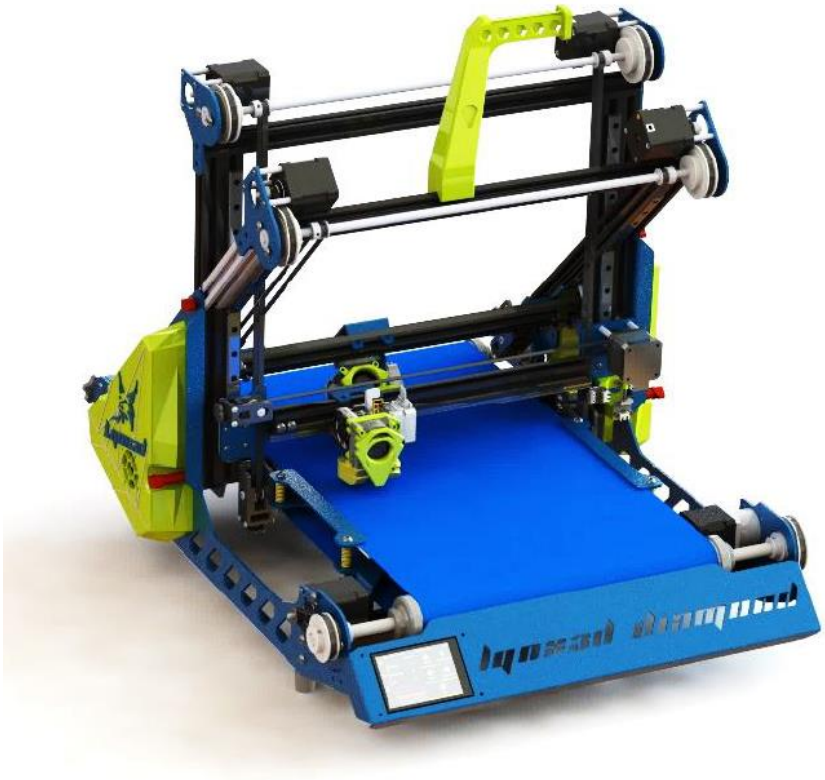
LYNX 3D DIAMOND BELT KIT

ASSEMBLY MANUAL



STEP BY STEP INSTRUCTION MANUAL

BY ADITIVA 3D

V1.0

ADITIVA3D

Content

Chapter 1 Intro

Step 1.1 What is included in this kit?

Welcome to our Lynx3D Diamond Belt Printer Assembly Kit Manual! We are excited to provide you with all the necessary parts to build your very own 3D printer. This kit comes with everything you need to get started, including hardware, electronics, and a detailed set of instructions. However, there are a few additional components that need to be 3D printed before you can fully assemble your printer.

Don't worry though, we've got you covered! The 3D printer assembly kit includes all the files and specifications needed to print the required parts, ensuring that your printer is complete and ready to go.

Building your own 3D printer is an exciting and rewarding experience, and we're thrilled to be a part of it. Our team has worked hard to make this assembly process as straightforward and user-friendly as possible. We've included detailed illustrations, step-by-step instructions, and helpful tips to guide you through every stage of the build.

So, let's get started! By the end of this manual, you'll have a fully functional 3D printer that you can use to create amazing things. We're excited to see what you'll make with your new printer, and we're confident that you'll love the experience of building it yourself.

Step 1.2 Additional printable parts

There are few printable parts for finish this build, since they will be provided as STL digital format, they are subject to upgrades and few more will be added in the future, please check for regular updates, at this stage you’re totally free to choose the color for your parts (besides we highly recommend to use a Lime green color) for all parts, since they are not mechanical parts that will withstand any forces or stress you can use PLA without any problems.

- ✓ Gantry endstop bracket

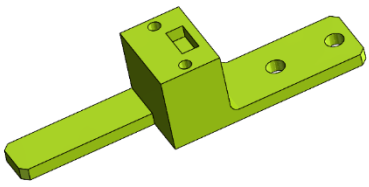


Figure 1 Gantry endstop bracket

- ✓ X axis endstop bracket

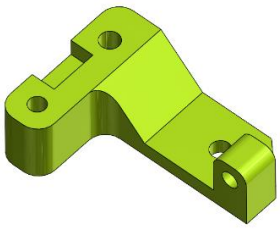


Figure 2 X axis endstop bracket

✓ Motherboard case and lid

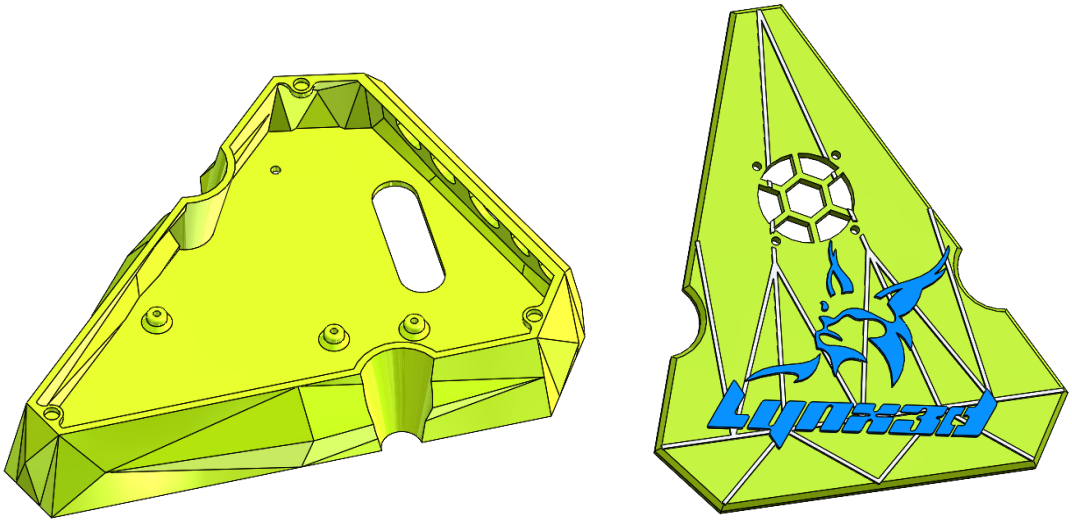


Figure 3 Motherboard case and lid

✓ PI board case and lid

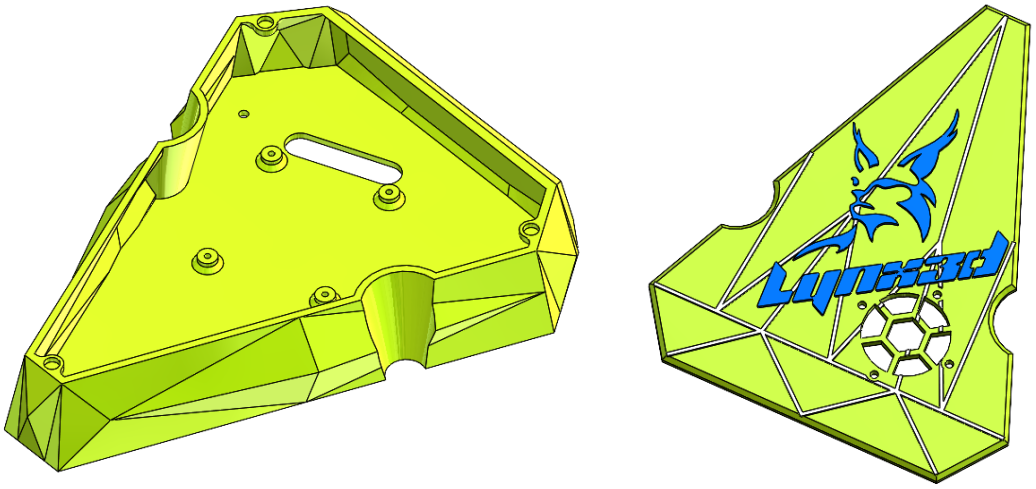
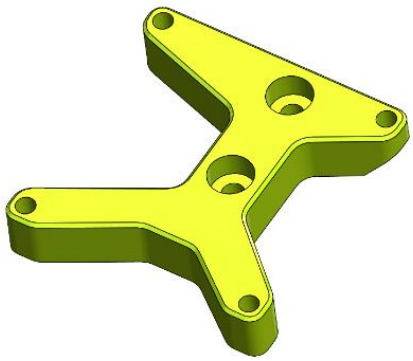
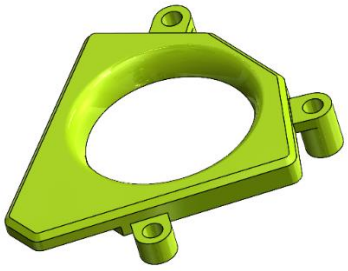


Figure 4 PI case and lid

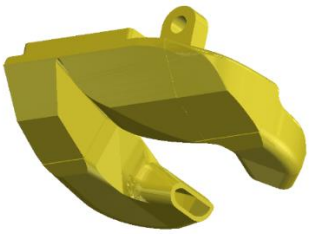
✓ Layer fan bracket



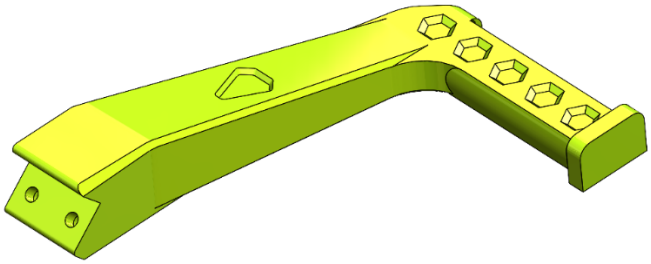
✓ Layer Fan cover



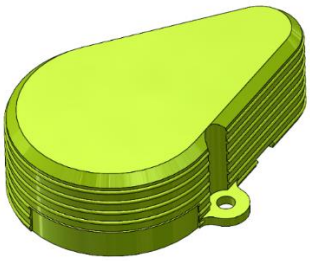
✓ Layer fan duct (ABS like resin printed is recommend)



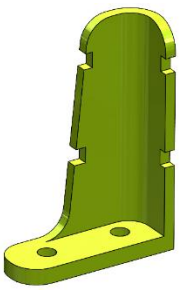
✓ Filament holder



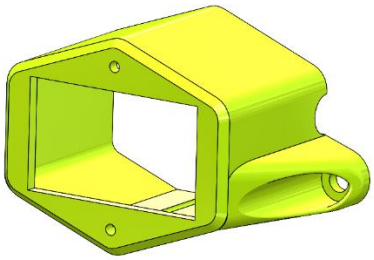
✓ Right side Pulley cover



✓ Extruder harness stress reliever



✓ Power switch case



Step 1.3 Needed tools

In order to fully install this kit, you will need the next tools:

- ✓ Set of Allen keys
- ✓ Adjustable wrench or wrench kit
- ✓ Measuring tape
- ✓ Vernier caliper
- ✓ Metal ruler (for alignment)
- ✓ Arduino Uno and set of DuPont wires (for firmware flashing)

Chapter 2 Preparing frame

Step 2.1 Building main Frame

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity
1	P1/L Side Plate (left)	1
2	P2/L Side Plate (Right)	1
3	2040 V-Slot 465 mm (no holes)	1
4	2020 V-Slot 465 mm (2 holes)	1
5	M5 x 8 mm Screw	8

✓ Assemble the aluminum bars and side plates, arranging them as shown in the next picture (Figure 5 and 6):

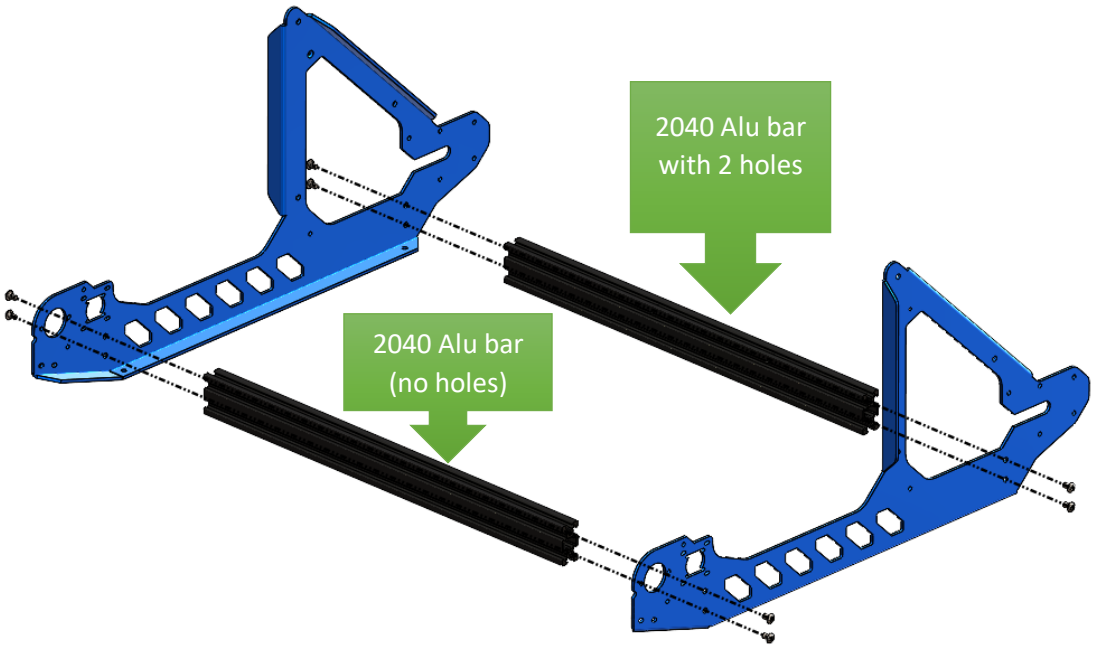


Figure 7 Fix the side plates using M5x8 screws, 4 on each side

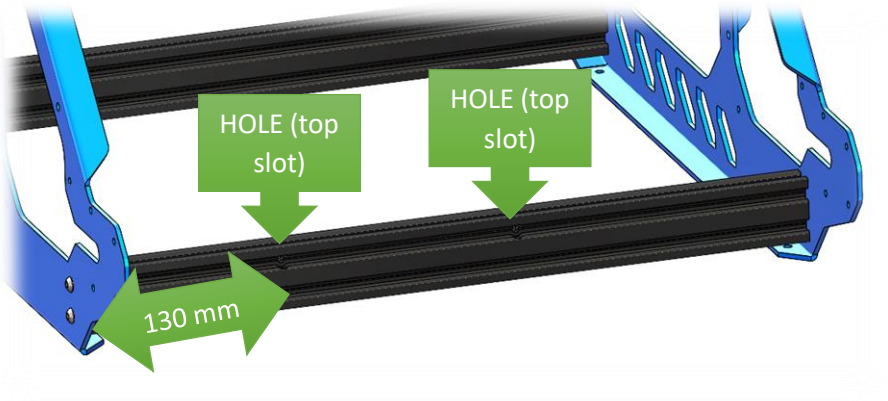


Figure 8 Position of the back 2040 Bar, back view

Step 2.2 Installing Rubber feets

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	Bottom Frame Assembly	1	Assembly
2	M4 Rubber feet	4	Kit
3	M4 x 16 mm Screw	4	Kit
4	M4 Nylock nut	4	Kit

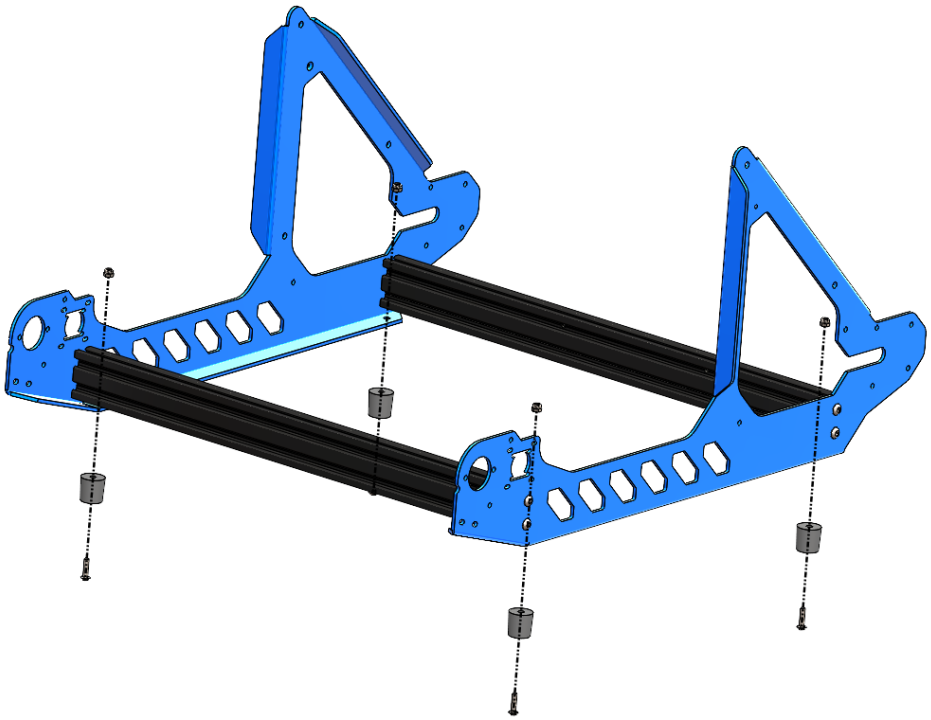


Figure 9 Using 04 units M4x16 screws and Nylock nuts to fix rubber feets at the bottom part of the frame

Figure 10 detail of rubber feet with screw and Nylock nut

Step 2.3 Installing Conveyor BELT tensioner plates

- ✓ In the Lynx 3D Diamond, conveyor BELT tensioners are positioned at the back side of the printer.
- ✓ Next items from the KIT and Original parts will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	Bottom frame with feet Assembly	1	Assembly
2	P9 CNC BELT TENSIONER	2	Kit
3	M4 x 12 mm Screw	8	Kit

✓ Install 2 plates as shown in the next picture, M4x12mm screws will be used, NOTE: CNC Belt Tensioners Plates are the same for both sides:

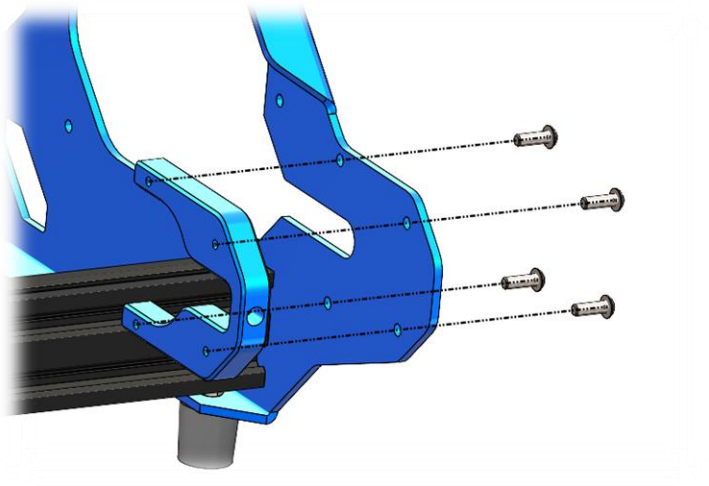


Figure 11 Installing CNC BELT tensioners plates on each corner of bottom frame using M4x12 screws

✓ Repeat the process on the other side.

