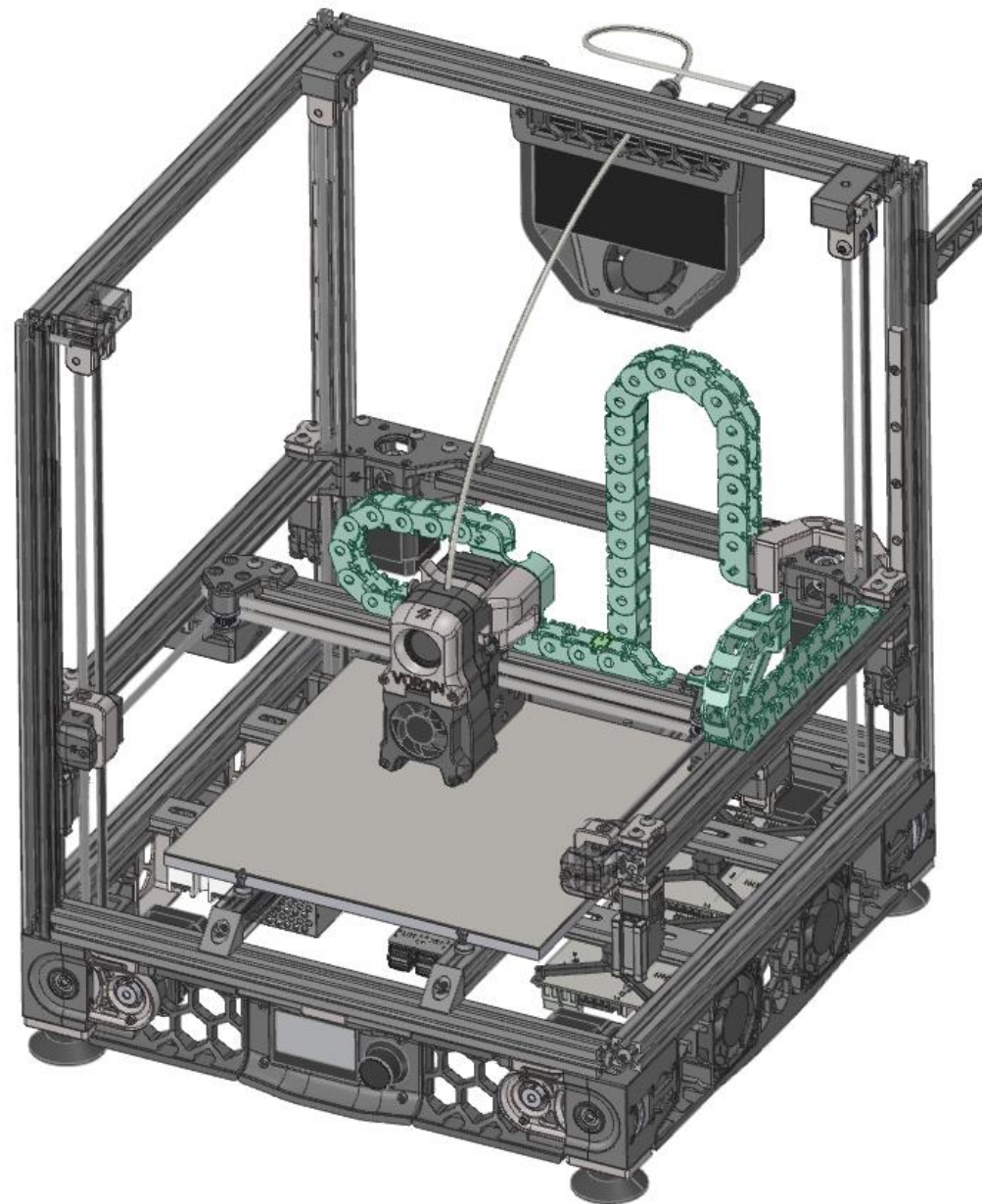# PanzerChain 2.4
for Voron 2.4

Assembly Manual
Version 2020.08.16

Index

- Introduction

- What it is & what it is not!

