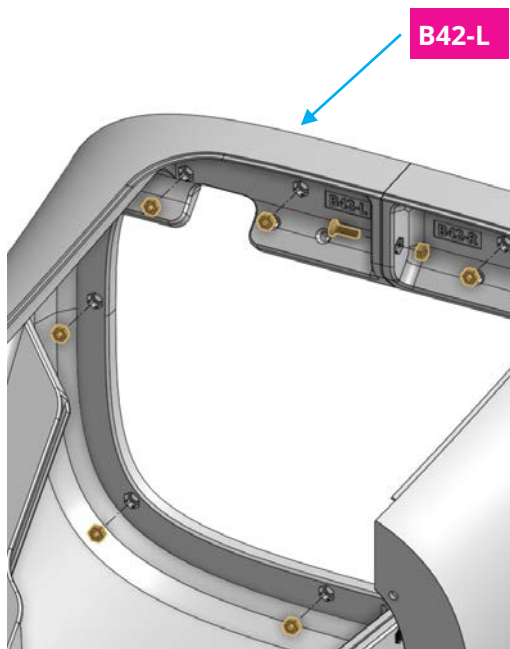
Connect ribcage (previous assembly) to assembly from step 7 with **8 x M3 12mm screws**.

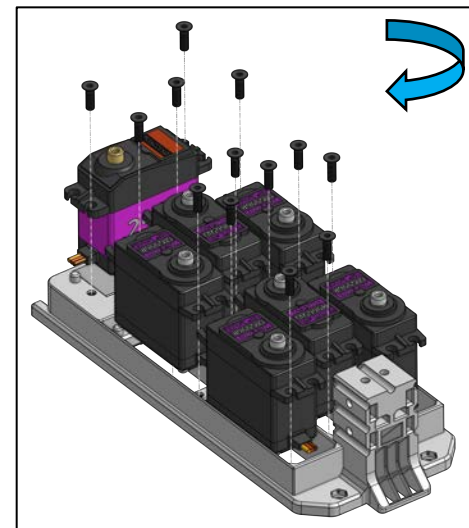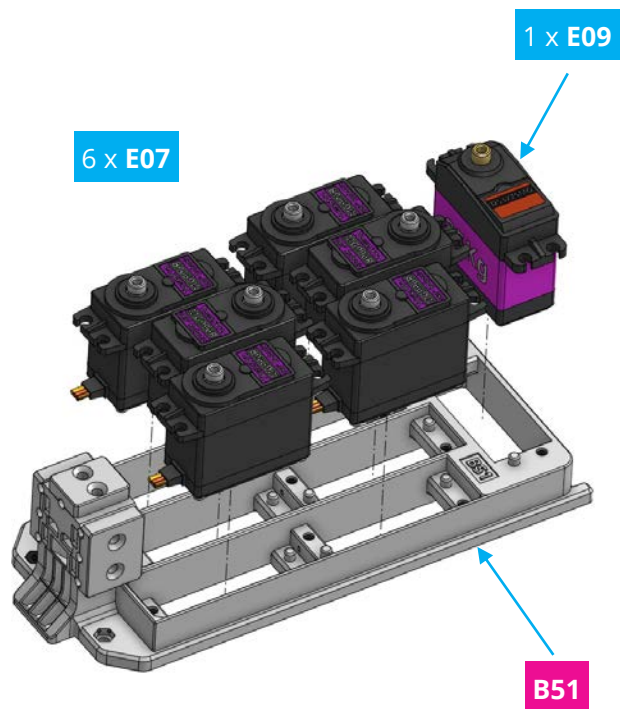
B42-L+R
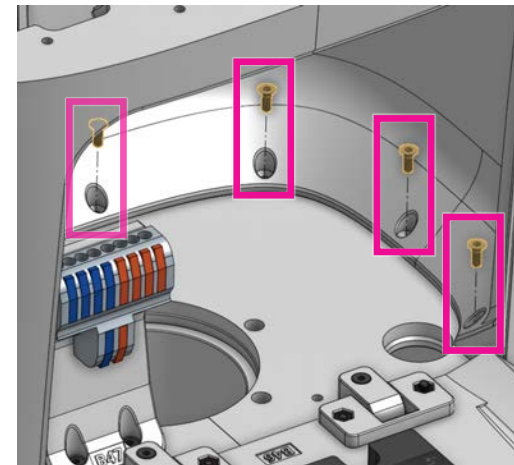
Step 10a

Place **20 x M3 nuts** in **B51**.

2   20x

B51
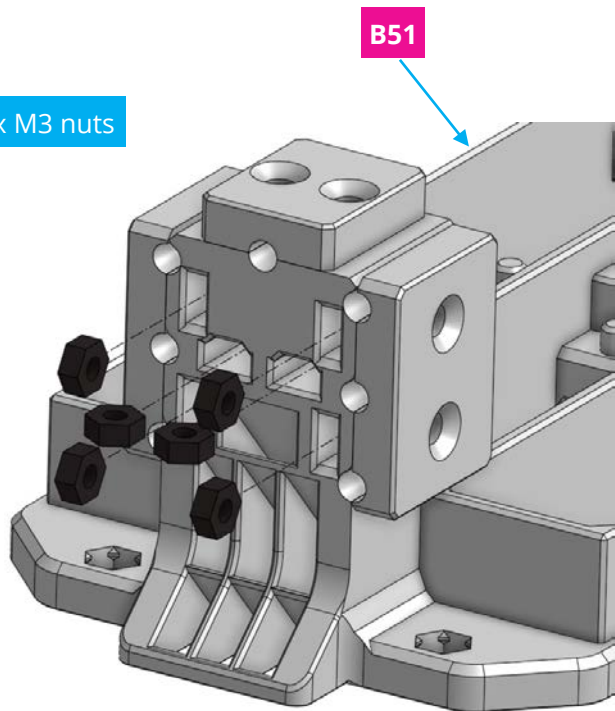
6 x M3 nuts

B51

14 x M3 nuts

Step 10b

2 14x
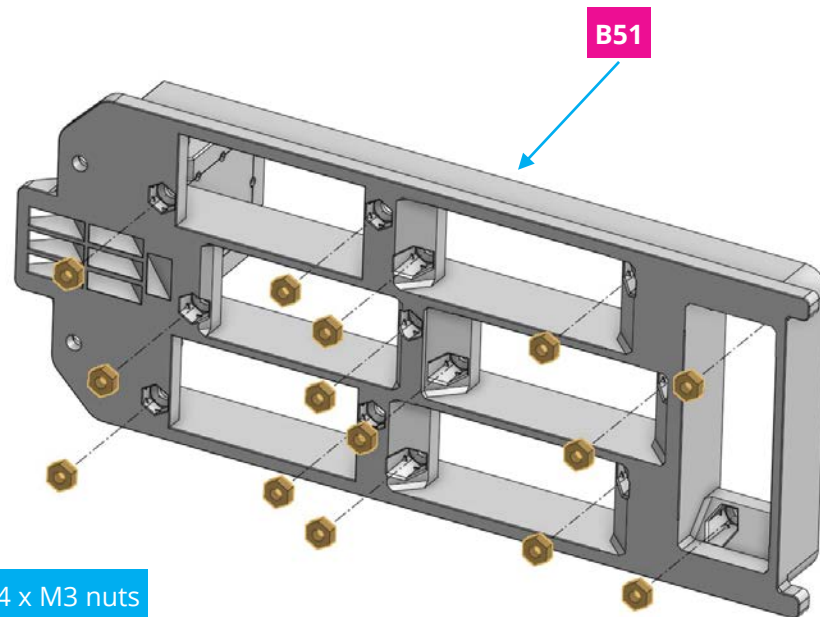
Assemble 6 x **E07** motors and 1 x **E09** in using 14 x **M3 10mm** screws.

