pib

How to build your robot

www.pib.rocks/build

assembly instructions for:
UPPER BODY
v2025

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

B55-Logo_edu

2 x **B56**-Speaker_spring

2 x **B57-**Printed_washers

B47-Power_holder

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

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 **E03**-TinkerForge ServoBricklet
12 x **E07**-MG996R
2 x **E09**-DS3225
1 x **E16**-RPi Power Supply
3 x **E25**-RGB buttons
2 x **E26**-Speakers
1 x **E24**-Relay

132 x **S01** M3 nuts
12 x **S02** M3 6 mm screws
6 x **S03** M3 8 mm screws
62 x **S04** M3 10 mm screws
16 x **S05** M3 12 mm screws
10 x **S06** M3 16 mm screws
12 x **S08** M3 20 mm screws
2 x **S09** M3 22 mm screws
4 x **S10** M3 25 mm screws
2 x **S11** M3 30 mm screw
12 x **S13** M3 40 mm screws
4 x **M08** 20 mm metal rods
8 x **M13** Distancer

Printable parts - Overview

B19-Flat_stand_right
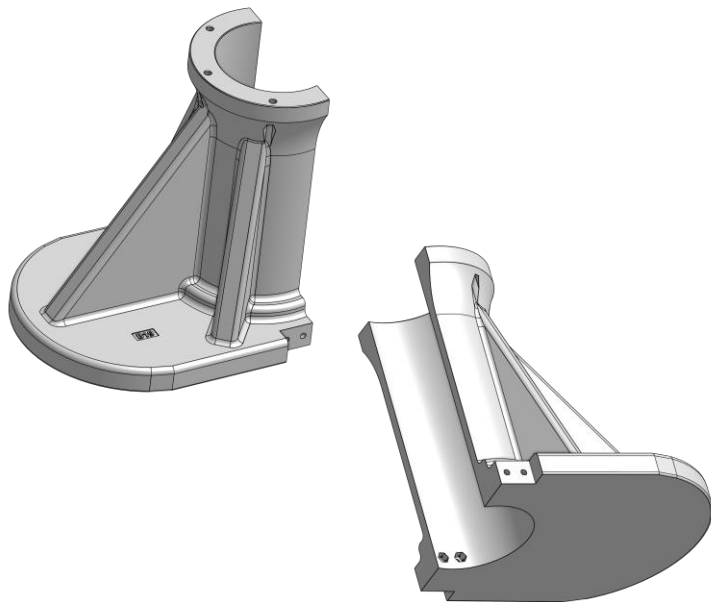
B20-Flat_stand_left
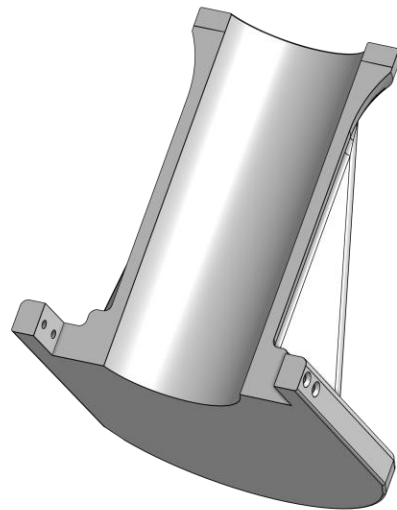
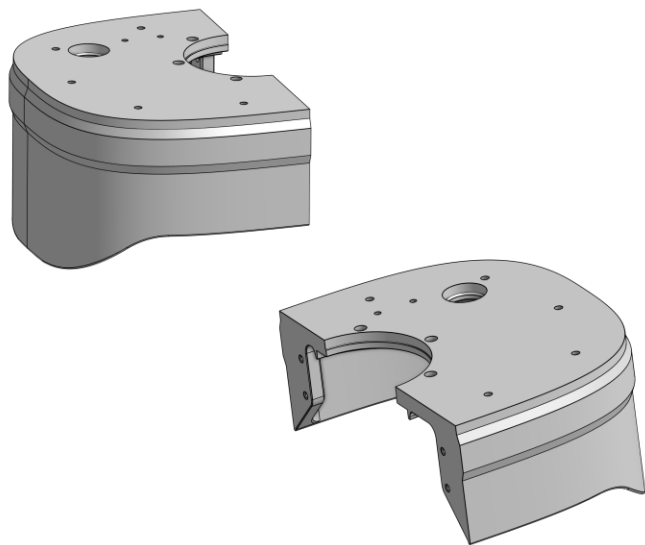# Printable parts - Overview

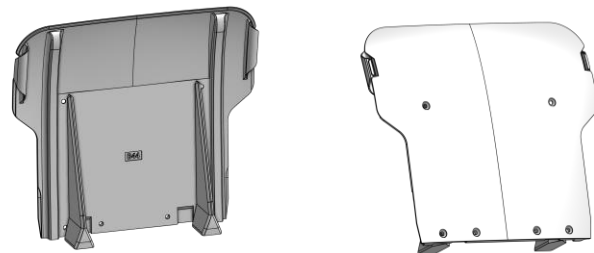**B41-L/-R**-Clavicle_Left/Right
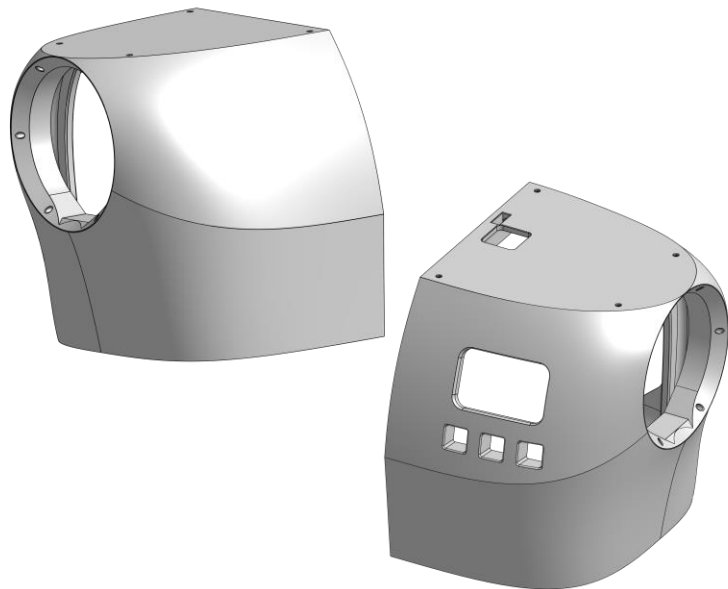
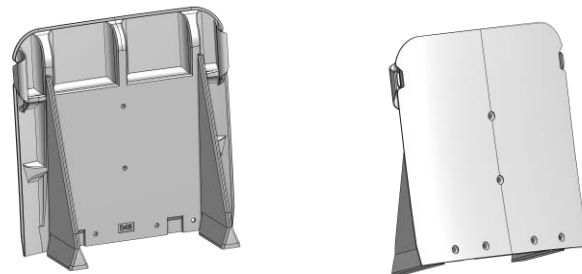**B42-L/-R**-Ripcage_Left/Right

Printable parts - Overview

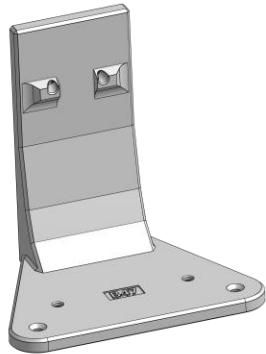## B43-L/-R-Ripcage_Lower_Left/Right
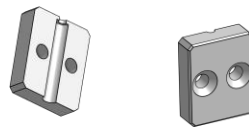

B44-Electronics_back

B46-Power_back
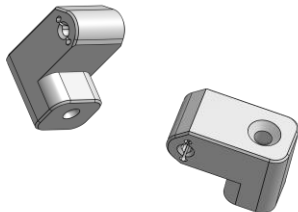
Printable parts - Overview
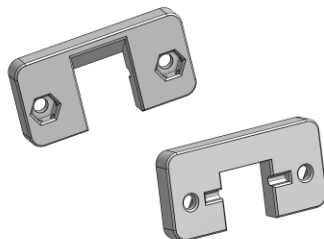
B47-Power_Holder
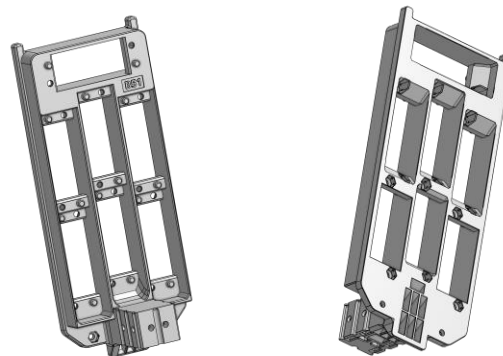
B53-Tube_Holder_Top

B60p-M3-M4.5_Adapter

B51-Servo_Array_Scaffold
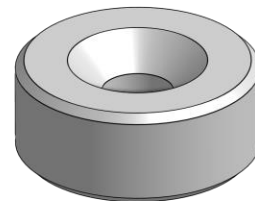
B48-Hinge

B49-Hinge_Plate

Printable parts - Overview

B45-Electronics_base
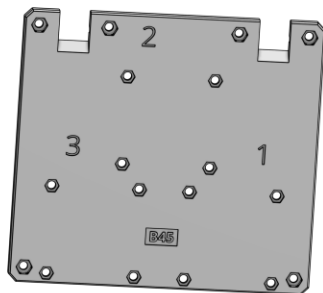
B52-Tube_Holder_Slide
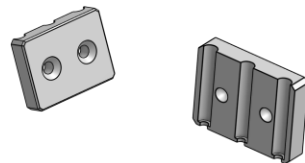
B27-Wire_connector_mount

B31-Wire_connector_pawl_forearm
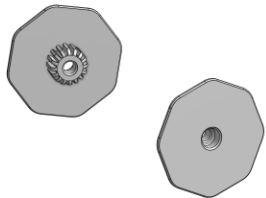
B25-Wire_connector

B26-Wire_connector_pawl
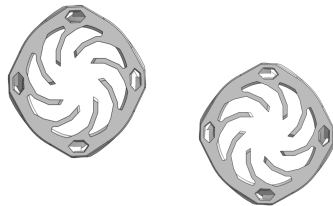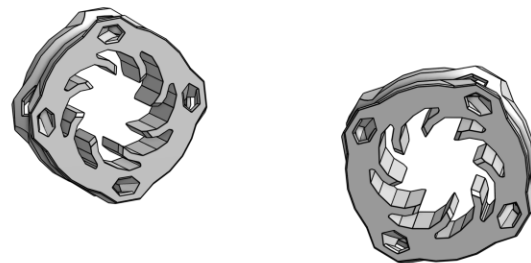
Build it better: our suggestion for assembling pib

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 0

Make sure all motors in this tutorial are calibrated according to tutorial "**step 1c motor calibration**"

Step 1

2   4x   4x
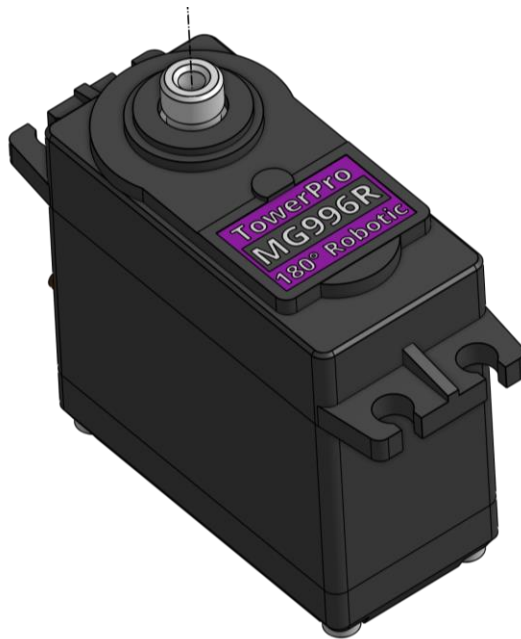
Place **2 x nuts** in the shown spots in **B19**, then use 2 **x 30 mm screws** to fix **B20 to B19**.

B19

B19

B20

Step 2a

2 6x
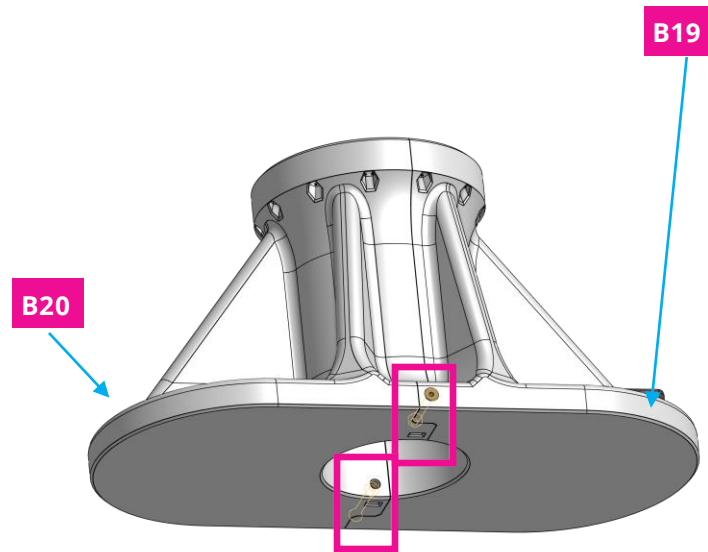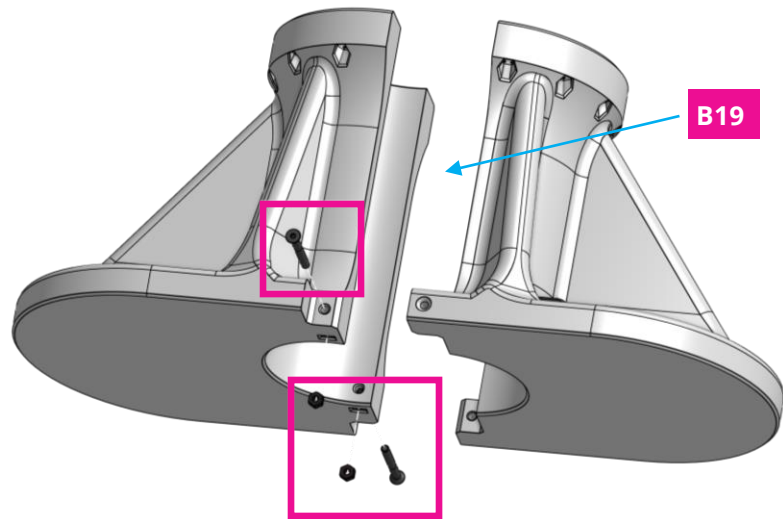
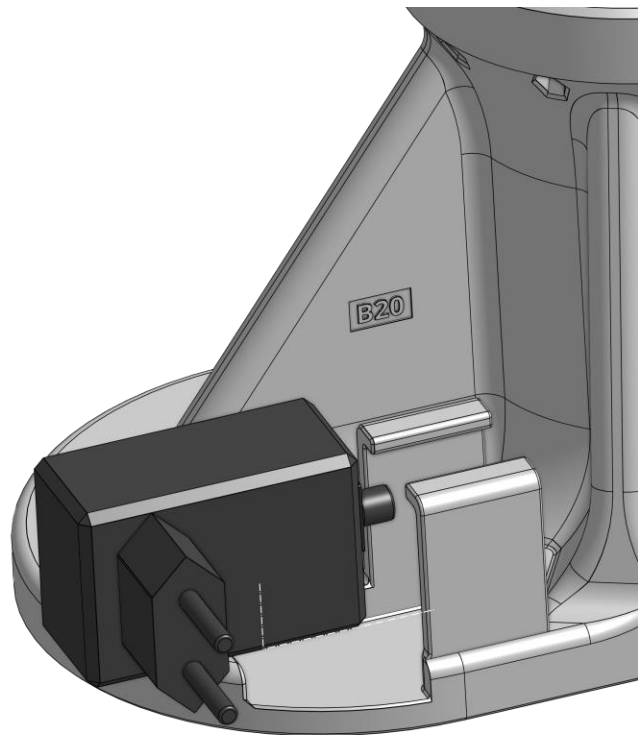Place **12 x nuts** in shown spots in **B19** and **B20**.