- When to use?

- Improvements

- Printing

- Parts and Options
  - Links
  - Assembly of Links
  - X-Chain
  - Y-Chain
  - Z-Chain

Introduction

I find black chains boring and I coulnd´t find visually appealing printably chains that follow the spirit of Voron.

That´s why I spent kilograms of filament and days of work to develop PanzerChain:

In 2019 the initial PanzerChain was born which was based on the well known igus design. This first release was liked by quite a lot people of the community due to it´s design and functionality.

Even though this first iteration still works very well on my first Voron 2.2 i felt the need to improve it for 2.4 and my second Voron.

I am therefore particularly pleased to present PanzerChain 2.4

Enjoy!

What it is and what it is not!

- It is :
  - a custom energy chain for x/y and z axis meant to be used for Voron 2.4

- It is not:
  - an identical replacement for IGUS chain E2i.10.10.018 on XY-axis
  - …nor for the E2.15.10.028 IGUS chain on Z-axis
  - a chain with separate compartments for wire organization
  - perfect (for example it needs a little wear in time)
  - compatible with any other chain

When to use?

- you like to print your own stuff :-)

- you like accessible/openable links for easy maintenance

- you prefer accent colors (see folder 'themes' for ideas)

- you want to save some money (it´s not a lot! Go for Igus if in doubt or some alternative cheap Ali-stuff)

- you don´t want to wait for your order to arrive

- you don´t like tape chains (wire failure) or zip chains (fiddly)

- you don´t care about
  - extreme noise reduction
  - a not perfect bending radius
  - or any other shortcomings due to additive manufacturing / fdm

Improvements of this Reboot

- even easier to print

- less supports

- more room where chain hits xy-joints
  - probably some z-height loss

- larger bending radius (ideal for heluflon wires)

- clips are easier open without tools

- Removed unnecessary tolerance options

- new logo

- Nicer bending behavior (no s-curve/sagging but nearly pure u-curve)

- Revision Numbering from now on as Voron V2 (1 chain release per)

Printing

- do a test print of 3-4 xy-links

- check for layer adhesion
  - print slower and/or with higher temp if necessary

- filament: esun abs+
  - feel free to experiment, but don´t blame me!
  - (petg seems to be okay or even superior based on user feedback)

- 0.2mm layer height incl. first layer

- no supports: required supports are already incorporated and easy to remove

- check your slicer preview: all walls need to be filled as much as possible

- tested at roughly 40mm/s - 60mm/s print speed (inner and outer shells)
  - if in doubt: go slower 25-30mm/s should work fine!

- at least 2 links per print for cooling time or slower speed

- Pressure Advance should be calibrated to allow for smoother kinematics
  (for example refer to Klipper Documentation)