1 x **E09**

6 x **E07**

B51

B51

B51
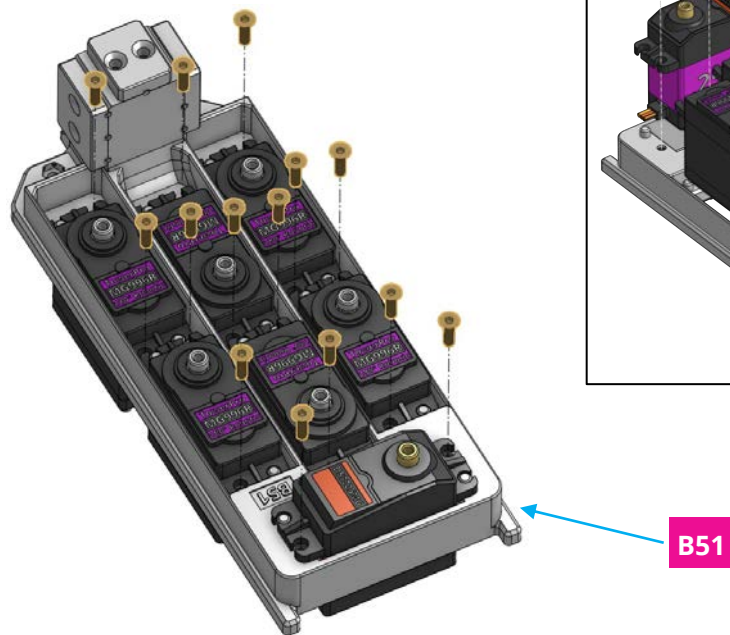
Note

Flip **B26** to switch orientation between clockwise (CW) and counterclockwise (CCW).

Clockwise (CW)

Counter clockwise (CCW)
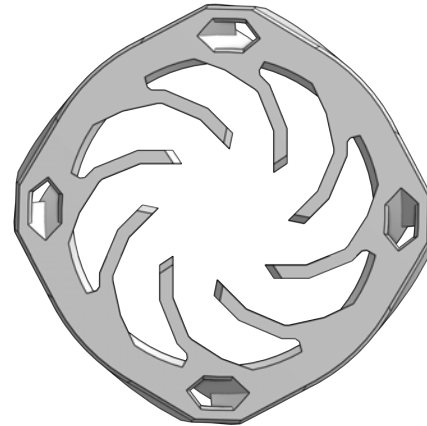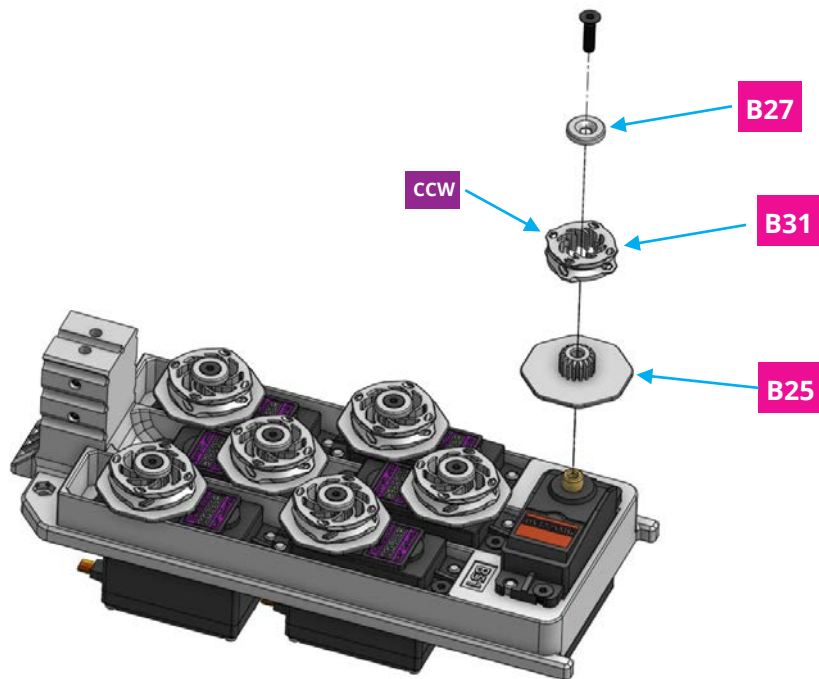
Step 10c

Assemble wire connectors using the shown arrangment by using **6 x B25**, **B26**, **B27** and **6x M3 12mm screws**. Make sure **B26** orientation matches the shown one the right picture.
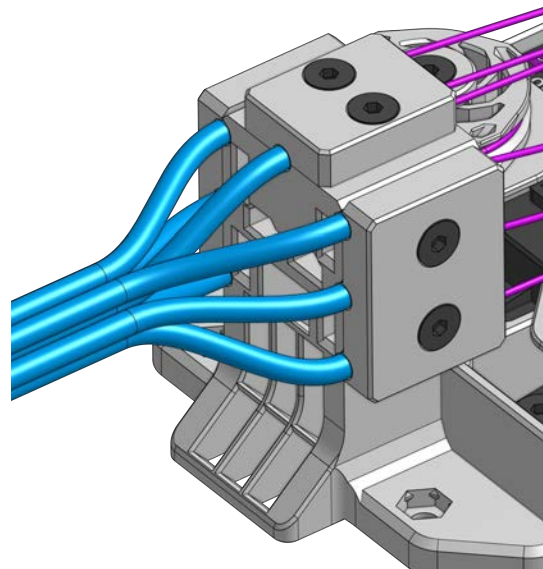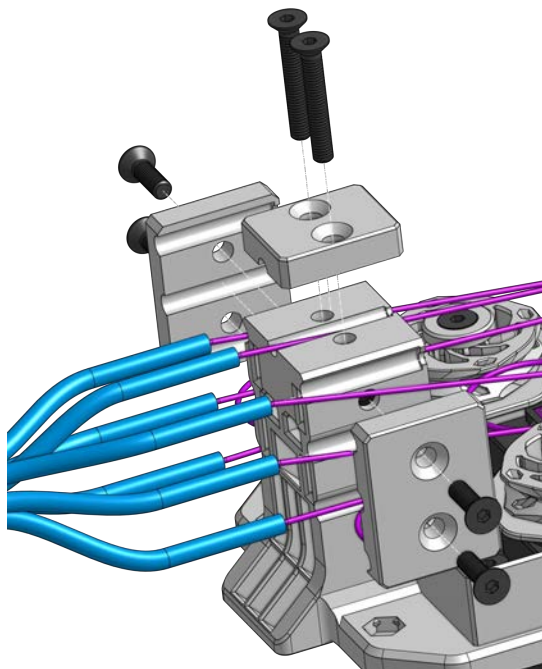
Step 10d

2   1x
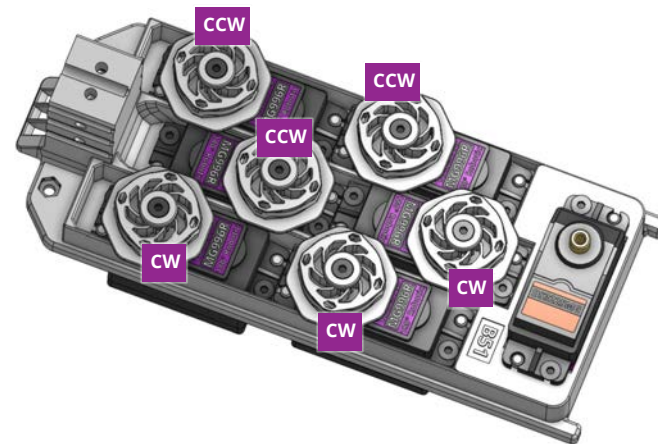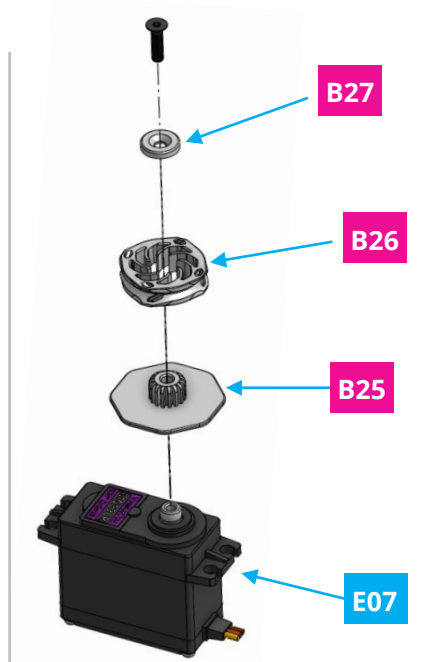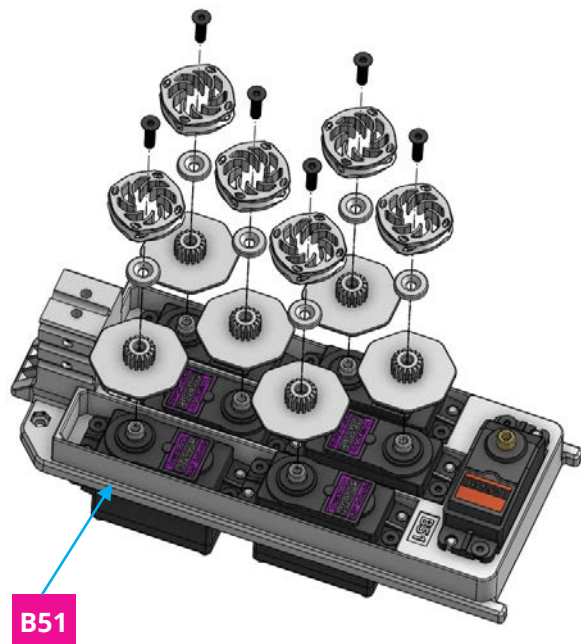
Assemble wire connectors using the shown arrangment by using **B25**, **B31**, **B27** and

1x M3 12mm screw. Make sure **B31** is switched to counterclowise orientation.

