



How to build your robot

www.pib.rocks/build

assembly instructions for:

Hand

pib#4



PRINT

BUILD

DEVELOP

YOUR OWN ROBOT

Printable parts

Pib's hand consists of **4 printable parts** and is assembled in **8 steps**.

In order to construct the hand, you will need to print the parts as seen in the table. You also need 5 assembled fingers.

Please note: For better readability we use the abbreviations in the tutorial: D02 instead of D02-Palm_right.

This tutorial is for the right hand. If you want to build a left hand, please substitute D13-R with D13 and D11-R with D11.

Printable parts

D02-Palm_right

D10-Tube_cover

D11-R-Ballbearing_enclosure_right

D13-R-Thumb_rotator_right

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 **S01** M3 nuts

1 x **S07** M3 18 mm screws

2 x **S10** M3 25 mm screws

7 x **M08** metal rods

12 x **M01** Ballbearings

2 x **M03** ballbearings

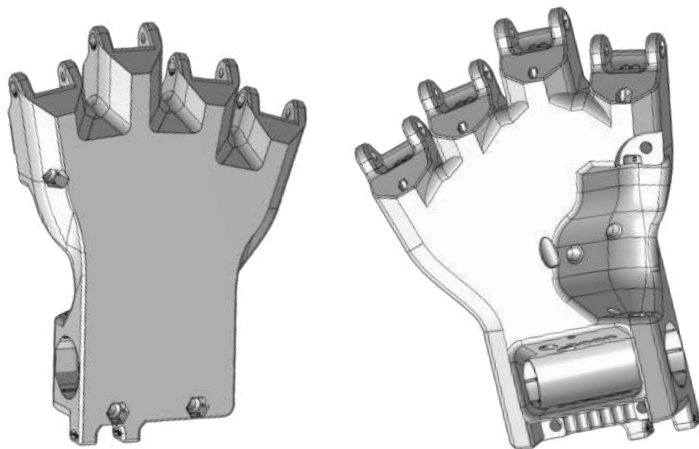
5 x **M10** Spring TOR410

150cm + 150cm Fluorocarbon string

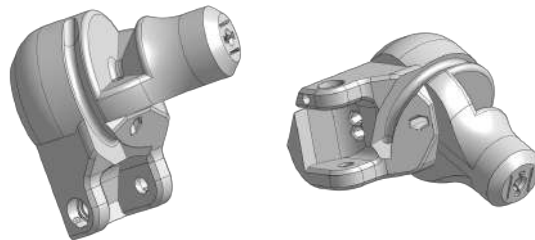
4 x 100cm + 2 x 105cm teflon tubes

Printable parts - Overview

D02-Palm_right



D13_R-Thumb_rotator_right



D11_R-Ballbearing_enclosure_right



D10-Tube_cover



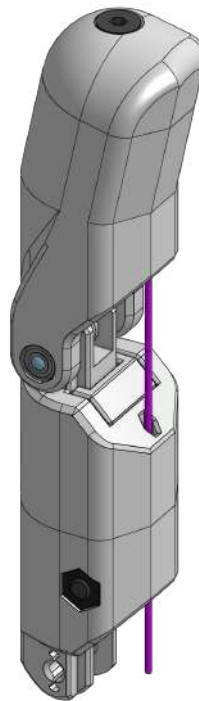
Preassembled parts

You also need 5 assembled fingers.

You can find the assembly instructions for the finger here:

<https://pi.b.rocks/build/how-to-build-pibs-finger/>

Finger



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

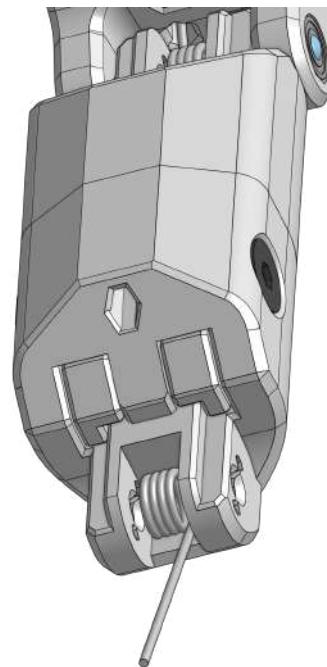
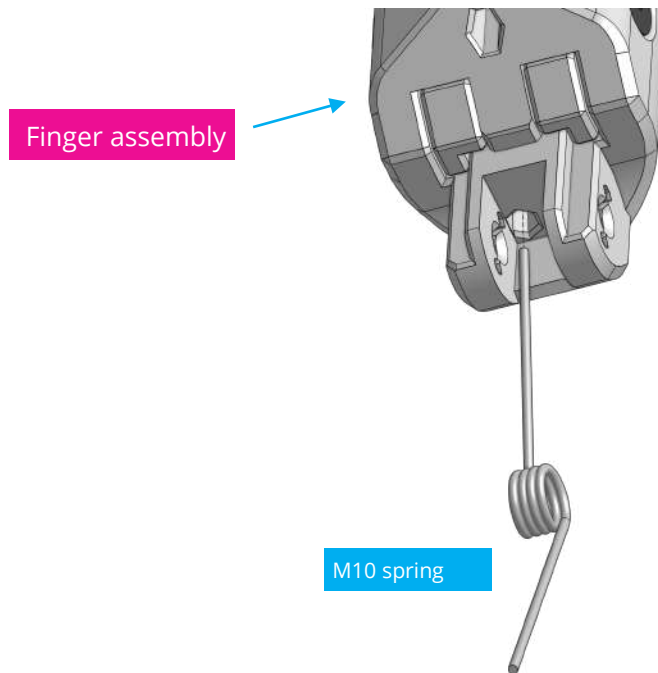
We have categorized each step according to its **difficulty** - from **1-5** (1 being the easiest, 5 the hardest)



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

Step 1

Insert **1 x M10** spring into the shown place in **D05** (= at the end of the finger assembly).