B19
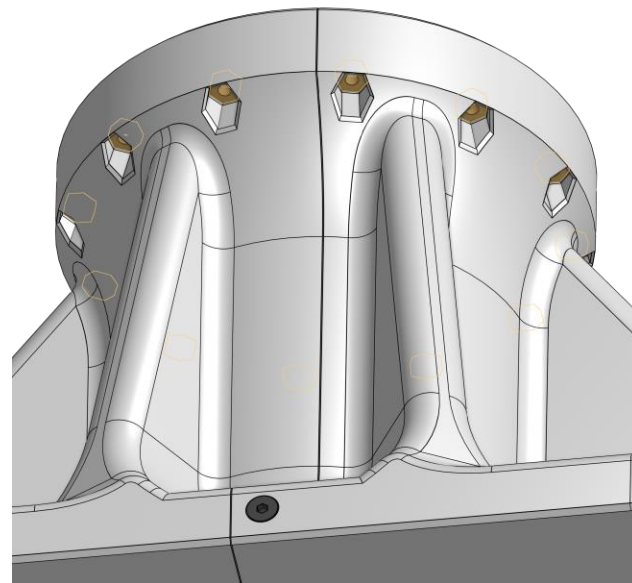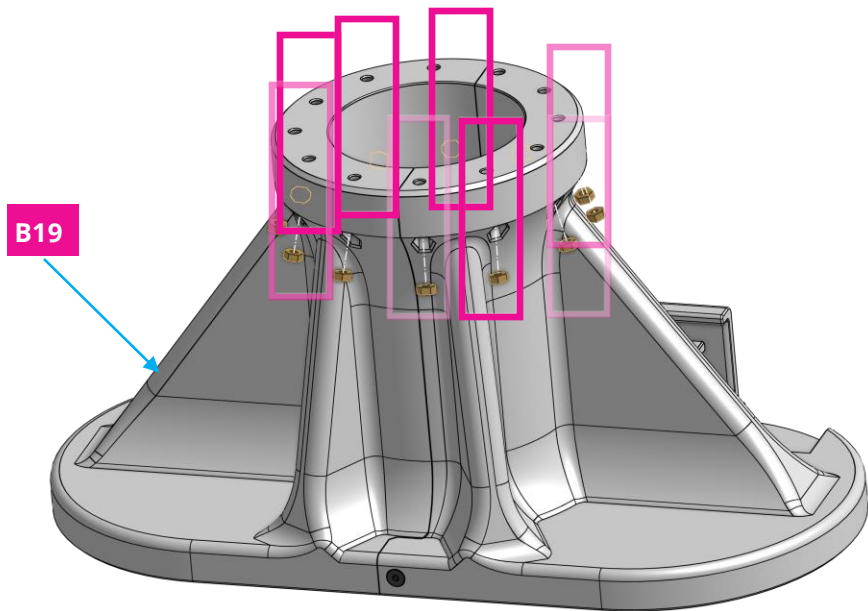
B20

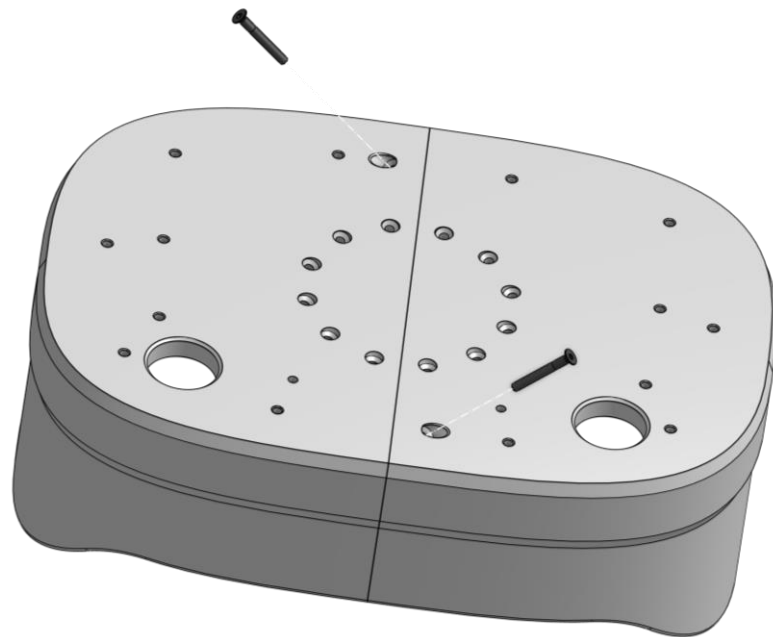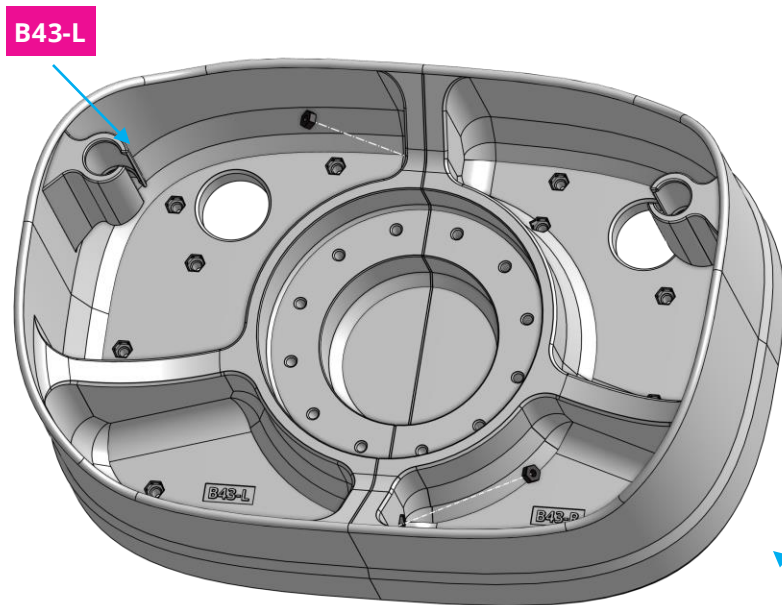*It is easier to put the nuts into place, when you flip the assembly.*

Step 2b

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

B20
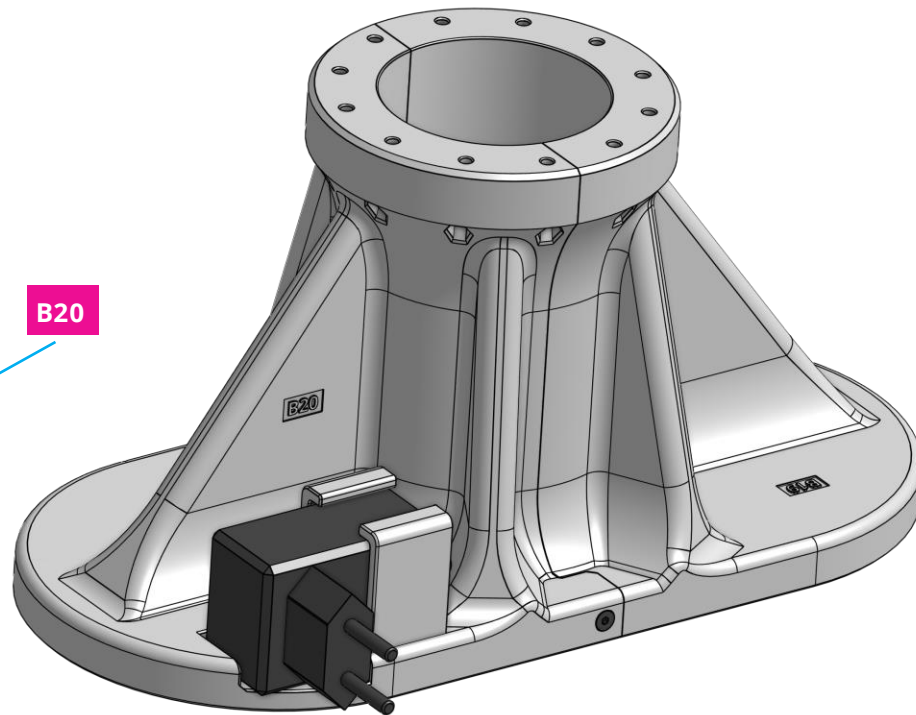
Step 3a

Connect **B43-L** and **B43-R** using **2 x M3 nuts** and **2 x M3 25mm screws**.

2   2x   2x

B43-L

B43-R

2   16x

Place **16 x M3** nuts in the assembly.

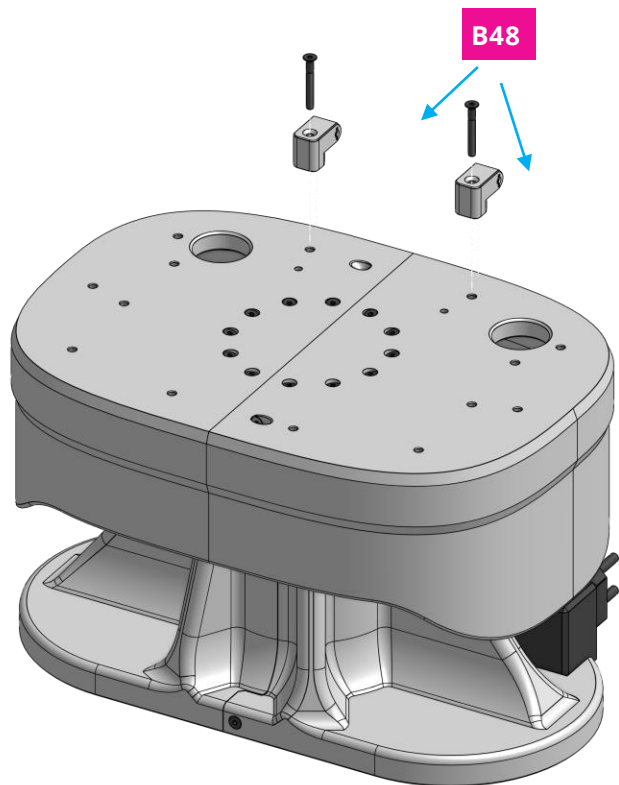## Step 4

2 | 12x
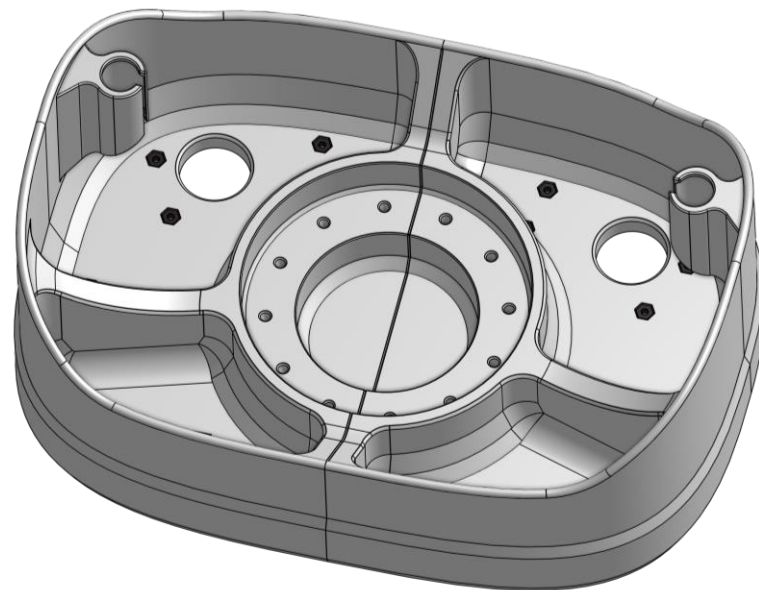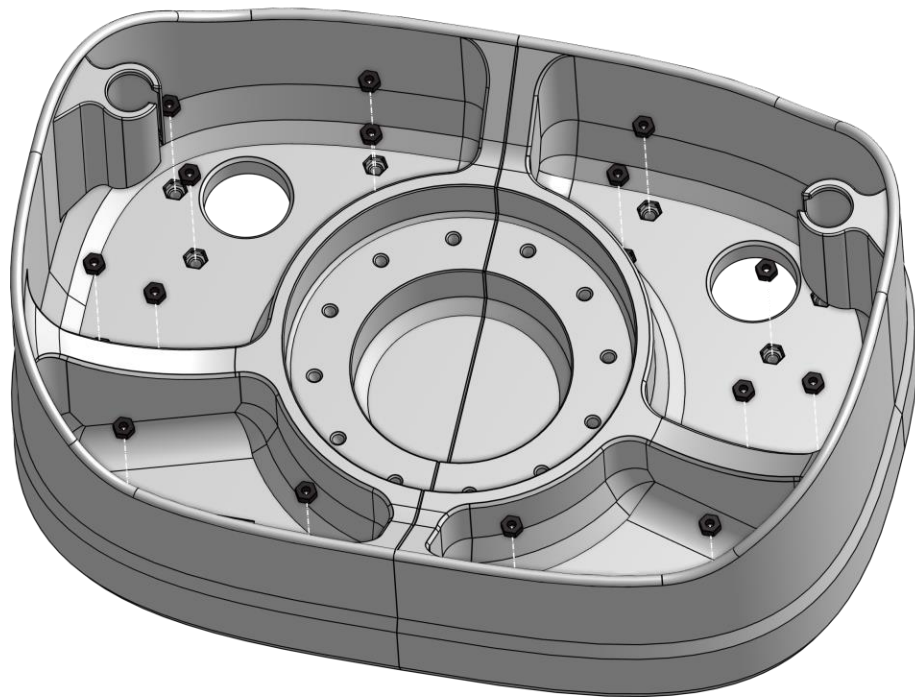
Connect both assemblies using **12 x 40 mm screws**.
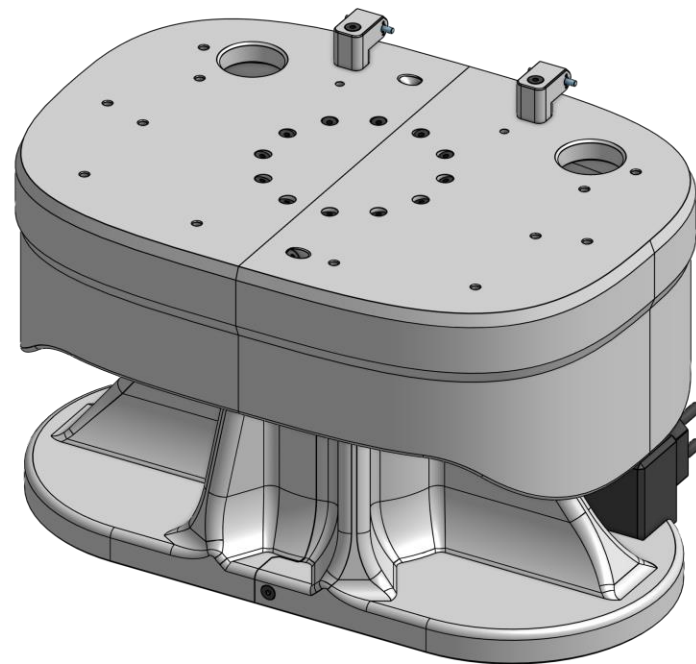
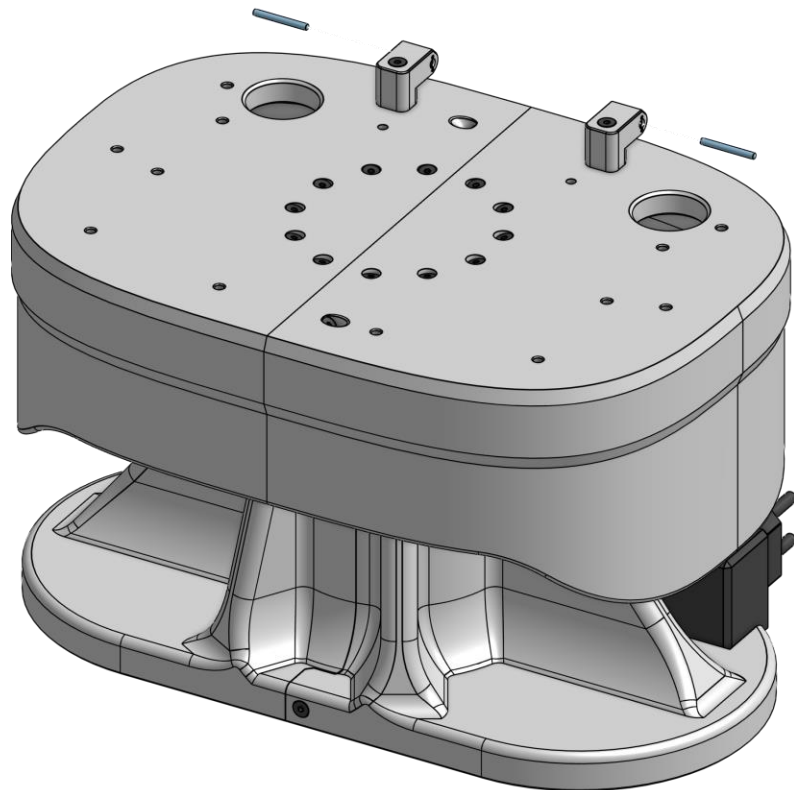You may apply some gentle force to connect the assemblies.

