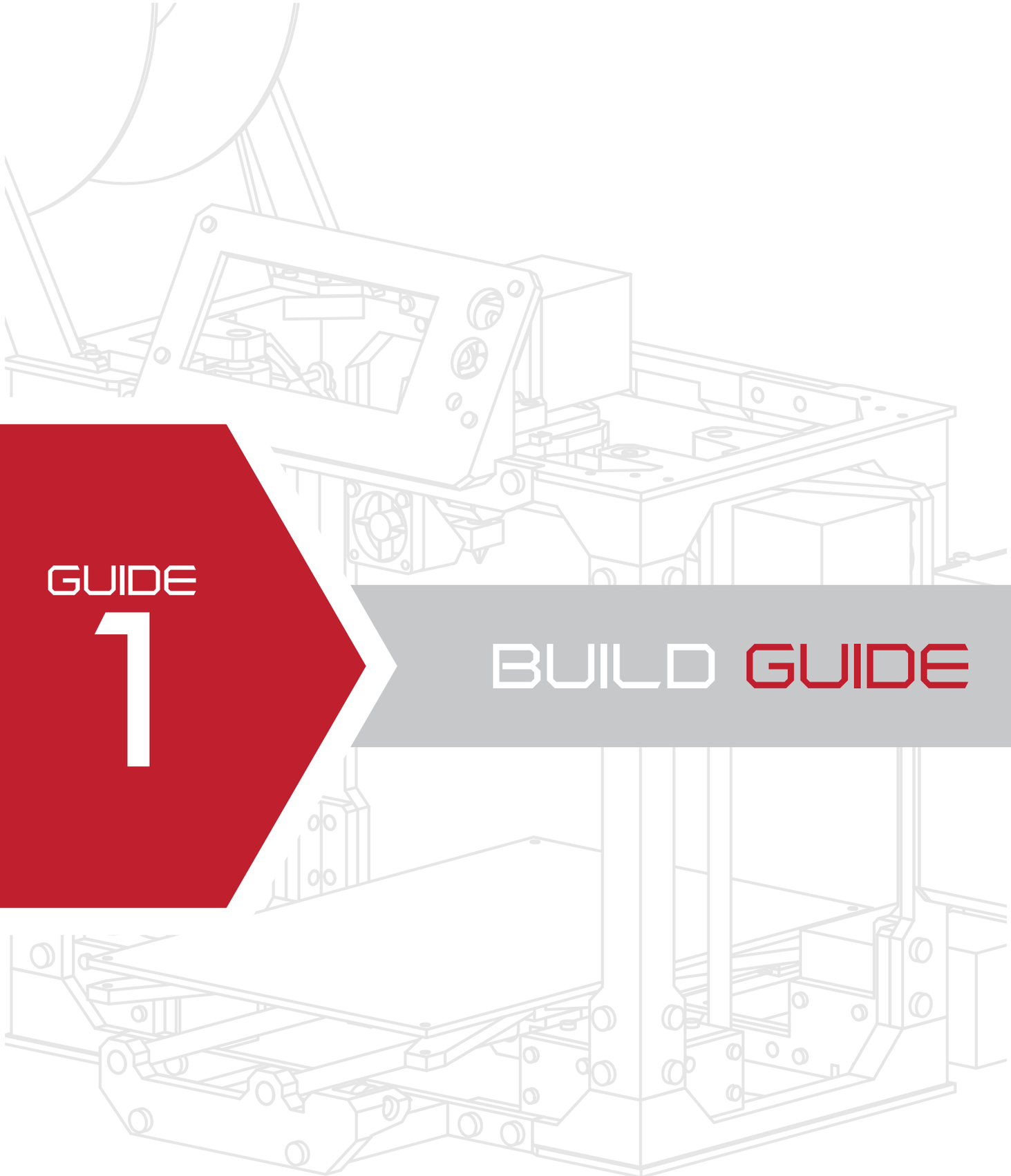
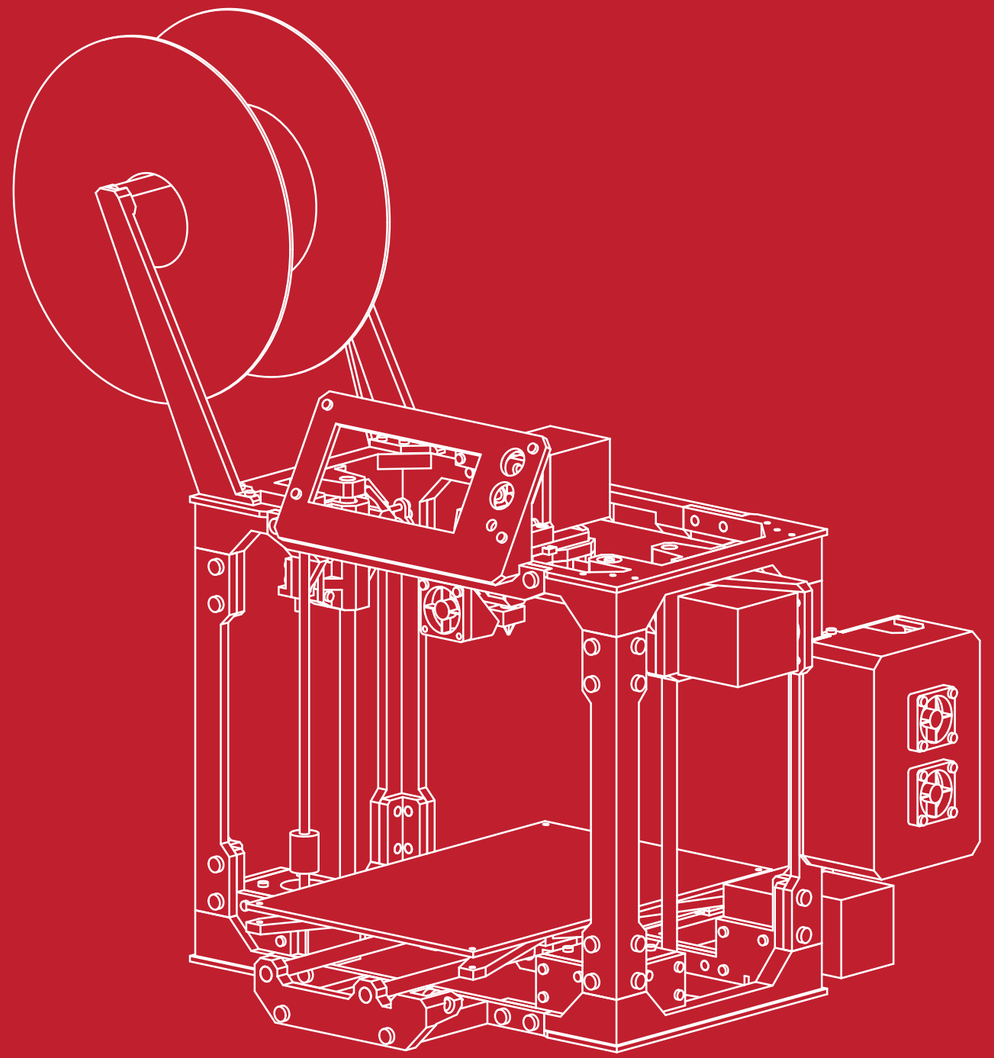


GUIDE 1

BUILD GUIDE

mapleMaker
ADDITIVE MANUFACTURING

SECTION



1.1 Introduction

Welcome, and Thank you!

Thank you for your interest in the mapleMaker Mini V2 3D Printer.

The **mapleMaker Mini** introduces you to the world of additive manufacturing and 3D printing. With your own 3D printer, your concepts and design ideas can be translated from computer drawings to physical objects in short period of time.

The goal of this guide is to **introduce you to the parts and pieces** that will be required before you can assemble your printer kit. Most of these items can be sourced both locally and from any number of online retailers.

The aim of this kit was to reduce costs and create an **accessible, hackable, upgradeable, and ultimately, user customizable 3D Printer.** We believe that a 3D printer should evolve with it's users needs and knowledge, and become a platform for any number of future upgrades and additions without the need for costly re-works or additional components.

Ultimately though, we want to empower the next generation of designers, developers, and engineers by giving them the platform and tools to suite their needs for today, tomorrow, and well into the future.

We are Open Source. Collaboration fuels Innovation.
Create, Innovate, and Share.

1.2 Table of Contents

This guide is broken into several sections which encompasses the build process of the maplePrint Mini 3D printer. The process begins with the basic frame assembly and finishes with the final wiring and installation.

While we try to maintain the most up to date diagrams and illustrations, there may be slight differences between the illustrations contained within this guide, and the printed parts in your kit. If there are major changes or differences between the instructions contained within and the printed parts, you should have received an updated insert in your kit containing the revised instructions.

1.3 Required Tools

Before we begin the assembly process, it is vital that we have the proper tools to complete the build. Thankfully though, there are only a few tools required for the build. These tools were either included with your kit, or available at any local hardware or tool store.

You will need the following:

#2.5 Allen Key (for use with M3 screws)

#3 Allen Key (for use with M4 screws)

#4 Allen Key (for use with M5 screws)

Ceramic screw driver (for adjusting RAMPS drivers)

Spatula (to remove printed parts from the print bed)

Exacto Knife (for trimming and cleaning parts)

Needle nose or similar pliars

Nylon wire ties or zip ties (for securing wiring looms)

3M Blue painters tape (for printing with PLA)

Hot glue gun (to secure endstops)

--------Add photos of tools here---------

1.4 Reseller Information

Below is a list of resellers and manufacturers of the components used in the mapleMaker Mini 3D Printer.

Some components may be sourced from your local home improvement retailers or specialist hobby stores.

Electronics, motors & extruders

Folger Technologies, LLC:	www.folgertech.com
Active Surplus:	www.active123.com
EckerTech Inc:	www.eckertech.com
Misumi	www.us.misumi-ec.com/
Mixshop	www.mixshop.com
RepMachina	www.repmachina.ca
SDP/SI CA	www.sdp-si.com/
Skyhunt	www.skyhunt.net
ROBOTDIGG	www.robotdigg.com
Voxel Factory	www.voxelfactory.com

Linear rods & movement

Folger Technologies, LLC:	www.folgertech.com
ROBOTDIGG	www.robotdigg.com
EckerTech Inc:	www.eckertech.com
Mixshop	www.mixshop.com

Fasteners

HD Supply Canada:	www.brafasco.com (minimums may apply)
Fastenal	www.fastenal.com (minimums may apply)

Misc. electronics

Digikey:	www.digikey.ca
McMaster-Carr	www.mcmaster.com (minimums may apply)

1.5 Components

The following list comprises the components required to build your printer. For the purposes of this build, we have used ROBOTDIGG (www.robotdigg.com) to source the major components. ROBOTDIGG offers almost every component required, minus fasteners and threaded rod.

NEMA 17 48oz Stepper Motor

Quantity: 3
URL: http://www.robotdigg.com/product/206/Nema17-48mm-Stepper-Motor
Unit Cost: $9.50

NEMA 17 34oz Stepper Motor

Quantity: 2
URL: http://www.robotdigg.com/product/28/NEMA14-34mm-0.8A-or-1.25A-stepper-motor
Unit Cost: $6.80

Flexible Coupling - 5mm to 5mm

Quantity: 2
URL: http://www.robotdigg.com/product/83/Flexible-Coupling-5mm-Shaft-to-5mm-Screw
Unit Cost: $1.80

20 Tooth GT2 Pulley

Quantity: 2
URL: http://www.robotdigg.com/product/166/2GT-20-Tooth-6.35mm-Bore-Pulley
Unit Cost: $1.85

Open Ended 6mm GT2 Belt (2 meters

Quantity: 1
URL: http://www.robotdigg.com/product/10/Open-Ended-6mm-Width-GT2-Belt
Unit Cost: $1.80

LMS8UU (Short) 8mm Linear Bearing

Quantity: 12
URL: http://www.robotdigg.com/product/13/LM8UU-Linear-Bearing
Unit Cost: $0.60

623ZZ Ball Bearing

Quantity: 4
URL: http://www.robotdigg.com/product/62/623ZZ-Ball-Bearing
Unit Cost: $3.60

Poloululu 4988 Stepper Drivers

Quantity: 4
URL: http://www.robotdigg.com/product/120/A4988-stepper-driver
Unit Cost: $3.80

Endstop

Quantity: 3
URL: http://www.robotdigg.com/product/141/Endstop,-Snap-Action-Limit-Switch-SS-5GL
Unit Cost: $0.60

RAMPS 1.4 Controller

Quantity: 1
URL: http://www.robotdigg.com/product/121/Ramps-1.4-Board
Unit Cost: $12.80

Arduino Mega 2560

Quantity: 1
URL: http://www.robotdigg.com/product/123/Arduino-Mega-2560-R3
Unit Cost: $15.80

RAMPS LCD Display

Quantity: 1
URL: http://www.robotdigg.com/product/122/RAMPS-LCD2004-with-SD-Socket
Unit Cost: $12.80

30mm Cooling Fan

Quantity: 4
URL: http://www.robotdigg.com/product/197/12V-3CMHotend-Cooling-Fan
Unit Cost: $1.50

1.5 Components

12V 5A Power Supply
Quantity: 1
URL: http://www.robotdigg.com/product/350/12V-5AAC/DC-Adapter-Power-Supply
Unit Cost: $5.00

NEMA 17 34oz Stepper Motor
Quantity: 2
URL: http://www.robotdigg.com/product/28/NEMA14-34mm-0.8A-or-1.25A-stepper-motor
Unit Cost: $6.80

Thermistor Cable (1m)
Quantity: 1
URL: http://www.robotdigg.com/product/188/2pin-1MLong-Thermistor-Cables-w/-Dupont-Connector
Unit Cost: $0.40

Endstop Cables (1m)
Quantity: 3
URL: http://www.robotdigg.com/product/189/3pin-1MLong-Endstop-Cables-w/-Dupont-Connector
Unit Cost: $0.60

All Metal Hot End
Quantity: 1
URL: http://www.robotdigg.com/product/182/All-metalhotend-w/-0.4mm-nozzle-for-1.75mm-filament
Unit Cost: $36.00

MK8 Extruder Drive Gear
Quantity: 1
URL: http://www.robotdigg.com/product/242/MK8-Filament-Drive-Gear
Unit Cost: $3.00

Compression Spring (for Extruder & bed)
Quantity: 5
URL: http://www.robotdigg.com/product/71/Compression-Spring-for-Heatbed-and-Extruder
Unit Cost: $2.00

492mm length Linear Rods (Pack of 6)
Quantity: 1
URL: http://www.robotdigg.com/product/113/Rostock-Mini-492mm-Long-8mm-Diameter-Smooth-Rod-Pack
Unit Cost: $16.80

Allen Key Set
Quantity: 1
URL: http://www.robotdigg.com/product/128/1.5,-2,-2.5,-3,-4-size-allen-key-with-ball-head-in-pack
Unit Cost: $2.00

Nylon Cable Ties (100 pack)
Quantity: 1
URL: http://www.www.robotdigg.com/product/127/Nylon-Cable-Ties-2.5*100mm-100pcs-n-3.6*200mm-100pcs-Pack
Unit Cost: $1.80

Ceramic Screwdriver
Quantity: 1
URL: http://www.robotdigg.com/product/181/Ceramicscrewdriver-for-A4988-stepper-driver
Unit Cost: $1.20

4GB SD Card
Quantity: 1
URL: http://www.robotdigg.com/product/345/4GB-SDCard-for-3D-Printing
Unit Cost: $4.50

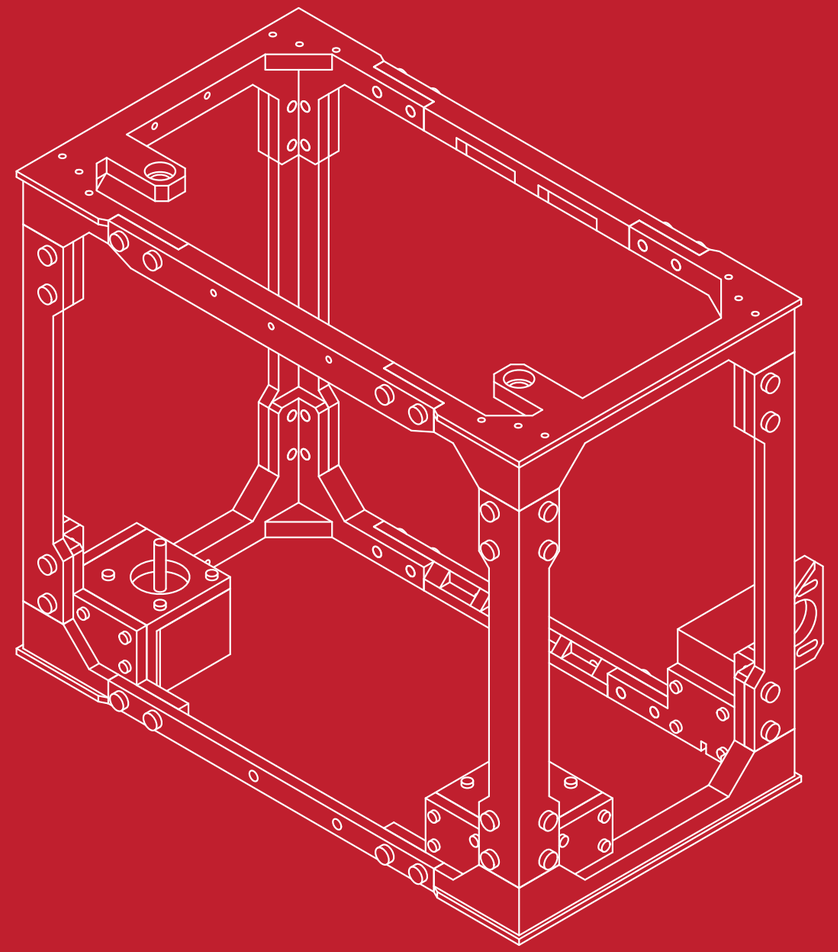
Fasteners & Threaded Rod:

You will also require the following fasteners and threaded rod to complete the build. These items can be purchased from your local hardware retailer or online.

