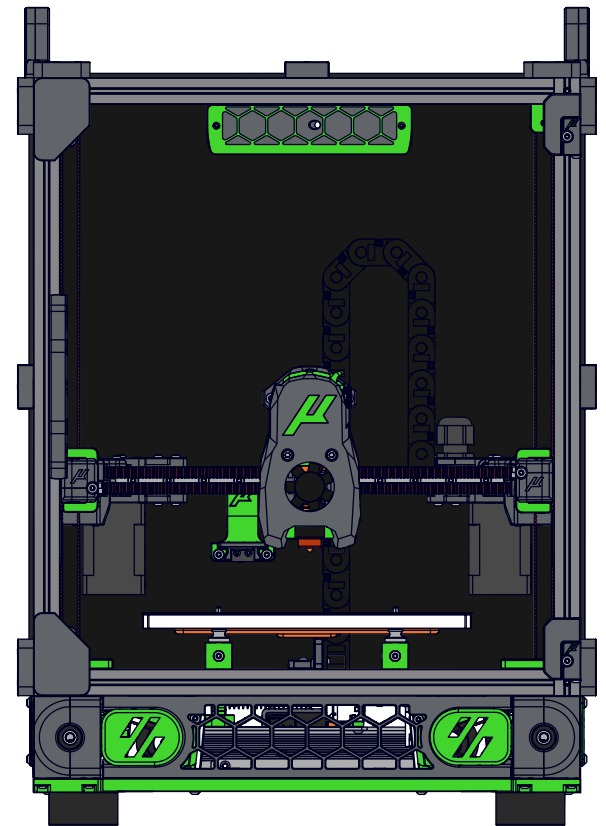


MICRON

Assembly Manual

Everything is smaller, but the price.



VERSION 11/4/2023

TABLE OF CONTENTS

STL FILE KEY

The STL naming convention used for Micron is the same as that used for VORON printers:

PRIMARY COLOR

Example

z_drive_main_a_x2.stl

These files will have nothing at the start of the filename.

ACCENT COLOR

Example

[a]_z_motor_mount_a_x2.stl

These files will have "[a]" to the front to mention that they are intended to be printed with an accent color.

QUANTITY REQUIRED

Example

[a]_z_motor_mount_a_x2.stl

If a file ends with "_x#", that is telling you the quantity of that part required to build this system..

PRINT GUIDELINES

The recommended print settings are also those used for VORON printers:

FDM MATERIAL

Micron was designed for ABS.
Use other plastics at your own discretion.

LAYER HEIGHT

Recommended : 0.2mm

EXTRUSION WIDTH

Recommended : Forced 0.4mm

INFILL PERCENTAGE

Recommended : 40%

INFILL TYPE

Grid, Gyroid, Honeycomb, Triangle, Cubic, Adaptive Cubic.

WALL COUNT

Recommended : 4

SOLID TOP/BOTTOM LAYERS

Recommended : 5

SUPPORTS REQUIRED

If the part needs supports, they are built into the model.

HOW TO GET HELP

If you need assistance with your build you can head over the DOOMCUBE Discord server and post your questions (typically in the **#micron_build_questions** channel). It is the primary help channel for the Micron! You can also check the Github page for the latest releases.

DISCO? OH ...DISCORD

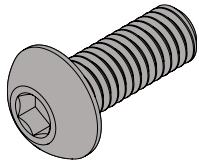
If you need assistance with your build you can head over the DOOMCUBE Discord server and post your questions (typically in the **#micron_build_questions** channel). It is the primary help channel for the Micron!



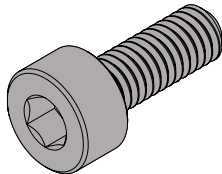
GIT GUD

If you want to stay up to date on the latest files for Micron. The github page is the only source for the latest files.

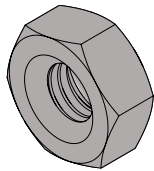


**BUTTON HEAD CAP SCREW (BHCS)**

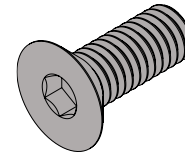
Metric fastener with a domed shaped head and hex drive. Most commonly found in locations where M3 fasteners are used.

ISO 7380-1**SOCKET HEAD CAP SCREW (SHCS)**

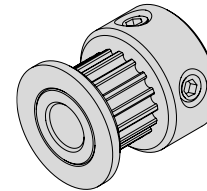
Metric fastener with a cylindrical head and hex drive. The most common fastener used on the Voron.

ISO 4762 / DIN 912**HEX NUT**

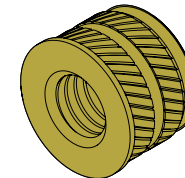
Hex nuts couple with bolts to create a tight, secure joint. You'll see these used in both M2 and M3 variants throughout this guide.

ISO 4032 / DIN 934**FLAT HEAD CAP SCREW (FHCS)**

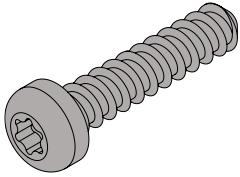
Metric fastener with a cone shaped head and a flat top.

ISO 10642**PULLEY**

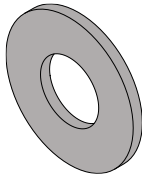
GT2 pulley used on the motion system of the Micron.

**HEAT SET INSERT**

Heat the inserts with a soldering iron so that they melt the plastic when installed. As the plastic cools, it solidifies around the knurls and ridges on the insert for excellent resistance to both torque and pull-out.

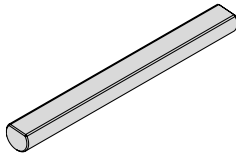
**SELF TAPPING SCREW**

Fastener with a pronounced thread profile that is screwed directly into plastic.

**M3 SHIMS**

Not to be confused with stamped washers. These are used in all M3 call-out locations in this manual.

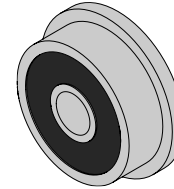
3x6x0.5 DIN 988

**5mm x 47mm Shaft**

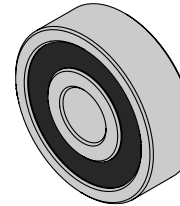
Steel shaft, 5mm in diameter, 47mm long with a flat ground on it used in the Z drive gear box assembly

**ATTENTION BUBBLE**

This logo denotes steps that are common areas that mistakes can occur.

**F623 BEARING**

A ball bearing with a flange used in various gantry locations.

**625 BEARING**

A ball bearing with used in the Z drive.

**MICRON Logo**

Look for Micron Logo next to the printed part, this is a direct link to the file on the github repo.

Hardware Used

Look for the **GREEN** call outs to mention the various hardware used

(qty) – location - SIZE

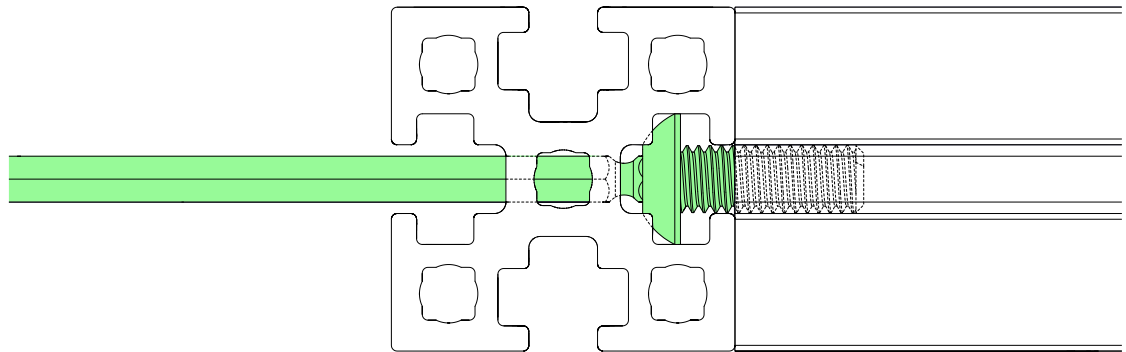
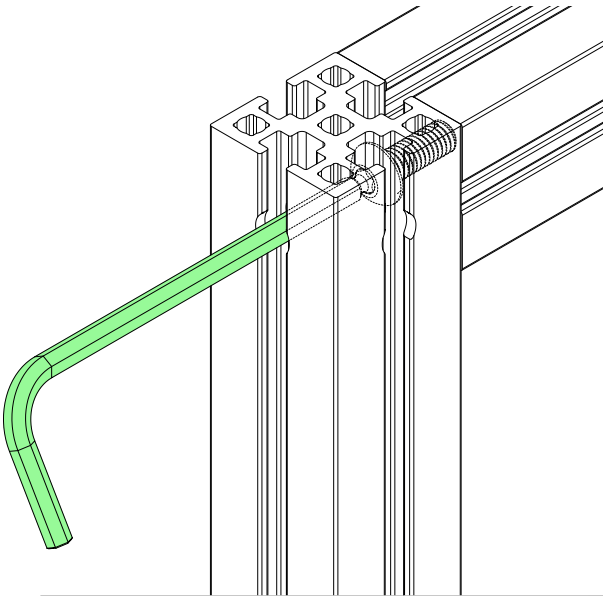
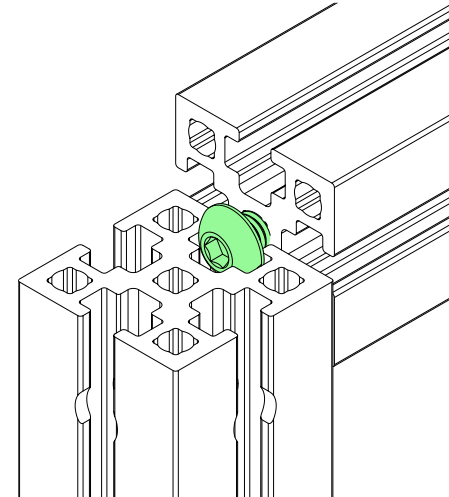
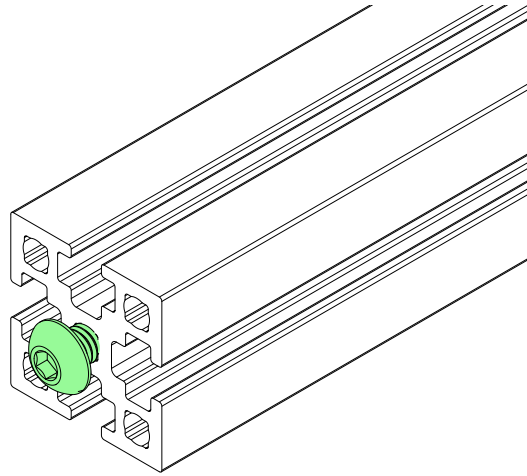
Look for the **BLACK** call outs to mention the preloaded M3 nuts, **NOTE:** some of them are specific to the size of printer and will be in bold at the end

BLIND JOINT BASICS

Blind Joints provide a cost-effective and rigid assembly method.

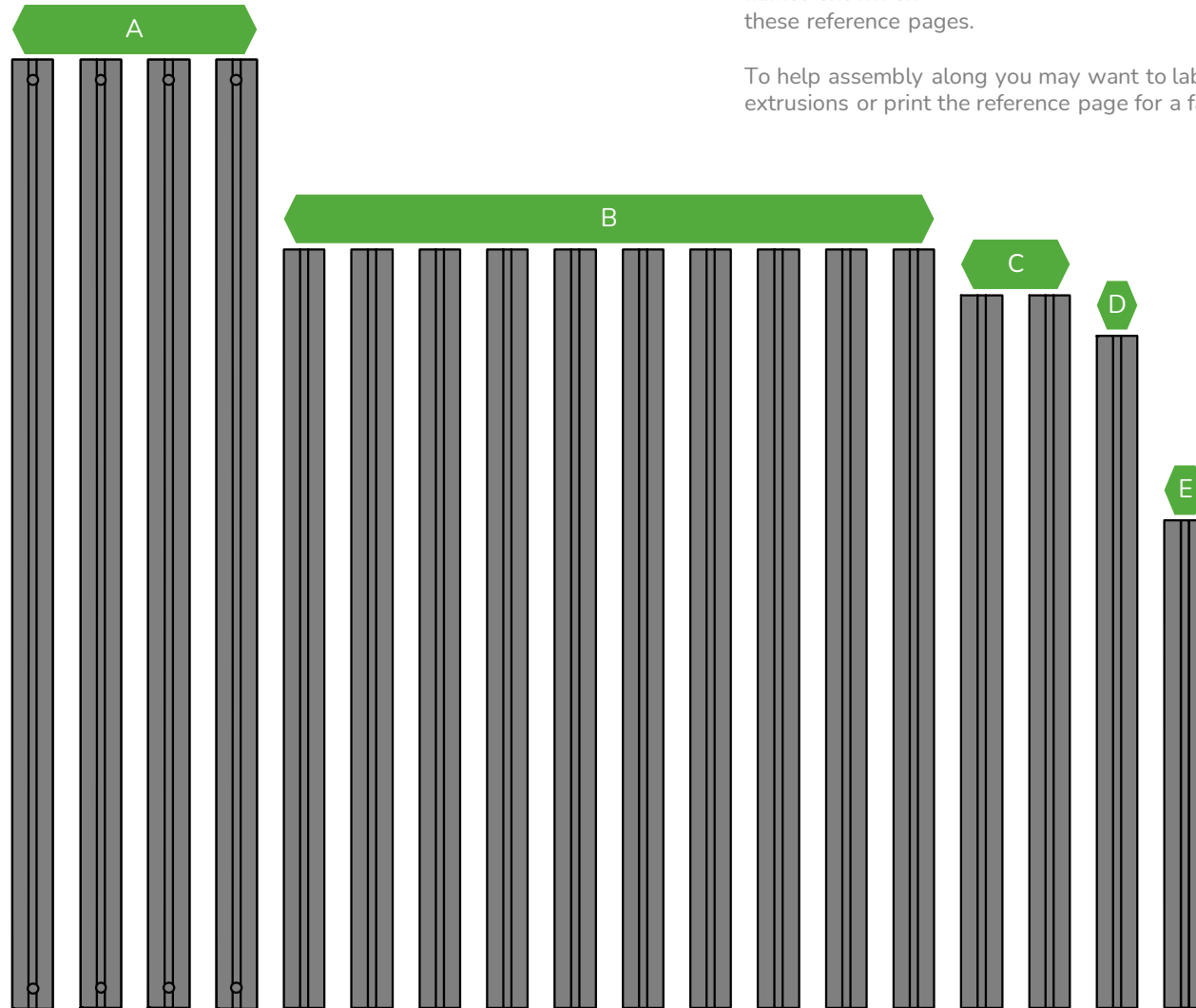
The head of the BHCS is slid into the channel of another extrusion and securely fastened through a small access hole in the extrusion.

If you've never assembled one before we recommend you watch the linked guide.



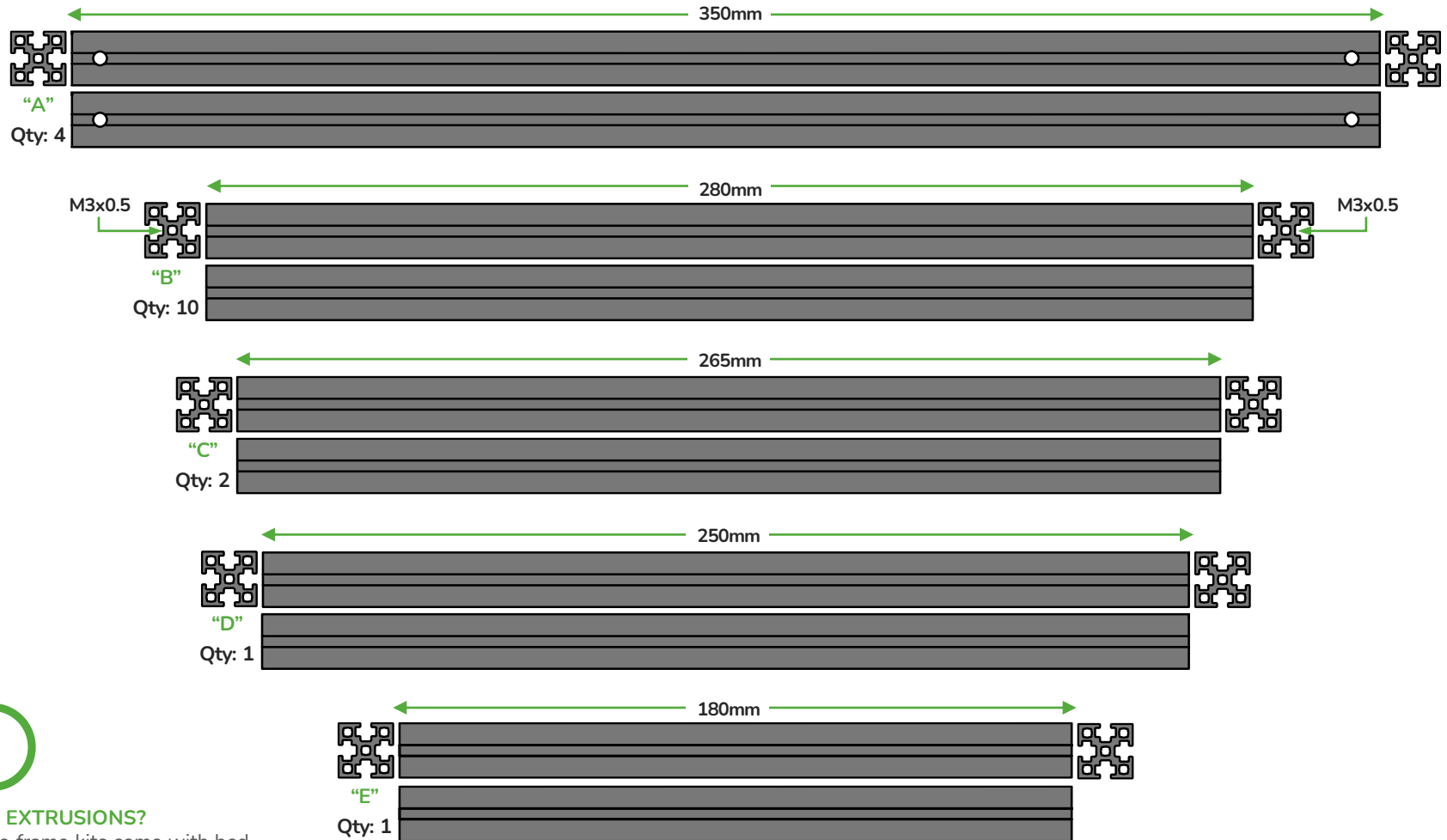
SORT EXTRUSIONS

Collect your extrusions and sort them by length. We will highlight the extrusions used in each step and label them as shown on this page.

**EXTRUSION CALL-OUTS**

To avoid confusion, we will call out the extrusions by the names shown on these reference pages.

To help assembly along you may want to label the extrusions or print the reference page for a faster lookup.

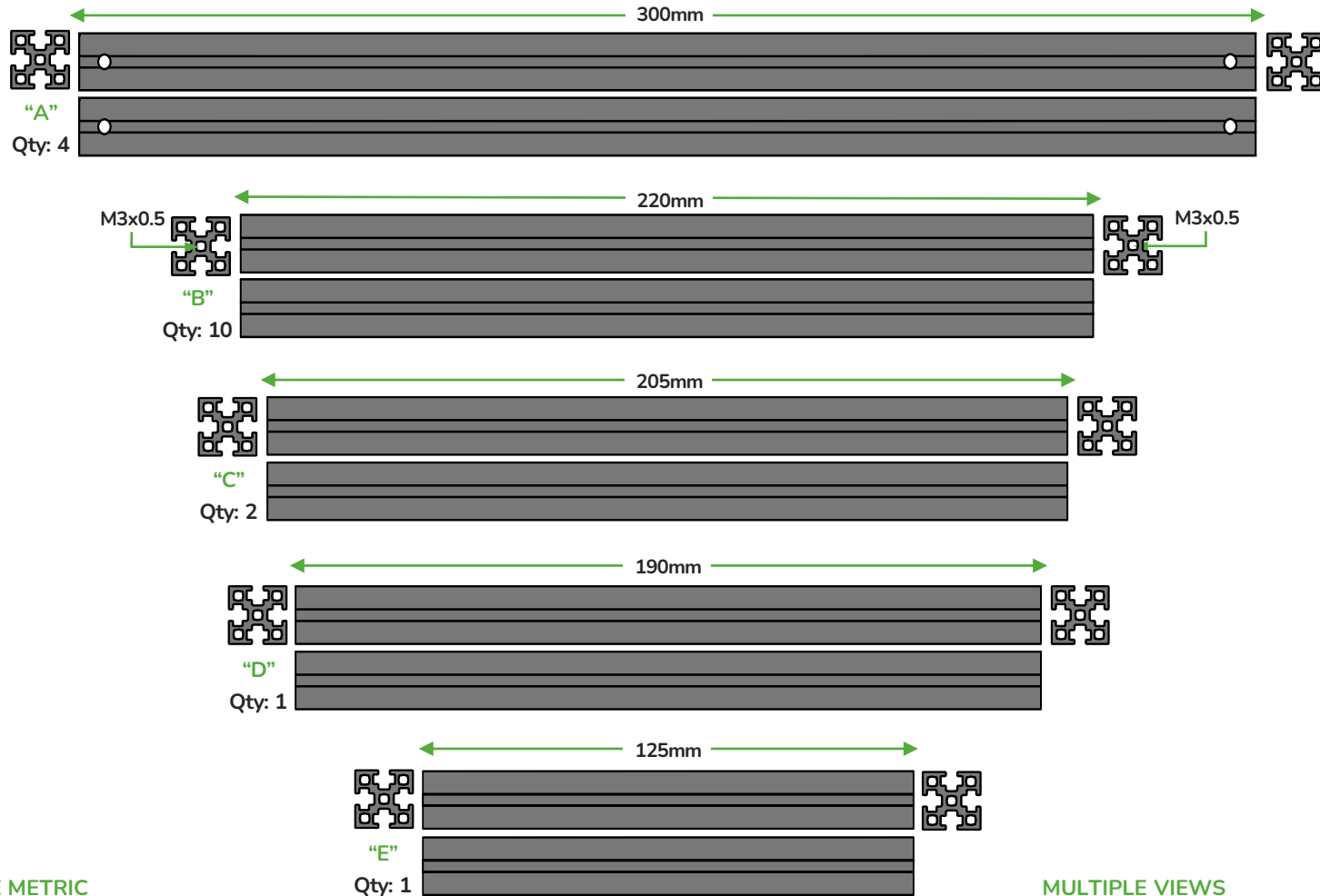


BED EXTRUSIONS?

