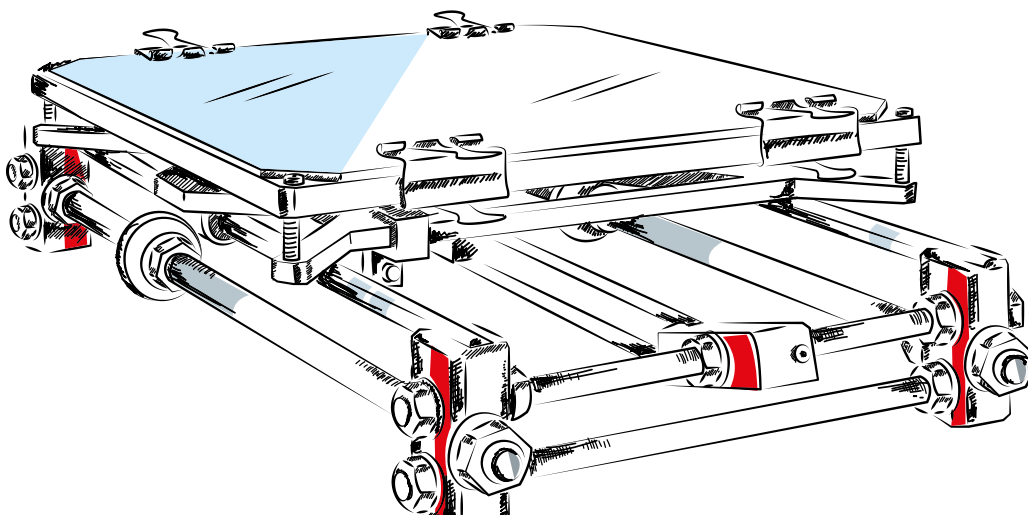# 4

Assembly of Axle Y
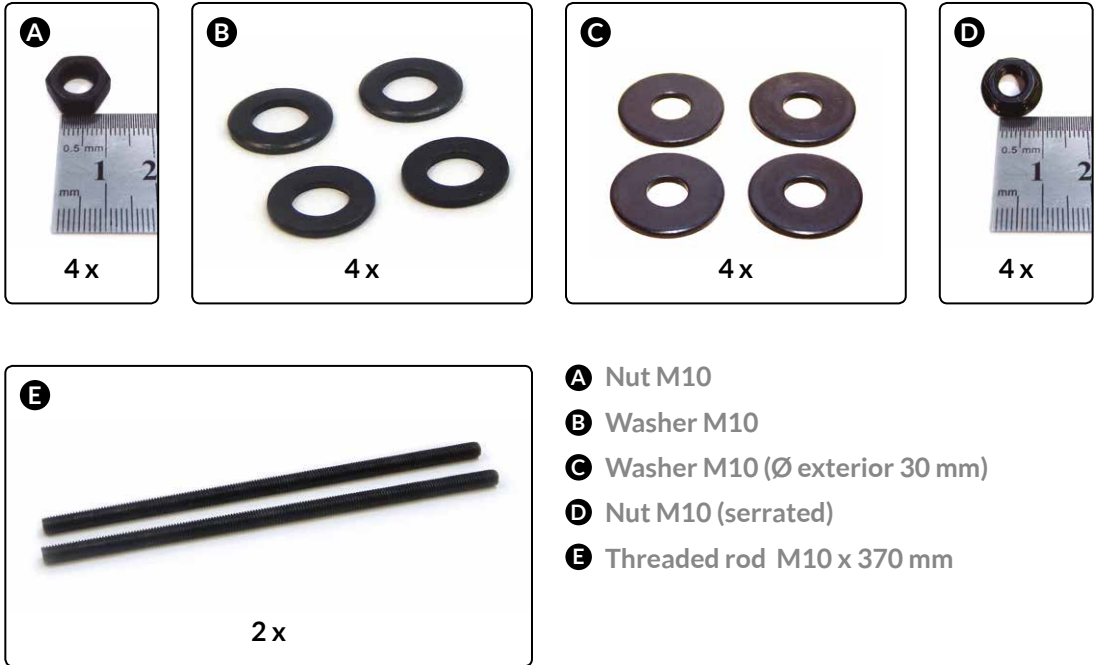
List of components for Axle Y
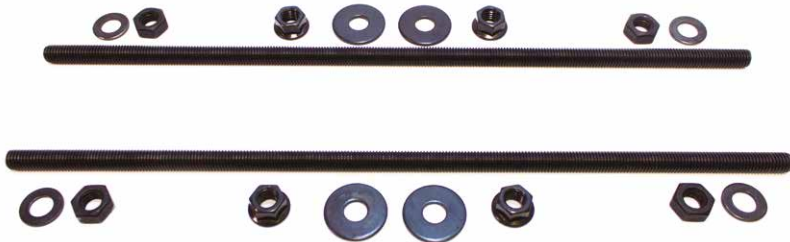
2 x Smooth chrome rod Ø 8 mm x 340 mm

2 x Threaded rod M10 x 370 mm

4 x Black threaded rod M8 x 205 mm

1 x Screw M3 x 16 mm - DIN-912 class 8.8 black

6 x Screw M3 x 25 mm - DIN-912 class 8.8 black

7 x Screw M3 x 10 mm - DIN-912 class 8.8 black

1 x Screw M3 x 20 mm - DIN-912 class 8.8 black

5 x Nut M3 - DIN 934 class 8 black

22 x Nut M8 - DIN 934 class 8 black

8 x Nut M10 - DIN 934 class 8 black

4 x Nut M10 DIN 6923 class 8 black, serrated

22 x Washer M8 - DIN-125 class 6 black

8 x Washer M10 - DIN-125 class 6 black

4 x Washer M10 (Ø exterior 30 mm) DIN-9021 black

1 x Belt-holding printed part axle Y

1 x Motor printed part axle Y

4 x Corner printed part axle Y

1 x End-stop frame printed part axle Y

1 x Axial ball bearing B623ZZ

1 x Pulley GT2 (20 teeth)

