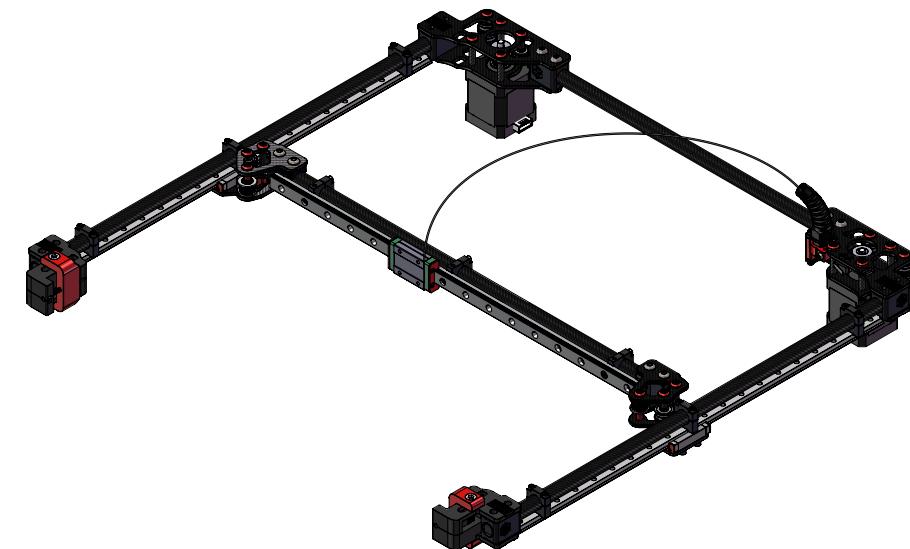


# CHAOTICLAB



## VORON2.4 XY CARBON FIBER KIT BUILD GUIDE

---

---

VERSION 2022-07-21

**ONLY USE X-AXIS**

The x-axis part(Contains Left/Right XY Joints) of this kit is only compatible with the original design for MGN12H rail and block.



Before you begin on your journey, a word of caution.

In the comfort of your own home you are about to assemble a robot. This machine can maim, burn, and electrocute you if you are not careful. Please do not become the first VORON fatality. There is no special Reddit flair for that.

Please, read the entire manual before you start assembly. As you begin wrenching, please check our Discord channels for any tips and questions that may halt your progress.

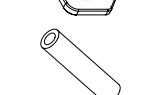
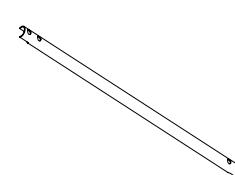
Most of all, good luck!