M3X10mm Socket Cap Screw **x135**
M3X20mm Socket Cap Screw **x8**
M3X16mm Socket Cap Screw **x8**
M4X10mm Socket Cap Screw **x1**
M4X16mm Socket Cap Screw **x2**
M5X12mm Socket Cap Screw **x60**
M3X40mm Socket Cap Screw **x1**
4mm - 0.7 Stainless Steel Threaded rod
4mm - 0.7 Flat nut **x3**

SECTION

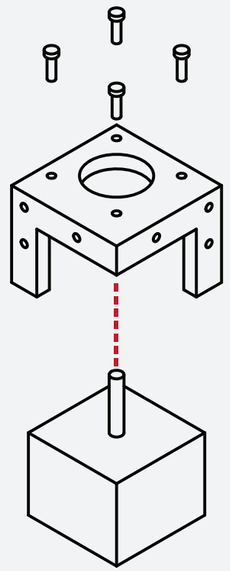
B



B 2.1

Z Motor Assembly (Right Front)

1



Locate the Hardware bag marked:
Z-Motor Mounts

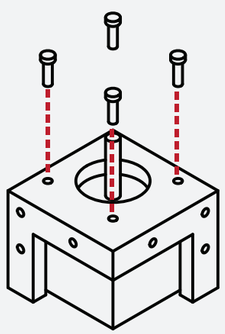
Locate the **Right Front Motor mount**, the upright mounts should face the outside of the frame.

From the Stepper Motor package, select **1** of the **34mm (short) stepper motors.**

From the Fastener package, select:
4 M3x10 cap screws

X 4 M3 x 10

2



Insert the Stepper Motor into the base of the **Right Front Motor Mount**

The threads on the face of the Stepper Motor should align with the 4 holes of the Right Front Motor Mount.

N/A

B 2.1

Z Motor Assembly (Right/Left Front)

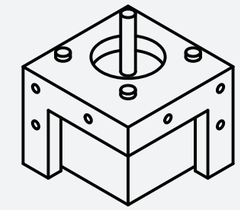
3

Using the **M3 Hex wrench**, screw the **4 M3 x 10 cap screws** through the **Right Front Motor** mount into the stepper motor.

Note: Take care not to over-tighten the screws, or you may break the motor mount.

Congratulations, the Right Front Z Motor Assembly is complete!

N/A



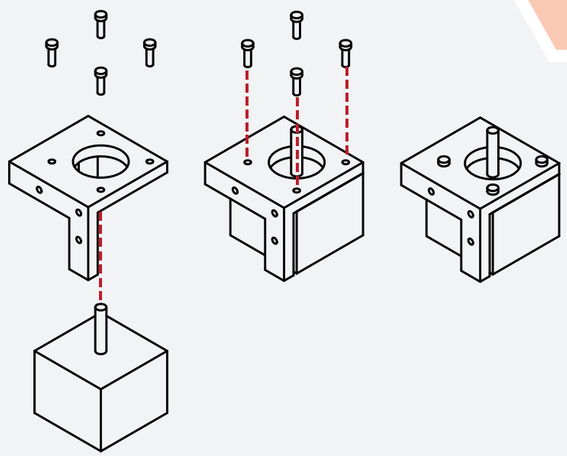
!

Alert: Left Front Z Motor Assembly

Collect the **Left Front Motor Mount, the second 34mm (short) stepper motor and 4 M3x10 cap screws.**