Step 5

2 2x
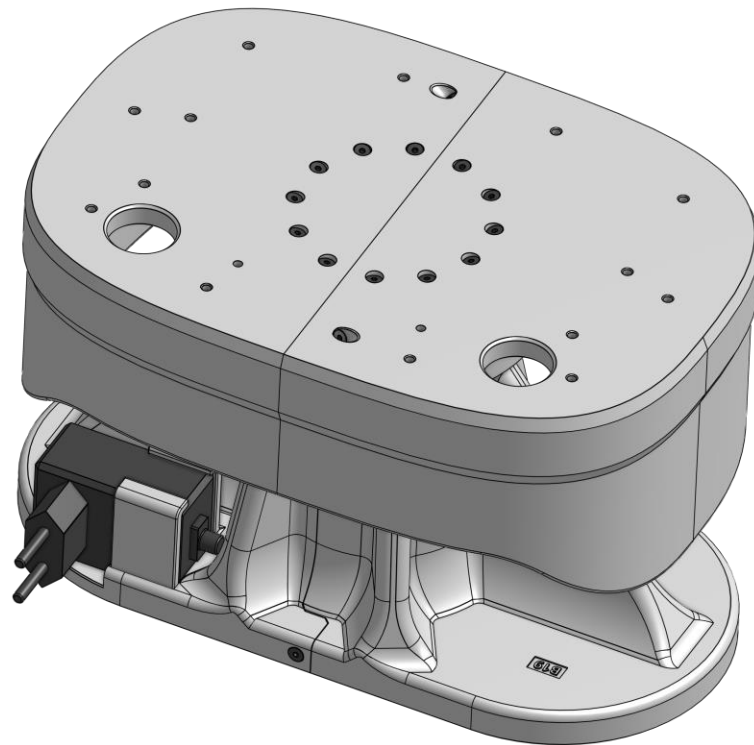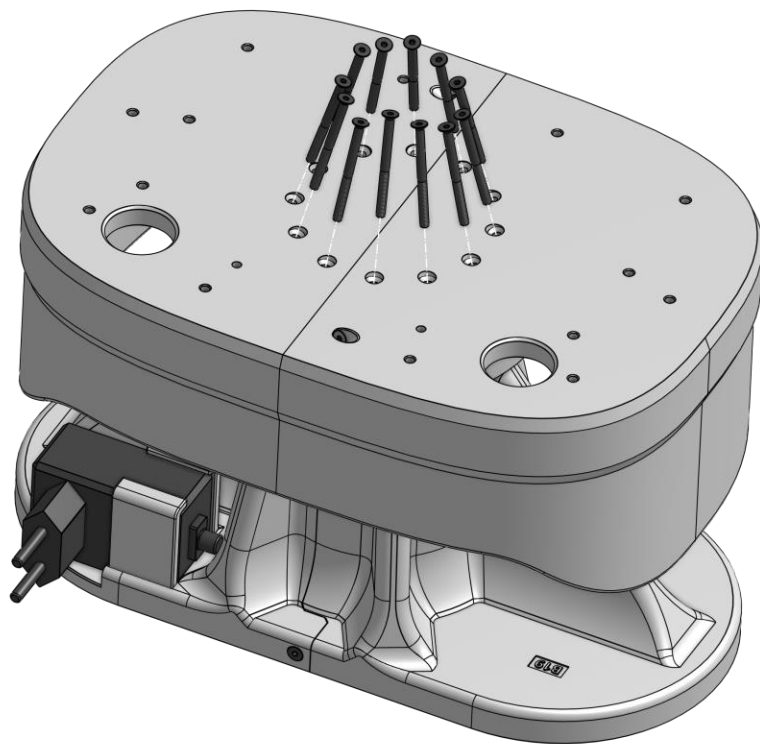
Connect 2 x **B48** to **assembly** using **2 x 25 mm screws.**
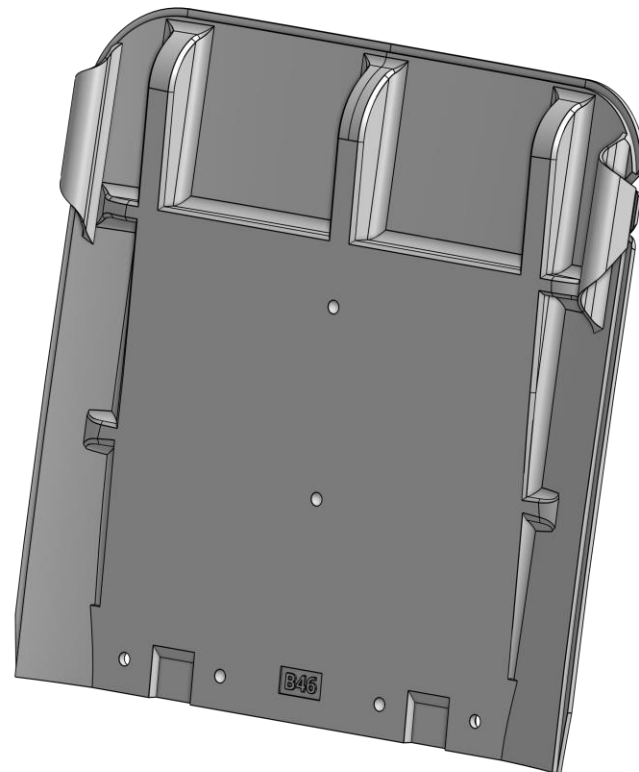
B48
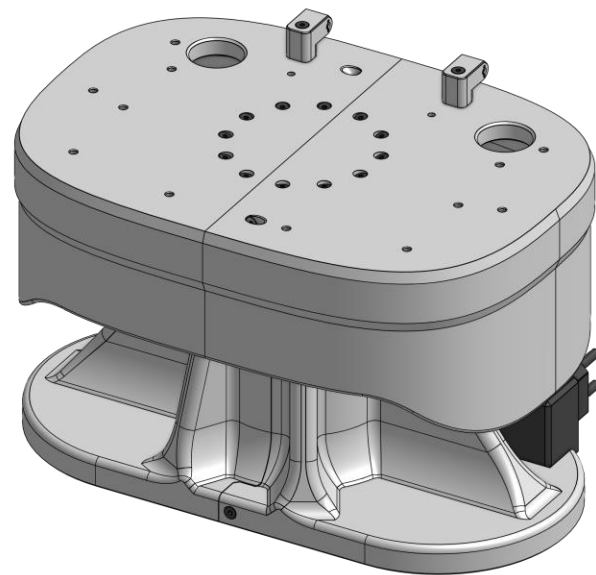
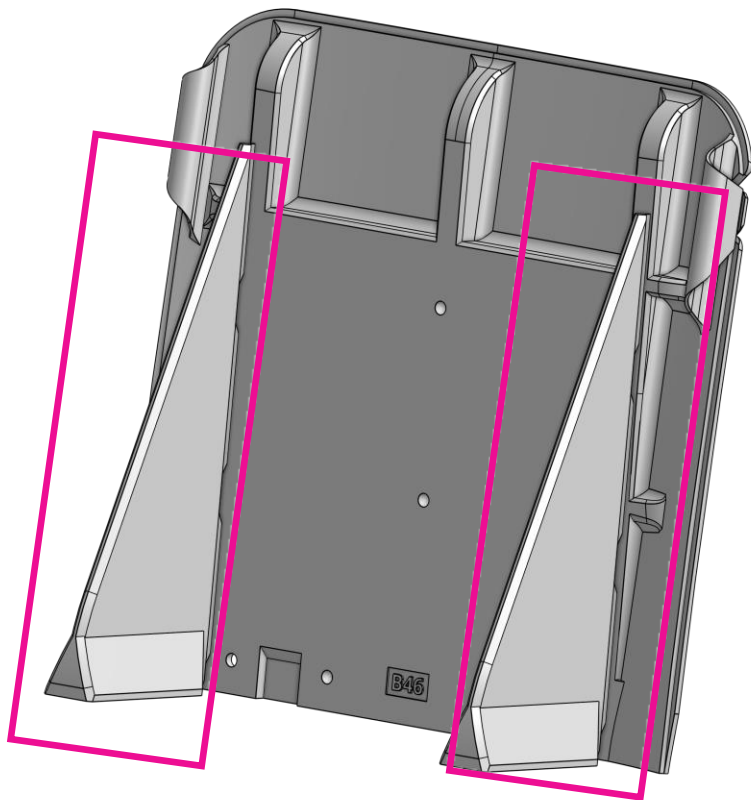## Step 6a

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

2

2x

Step 6b

Remove the print helpers from **B46** gently with your hands or a plier

Step 7

2 | 4x | 4x

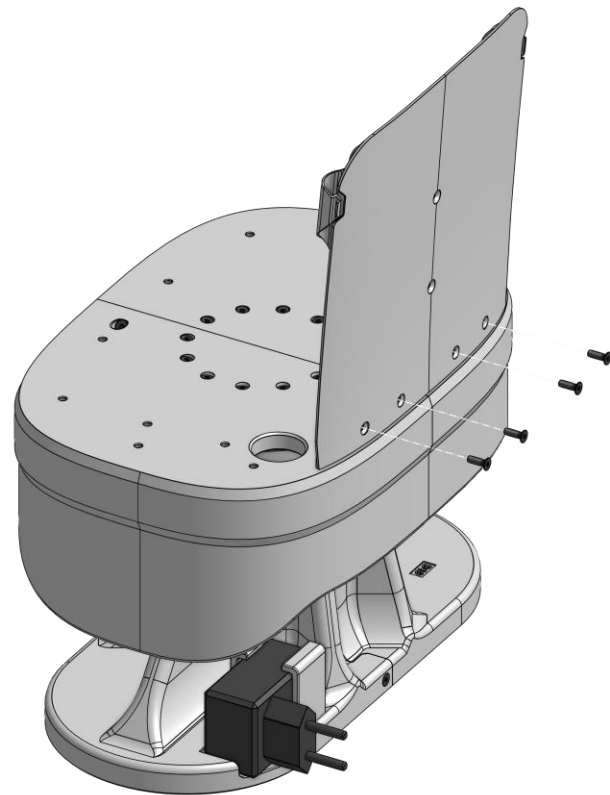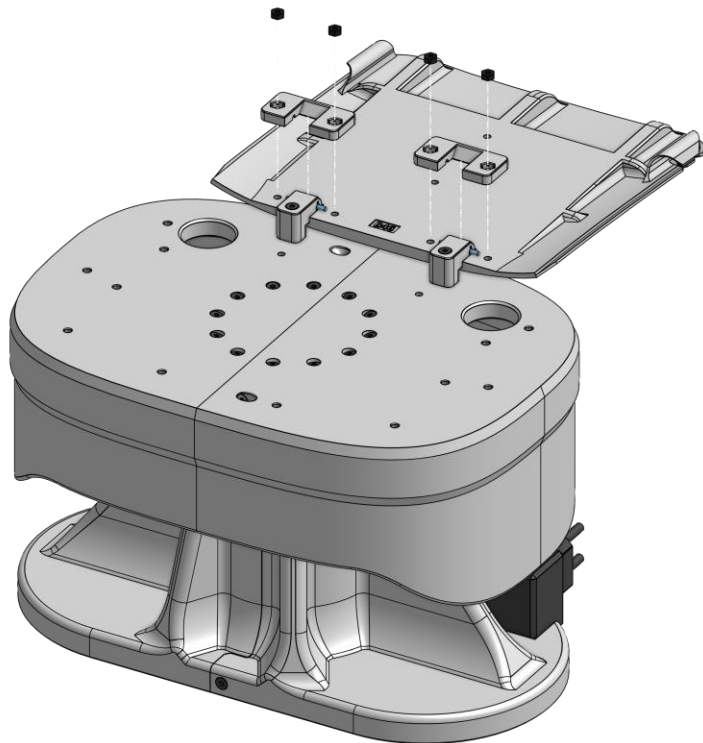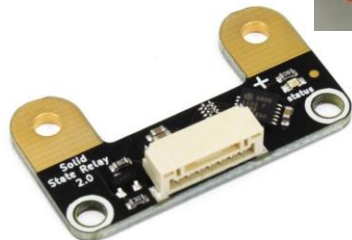Connect **B46** to the previous assembly using **2 x B49**, **4 x M3 nuts** and **4 x M3 10mm screws**.

Step 8a

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 8b

2 · 4x · 2x

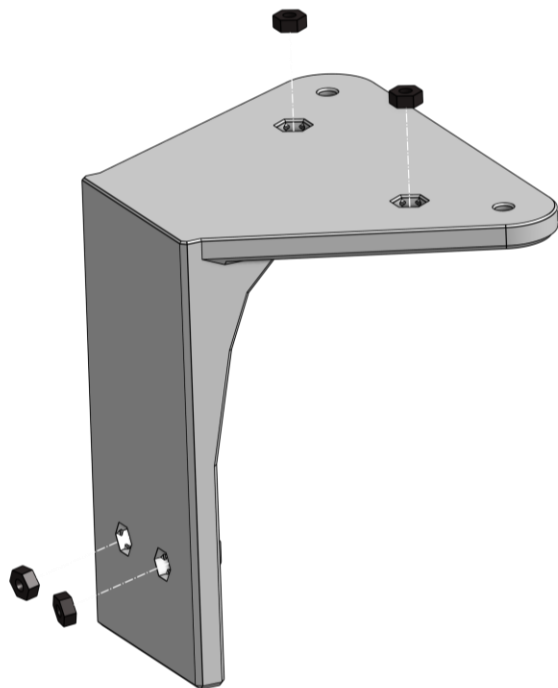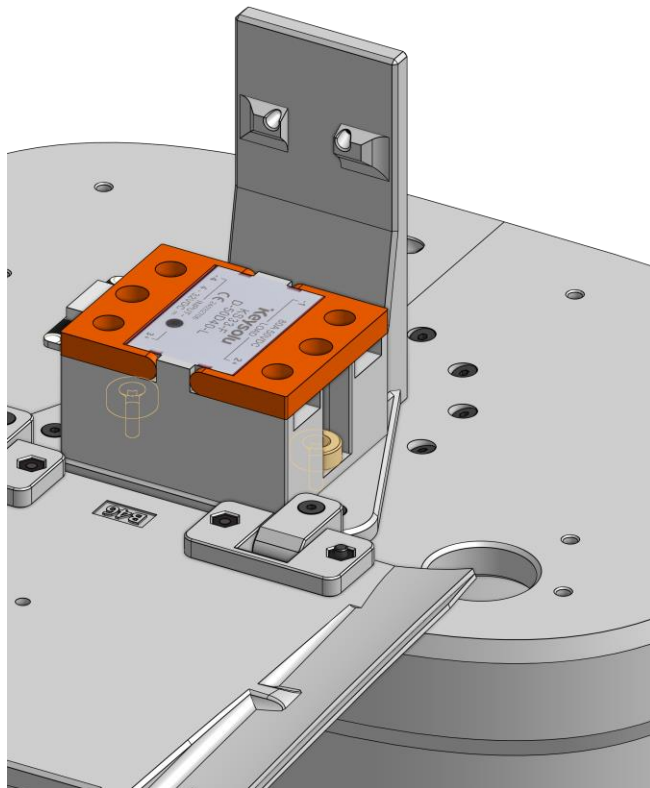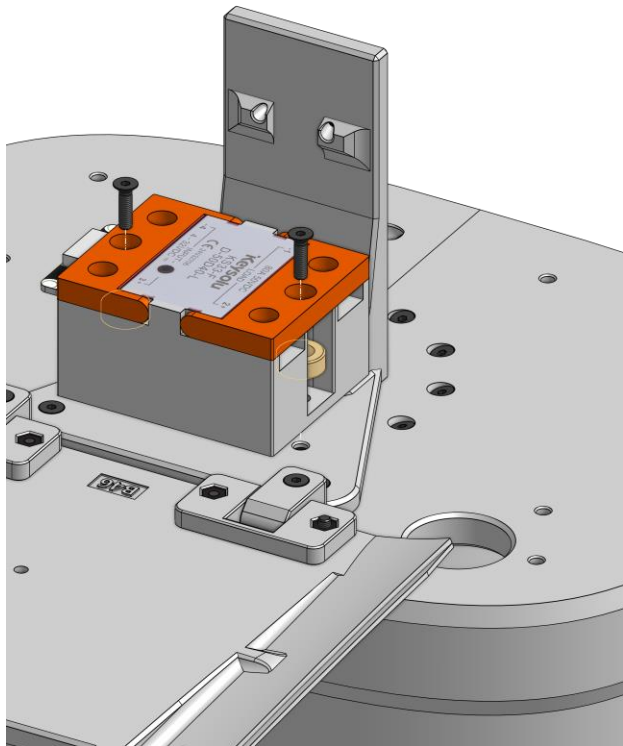Connect **B47** to **B43-L and B43-R** using **4 x M3 nuts** and **2 x M3 16mm screws**.
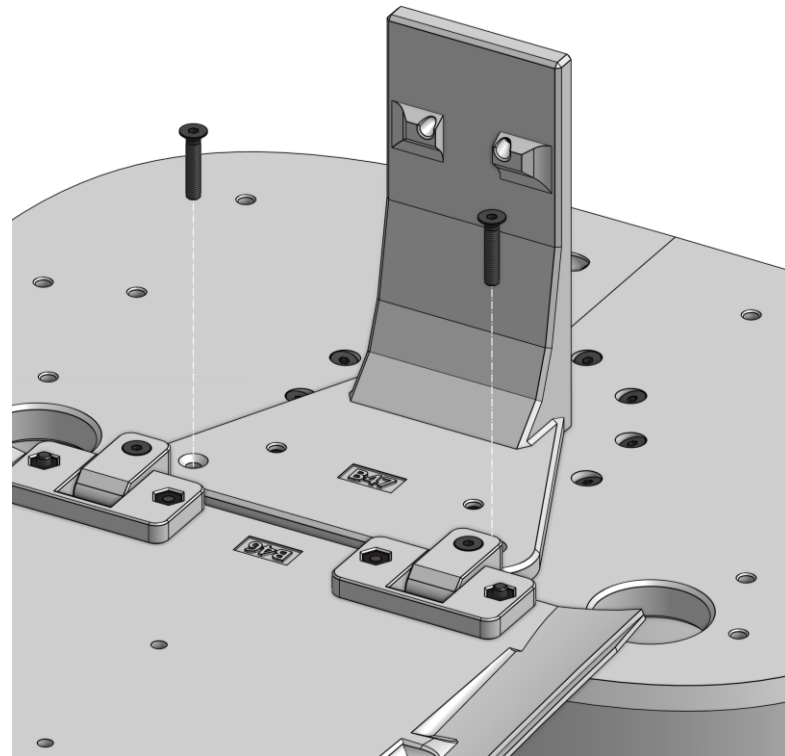
Step 8c