Some frame kits come with bed extrusions that are mounted using blind joints. These will end up being 2 longer extrusions and 8 B extrusions.

MULTIPLE VIEWS

The views shown are the left, front, right, and bottom views of each extrusion.



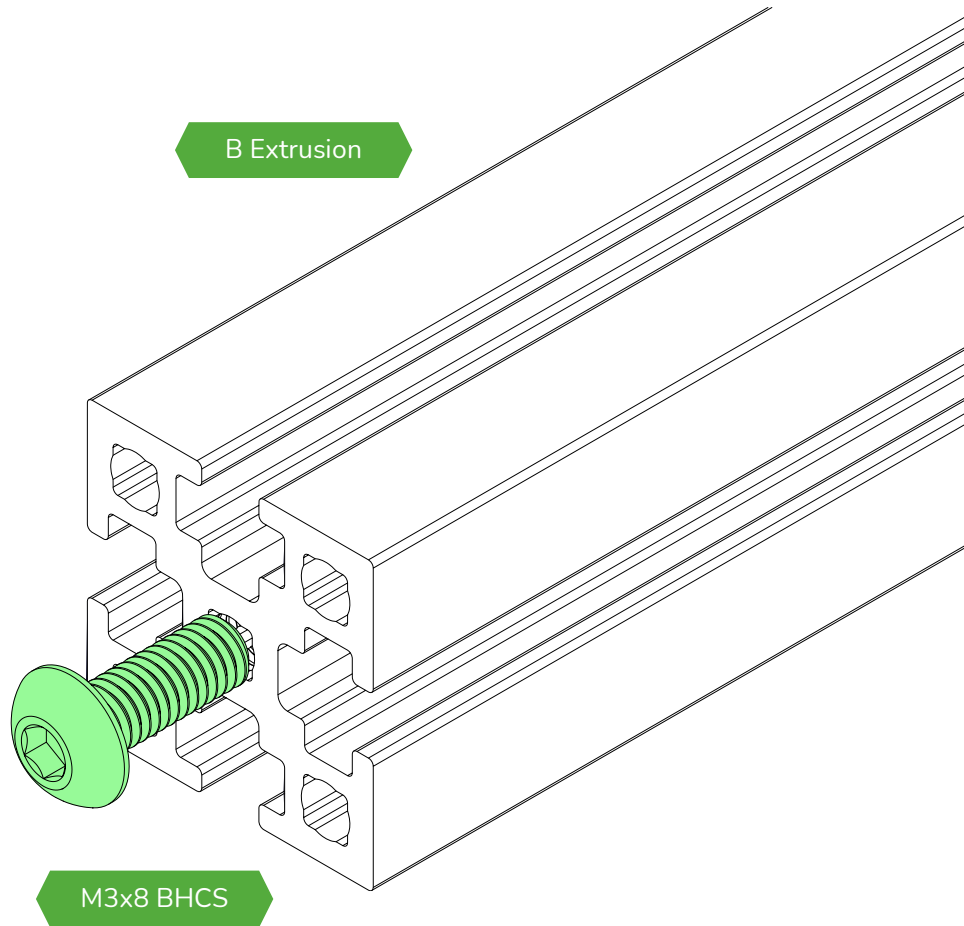
ALL UNITS ARE METRIC

If a unit is not specified assume it's metric.

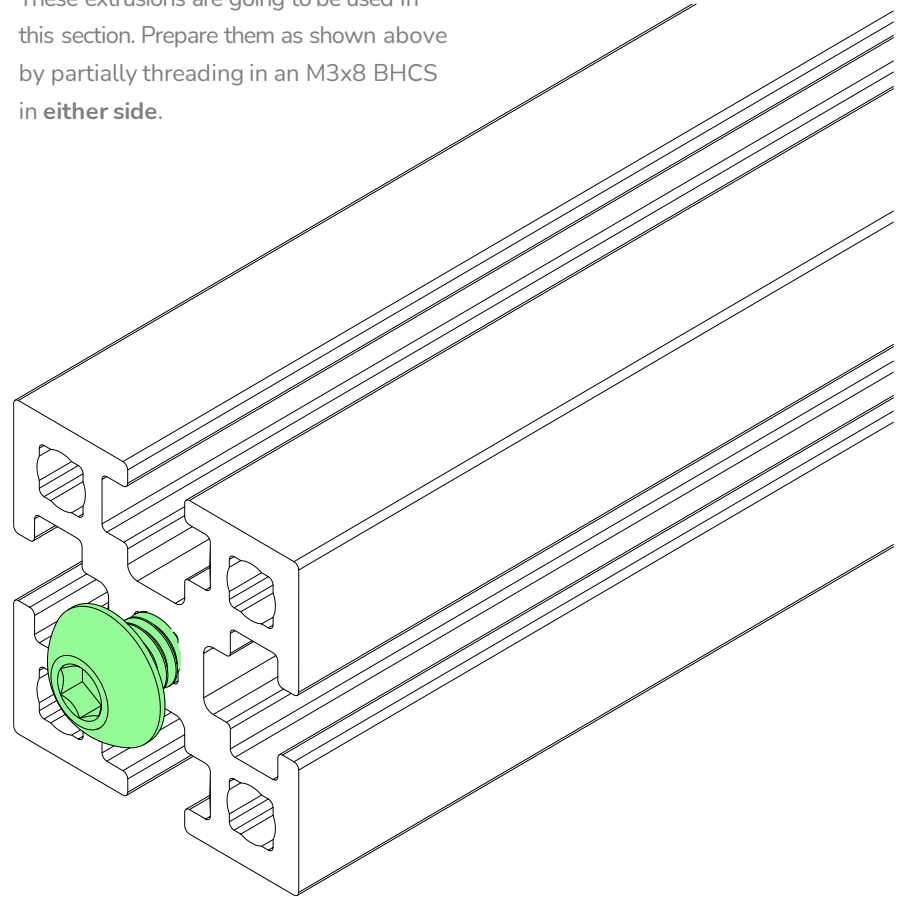
MULTIPLE VIEWS

The views shown are the left, front, right, and bottom views of each extrusion.



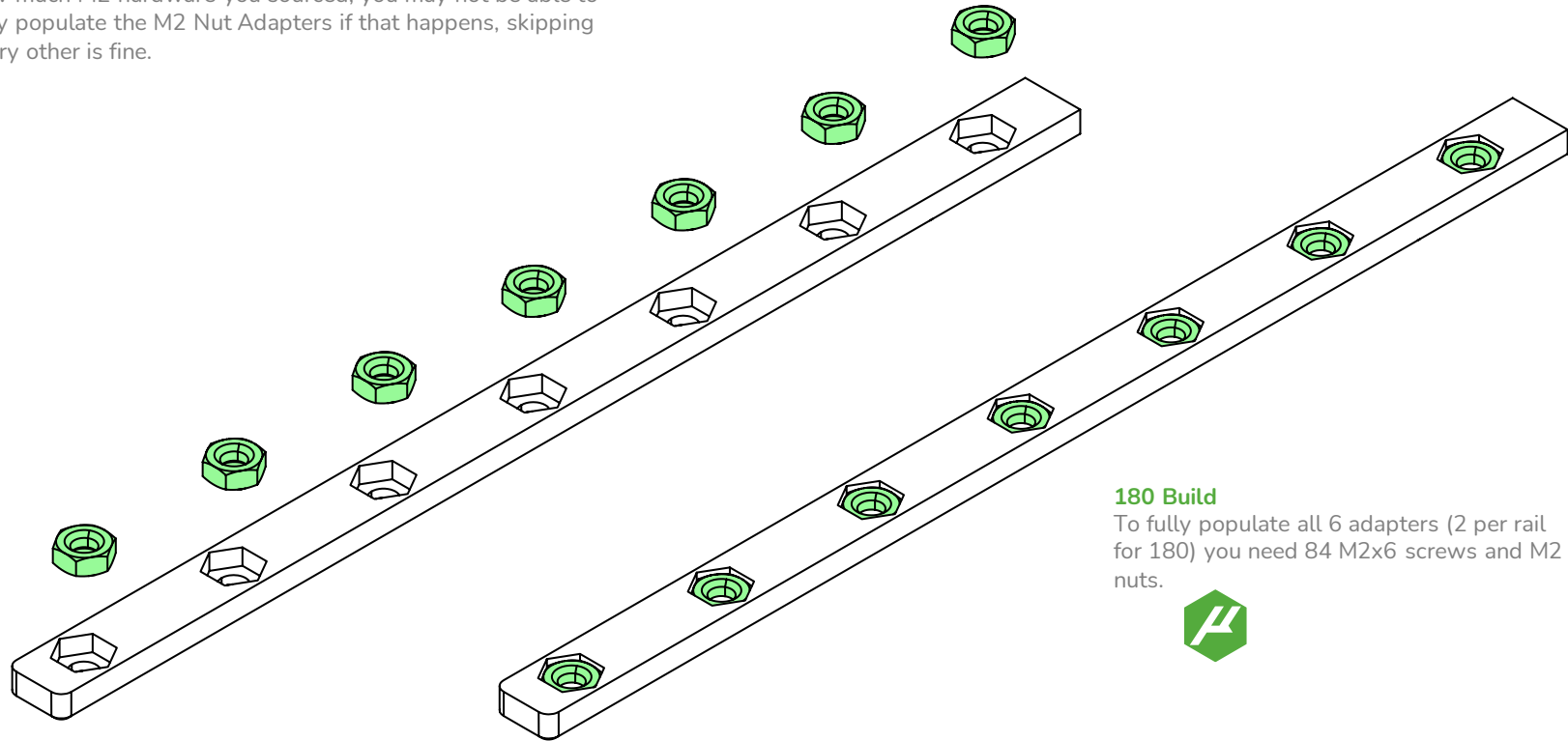
**PREPARE 8 EXTRUSIONS**

These extrusions are going to be used in this section. Prepare them as shown above by partially threading in an M3x8 BHCS in **either side**.



POPULATING NUT CARRIERS

Pictured shows all the m2 nuts populated, but depending on how much M2 hardware you sourced, you may not be able to fully populate the M2 Nut Adapters if that happens, skipping every other is fine.

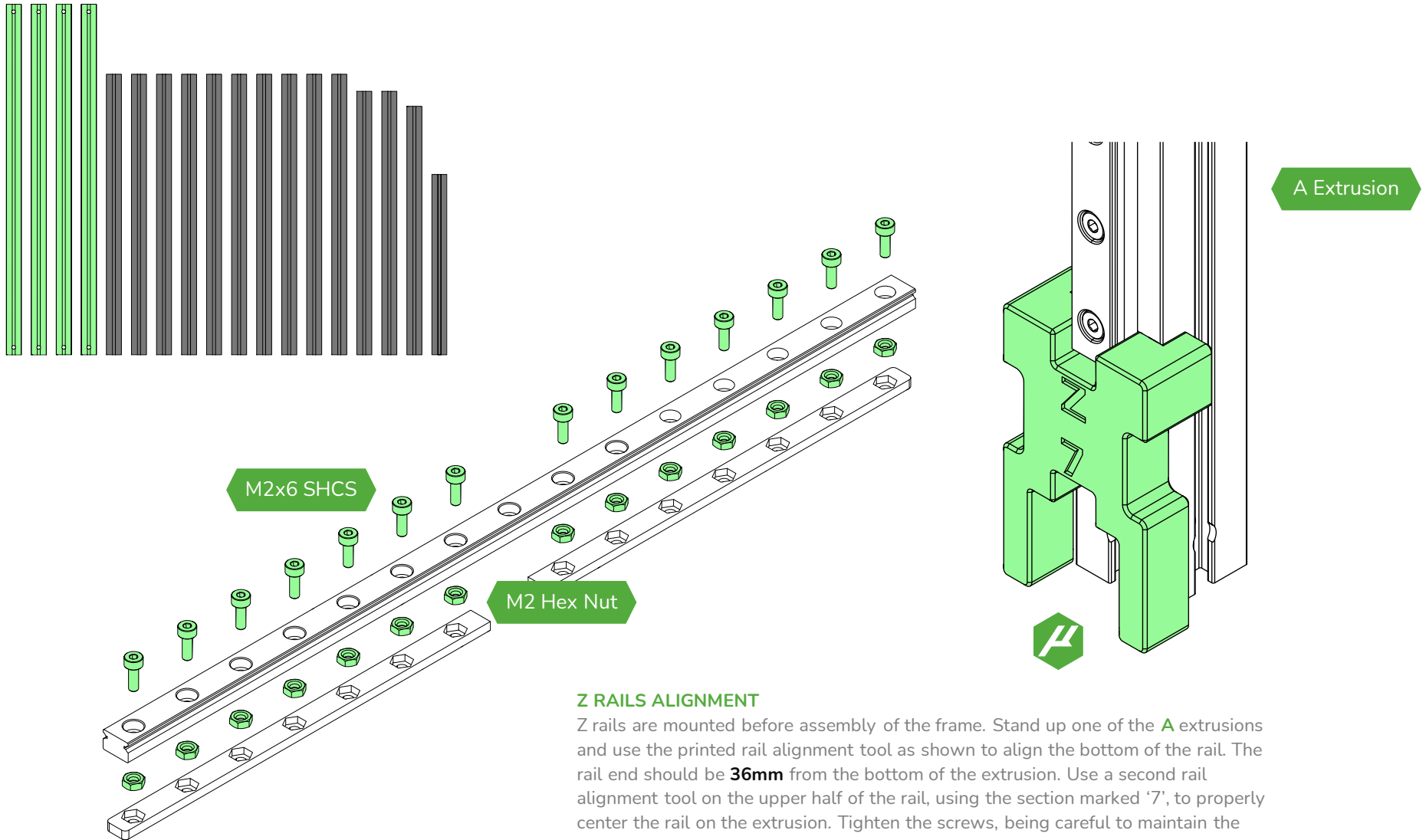
**120 Build**

To fully populate all 6 adapters (1 per rail for 120) you need 60 M2x6 screws and M2 nuts.

**180 Build**

To fully populate all 6 adapters (2 per rail for 180) you need 84 M2x6 screws and M2 nuts.



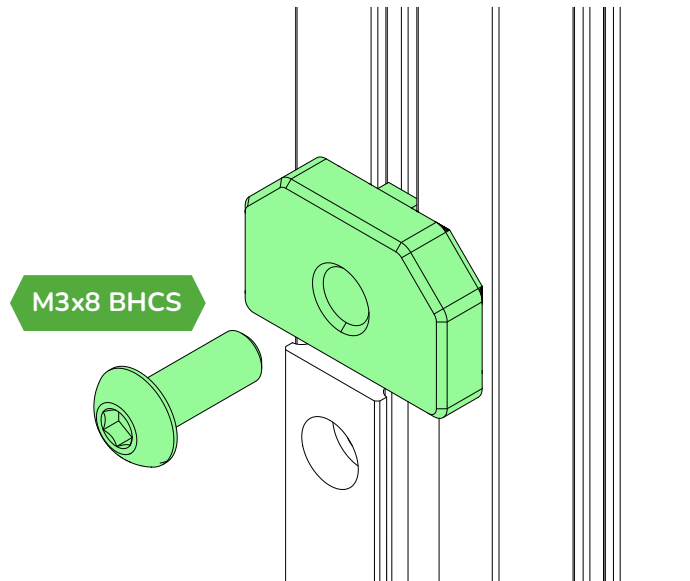


Z RAILS ALIGNMENT

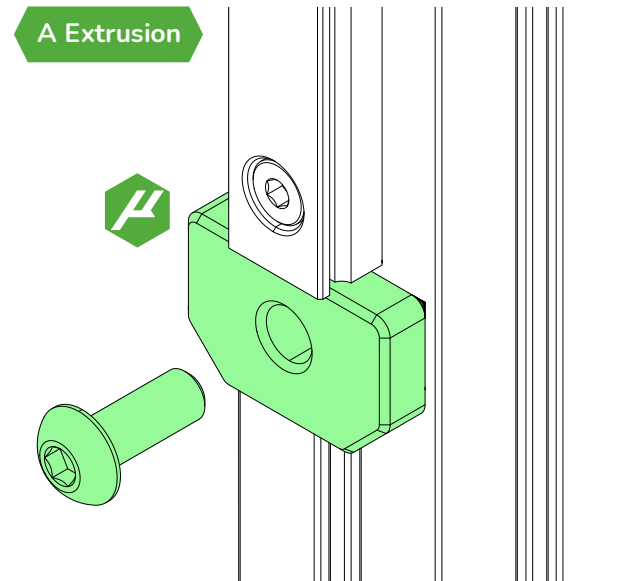
Z rails are mounted before assembly of the frame. Stand up one of the **A** extrusions and use the printed rail alignment tool as shown to align the bottom of the rail. The rail end should be **36mm** from the bottom of the extrusion. Use a second rail alignment tool on the upper half of the rail, using the section marked '7', to properly center the rail on the extrusion. Tighten the screws, being careful to maintain the alignment provided by the printed tools. Repeat this process for all 4 **A** extrusions and their rails.

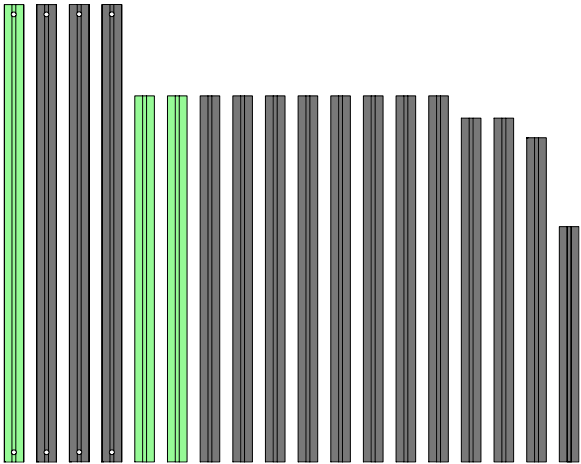
WHERE'S THE NUT!?

The instructions won't call out nuts that were inserted in a previous step, nor nuts that can be easily inserted in the current step. If a screw does NOT thread into a nut we will explicitly state this. **You can assume that all screws that enter extrusion slots thread into a nut.**

**RAIL STOPS**

With the Z rails installed, the rail stops can now be added to both ends. Loosely screw an M3x8 BHCS. Repeat for both ends of all 4 Z rails. Now you can work on the build without risking a Z carriage flying off its rail.

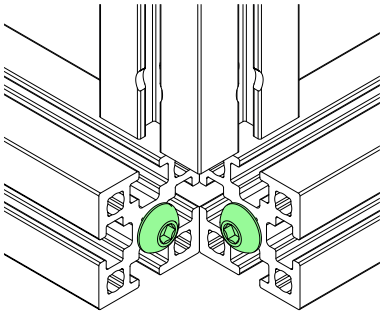




Corner 1

CORNER #1 ASSEMBLY

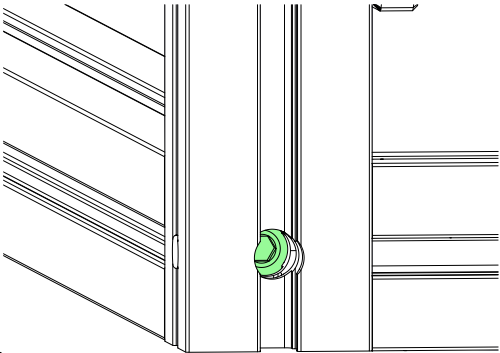
Start with one of our preassembled **A** extrusions, and two of the **B** extrusions. Note the direction the linear rail is facing. Slide the one of the **A** extrusions on forming the first corner with the two **B** extrusions. While using your assembly surface to hold things flush and square, tighten the two screws to make the first corner secure.



A Extrusion

BUILD ON A FLAT SURFACE

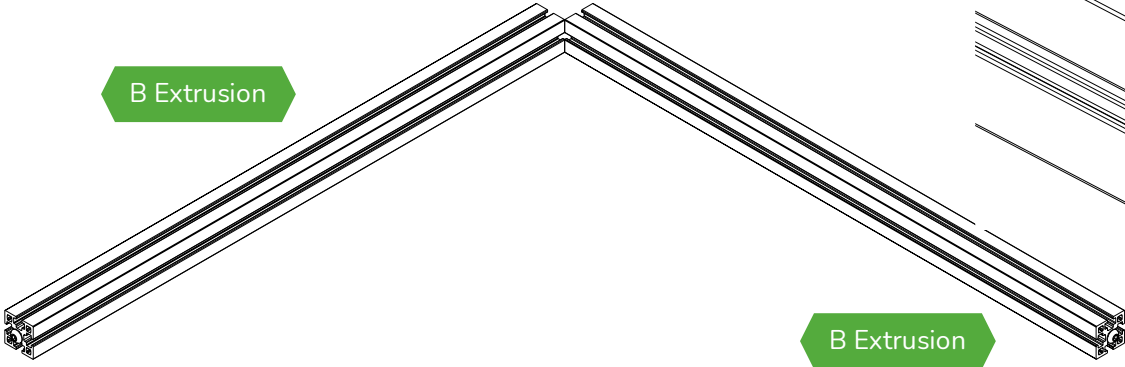
Build the frame on a glass or granite surface to ensure you can get it as square as possible.



