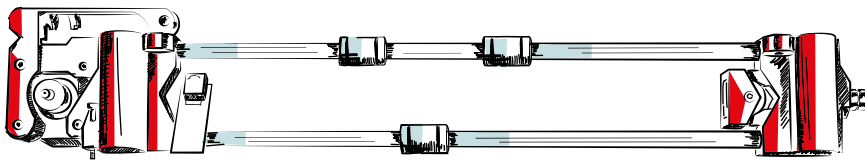


2

# Assembly of Axle X

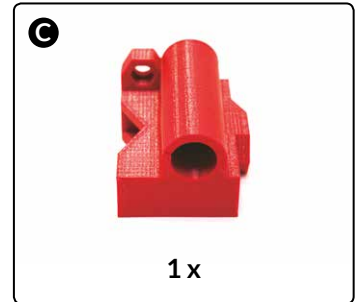
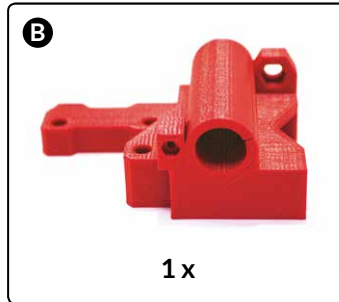


## List of components for Axle X

- 2 x** Smooth chrome rod Ø 8 mm x 370 mm
- 4 x** Screw M3 x 10 mm - DIN-912 class 8.8 black
- 2 x** Screw M3 x 16 mm - DIN-912 class 8.8 black
- 2 x** Screw M3 x 20 mm - DIN-912 class 8.8 black
- 1 x** Screw M3 x 25 mm - DIN-912 class 8.8 black
- 1 x** Screw M6 x 40 mm – DIN 912 class 8.8  
(with thread halfway along)
- 2 x** Nut M3 - DIN 934 class 8 black
- 3 x** Nut M6 - DIN 934 class 8 black
- 1 x** Axle X carriage B printed part
- 1 x** Left chain coupling axle X printed part
- 1 x** End-Stop axle X printed part
- 1 x** Pulley GT2 (20 teeth)
- 1 x** Belt GT2 6 mm x 1 m
- 7 x** Linear ball bearing LM8UU
- 5 x** Black strap, 100 x 2.5 mm

# 1

## Inserting the bearings



**A** Linear ball bearing LM8UU

**B** Left-hand axle X printed part

Left-hand end of Axle X, where the Nema 17 motor of that axle will be supported.

**C** Right-hand axle X printed part

Part at the right-hand end of Axle X, where the axle's belt tensioner will be supported.



In order to insert the bearings, you will first need to file down the imperfections inside the hole in the printed part, which always form in the top layers. If the bearing still does not go in, cut the closed end of the part's base, and carefully insert the bearing.

Once the bearings have been inserted, it is advisable to insert a smooth rod, 8mm long, to ensure that the two bearings are correctly aligned.

1.

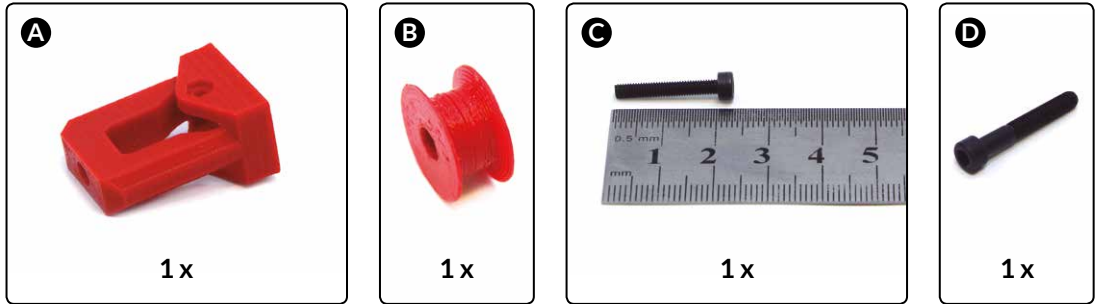


2.



# 2

## Preparing the Axle X tensioner

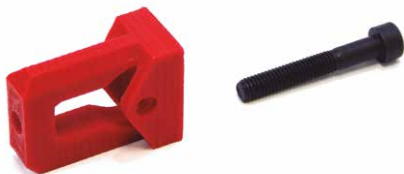


- A** Bearing tensioner B623ZZ
- B** Pulley
- C** Screw M3 x 20 mm
- D** Screw M6 x 40 mm (with thread halfway along its length)

### Assembly:

Insert the screw (D) in the hole in the tensioner until it is positioned as shown in figure 2. Fix the pulley with the screw (C), as shown in figure 4.