Links

xy-link.stl / z_link.stl

xyz_clip.stl

- open while joining links
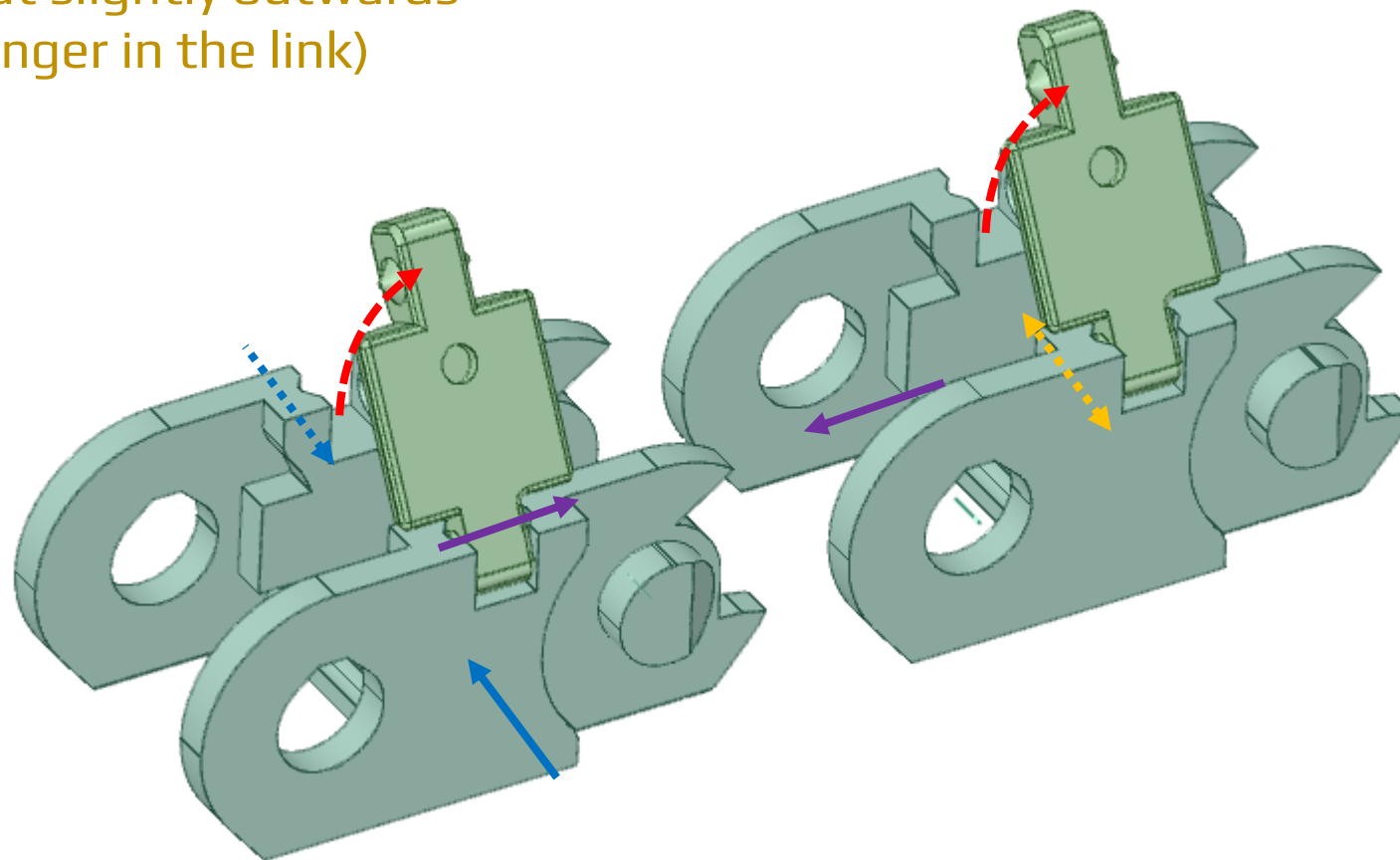
- 'Easy Open'
  - o-marker