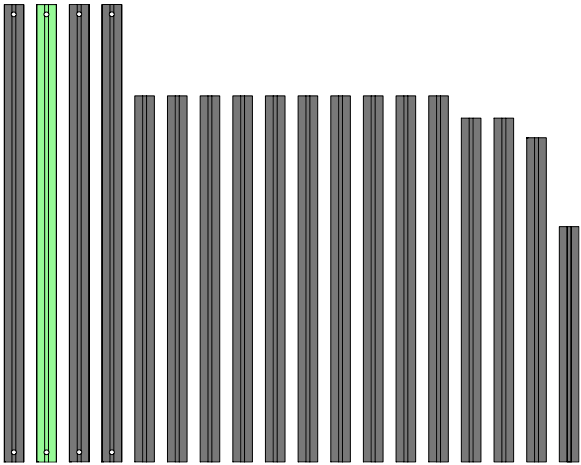
B Extrusion

FRAME ASSEMBLY

This design relies on blind joints to assemble the frame. We outlined the basics of blind joints on page 7

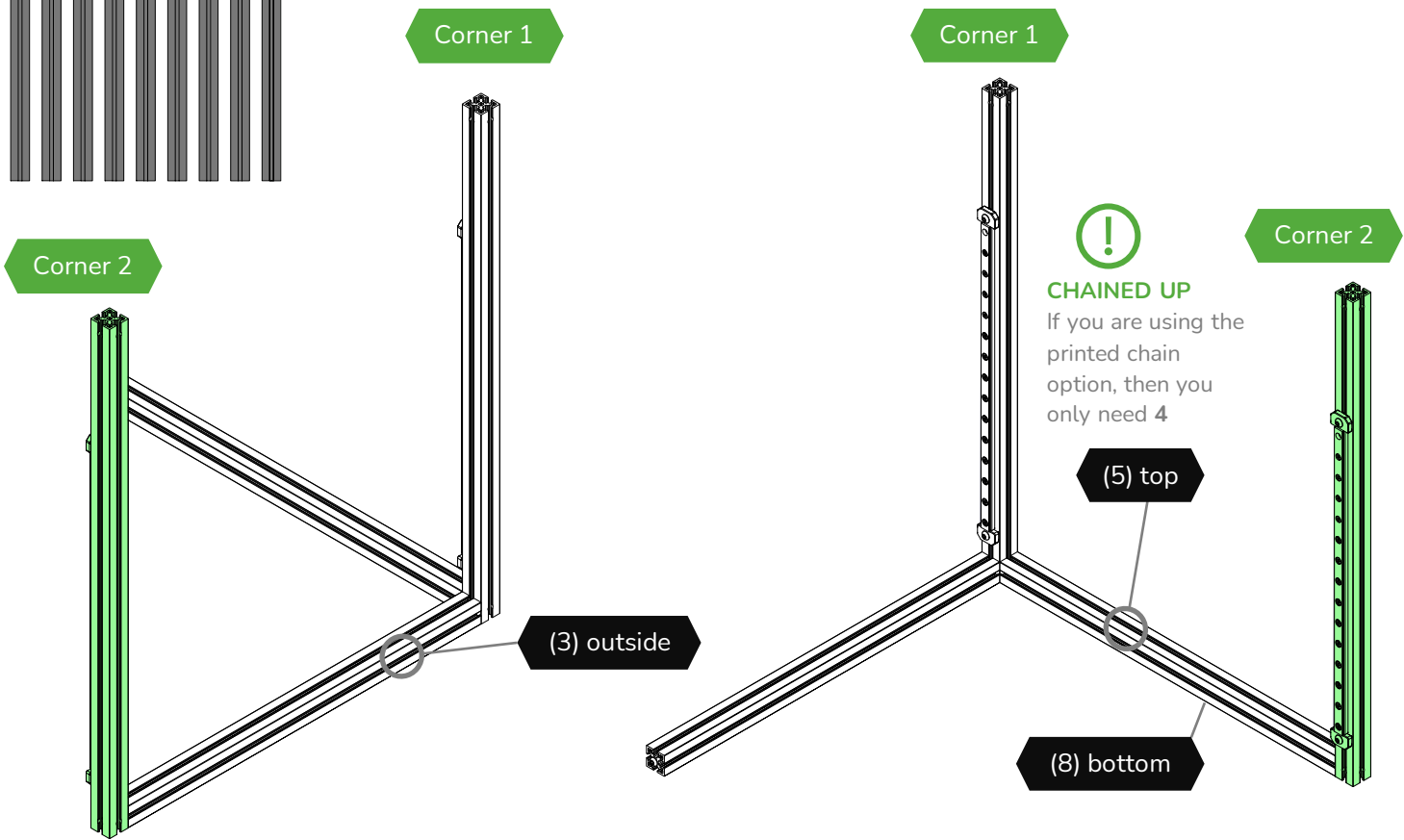


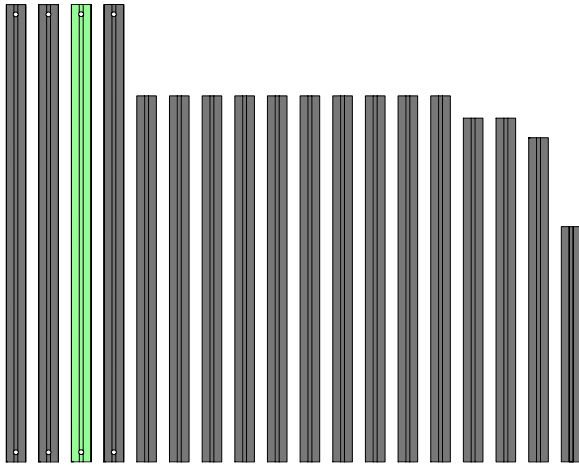
B Extrusion



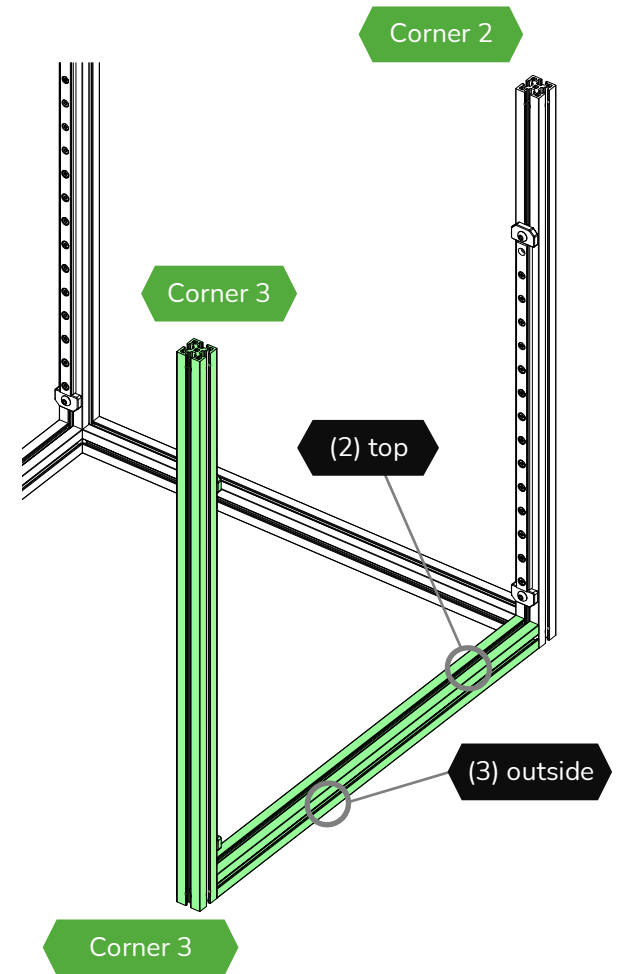
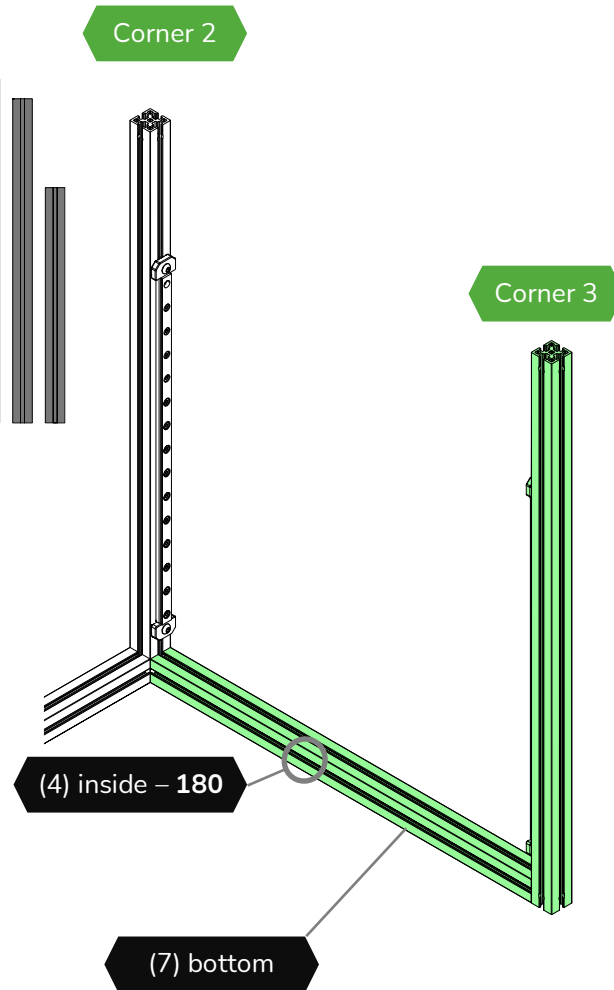
CORNER #2 ASSEMBLY

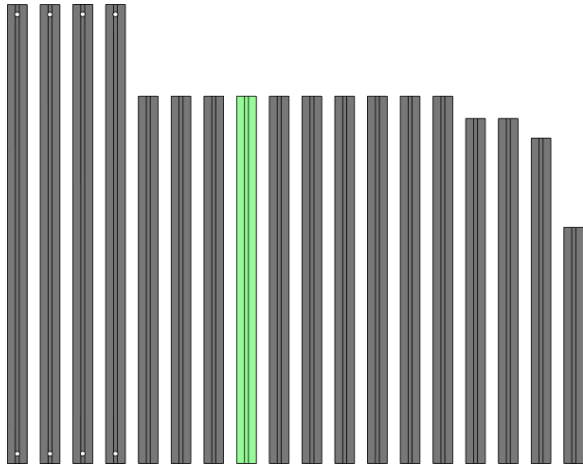
Before adding the next **A** extrusion, preload nuts into the **B** extrusion that is about to be enclosed, as shown. It receives. Corner extrusion **#2** will install the same as the first, using an M3x8 BHCS for the blind joint. Note that the linear rail should face the same direction as the rail on Corner **#1**. Keep things as square and flush as possible as you tighten the screw to snug up the corner.



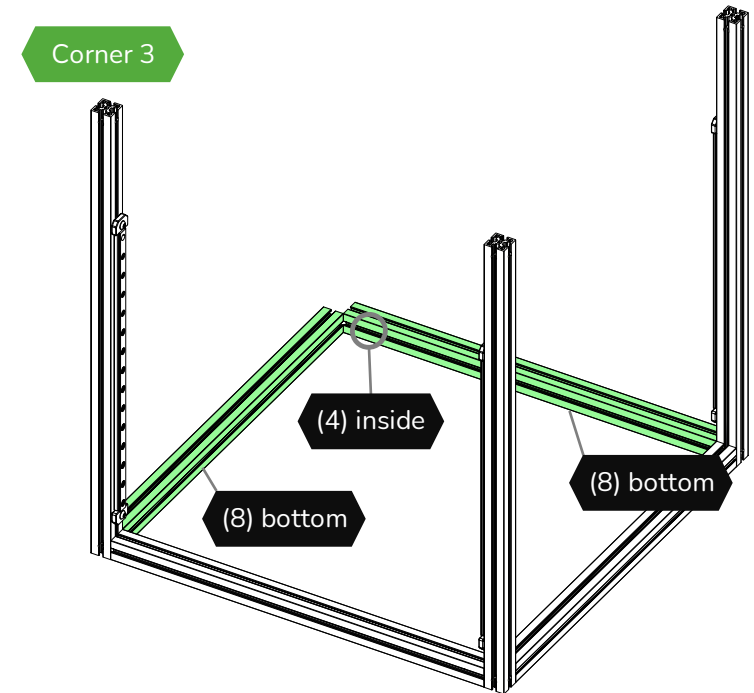
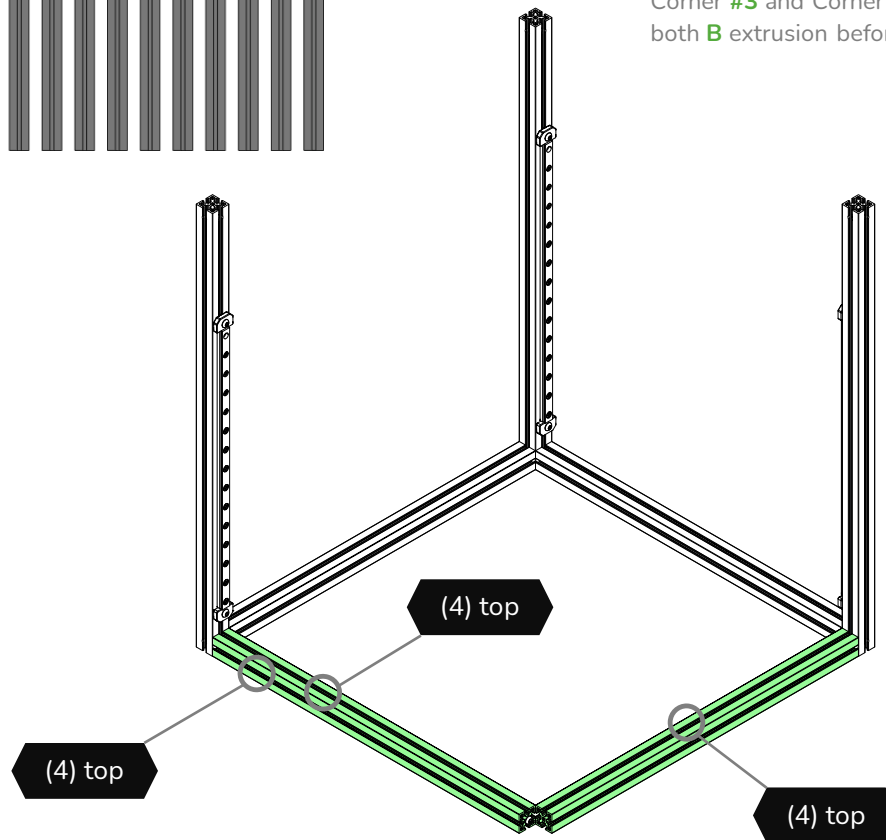
**CORNER #3 ASSEMBLY**

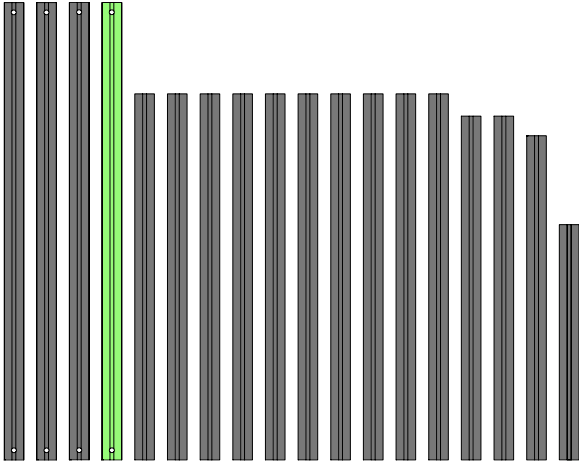
Before adding the next **A** extrusion, preload M3 nuts into the **B** extrusion that is about to be enclosed, as shown. It receives. Corner extrusion **#3** will install the same as the others, using an M3x8 BHCS for the blind joint. Note that the linear rail should face Corner **#2**. Keep things as square and flush as possible as you tighten the screw to snug up the corner.



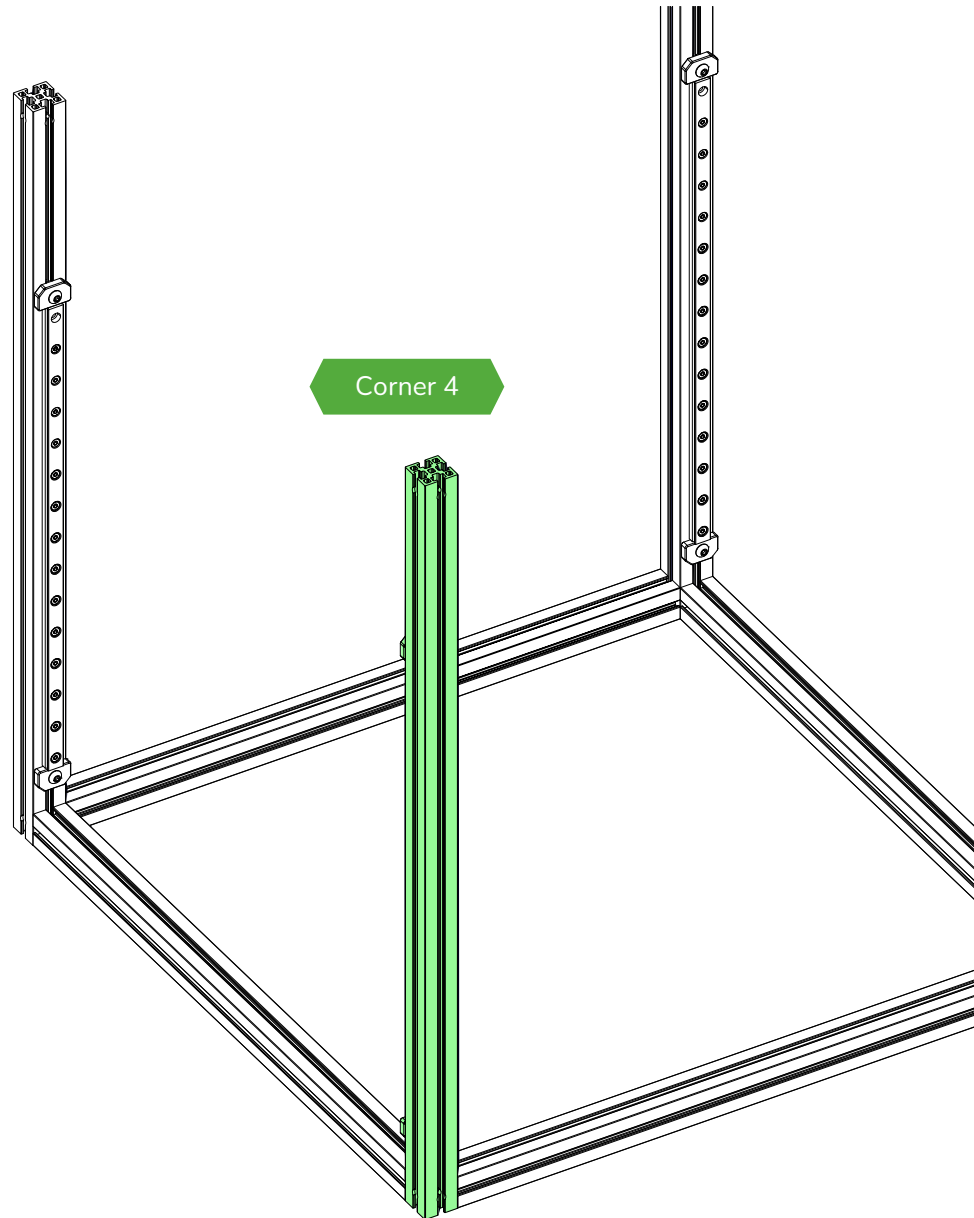
**FINAL LOWER EXTRUSION**

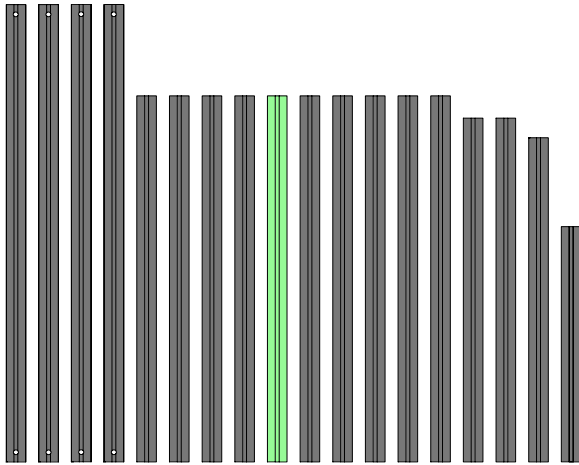
Before adding Corner #4, there are 2 **B** extrusions that need to be secured to both Corner #3 and Corner #1 with a blind joint. Then preload all nuts into the as shown in both **B** extrusion before proceeding to the next page.



**CORNER #4 ASSEMBLY**

Now add the last **A** extrusion, being sure the linear rail faces Corner **#1**. Use blind joints to secure it to the **B** extrusions as we did with the other corners. The bottom half of the frame is complete. Great job! Did you get all the preloads in place? This would be a great time to make a visual count, and double check.