THE CHAOTICLAB TEAM

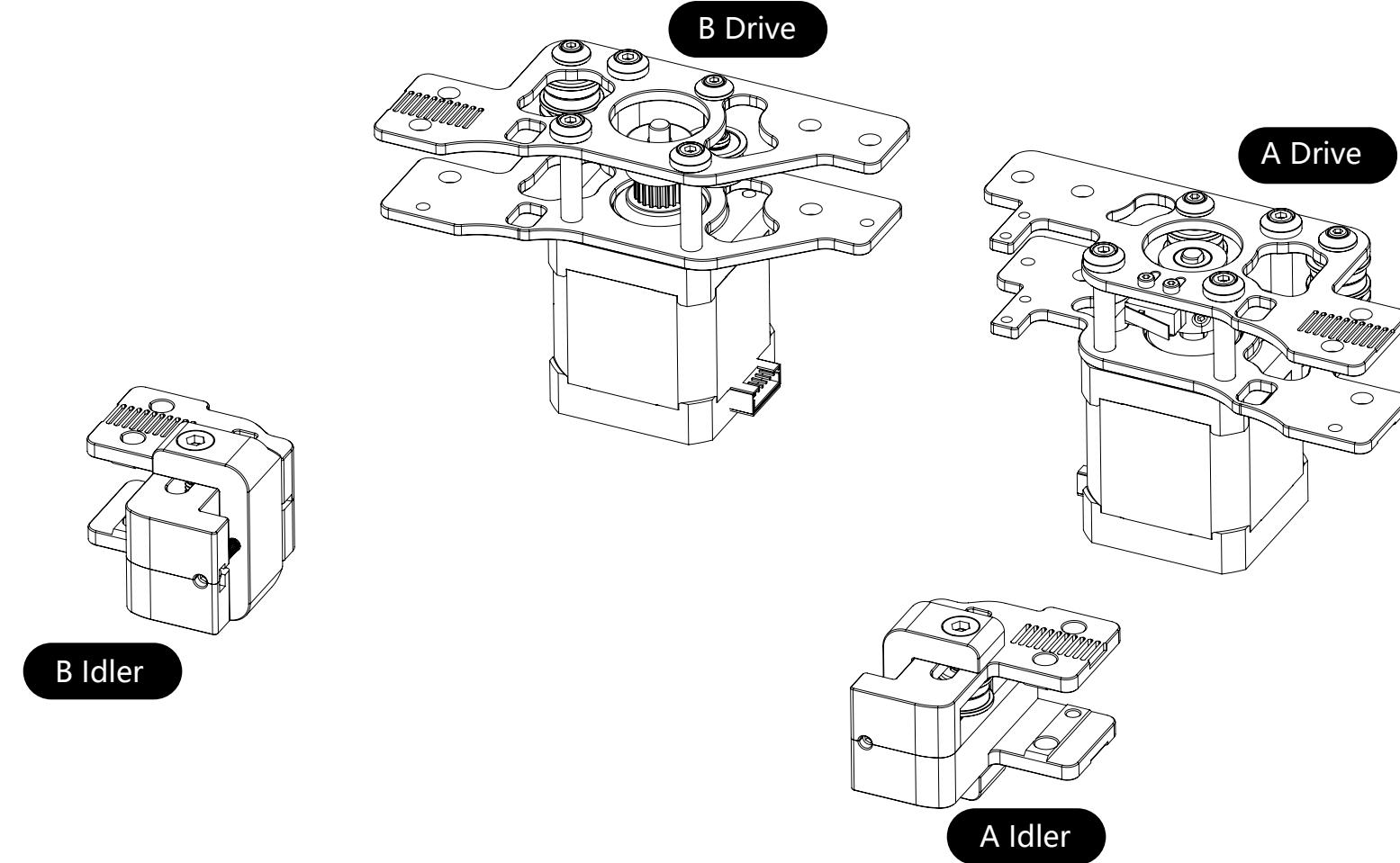
<a href="#">Introduction</a>	
<a href="#">Table Of Content</a>	
<a href="#">Packing List</a>	
<a href="#">A/B Drives and Idlers</a>	1
<a href="#">A Idler</a>	3
<a href="#">B Idler</a>	6
<a href="#">A Drive</a>	9
<a href="#">B Drive</a>	16
<a href="#">Gantry</a>	22
<a href="#">Y Axis</a>	30
<a href="#">Left XY Joint</a>	37
<a href="#">Right XY Joint</a>	41
<a href="#">X Axis</a>	45
<a href="#">Cable</a>	53