Connect **E16** to **B43-L and B43-R** using **2 x B57** and **2 x M3 12mm screws**.

2

2x

Step 8d
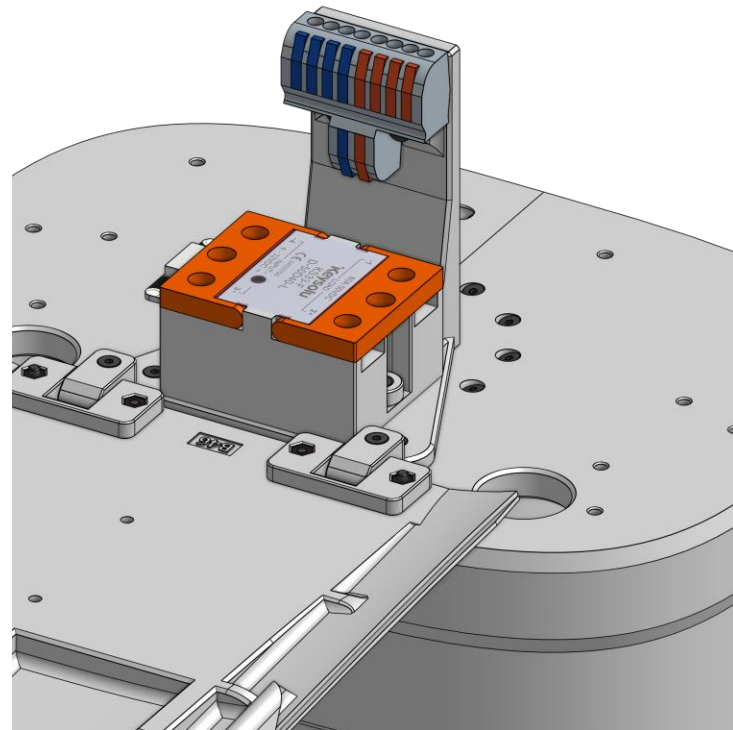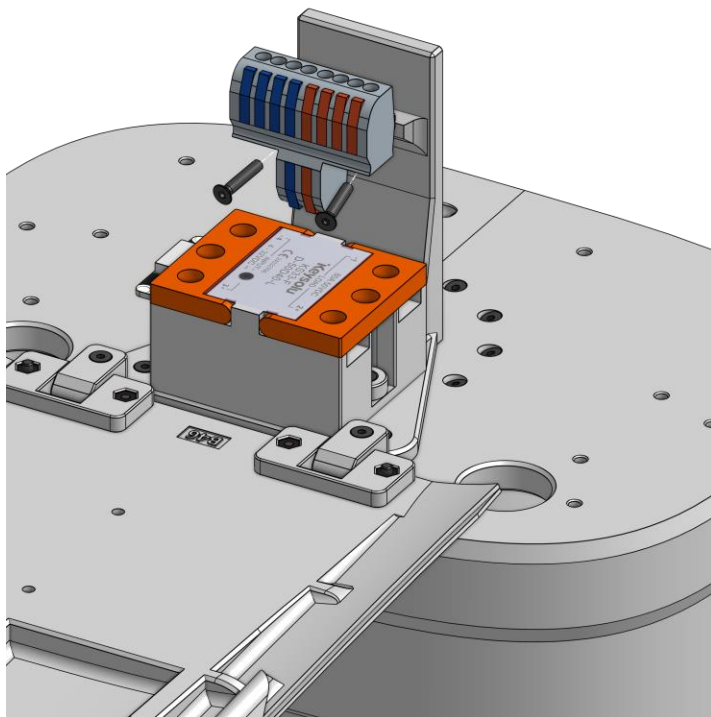
Connect **E13** to **B47** using **2 x M3 16mm** screws.

2

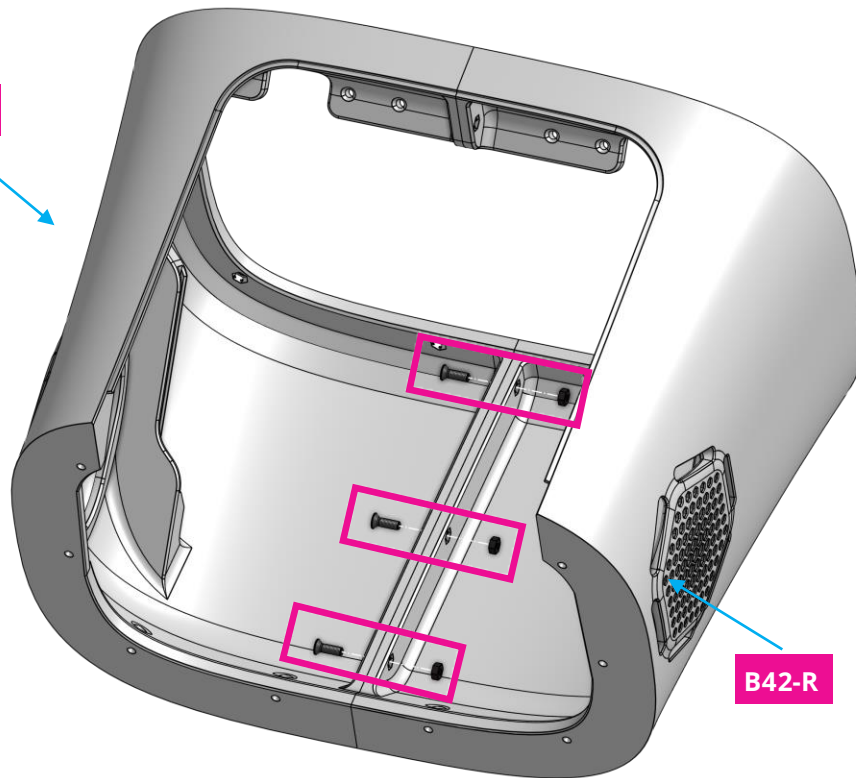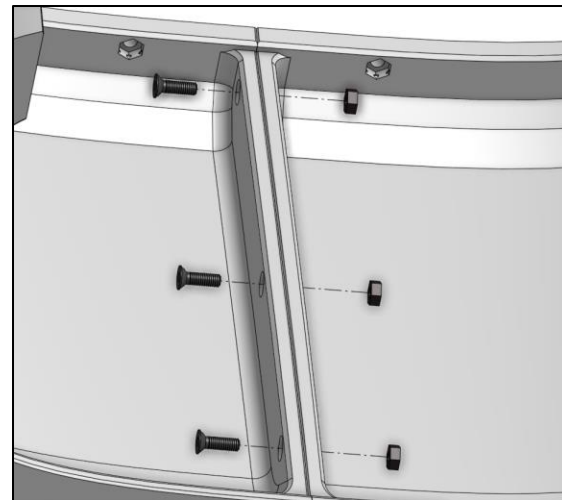2x

Step 9a

2 · 3x · 3x

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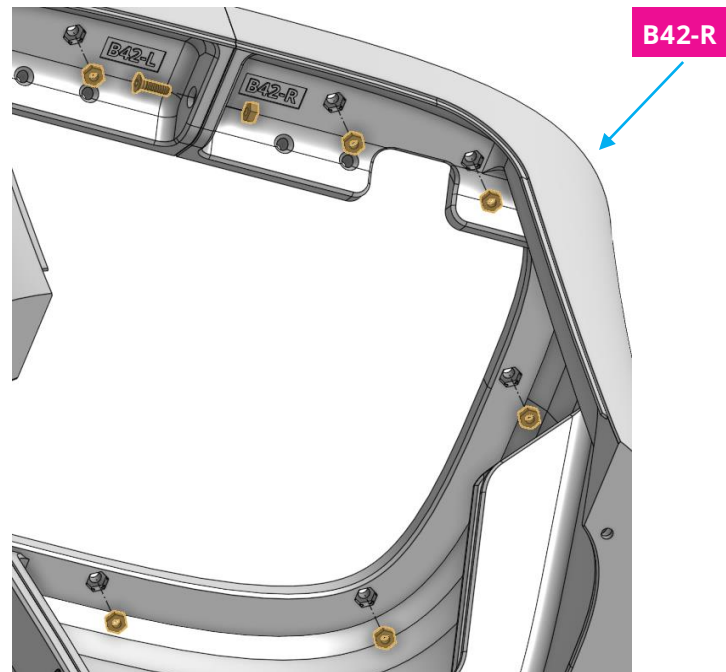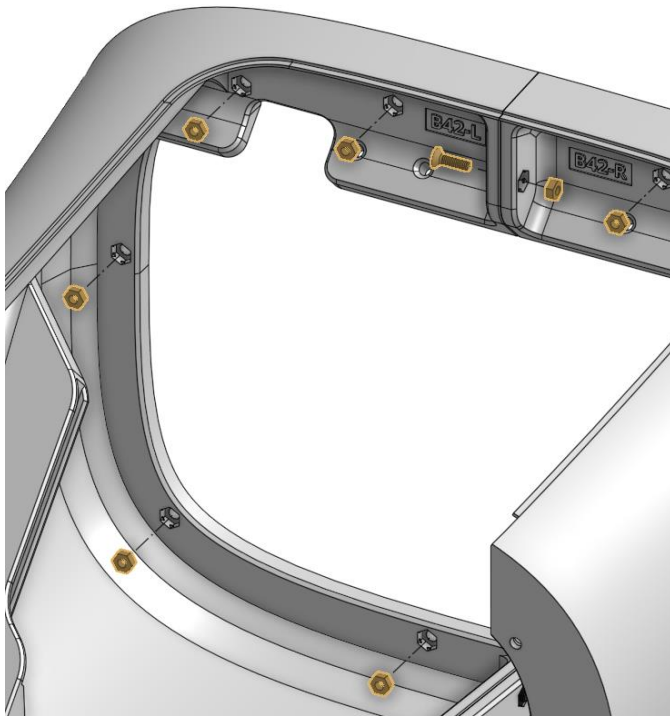

B42-L

B42-R

Step 9b

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**.
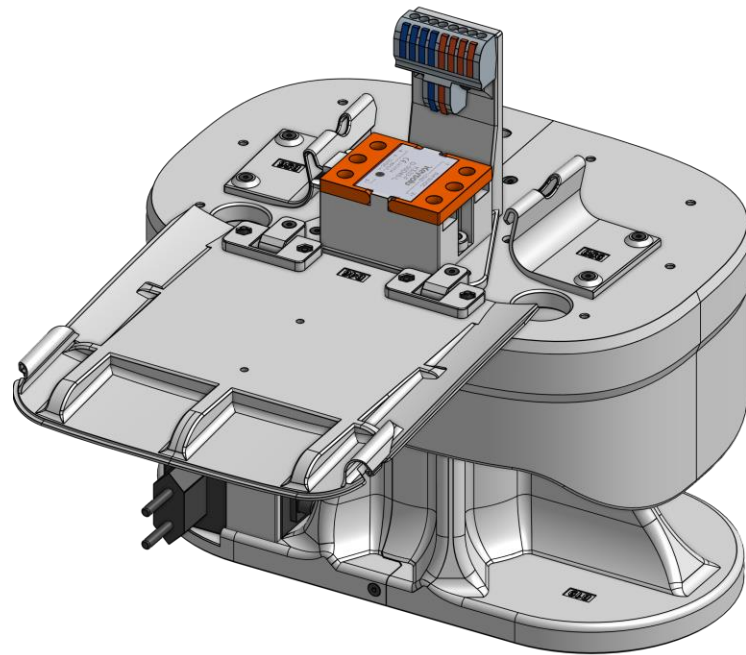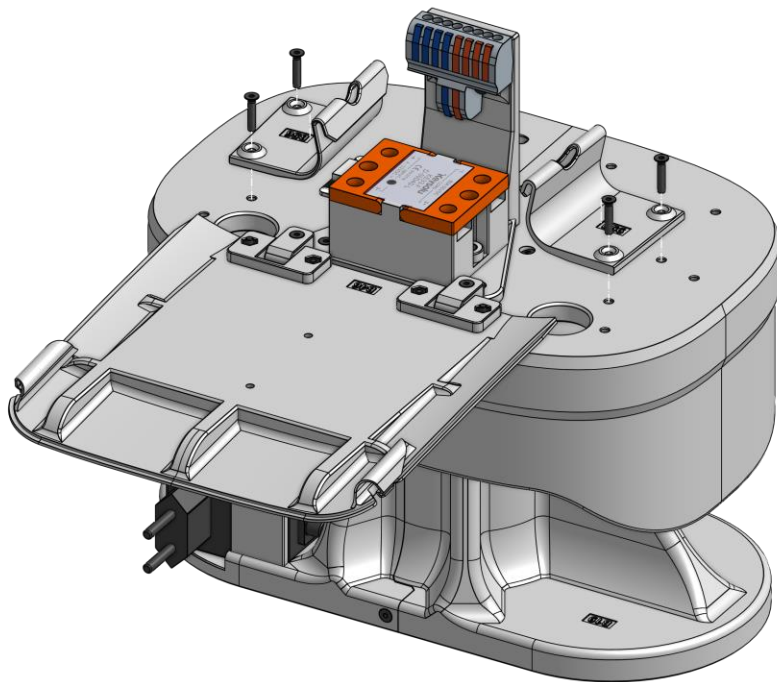