  - extended latch
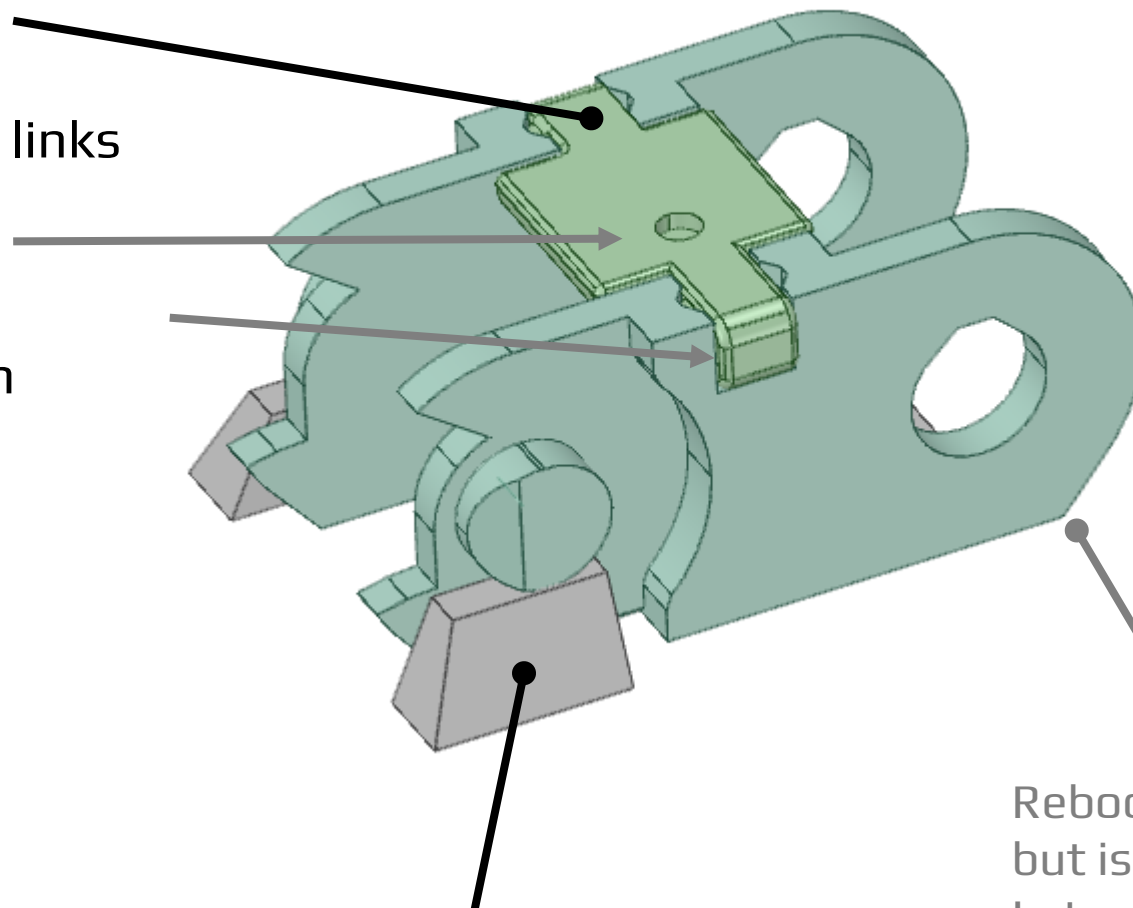
Reboot uses less supports here but is less rounded.
Let me know if you need a rounded version.