Repeat Steps 1-3 to complete the **Left Front Z Motor Assembly**

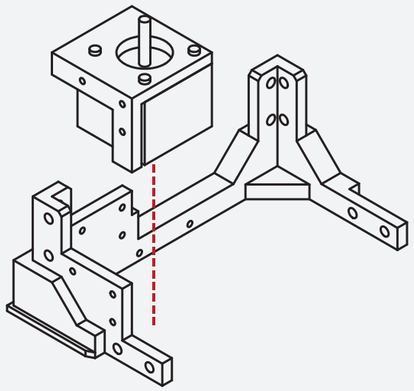
X 4 M3 x 10



Lower Frame Assembly

B 2.2

1

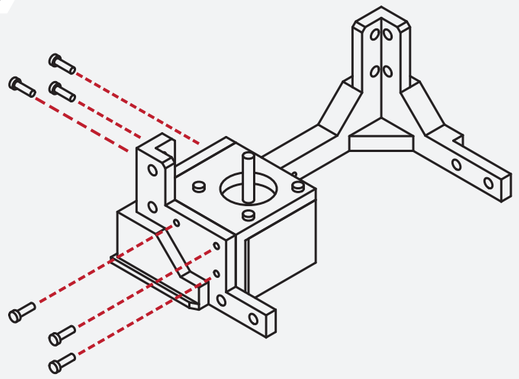


Text
Item

X X

M3 x 10

2



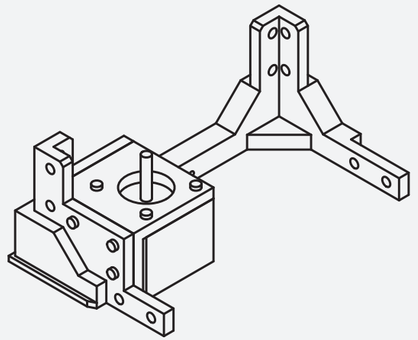
Text
Item

N/A

3

Text
Item

N/A

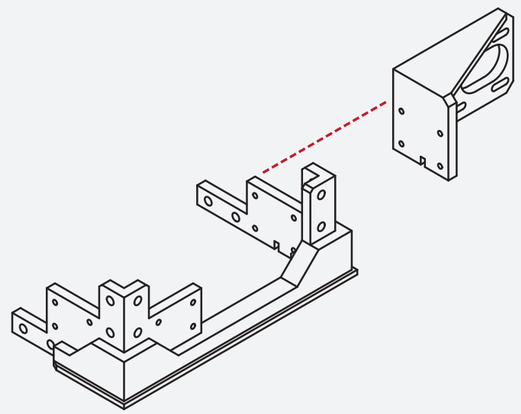


4

Text
Item

X X

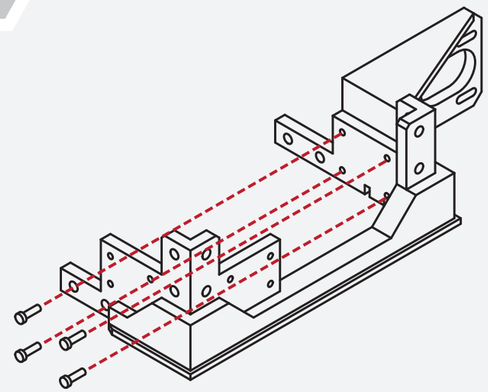
M3 x 10



Lower Frame Assembly

B 2.2

5

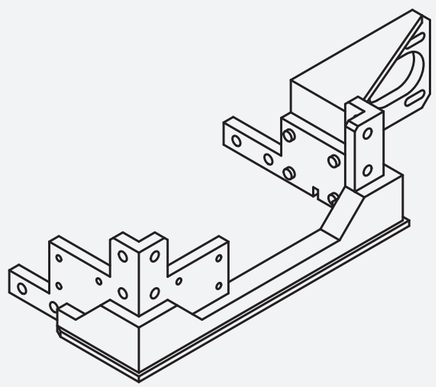


Text
Item

X X

M3 x 10

6



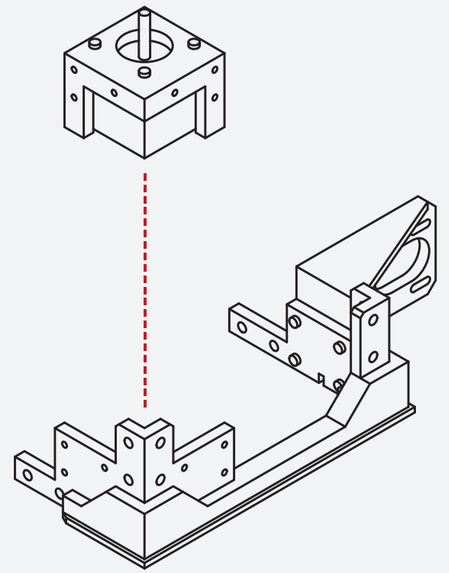
Text
Item

N/A

Text
Item

N/A

7

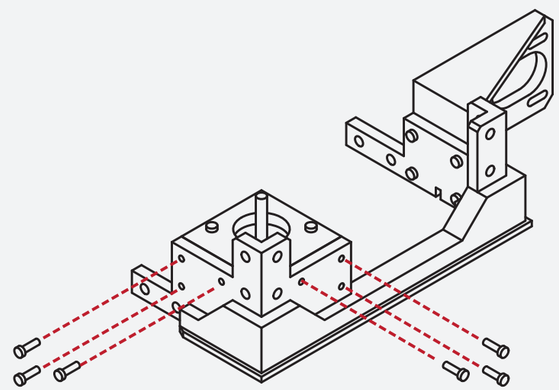


Text
Item

X X

M3 x 10

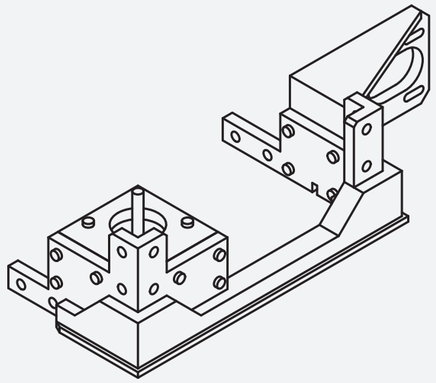
8



Lower Frame Assembly

B 2.2

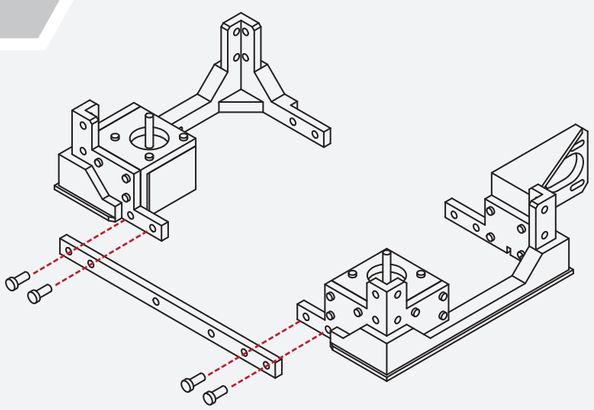
1



Text
Item

X X M3 x 10

2



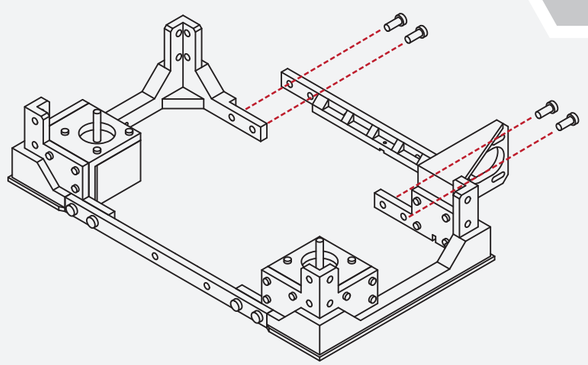
Text
Item

N/A

Text
Item

N/A

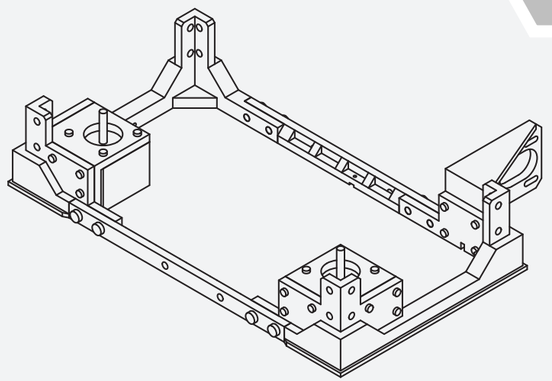
3



Text
Item

X X M3 x 10

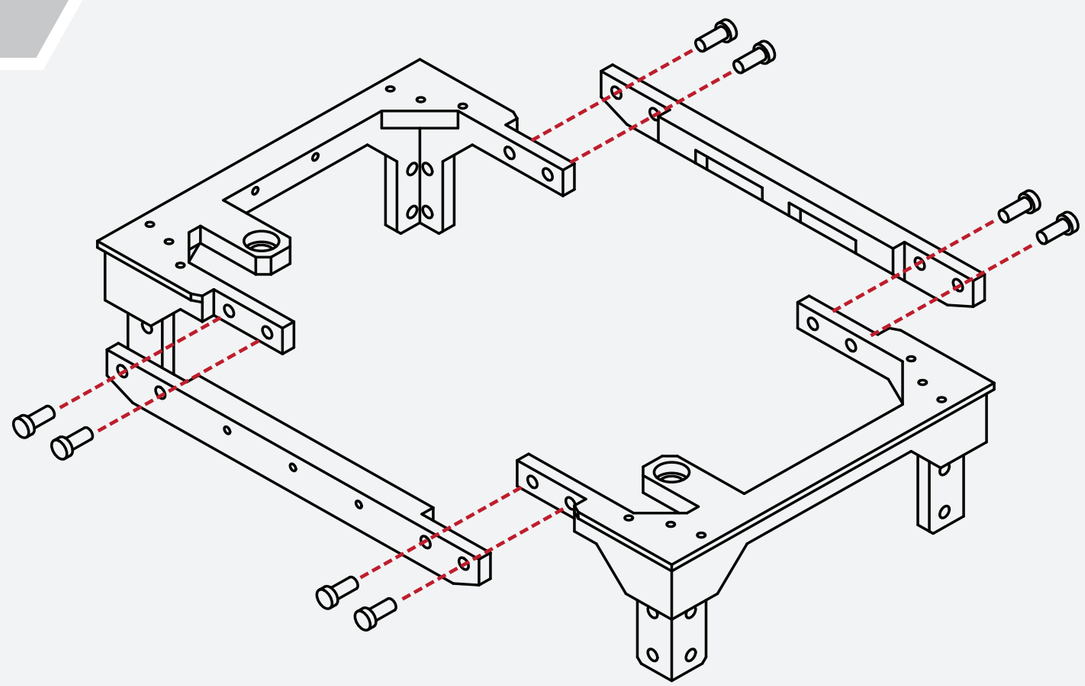
4



Upper Frame Assembly

B 2.3

1

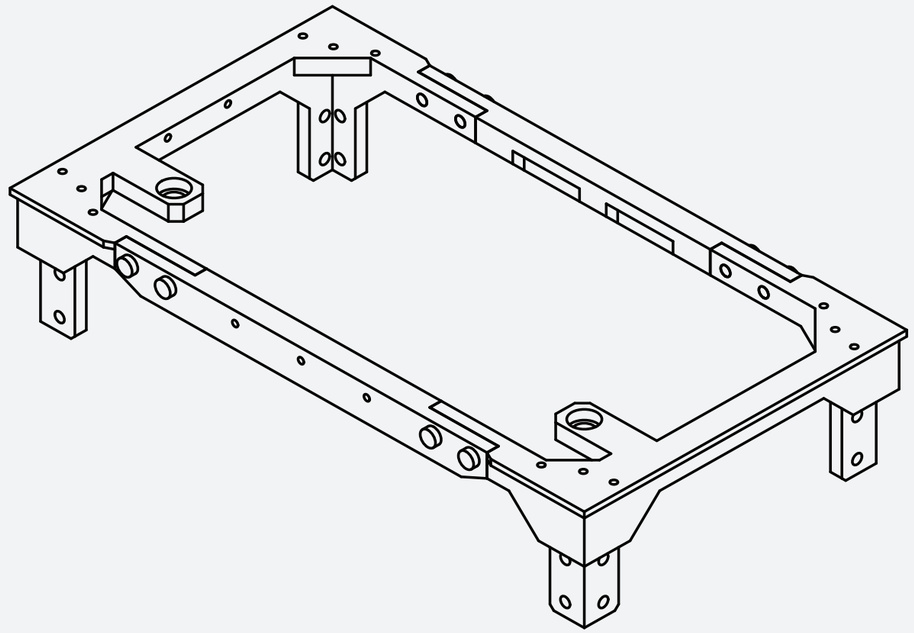


Text
Item

N/A

M3 x 10

2



N/A

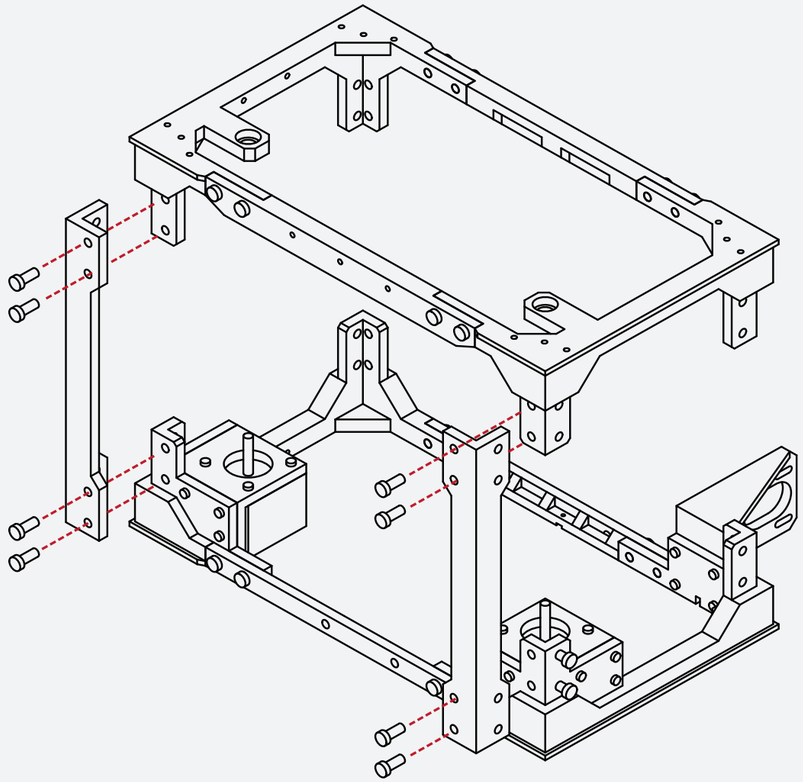
M3 x 10

Text
Item

Lower & Upper Frame Union

B 2.4

1

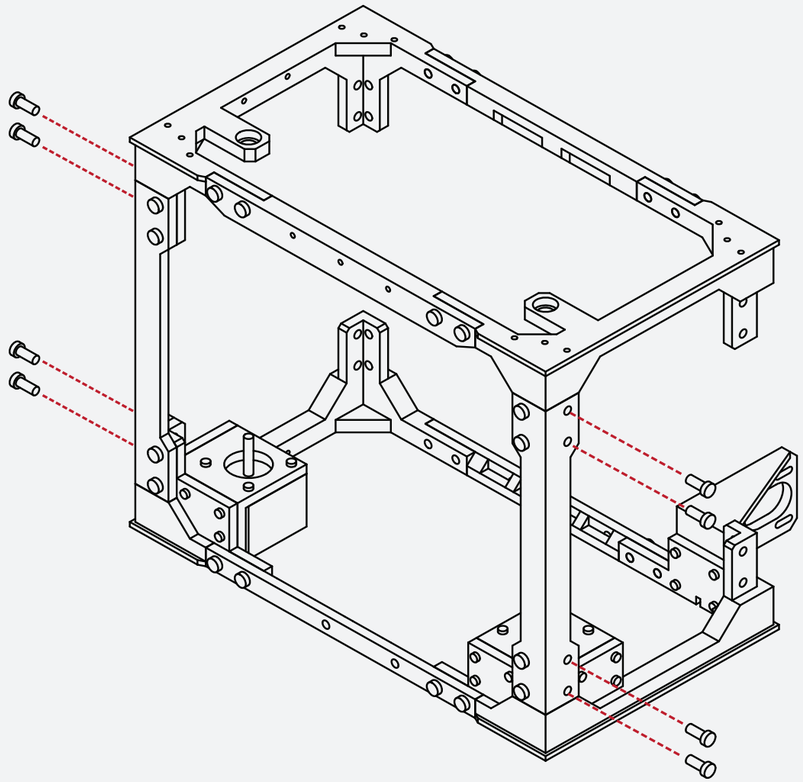


Text
Item

N/A

M3 x 10

2



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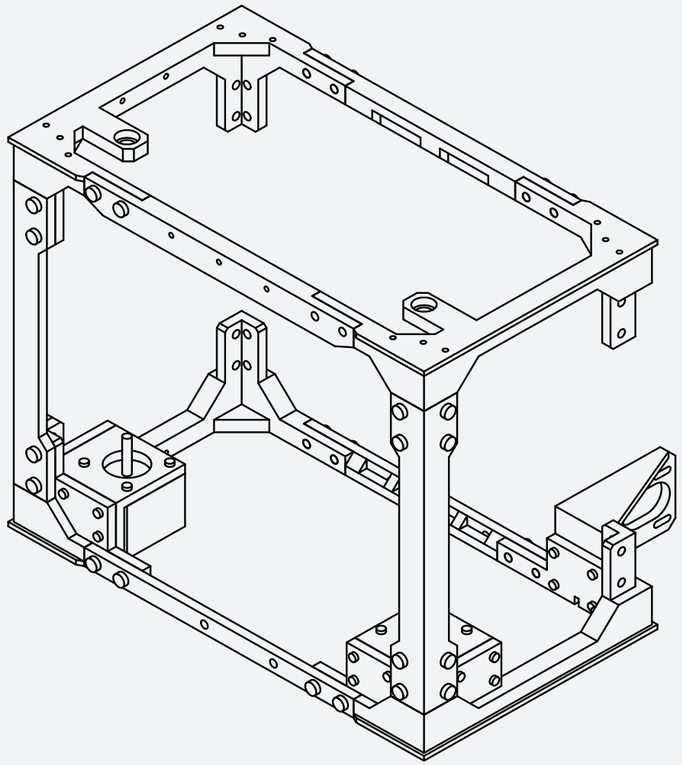
M3 x 10

Text
Item

Lower & Upper Frame Union

B 2.4

3

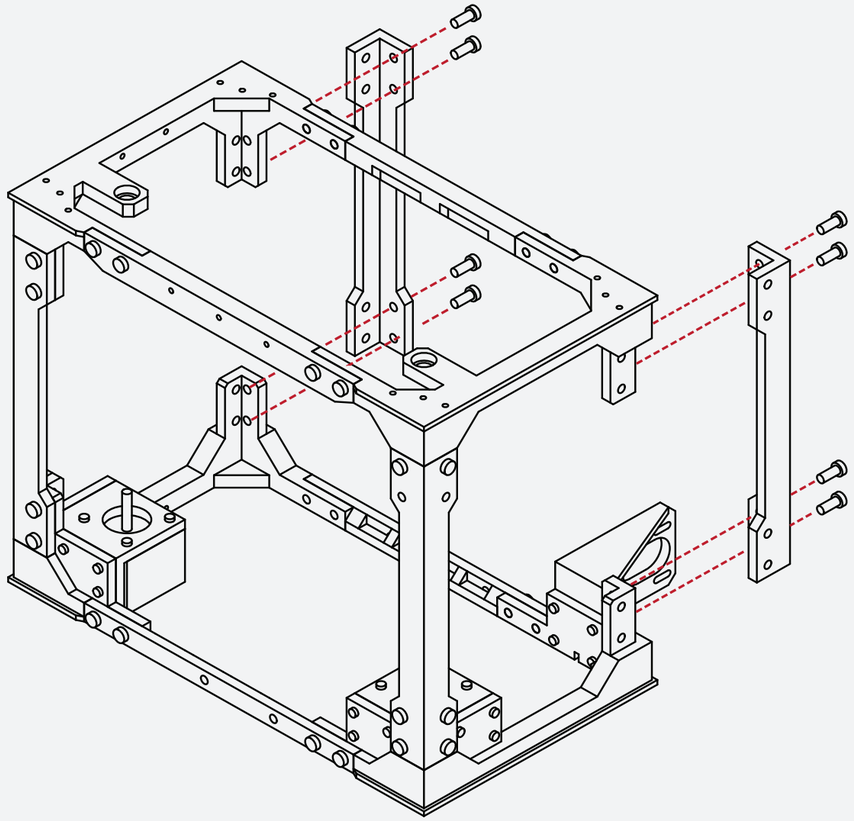


Text
Item

N/A

M3 x 10

4



N/A

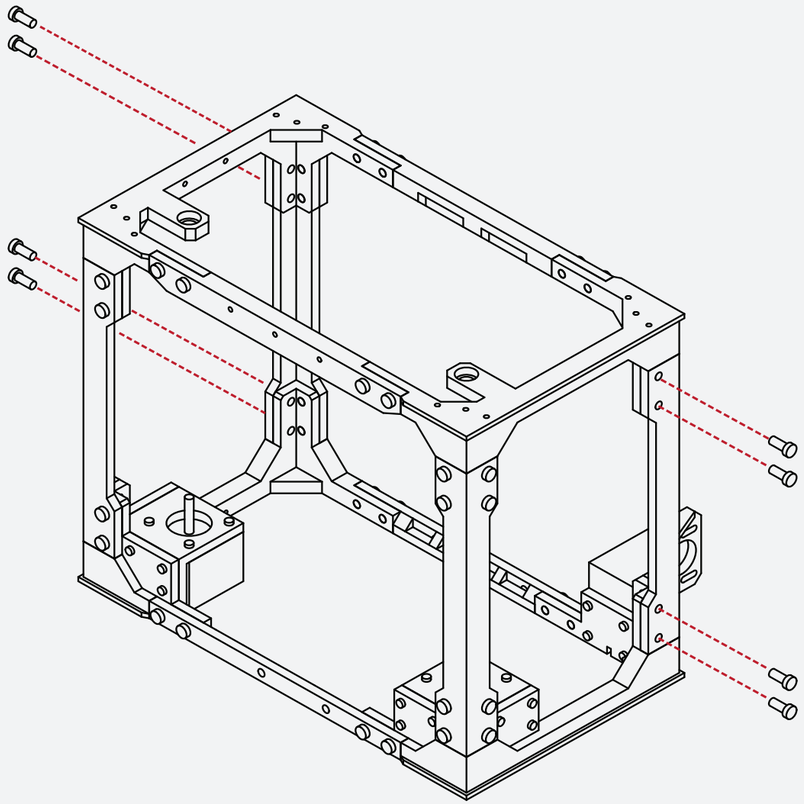
M3 x 10

Text
Item

Lower & Upper Frame Union

B 2.4

5

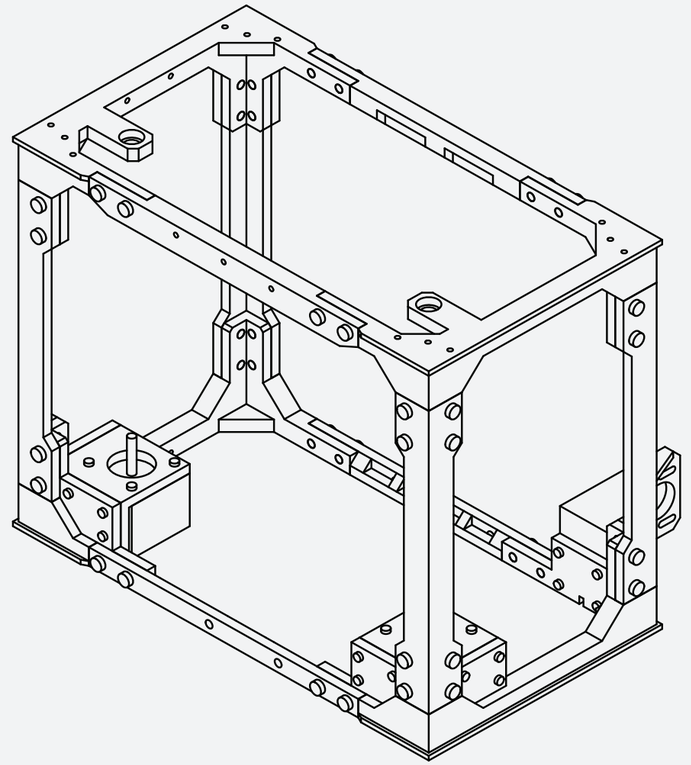


Text
Item

N/A

M3 x 10

6



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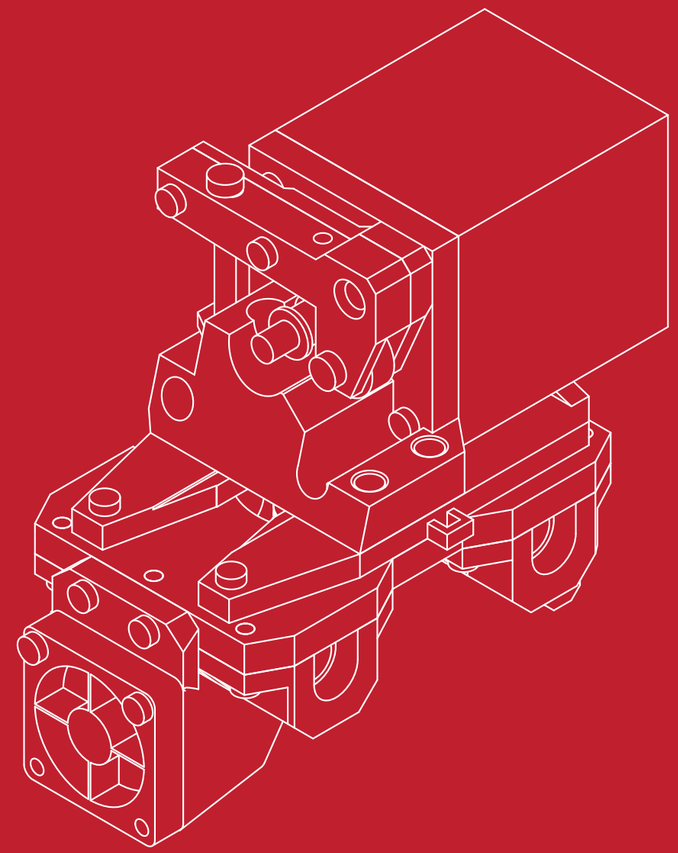
M3 x 10

Text
Item

SECTION

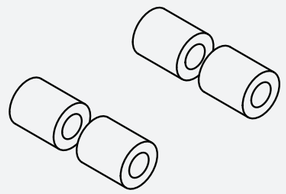
C

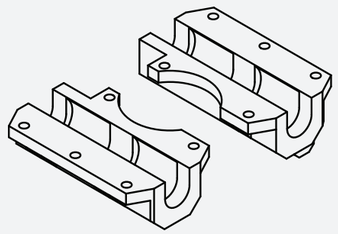


Extruder Assembly

3.1

1



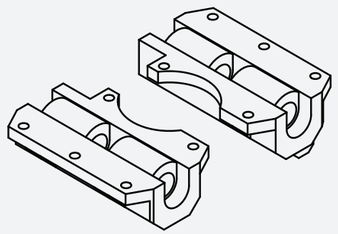


Text
Item

X X

M3 x 10

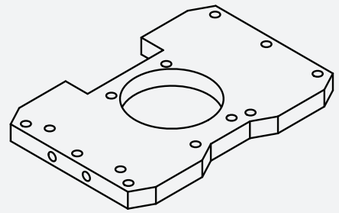
2

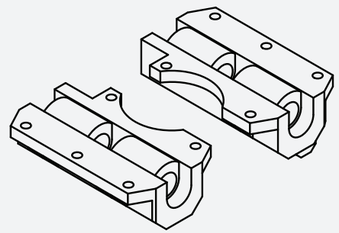


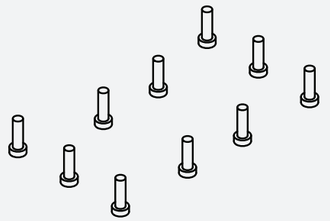
Text
Item

N/A

3







N/A

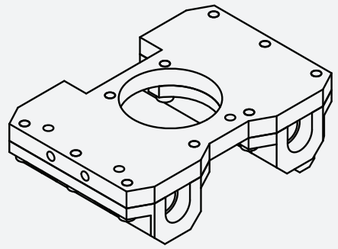
M3 x 10

Text
Item

Lower Frame Assembly

3.1

4

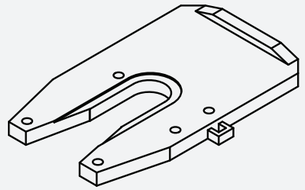


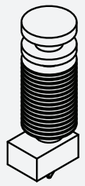
Text
Item

X X

M3 x 10

5





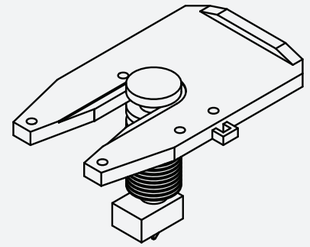
Text
Item

N/A

Text
Item

N/A

6



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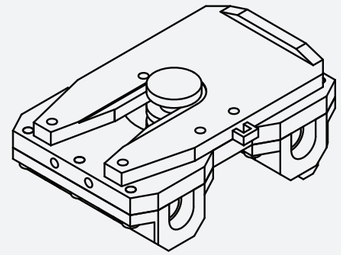