B42-R

Step 9c

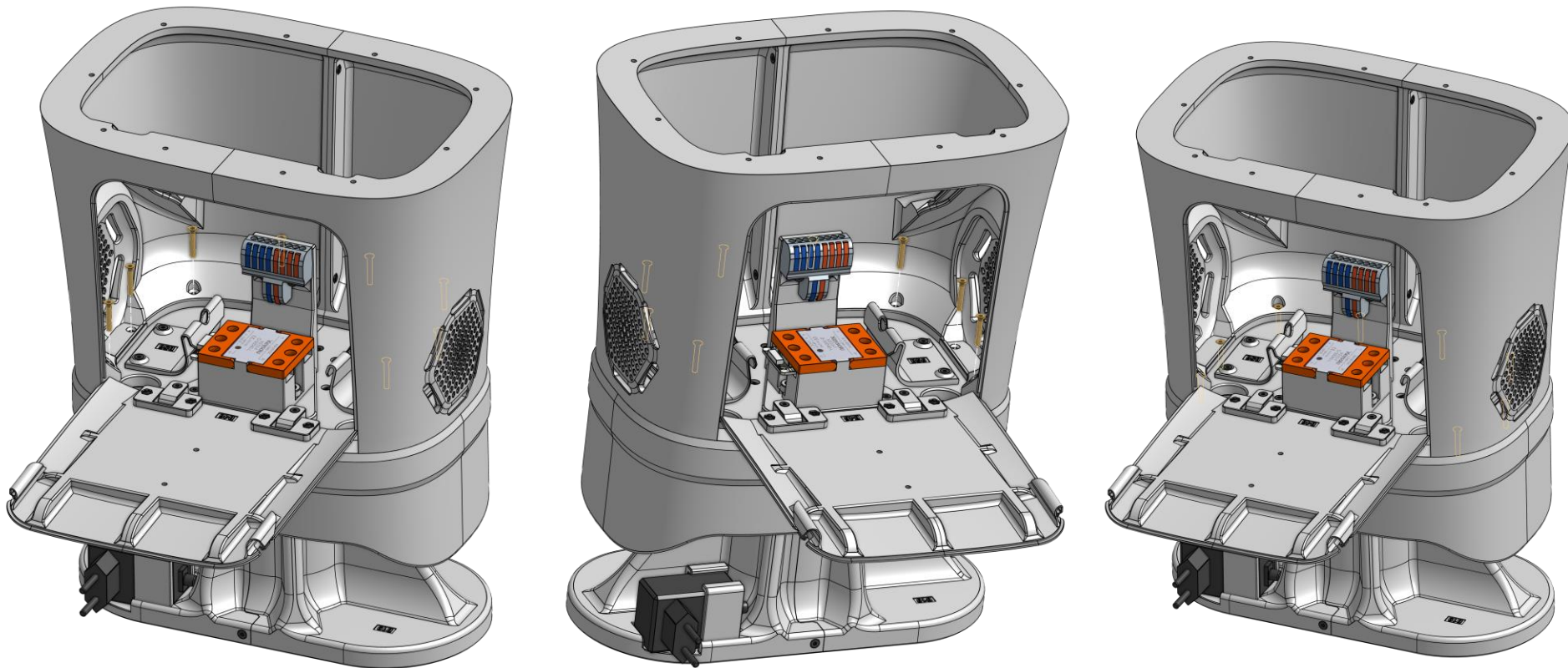Connect **2 x B56** to assembly with **4 x M3 16mm** screws

2   4x

Step 9d

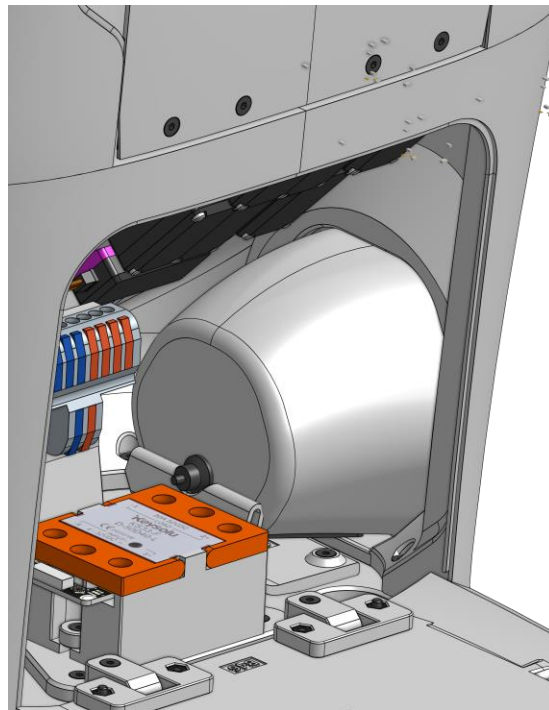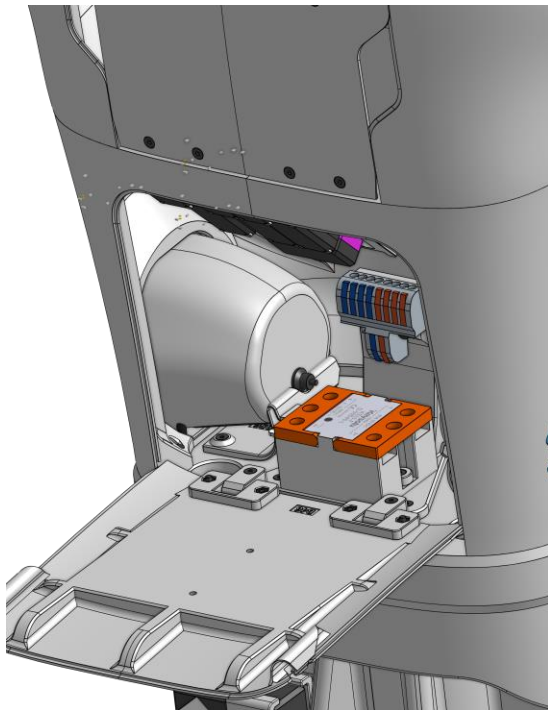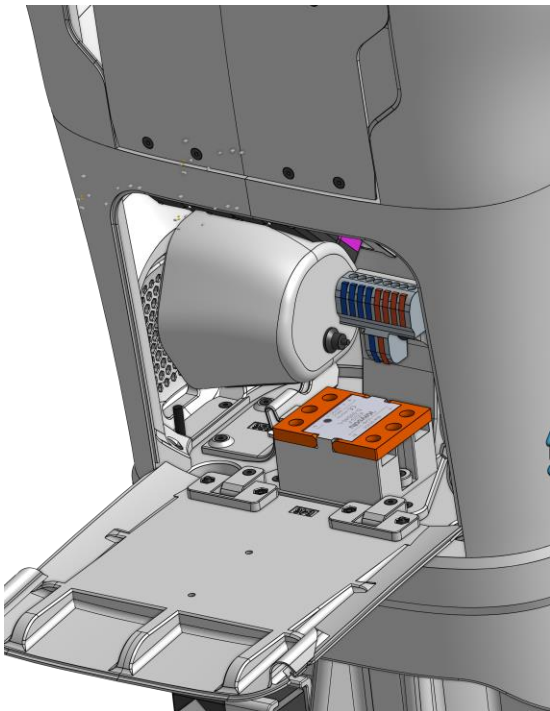Connect ribcage (previous assembly) to assembly with **8 x M3 20mm screws**.

2   8x

Step 9e

Connect **2 x E26-Speakers** to **B42-L** and **B42-R**
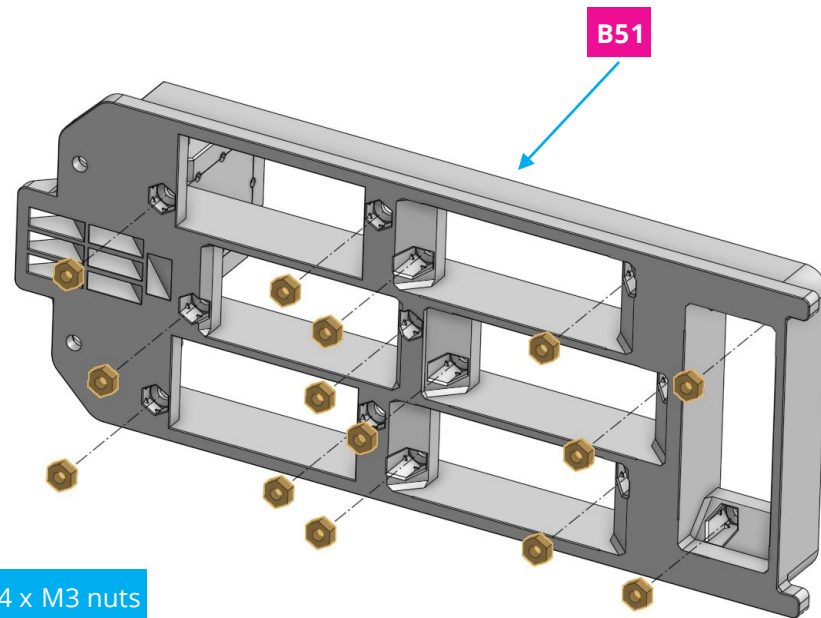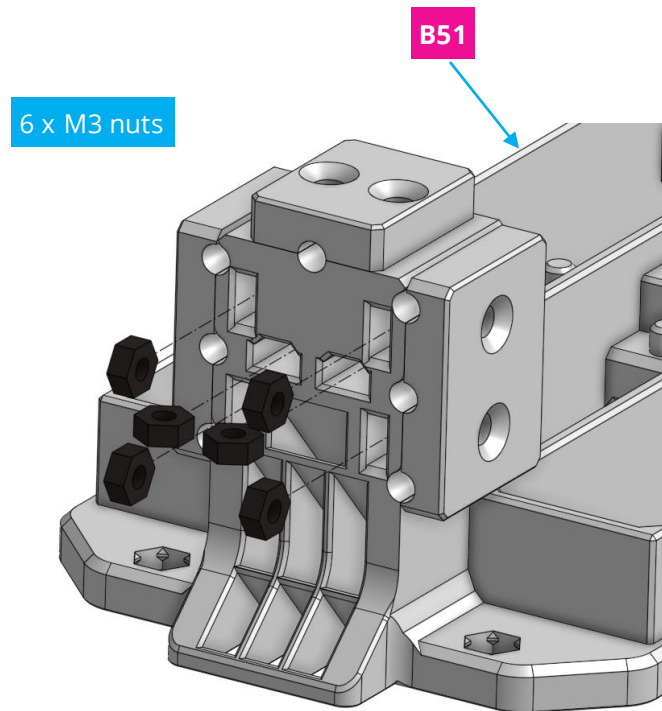
Step 10a

2 | 20x

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

B51

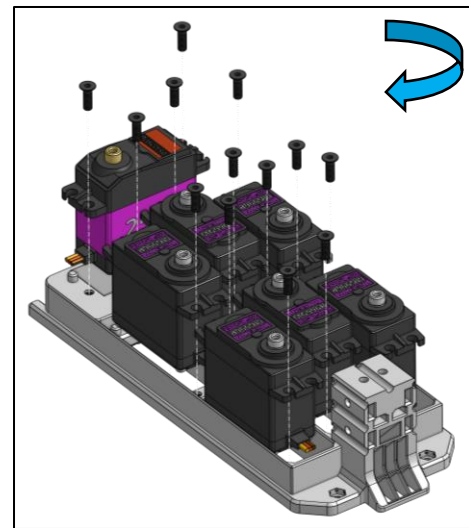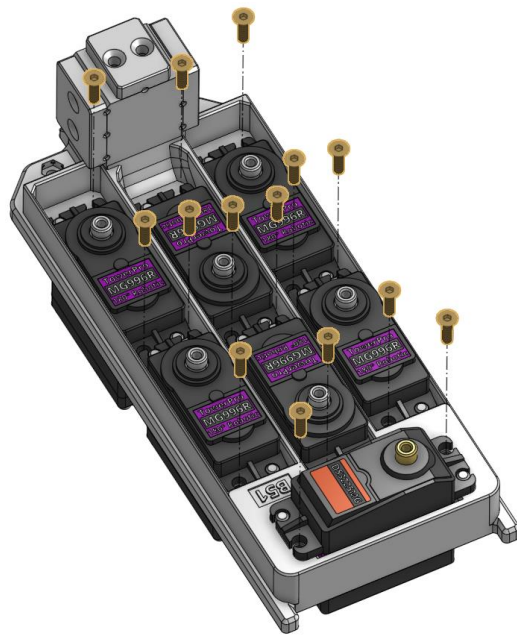6 x M3 nuts

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
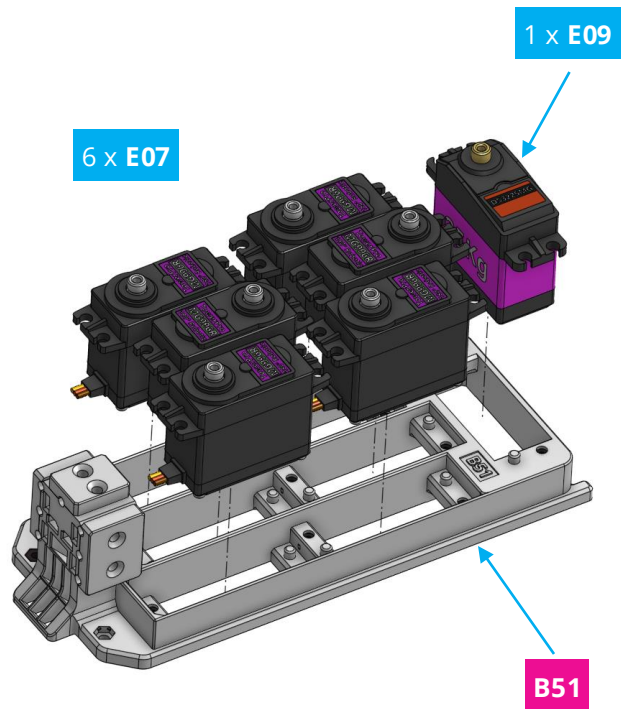
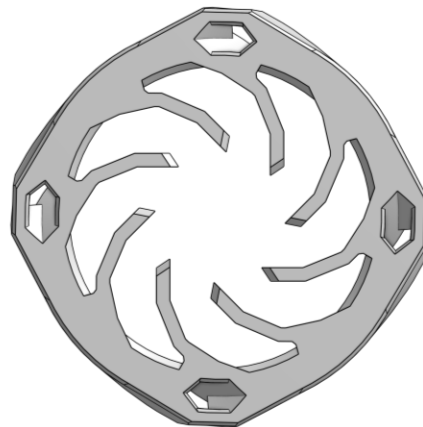*Please revert to step 0 and calibrate the motor if it was not calibrated*

Note

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

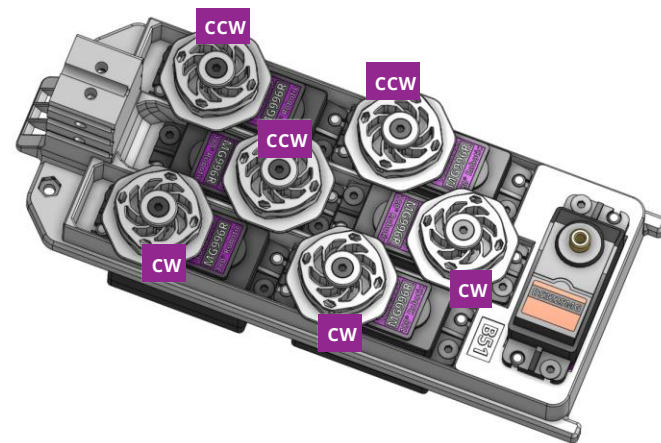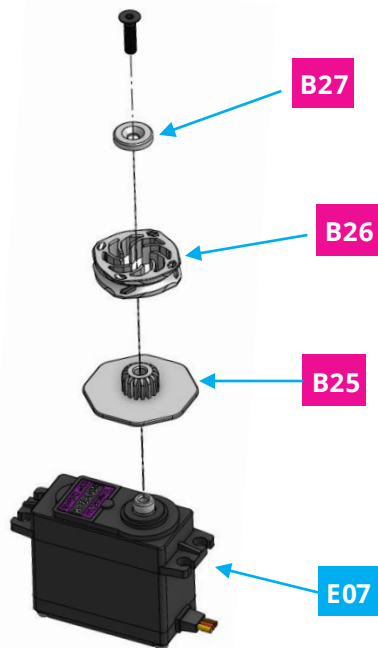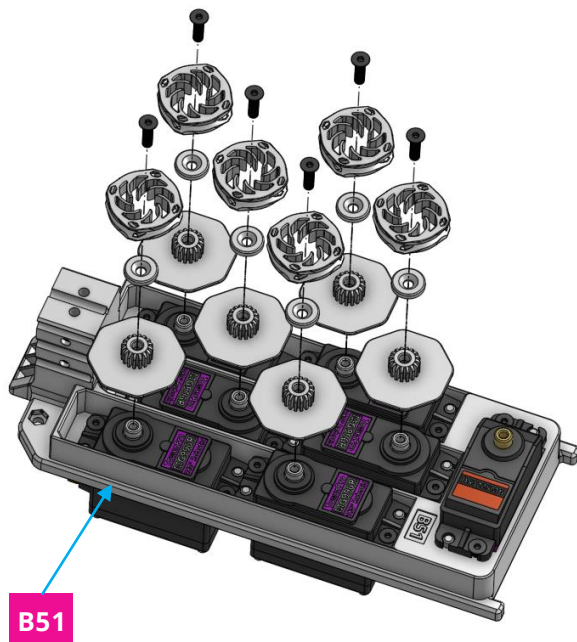| Clockwise (CW)	Counter clockwise (CCW)

Step 10c

2 · 6x

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.