B27

CCW

B31

B25

Step 10e

Insert the **teflon tubes** from forearm through the shown spots and use **2 x B52, 1 x B53** and **2 x 20 mm** screws **and 4 x 10 mm** to fix them.

(Tipp: Wrap 2 x pieces of tape around each end of the tube before fixing them to have better grip.)

2

Insert **fluorocarbon wires** coming out of the **teflon tubes** in shown holes of the **B26** and **B31**

connectors and tigh a knot at the end to fix them. Wires and tubes will be hidden in following slides.

Tie a knot here
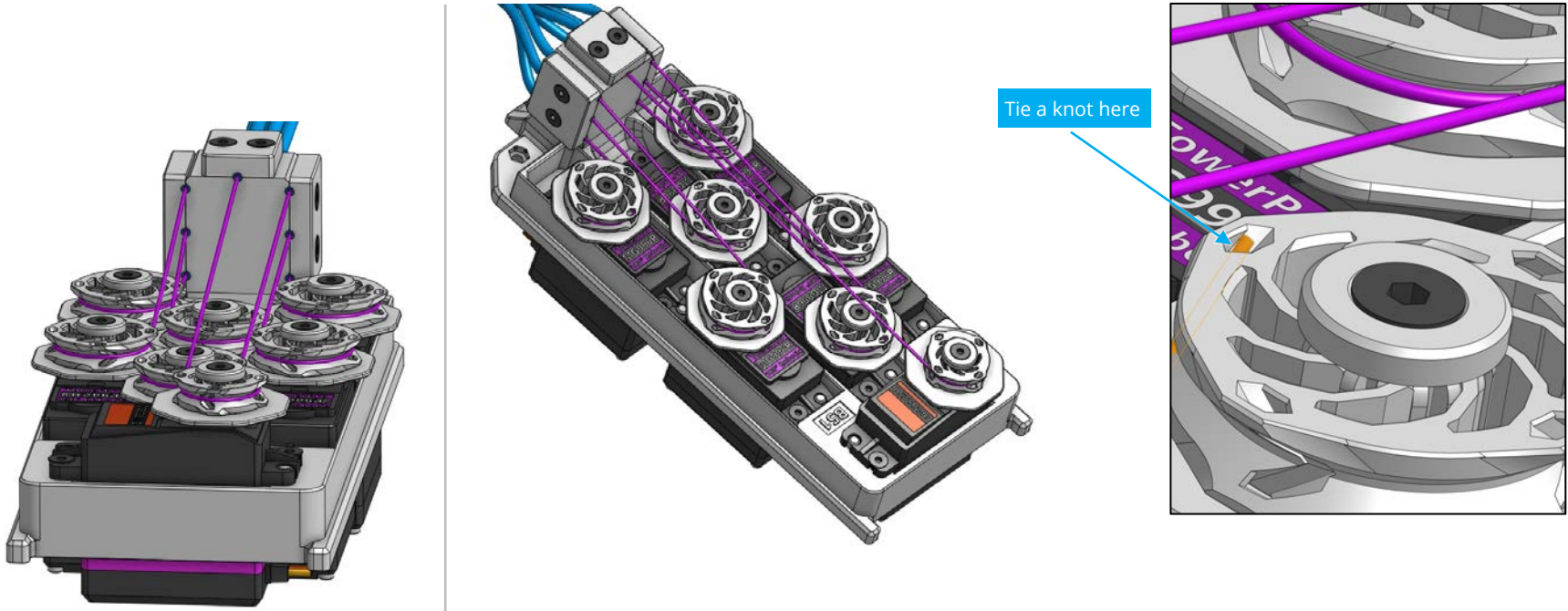
Step 11

2   1x   1x

Slide servo array into ribcage and fix it using **1 x M3 nut** and **1 x M3 16mm screw**.

Servo array

Ribcage

Step 12a

2
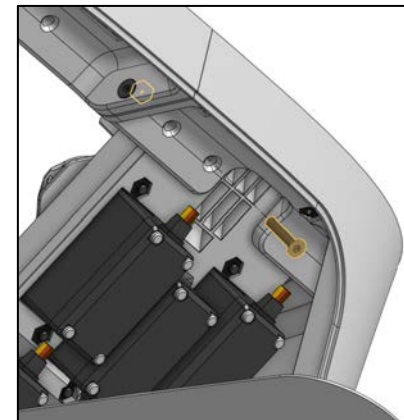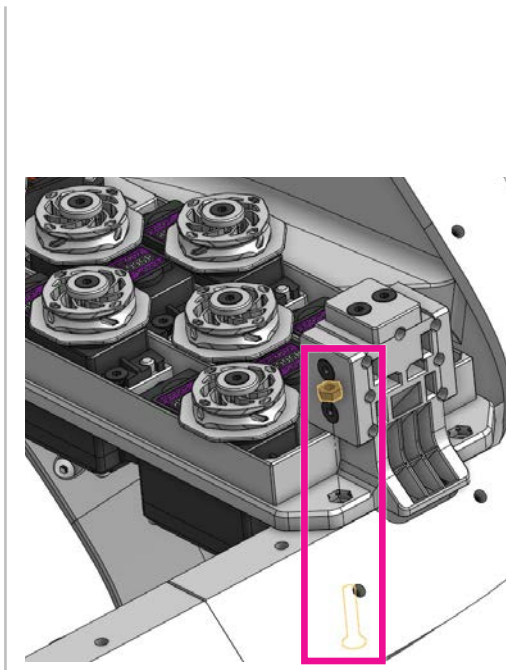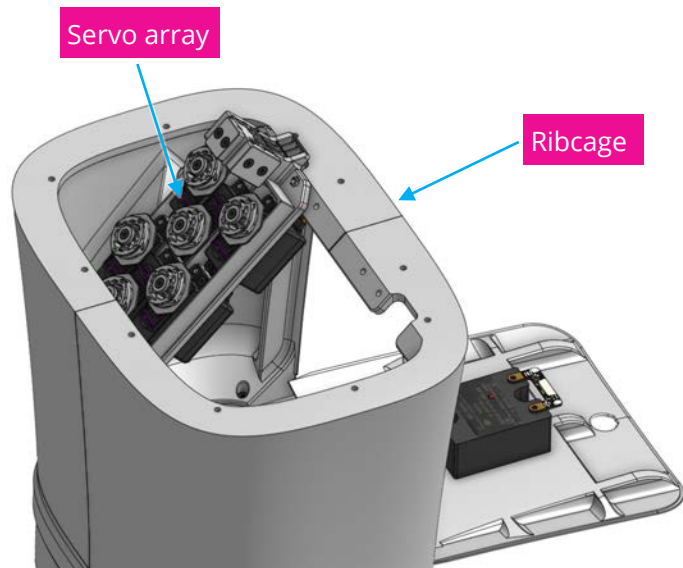
Assemble **2 x B48** to assembly using **2 x M3 22mm screws** and insert **2 x M08**.