Supports

- need to be removed

Assembly of Links

1) Open clips

2) Push inwards

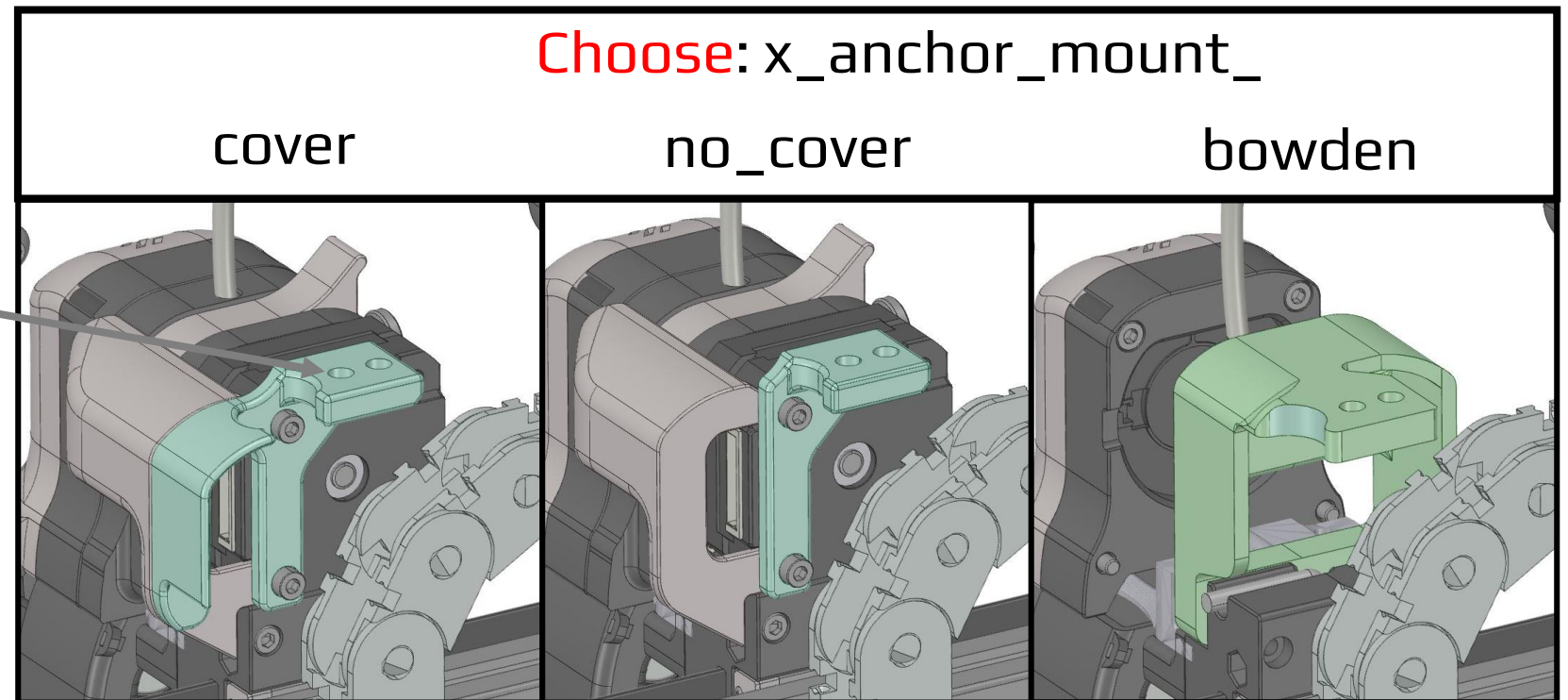3) Push out slightly outwards
   (put a finger in the link)