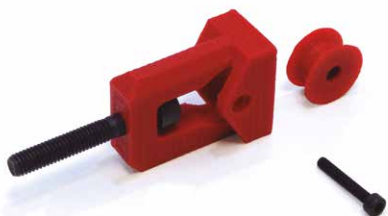
1.



2.



3.

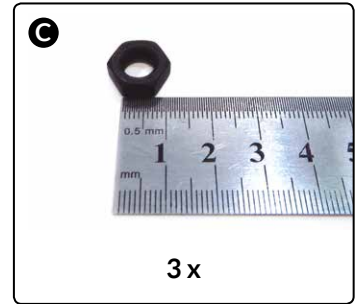
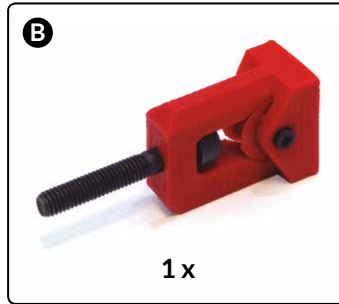
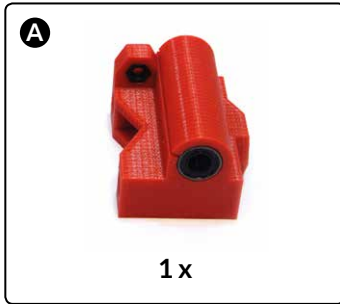


4.



# 3

## Inserting the Axle X tensioner



- A** Set for step 1
- B** Set for step 2
- C** Nut M6

### Assembly:

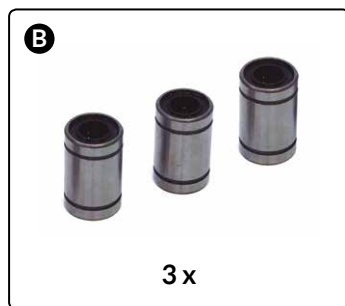
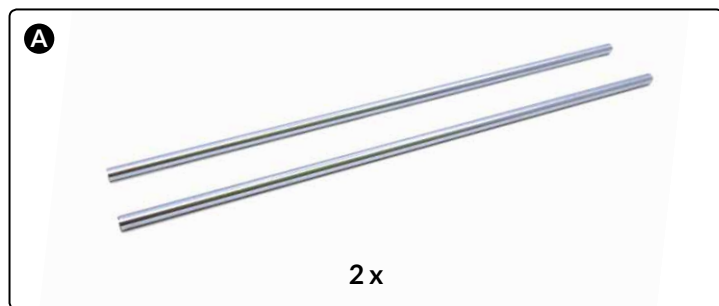
The purpose of the tensioners is to stretch or loosen the belt once it has been fitted, in a convenient manner. File parts **1** and **2**. The tensioner should slide perfectly inside the part which houses it (**3**).

Insert the set for step 1 into the set for step 2, and screw the nuts onto the end of the screw, tightening one against the other so that the nuts remain solidly fixed to the screw. Use a fixed spanner as a handle to slide the tensioner in a straight line.



# 4

## Sliding the bearings onto the smooth rods



**A** Smooth chrome rod  $\varnothing 8 \times 370$  mm

**B** Linear ball bearing LM8UU

1.

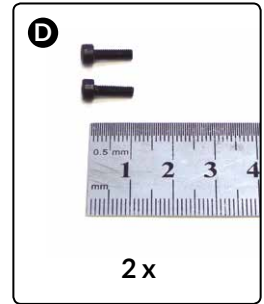
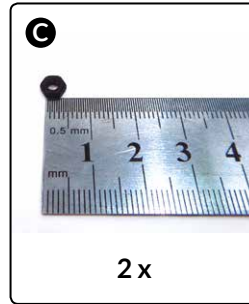
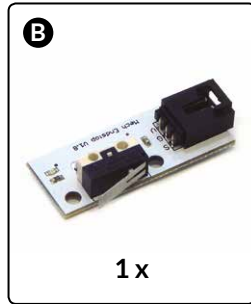
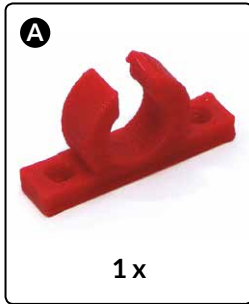


2.



# 5

## Preparing the End-Stop sensor



### A End-Stop printed part

End-stop printed part to be fastened to the smooth rod in Axle X.