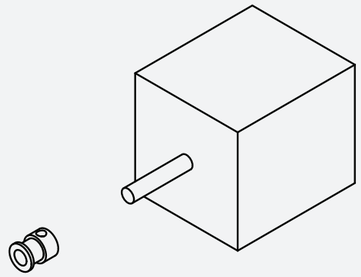
Text
Item

X X

M3 x 10

3.1

8

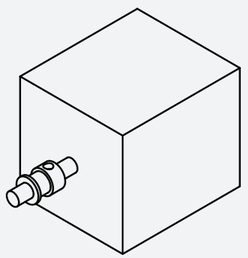


Text
Item

X X

M3 x 10

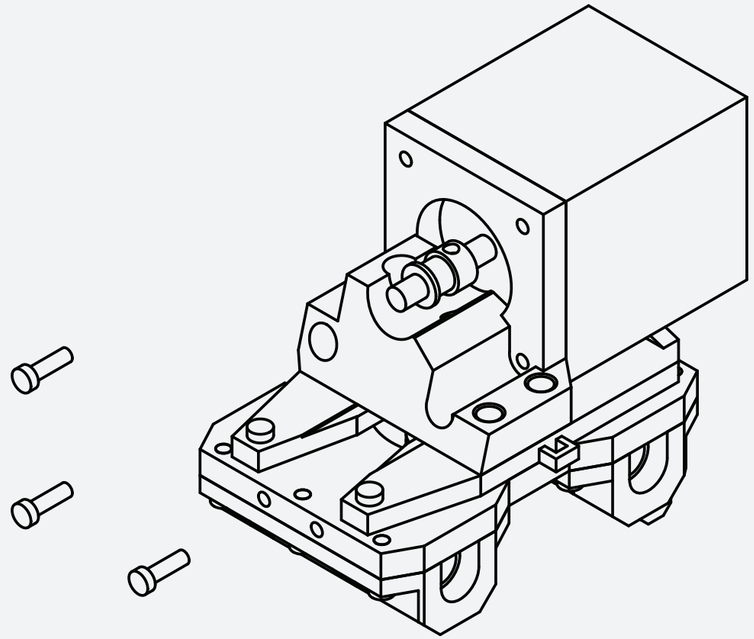
9



Text
Item

N/A

9

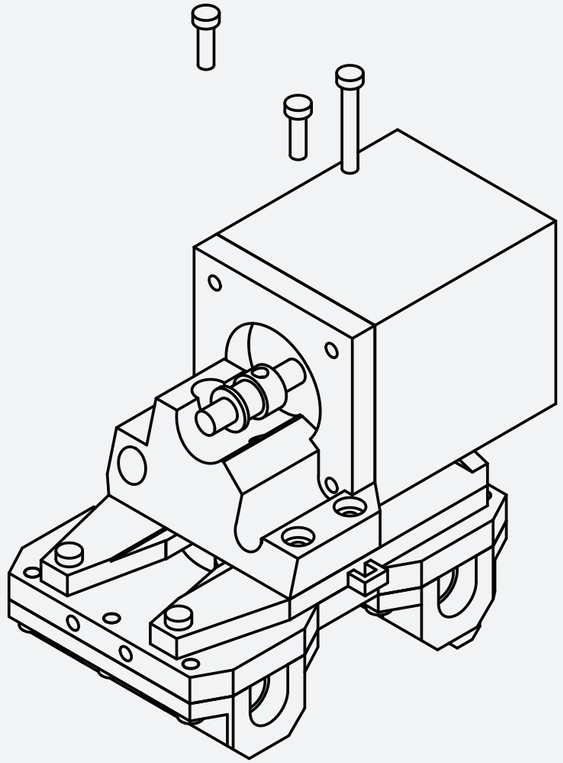


N/A

M3 x 10

Text
Item

10



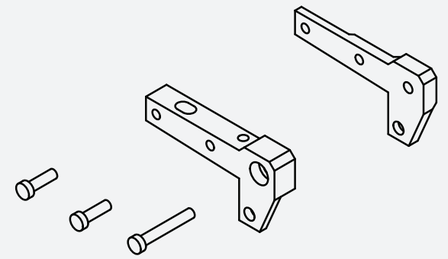
Text
Item

N/A

M3 x 10

3.1

11

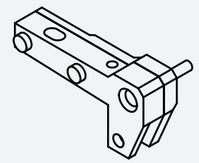


Text
Item

N/A

12

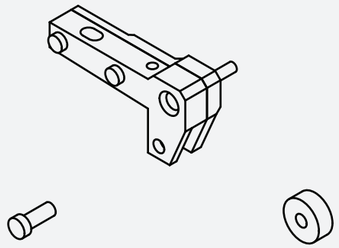
Text
Item



X X

M3 x 10

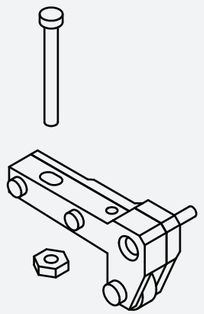
13



Text
Item

X X — M3 x 10

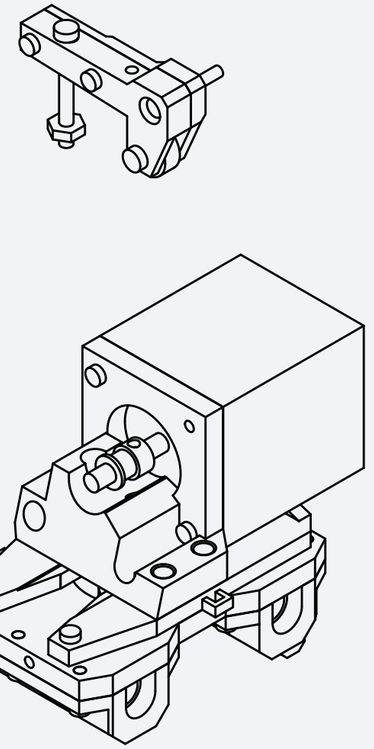
14



Text
Item

N/A

15

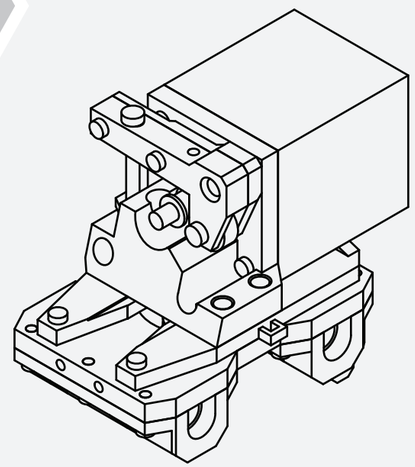


N/A — M3 x 10

Text
Item

3.1

16

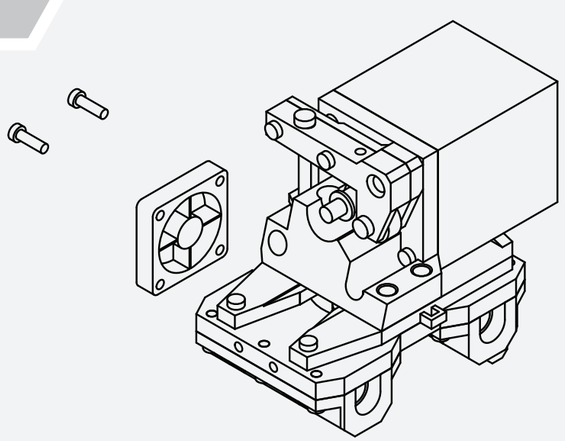


Text
Item

X X

M3 x 10

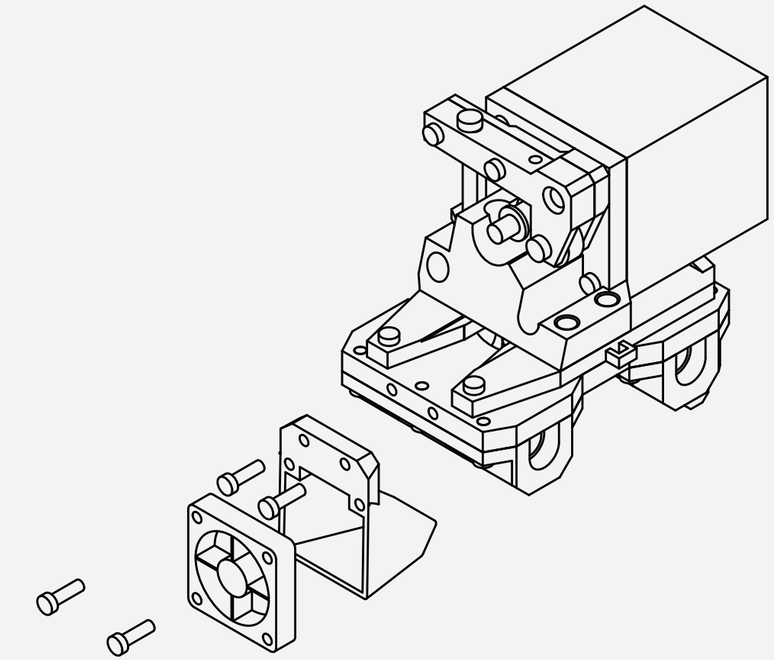
17



Text
Item

N/A

18

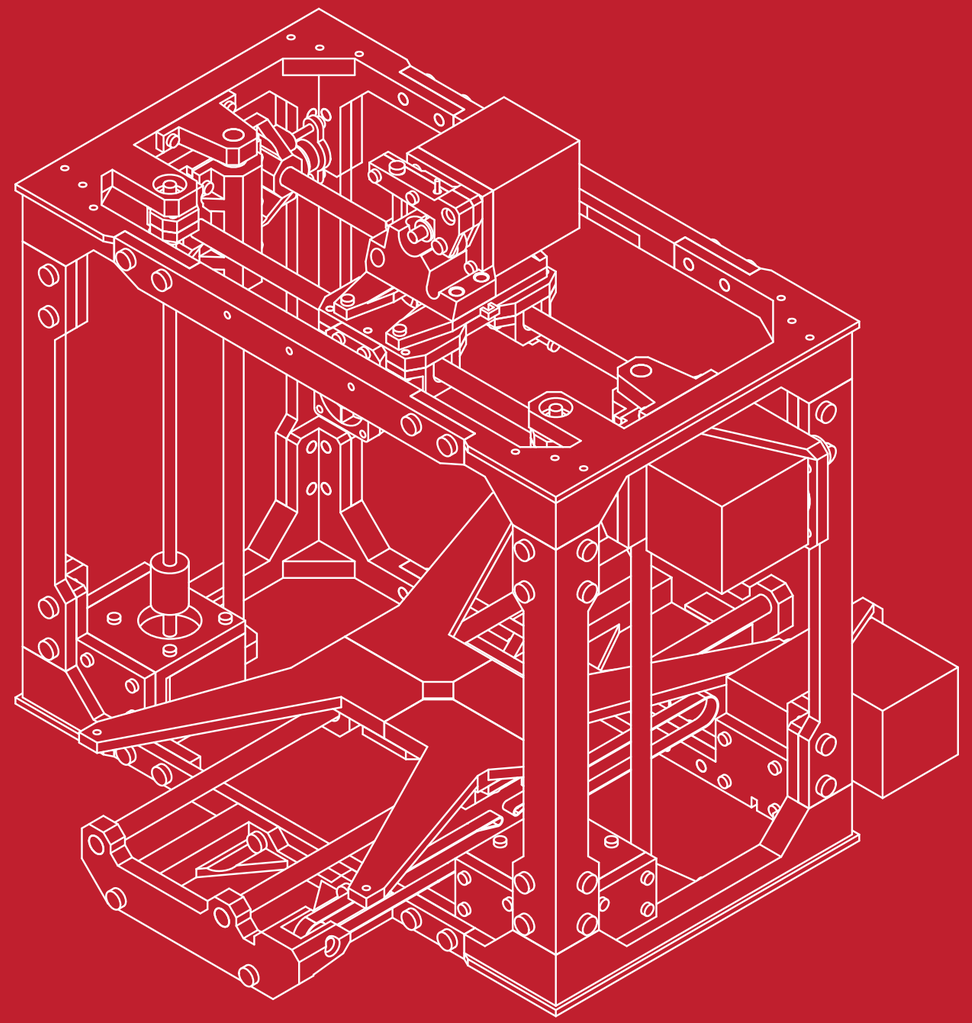


N/A

M3 x 10

Text
Item

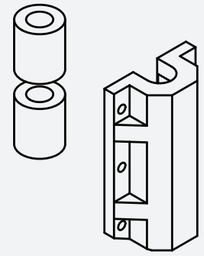
SECTION 4



X Carriage Assembly

D 4.1

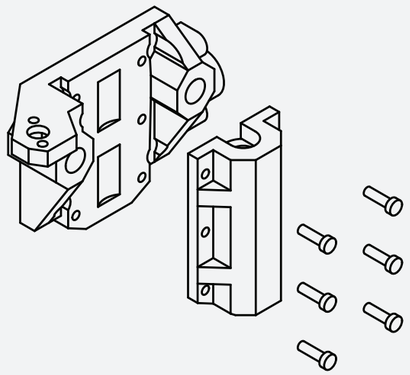
1



Text
Item

X X M3 x 10

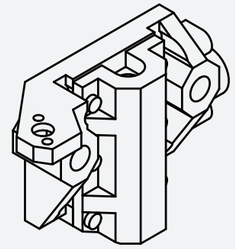