1 x Belt GT2 6 mm x 1 m

1 x Aluminium base

1 x Aluminium frame

1 x Methacrylate base

3 x Linear ball bearing LM8UU

1 x Glass piece 220 x 220 x 3 mm

4 x Spring (length: 30.5 mm, external Ø : 4.5 mm and thickness: 0.45 mm)

4 x Black binder clip (35 x 10 mm)

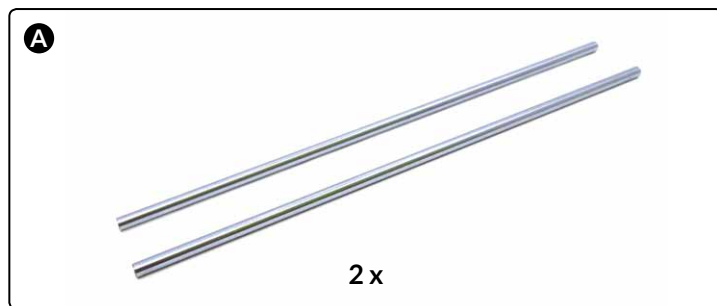**11 x** Black strap 100 x 2.5 mm

1

Preparing the threaded rods

A 4 x

B 4 x

C 4 x

D 4 x

E 2 x

A Nut M10
B Washer M10
C Washer M10 (Ø exterior 30 mm)
D Nut M10 (serrated)
E Threaded rod M10 x 370 mm

1.

2.

2

Preparing the smooth rods

A

2 x

B

3 x

Ⓐ Smooth chrome rod Ø 8 x 340 mm

Ⓑ Linear ball bearing LM8UU

1.

2.

3

Joining the rods

A

4 x

B

1 x

C

1 x
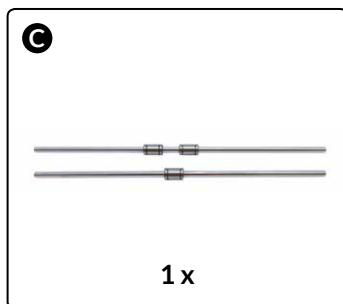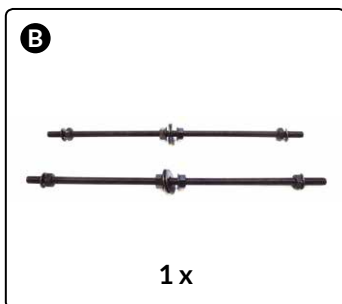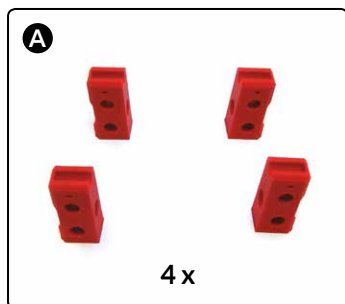
A **Corner printed part axle Y**
Corners which form the base and the structure of Axle Y

B **Set for step 1**

C **Set for step 2**

Assembly:

Join the ends of sets **B** and **C** to the parts which form the corners.

1.

2.

4

Fixing with nuts

A

4 x

B

4 x
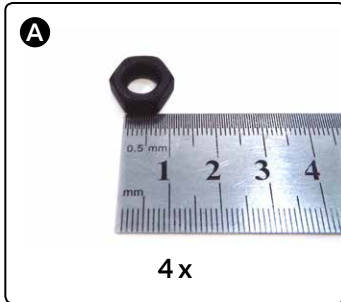
A Nut M10

B Washer M10

Assembly:

Tighten the washers and nuts at the ends of the rods so that the part is well fastened.

1.

2.

5

Fixing with straps

A

4 x
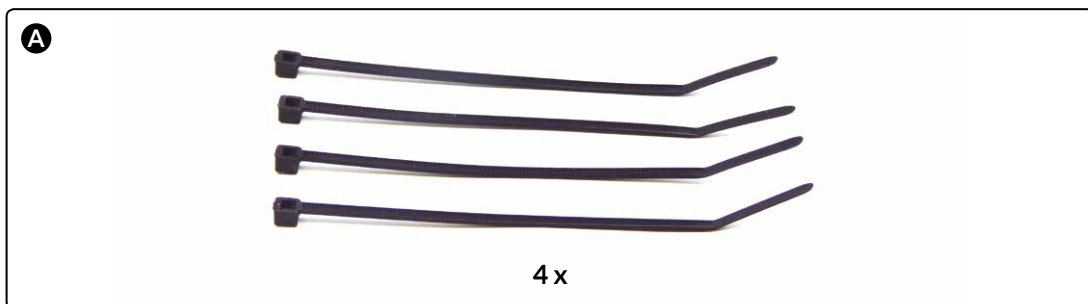
A Black strap 100 x 2.5 mm

Assembly:

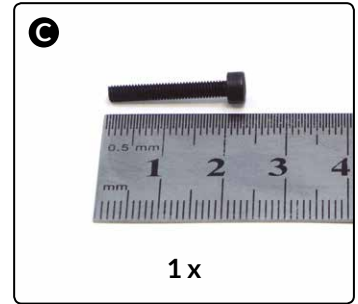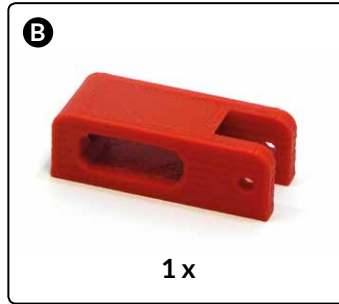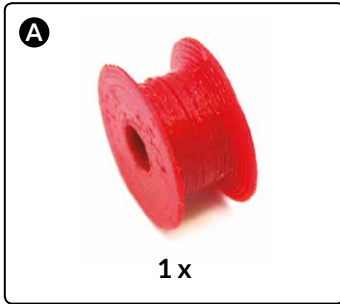Fix the smooth rods by positioning the flanges as shown in the figures.