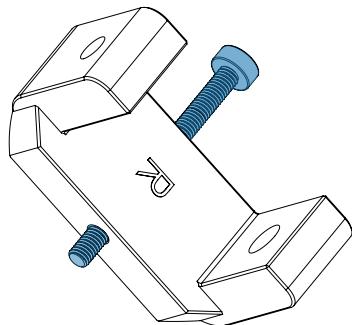
## PACKING LIST

WWW.CHAOTICLAB.COM

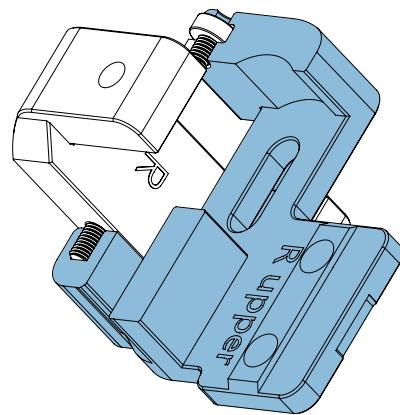
	A DRIVE UPPER 1pcs		X CONNECTOR LEFT 1pcs		MICROSWITCH NUT 1pcs
	A DRIVE LOWER 1pcs		X CONNECTOR RIGHT 1pcs		ANTI BENDING CABLE SLEEVE 1pcs
	B DRIVE UPPER 1pcs		Y CONNECTOR LEFT 3pcs		GRAPHITE COMPOSITE NYLON WASHER 10pcs
	B DRIVE LOWER 1pcs		Y CONNECTOR RIGHT 3pcs		ALUMINIUM ALLOY SHIM M2.5 18pcs M3 8pcs
	LEFT XY JOINT UPPER 1pcs		CF ROD CLAMP MGN12 3pcs		Socket Head Cap Screws M2.5x6 16pcs M2.5x12 18pcs M2.5x16 4pcs M2x10 2pcs M3x5 9pcs M3x8 9pcs M3x10 2pcs
	RIGHT XY JOINT UPPER 1pcs		CF ROD CLAMP MGN9 6pcs		
	LEFT XY JOINT LOWER 1pcs		CF ROD CLAMP 9pcs		
	RIGHT XY JOINT LOWER 1pcs		CF PLATE SPACER 2pcs		
	Y JOINT 2pcs		CF ROD LOCK NUT 8pcs		Socket Head Cap Screws M5x8 8pcs M5x16 8pcs M5x20 4pcs
	CARBON STANDOFF 6pcs		BEARING STAND OFF 6pcs		
	CARBON ROD For X-Axis For Y-Axis For Y-axis rear connection 1pcs 2pcs 1pcs		IDLER STAND OFF 2pcs (red)		HSCHS M2.5x6 4pcs
			SUPPORT COLUMN 2pcs		
			DRAG CHAIN BRACKET 1pcs		