2



Text
Item

N/A

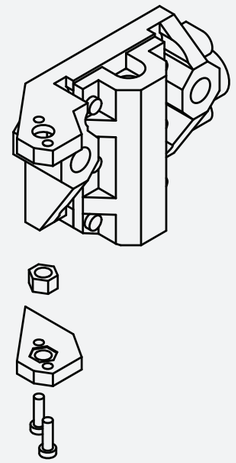
3



Text
Item

N/A

4



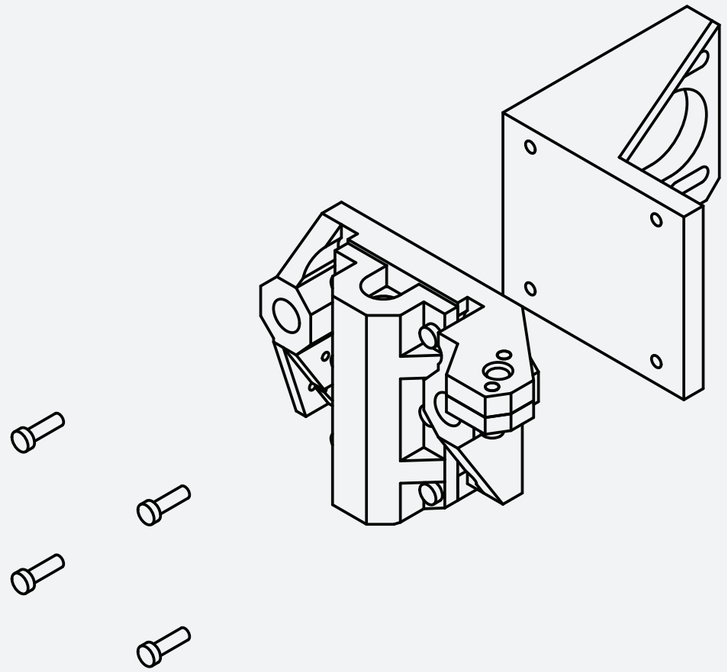
Text
Item

X X M3 x 10

X Carriage Assembly

D 4.1

5

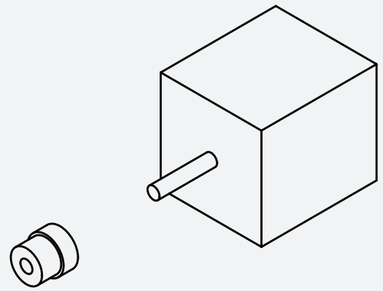


Text
Item

N/A

M3 x 10

6



Text
Item

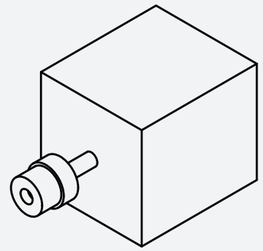
N/A

7

Text
Item

X X

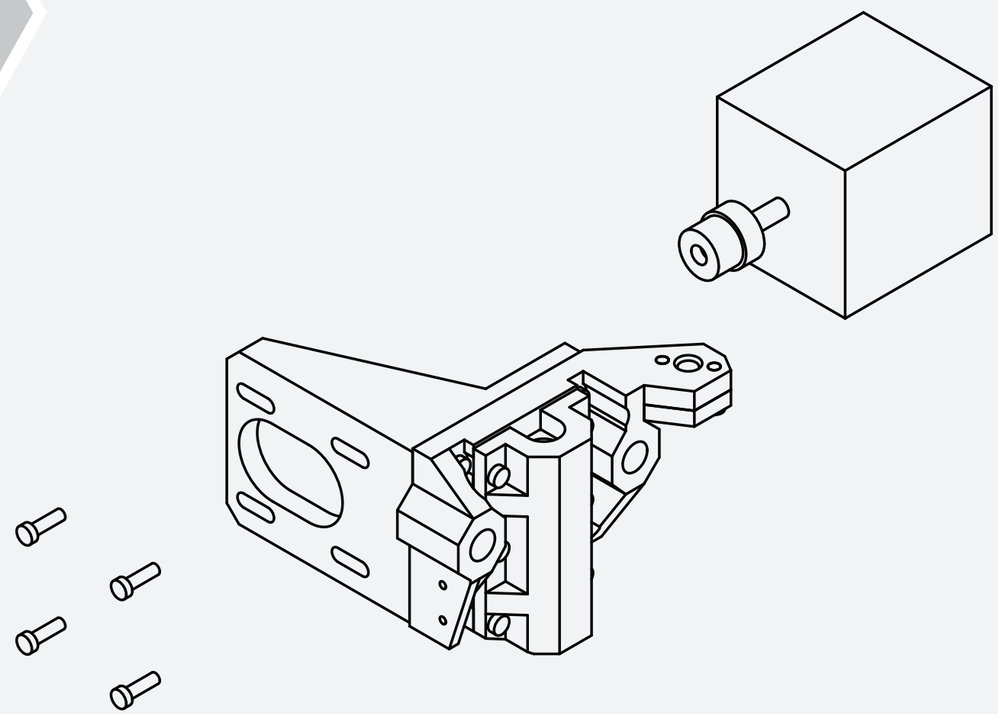
M3 x 10



X Carriage Assembly

D 4.1

8

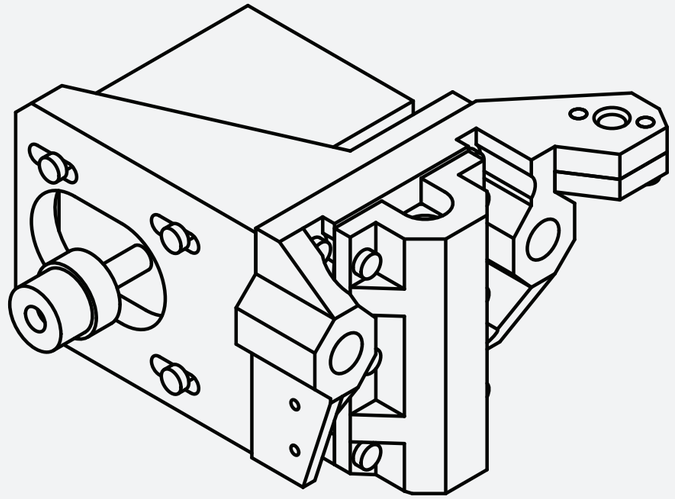


Text
Item

N/A

M3 x 10

9



N/A

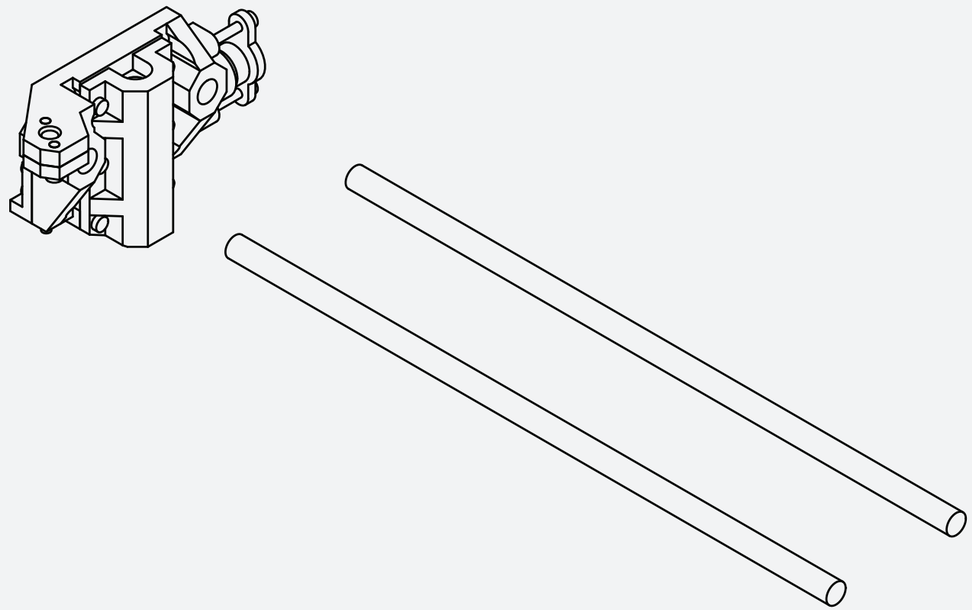
M3 x 10

Text
Item

X Carriage Assembly

D 4.1

10

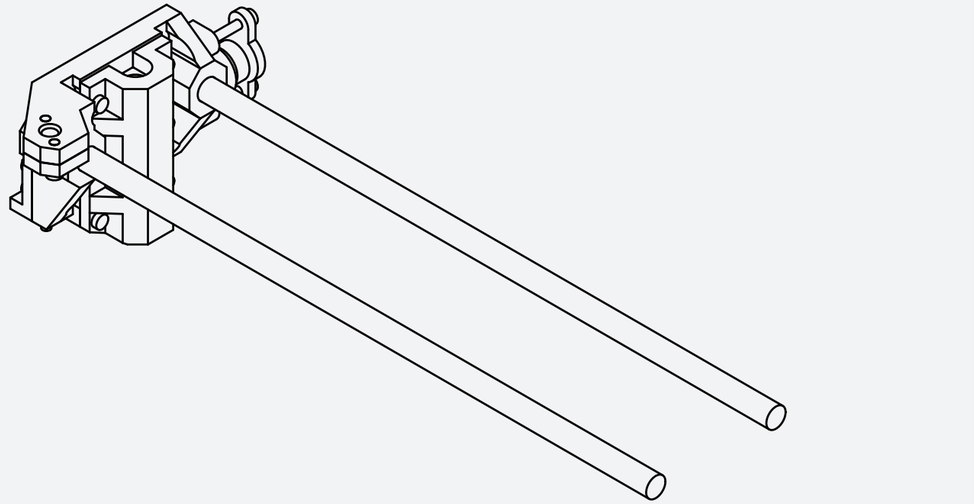


Text
Item

N/A

M3 x 10

11



N/A

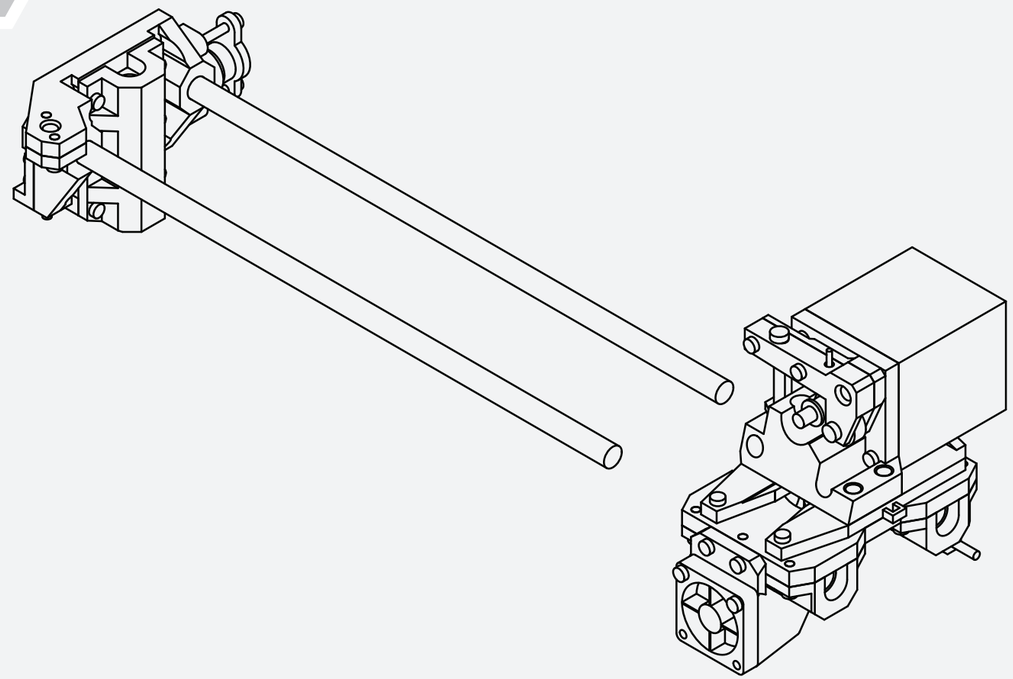
M3 x 10

Text
Item

X Carriage Assembly

D
4.1

10

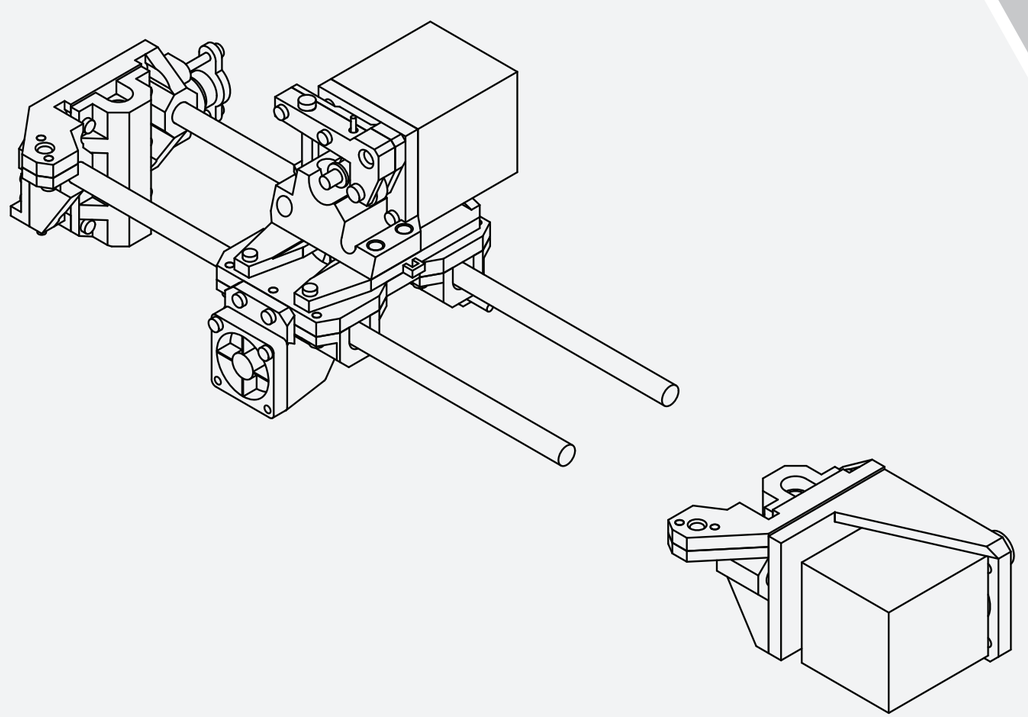


Text
Item

N/A

M3 x 10

11



N/A

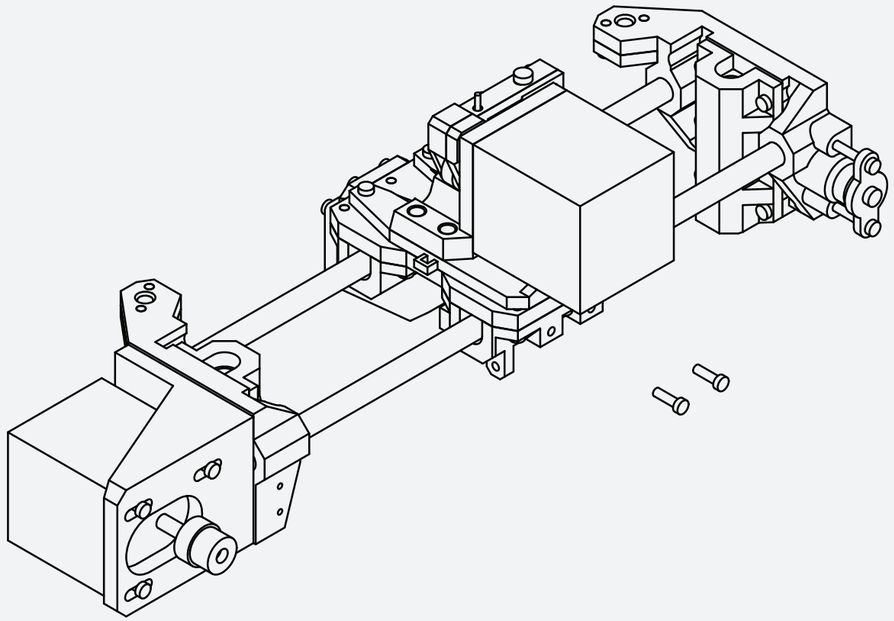
M3 x 10

Text
Item

X Carriage Assembly

D 4.1

12

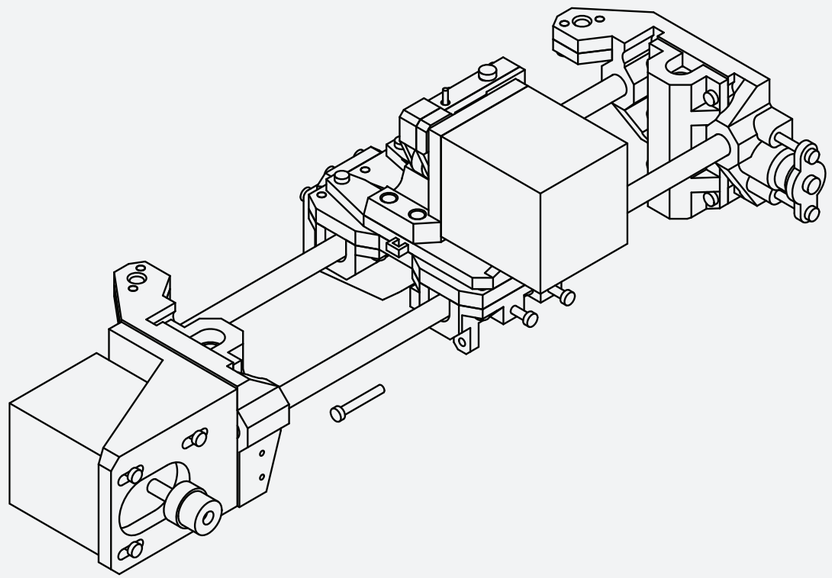


Text
Item

N/A

M3 x 10

13



N/A

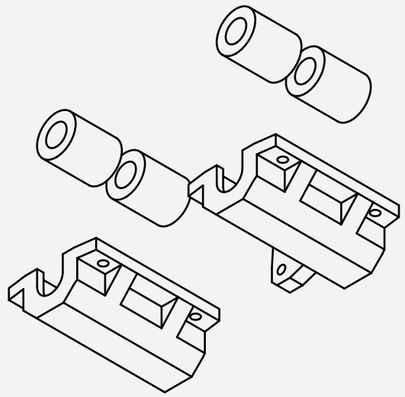
M3 x 10

Text
Item