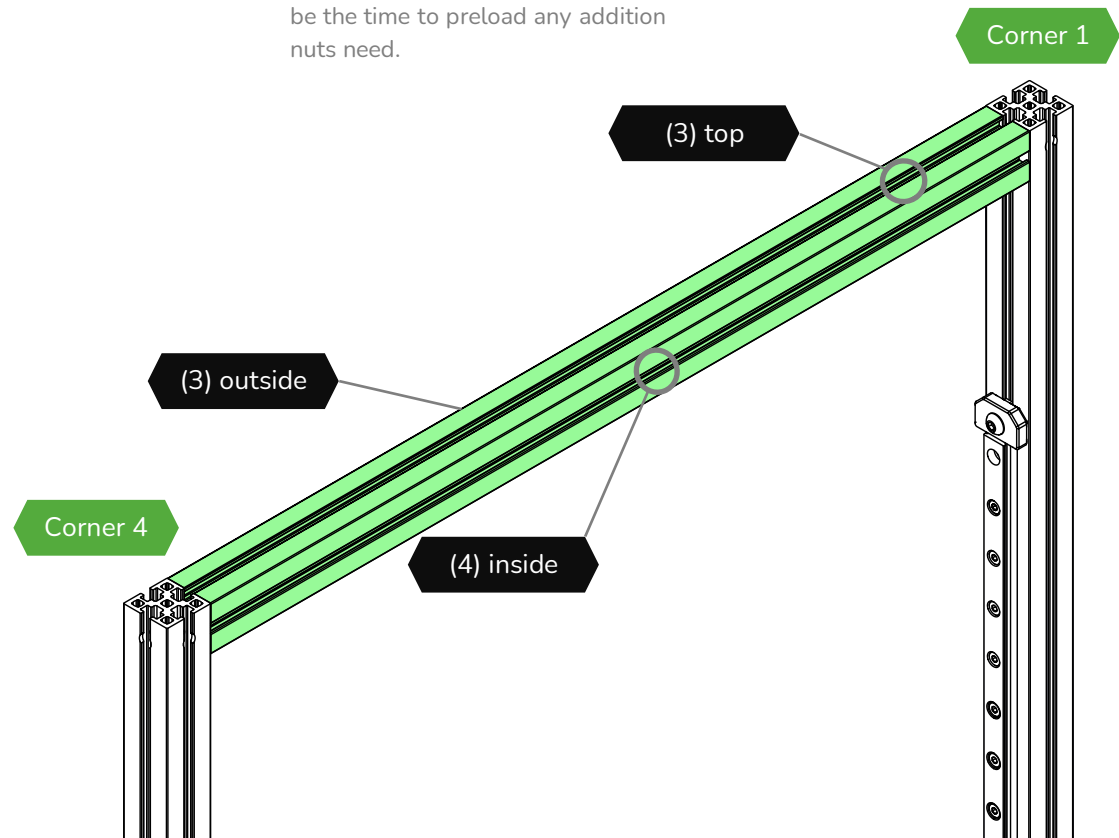


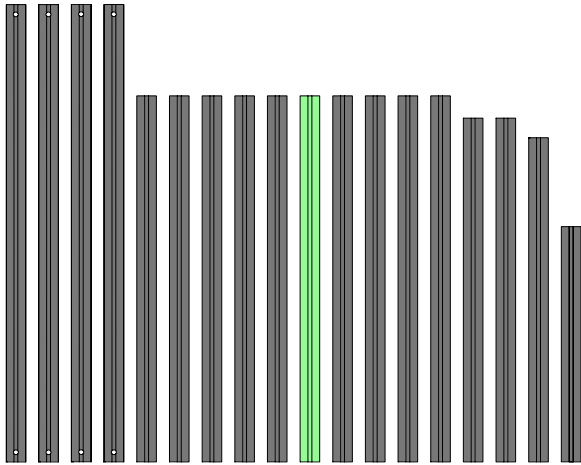
UPPER FRAME ASSEMBLY

The remaining four **B** extrusions will install using blind joints, the same way the lower ones were assembled. The following pages will detail the preloads for these extrusions, including preloads for the optional handles. Start with the extrusion that connects Corners **#1** and **#4**.

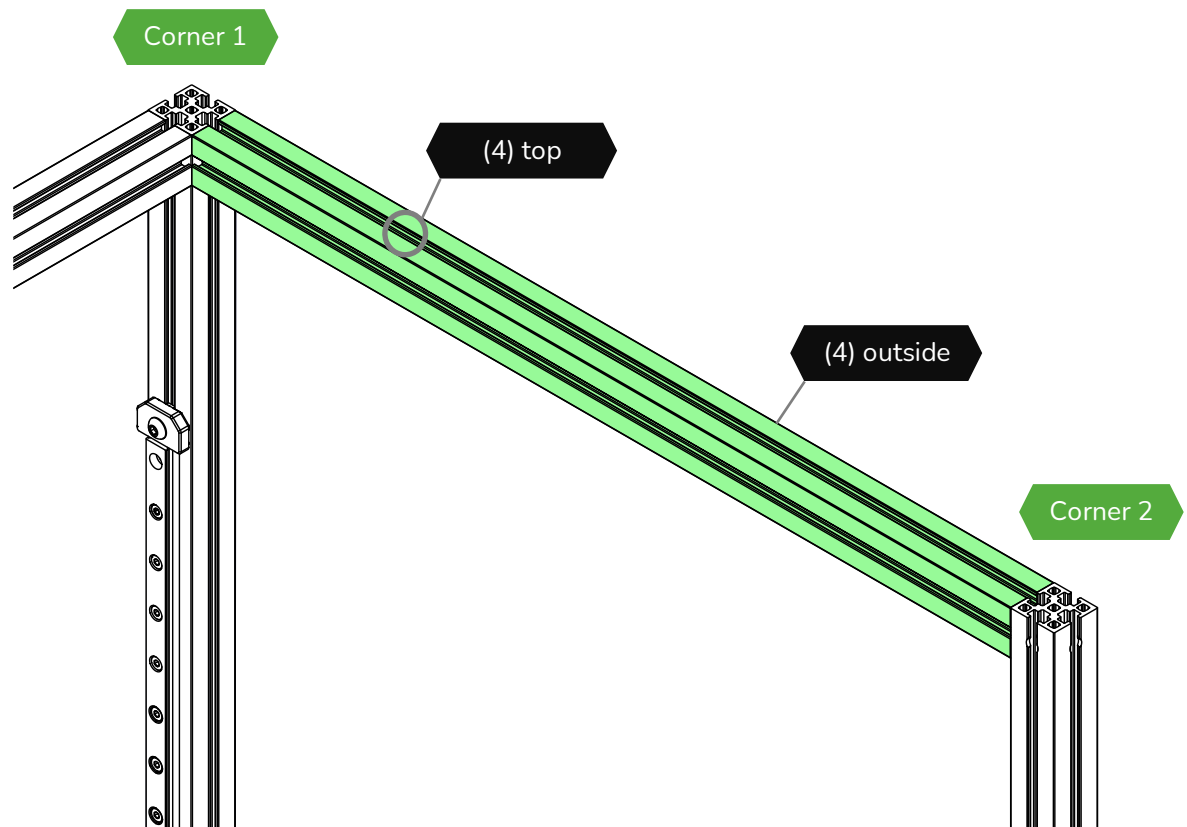
CAN YOU HANDLE IT?

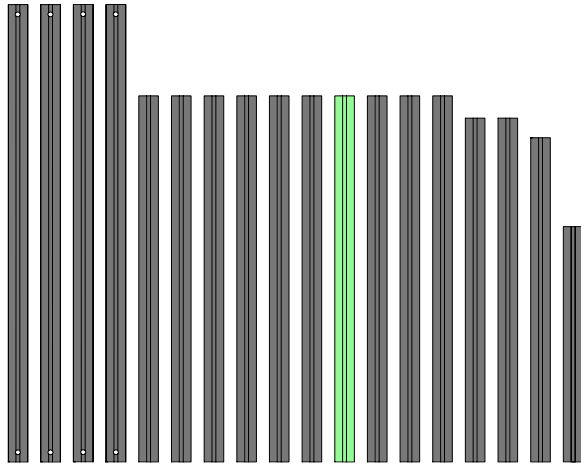
Handles are an optional component you can install atop your Micron. They make carrying the printer very easy. If you want to install handles now would be the time to preload any addition nuts need.



**TOP OF FRAME**

The **B** extrusion that connects Corners #1 and #2 receives: 4 nuts on top, and 4 nuts on the outside slot. Attach using blind joints as with previous beams.

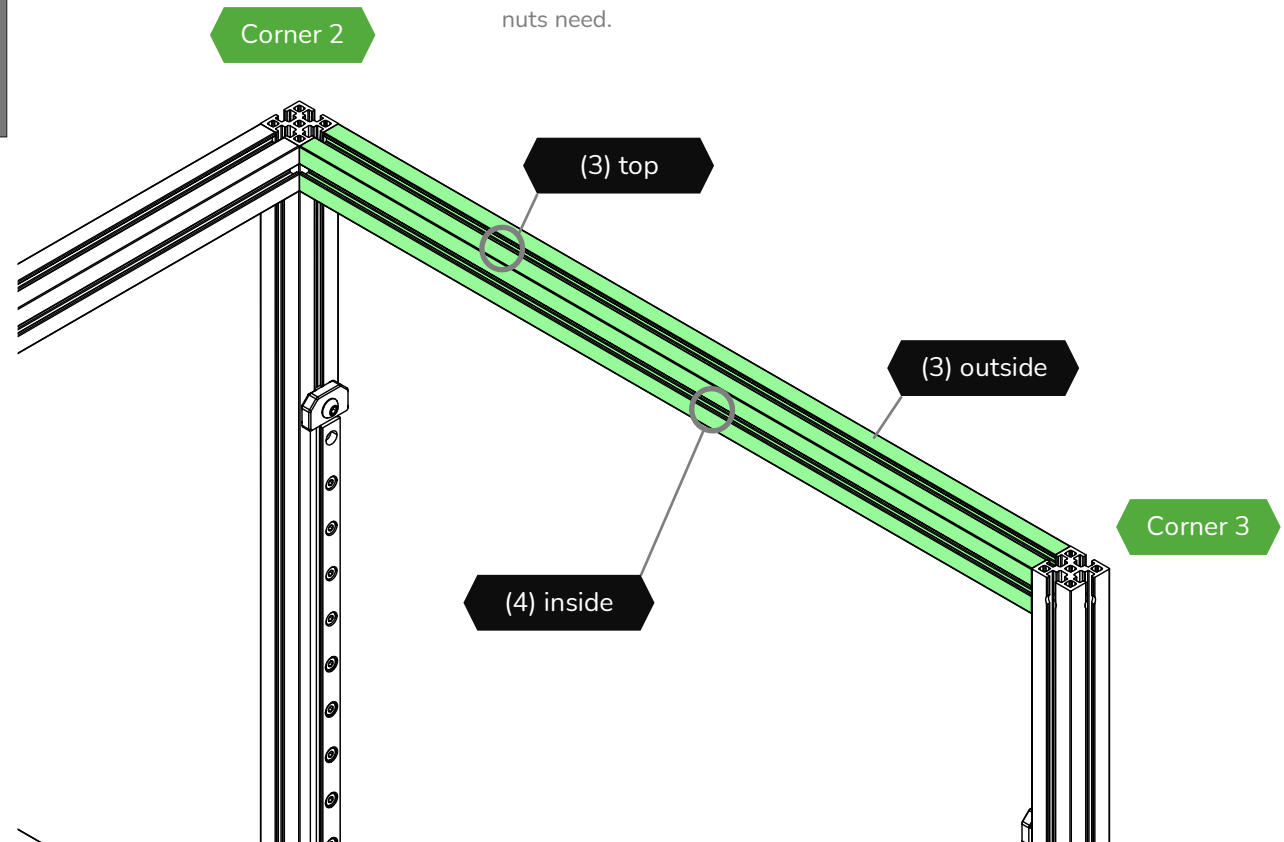


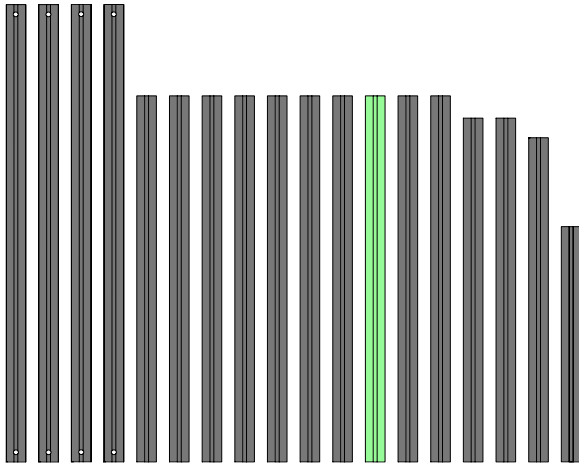
**TOP OF FRAME #3**

The **B** extrusion that connects Corners **#2** and **#3** receives: 4 nuts on top for handles (3 for no handles), 4 nuts inside, and 3 nuts outside. Attach using blind joints as with previous beams.

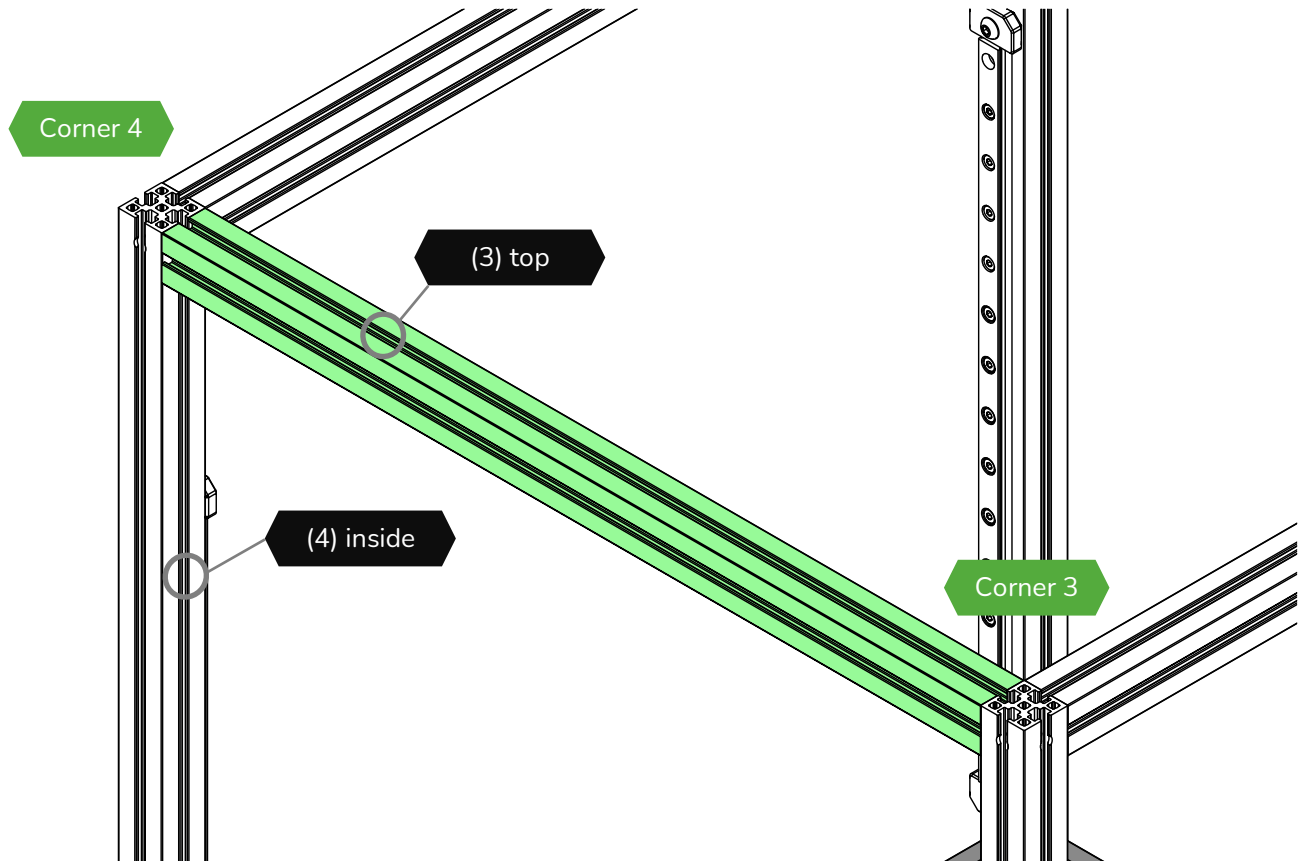
YOU CAN'T HANDLE THE TRUTH!

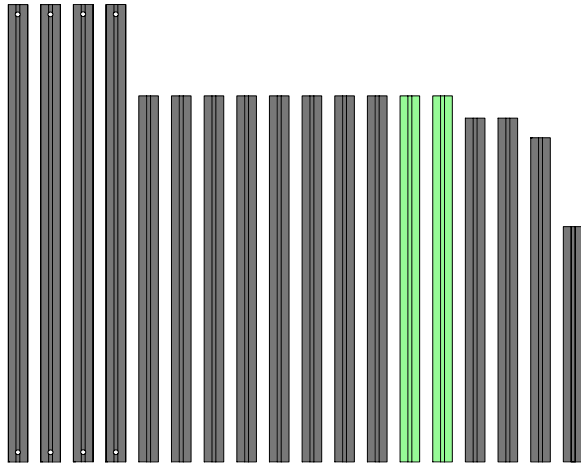
Handles are an optional component you can install atop your Micron. They make carrying the printer very easy. If you want to install handles now would be the time to preload any additional nuts need.



**TOP OF FRAME #4**

Before placing the final **B** extrusion, Corner **#4** gets 4 M3 nuts preloaded in the slot that faces corner **#3**. The final **B** extrusion itself receives: 3 nuts on top.