2x B31

2x M8

Step 12b

2   8x   6x   8x
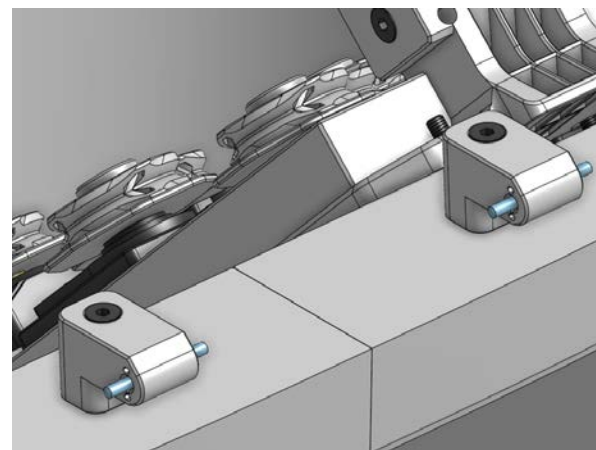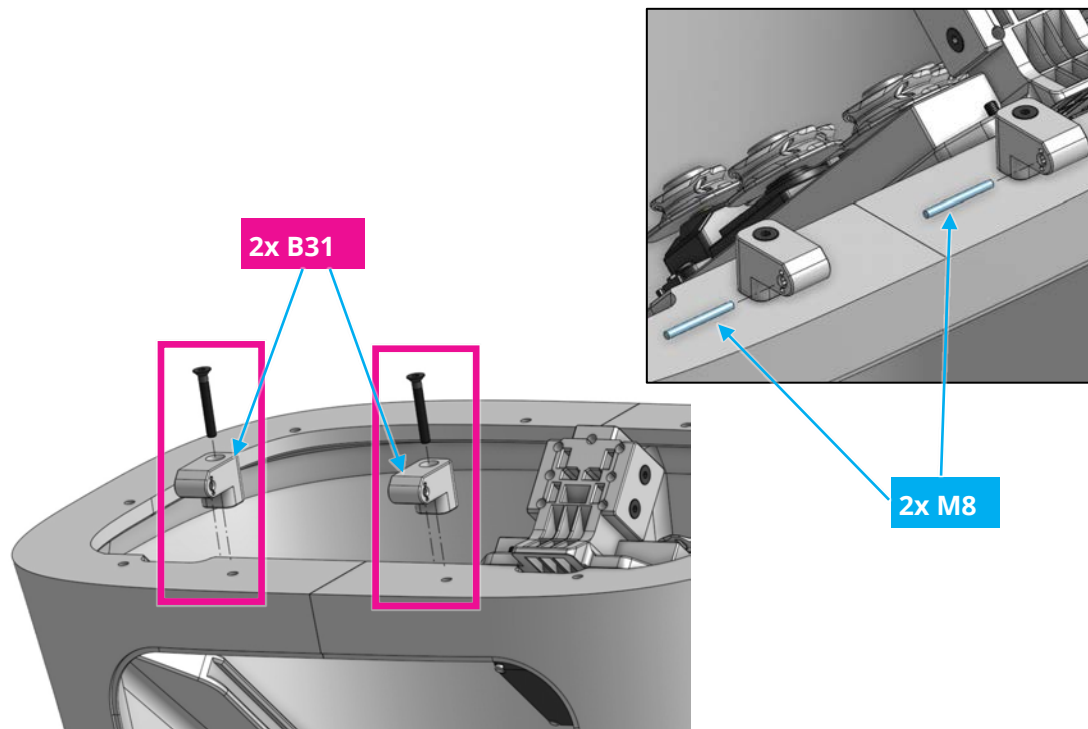
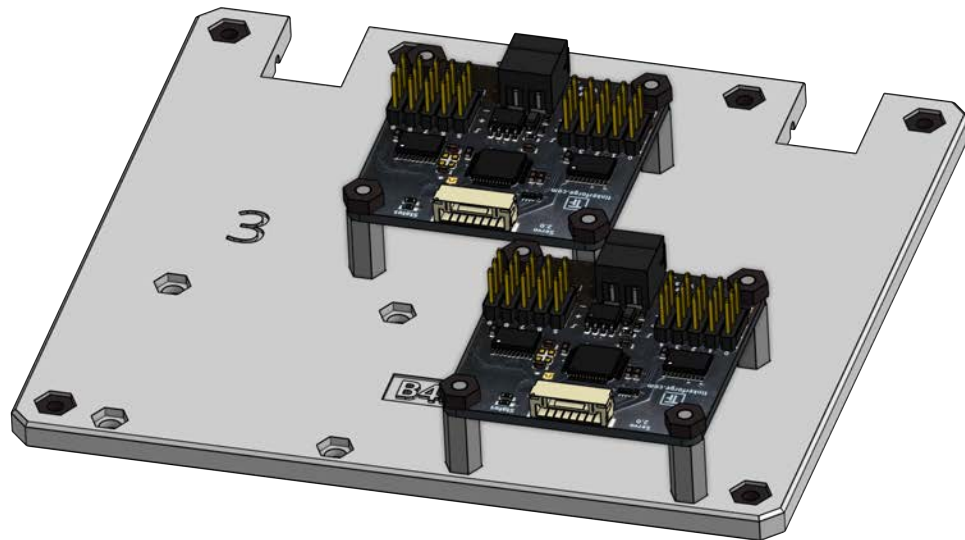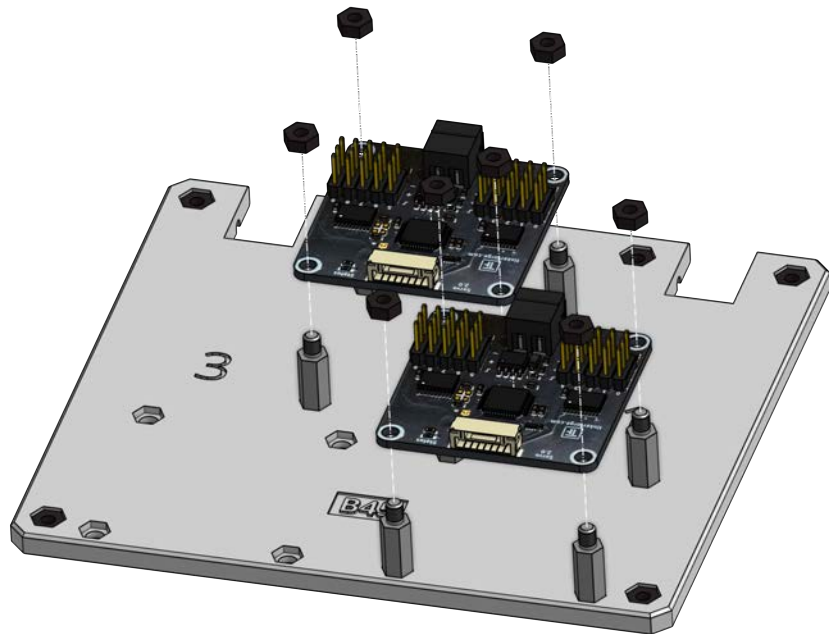Insert **6 x M3 nuts and 8 x M13 distancers** in **B45**. Fix the distancers using **8 x M3 6mm screws**.

Step 12c

2   8x
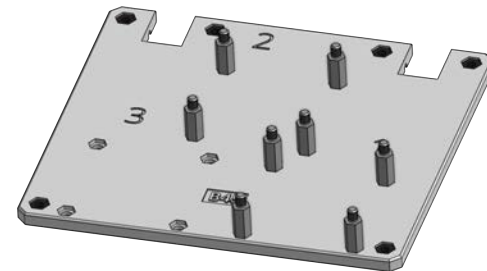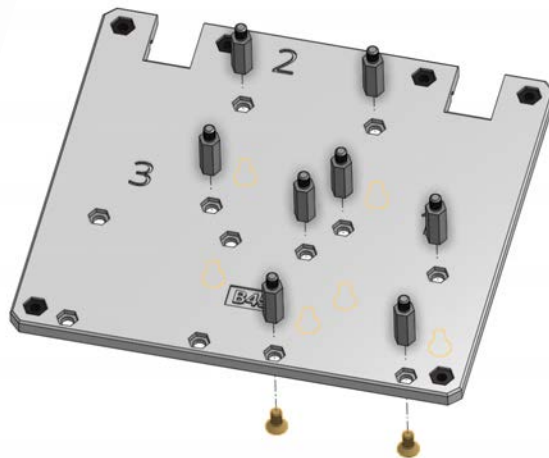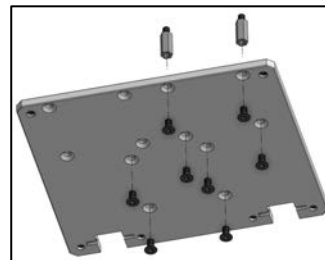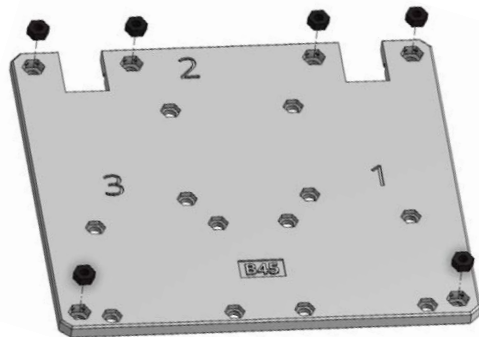
Connect **2 x E03** to the assembly and fix them using **8 x M3 nuts**.
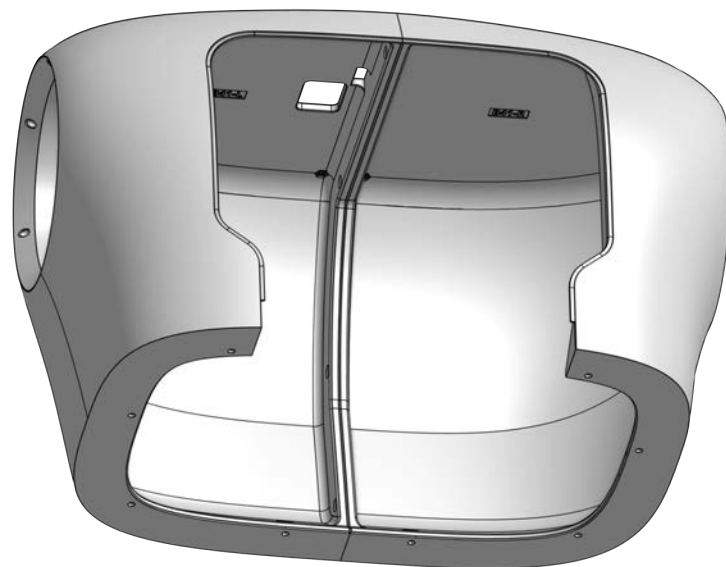
2   10x