Y Carriage Assembly

D
4.2

1

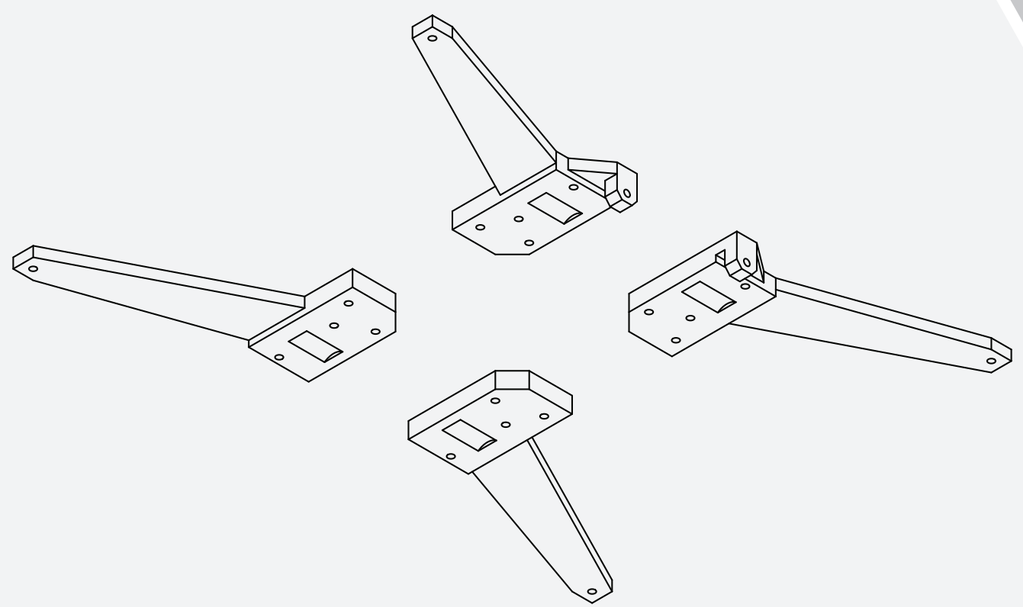


Text
Item

N/A

M3 x 10

2



N/A

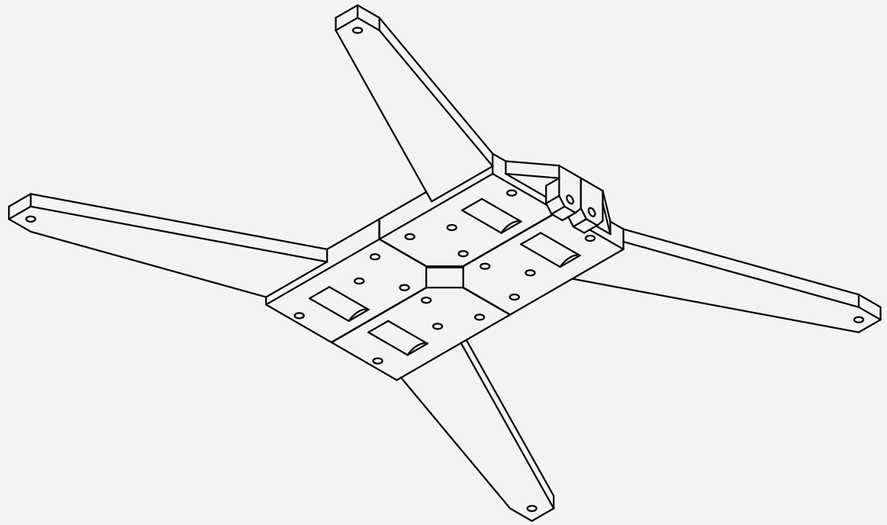
M3 x 10

Text
Item

Y Carriage Assembly

D
4.2

3

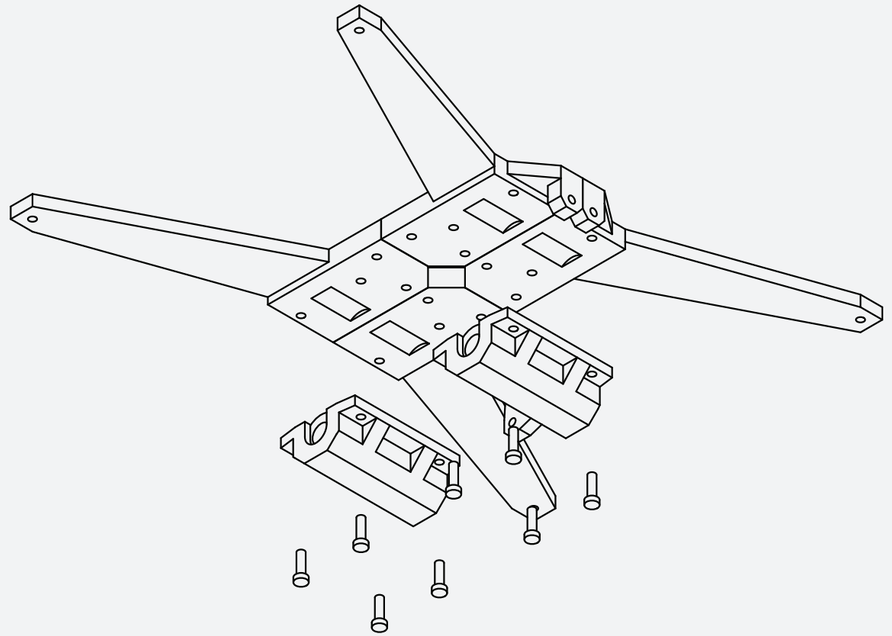


Text
Item

N/A

M3 x 10

4



N/A

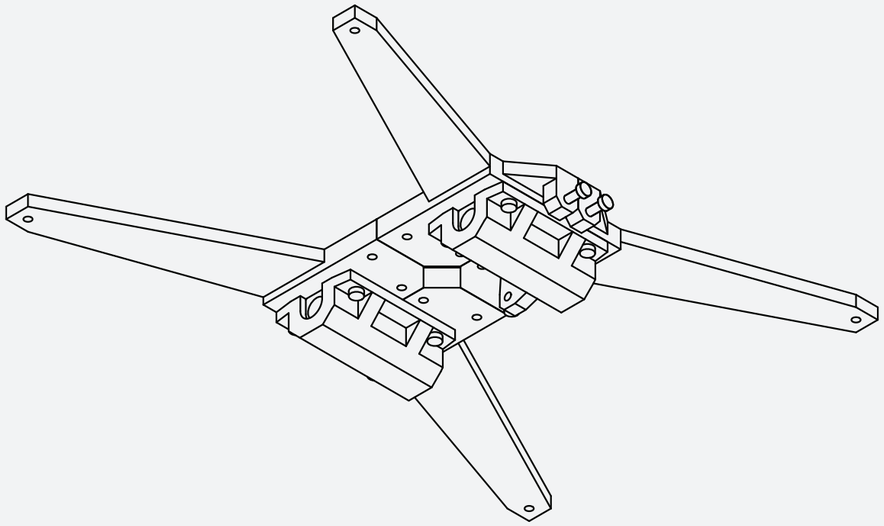
M3 x 10

Text
Item

Y Carriage Assembly

D
4.2

5

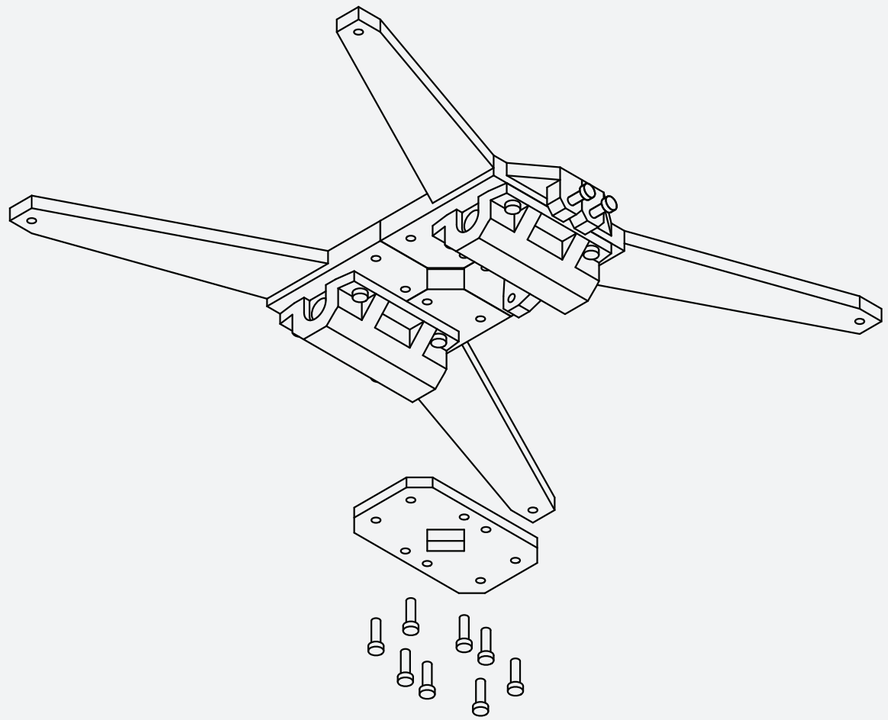


Text
Item

N/A

M3 x 10

6



N/A

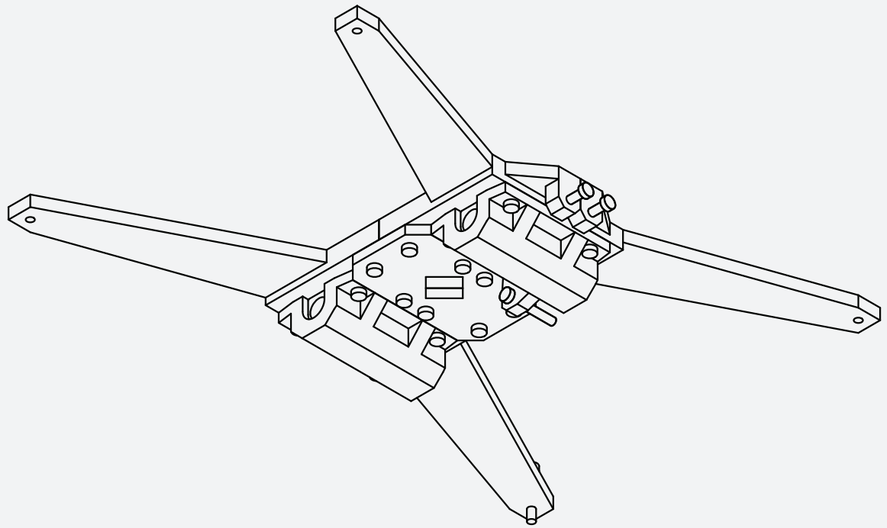
M3 x 10

Text
Item

Y Carriage Assembly

D 4.2

7

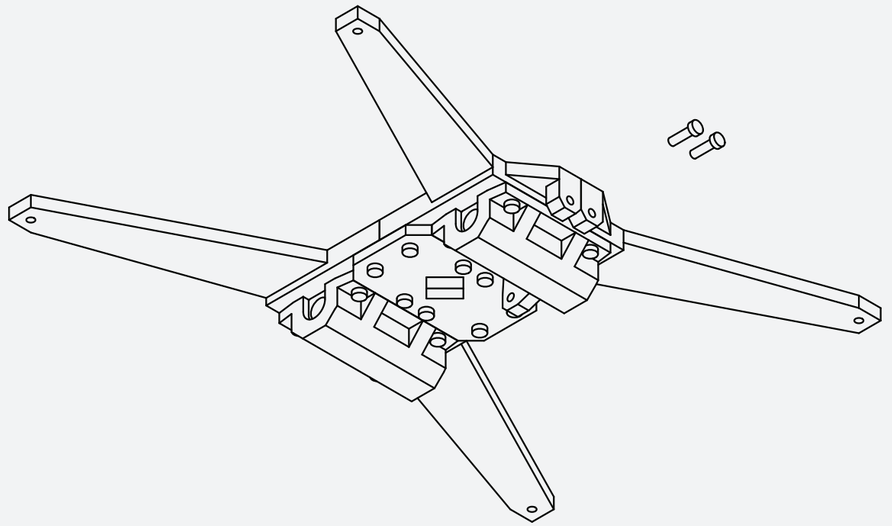


Text
Item

N/A

M3 x 10

8



N/A

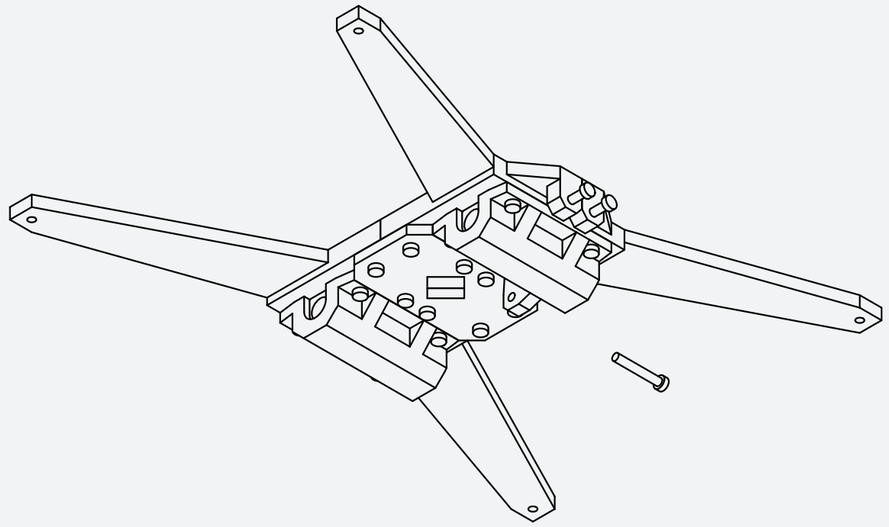
M3 x 10

Text
Item

Y Carriage Assembly

D
4.2

7

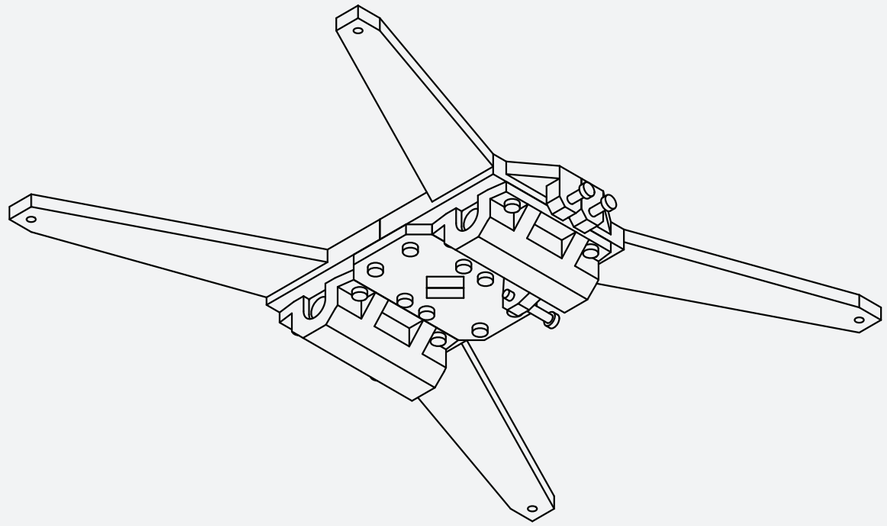


Text
Item

N/A

M3 x 10

8



N/A

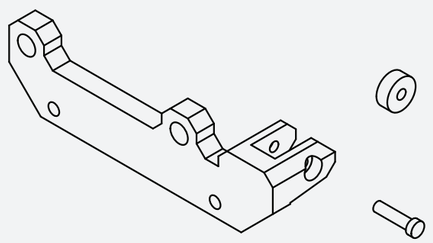
M3 x 10

Text
Item

Y Carriage Assembly

D 4.2

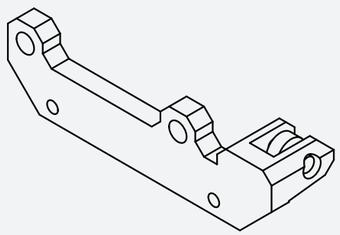
9



Text
Item

X X M3 x 10

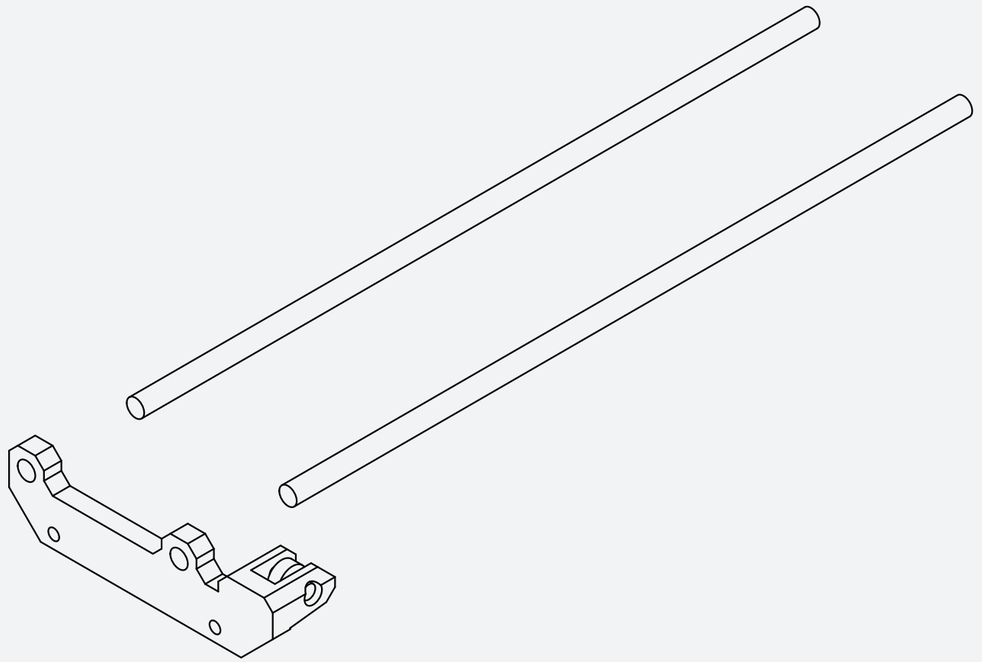
10



Text
Item

N/A

11



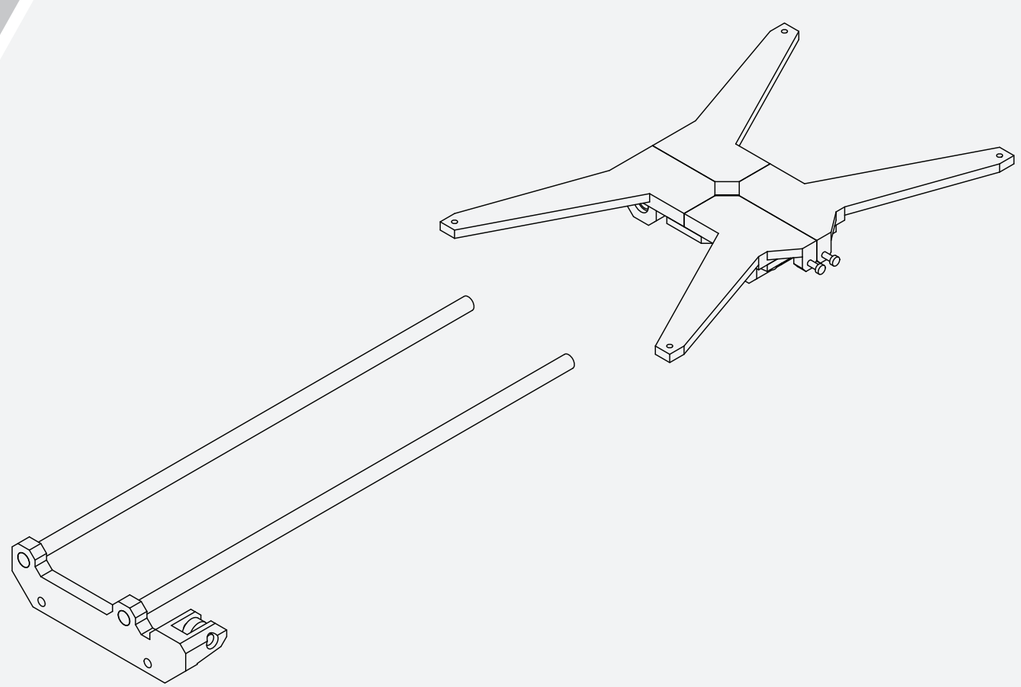
N/A M3 x 10

Text
Item