Step 2 - Introduction

Now we will assemble the finger to the hand palm.

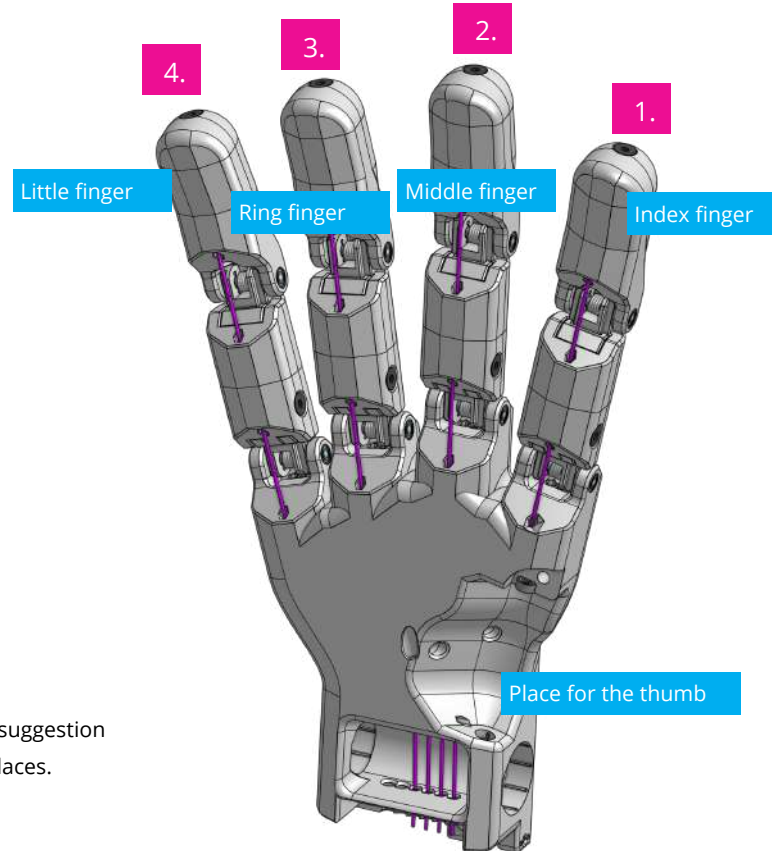
We highly suggest the following order

- Index finger
- Middle finger
- Ring finger
- Little finger

Repeat the steps 1, 2a and 2b for each finger.

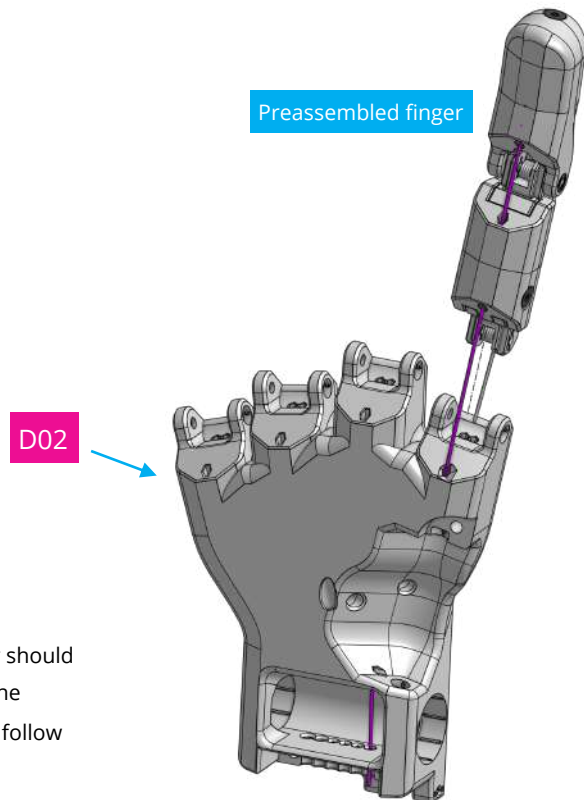


By starting with the index finger and then following our suggestion it will be easier to put the small ballbearings into their places.



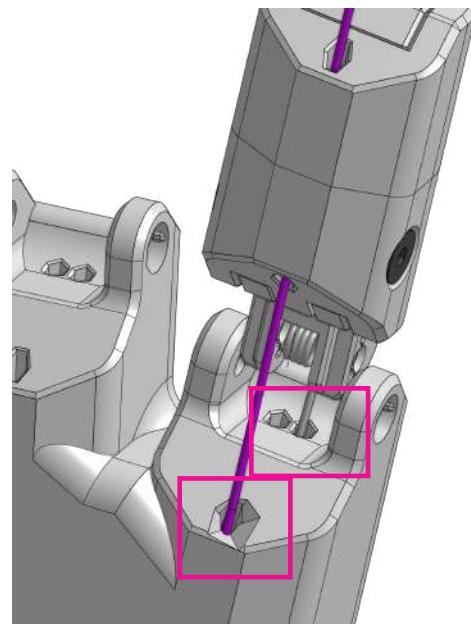
Step 2a

Guide the **fluorocarbon string** from each finger to the shown hole of **D02** and also put the **M10 spring** into the shown hole.



The fluorocarbon string of the index finger should come out of the first hole on the right (in the bottom part of D02). The other strings will follow on from this.