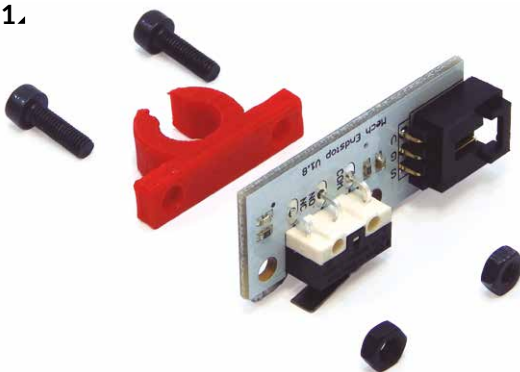
### B End-Stop

End-Stop mounted on a PCB with an LED indicator.

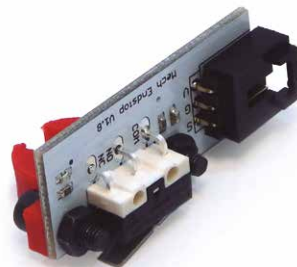
### C Nut M3

### D Screw M3 x 10 mm

1.

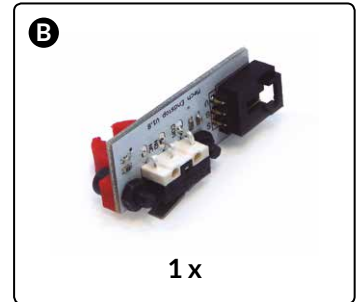
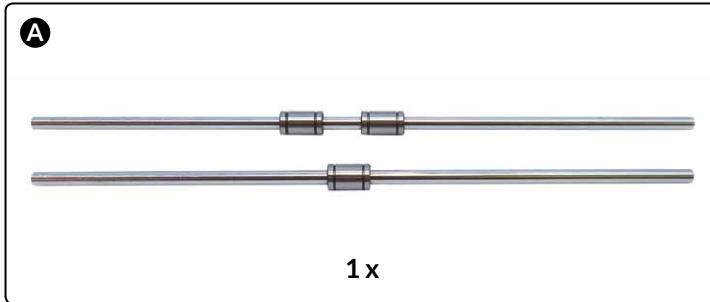


2.



# 6

## Placing the End-Stop sensor on the smooth rod



**A** Set for step 4

**B** Set for step 5

### Assembly:

Place the part which you assembled in step 5 on one of the rods of step 4, specifically on that on which there is only one bearing.

1.



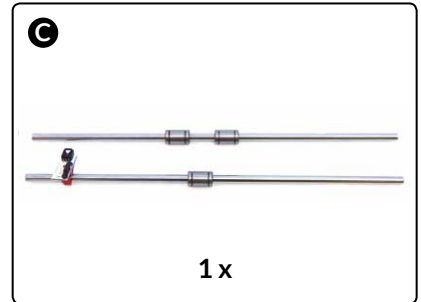
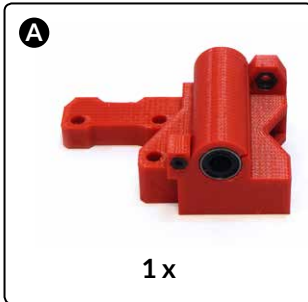
2.





# 7

## Inserting the smooth rods into the lateral parts



**A** Set for step 1

**B** Set for step 2

**C** Set for step 3

### Assembly:

Insert the ends of the rods which you prepared in the previous step into the holes in the parts which you prepared in step 1.



*The length of the rod, once the lateral parts have been joined onto it, should be about 31 cm.*

1.

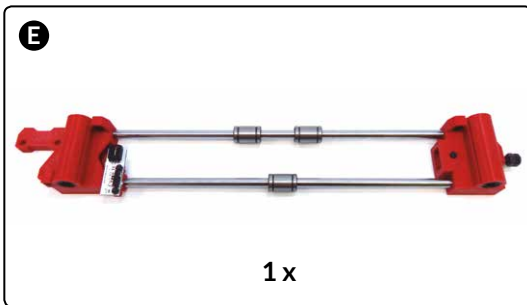
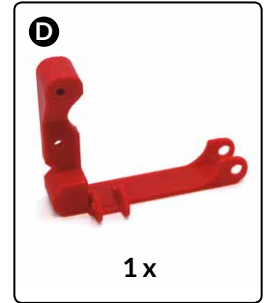
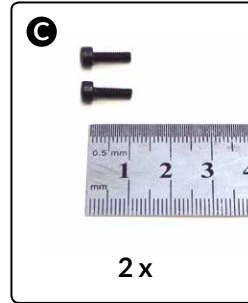
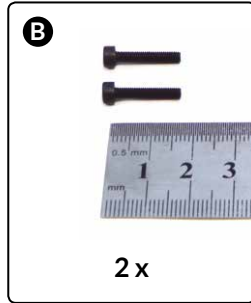
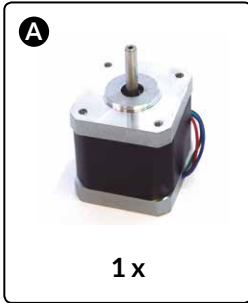


2.