Y Carriage Assembly

D 4.2

12

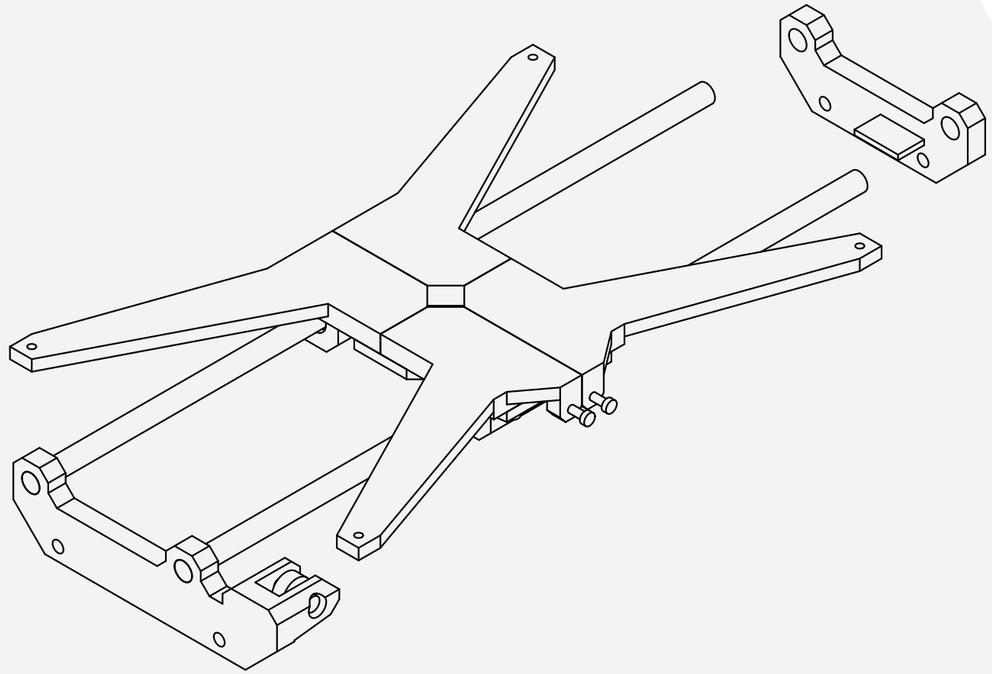


Text
Item

N/A

M3 x 10

13



N/A

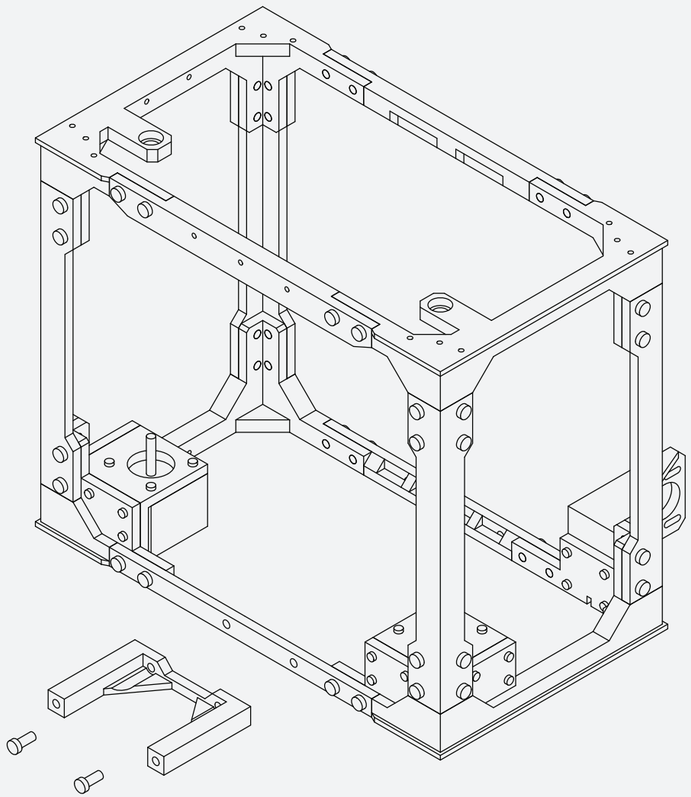
M3 x 10

Text
Item

Print Bed Installation

4.3

1

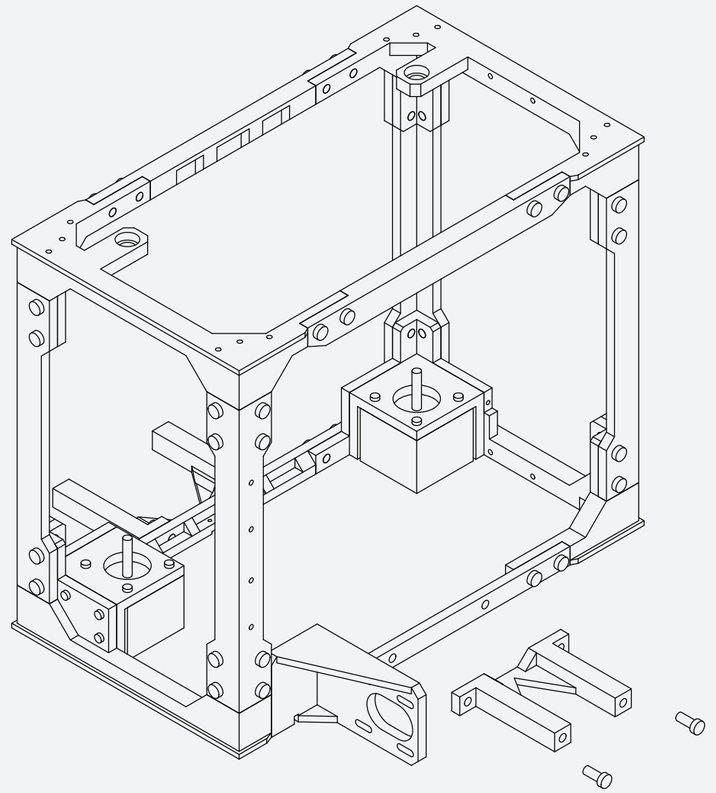


Text
Item

N/A

M3 x 10

2



N/A

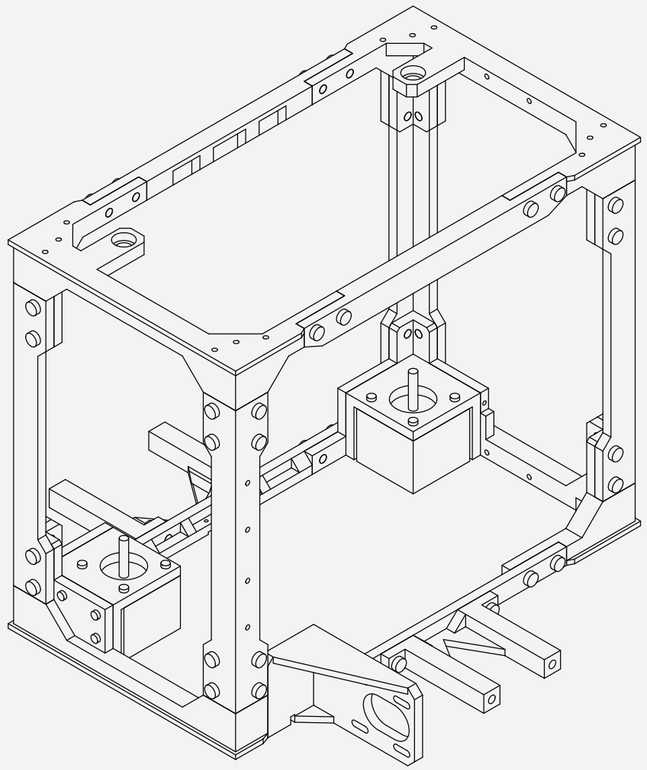
M3 x 10

Text
Item

Print Bed Installation

D
4.3

3

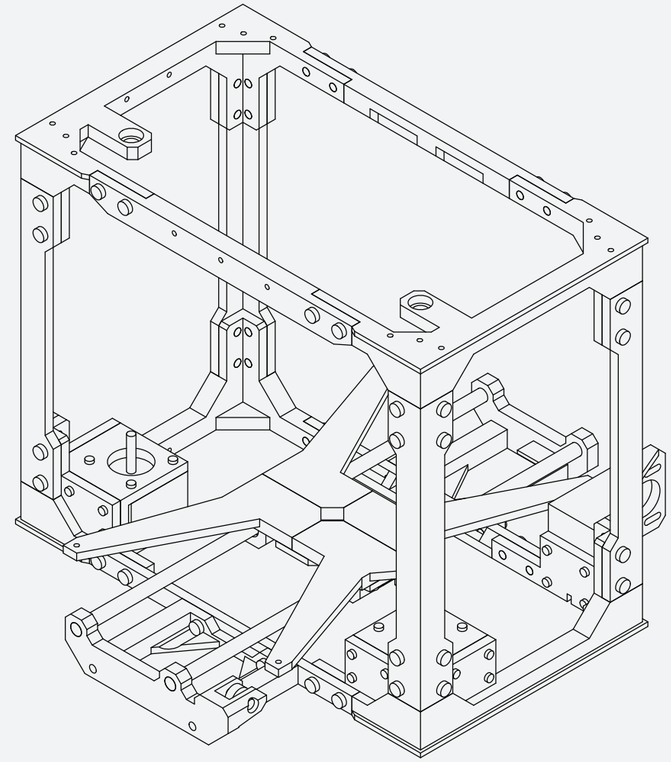


Text
Item

N/A

M3 x 10

4



N/A

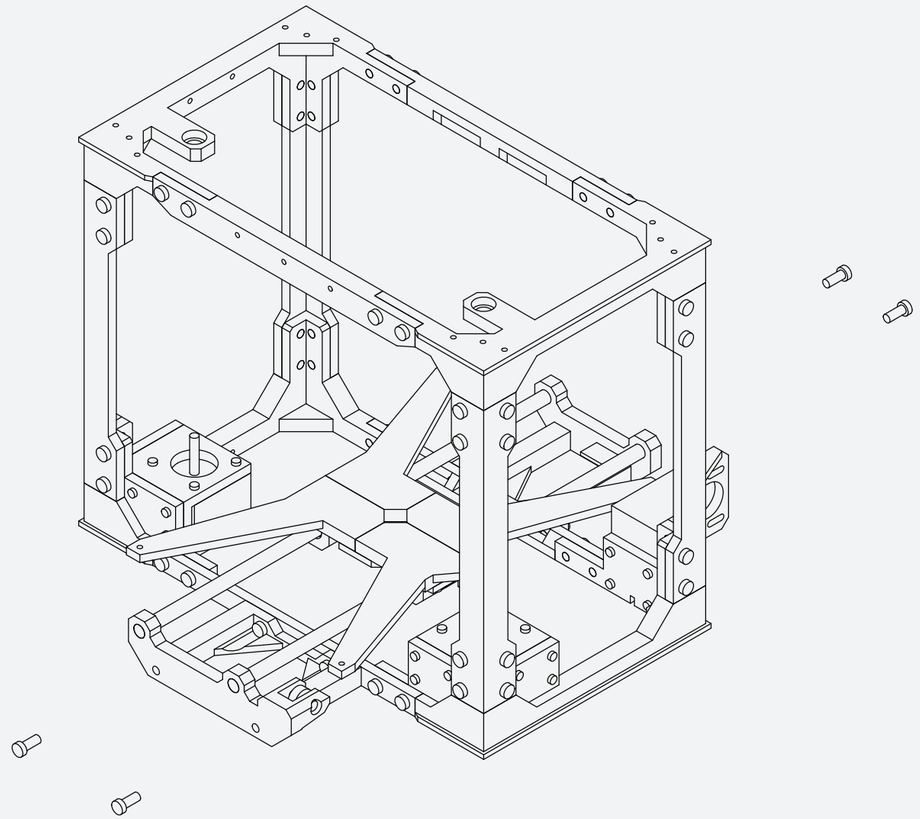
M3 x 10

Text
Item

Print Bed Installation

D 4.3

5

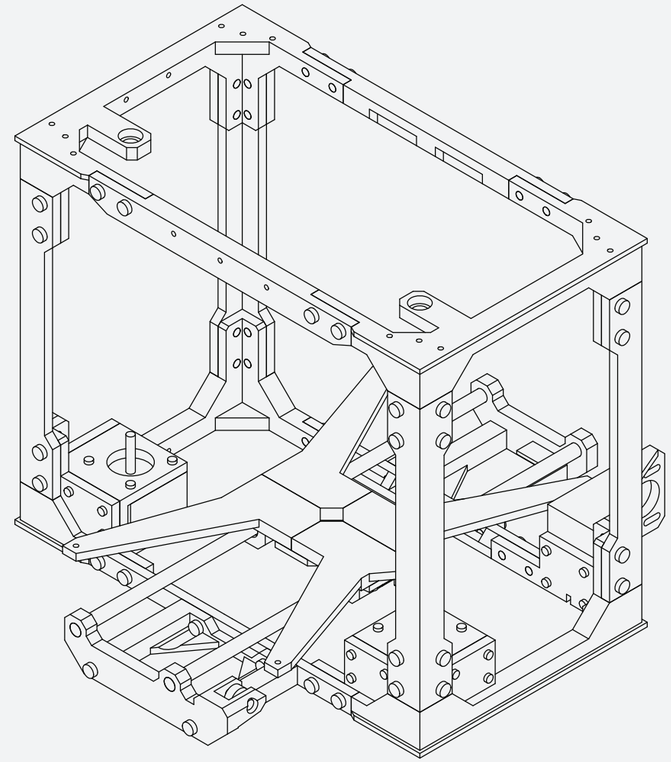


Text
Item

N/A

M3 x 10

6



N/A

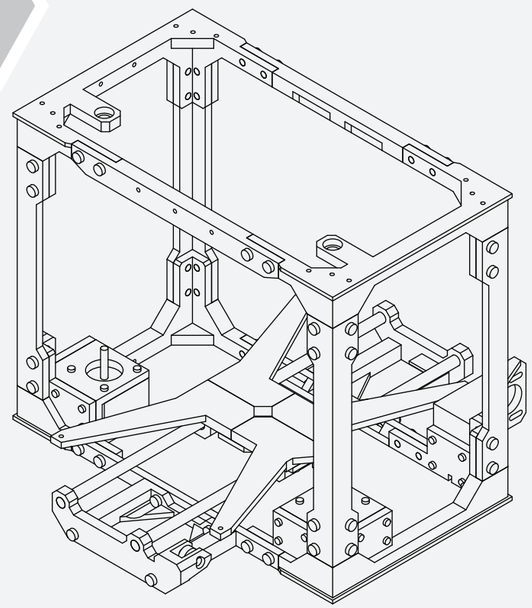
M3 x 10

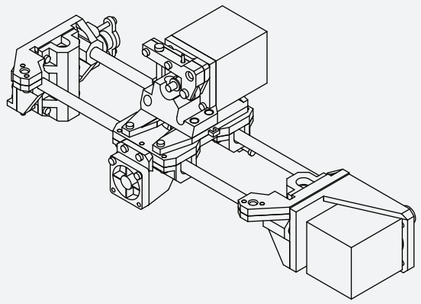
Text
Item

Z Carriage Assembly

D
4.4

1



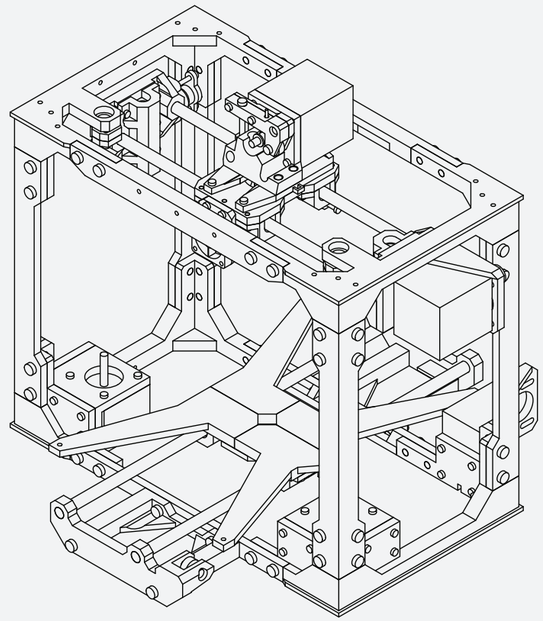


Text
Item

N/A

M3 x 10

2



N/A

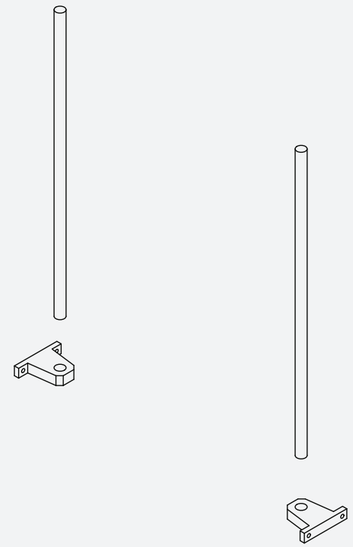
M3 x 10

Text
Item

Z Carriage Assembly

D
4.4

3



Text
Item

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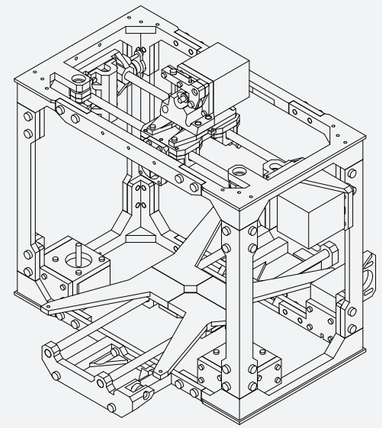
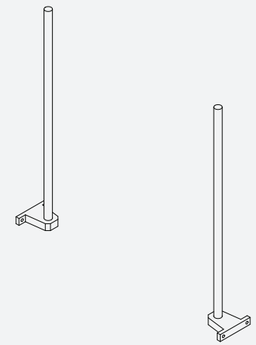
M3 x 10