Step 2.4 Preparing Gantry frame

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	2020 V-Slot 465 mm	1	Kit
2	2040 V-Slot 340 mm with HOLES	2	Kit
3	M5 x 30 mm Screw	4	Kit

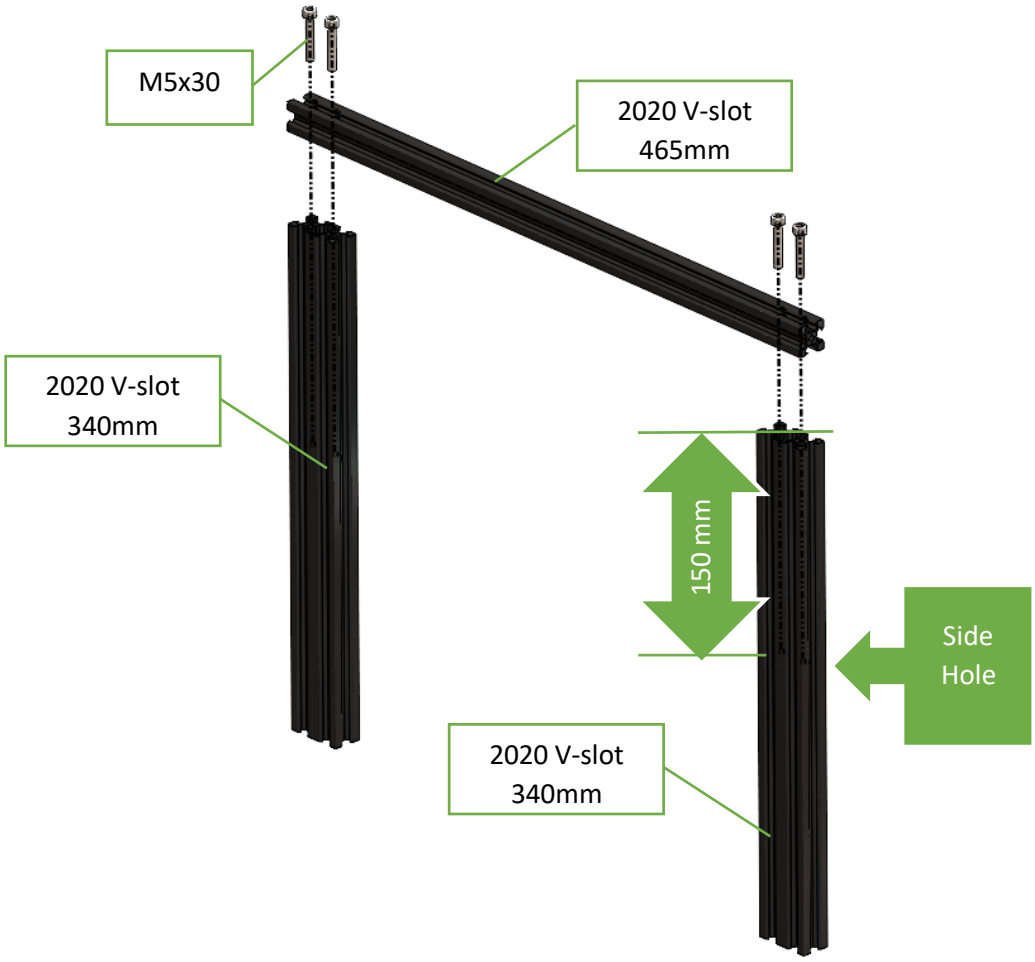


Figure 12 Basic gantry frame assembly

Figure 13 Corner joint detail

Step 2.5 Gantry with plates Assembly

- ✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	Basic gantry assembly	1	Assembly
2	P3 TOP CORNER BRACKET	2	Kit
3	M5 SPRING T-NUT	2	Kit
4	M5x8 mm Screw	4	Kit

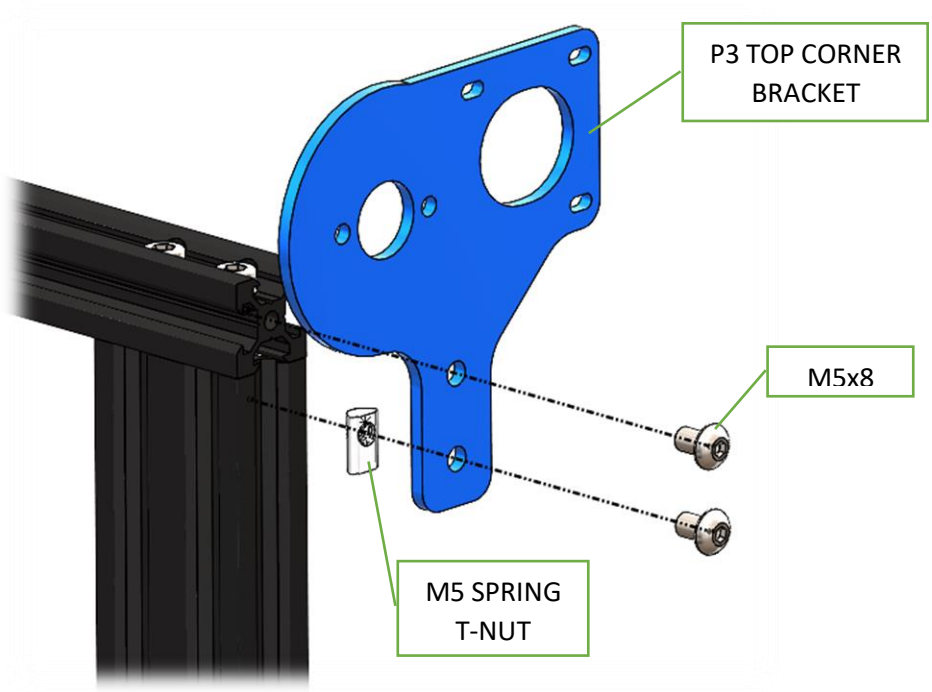


Figure 14 Basic gantry frame assembly

Figure 15 Repeat process on the other side

Chapter 3 Mounting rails and movement parts

Step 3.1 Installing Top mechanism

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	SHAFT 8mm, 476mm LENGHT	1	Kit
2	Timing Pulley 60T, Bore 8mm GT2	1	Kit
3	Pulley 20T, Bore 8mm GT2	2	Kit
4	Pulley 80T, Bore 8mm GT2	2	Kit
5	8mm Flange Bearing	2	Kit
6	M5x8 Screw	4	Kit
7	GT2 Closed BELT 188mm	1	Kit
8	Pulley 16T, Bore 5mm GT2	2	Kit
9	NEMA 17 x40mm Motor	2	Kit
10	M3x30 Screw	6	Kit
11	M3x24 SPACER	6	Kit
12	8mm RETAINING RING	2	Kit

✓ Slide next components into **SHAFT 8mm 476 mm**, keep same direction of each component as shown in the next picture, DO NOT ADJUST THEM YET:

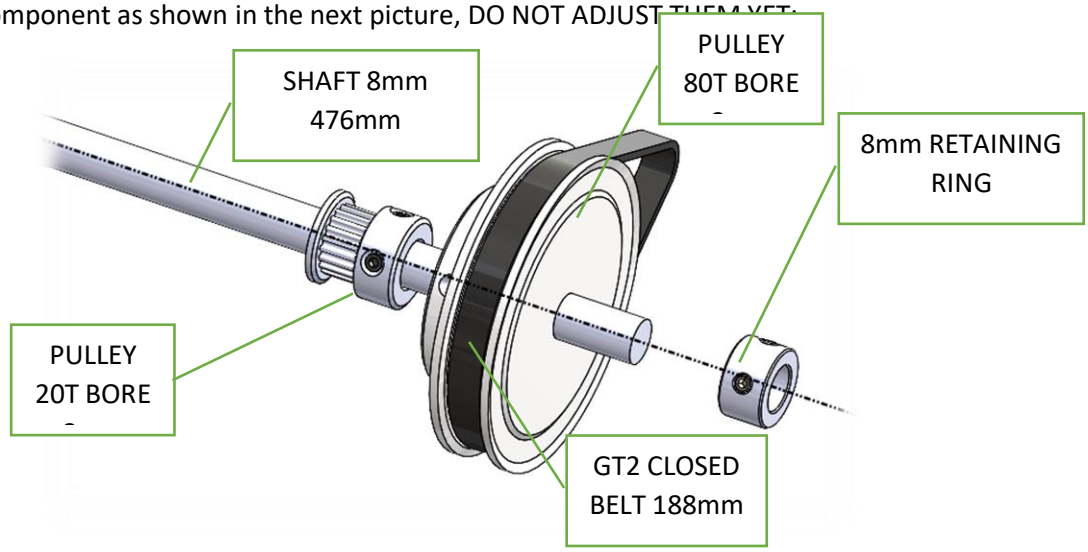


Figure 16 Top shaft components in order

✓ Repeat the process on the left side as well:

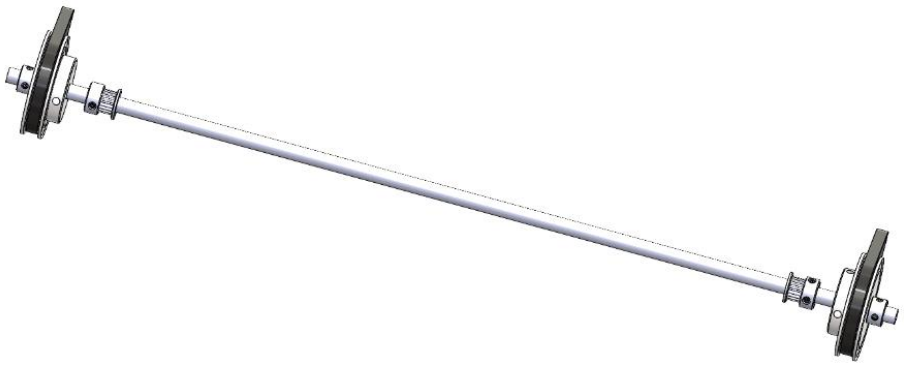
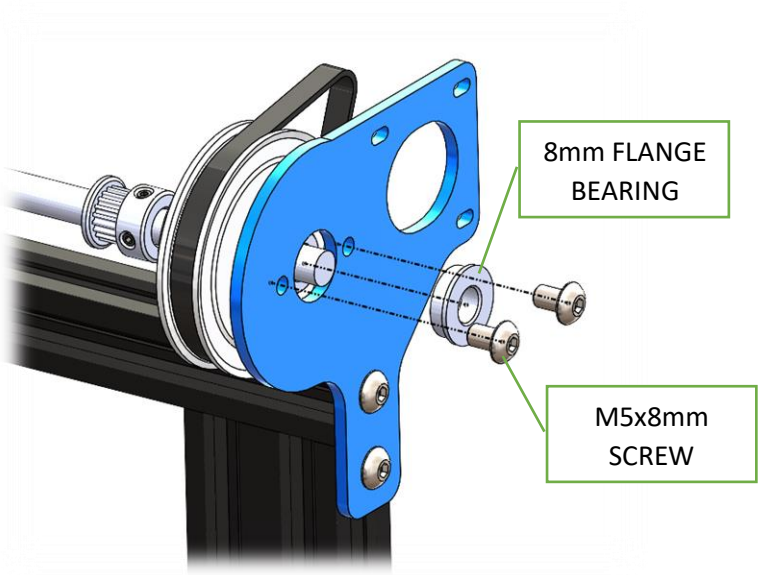


Figure 17 Top shaft with its components

✓ Insert **SHAFT 8mm 476mm** with previous mounted items into both sides holes as shown:

Figure 18 Top Shaft placed between top brackets

✓ Secure both sides of shaft using **8mm Flange Bearing** and M5x8mm Screws, adjust screws on both sides:



✓ Center **SHAFT 8mm 476mm** on both sides, push **RETAINING RINGS** against flange bearings then adjust Set Screws of both pulleys:

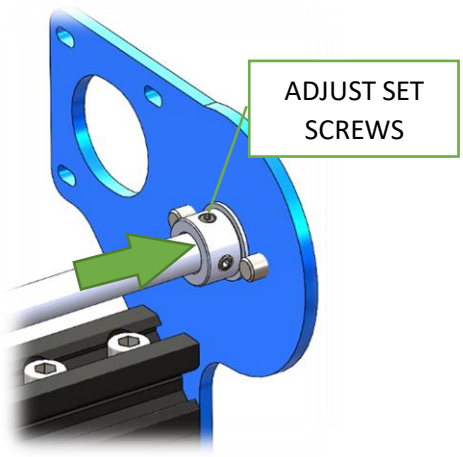


Figure 19 Securing SHAFT on both sides

✓ Adjust Set screws of the 80T pulley as well, keeping the Pulley against the retaining ring:

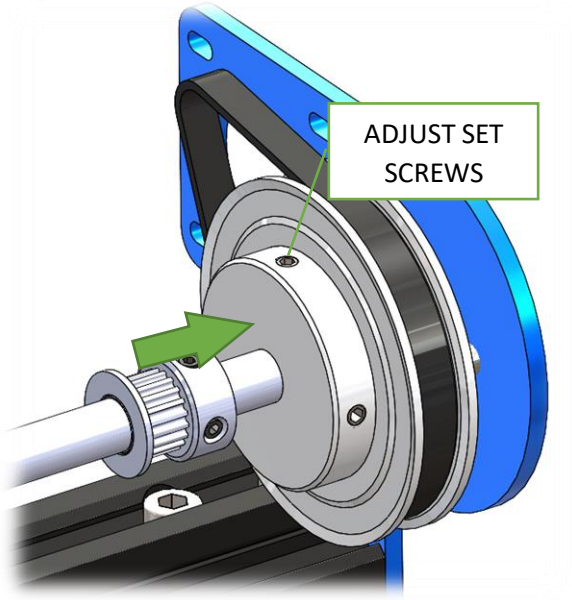


Figure 20 Adjusting 80T pulleys

✓ TOP MOTORS MOUNTING: Install Z motor with 3 units **M3x30 Screws** and **M3x24 SPACERS** insert a **Pulley 16T, Bore 5mm GT2** into motor shaft.
Align both Pulleys (motor and shaft pulleys connected with closed loop sync belt) and secure them with its SET screws to their own shafts, finally adjust belt tension using slotted holes in motor bracket:

NEMA17 x 40mm

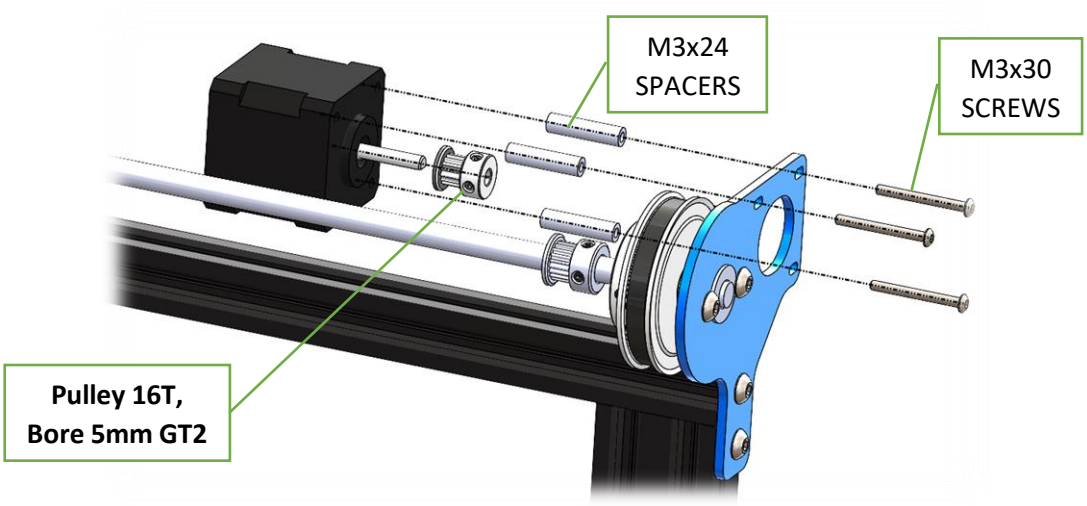


Figure 21 Top motor mounting components

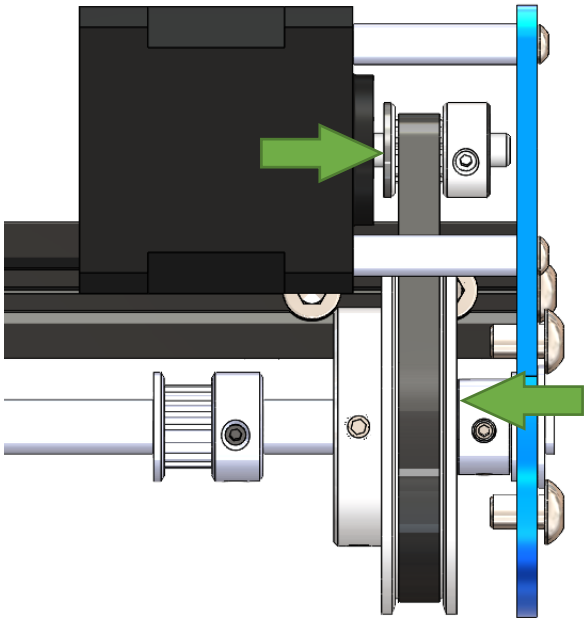


Figure 22 Top view of motor mounting, pulleys and closed belt has to be perfectly aligned.