1.

2.

3.

6

Preparing the tensioner

A

1 x

B

1 x

C

1 x

D

1 x

E

2 x
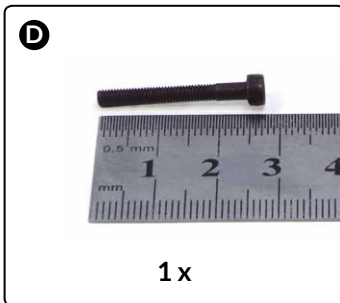
Ⓐ Pulley

Ⓑ Bearing tensioner B623ZZ printed part axle Y

Ⓒ Screw M3 x 20 mm

Ⓓ Screw M3 x 25 mm

Ⓔ Nut M3

Assembly:

Screw the long screw (**D**) through the pulley and fix it with the two nuts. Insert the short screw (**C**) into the bearing tensioner as shown in the picture.
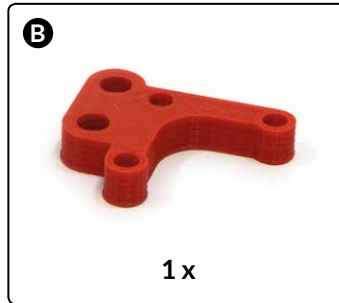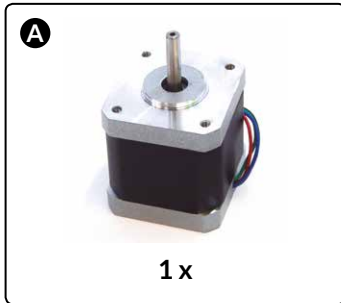
1.

2.

7

Preparing the motor

1 x

1 x

3 x
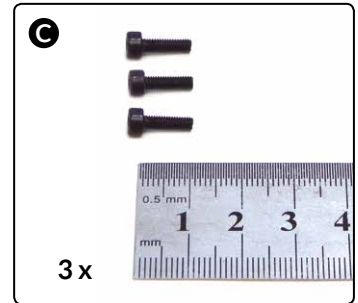
Ⓐ Motor Nema 17
Nema 17 bipolar step motor
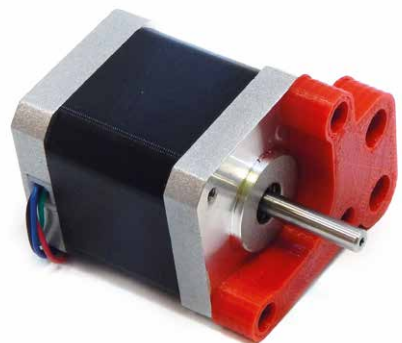(2.5A 1.8 deg/step)

Ⓑ Motor printed part axle Y
Printed part to fasten the Nema 17 motor of Axle Y to
the threaded rods

Ⓒ Screw M3 x 10 mm

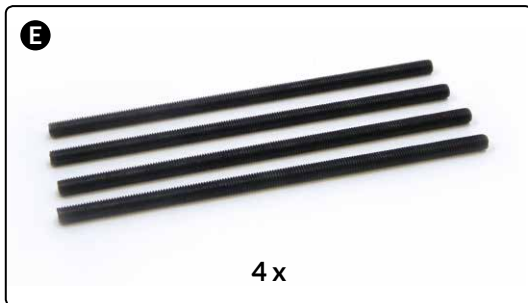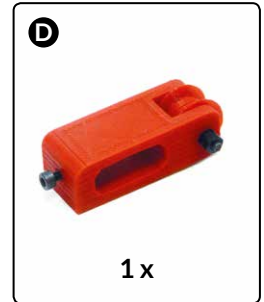*Make sure that the orientation of the
motor is correct.*

1.
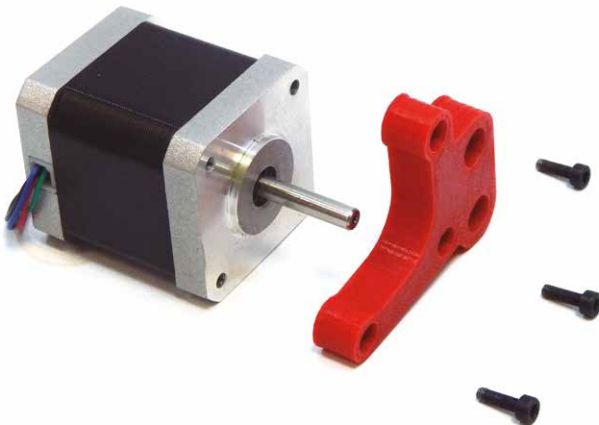
2.

8

Preparing the threaded rods (Part 1)

A

6 x

B

6 x

C

1 x

D
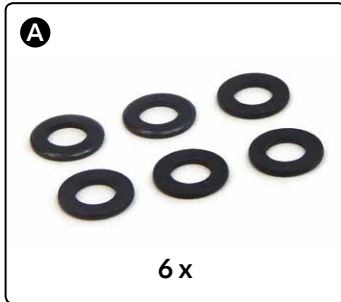
1 x

E

4 x
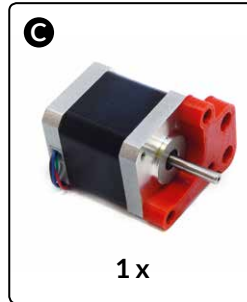
A Washer M8
B Nut M8
C Set for step 6
D Set for step 7
E Threaded rod M8 x 205 mm

Assembly:

Fix the step 7 set to two of the threaded rods, securing them with the washers and nuts. Do the same with the step 6 set.
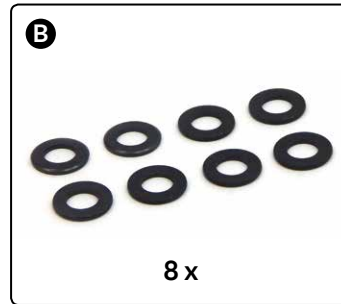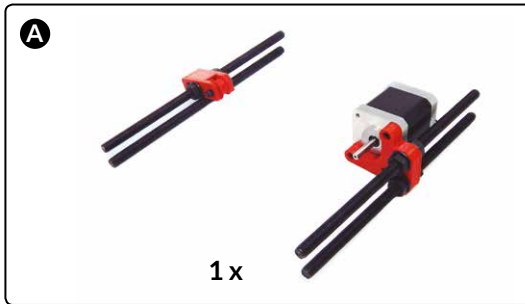
1.