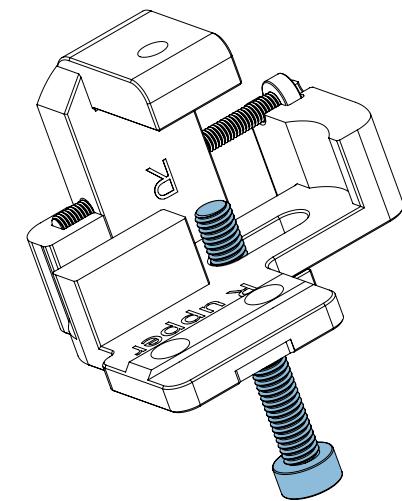




M3x36 SHCS



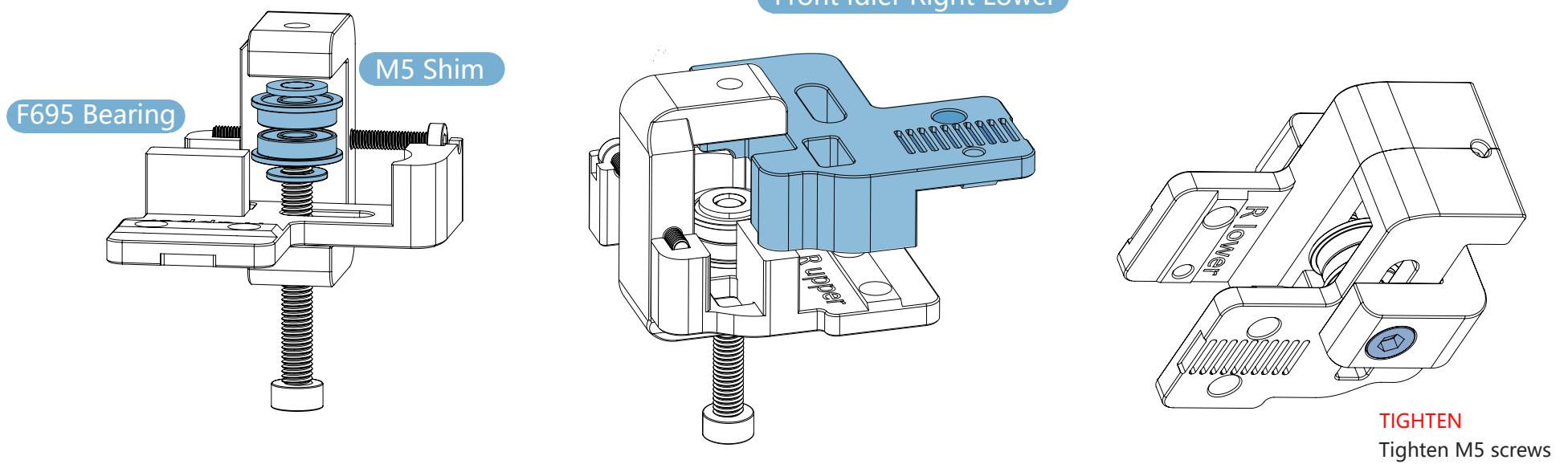
Front Idler Right Upper



M5x38 SHCS

**NOT INCLUDED**

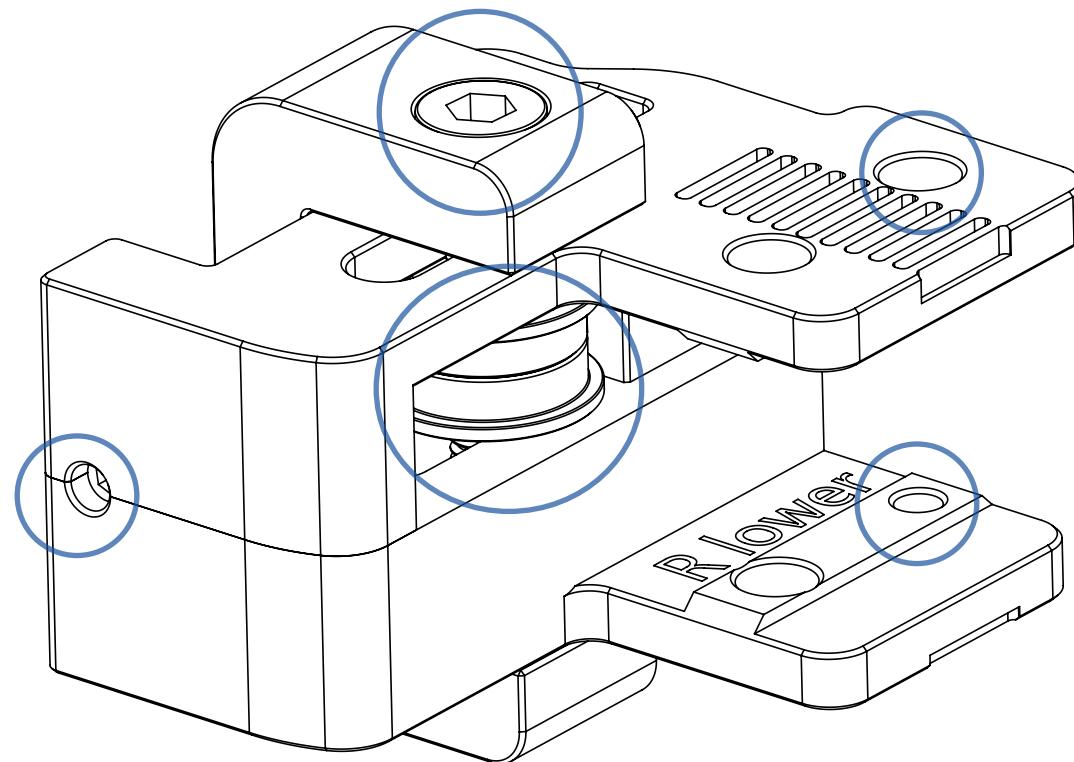
It is not included in the kit. There is only to show the installation steps.

**NOT INCLUDED**

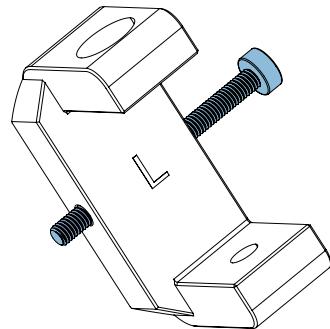
It is not included in the kit. There is only to show the installation steps.

**CHECK YOUR WORK**

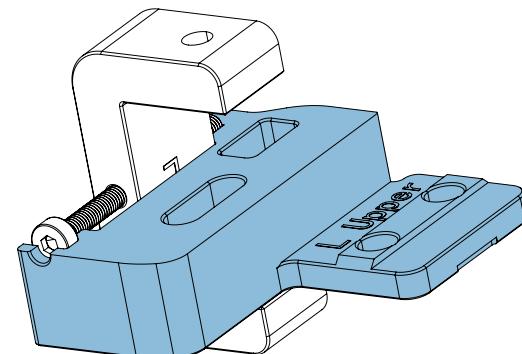
Compare your assembled parts to the graphics shown here. Pay attention to the features highlighted by the circles.