**CHAINED UP**

If you are using the printed chain option, then you need 3



(2) top

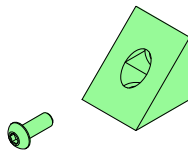
(2) top

(2) bottom

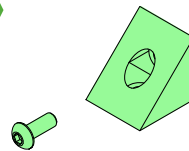
(2) bottom

BED EXTRUSIONS

Attach 2 corner brackets to the end of the last two **B** extrusions

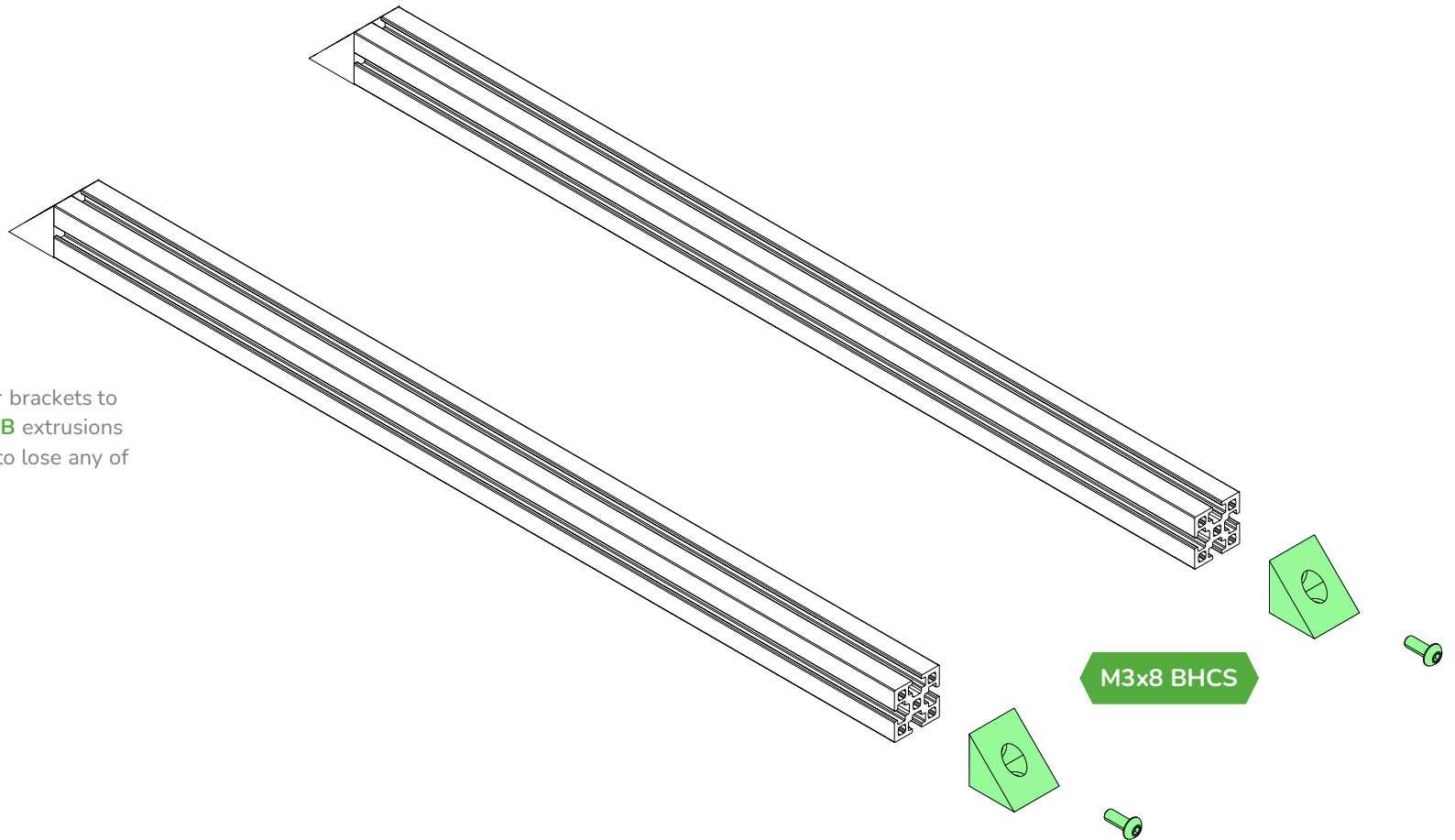


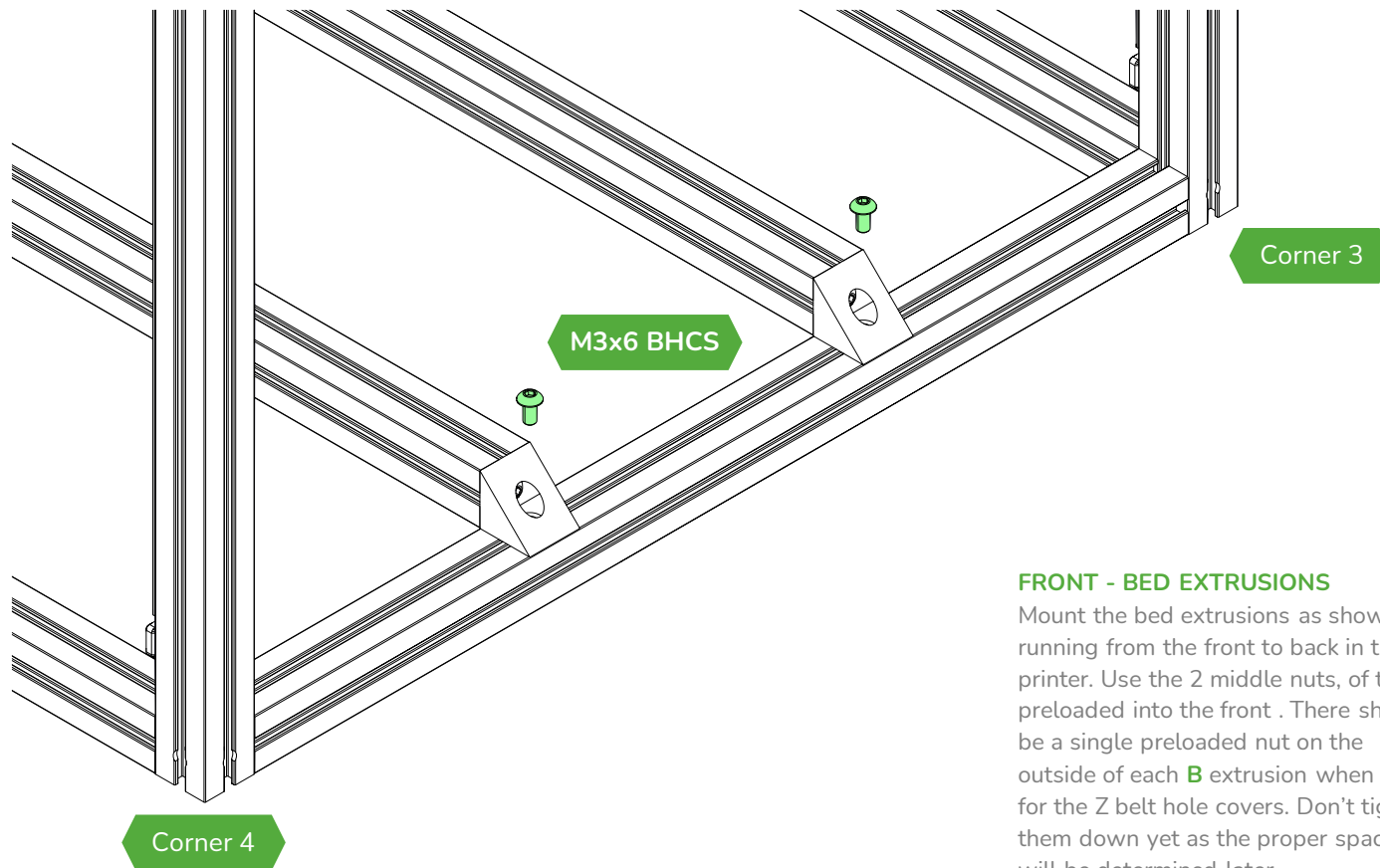
M3x8 BHCS



BED EXTRUSIONS

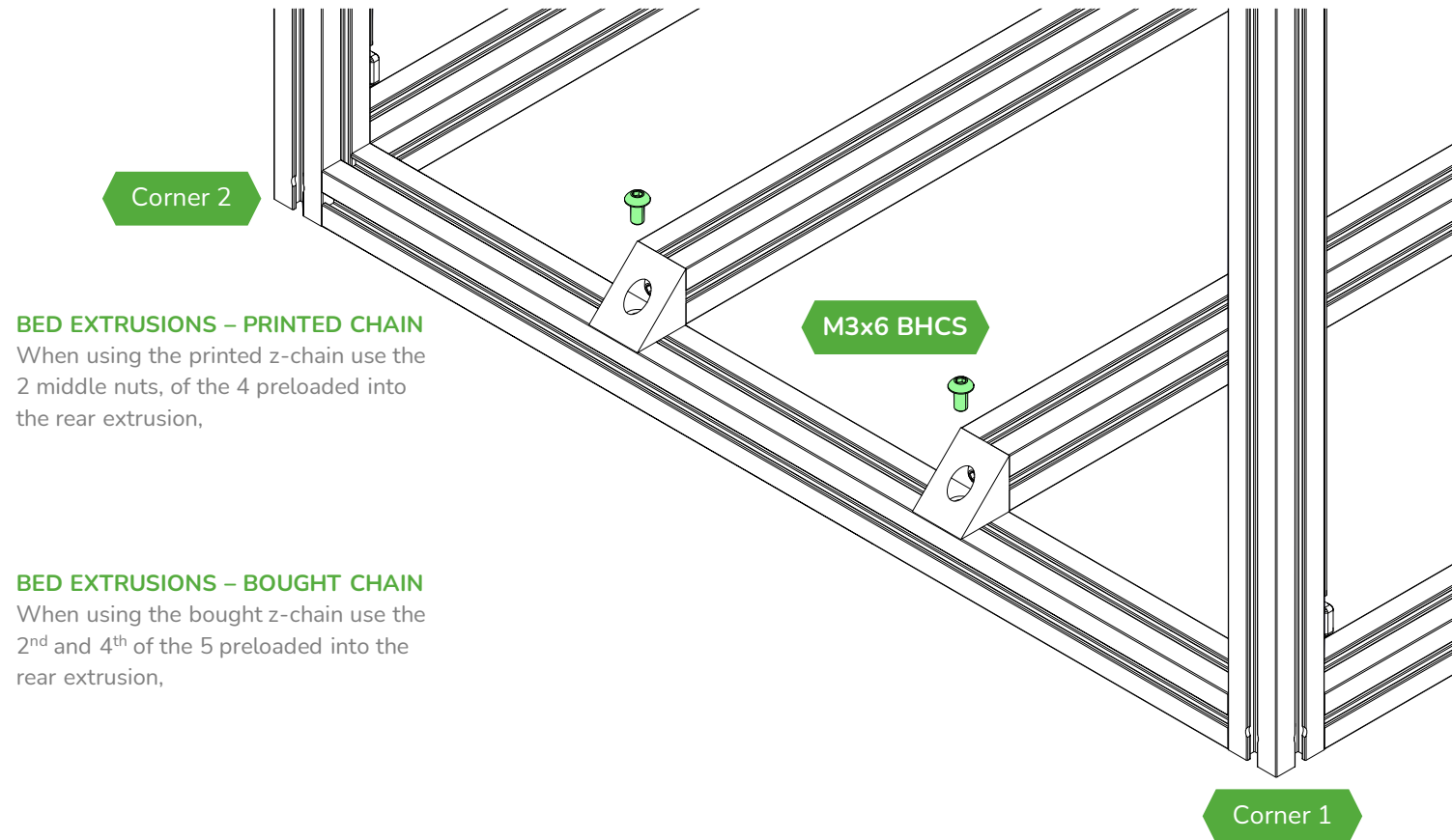
Attach the last 2 corner brackets to the end of the last two **B** extrusions while making sure not to lose any of the preloaded nuts





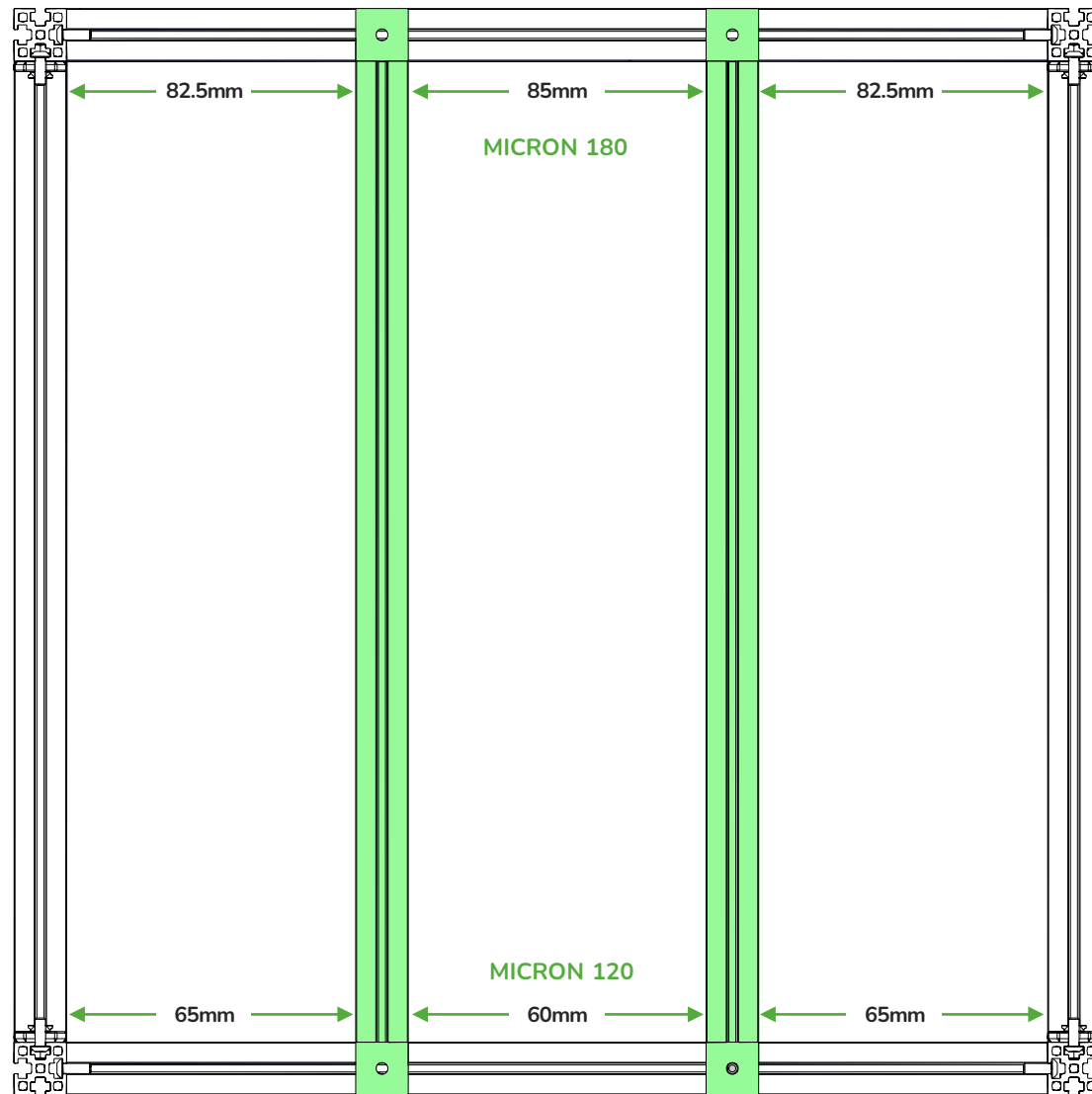
FRONT - BED EXTRUSIONS

Mount the bed extrusions as shown, running from the front to back in the printer. Use the 2 middle nuts, of the 4 preloaded into the front . There should be a single preloaded nut on the outside of each **B** extrusion when done for the Z belt hole covers. Don't tighten them down yet as the proper spacing will be determined later.



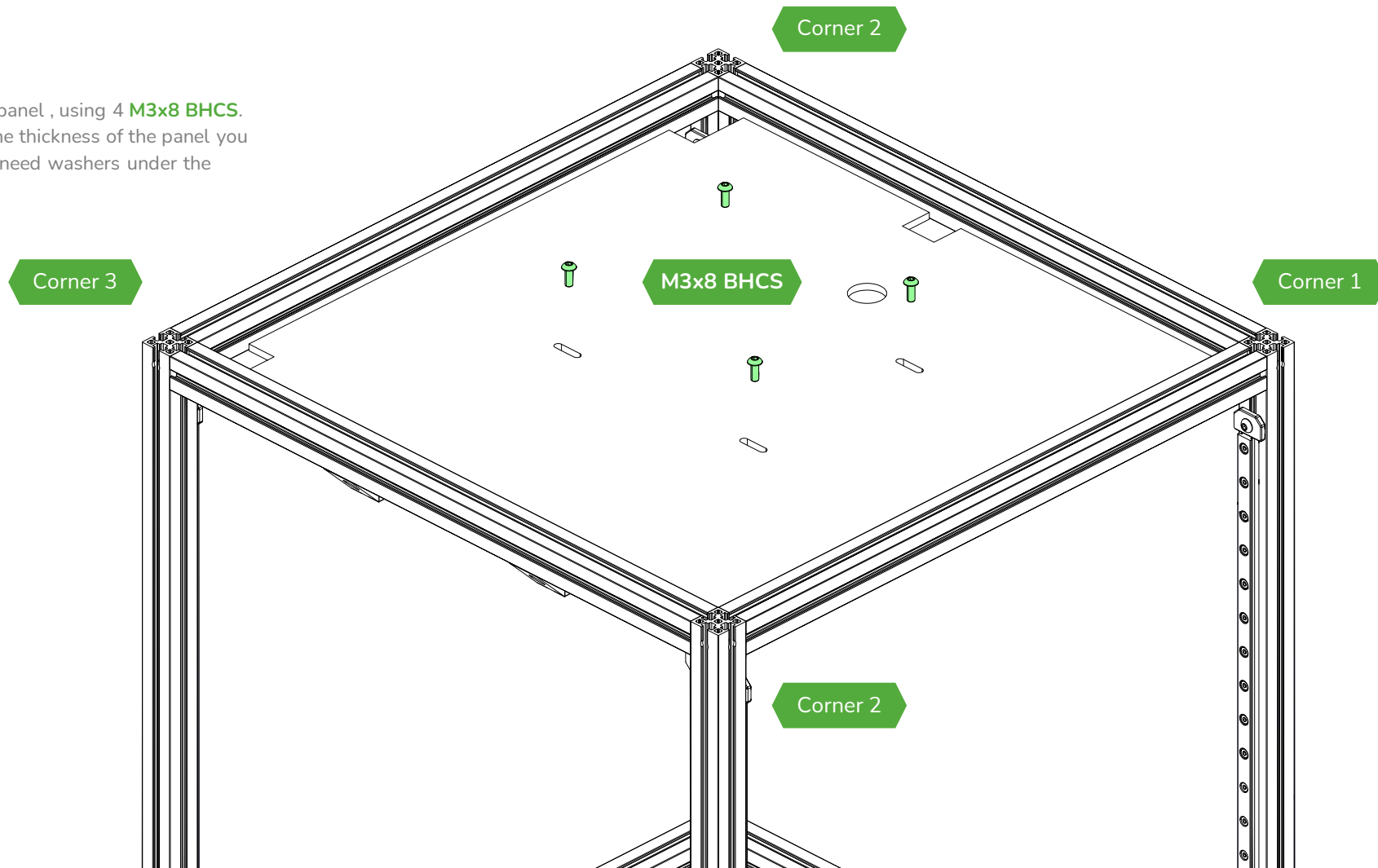
BED EXTRUSIONS

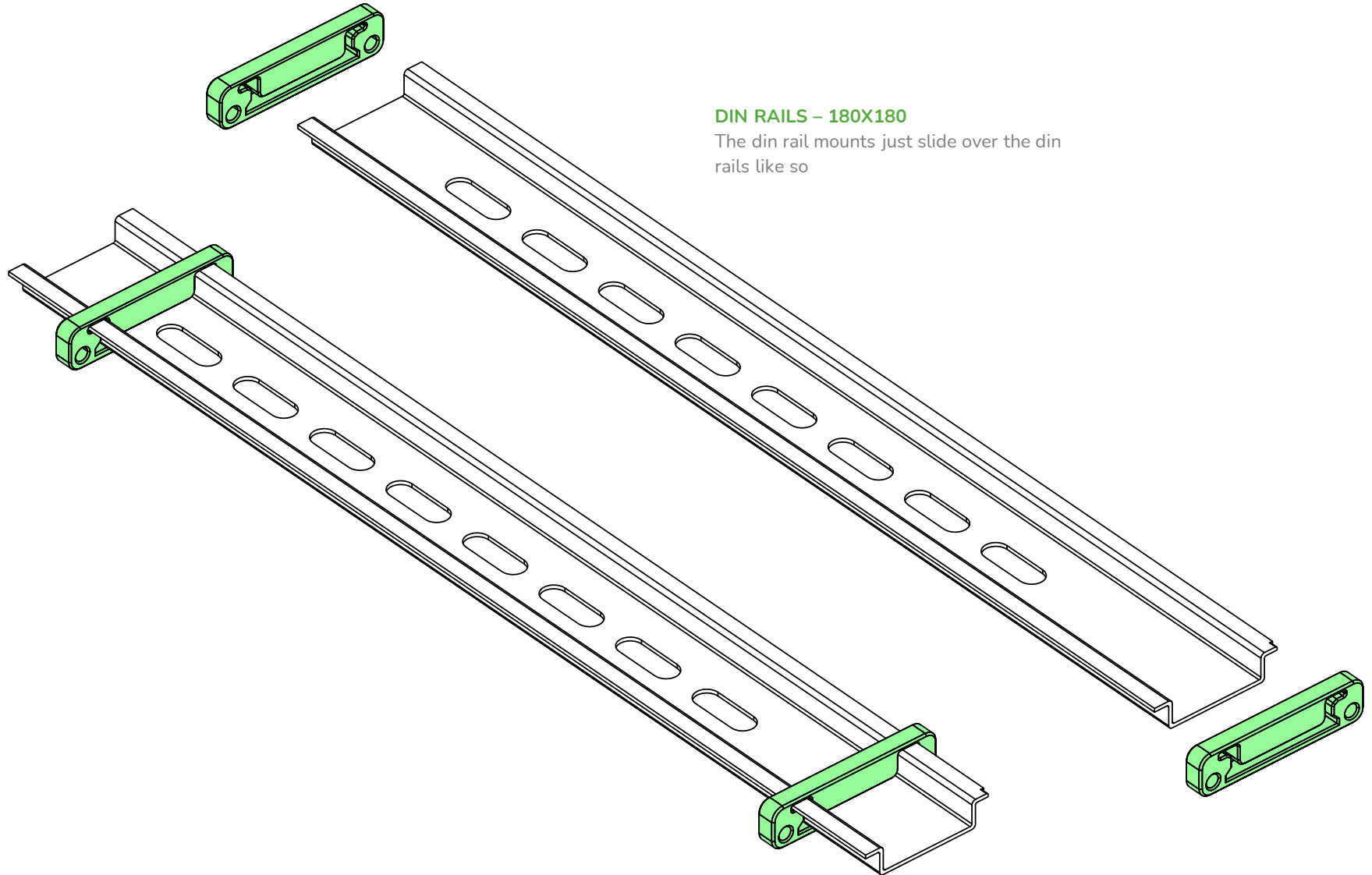
Mount the bed extrusion as shown, making sure to center the extrusions on the frame with the correct amount of space between them for your build. After they are aligned properly, you can then tighten the 4 **M3x6 BHCS** to secure the bed frame.



DECK PANEL

Install the deck panel , using 4 **M3x8 BHCS**.
Depending on the thickness of the panel you
may or may not need washers under the
screws

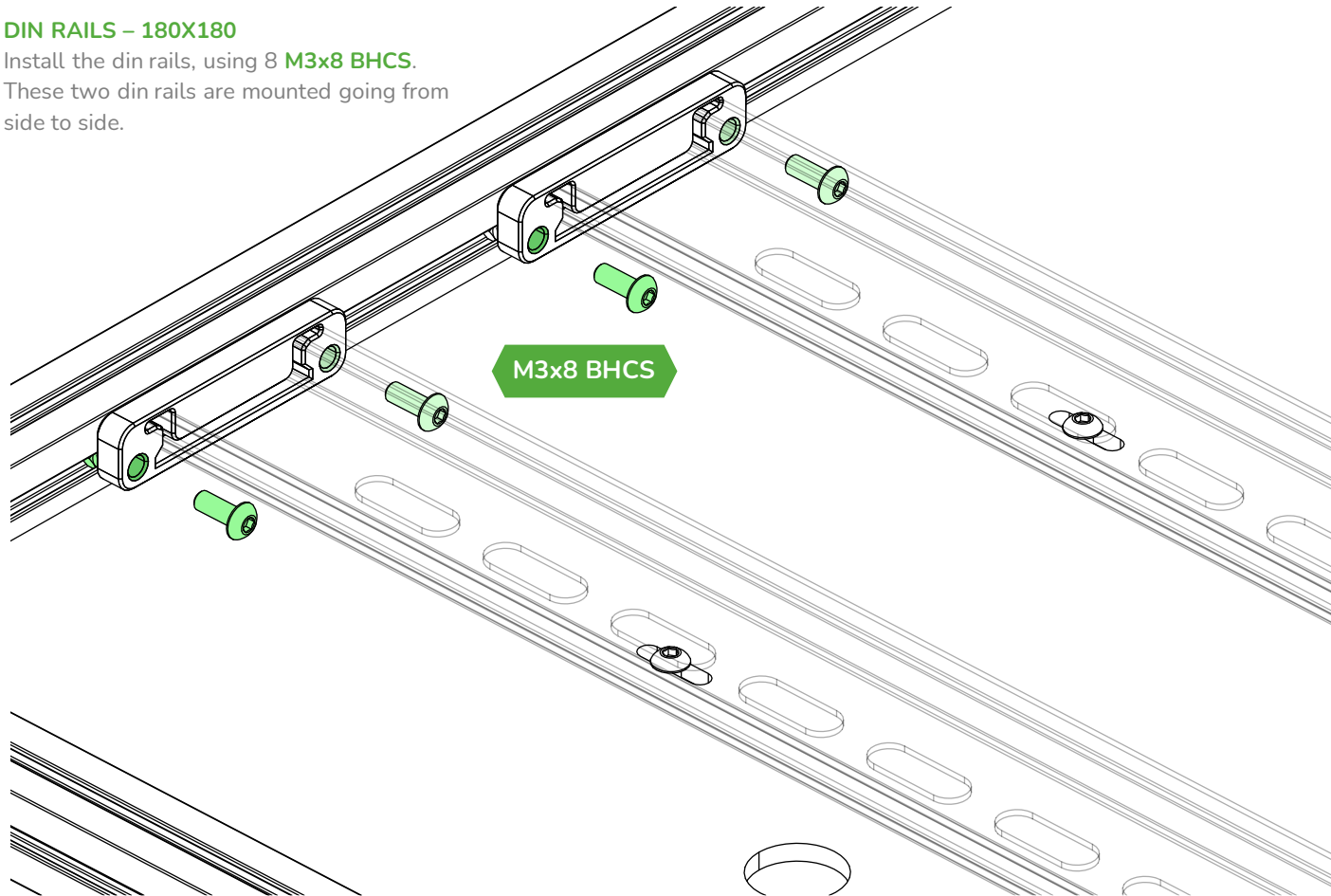




DIN RAILS – 180X180

Install the din rails, using 8 **M3x8 BHCS**.