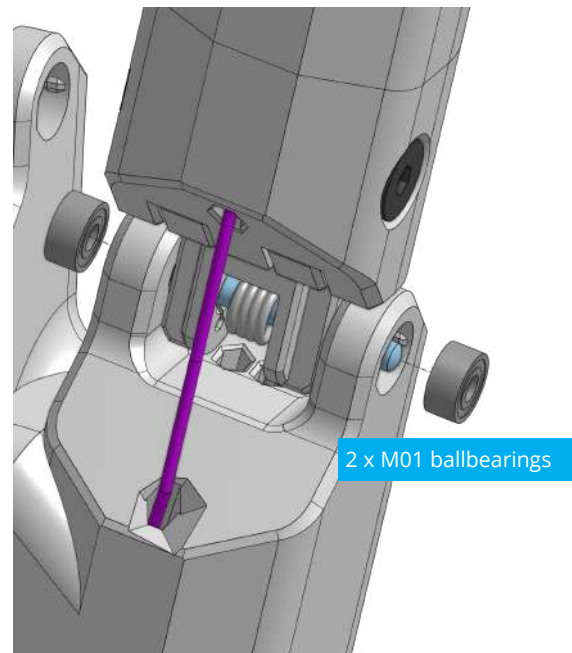
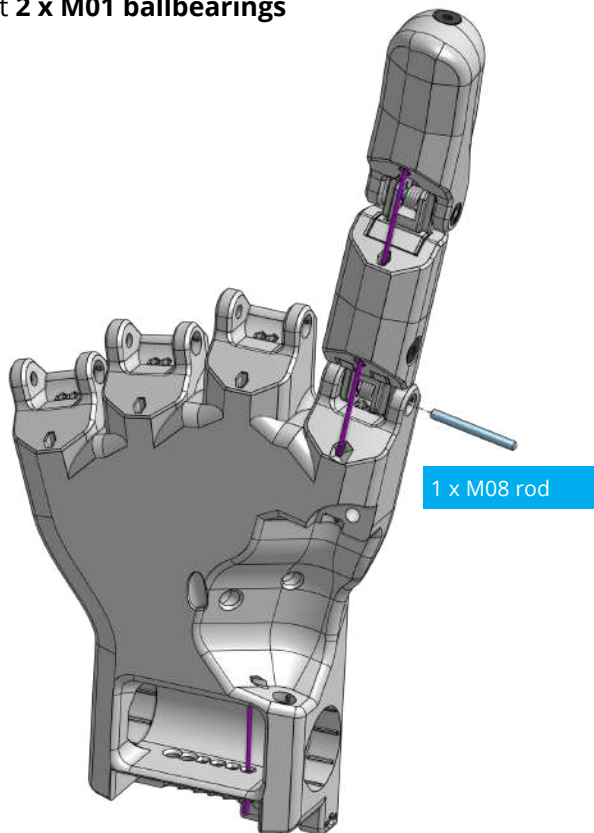
1



Step 2b

Fix the finger using **1 x M08 rod** and insert **2 x M01 ballbearings** in the shown spots of D02.

This step can be a little tricky!
We suggest to start with the ballbearing which faces a finger, then putting the rod and closing it with the other ballbearing. A hammer and a tongs will help you here!

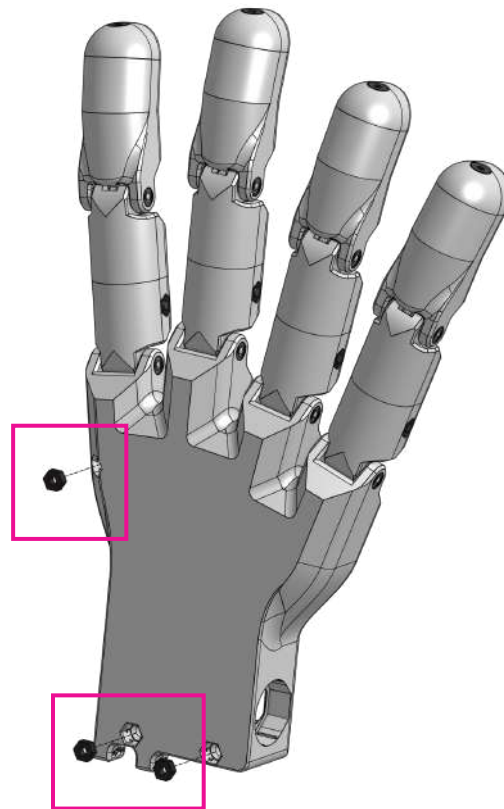


Step 3a

Place **3 x nuts** in the shown spots of **D02**.



3x



Step 3b

Place **2 x M03 ballbearings** into the shown spots of **D02**.



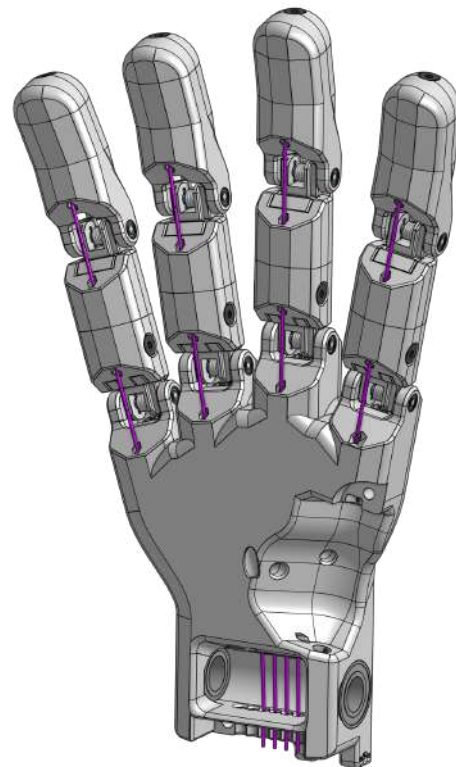
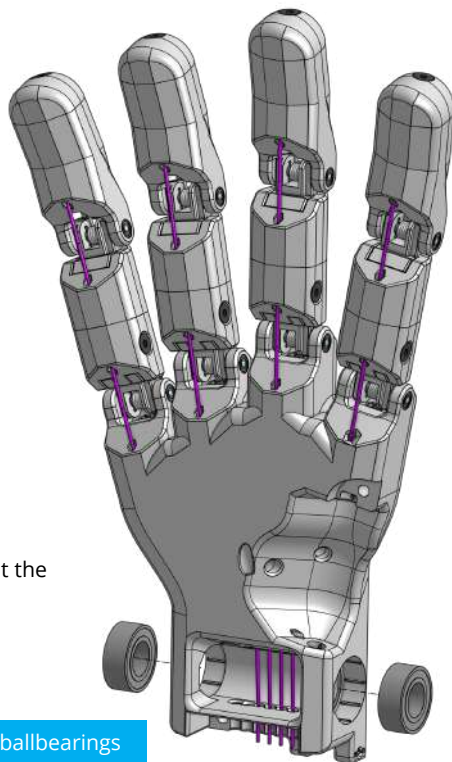
1