**NOT INCLUDED**

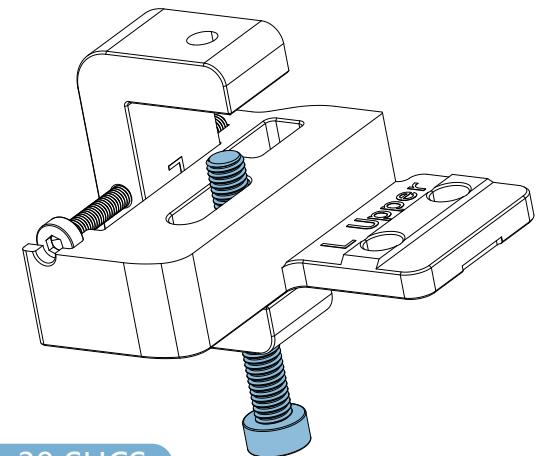
It is not included in the kit. There is only to show the installation steps.



M3x36 SHCS

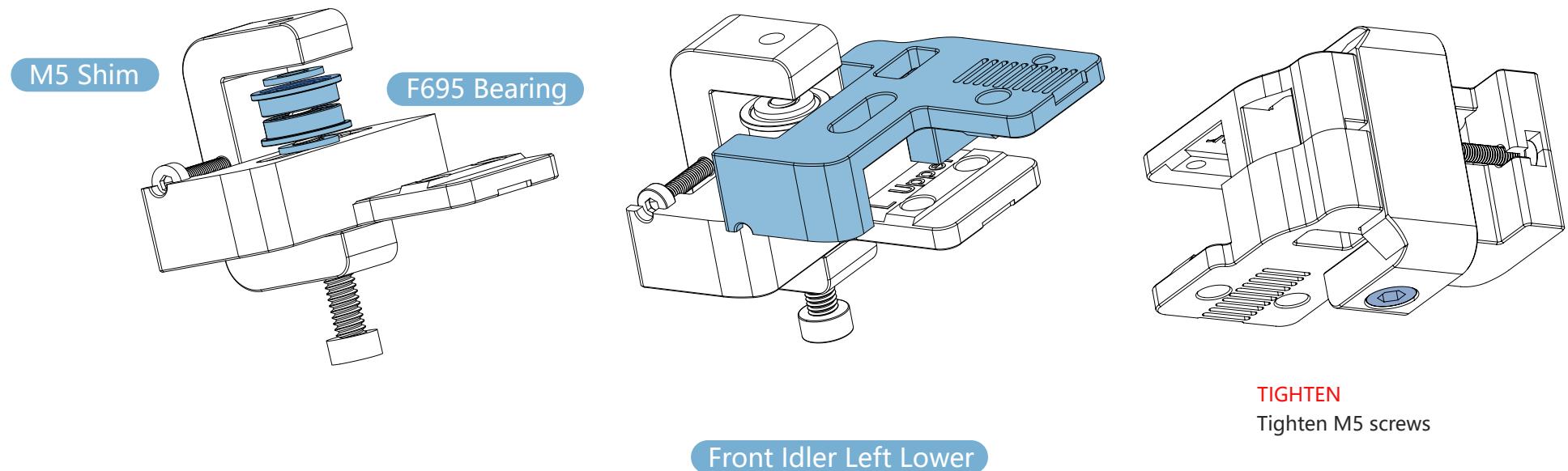


Front Idler Left Upper



M5x38 SHCS

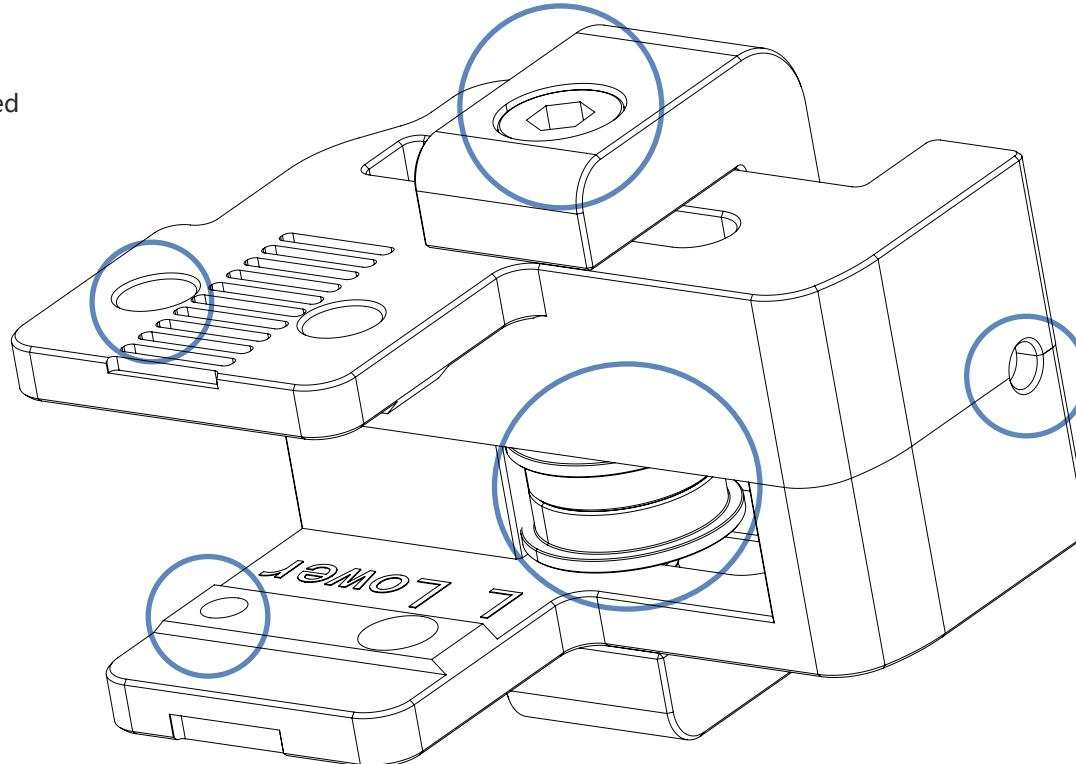
NOT INCLUDED

**NOT INCLUDED**

It is not included in the kit. There is only to show the installation steps.