2.

9

Preparing the threaded rods (Part 2)

A

1 x

B

8 x

C

0.5 mm   1   2

mm

8 x

A Set for step 8
B Washer M8
C Nut M8

Assembly:

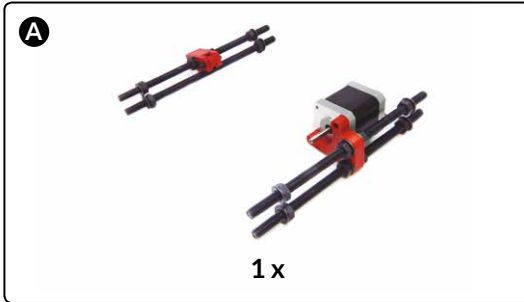Put the washers and nuts onto the set which you assembled in the previous step, as shown in the picture.

2.

10

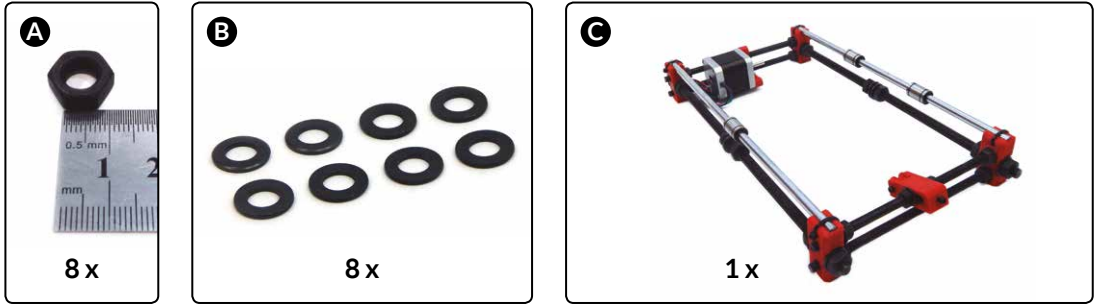## Joining the rods

A

1 x

B

1 x

Ⓐ Set for step 9

Ⓑ Set for step 5

Assembly:

Fit together the four sets which you assembled in previous steps, by inserting the ends of the rods into the holes in the printed parts of the corners.
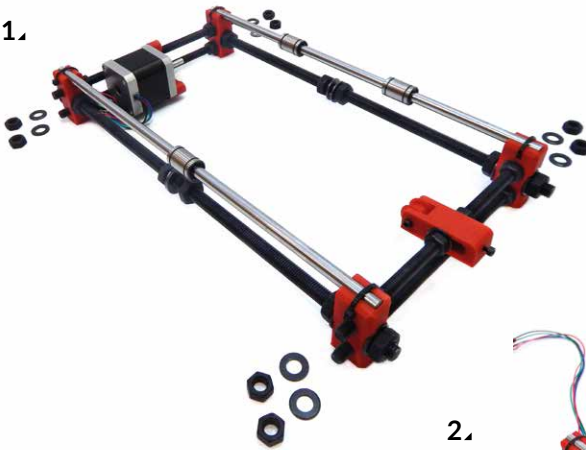
1.

2.

11

Fixing the structure

8 x

8 x

1 x

Ⓐ Nut M8

Ⓑ Washer M8

Ⓒ Set for step 10

1.

2.

12

Preparing the aluminium base

Ⓐ

1 x

Ⓑ

1 x

Ⓒ

2 x
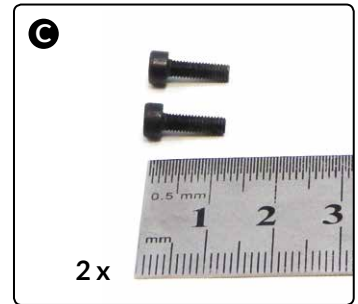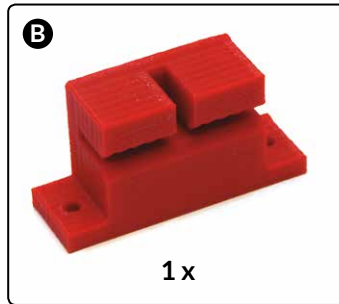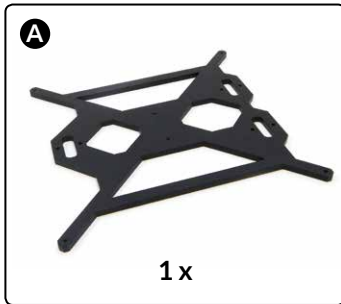
Ⓐ Aluminium base

Ⓑ Belt-holding pirnted part axle Y
Part for holding the belt GT2 corresponding to Axle Y

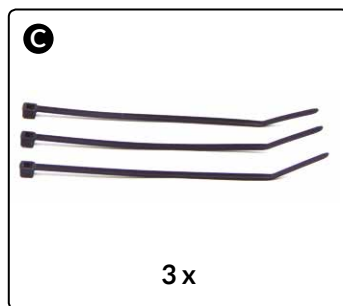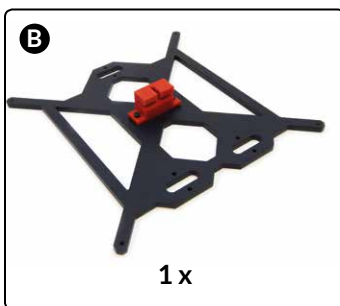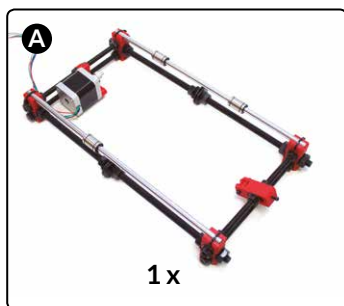**Ⓒ Screw M3 x 10 mm**

Assembly:

Screw the printed part which will hold the belt onto the aluminium base.