2x

You may apply some gentle force to put the ballbearings into place.

2 x M03 ballbearings



Step 4a

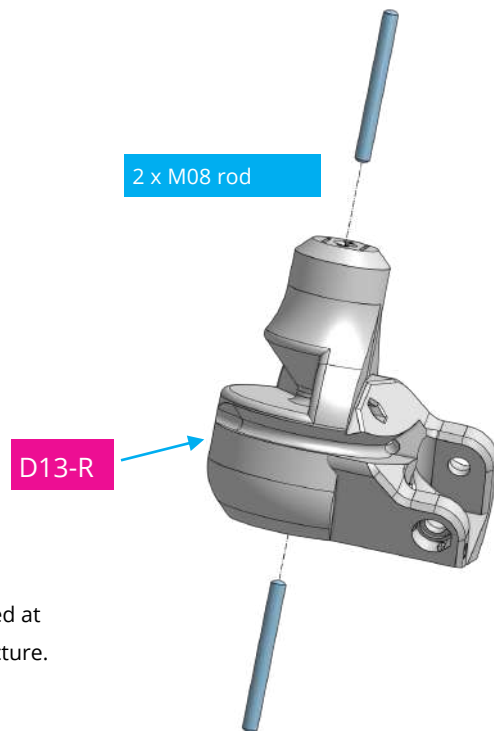
Insert **2 x M08 rods** inside **D13-R**.



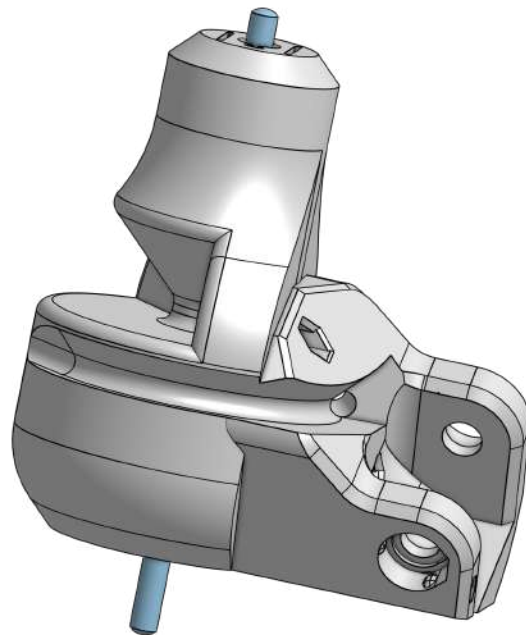
1



2x



Please note: The metal rods should be inserted at different depths in D13_R, as shown in the picture.

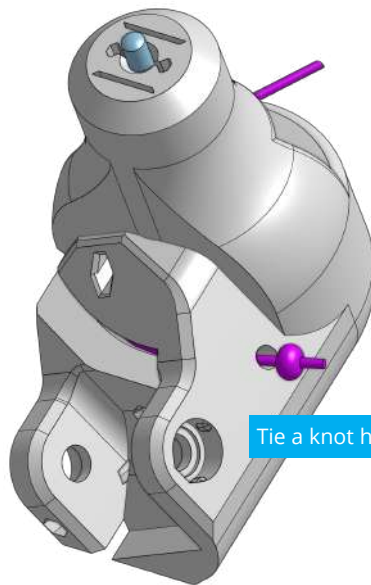


Step 4b

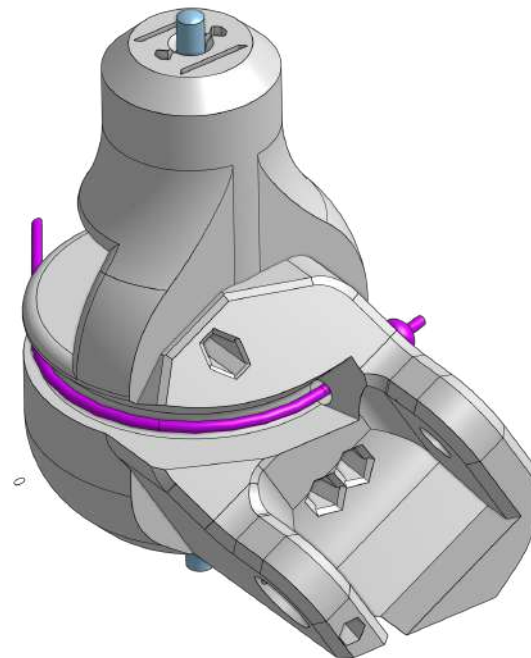
Insert **160cm fluorocarbon string** through the shown spot in **D13-R** and tight a knot to tighten it.



160cm



Our tip: Pull on the string to tighten the knot a little bit more.