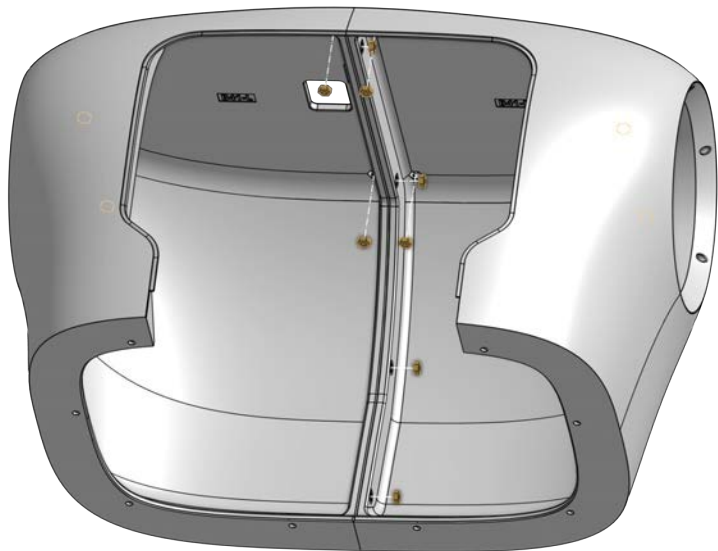Connect **B44** to **B45** using **6 x M3 10mm screws.**

Step 13a

2 12x
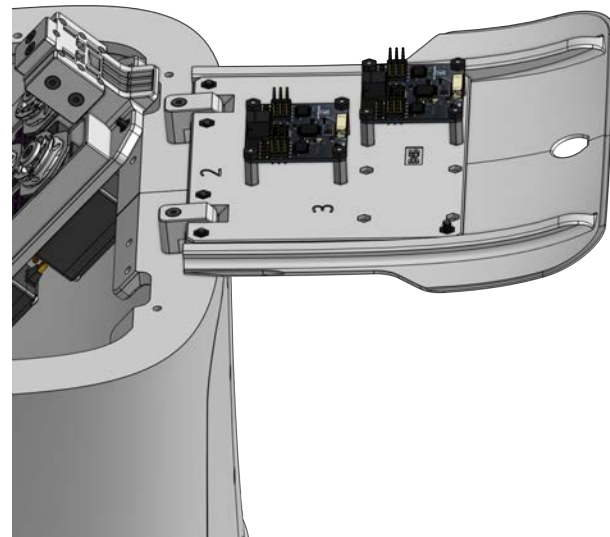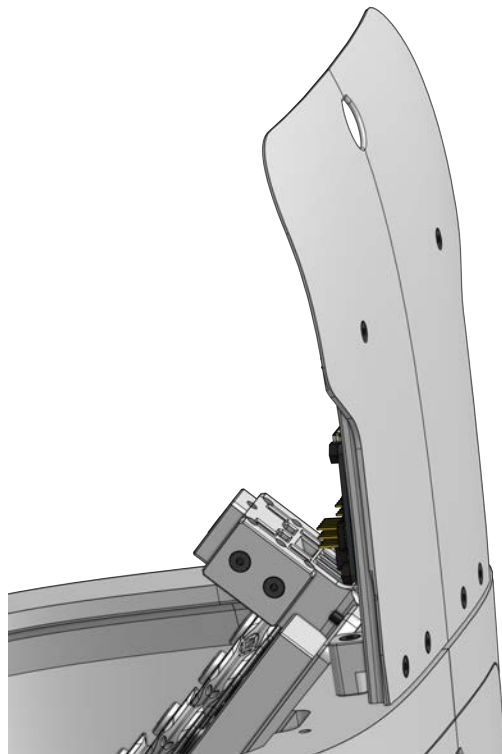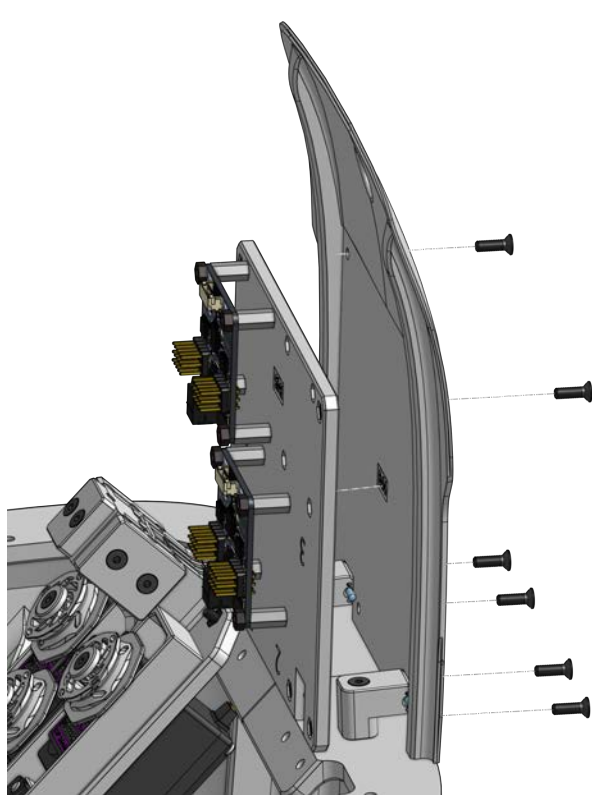
Insert **12 x M3 nuts** into **B41-L** and **B41-R.**
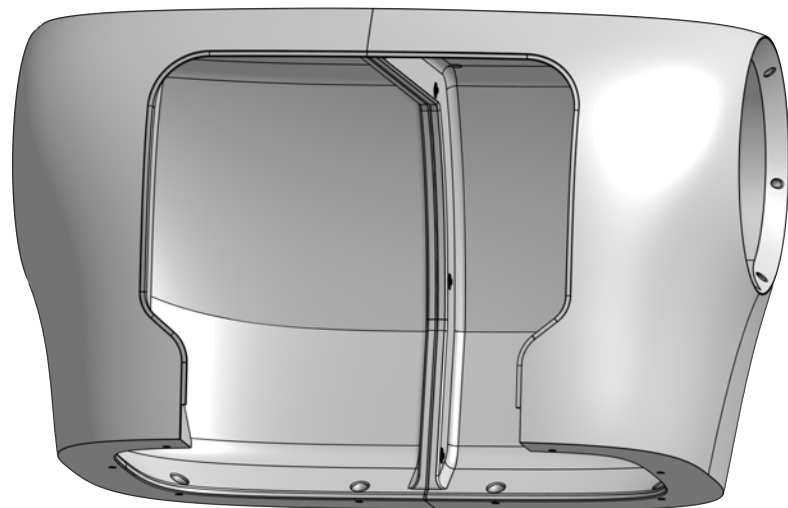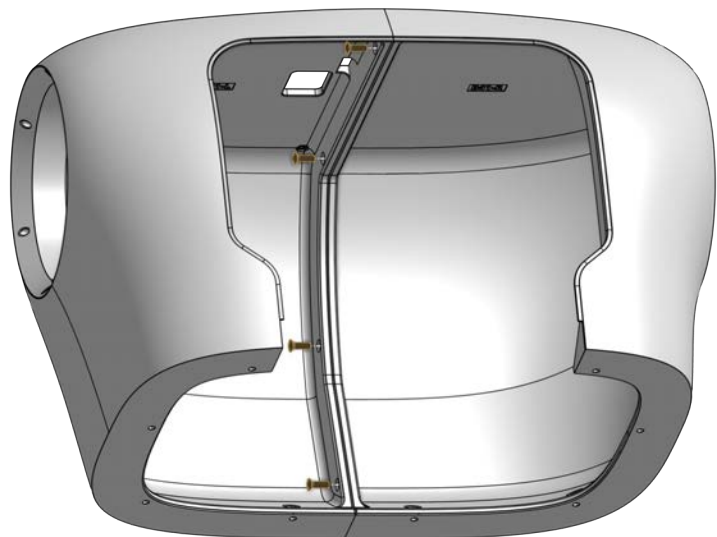
Step 13b