1.

2.

13

Fixing the aluminium base with straps

A

1 x

B

1 x

C

3 x

A Set for step 11
B Set for step 12
C Black strap 100 x 2,5 mm

Assembly:

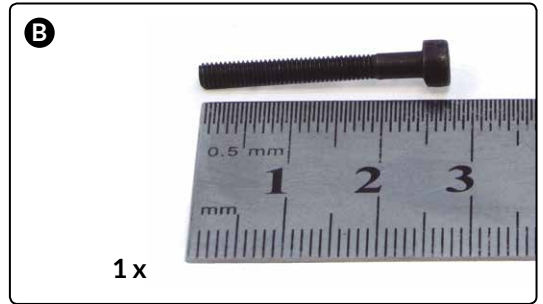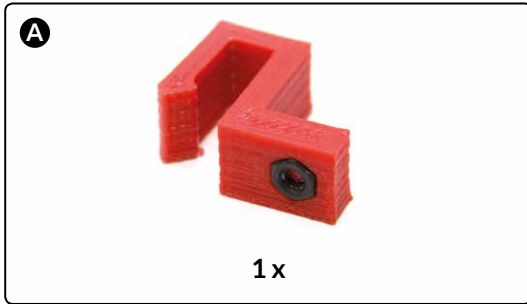Join the sets for steps 11 and 12, fastening the ends with the straps.

1.

2.

3.

4.

5.

6.

7.

14

Preparing the end-stop sensor of the base

A 1 x

B 1 x

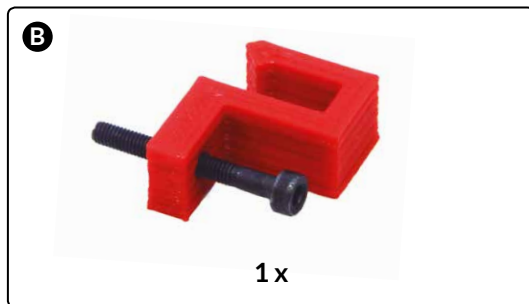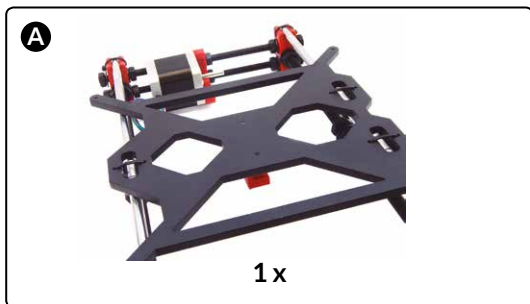**A** **End-stop printed part axle Y (base)**
The part which is located on the base of Axle Y and which incorporates a screw with M3 nut to adjust the total stroke of the axle. It is completed by the part which holds the end-stop part to the frame.
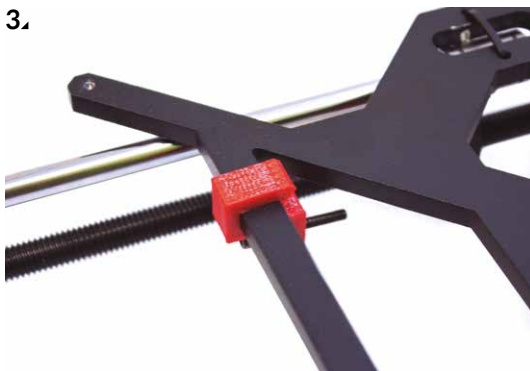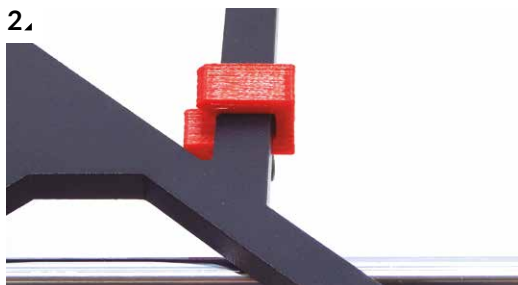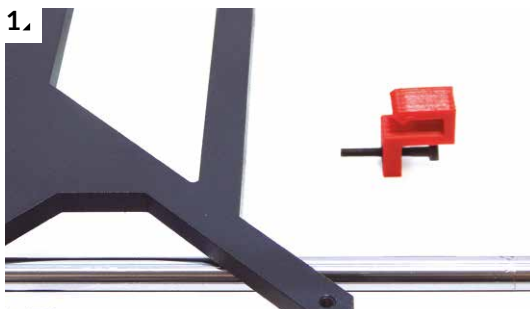
B **Screw M3 x 25 mm**

1.