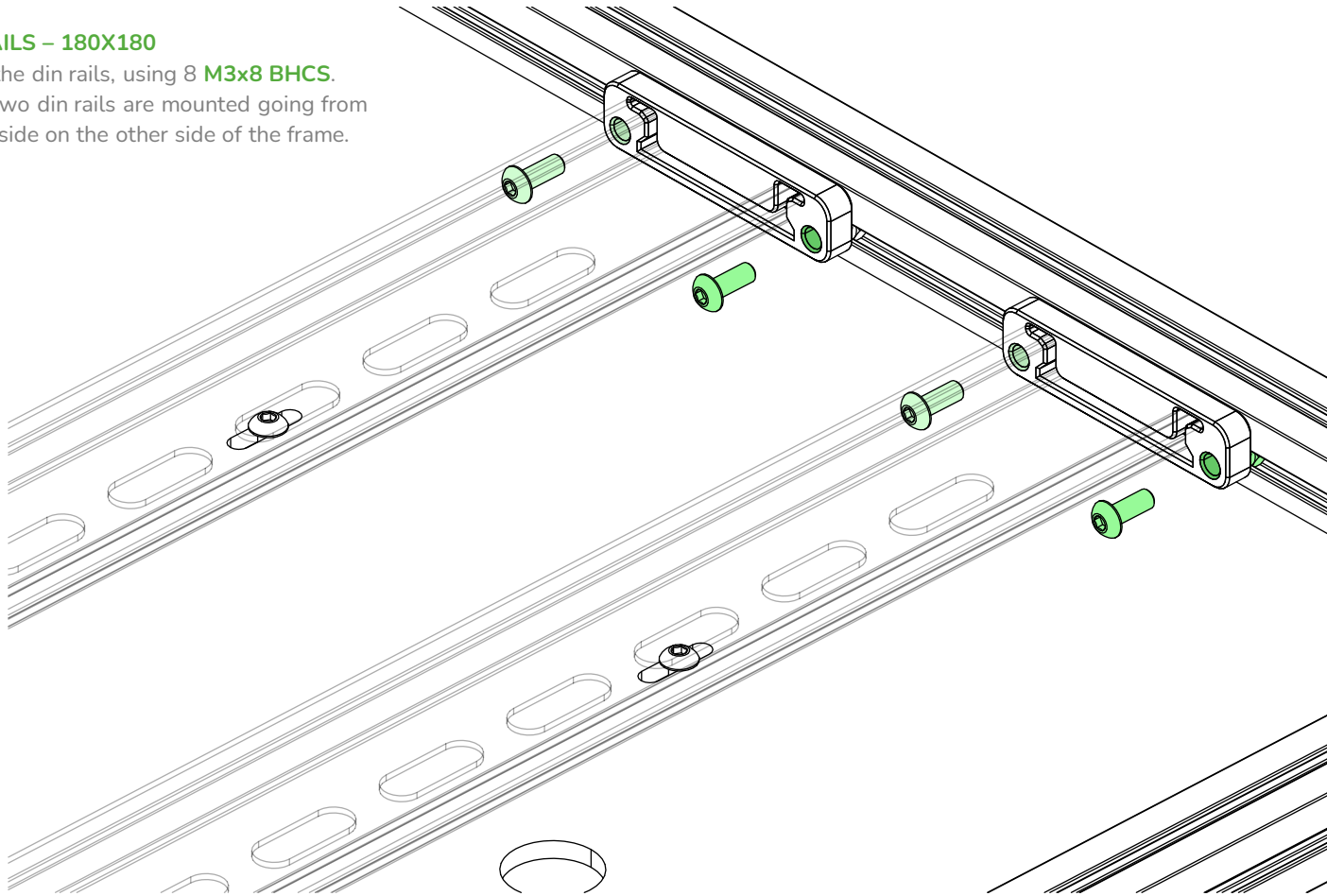
These two din rails are mounted going from side to side.

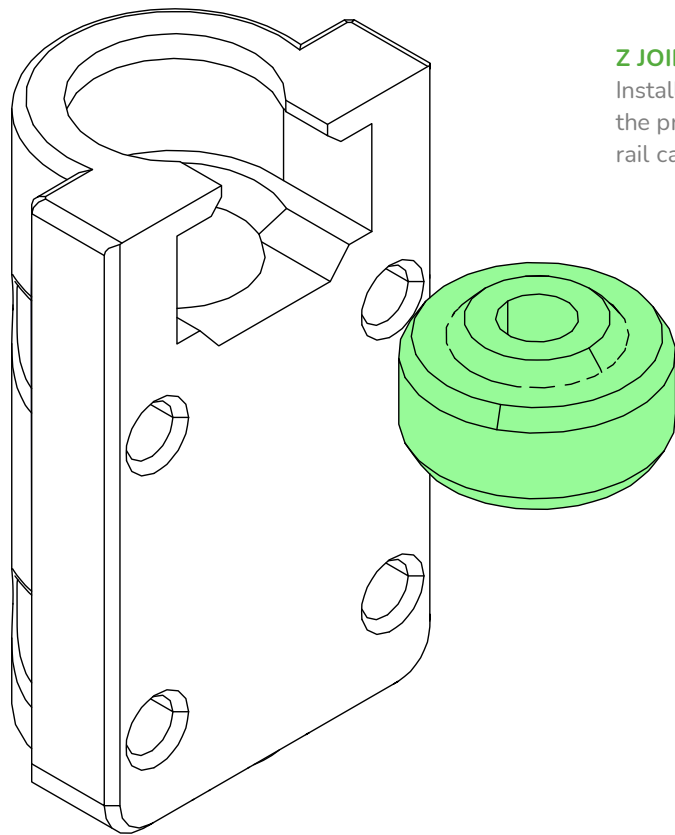


DIN RAILS – 180X180

Install the din rails, using 8 **M3x8 BHCS**.

These two din rails are mounted going from side to side on the other side of the frame.

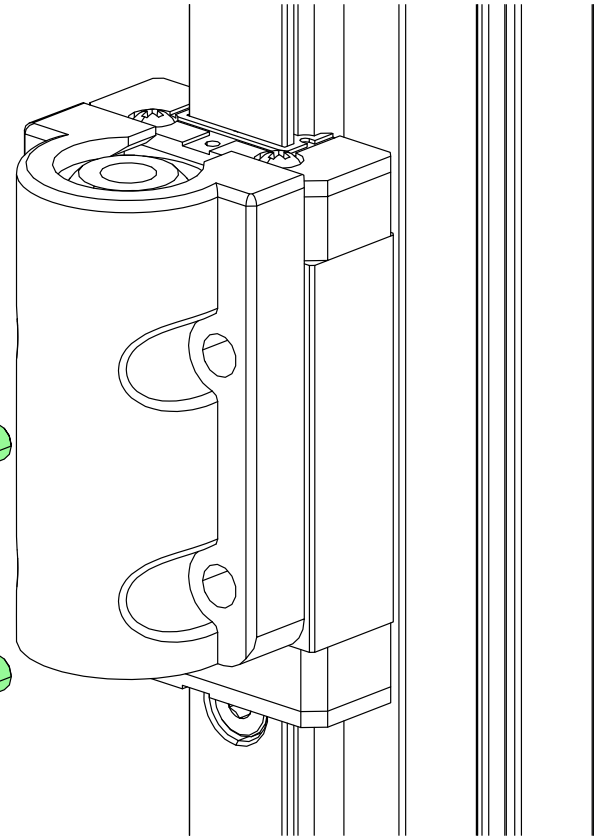




Z JOINTS

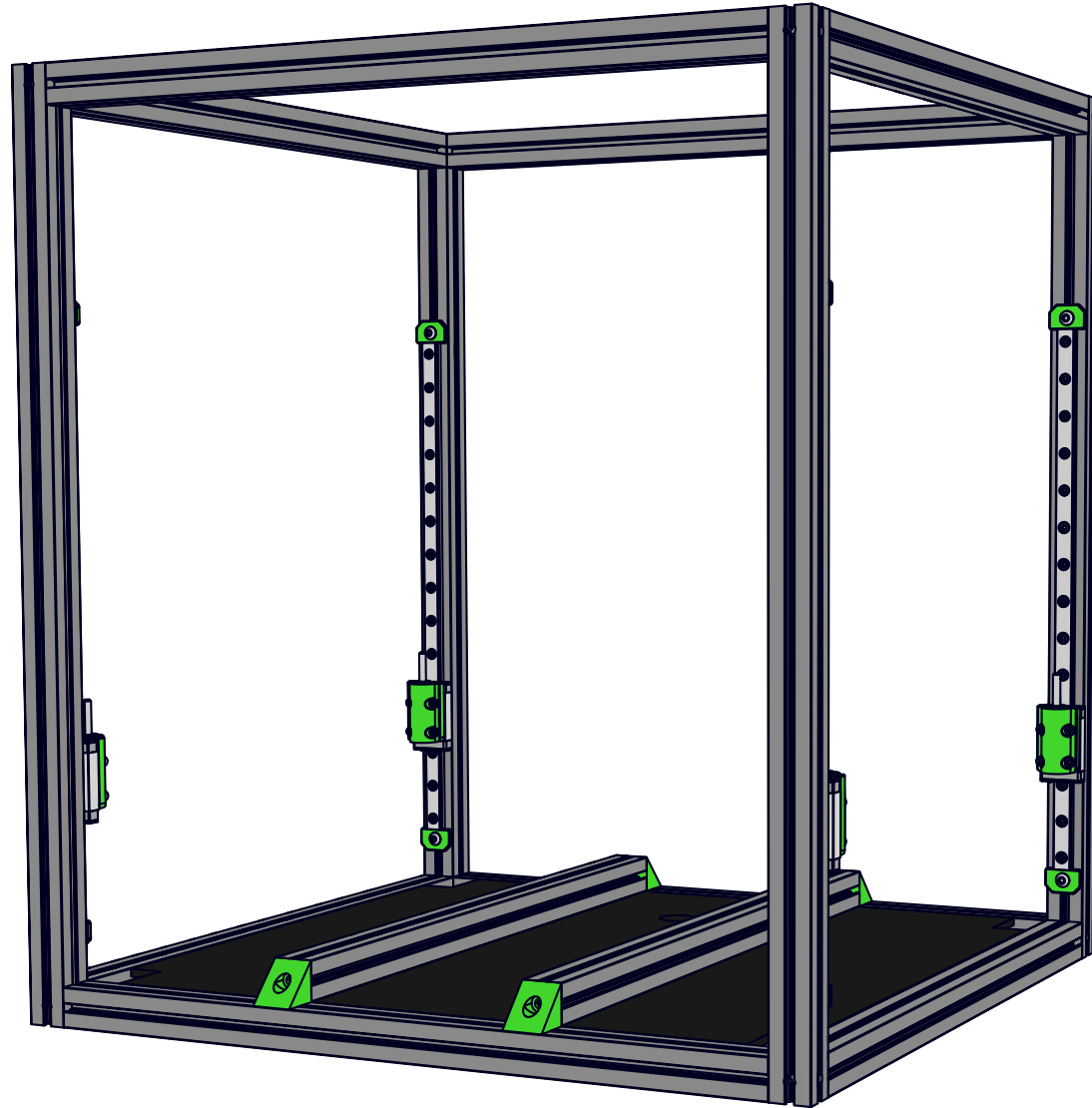
Install the 4 **KGLM-03** bearings into the printed part. Attach these to the Z rail carriages using 4 **M2x6** SHCS

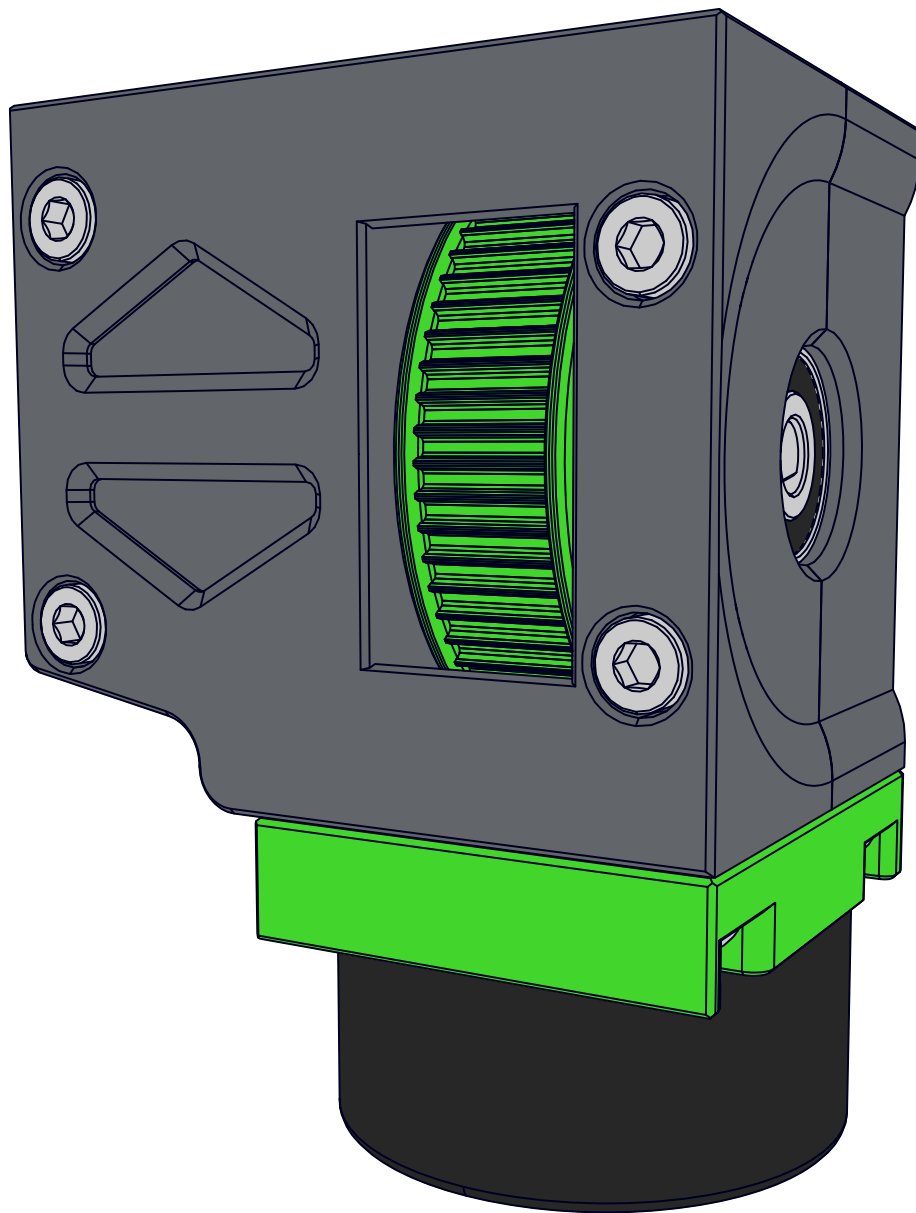
M2x6 SHCS



YOU HAVE BEEN FRAMED!!

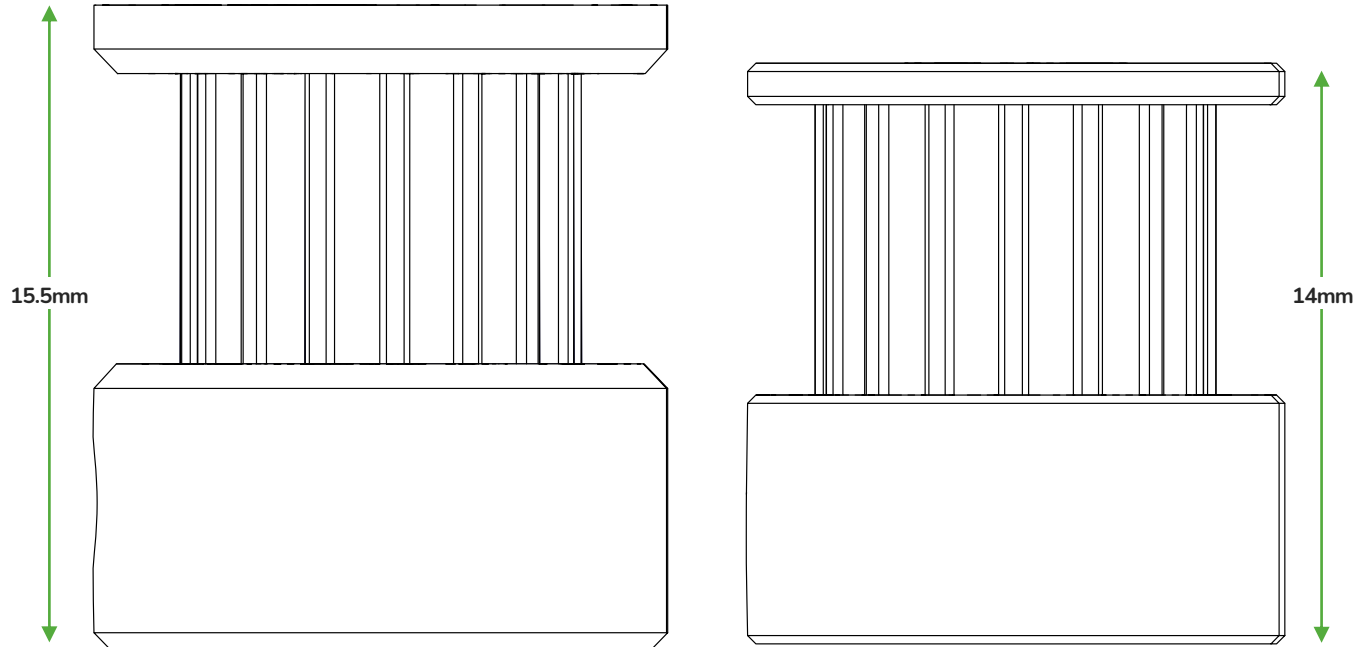
At this point your frame should begin to assemble this picture here





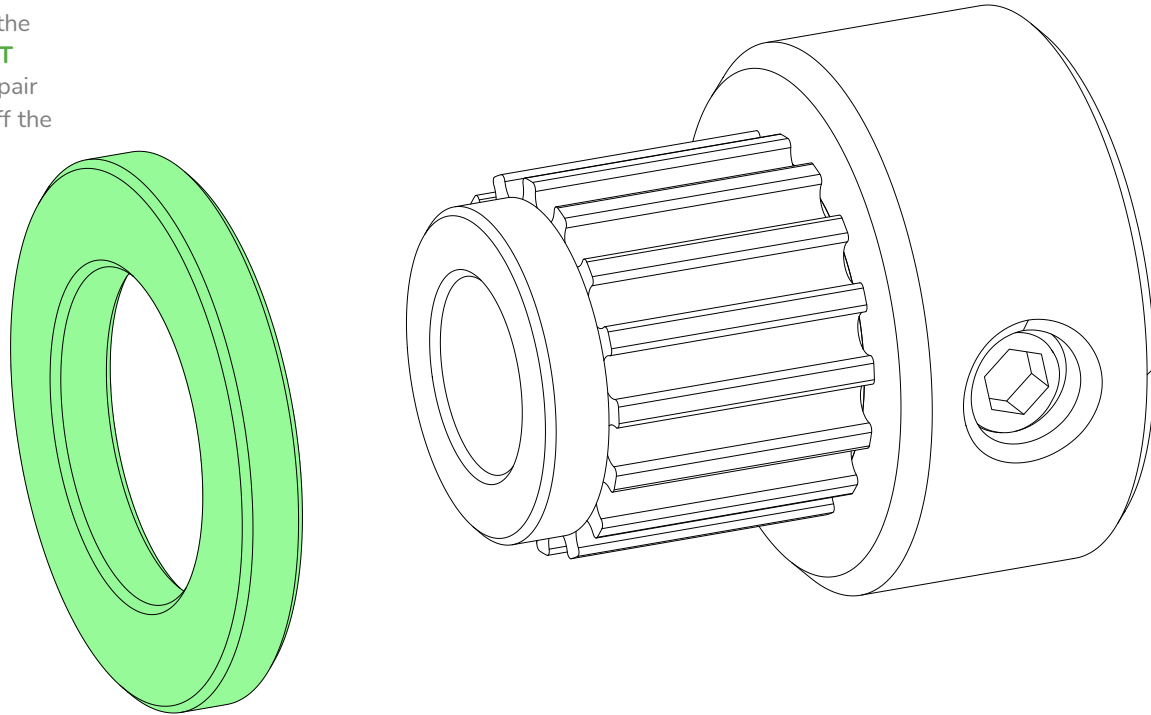
WHICH PULLEY?

Before you start the shaft assembly, make sure to measure the length of your **GT2-16T** pulleys. There are 2 different lengths. The length will determine how you assemble the shaft assembly, and which printed spacers to use.