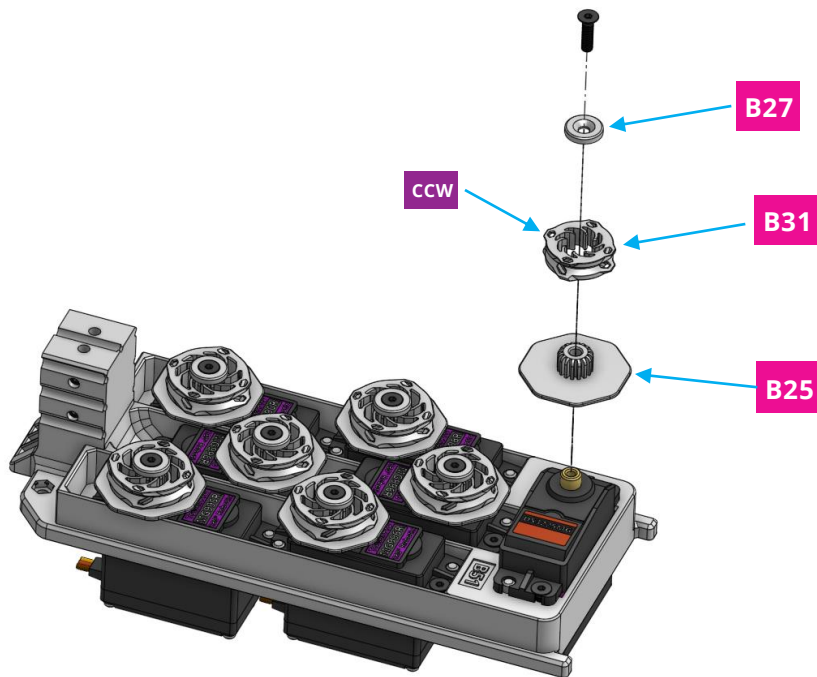B27

B26

B25

E07

B51

CCW
CCW
CCW
CW
CW
CW

Step 10d

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.

Step 10e

2

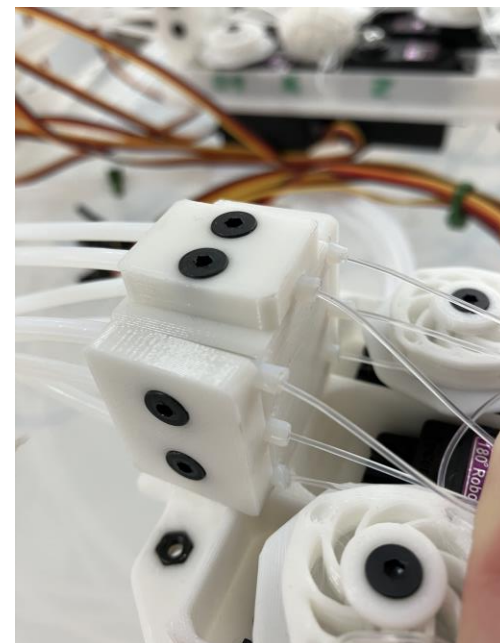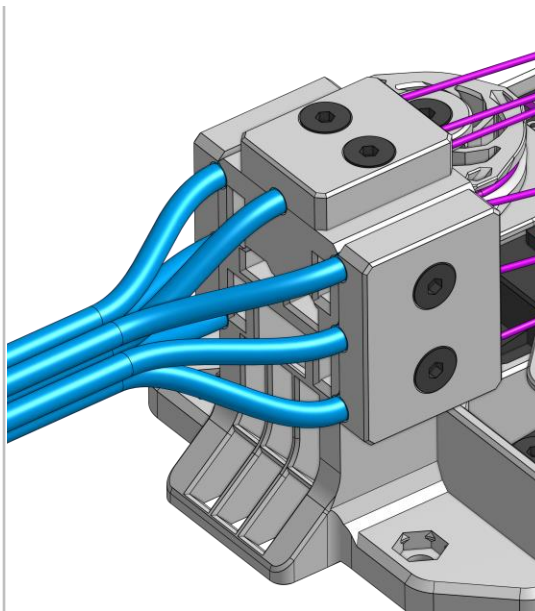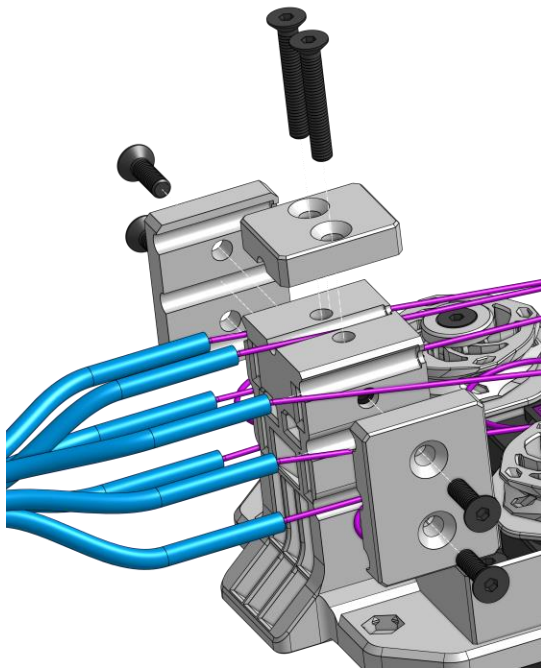6x

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.)
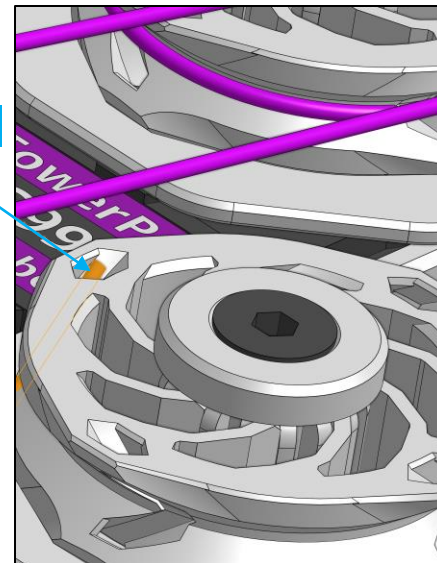
Step 10f

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

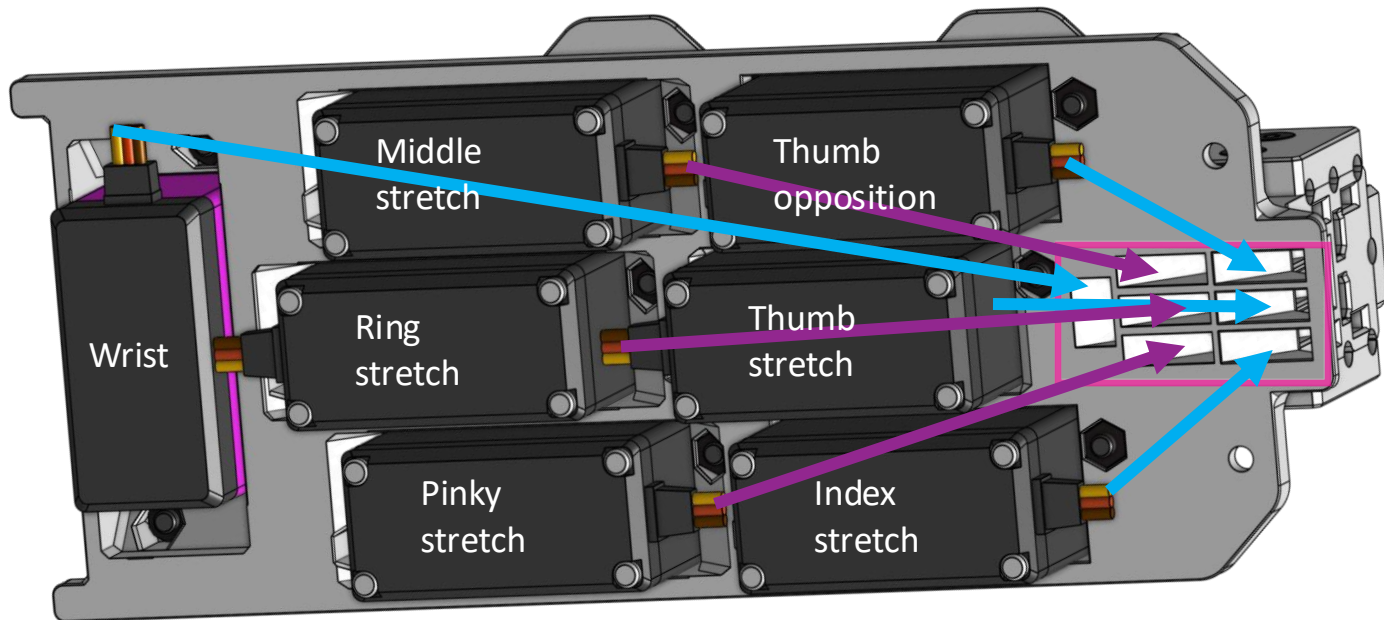connectors and tigh a knot at the end to fix them. Wires and tubes will be hidden in following slides.
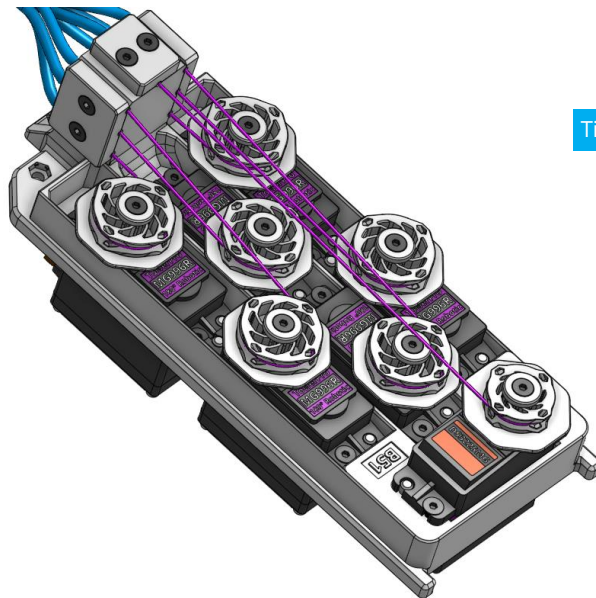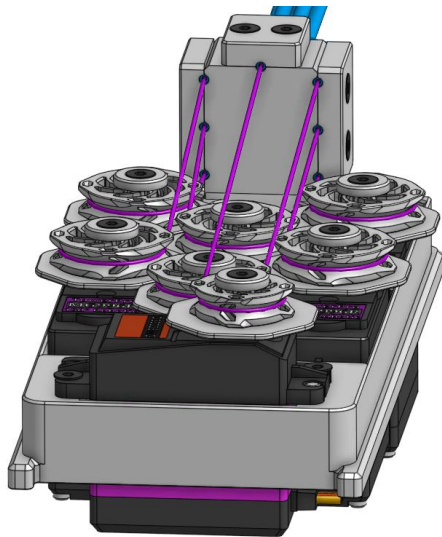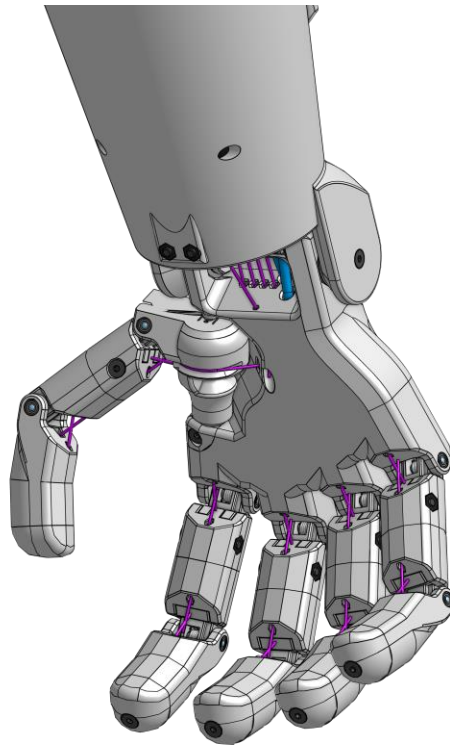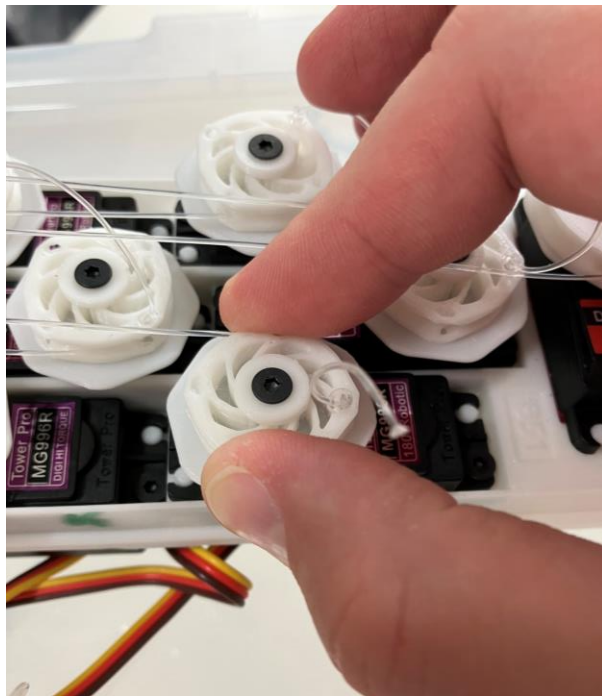

Tie a knot here

Note

Guide servo wires through the shown holes with an arrangment that makes it easy to connect servos to electronics later, illustrated is a recommended arrangment

Note

After inserting the wire tigh a knot like shown in the picture, and rotate the spindle until the wires are tight while fingers are at around 45 degrees

Note

If you overtighten the spindle and need to reset, unscrew it, rotate it and screw it again

Step 11

2   1x   1x

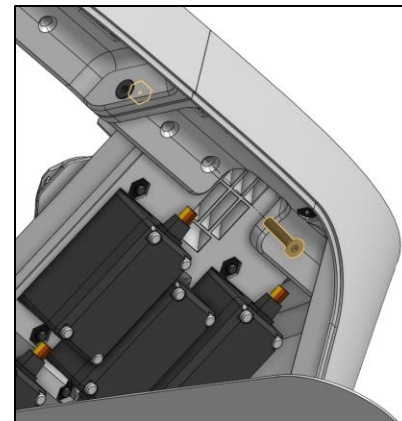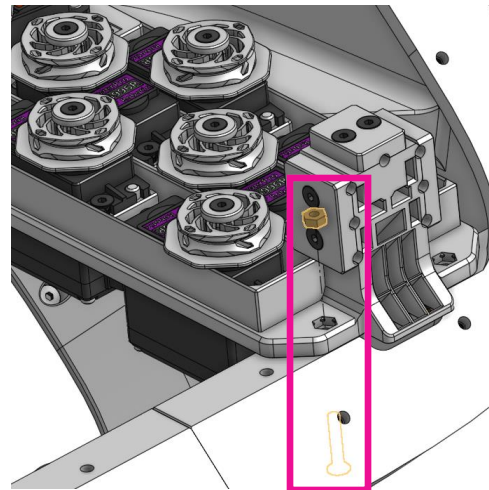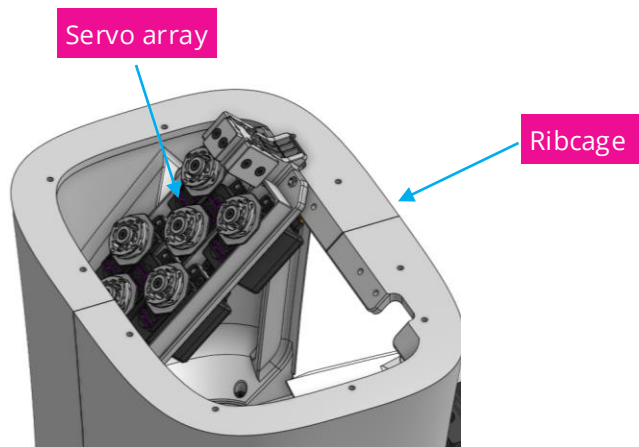Slide servo array into ribcage and fix it using **1 x M3 nut** and **1 x M3 16mm screw**.