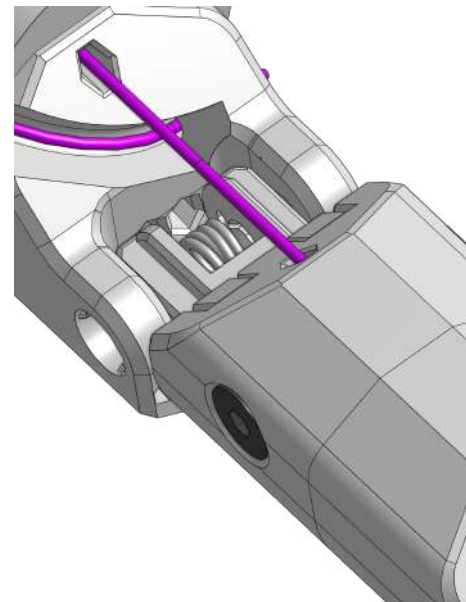
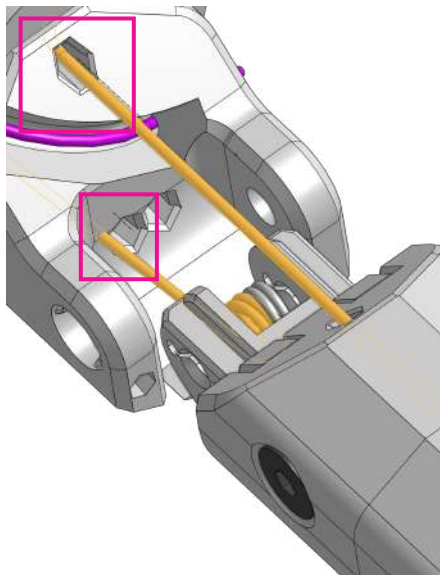
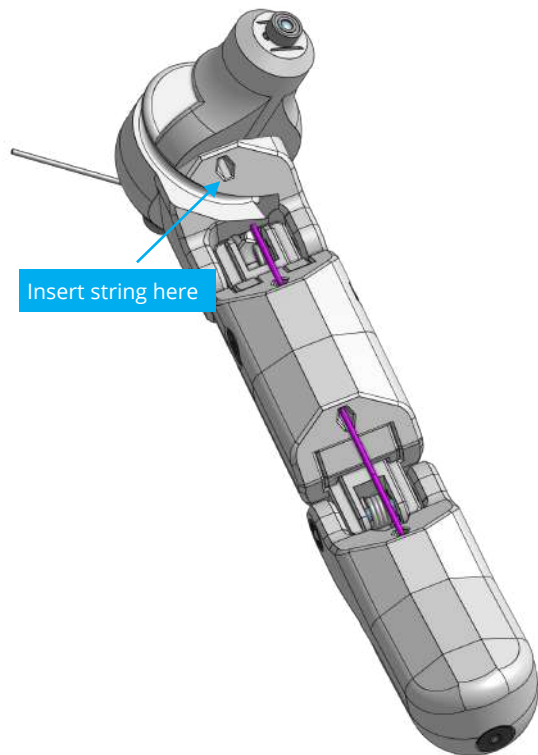


Step 5a

Attach a **pre-assembled finger** to **D13-R** by guiding its fluorocarbon string through the shown spot. Then, put the end of the **M10 spring** through the shown spot.

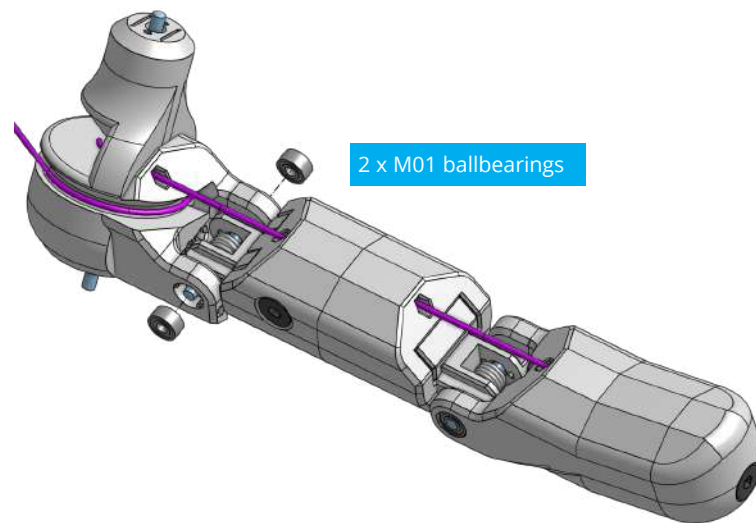
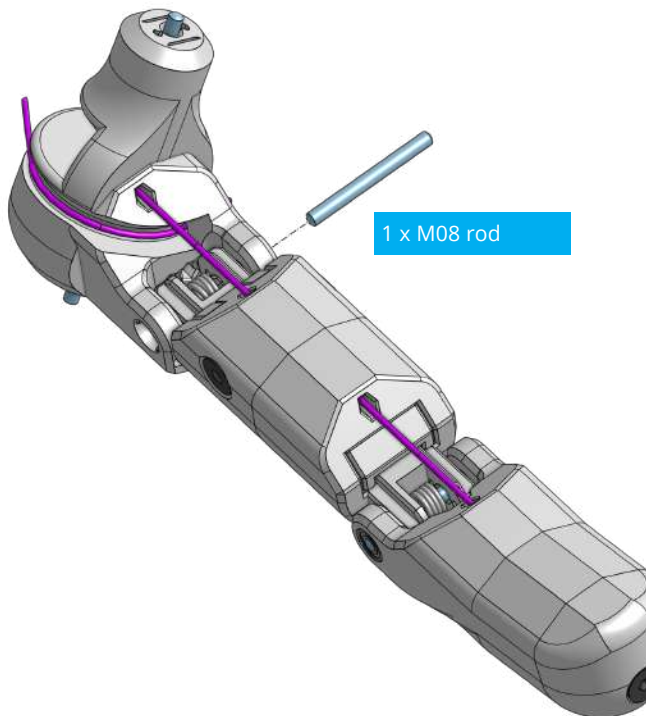