2.
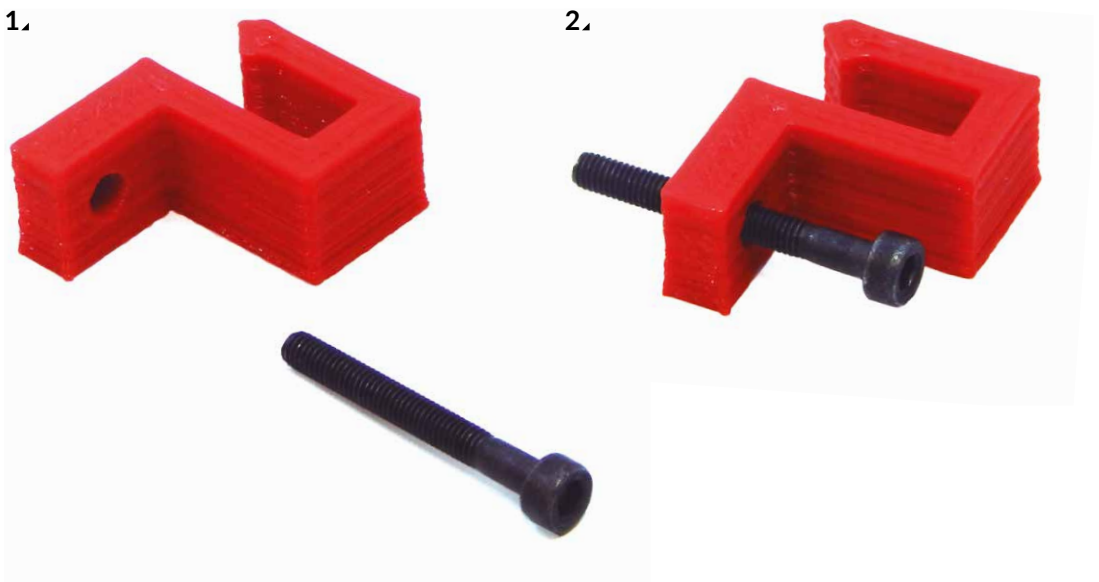
15

Anchoring the end-stop sensor to the base

A

1 x

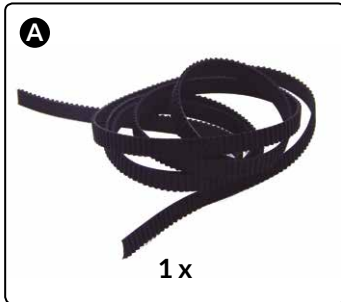**B**

1 x

Ⓐ **Set for step 13**
Ⓑ **Set for step 14**

1.

2.

3.

4.

16

Fitting the Axle Y belt

A

1 x

B

1 x

C

4 x
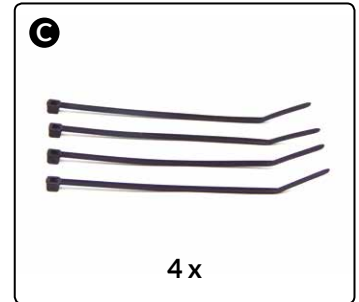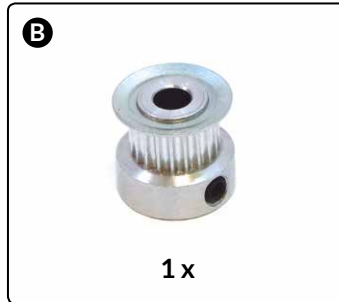
A Belt GT2 6 mm x 1 m

**B** Pulley GT2 (20 teeeth)

C Black strap 100 x 2,5 mm

Assembly:

Turn the set over and put the pulley onto the motor's axle, tightening it with the Allen key (**3**). Loosen the screw to slacken the tensioner (**5**), and fit the belt (**6**). When the belt has been fitted, cut off the remaining part (**7**, **8**, **9**, **10**, **11**).

Align the belt (**12**, **13**). Tighten it by turning the screw of the tensioner with the 2 mm Allen key (**14**).
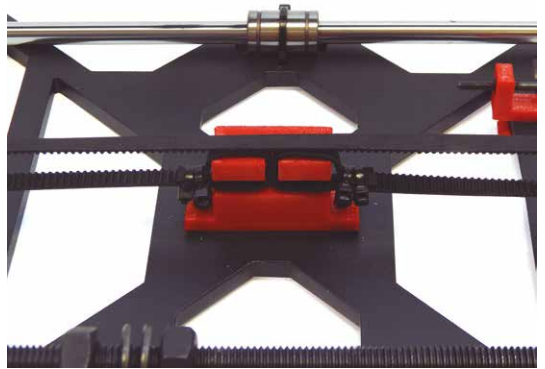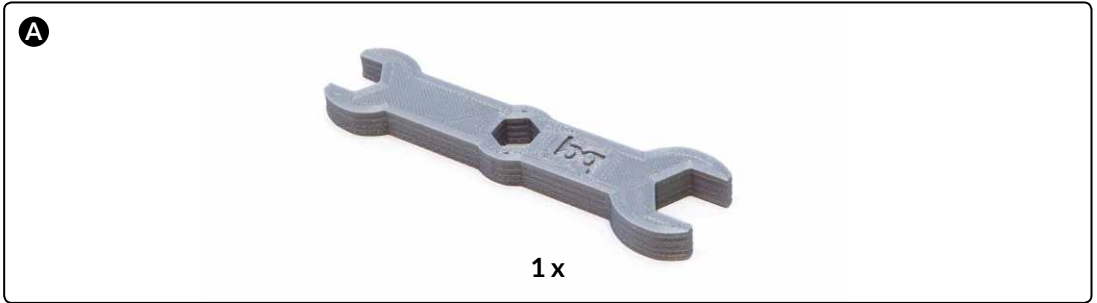
For this step you will need a 2 mm Allen key.

1.

2.

3.

4.

5.
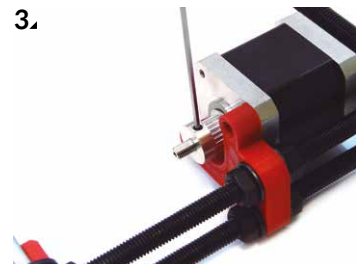
6.

7.

8.

9.

10.

11.

12.

13.

14.

17

Tightening all the nuts

A

1 x

A **Printed fixed spanner 10 (M6), 13 (M8), 17 (M10)**

Assembly:

Tighten all the nuts with the printed fixed spanner. Check that the base slides well with the smooth rods.