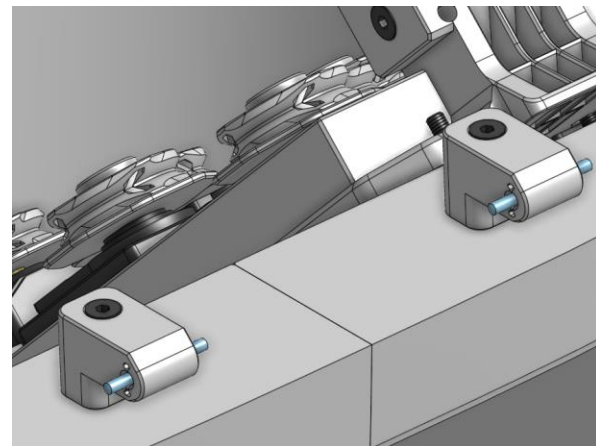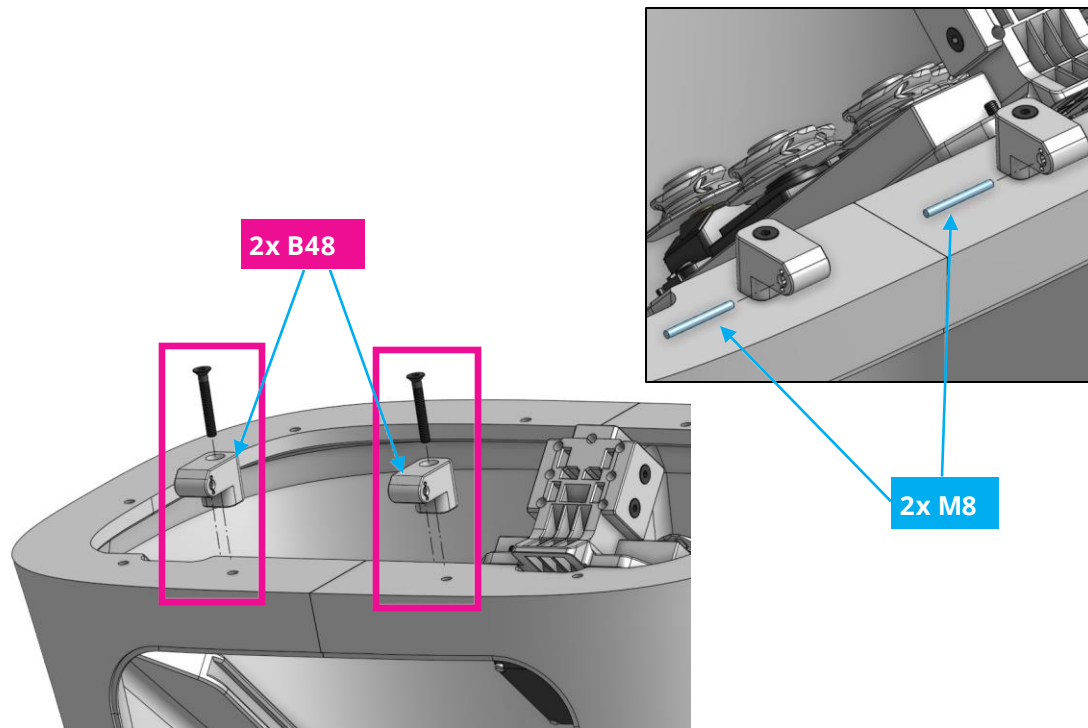Servo array

Ribcage

Step 12a

2

2x

2x

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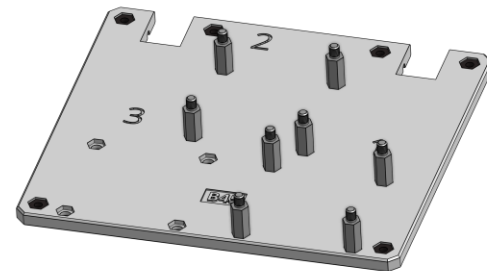
2x B48

2x M8

Step 12b

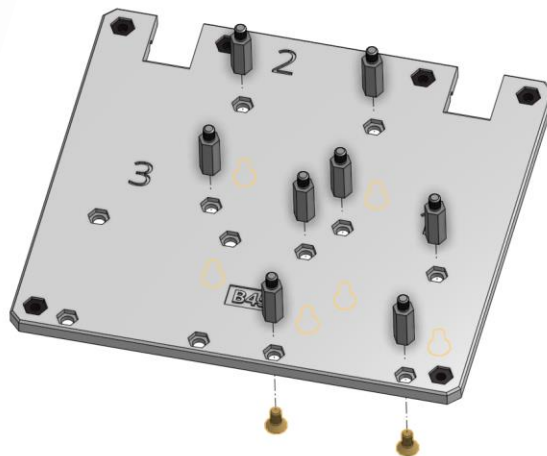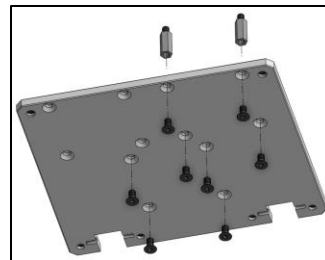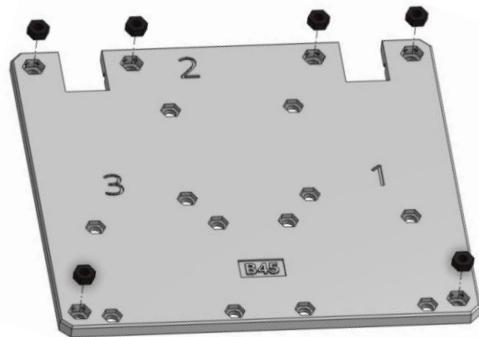2   8x   6x   8x

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
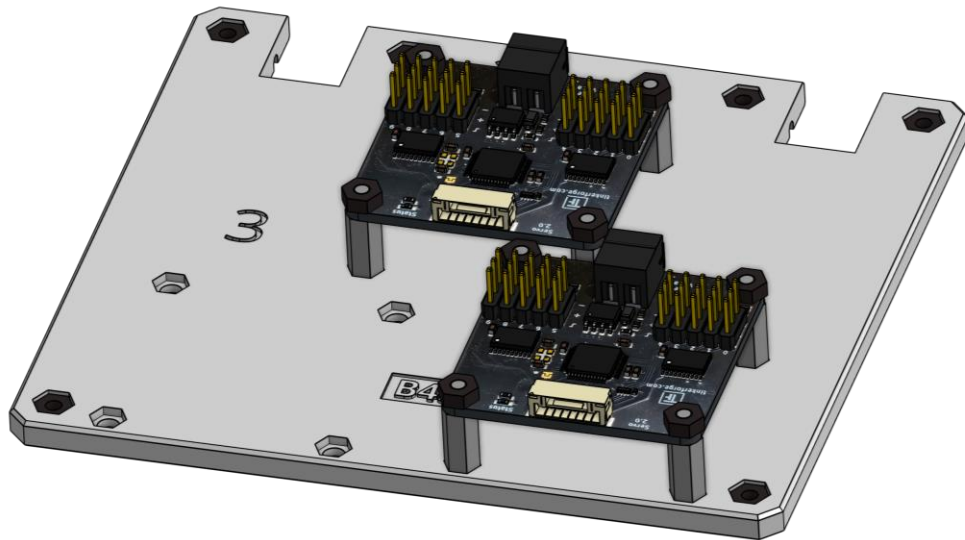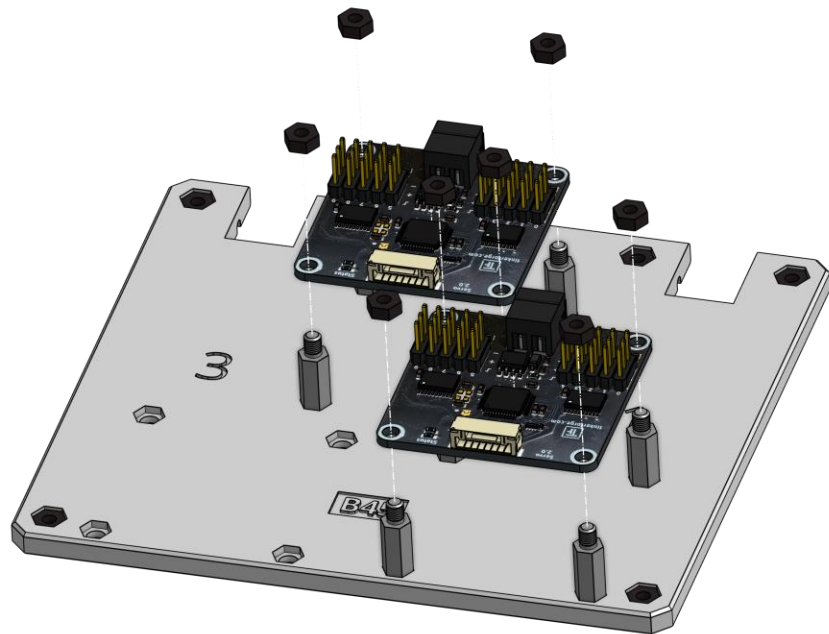
Connect **2 x E03** to the assembly and fix them using **8 x M3 nuts**.
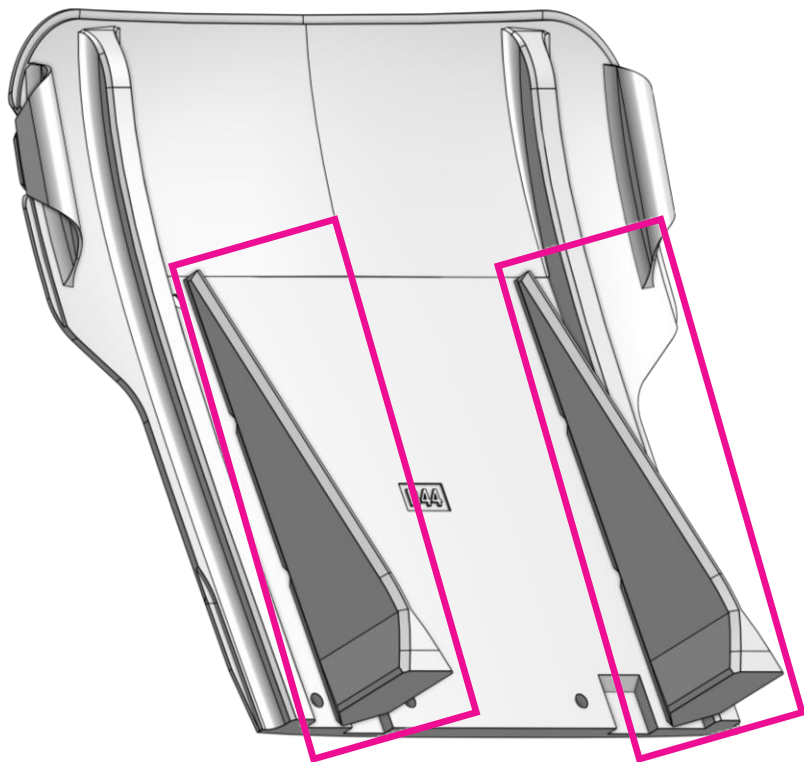
Step 12d

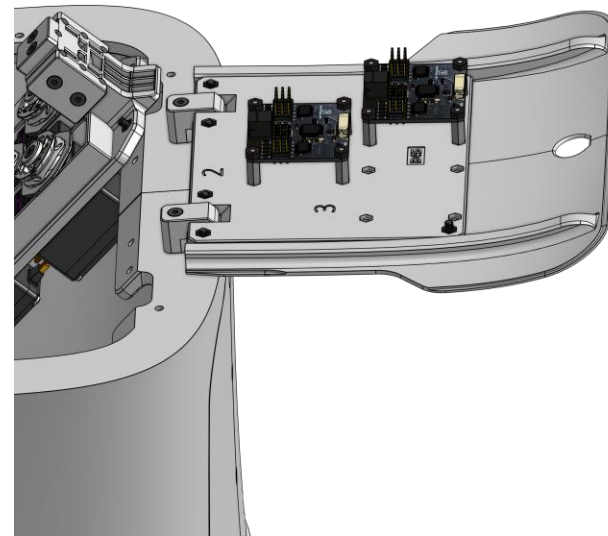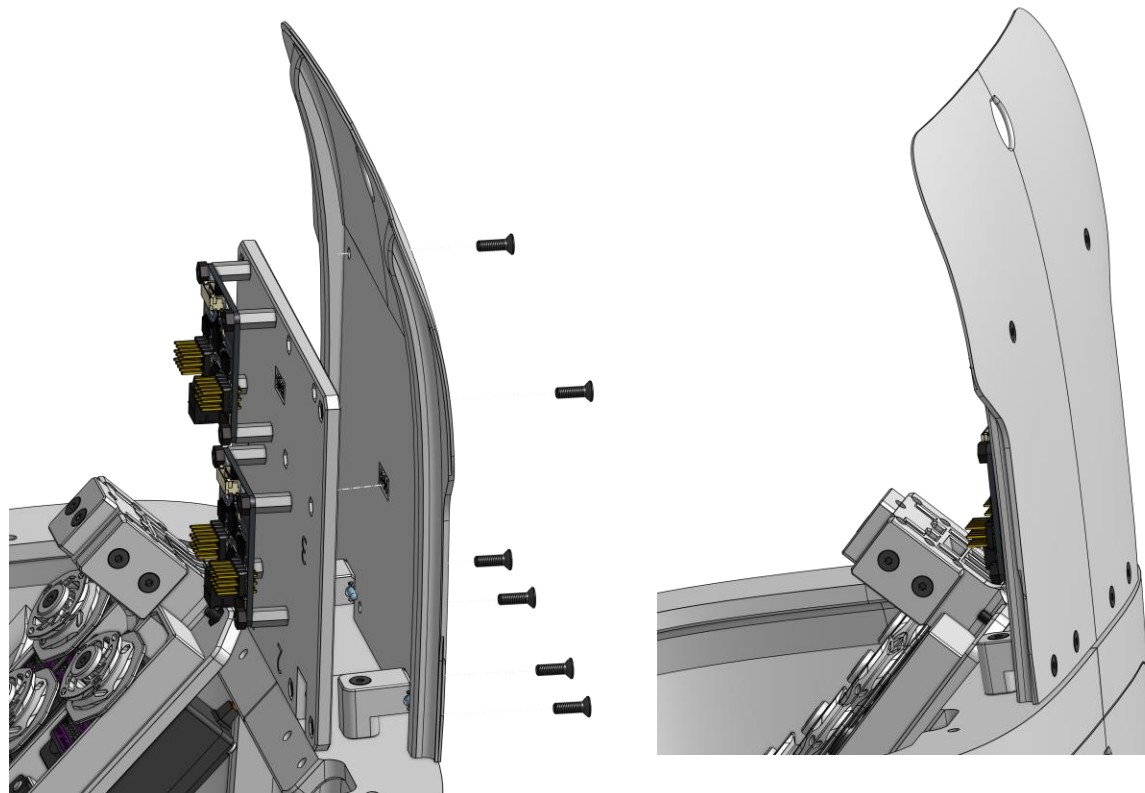Remove support structure gently from **B44** with hands or plier