1



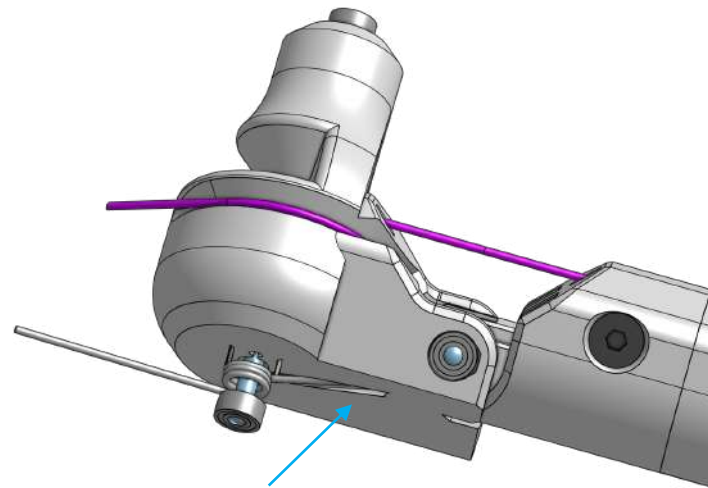
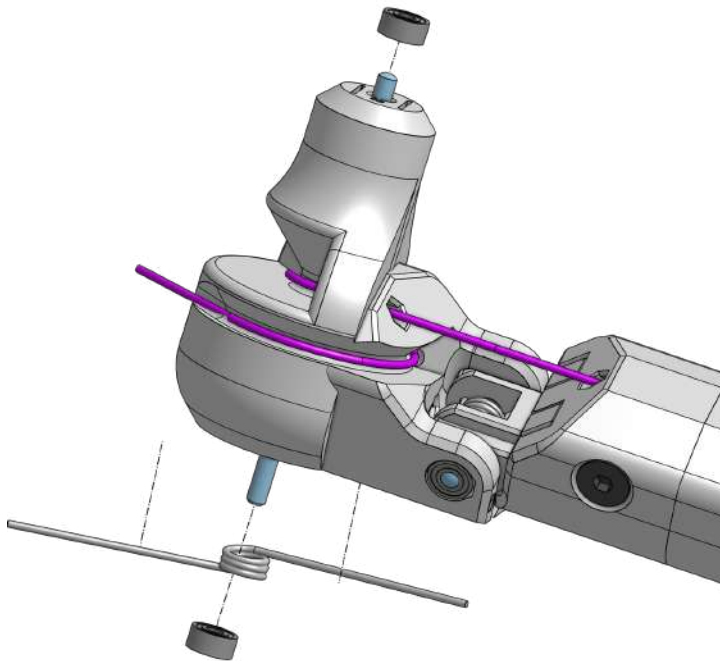
Step 5b

Fix the assembly using **1 x M08 rod**. Lastly insert **2 x M01 ballbearings**.



Step 5c

Attach **1 x M10 spring** and **2 x M01 ballbearings** to the shown ends of both **M08 rods**.

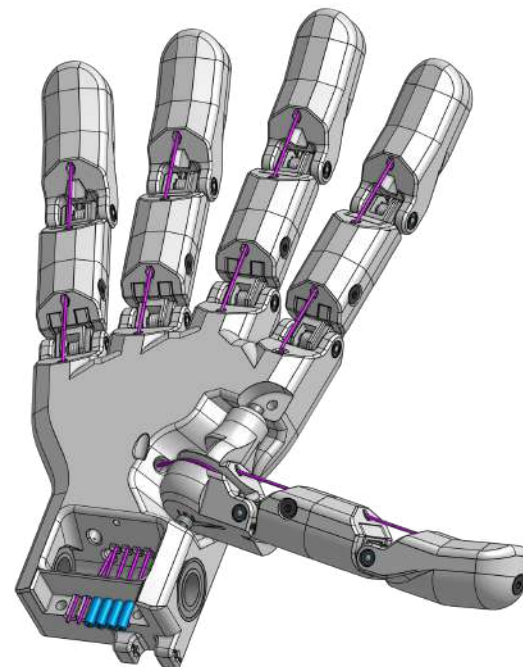
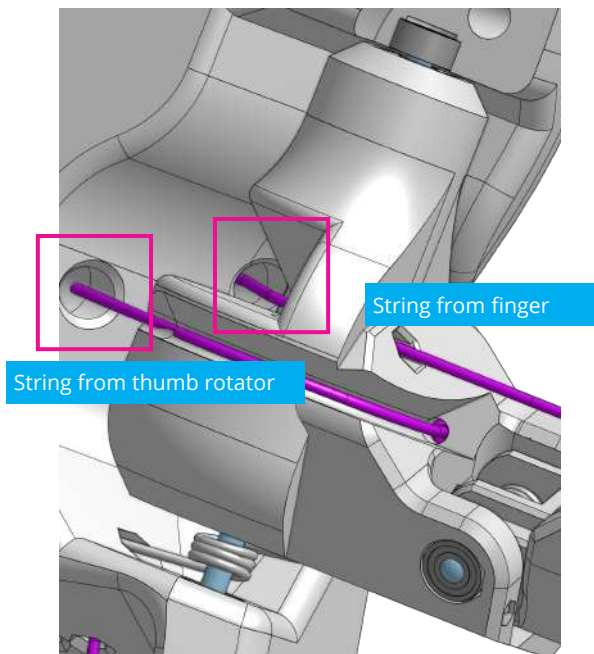


One end of the spring should be inserted here

Step 6a

Now we can assemble the thumb to the hand:

Guide **both strings** from the thumb through the shown holes and push the thumb into place (the thumb must snap into the palm).