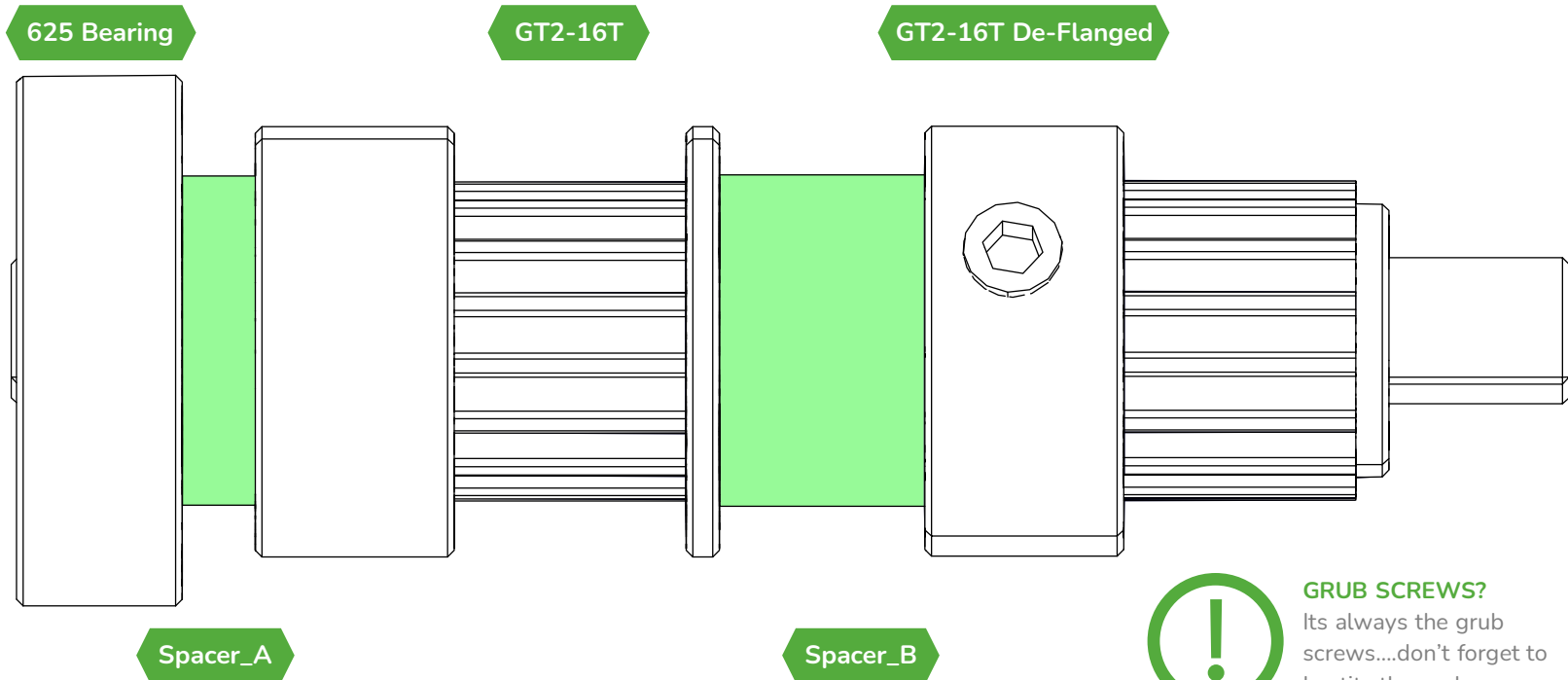
DEFLANGING PULLEY

To start assembly of the Belted Z drives you will start by removing the top flange from **x4** of the **GT2-16T** pulleys. To do this, you can use a pair of pliers and pull the top flange off the pulley.



SPACERS!!

Based on which size your **GT2-16T** is this will determine which spacers are needed.

**ABC..EASY AS 123**

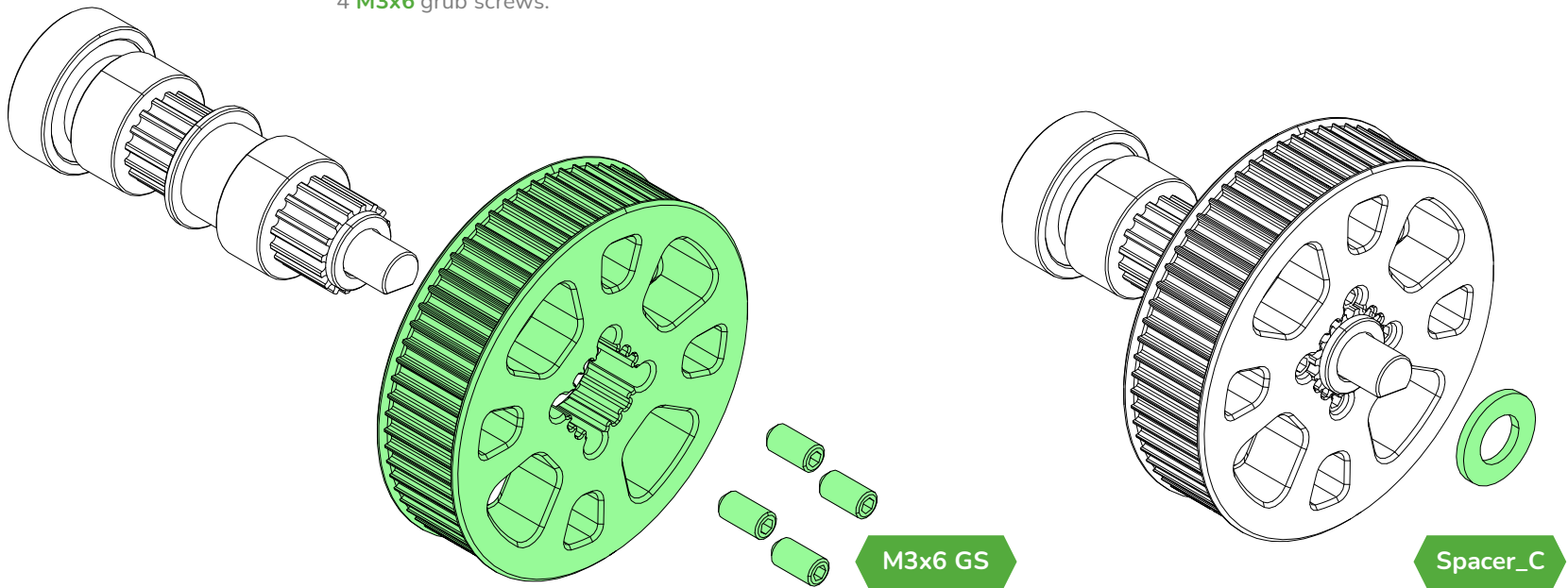
The spacers are labeled **A**, **B**, and **C**. If you have the 15.5mm pulleys, then you don't have a **C** spacer. The manual will be using the 14mm long pulley

**GRUB SCREWS?**

Its always the grub screws....don't forget to Loctite the grub screws so they don't come loose. Most issues on V2.4 and Micron Z drives are because of loose grub screws

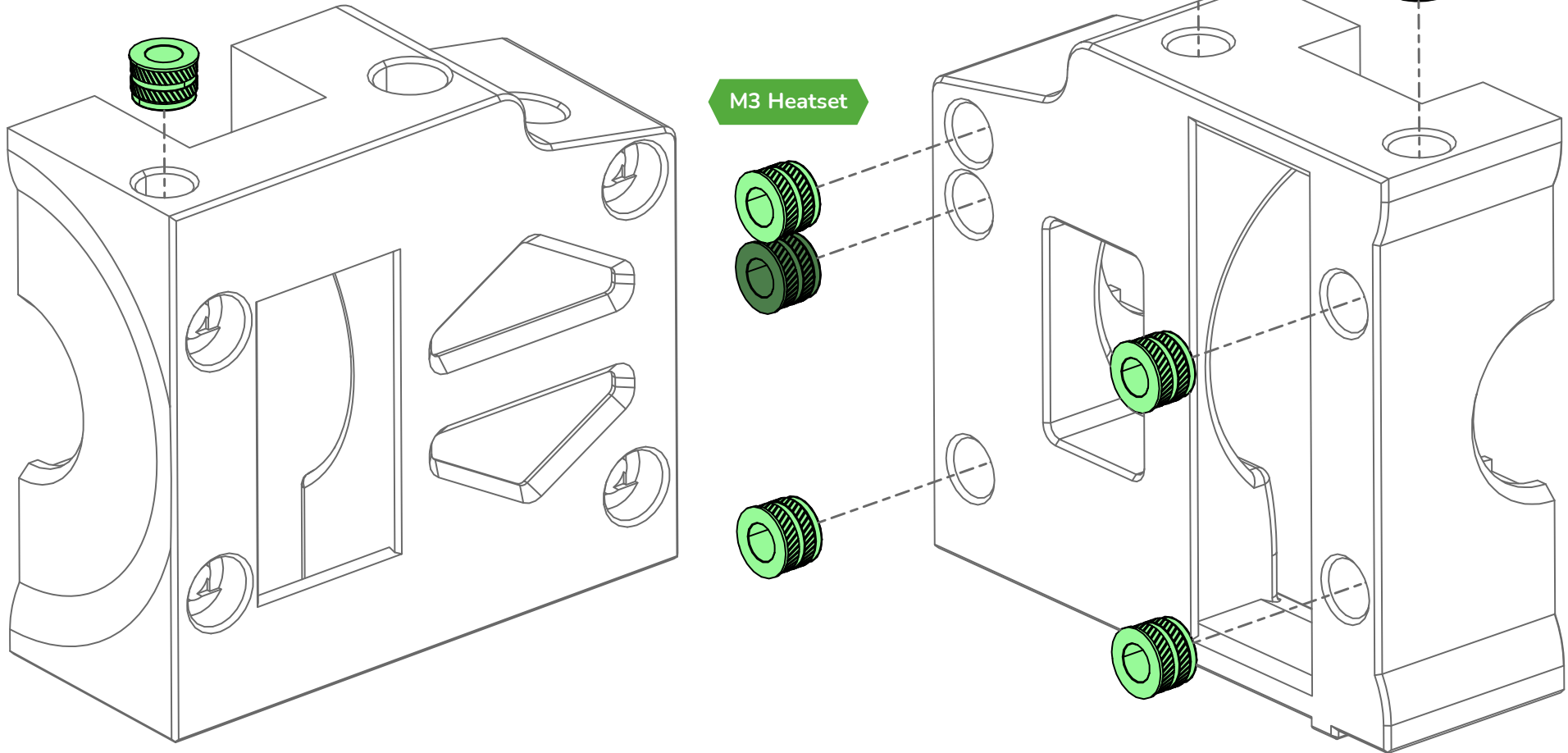
ASSEMBLING THE 64T PULLEY

The printed pulley has a flat side and a concave side.
The de-flanged pulley slides into the concave side of
the printed pulley and is secured from the flat side with
4 **M3x6** grub screws.



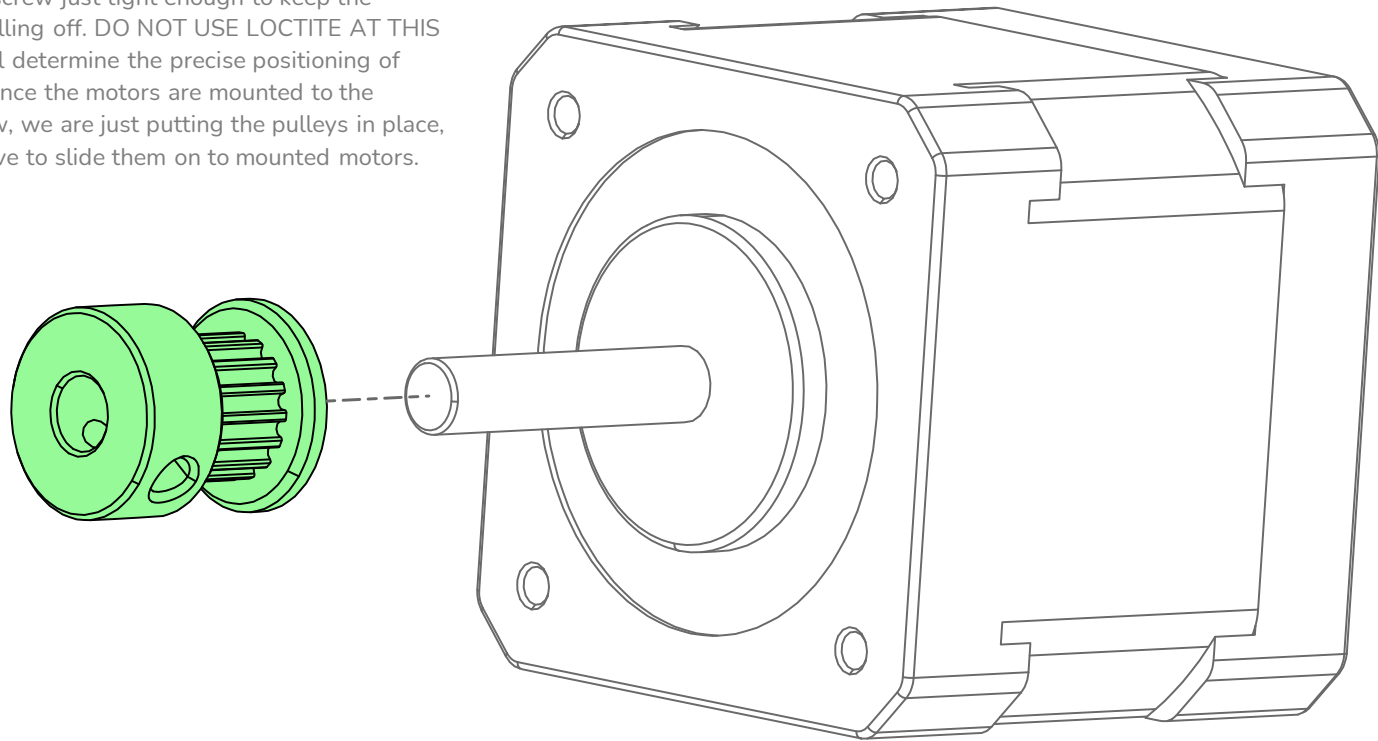
Z DRIVE ASSEMBLY

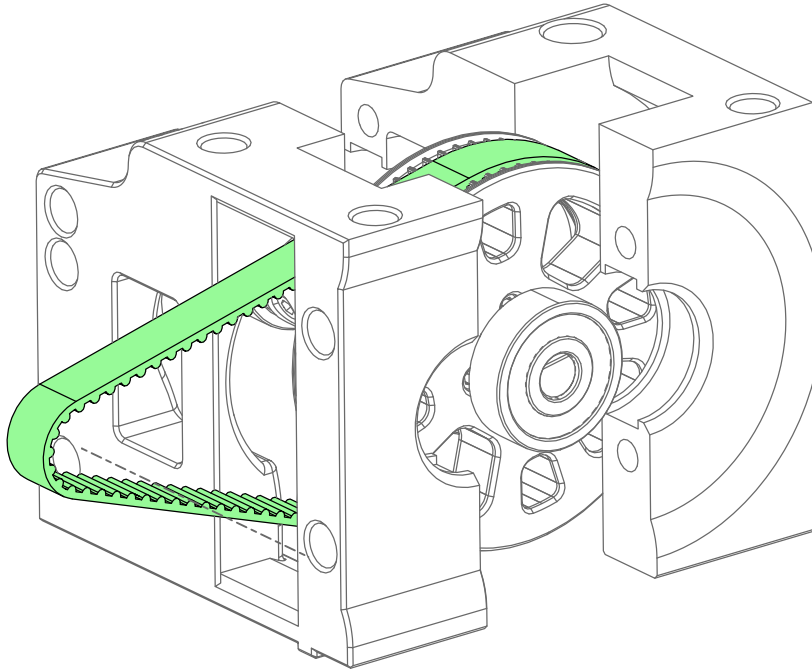
Begin by installing the heatset inserts into the Z drive parts. Each pair of Z drive halves has a total of 8 required heatsets, as shown in the illustrations below. If you are building a 180, the you only need 7. The darker green one isn't needed if building a 180



Z MOTOR PULLEY

To continue with the Z drive assembly, attach a GT2 16T pulley as shown to each of the 4 Z motors. Tighten one of the set screw just tight enough to keep the pulleys from falling off. **DO NOT USE LOCTITE AT THIS POINT!** We will determine the precise positioning of these pulleys once the motors are mounted to the printer. For now, we are just putting the pulleys in place, so we don't have to slide them on to mounted motors.

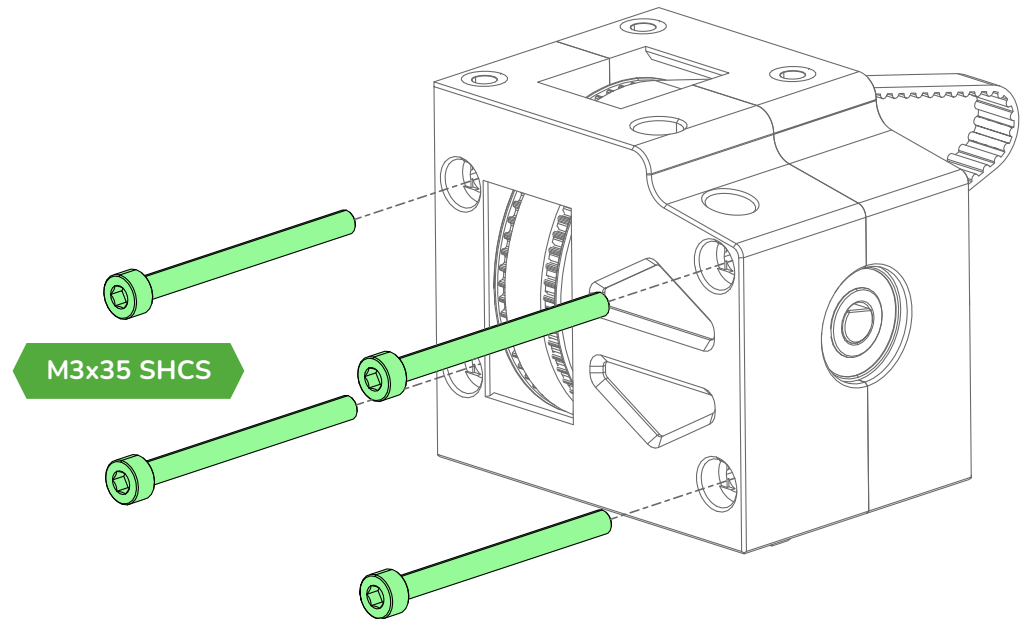


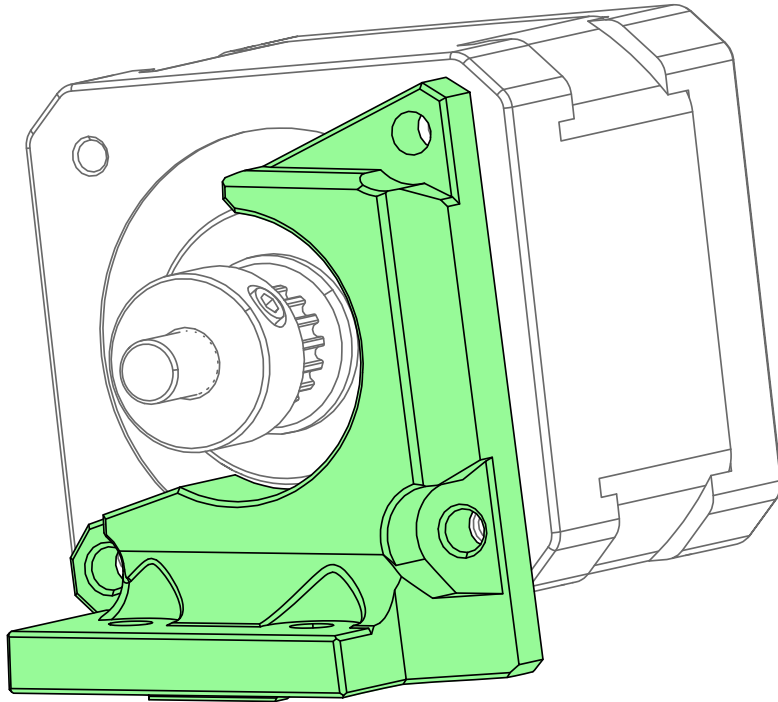
**Z DRIVE BELT**

Add the GT2-188t belt loop around the 64T pulley before closing it off.

Z DRIVE SECURING

secure the 2 halves of the Z drive assembly with 4 screws ensuring the belt is in the correct place.

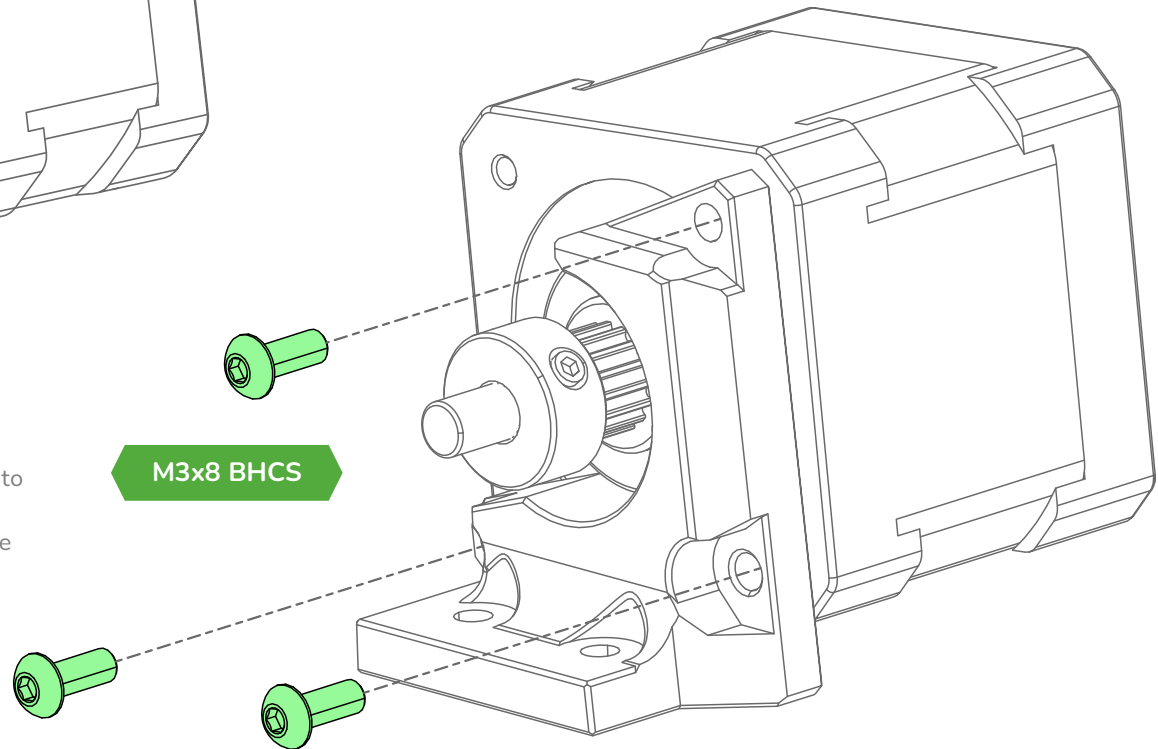


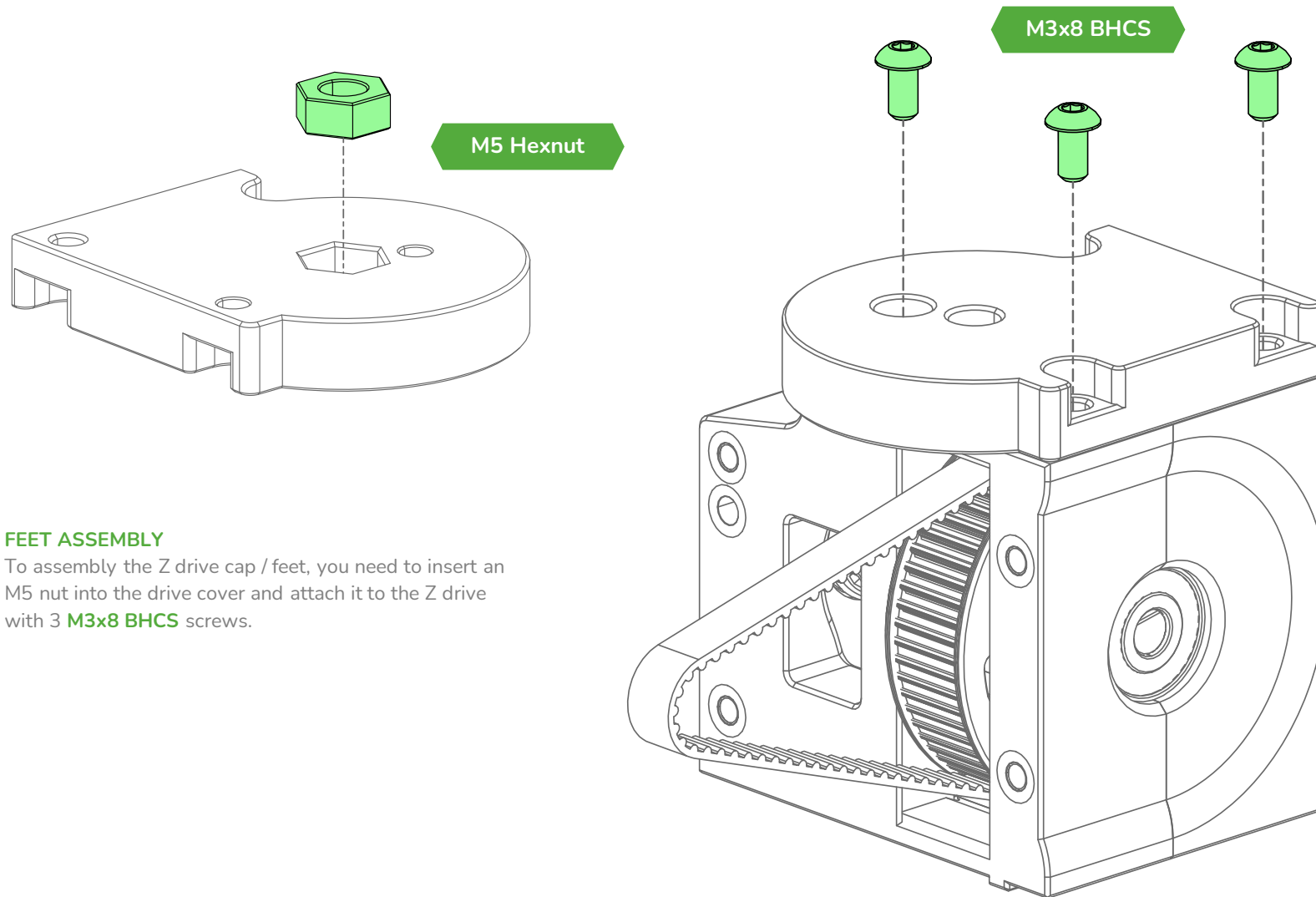


Z MOTOR MOUNT

Z motor mount is best used with the wires for the z to be facing down or towards the inside of the printer
Note: The motor is on a slight angle in relation to the motor mount.