4) Join

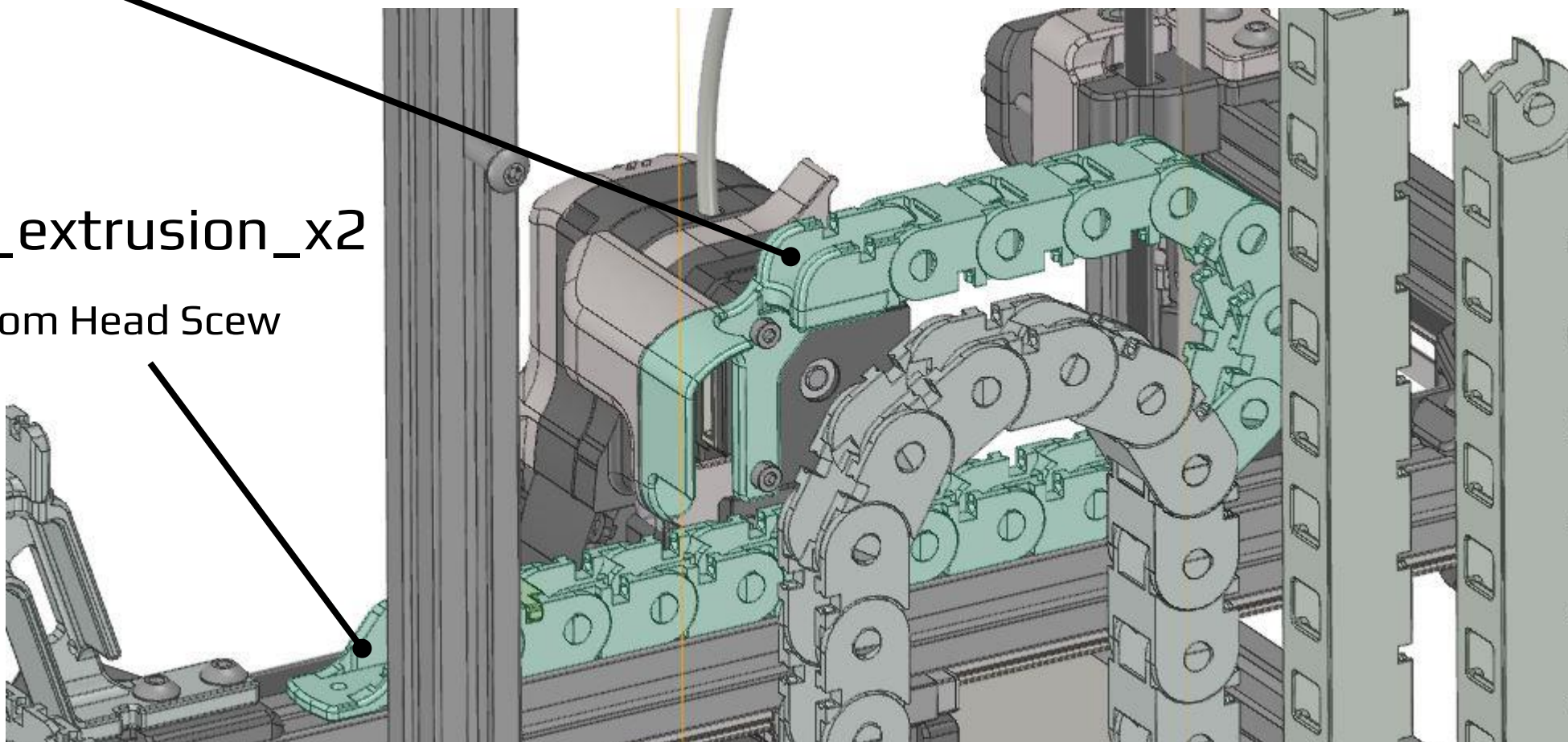# X-Chain

2x M3 heat inserts

x_anchor_direct_drive_x1.stl

xy_anchor_extrusion_x2

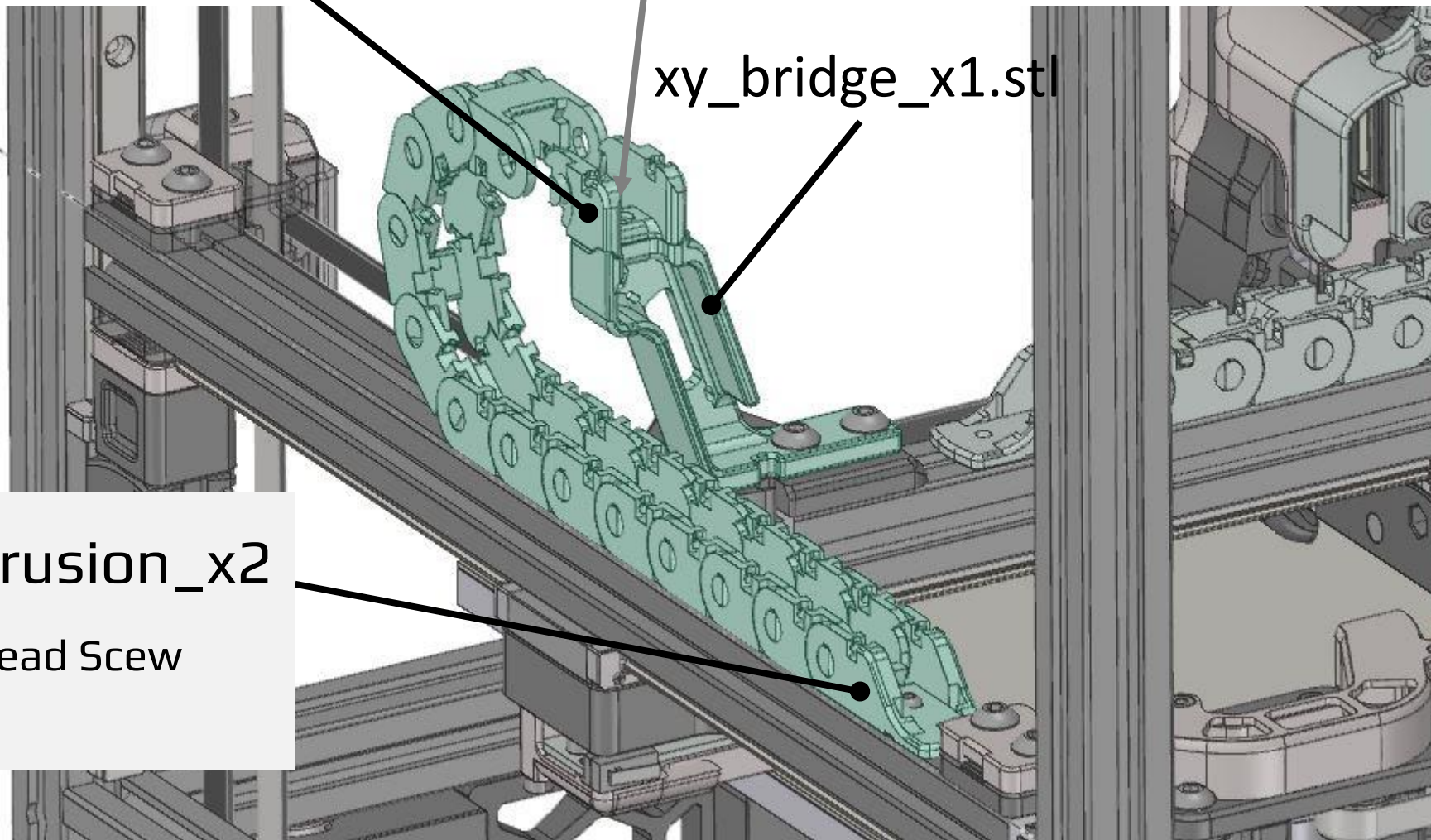- 2x M3 Bottom Head Scew
- Zip Ties