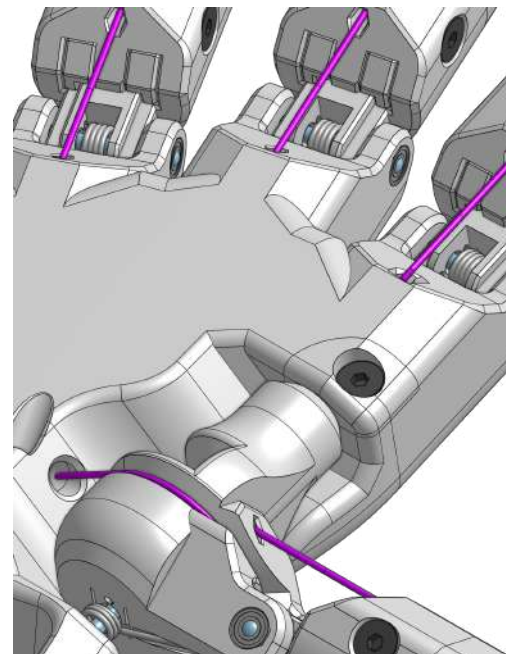
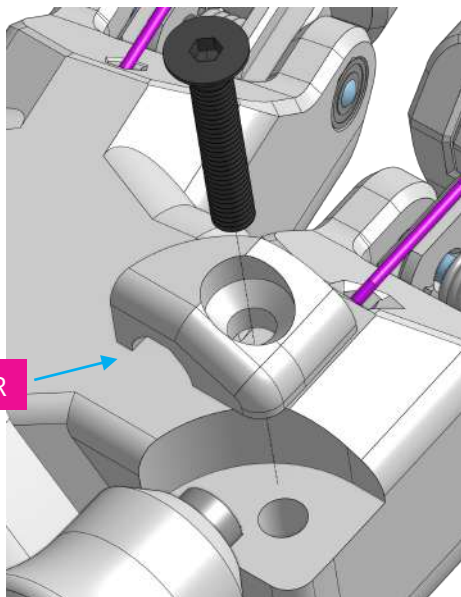
6 strings in total!

Step 6b

Use **D11-R** and **1 x 18mm screw** to fix ballbearing.



D11-R



Step 7a

Cut 4 x 100cm and 2 x 105cm teflon tubes.

Insert the 4 fluorocarbon strings of the finger into each 100cm teflon tubes.

Insert the 2 fluorocarbon strings of the thumb into each 105cm teflon tubes.



1



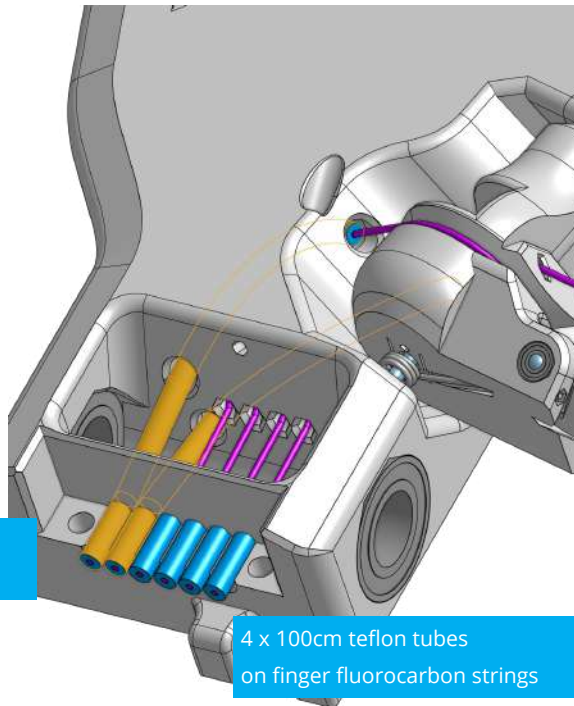
4 x 100cm

2 x 105cm

Put the thumb tubes as far into the palm as you can!

2 x 105cm teflon tubes
on thumb fluorocarbon strings

4 x 100cm teflon tubes
on finger fluorocarbon strings



Step 7b

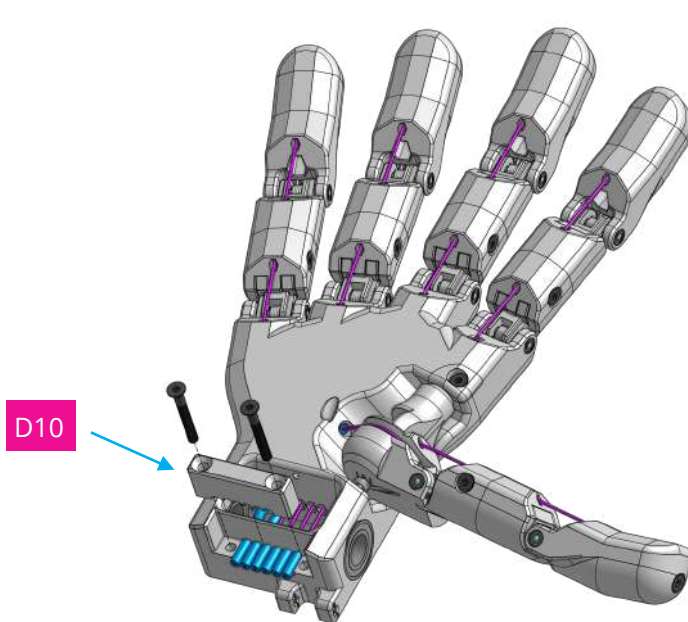
Enclose the tubes with **D10** and **2 x 25mm screws**.