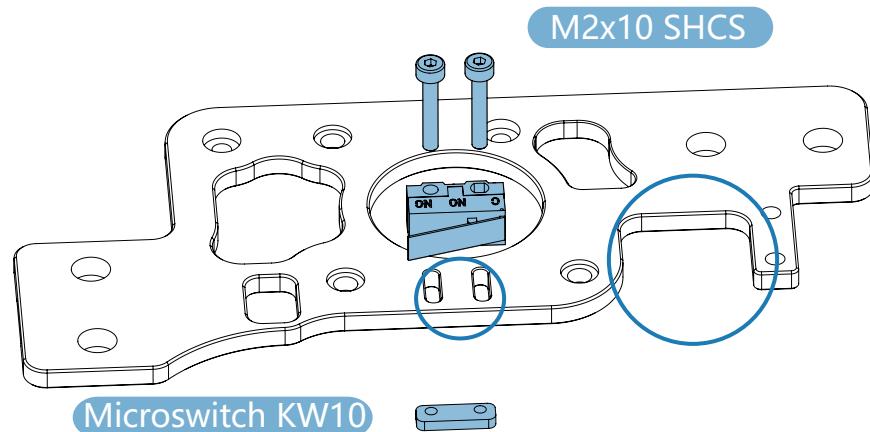
CHECK YOUR WORK

Compare your assembled parts to the graphics shown here. Pay attention to the features highlighted by the circles.



NOT INCLUDED

It is not included in the kit. There is only to show the installation steps.

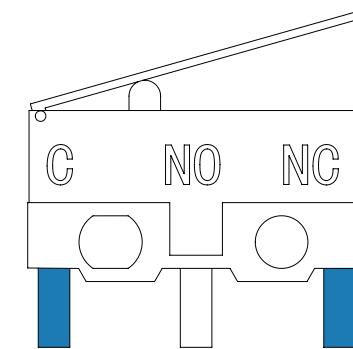


Microswitch Nut

#### CUTOUT

The carbon parts for the A drive have a cutout.