You need to file the imperfections of the fixed spanner to make it fit well on the nuts.
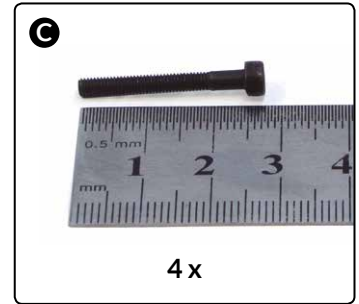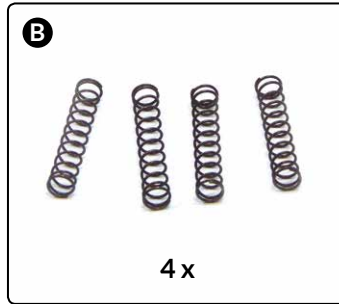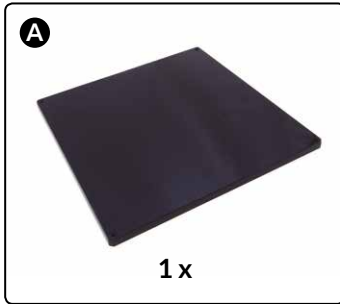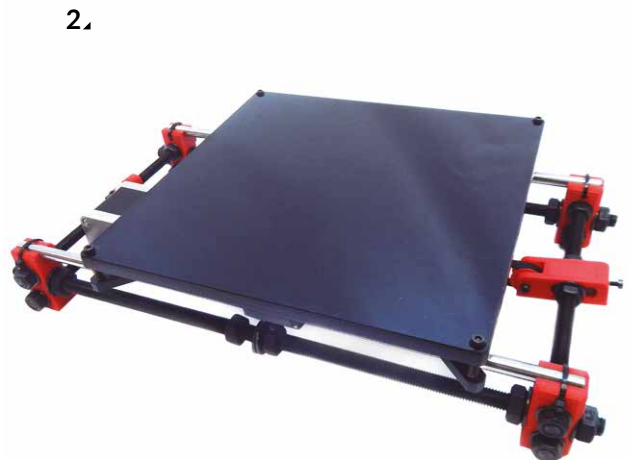
1.

18

Fitting the methacrylate base

A

1 x

B

4 x

C

4 x

A Methacrylate base

B Springs

C Screw M3 x 25 mm

Assembly:

Fix the methacrylate base to the structure which you assembled in previous steps. To do this, join the four corners of the methacrylate base to the four sides of the aluminium base, using the screws and the springs.

1.

2.

19

Preparing the end-stop sensor in the frame

A 2 x

B 2 x

C 1 x
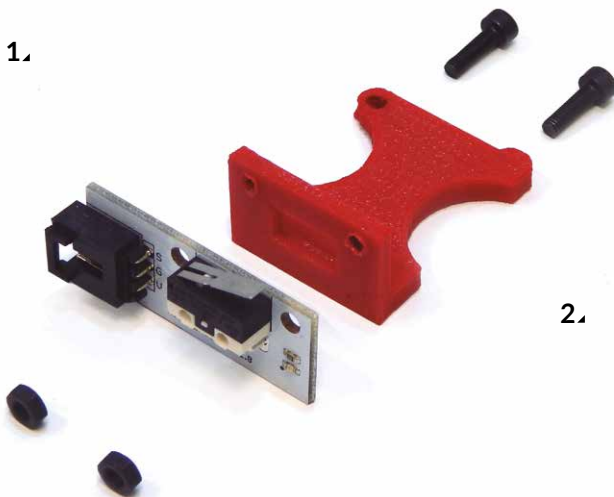
D 1 x

A Nut M3

B Screw M3 x 10 mm

C End-stop frame printed part axle Y
The part which fastens the Y axle's end-stop to the frame. It is completed by the base part which is adjustable with the screw and M3 nut.
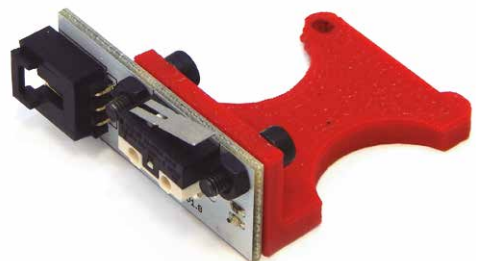
D End-stop frame
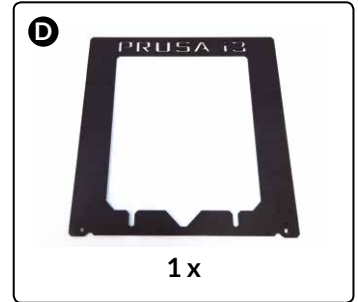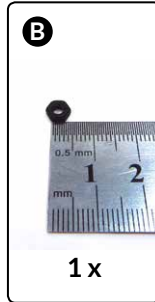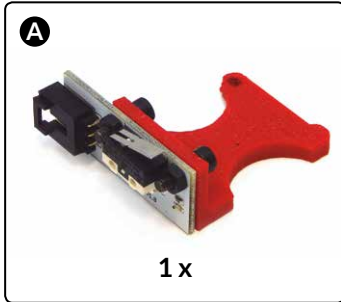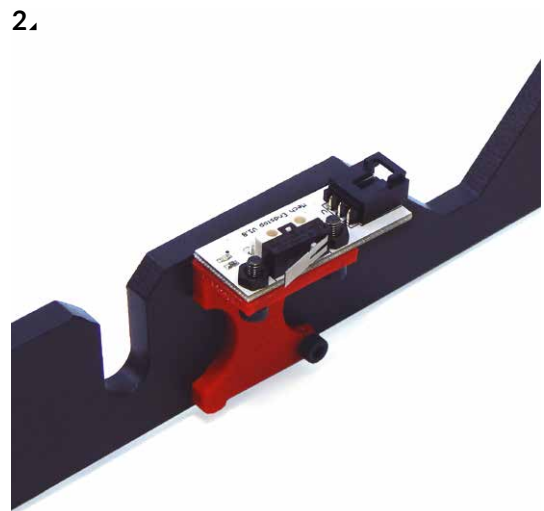The end-stop part mounted on a PCB with an LED indicator.