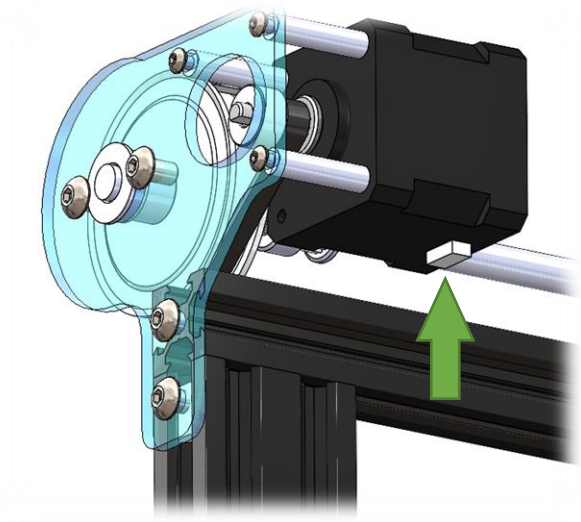


Figure 23 Bottom view, Motor connector is suggested to point downside

Figure 24 Repeat process on the left side

Step 3.2 Installing Sync belt tensioners and linear rails

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	Sync Belt Tensioner	2	Kit
2	M4x30 Screw	4	Kit
3	M4x20 SPACER	4	Kit
4	M4 SPRING T-NUT	4	Kit
5	MGN12H with RAILS 300mm	2	Kit
6	M3x8mm SCREWS	10	Kit
7	M3 Spring T-NUT	10	Kit

✓ In the inside/bottom part of the gantry, install the Sync Belt tensioners as shown next:

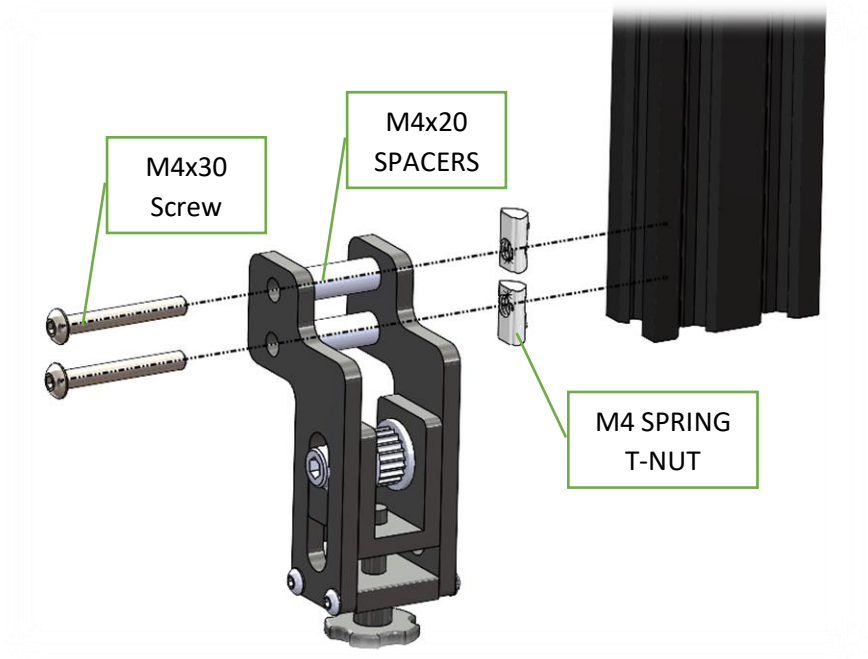


Figure 25 Detail of Sync Belt assembly

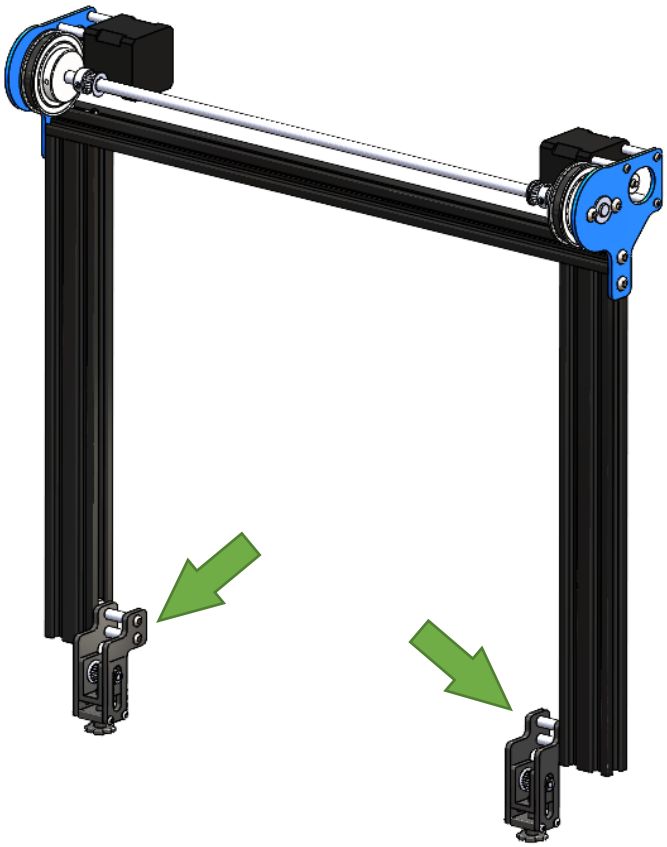


Figure 26 Sync Belt tensioners positioned

- ✓ Be sure to leave about 5mm from the bottom part of the aluminum bar, repeat process on the left side:

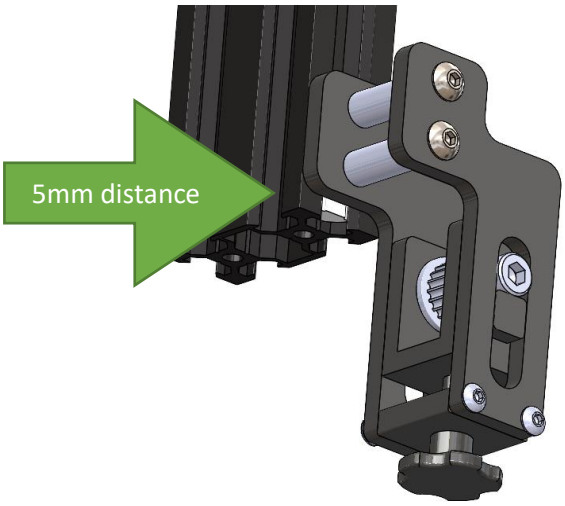
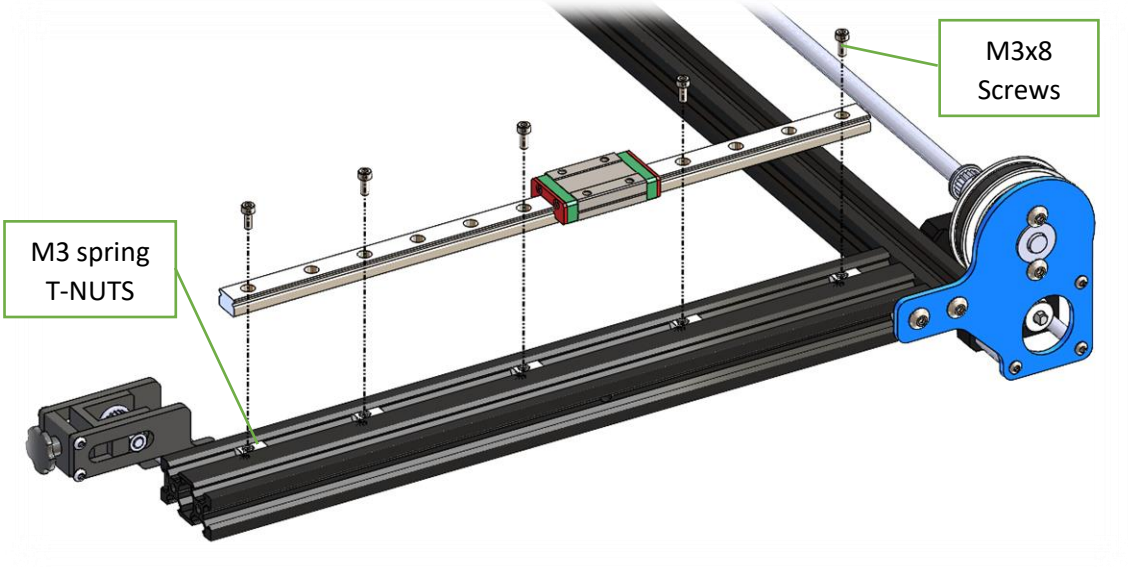


Figure 27 Bottom view of the Sync Belt tensioner

Step 3.3 Installing Sync Belts tensioners for gantry

- ✓ Install gantry rails, MGN12H with rails as shown, using 05 units M3x8 screws and M3 Spring T-NUTS, 2 at each end, 1 at the center, and 2 extra in between of those. Distance from the bottom gantry have to be 25mm:
  NOTE 1: don't tight screws yet!
  NOTE 2: be really careful with the slider part, do not let it out of the rail, it will lose some steel balls and won't work properly



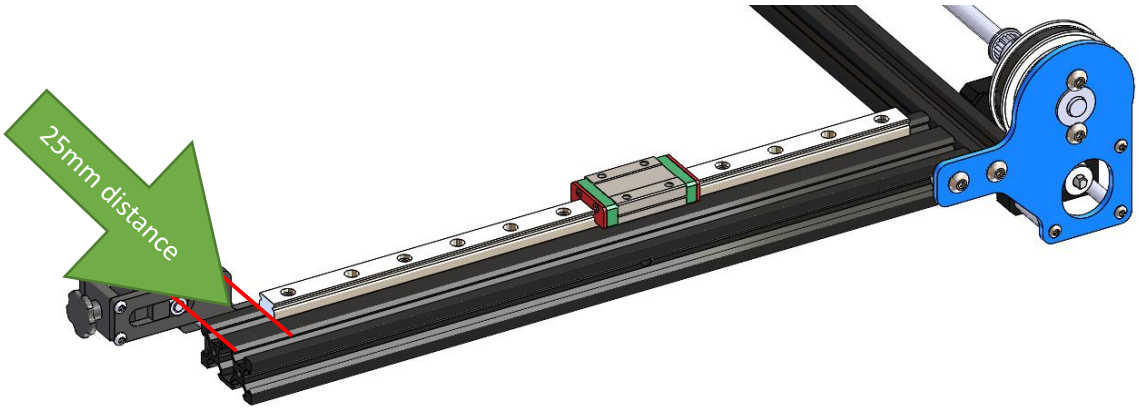


Figure 28 Linear rail position

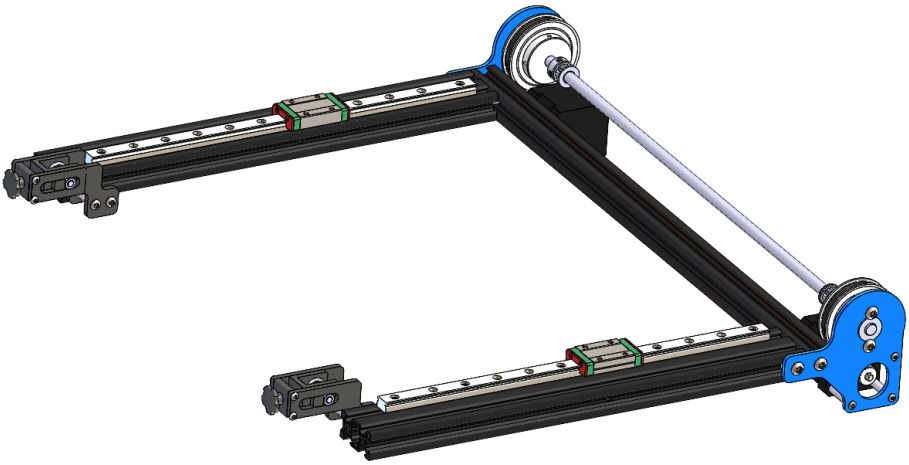


Figure 29 Gantry with linear rails on both sides

Step 3.4 Preparing X axis

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	2020 V-Slot 344 mm	1	Kit
2	P5 Left X plate	1	Kit
3	P6 Right X plate	1	Kit
4	M5x8mm SCREW	4	Kit
5	M5 Spring T-NUT	4	Kit
6	Sync Belt Tensioner	1	Kit
7	M3x6 SCREW	2	Kit
8	M4x8 SCREW	2	Kit
9	M4 Spring T-NUT	2	Kit
10	MGN12H with RAILS 350mm	1	Kit
11	M3x8 SCREW	10	Kit
12	M3 Spring T-NUT	6	Kit
13	P7 Extruder bracket	1	Kit
14	M3x30 Screw	3	Kit
15	M3x24 SPACER	3	Kit
16	Pulley 20T, Bore 5mm GT2	1	Kit

17	GT2 Sync BELT 6mm, 1 m length	1	Kit
18	BLUE Nylon ZIP TIE	4	Kit

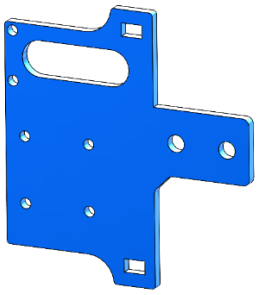


Figure 30 P5 Left X plate

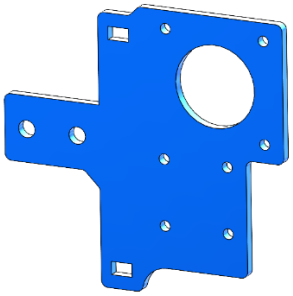


Figure 31 P6 Right X plate

✓ On the right side, use 02 units M5x8mm to fix P6 bracket to the 2020 Alu profile, using M5 Spring T-NUTS, as shown:

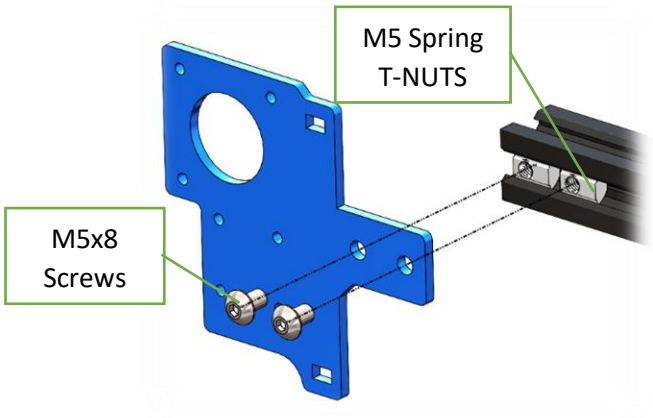


Figure 32 Back view for fixing bracket

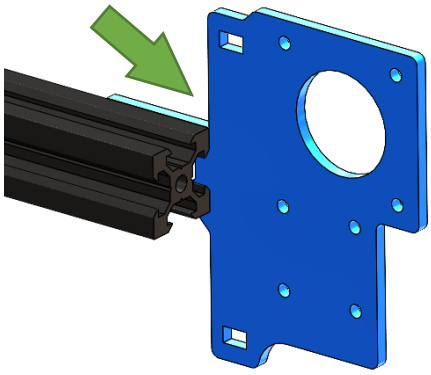


Figure 33 Bracket corner inner have to match with the end of the X beam

✓ On the left side, use 02 units M5x8mm to fix P6 bracket to the 2020 Alu profile, using M5 Spring T-NUTS, as shown:

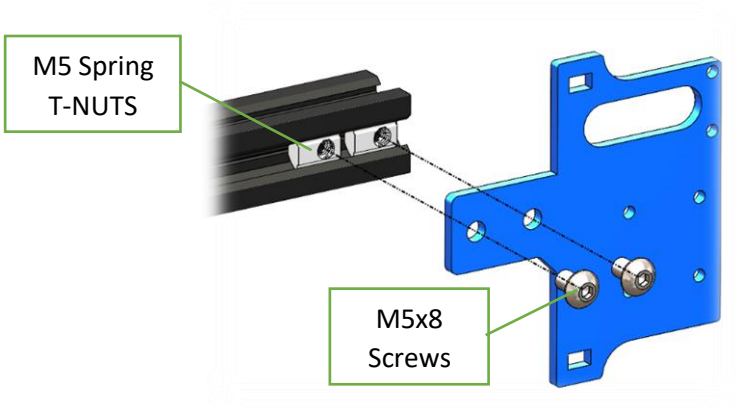


Figure 34 Back view for fixing bracket

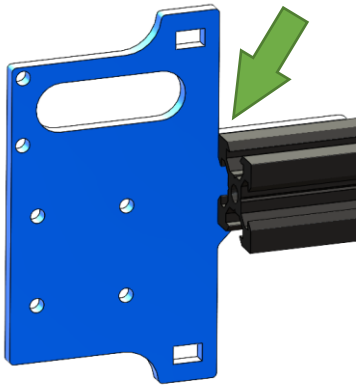
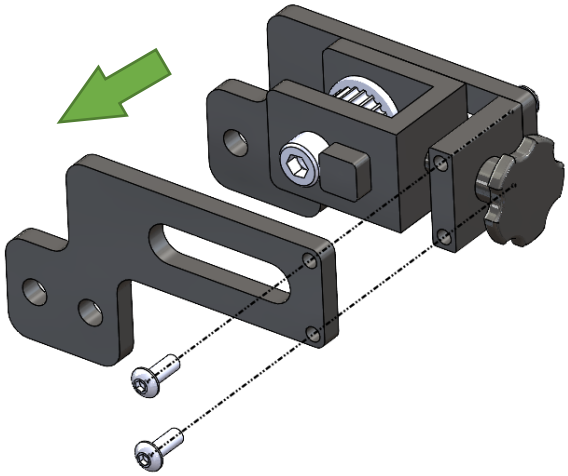


Figure 35 Bracket corner inner have to match with the end of the X beam

✓ Prepare tensioner for X Axis Sync Belt, remove one side of the tensioner assembly, as shown, discard the removed part, keep both M3 screws for the next step:



✓ Install the modified Sync Belt tensioner to the X axis assembly using previous M3 screws:

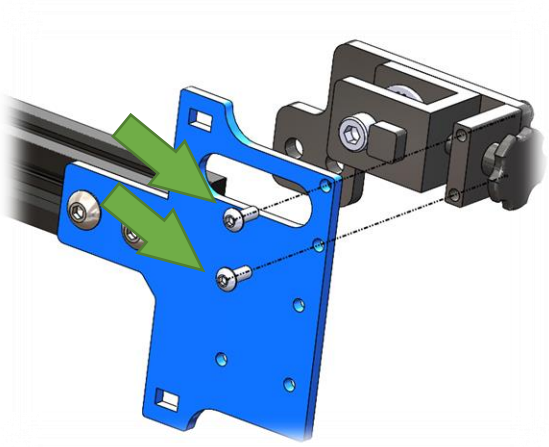


Figure 36 Install Sync Belt tensioner

Figure 37 Back view detail of the X axis belt tensioner

✓ Using M4x8 screws and M4 Spring T-NUTS fix the tensioner on the front side:

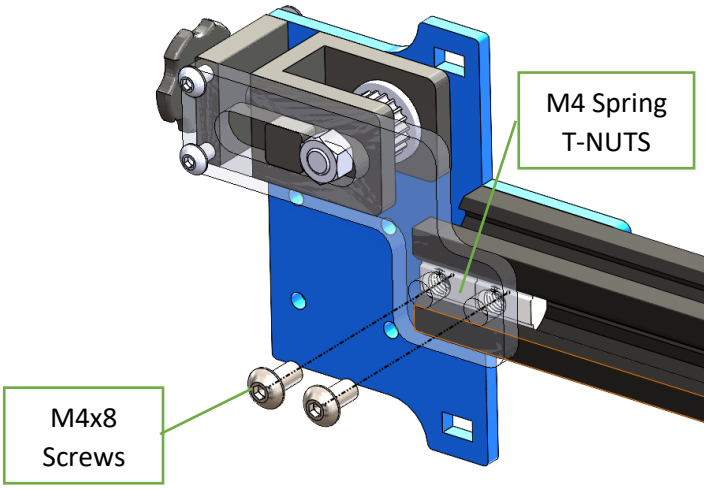


Figure 38 Detail for front fixing the tensioner

✓ Install X axis rail, MGN12H 350mm with rail as shown. Flip over previous assembly, using 06 units M3x8 screws and M3 Spring T-NUTS, 2 at each end, 2 at the center, and 2 extra in between of those. Rail has to be centered with the X axis beam, tight screws at this point:
NOTE 1: be really careful with the slider part, do not let it out of the rail, it will lose some steel balls and won't work properly

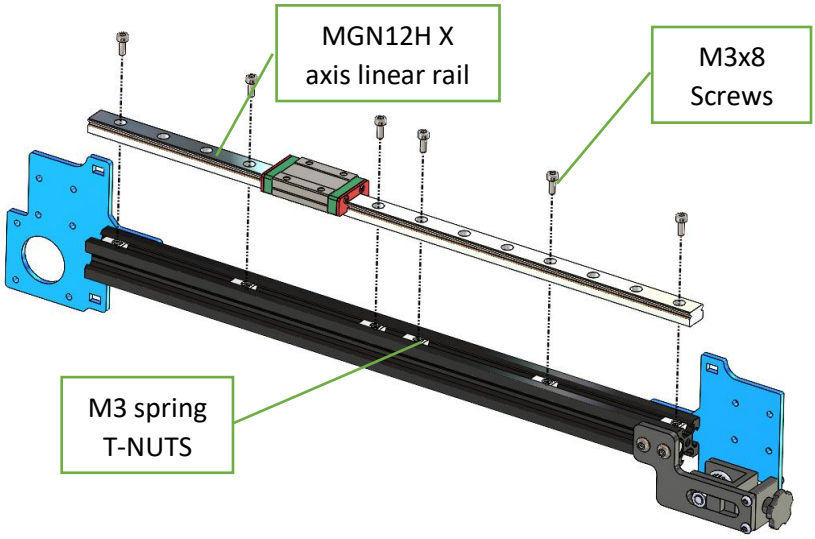


Figure 39 Bottom view of the X linear rail mounting

✓ Mount P7 Extruder bracket, directly to the X axis carriage, using 04 units M3x8 screws, as shown next:

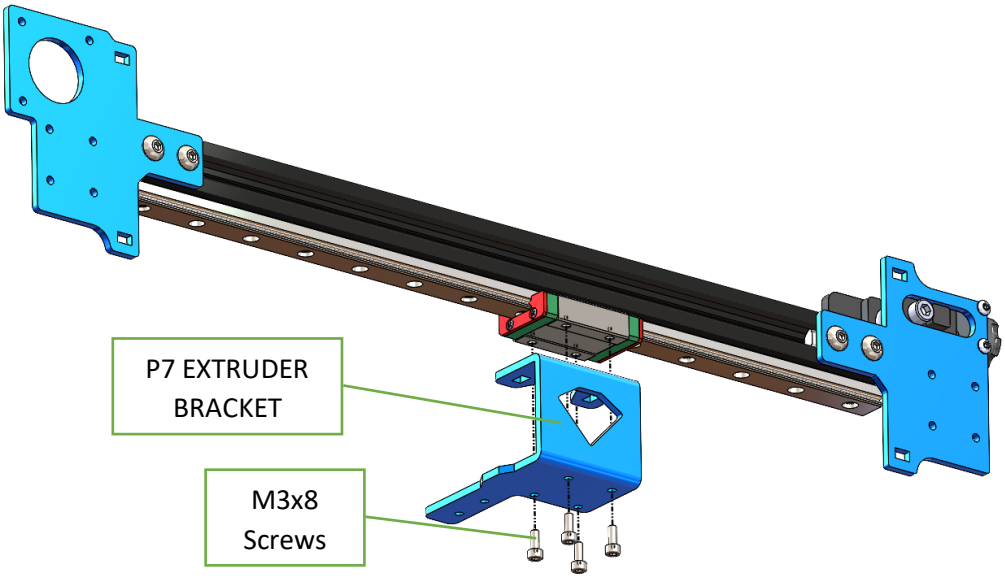


Figure 40 Installing Extruder bracket

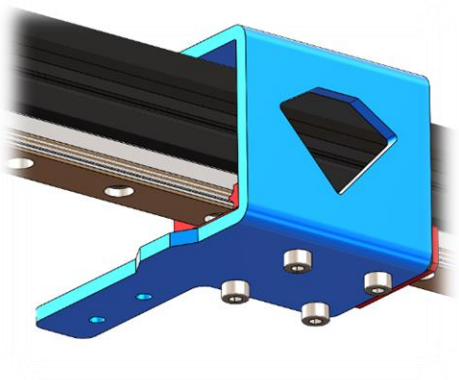


Figure 41 Back view for the extruder bracket

✓ Install Nema 17 motor using 3 units M3x30 screws and 3 units M3x24 spacers as shown, also install Pulley 20T GT2:

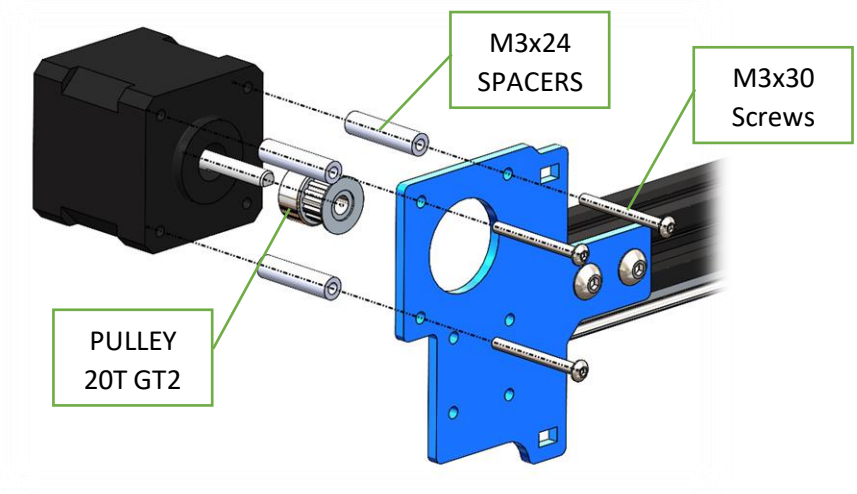


Figure 42 X motor mounting detail

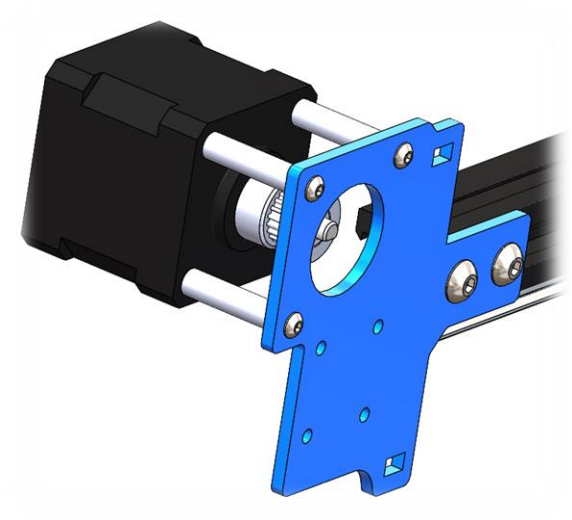


Figure 43 X motor detail

- ✓ Install GT2 Sync BELT 6mm - 1 m length, using 4 zip ties, as shown next. Then tension belt using left side sync belt tensioner:

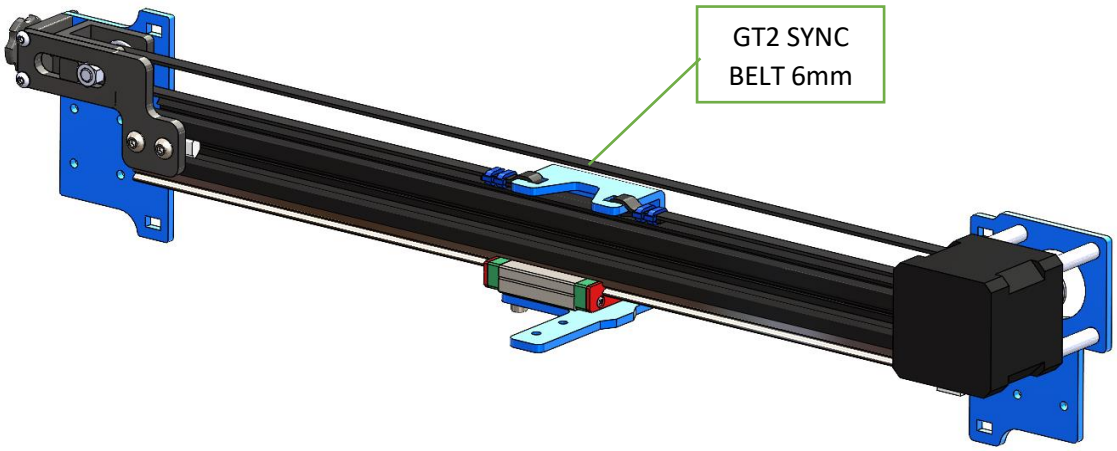


Figure 44 X Sync BELT mounting

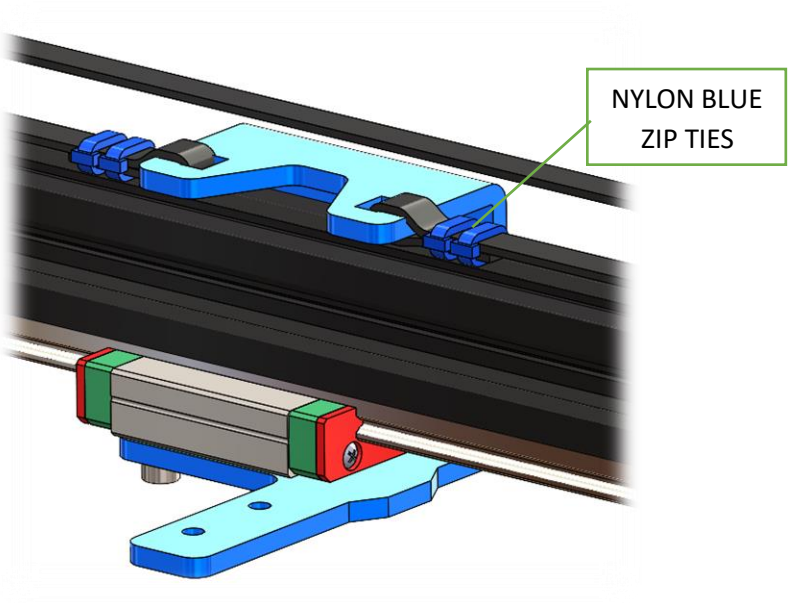


Figure 45 Fix belt with 2 Zip ties on each side of Extruder bracket

Step 3.5 Mounting X Axis to gantry

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	X axis endstop Bracket	1	Printed part
2	M3x8 SCREW	6	Kit
3	M3x10 SCREW	1	Kit
4	GT2 Sync BELT 6mm, 1 m length	2	Kit
5	BLUE Nylon ZIP TIE	8	Kit

✓ Take previous gantry assembly and install X axis, as shown:

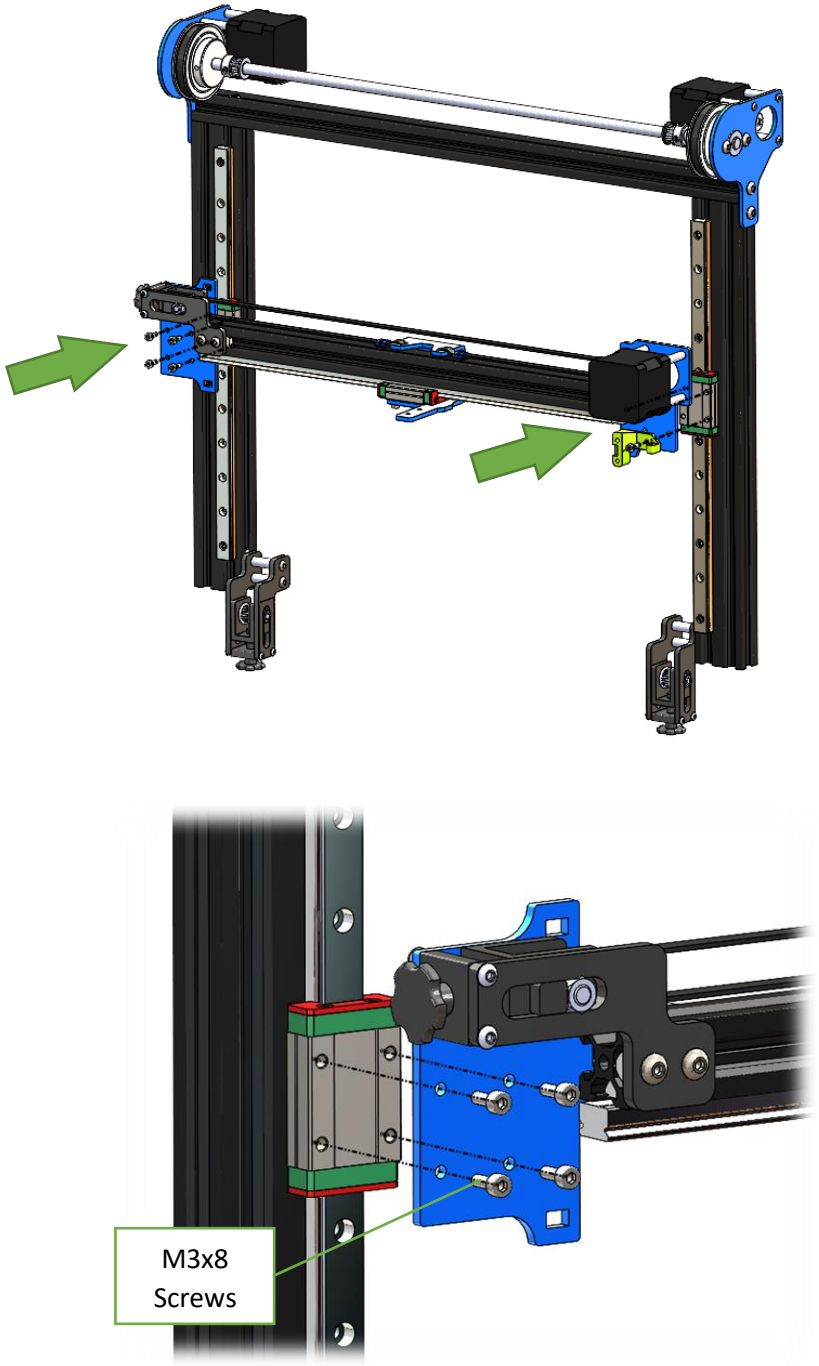


Figure 46 Left side X axis fixing to gantry

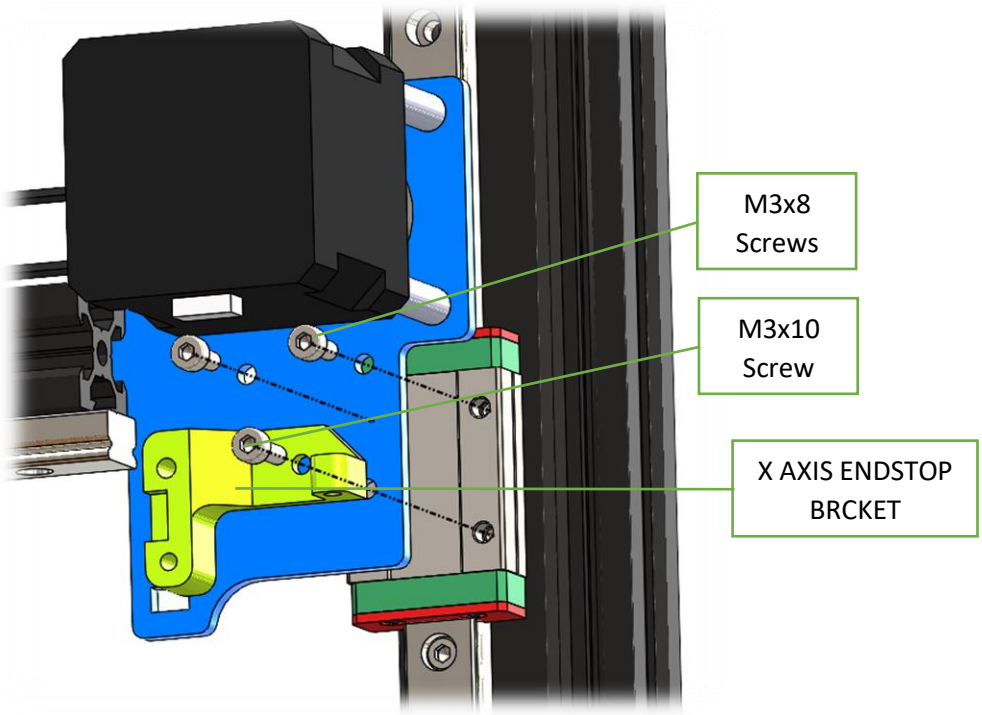
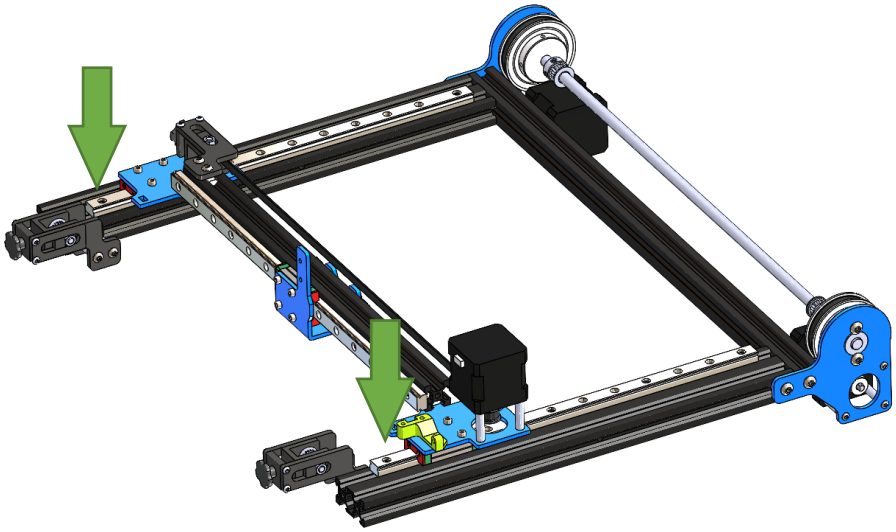
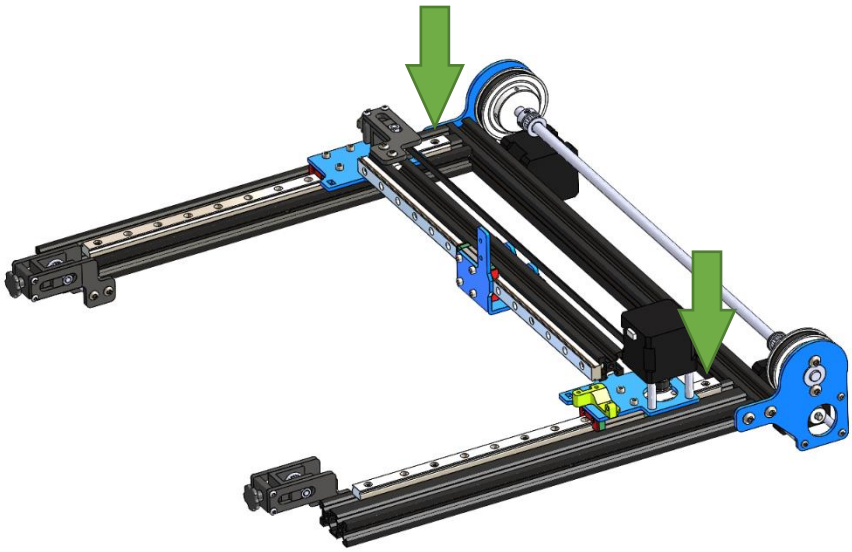


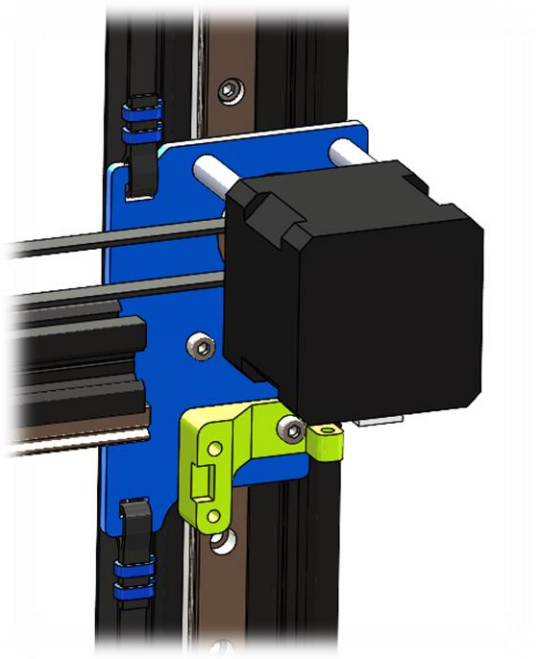
Figure 47 Right side X axis fixing to gantry

✓ Lay down gantry, move X axis manually to the bottom position, and adjust screws from bottom end of the gantry rails:



✓ Move X axis manually to the top position, and adjust screws from top end of the gantry rails, once done, adjust the rest of screws, try moving X axis from side to side, it should move freely and smoothly, if not repeat the process loosen all screws and tighten them again:





Chapter 4 Installing Belt and Heatbed system

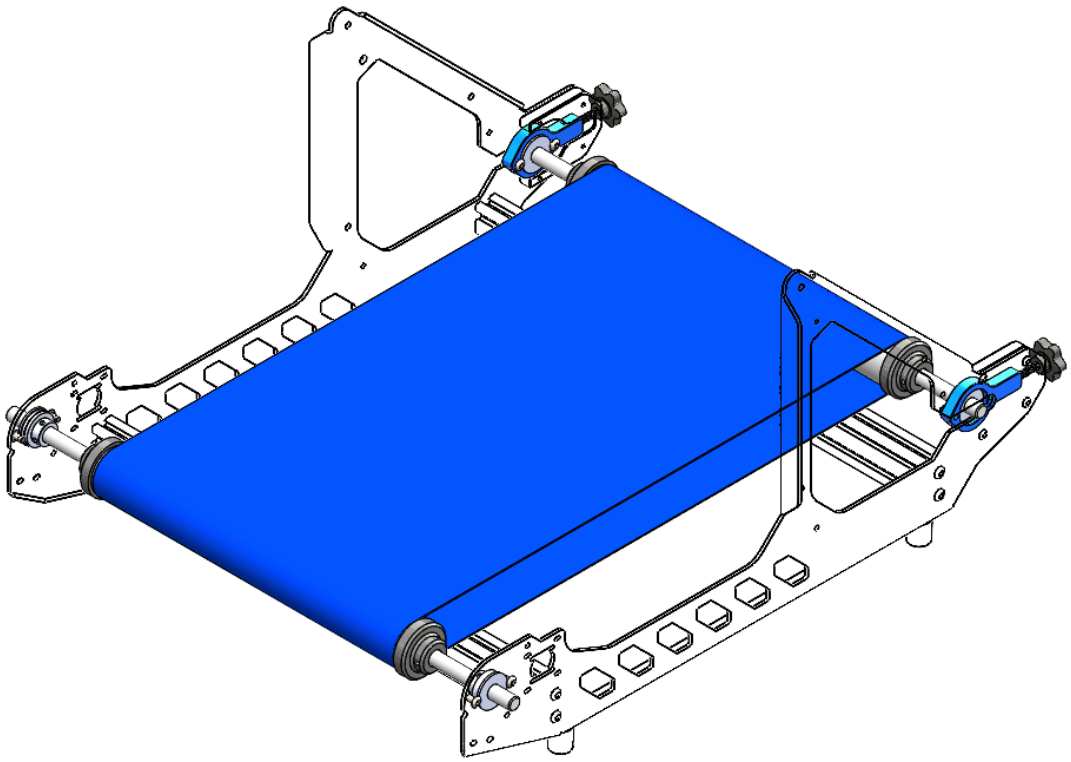


Figure 48 Belt system Assembly

Step 4.1 Preparing rollers

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	Roller BODY 40 mm	2	Kit
2	12 mm ROD L=520mm	1	Kit
3	12 mm ROD L=480mm	1	Kit
4	Roller Cap 46mm	4	Kit
5	M4x8mm Black Headless screw	8	Kit

✓ Using all the mentioned parts, proceed to assemble them in the next order, first place 12mm ROD inside Rolle BODY 40mm, then insert Roller CAP 46mm on each end, making sure to screw it until all fits very tight, keep in mind that 12mm ROD have to be centered with the roller body. Finally using an allen key, proceed to secure both ROLLER CAP 46mm with the M4x8mm BLACK HEADLESS SCREWS (02 on each side):
*Note: You have to repeat this process in order to get 2 rollers assembled.

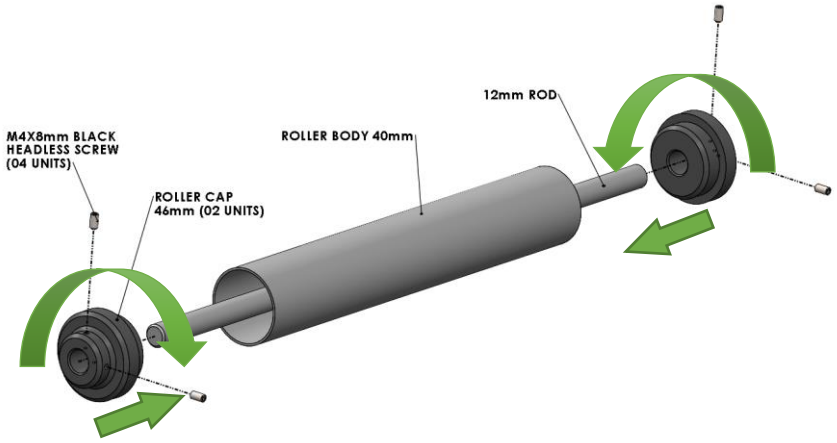


Figure 49 Roller assembly components

Figure 50 Front roller, Rod is centered with roller body

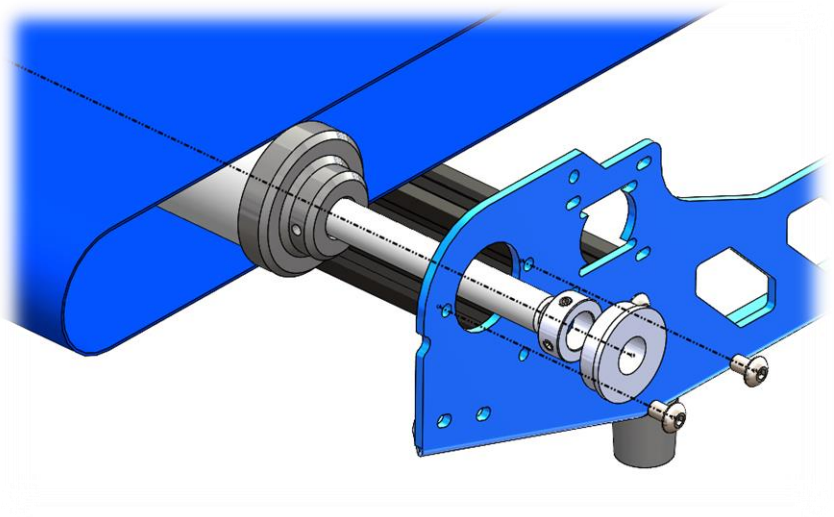
Figure 51 Back roller, Rod is centered with roller body

Step 4.2 Installing Rollers and Belt

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	Roller Assembly	2	Kit
2	12mm FLANGE BEARING	4	Kit
3	CNC belt tensioner sliding part	2	Kit
4	M5x8mm SCREW	8	Kit
5	BLUE CONVEYOR BELT	1	Kit
8	12mm RETAINING RING	2	Kit
9	M6X40 KNOB	2	Kit
10	P10 CNC belt tensioner SLIDER part	2	Kit

✓ Insert 8mm RETAINING RING, Flange Bearing 12mm on both sides of both Rollers, secure them with M5x8mm screws, center the roller, DO NOT FORGET TO INSERT THE ROLLER INTO THE BLUE BELT:



✓ One the roller is centered, adjust the inner 12mm Retaining ring:

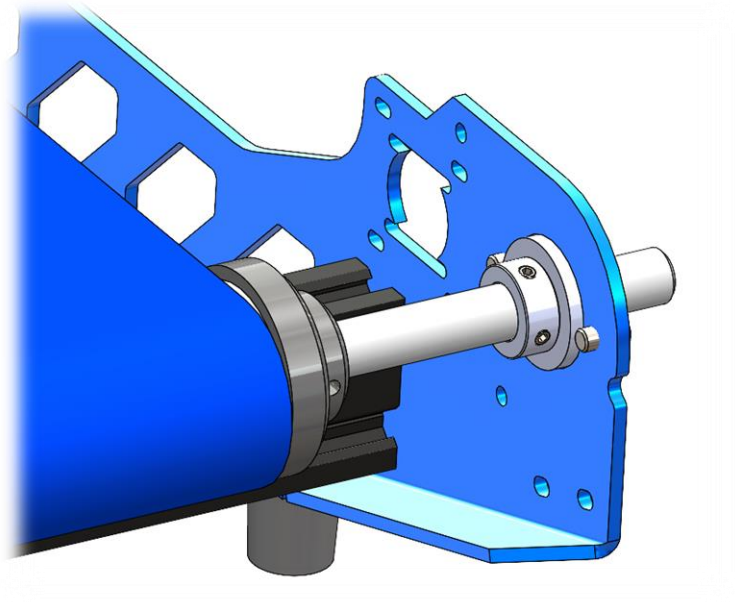


Figure 52 Inner view, detail for front roller fixing

✓ **REAR ROLLER MOUNT AND BELT TENSIONER:** Take the BACK ROLLER with FLANGE BEARINGS on it, install it with M5x8 SCREWS, please be aware in this step **belt** have to be inserted as shown in the next picture. Secure both FLANGE BEARINGS by adjusting its screws to hold it in place into the CNC tensioner slider part.
ROLLER HAS TO BE CENTERED!

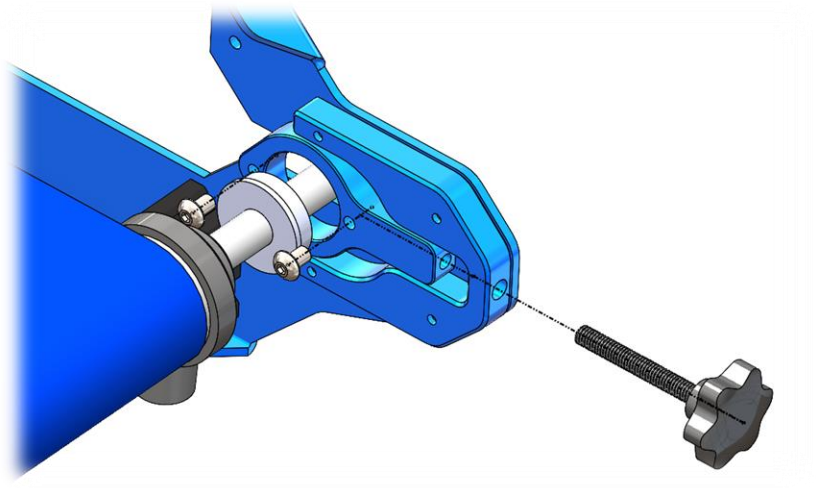


Figure 53 Rear roller mount and belt tensioning detail

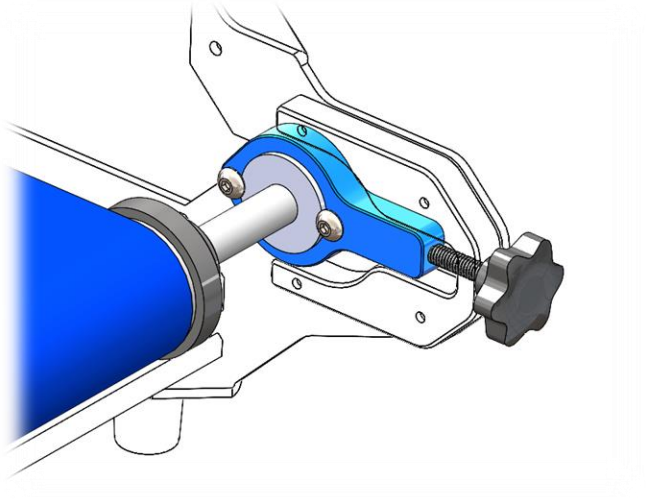


Figure 54 Back roller assembly, repeat process on the opposite side

NOTE: DO NOT ADJUST BELT TENSIONERS YET!