	Choose: x_anchor_mount_	
cover	no_cover	bowden

Y-Chain

xy_anchor_bridge_x1   1x M3 heat inserts

xy_bridge_x1.stl

xy_anchor_extrusion_x2

- 2x M3 Bottom Head Scew
- Zip Ties

Z-Chain

Choose

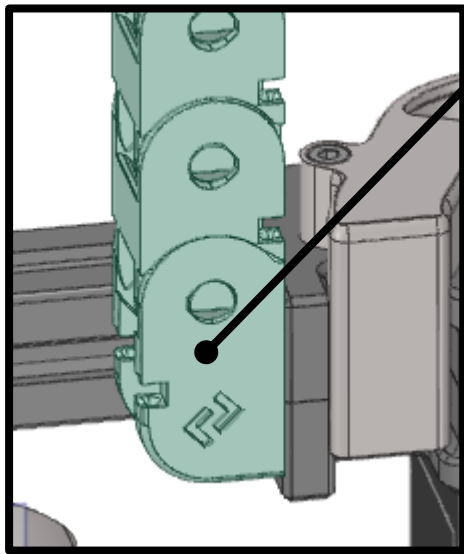z_anchor_frame_vertical_solid_

400
350
300
250
200
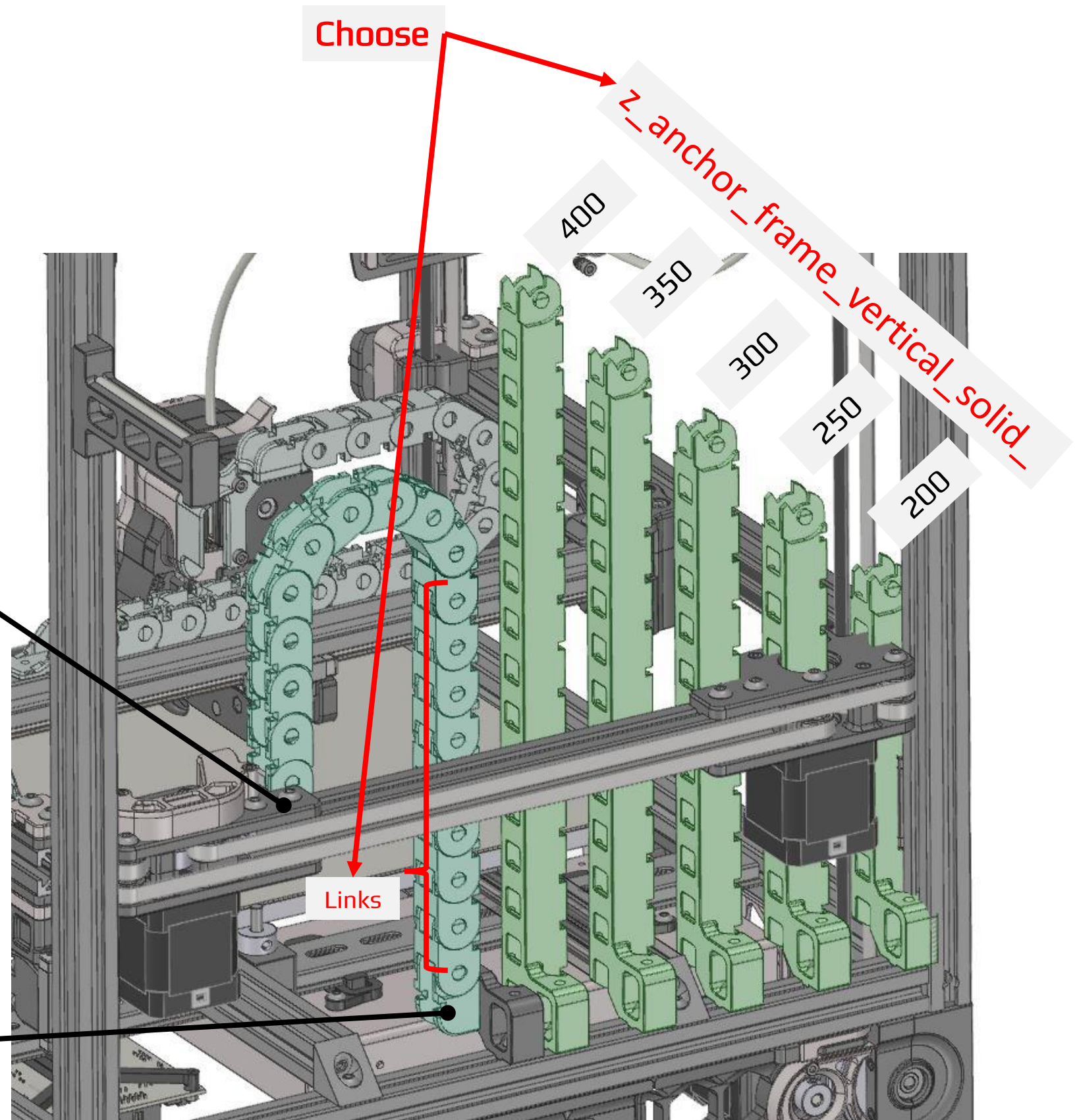
z_anchor_gantry_x1.stl

- 2x M3x8 Bottom Head Scew

Links

z_anchor_frame_x1.stl

- 2x M3x8 Bottom Head Scew