Step 12e

2 10x

Connect **B44** to **B45** using **6 x M3 10mm screws.**
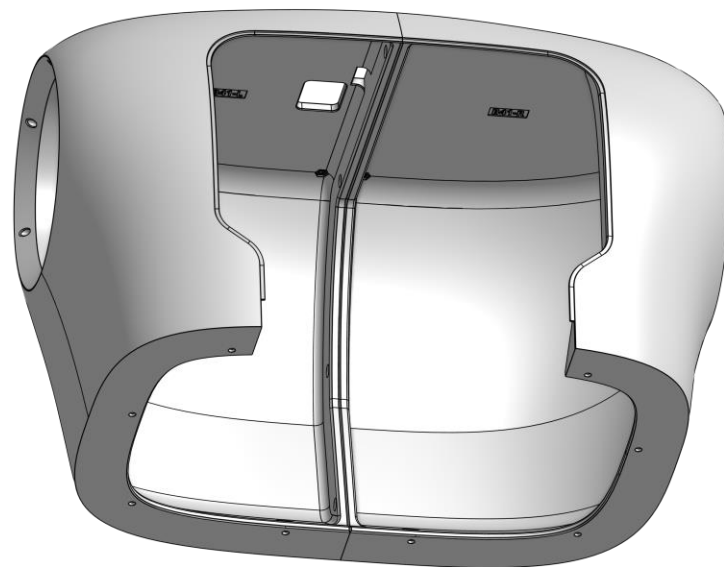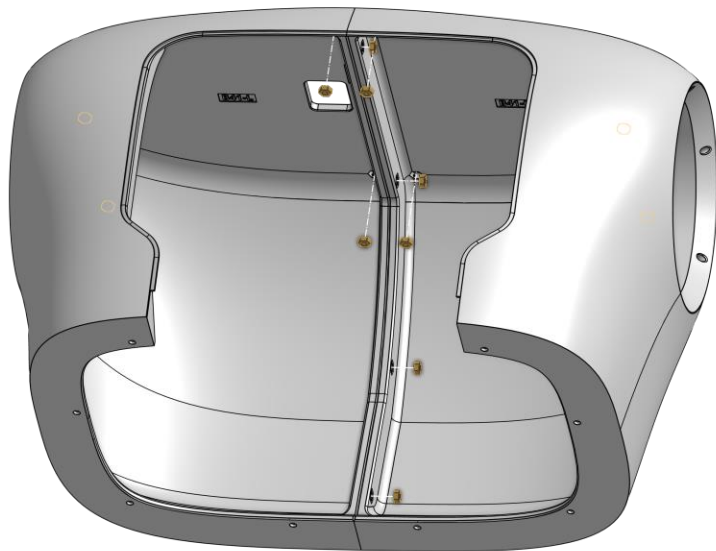
Step 13a

2   12x

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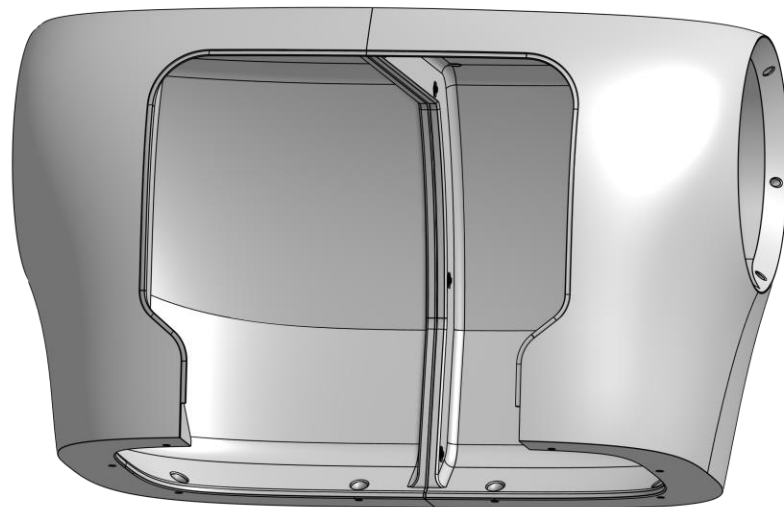
Step 13b

2   4x
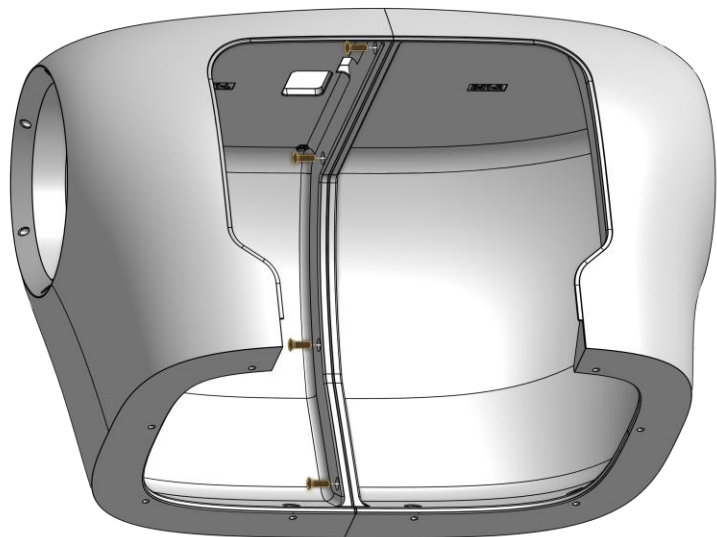
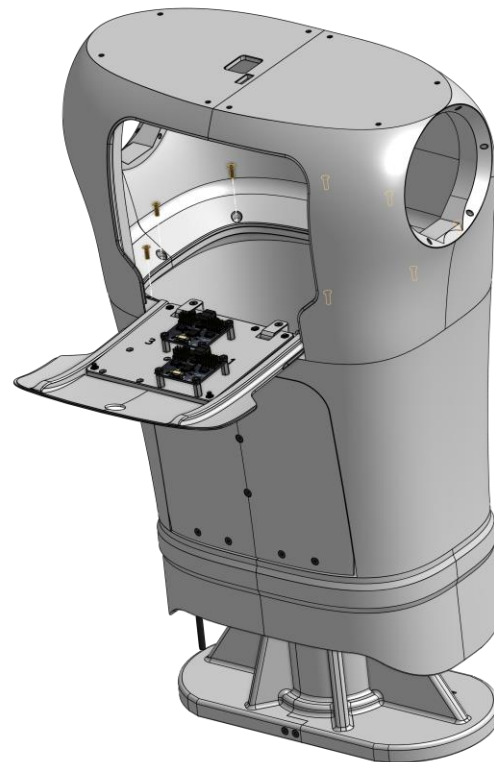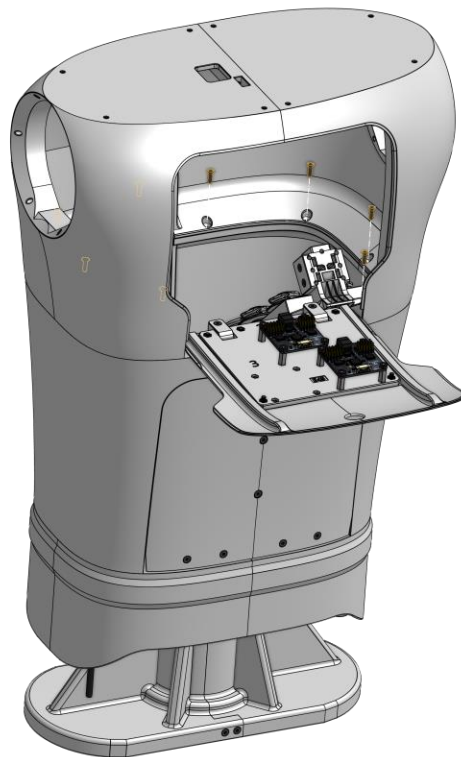Connect **B41-L** to **B41-R** using 4 **x M3 10mm** screws.
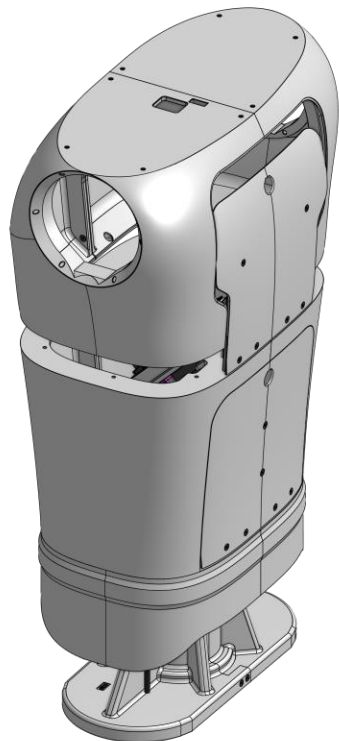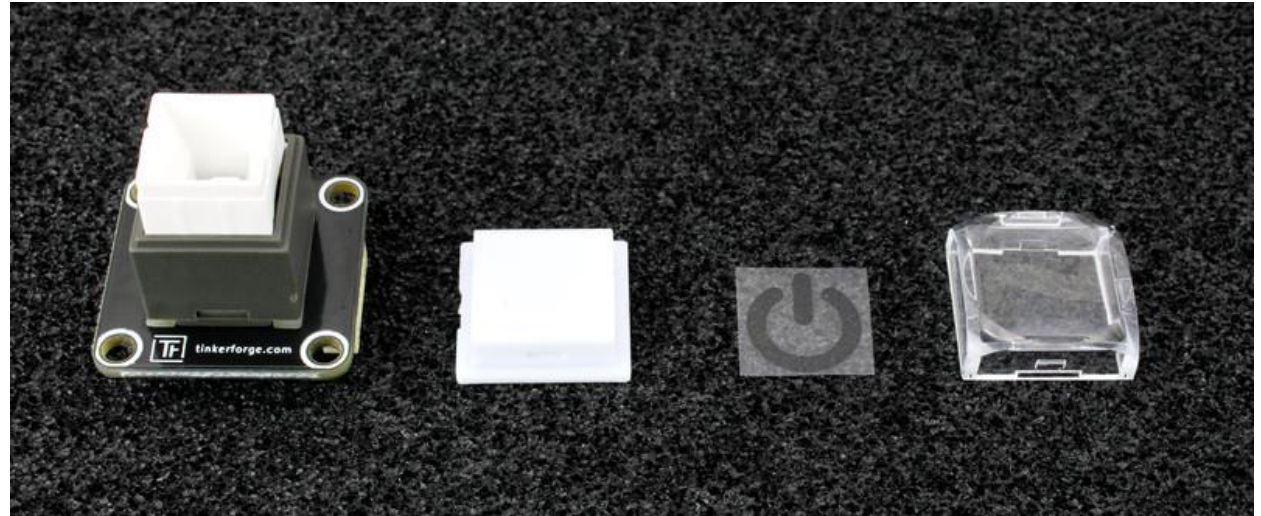
Step 13c

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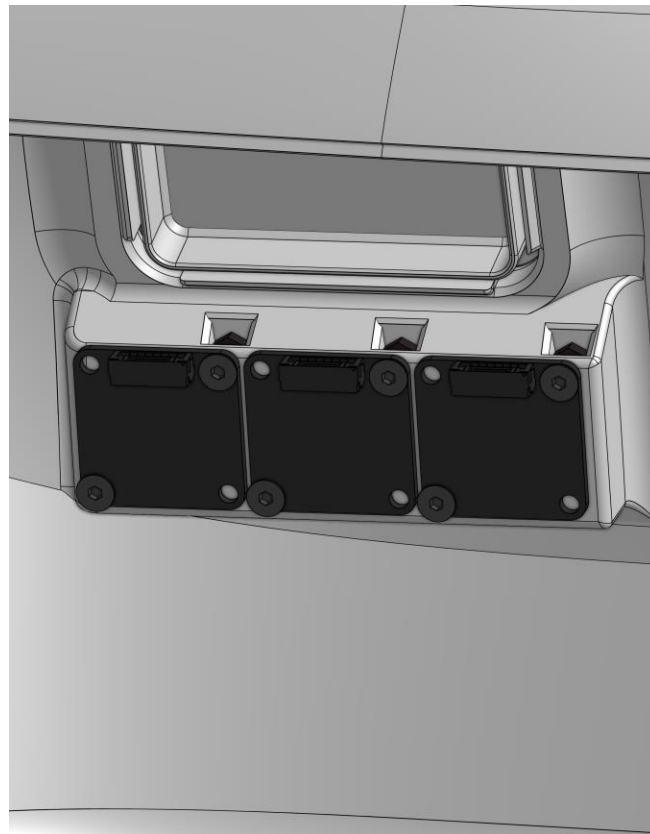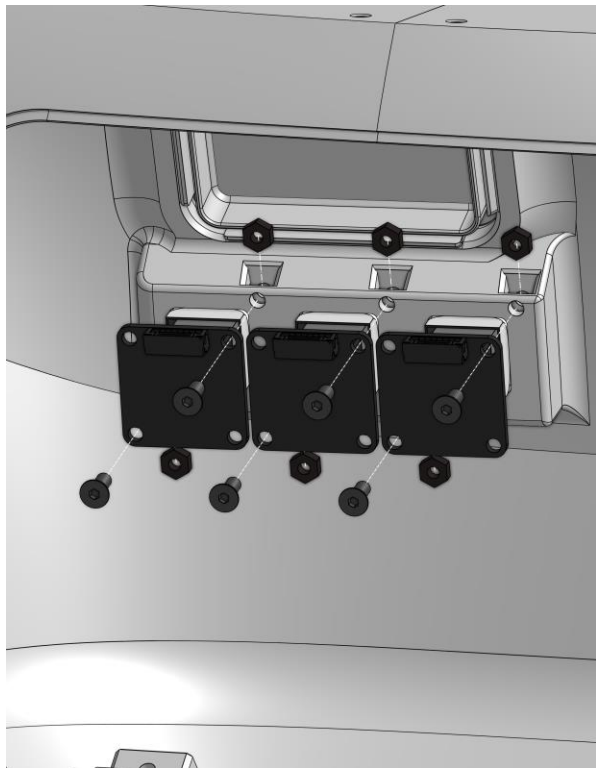
2   8x

Step 14a

Disassemble **3 x E25**

Connect **3 x E25** to **B41-L** using **6 x M3 nuts** and **6 x M3 8mm** screws
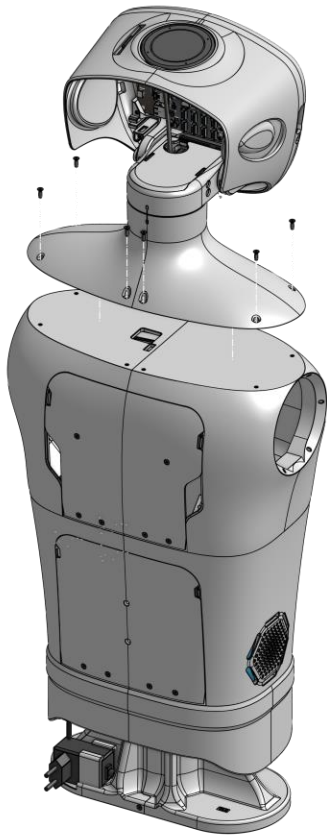
Step 14c

2

Reassemble **3 x E25**

Step 14d

Push **B55-logo** in **B41-L**

Step 15

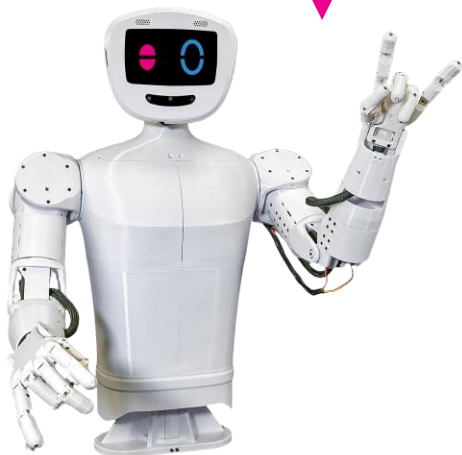Assemble neck and head to upperbody using **8 x M3 10mm screws**.

Congratulations

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

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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