Step 4.3 Installing Heatbed and support brackets

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	310x310mm 24v heatbed	1	Kit
2	P2 L Heatbed mount plate	1	Kit
3	P2 R Heatbed mount plate	1	Kit
4	M4x8 mm SCREW	8	Kit
5	M4 Spring T-nut	8	Kit
6	M4x35 Countersink Screw	4	Kit
7	M4 Plastic Leveling nut	4	Kit
8	Bed Spring	8	Kit
9	M5x8 SPACER	4	Kit
10	M5x40 Screw	4	Kit
11	P4 Belt holder plate	2	Kit

- ✓ Install P2 Heatbed mount plate (L and R) (Fixed by M4x8mm Screws + M4 Spring T-Nuts 2units on each side), install Heatbed assembly as shown in the next picture, right position is determined by the 75mm dimension from the inner side:
- ✓ NOTE: **Release any tension on the belt, for easy assembly**

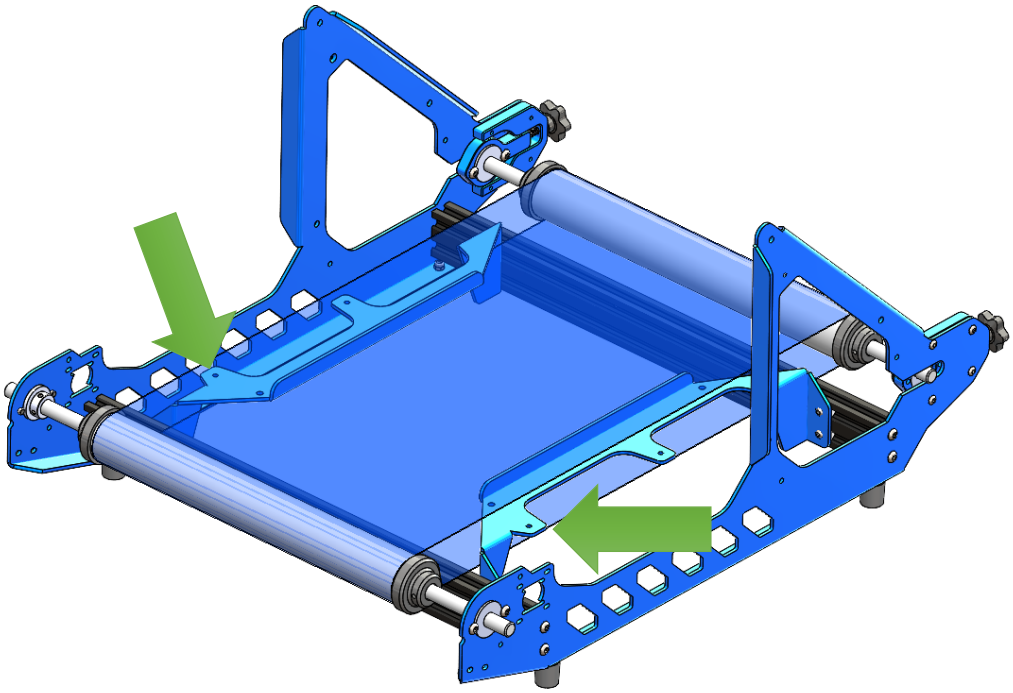


Figure 55 Assembly of bed support brackets, check the features for the right position of each

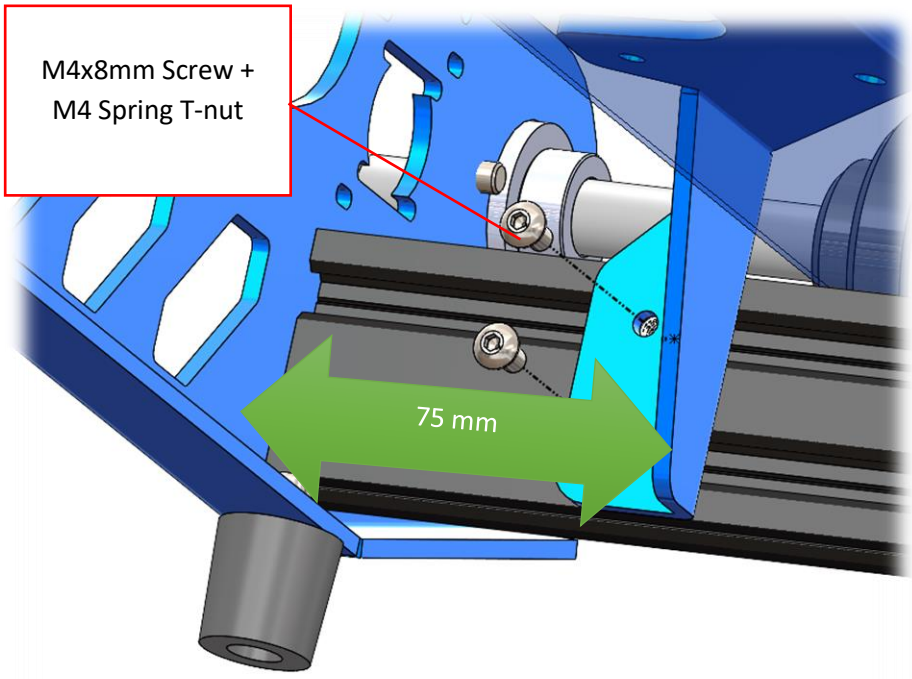


Figure 56 Bottom view for Heatbed bracket assembly

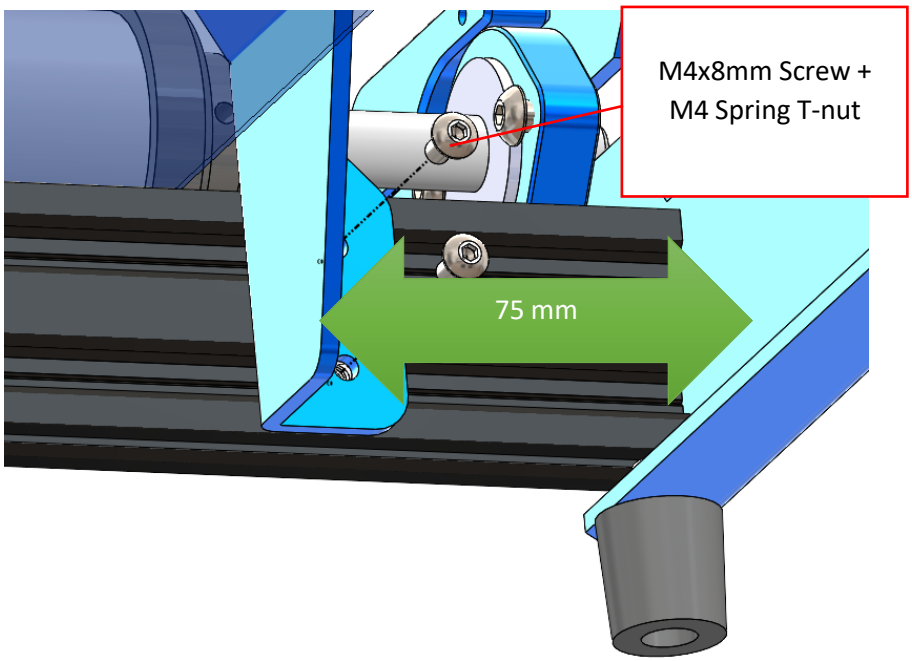
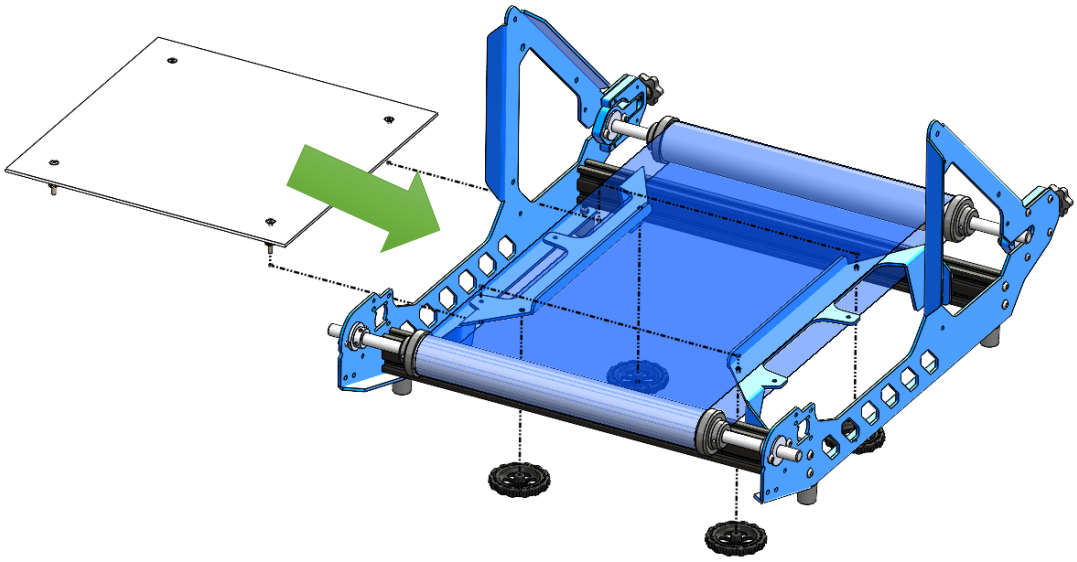


Figure 57 Repeat the process on the back section, and on the left side

✓ With the belt totally loosen, insert Heatbed including 4 units M4x35 Countersink Screws and Bed springs, insert them on the corresponding holes of the previous installed bed brackets, and finally secure them with the Leveling plastic nuts as shown:



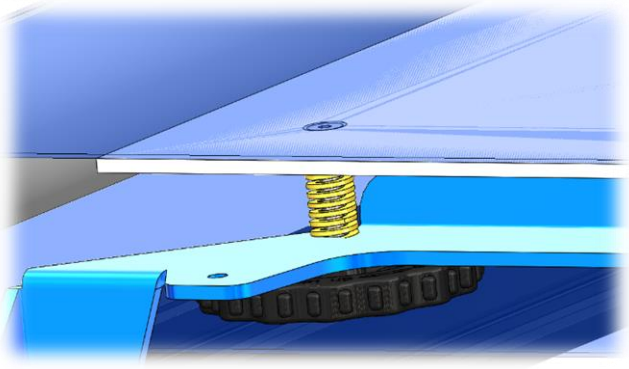


Figure 58 Spring detail

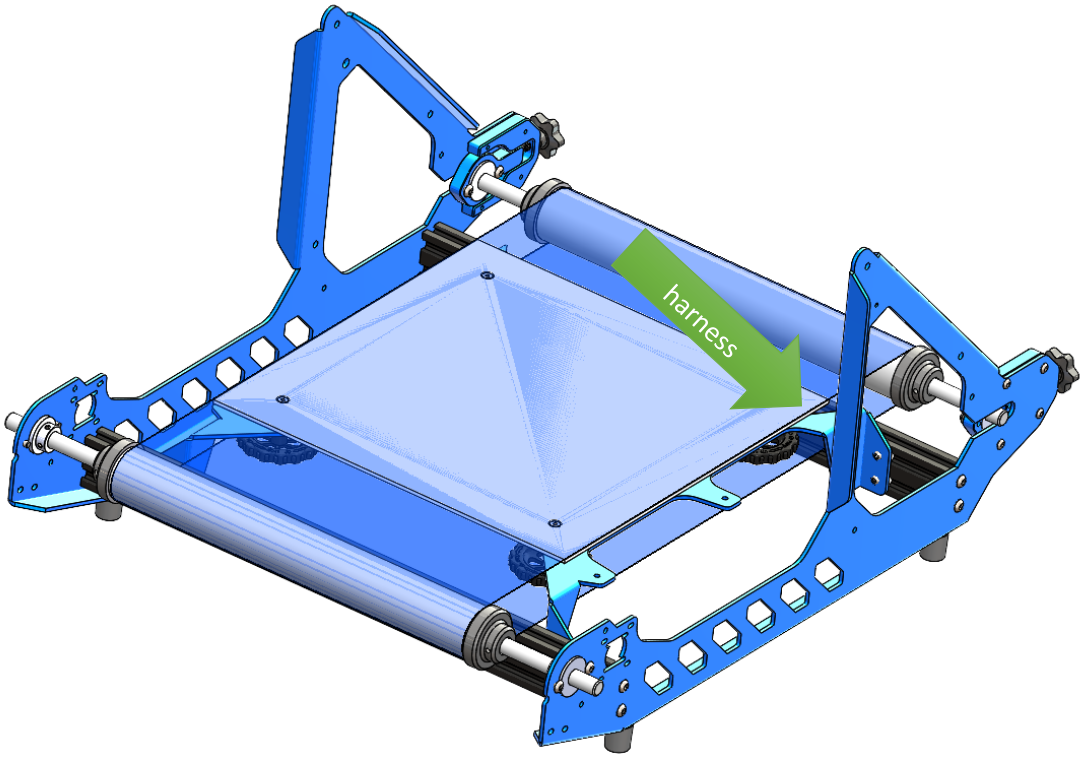


Figure 59 Harness of bed is recommended to be positioned at the back right side of the heatbed

✓ Belt holders assembly, slightly tension the belt, and then use M5x40, bed springs and M5x8 Spacers to install belt holders as shown:

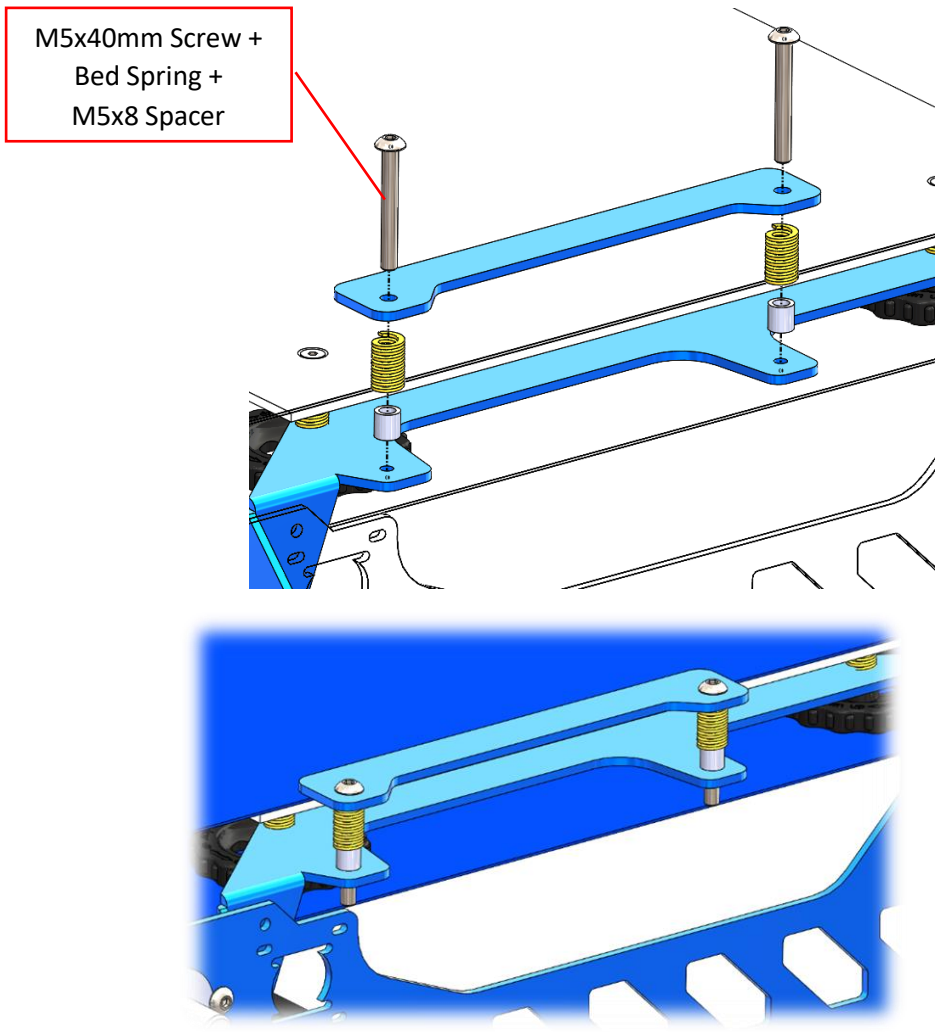


Figure 60 Slightly adjust both sides holders, in order to get small gap with the belt (use a sheet of paper)

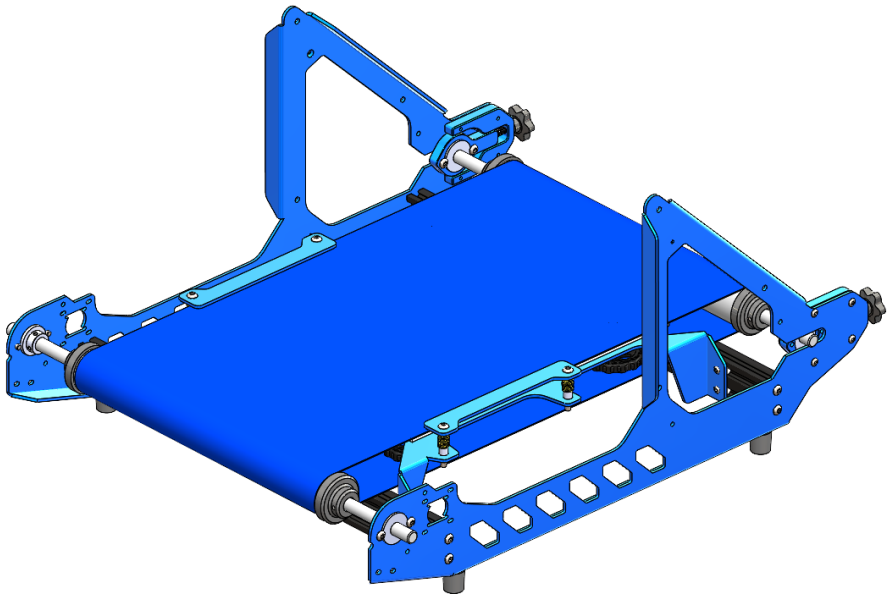


Figure 61 Progress so far with belt installed

✓ **Belt tensioning:** Using a measure tape, compare both ends of ROLLER SHAFTS (RODS), on both sides, adjust Screws until measure is the same on both sides, do not exceed tension on belt, otherwise it will cause a lot of friction problems and misalignment:
Belt preparation: Due to packaging belt might have some creases, to solve this problem it might need to preheat on the crease section using the heatbed, about 2 hours at 80°C with some flat weight over it, until crease is flatten and belt is softening, repeat if any other crease is present along the belt.
Note: One way to check for the right belt tension and alignment is once done previous step, roll the belt by hand and it have to move easy, smooth and straight without wobbling or needing to apply to much force, if this is happening, loose the screws and repeat previous step.