The carbon parts for the A drive upper have 2 open slot.



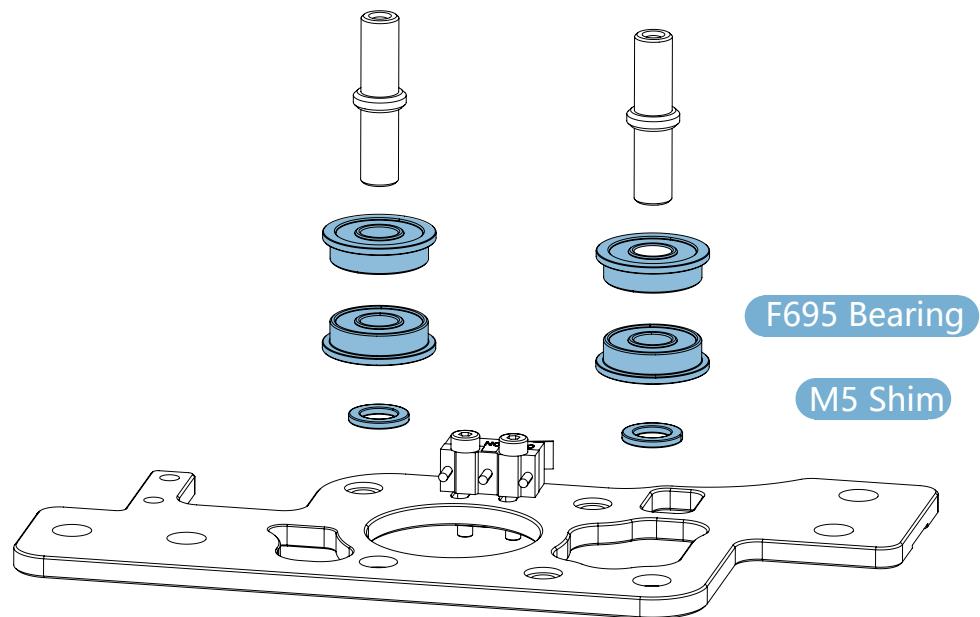
#### END-STOP SWITCHES FOR X AND Y

End-stops are wired in a "Normally Closed" configuration. On microswitches those are the 2 outer terminals indicated by C and NC.

Prepare the switches for X and Y by soldering 150mm of wire to each of the outer terminals.

#### NOT INCLUDED

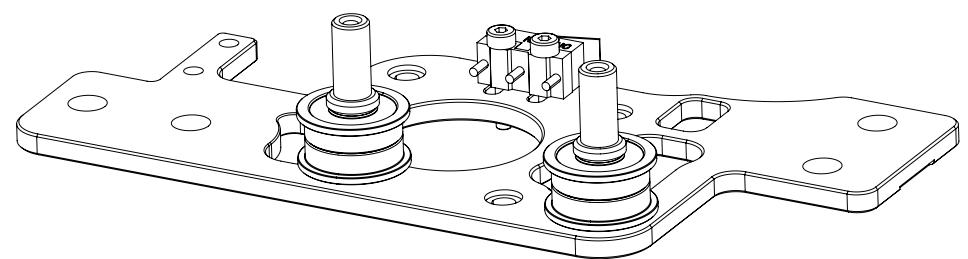
The micro switch is not included in the kit. There is only to show the installation steps.