2   4x

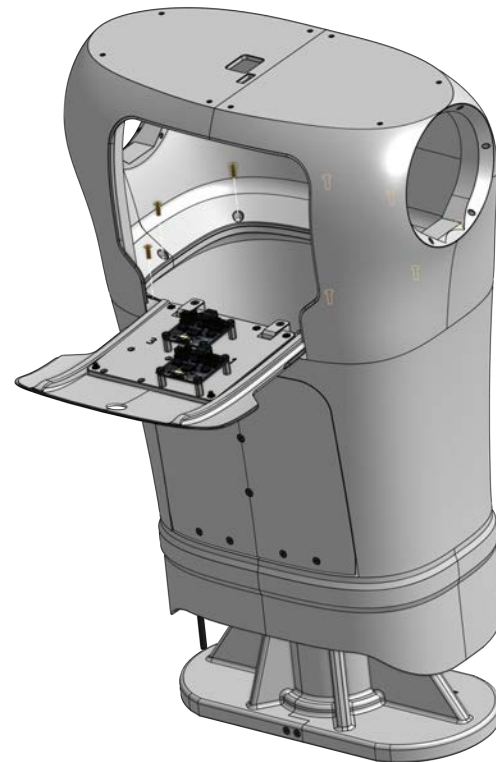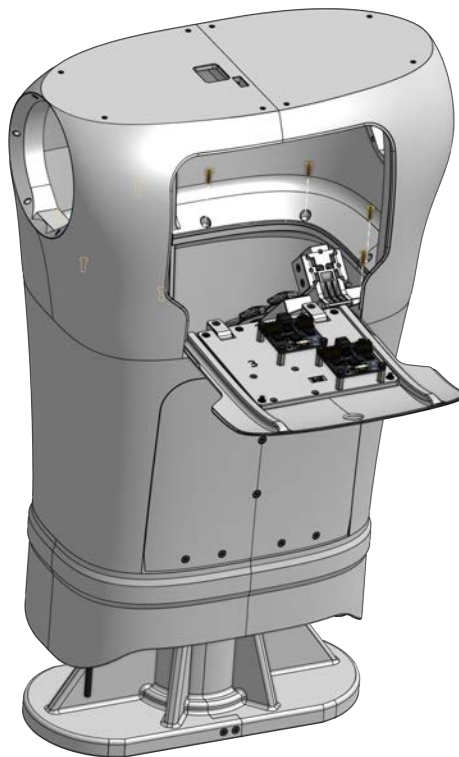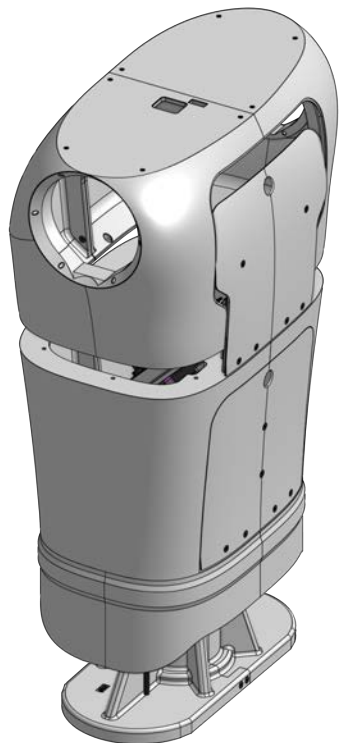Connect **B41-L** to **B41-R** using 4 **x M3 10mm** screws.

Step 13c

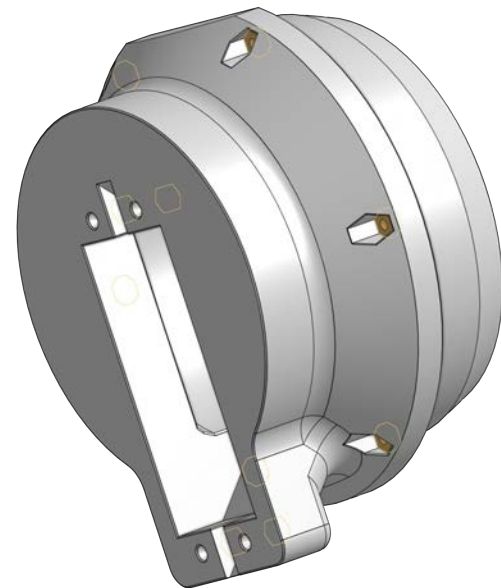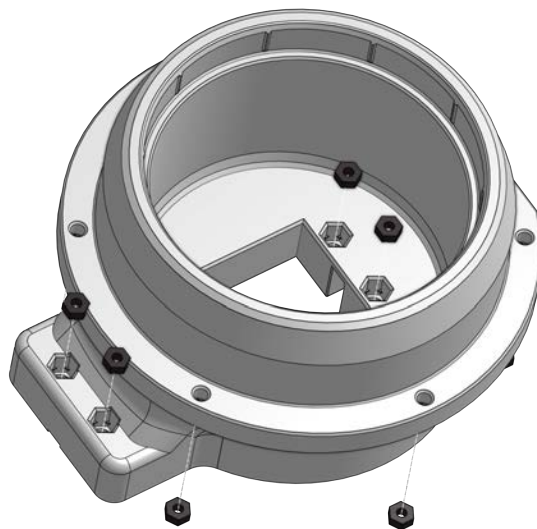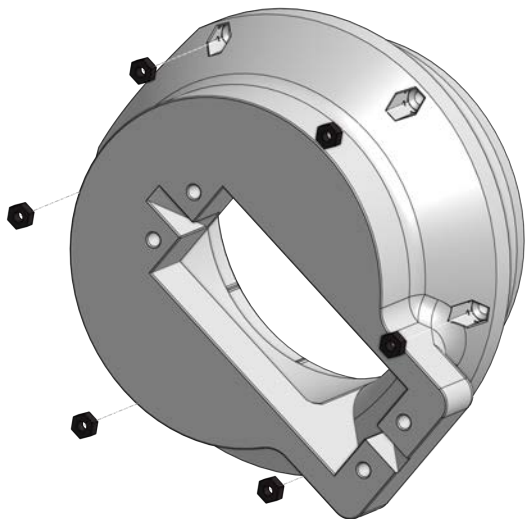Connect **Clavicles** to **assembly** using 8 x **M3 10mm** screws.
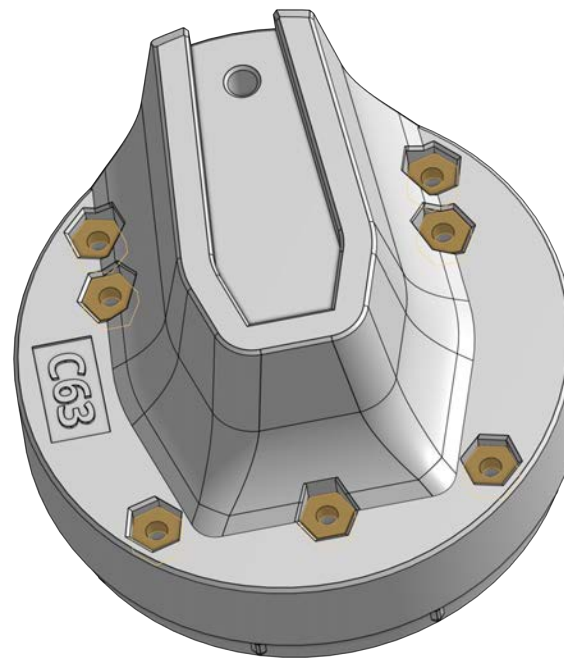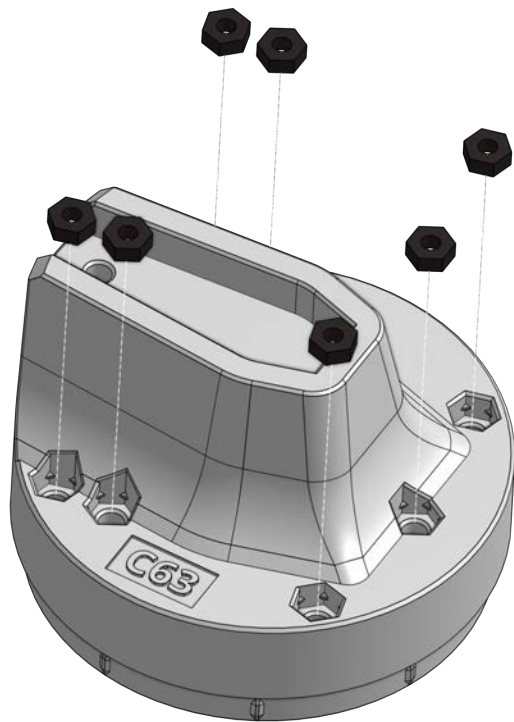
2   8x