Step 4.4 Belt motor installation

ITEM	ITEM DESCRIPTION	Quantity	Type
1	Pulley 80T, Bore 12mm GT2	1	Kit
2	GT2 Timing belt Closed Loop 214mm	1	Kit
3	MOTOR WITH GEARBOX 5.18	1	Kit
4	M3x6mm SCREW	4	Kit
5	Pulley 20T, Bore 8mm GT2	1	Kit

✓ **Belt motor installation**: On the right side of machine, take the **Timing Pulley 80T, Bore 12mm GT2** and insert it on the end of the REAR ROLLER, then using the MOTOR WITH GEARBOX 5.18 and 4 units M3x6 screws, proceed to install it. At this point place the **GT2 Timing belt Closed Loop** and align both pulleys, then adjust the gear box motor position in order to tension the closed loop belt. As shown in the next picture:

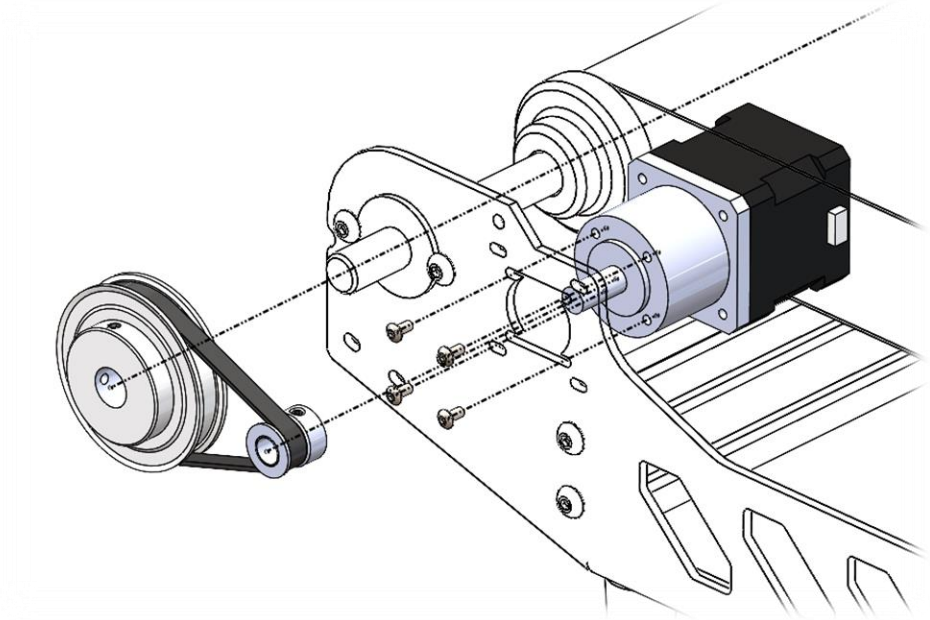
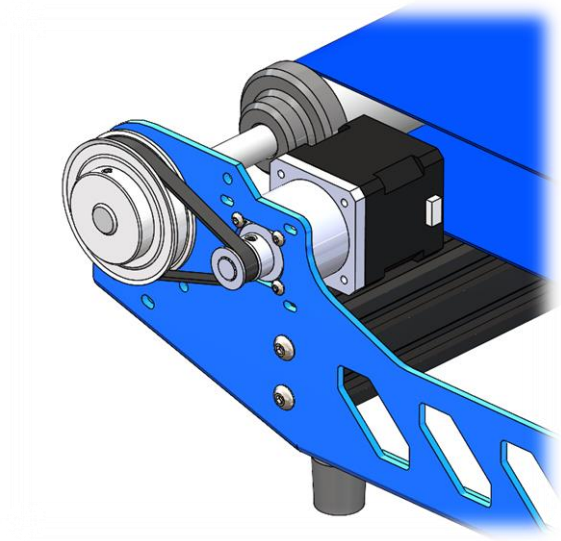


Figure 62 Belt motor assembly



Chapter 5 Preparing Hotend

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	Biqu H2 V2s Lite extruder	1	Kit
2	M3 x 8 mm Screw	6	Kit
3	M3 x 16 mm Screw	2	Kit
4	M3 x 25 mm Screw	2	Kit
5	M4 Volcano Nozzle (pointy)	1	Kit
6	Layer fan bracket	1	Printed
7	Fan duct	1	Printed
8	Fan cover	1	Printed
9	Extruder harness reliever	1	Printed
10	4020 TURBO FAN 24V	1	Kit
11	Blue nylon Zip ties	2	Kit

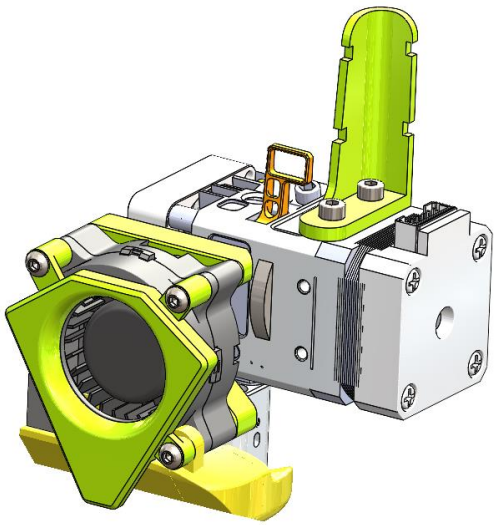


Figure 63 Hotend assembly

- ✓ Considerations:
  - Change original nozzle to supplied one
  - Adjust properly spring tensioner for filament feeder
  - Place wire harness free of movement from X endstop
  - Use zip ties to fix harness to the reliever part

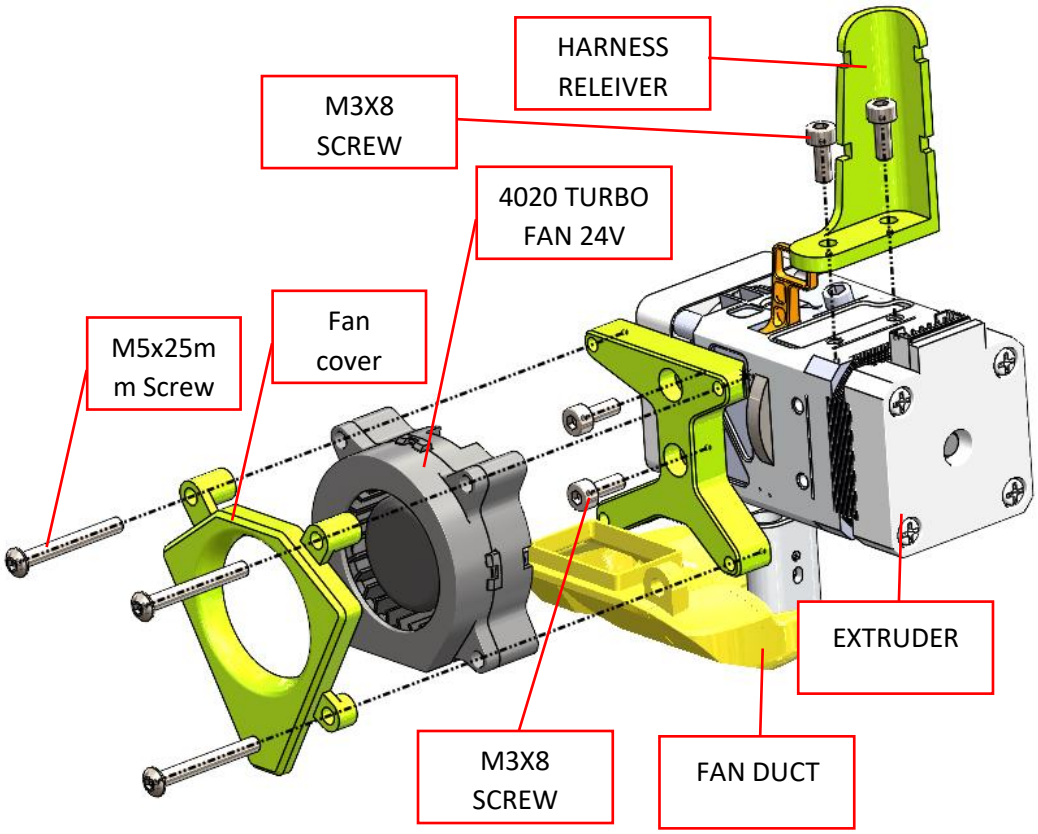
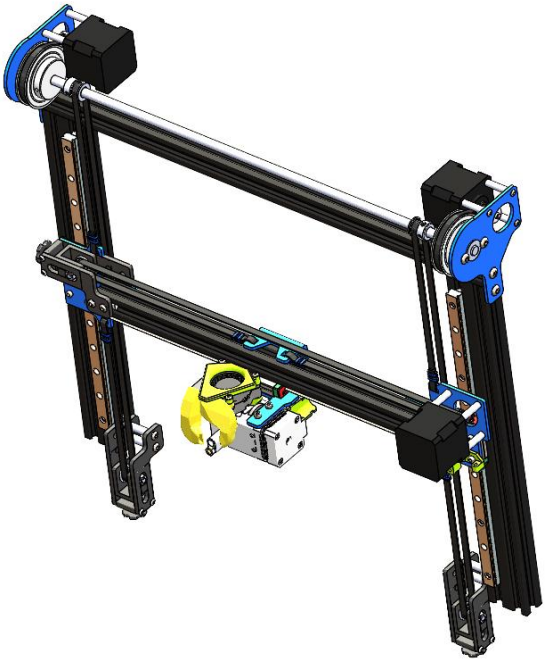


Figure 64 Hotend assembly

- ✓ 45 mode extruder positioning (use 2 M3x8 Screws for fixing)



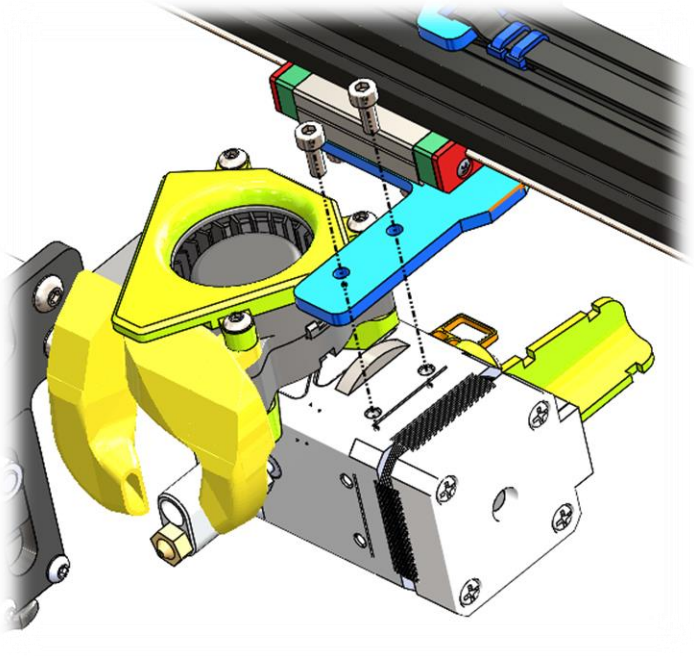
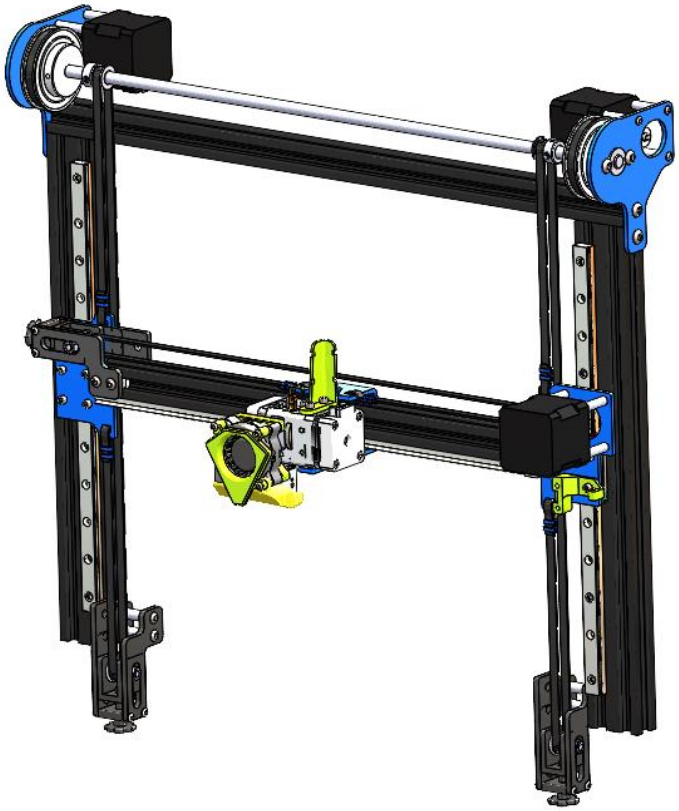


Figure 65 Extruder in 45 mode assembly

✓ 90 mode extruder positioning (use 2 M3x8 Screws for fixing)



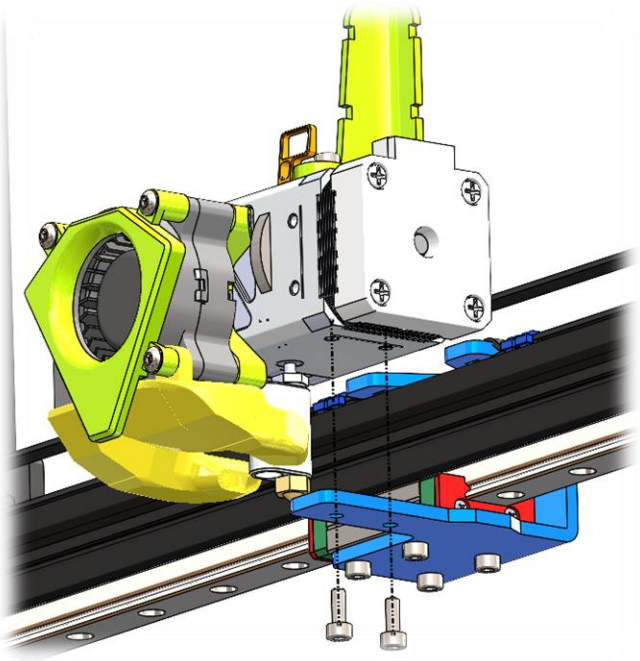


Figure 66 Extruder in 90 mode assembly

Chapter 6 Finishing installation

Step 6.1 Face plate and Screen Installation

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	P8 Face plate	1	Kit
2	TFT35 touchscreen	1	Kit
3	M3 x 12 mm Screw	4	Kit
4	M3X6X4 ALUMINUM SPACER	4	Kit
5	M3 Nylock nut	4	Kit
6	M4x12 Screw	4	Kit
7	M4 Nylock nut	4	Kit

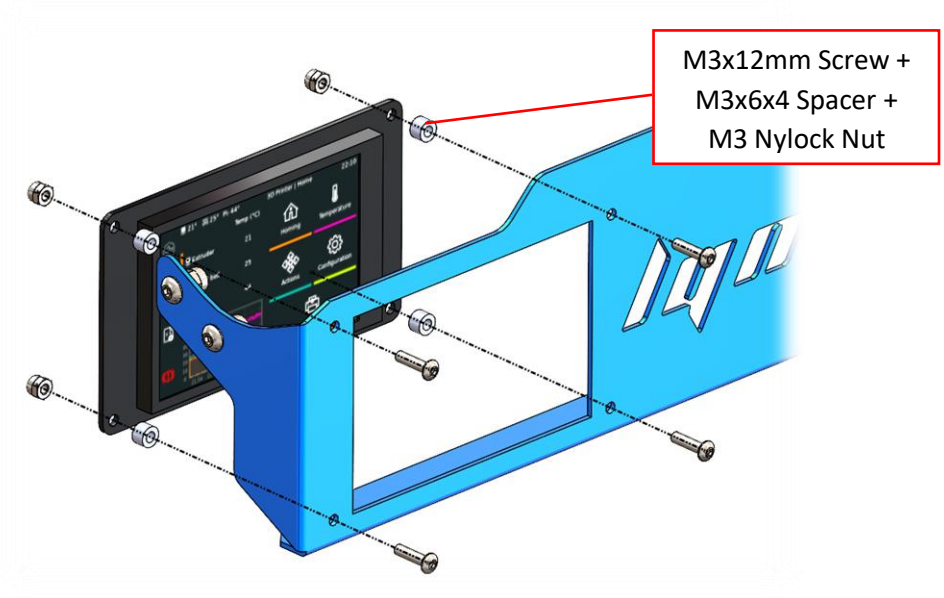


Figure 67 Faceplate and Screen mounting detail

✓ Mounting Faceplate to bottom frame, place faceplate part as shown, regulate position so it won't drag against belt, fix on both sides with M4x8 Screws and M4 Nylock nuts:

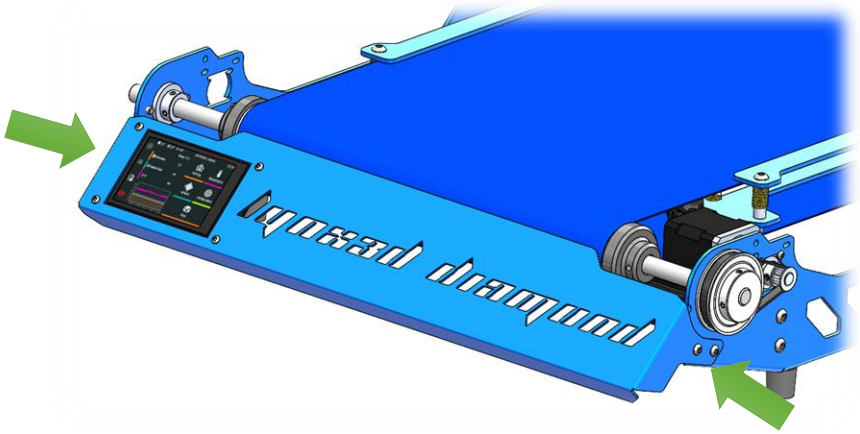


Figure 68 Fixing faceplate

Step 6.2 Side components Mounting

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	Motherboard case and Lid	1	Printed
2	Pi case and Lid	1	Printed
3	M3 x 8 mm Countersink Screw	2	Kit
4	M4 x 8 mm Screw	4	Kit
5	SKR Mini E3 V3 motherboard	1	Kit
6	MKS pi board	1	Kit
7	M3 x 6 mm Screw	4	Kit
8	M2.5 x 6 mm Screw	4	Kit
9	Round magnet 6x2mm	12	Kit