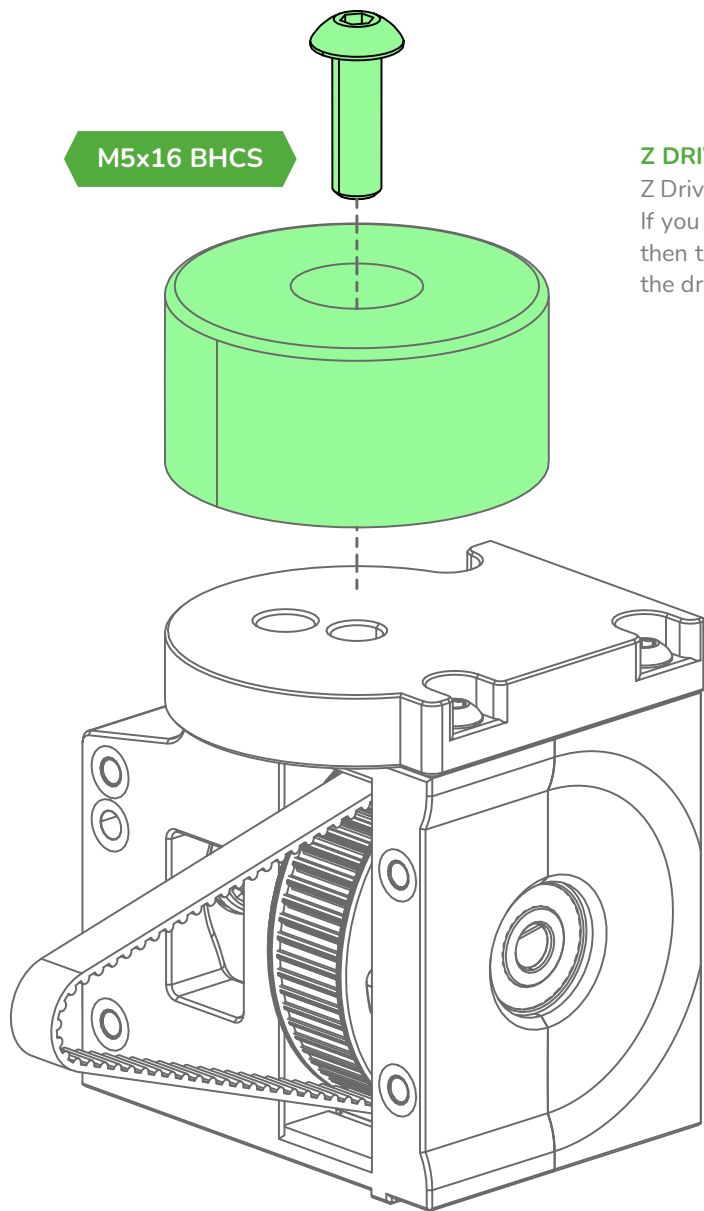
M3x8 BHCS





FEET ASSEMBLY

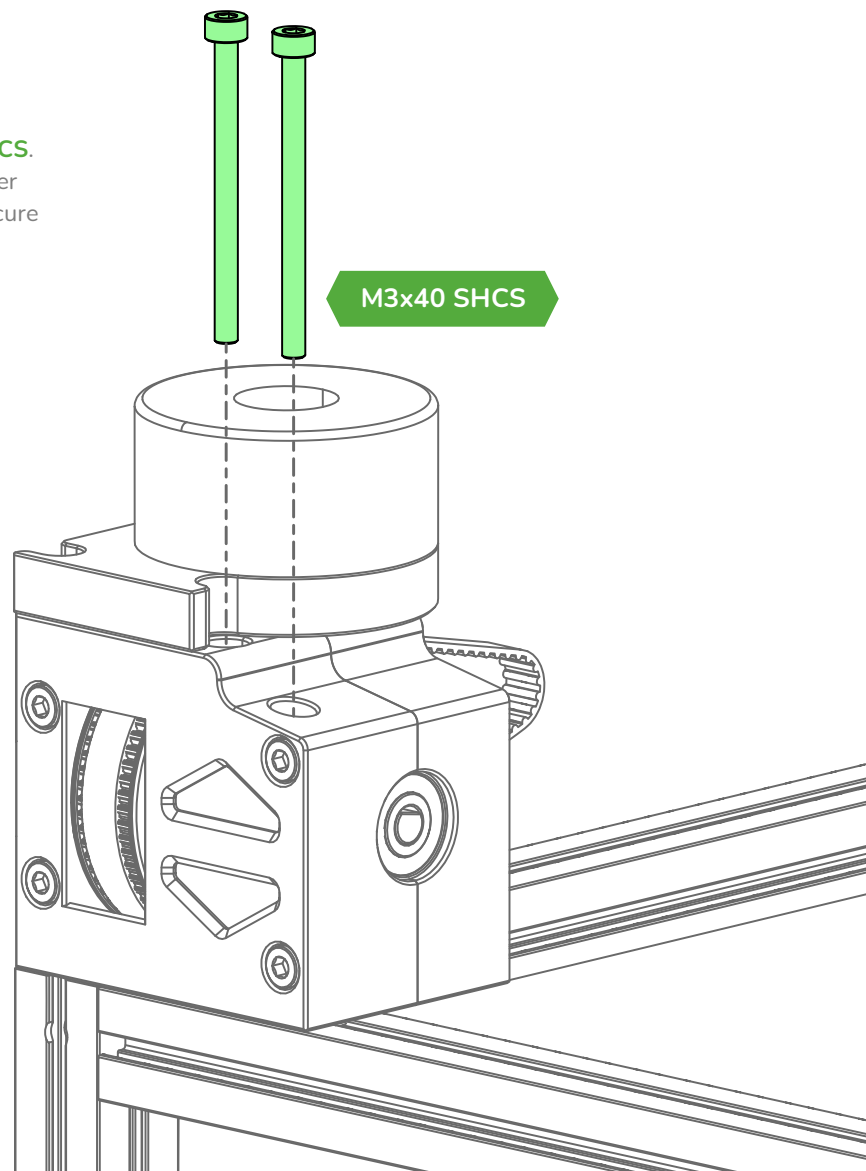
To assembly the Z drive cap / feet, you need to insert an M5 nut into the drive cover and attach it to the Z drive with 3 **M3x8 BHCS** screws.



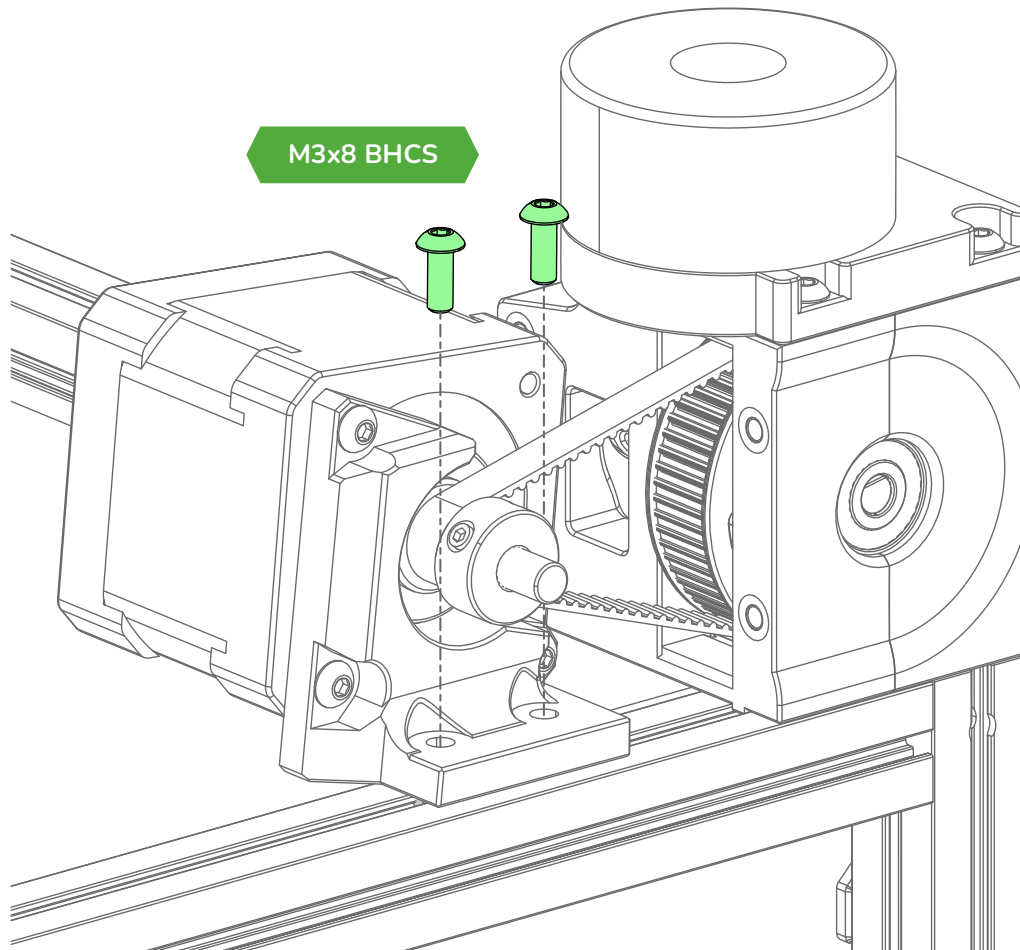
M5x16 BHCS

Z DRIVE MOUNT

Z Drive is mounted using two **M3x40 SHCS**.
If you installed the printed NDN nut holder
then this is where you will use that to secure
the drive housing.



M3x40 SHCS

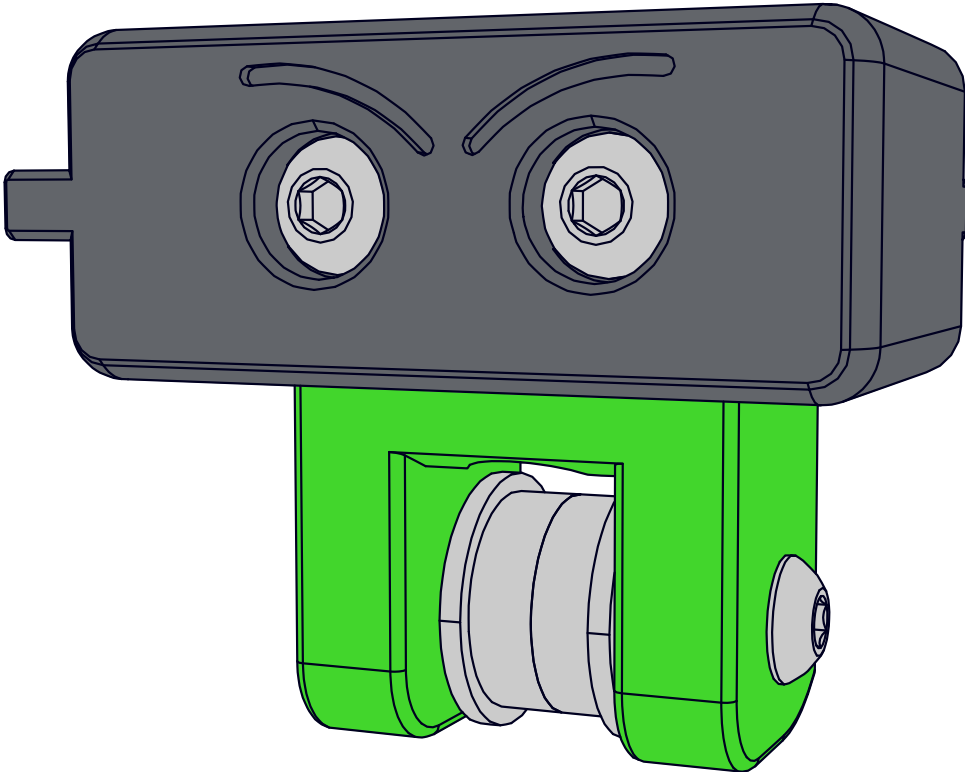


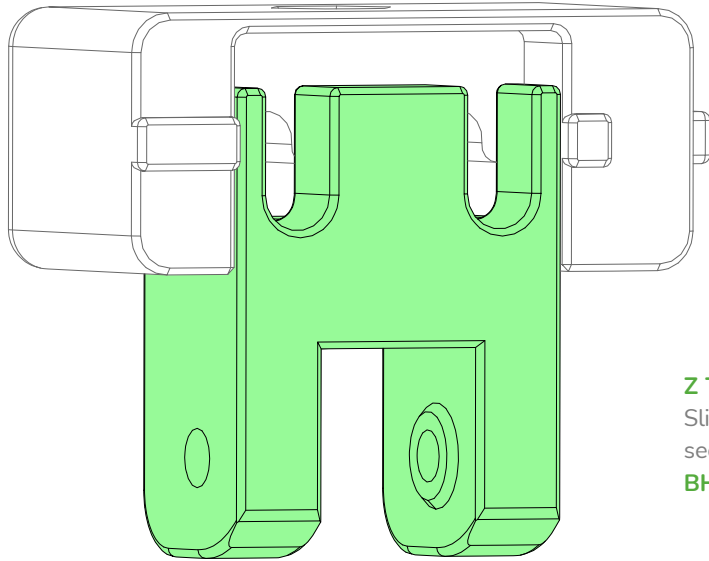
PRELOAD POSITIONS

Before installing the Z motors, take note of the 8 preloaded nuts in the slot to which we are mounting them. 4 of these nuts will be used to mount the Z motors. The position of the remaining 4 nuts is critical to finishing the assembly. When you have the motors mounted, you want one nut between each motor and its Z drive, and two nuts in the center, between the two motors. These 4 nuts will be used to secure the skirts later in the assembly.

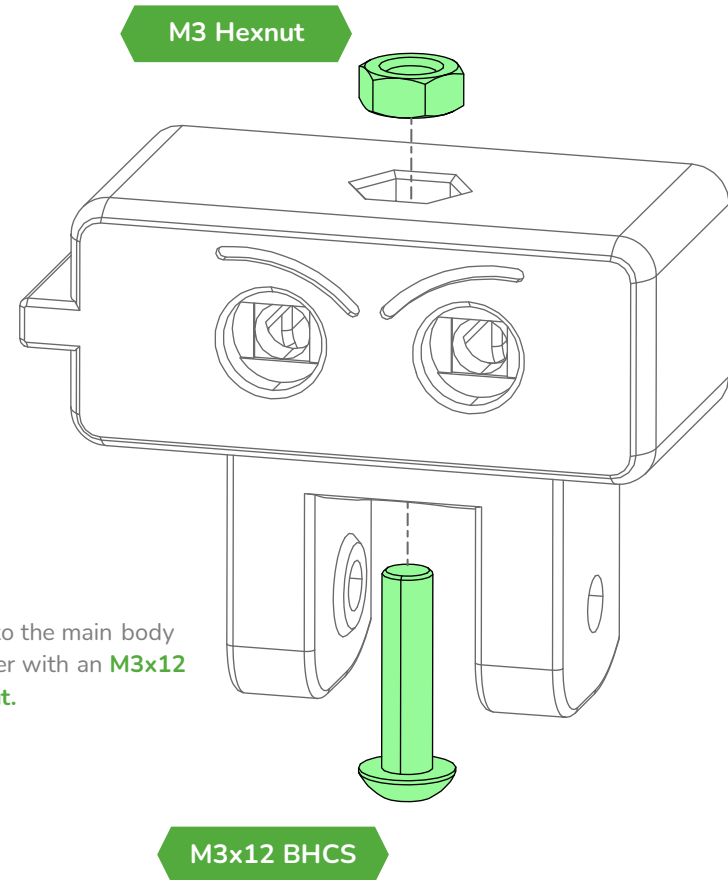
Z MOTOR MOUNTING

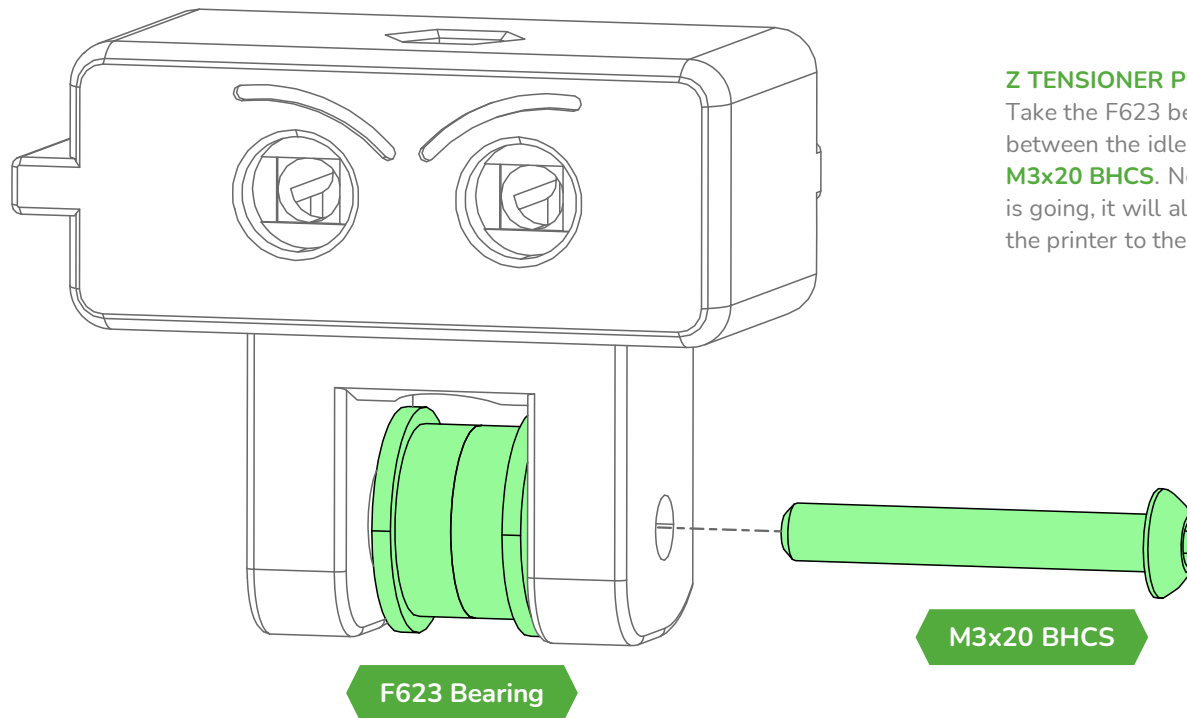
Using 2 **M3x8 BHCS** attach the Z motor. This is when you will tension the **188 tooth** belt loop.



**Z TENSIONER**

Slide the tensioner into the main body securing them together with an **M3x12 BHCS** and **M3 hex nut**.





Z TENSIONER PULLEY

Take the F623 bearing stack and place them between the idler securing them using an **M3x20 BHCS**. Note the direction the screw is going, it will always go from the Inside of the printer to the outside

Z IDLER MOUNTING

mounting the Z idlers on the top of the frame along the side extrusion.