1.

2.

20

Anchoring the end-stop sensor to the frame

A

1 x

B

0.5 mm

1 2

mm

1 x

C

0.5 mm

1 2

mm

1 x

D

PRUSA i3
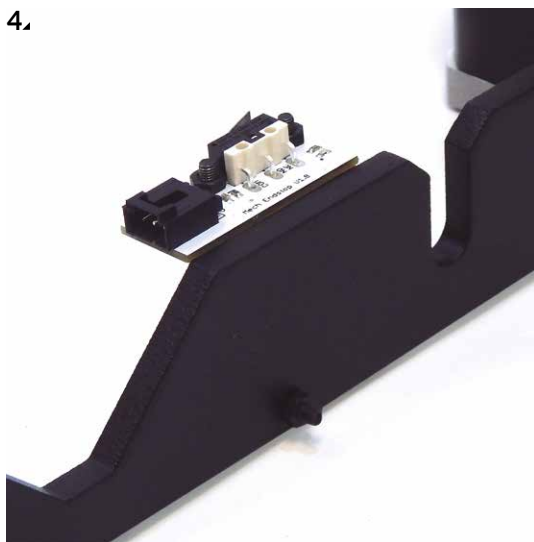
1 x

A Set for step 19

B Nut M3

C Screw M3 x 16 mm

D Black aluminium frame

1.

2.

3.
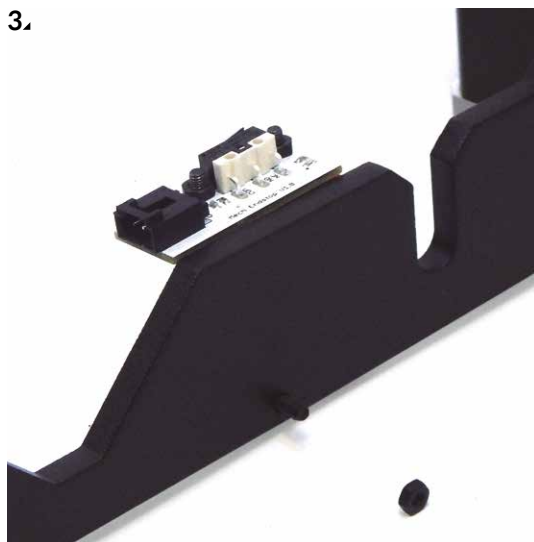
4.

5.

21

Joining of Axle Y with Axles X and Z (Part 1)

A

1 x

B

1 x

Ⓐ Axle Y

Ⓑ Axle X and Z

1.
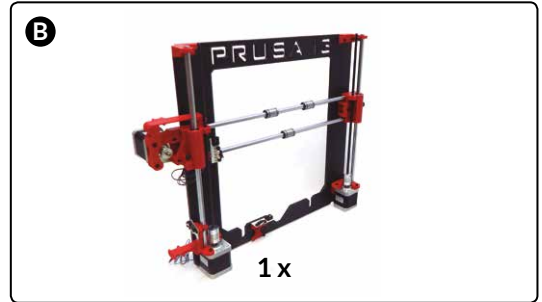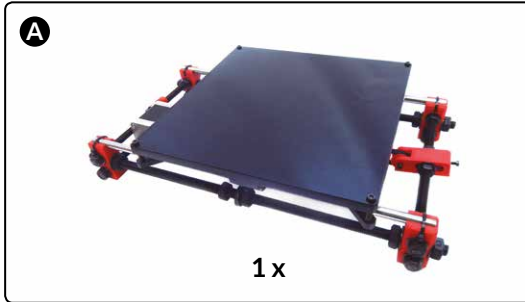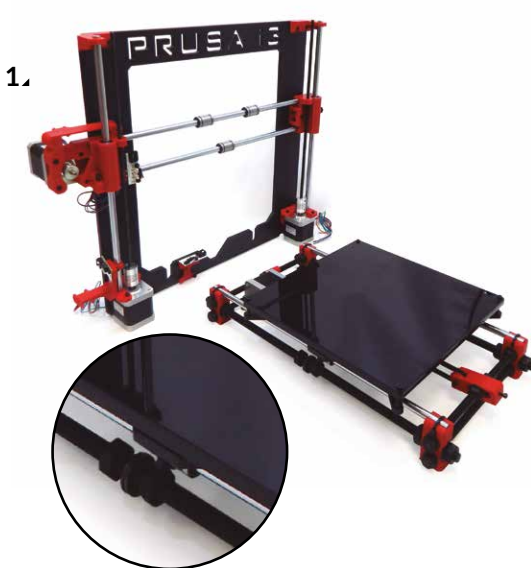
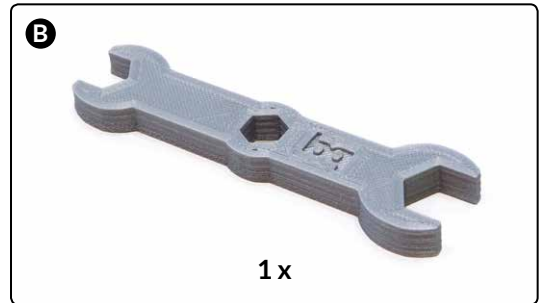*The distance from the aluminium frame to the printed part has to be 9.1 cm.*

22

Joining of Axle Y with Axles Ejes X and Z (Part 2)

A

1 x

B

1 x

A Set for step 21

B Printed fixed spanner 10 (M6), 13 (M8), 17 (M10)

1.