Step 14a

2   10x

Insert 12 x **M3** nuts in **C61.**

Step 14b

2   7x

Insert **7 x M3 nuts** in **C63.**
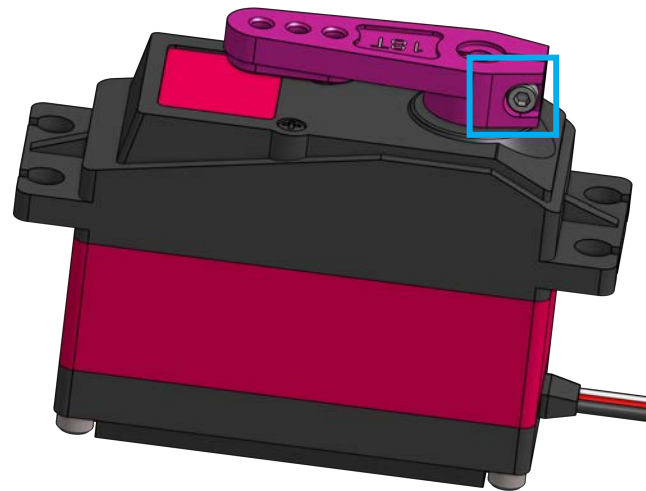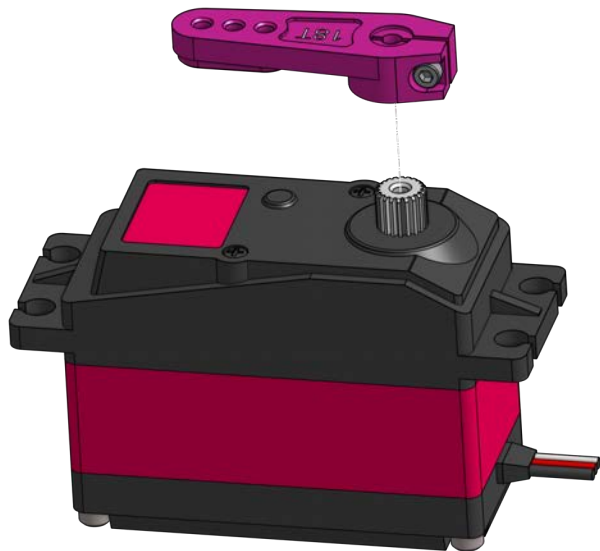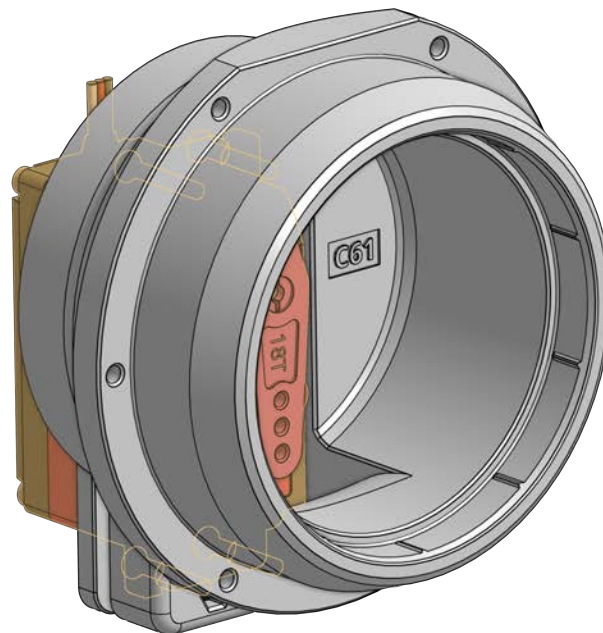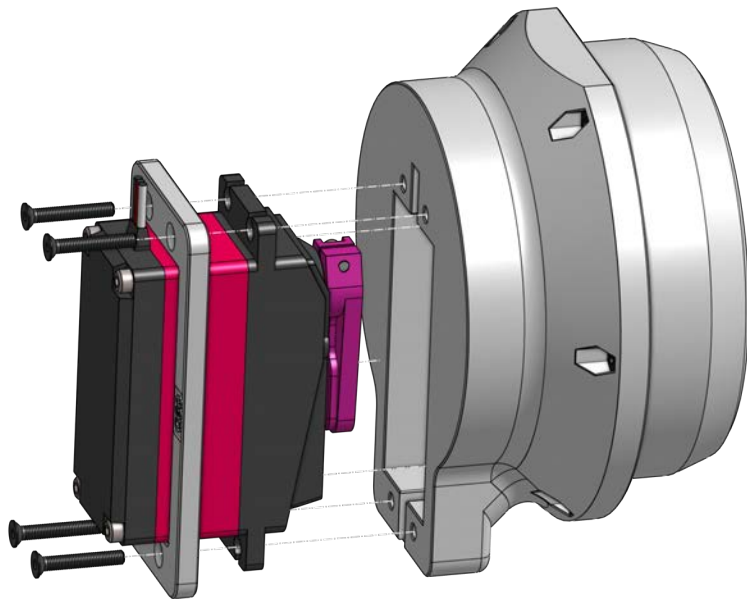
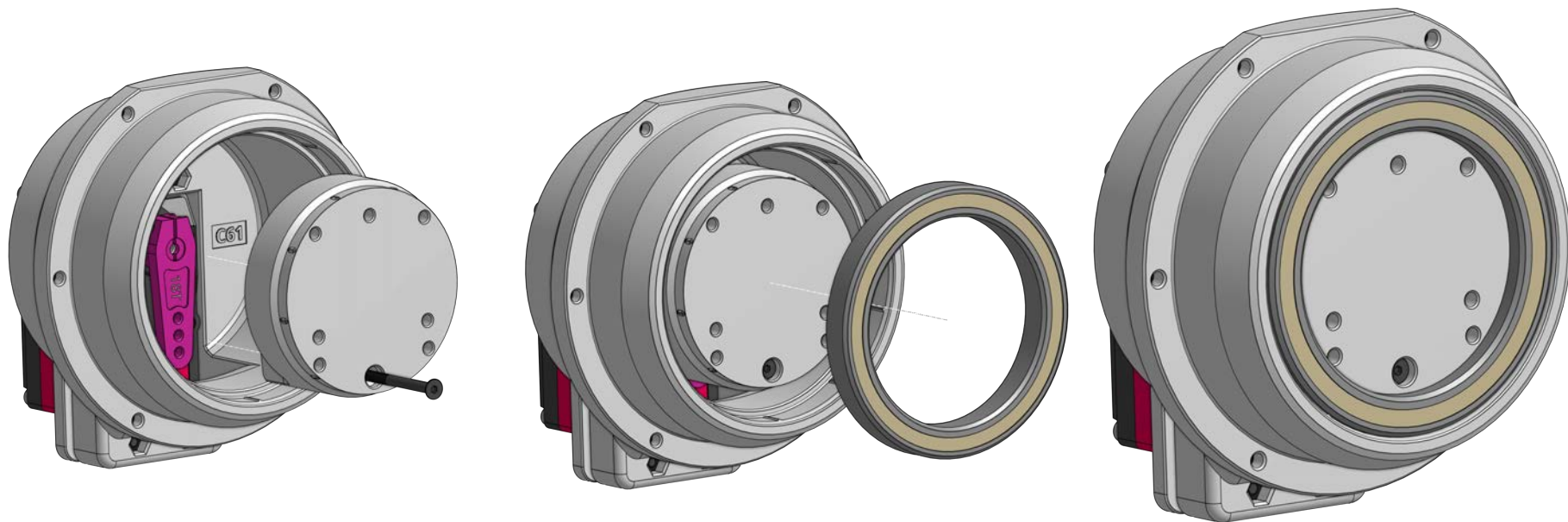Attach **M17** to **E15** and tighten the connection using the shown screw.