4





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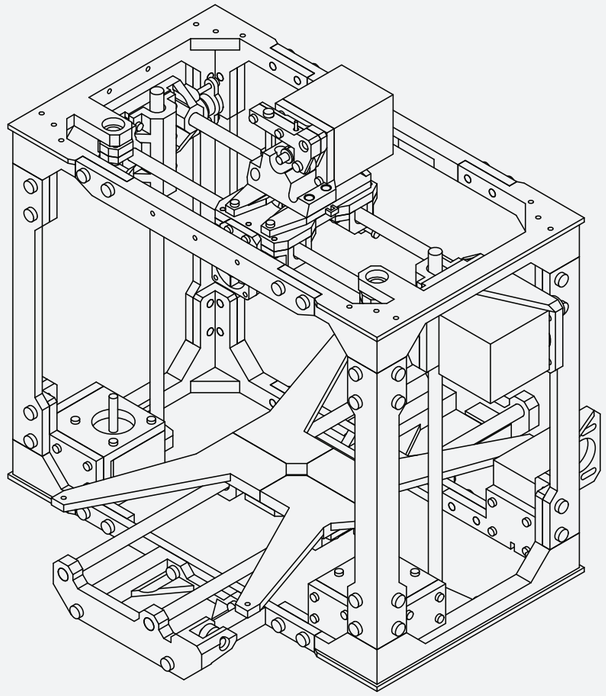
M3 x 10

Text
Item

Z Carriage Assembly

D
4.4

5



Text
Item

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M3 x 10

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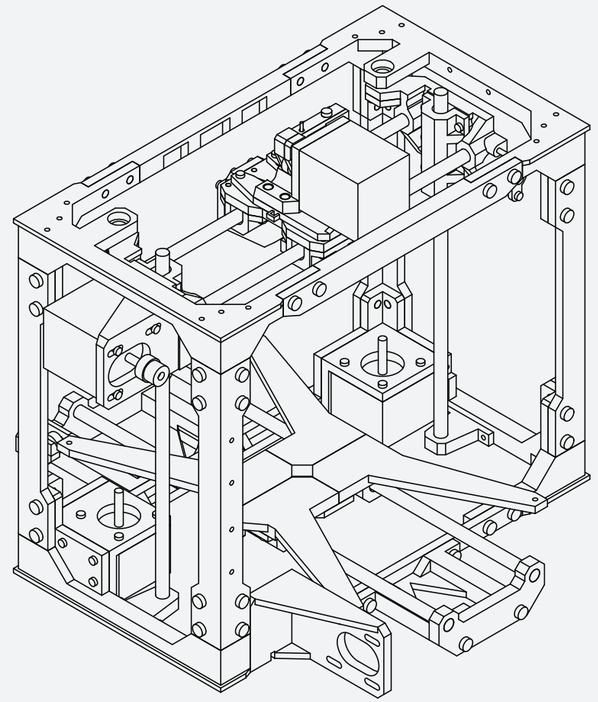


N/A

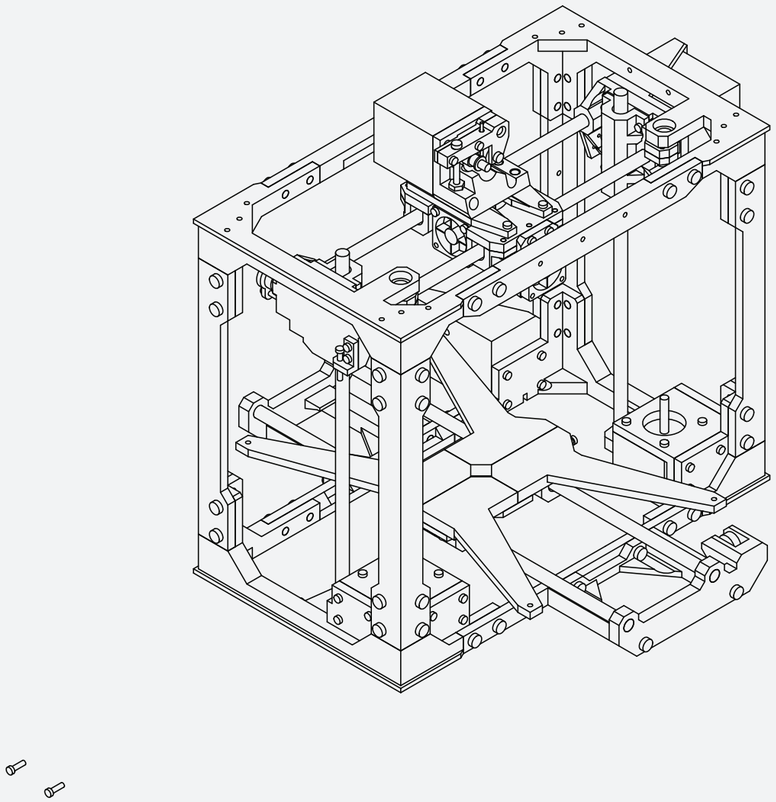
M3 x 10

Text
Item

Z Carriage Assembly

D 4.4

7

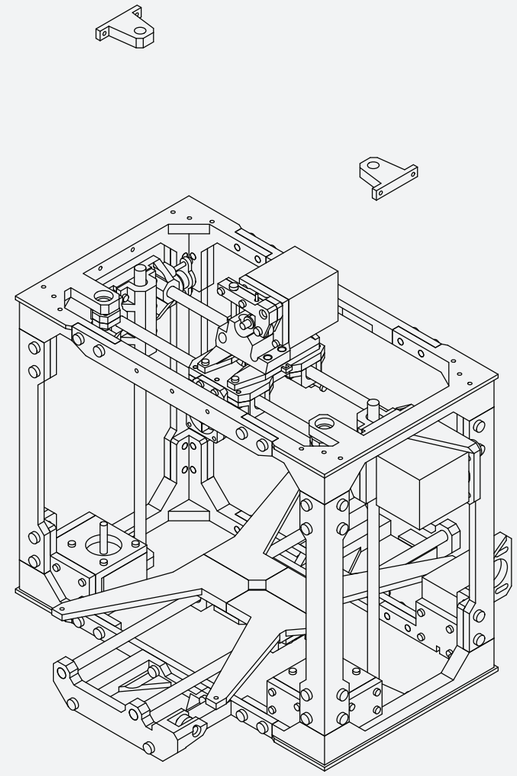


Text
Item

N/A

M3 x 10

8



N/A

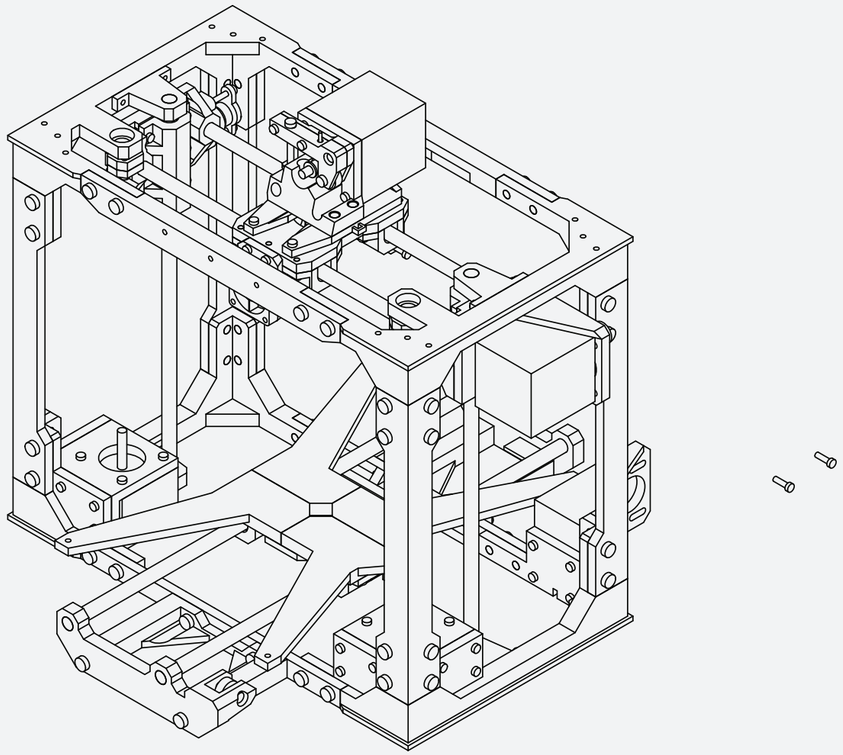
M3 x 10

Text
Item

Z Carriage Assembly

D
4.4

9



Text
Item

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M3 x 10

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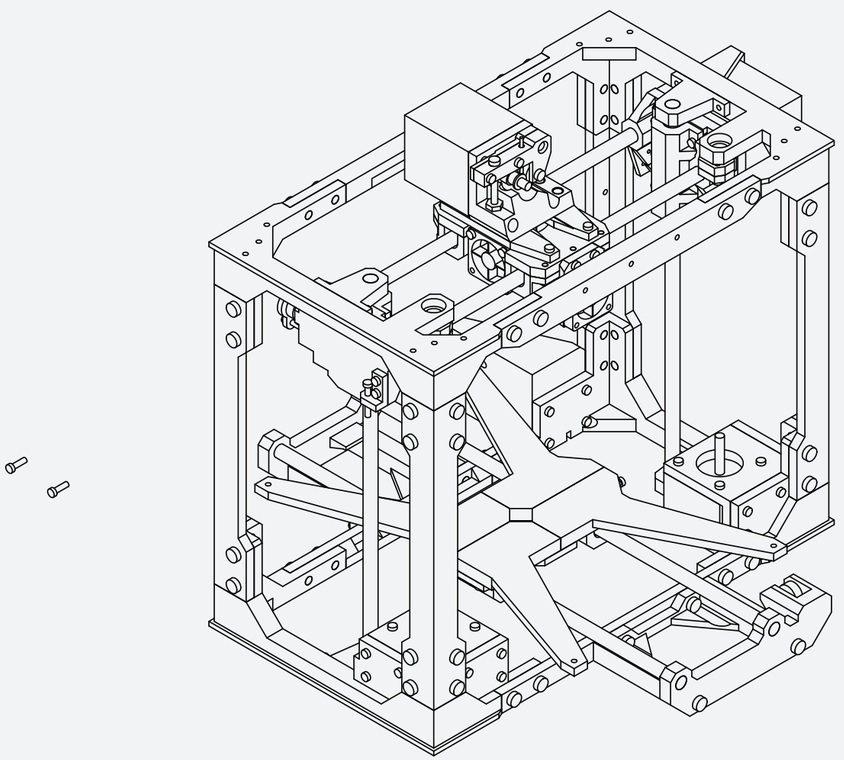


N/A

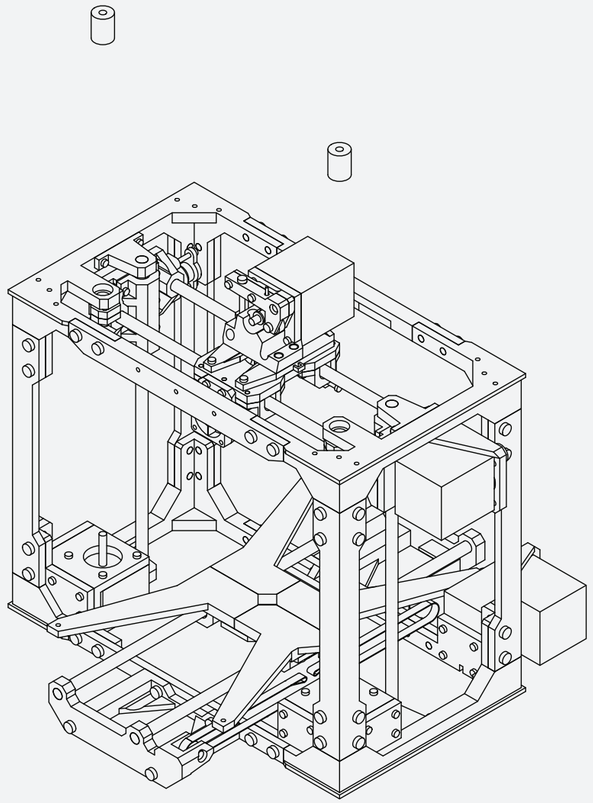
M3 x 10

Text
Item

Z Carriage Assembly

D
4.4

11



Text
Item

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M3 x 10

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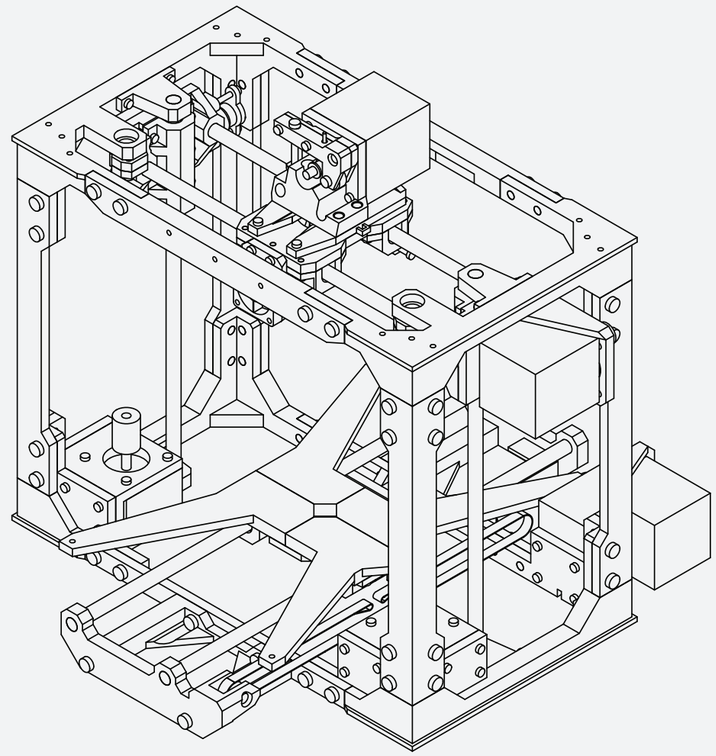

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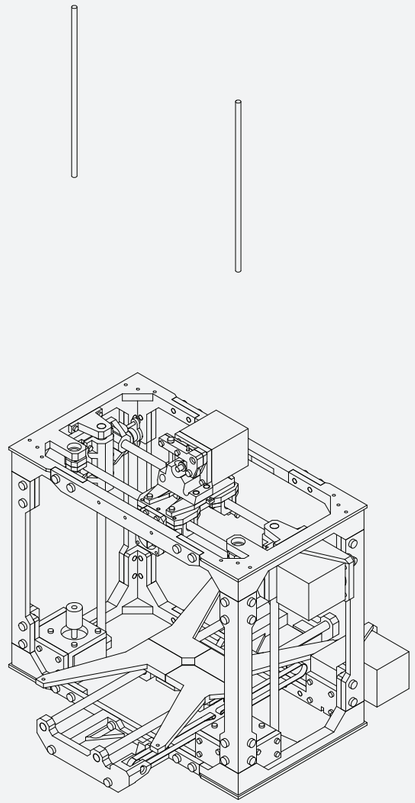
M3 x 10

Text
Item

Z Carriage Assembly

D
4.4

13



Text
Item

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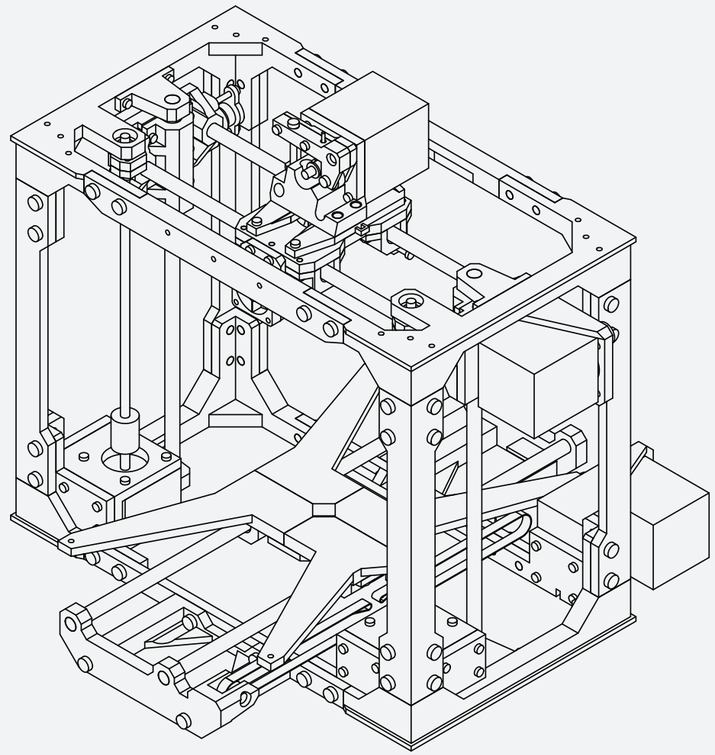
M3 x 10

14



N/A

M3 x 10

Text
Item

SECTION 5