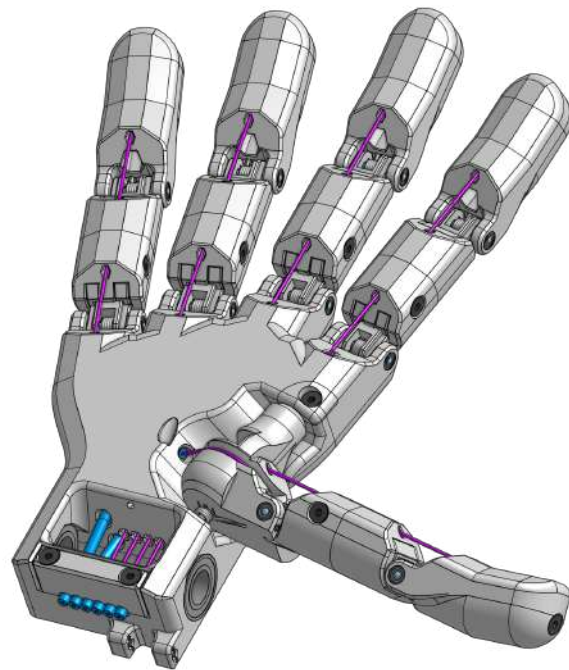
1



2x



Make sure to fix D10 tightly onto the hand.
The tubes shouldn't slip out!

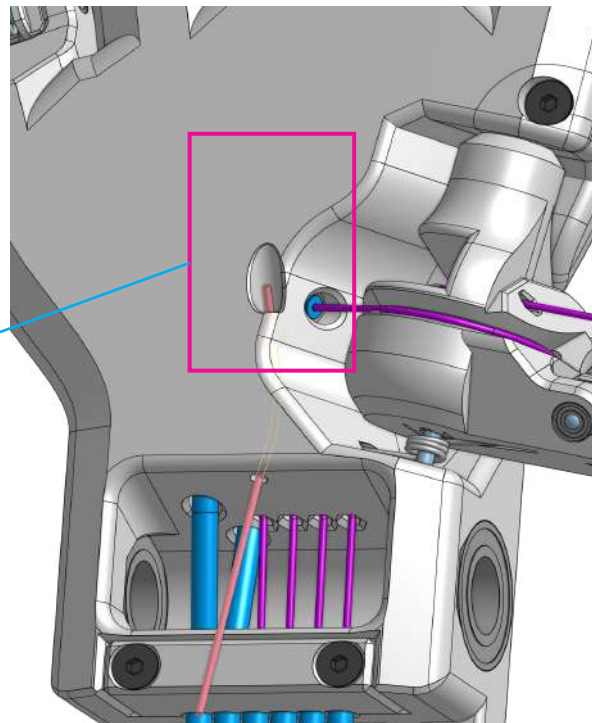
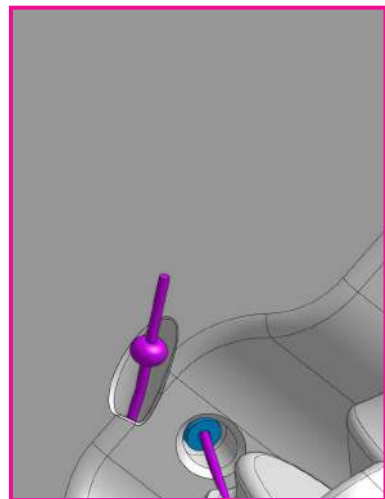


Step 8

Lastly, insert **150cm fluorocarbon wire** through the shown spot and tight a knot.



150cm

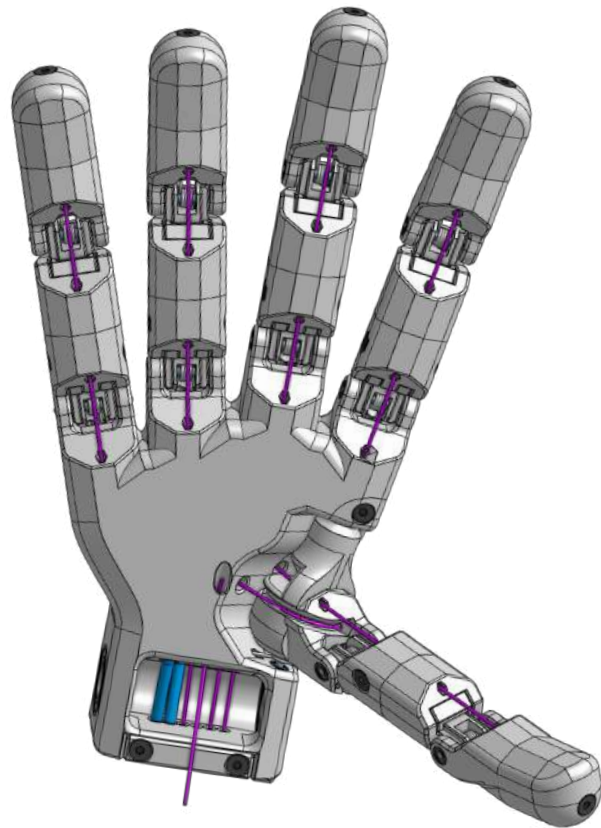
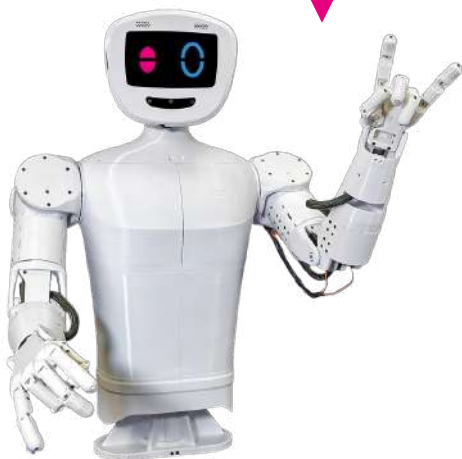


Our tip: Pull on the string to tighten the knot a little bit more.

Congratulations

You did a great job, pib's hand 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.



team@pib.rocks

Send us an email.



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