Step 15b

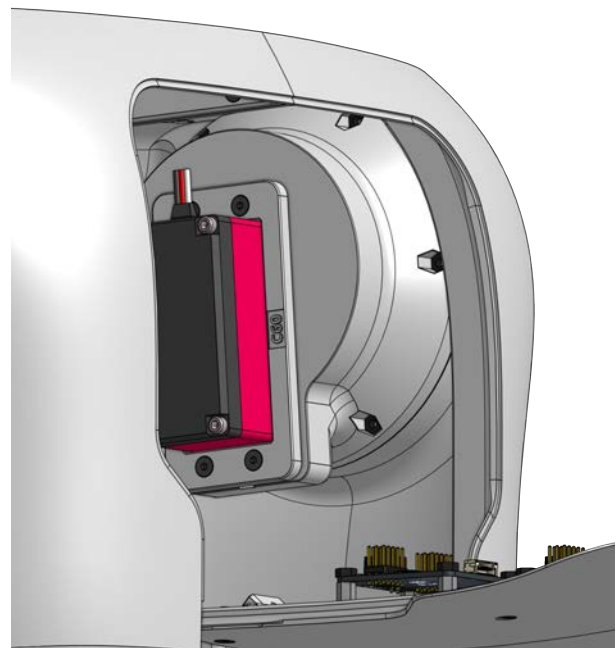Attach **E15** to **C61** using **C60** and **4 x M3 20mm** screws.

Step 15c

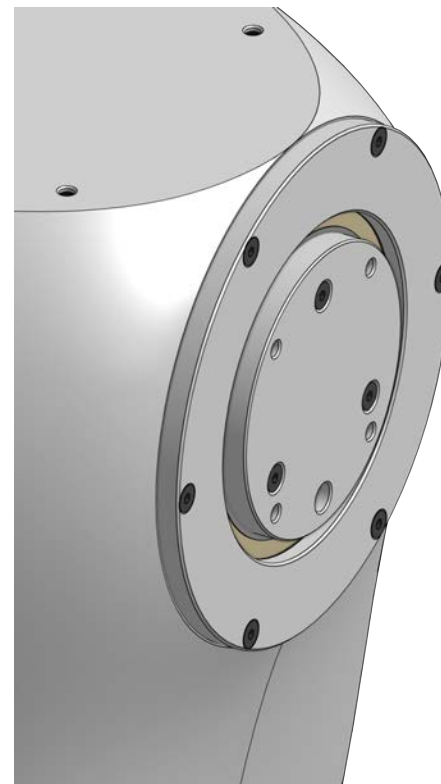Attach **C63** to assembly using **1 x M3 40mm** screw and place **1 x M04** ballbearing on top.
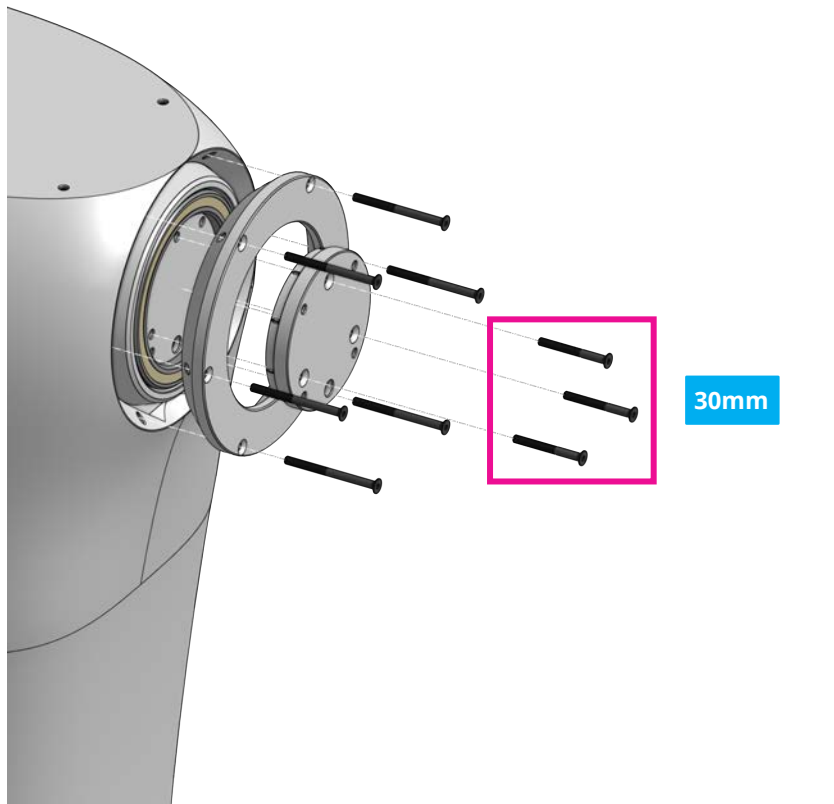
Step 16a

Place assembly into clavicles like shown in the pictures.

Step 16b

2   9x

Fix the shoulder using **C62** and **C64** with **6 x M3 40mm** screws and **3 x M3 30mm** screws.
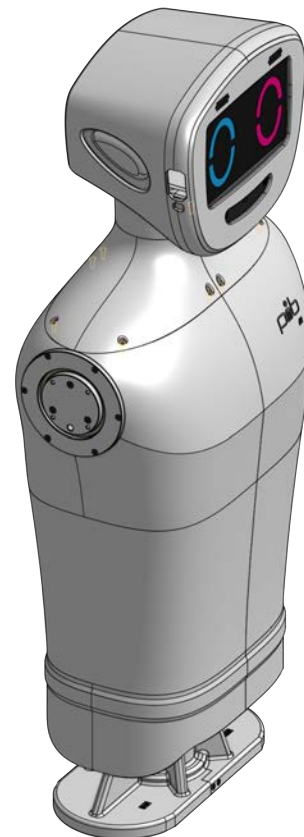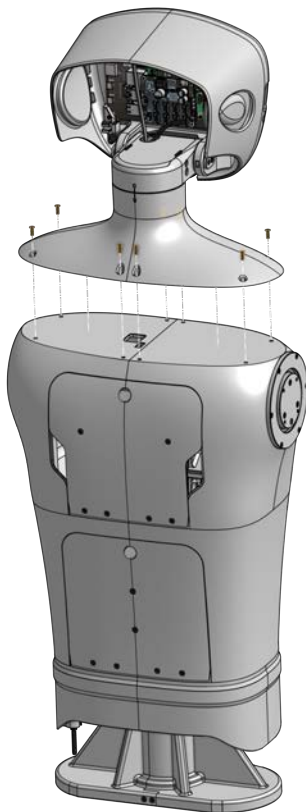

30mm

Step 17

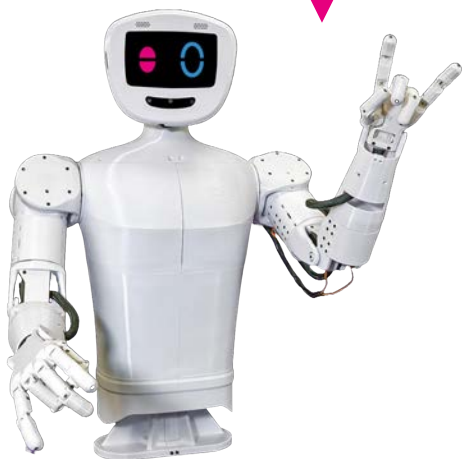Assemble neck and head to upperbody using **8 x M3 10mm screws**.

2   8x

Congratulations

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

Well done!

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.

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Send us an email.

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