# 8

## Assembling the motor



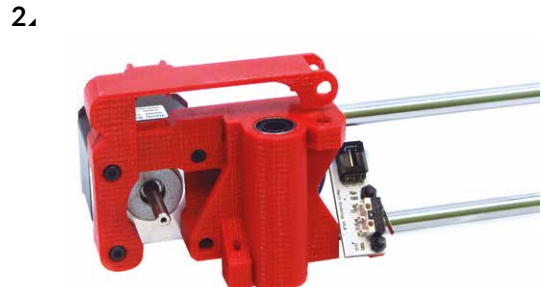
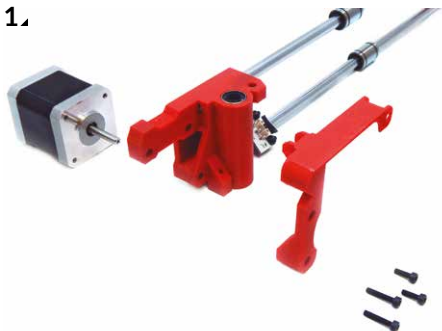
- A** Motor Nema 17
- B** M3 x 16 mm Screw
- C** M3 x 10 mm Screw
- D** Left chain coupling axle X printed part  
Coupling for holding the cable retractors in the part at the left-hand end of Axle X.
- E** Set for step 7



*Orientate the motor's cable by the upper part*

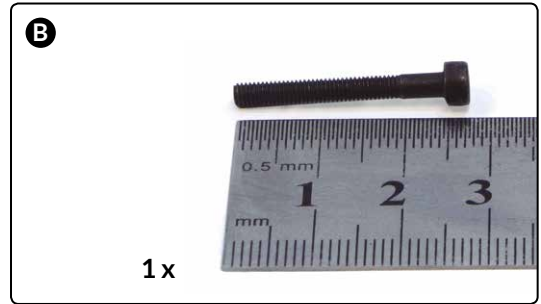
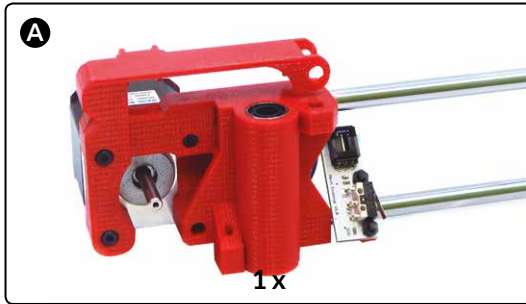
### Assembly:

Fix the chain coupling and the motor to the set from step 7 (**E**), using the screws (**B** and **C**).



# 9

## Inserting the adjusting screw for the End-Stop sensor

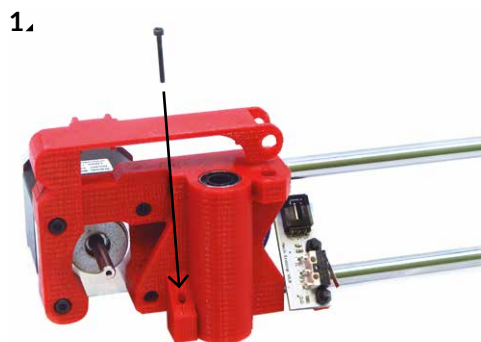


**A** Set for step 8

**B** Screw M3 x 25 mm

### Assembly:

Insert the adjusting screw for the End-Stop sensor into the hole, as shown in figure 2.



# 10

## Inserting the pulley into the motor



**A Motor Nema 17**

Nema 17 bipolar step motor (2.5A 1.8 deg/step).

**B Pulley GT2 (20 teeth)**

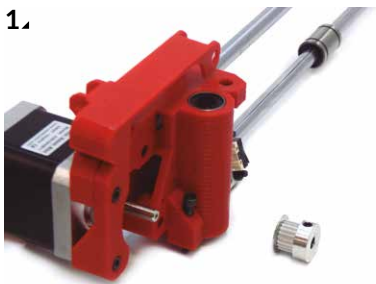
**Assembly:**

Fix the pulley to the motor with the help of a 2 mm Allen key. Tighten the set screw against the chamfered part of the motor's axle.

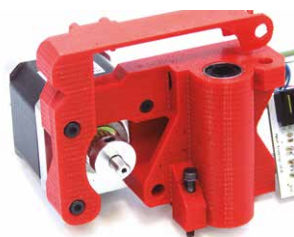


For this step you need a 2 mm Allen key.

1.



2.



3.