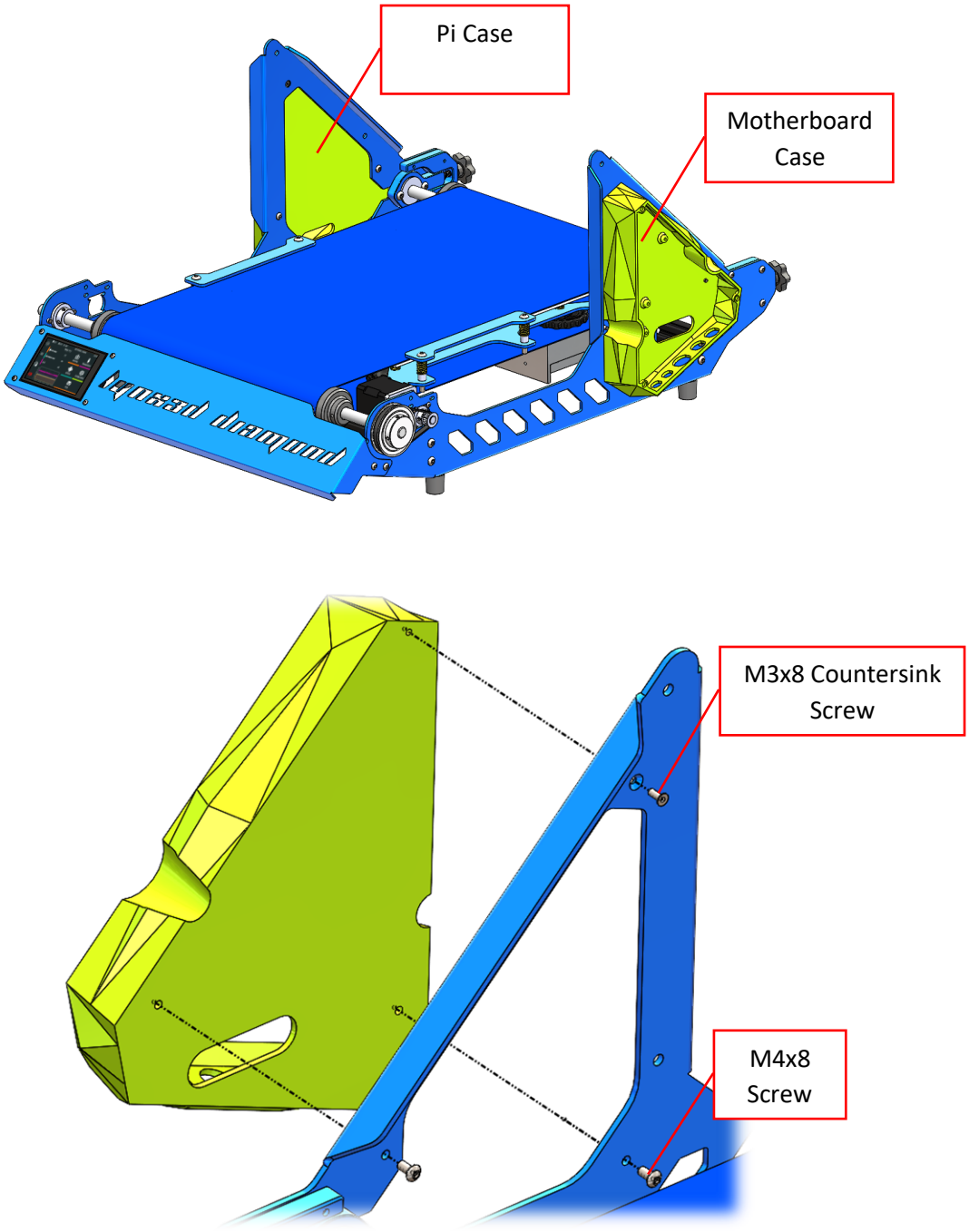


Figure 69 Fixing detail for Motherboard box, repeat process on the left side

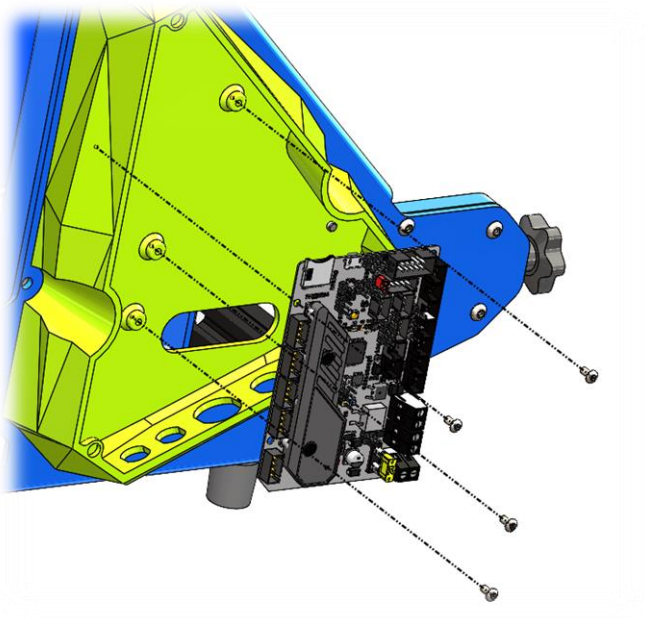


Figure 70 Install Motherboard, using M3x6 Screws

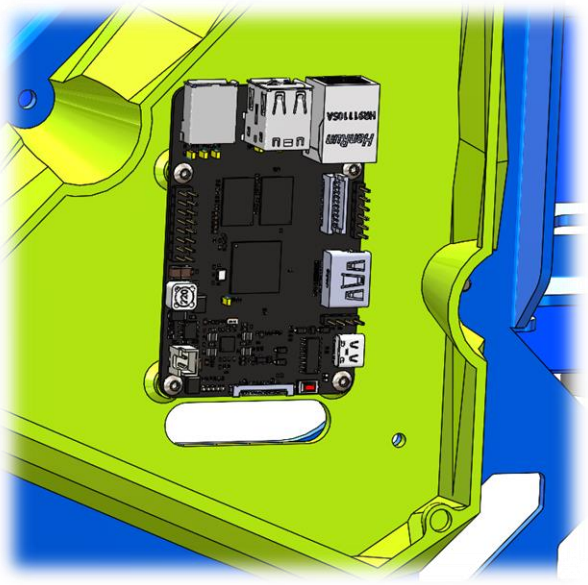


Figure 71 Install Pi board, using M2.5x6 Screws

- ✓ Insert Magnets (6x2mm) into lids and cases, using Cyanoacrylate glue to keep them in place:

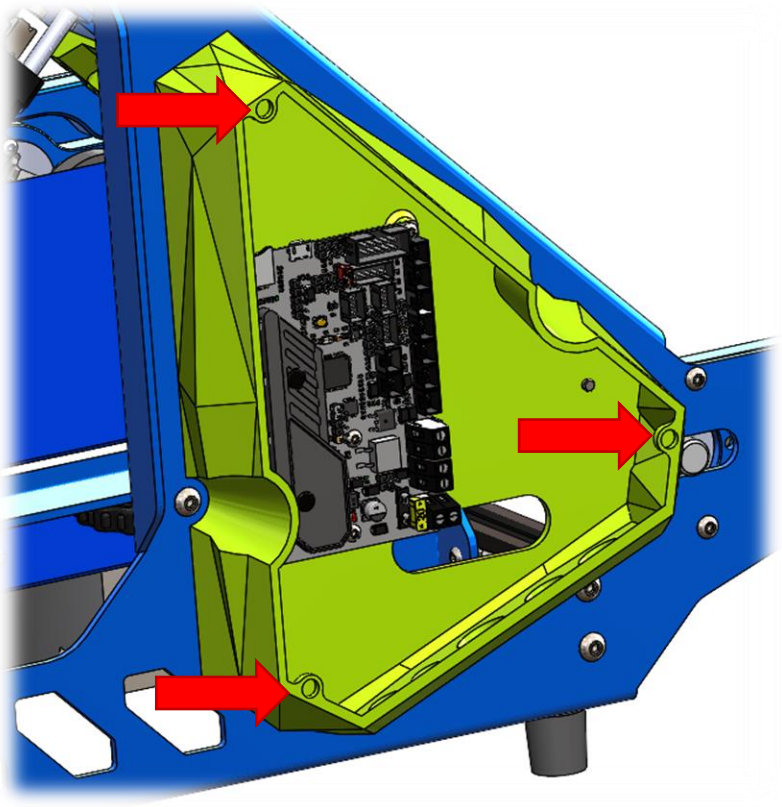


Figure 72 Magnet pockets

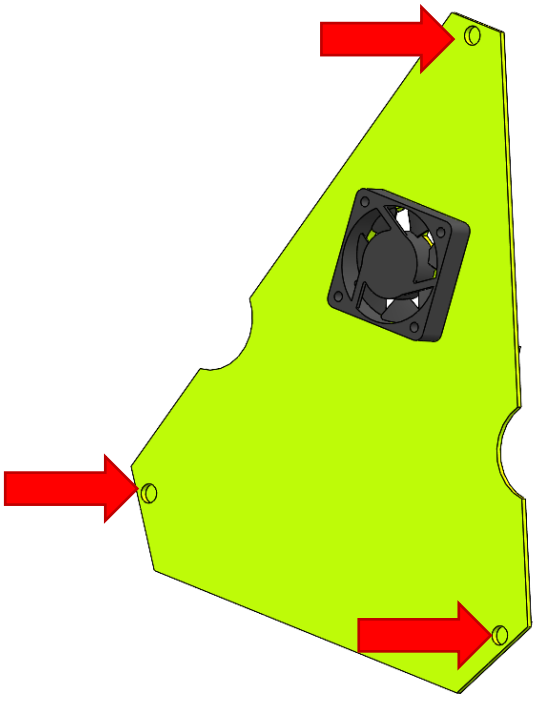


Figure 73 Magnet pockets on lids

- ✓ Install cooling fans into each lids, using M3x16 Screws, and M3 Nylock nuts, as follows:
  - 24V 4010 Fan to be used in the motherboard case/lid
  - 5V 4010 Fan to be used in the Pi case/lid

Step 6.3 Power Supply installation

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	360 Watts 24V Power Supply	1	Kit
3	M4 x 16 mm Screw	2	Kit

✓ Install power supply on the right side of machine, using M4x16mm Screws:

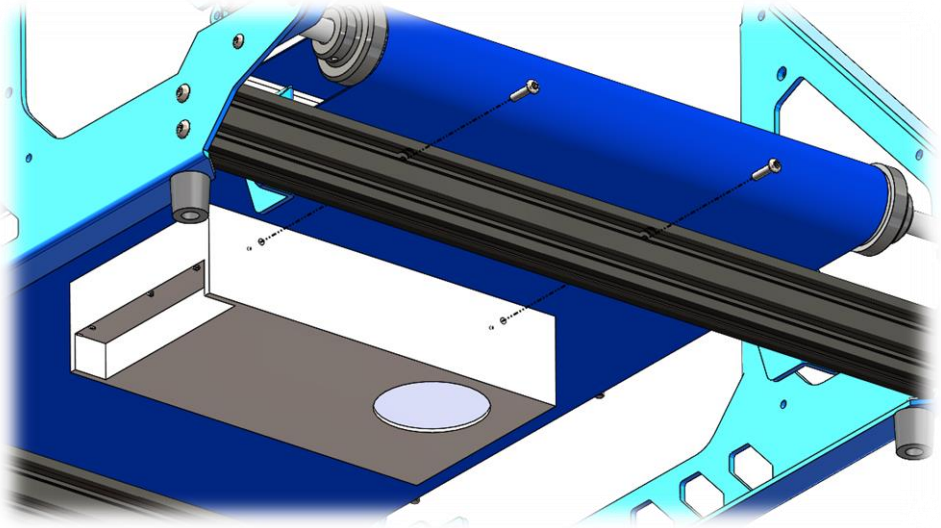


Figure 74 Bottom View for power Supply installation

Step 6.4 Power Switch mounting

✓ Next items from the KIT will be used:

ITEM	ITEM DESCRIPTION	Quantity	Type
1	Power switch case	1	Printed
2	Power Switch	1	Kit
3	M3 x 6 mm Screw	2	Kit
4	M5 x 8 mm Screw	2	Kit
5	M5 Spring T-nut	2	Kit

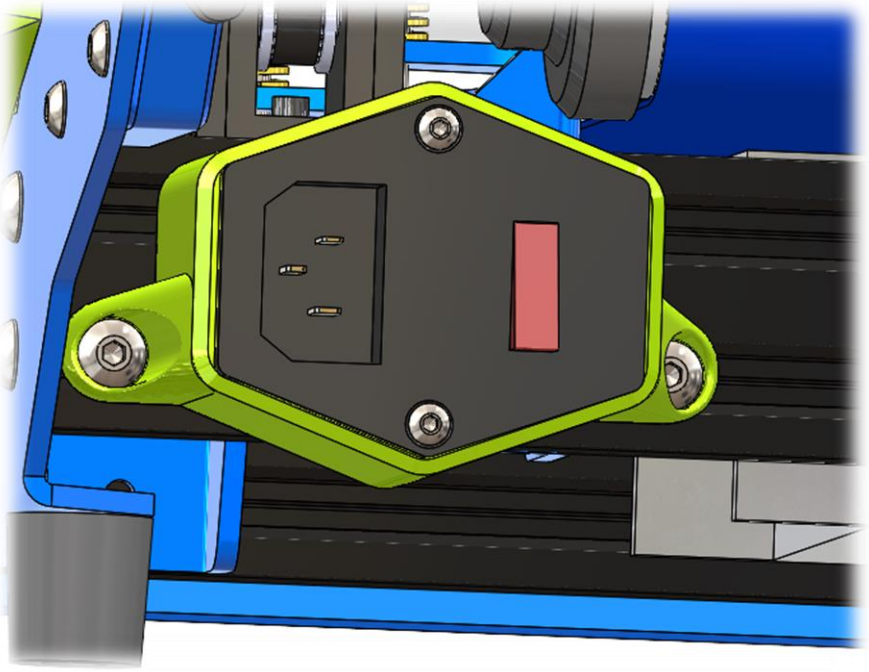
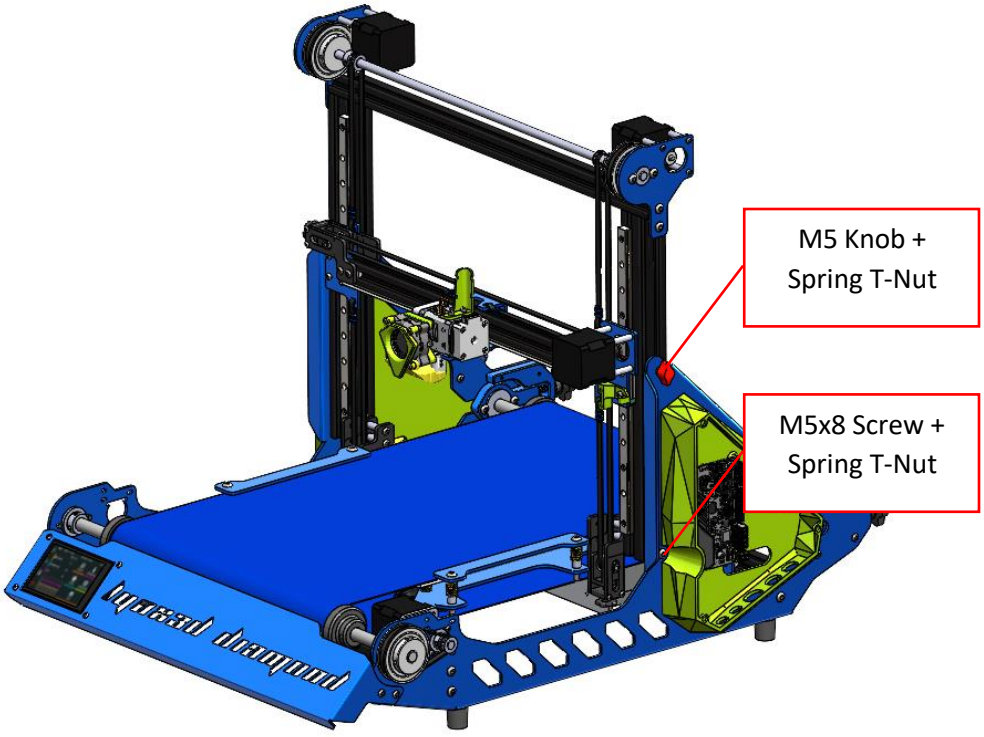


Figure 75 Power supply switch, mounted on the back right side

Step 6.5 Gantry and Bottom frame mounting

✓ Using M5 Spring T-nut and Aluminum Knob on each side, mount the gantry on the bottom frame as shown:



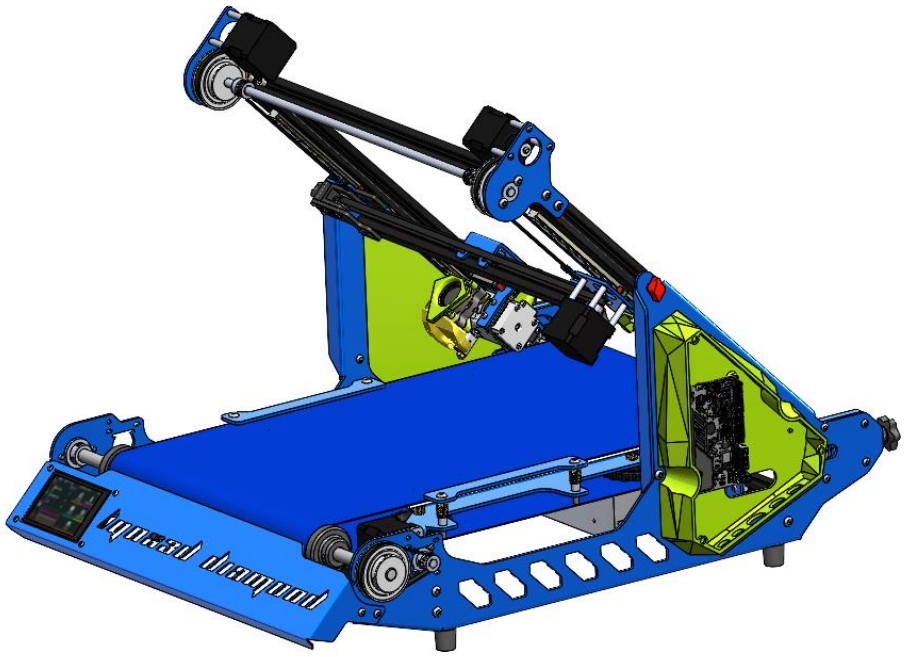


Figure 76 Change to 45 mode by losing the Knobs and rotating gantry

Step 6.6 Filament holder

- ✓ Install filament holder on the top frame of machine, using M5x8mm Screws and M5 Spring T-nuts, as shown next:

Figure 77 Suggested position for filament holder