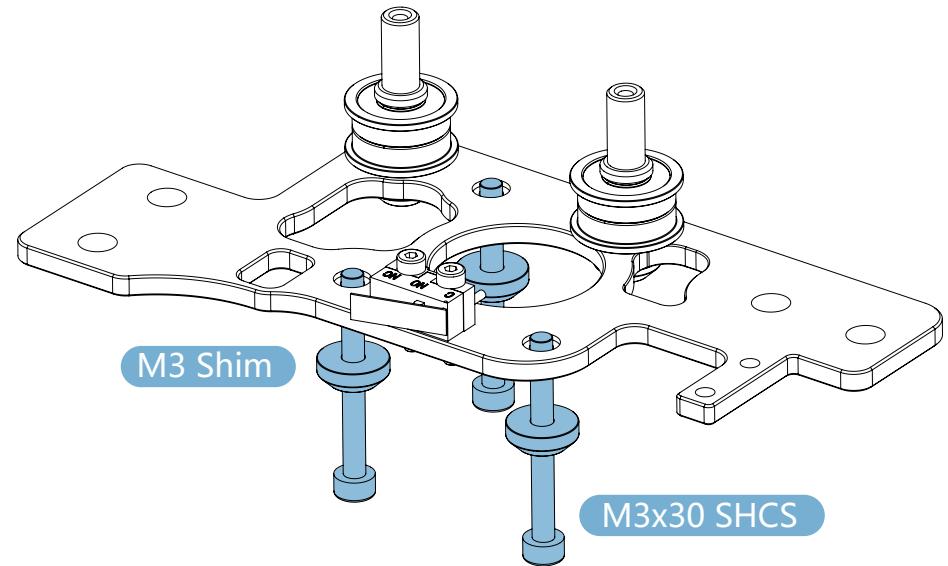
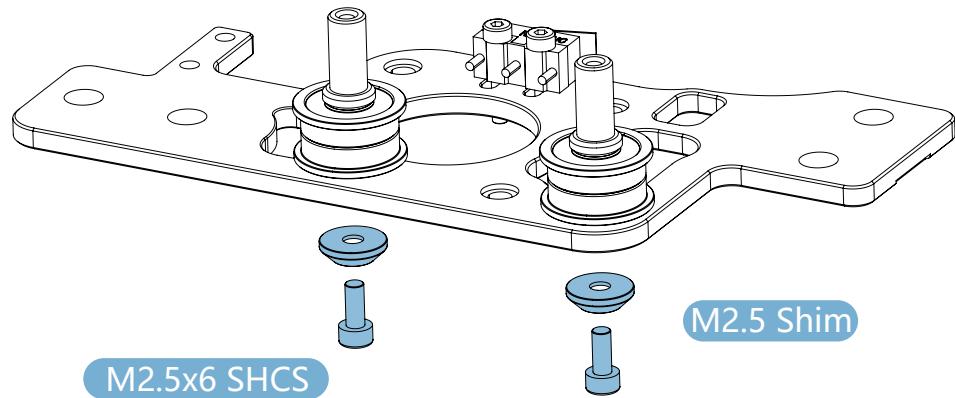
**STAND-OFF**

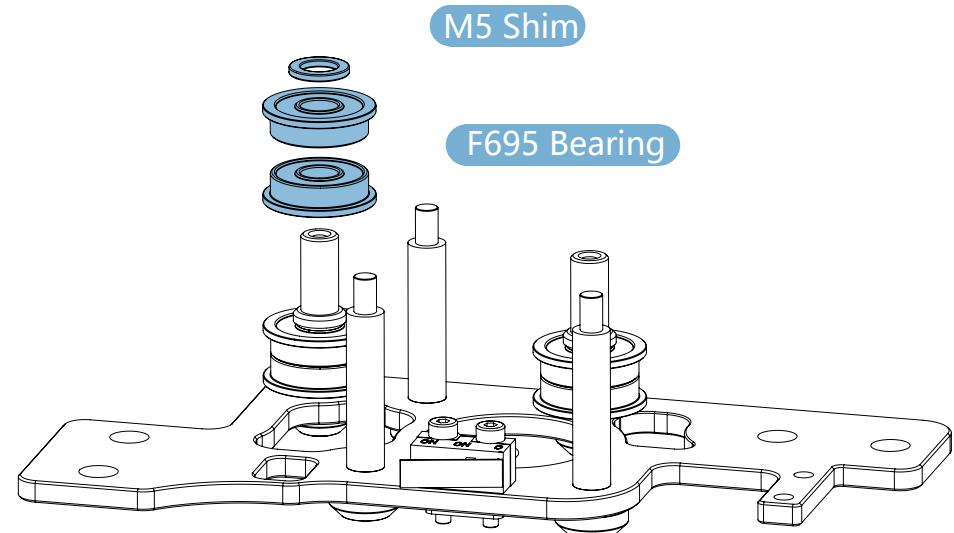
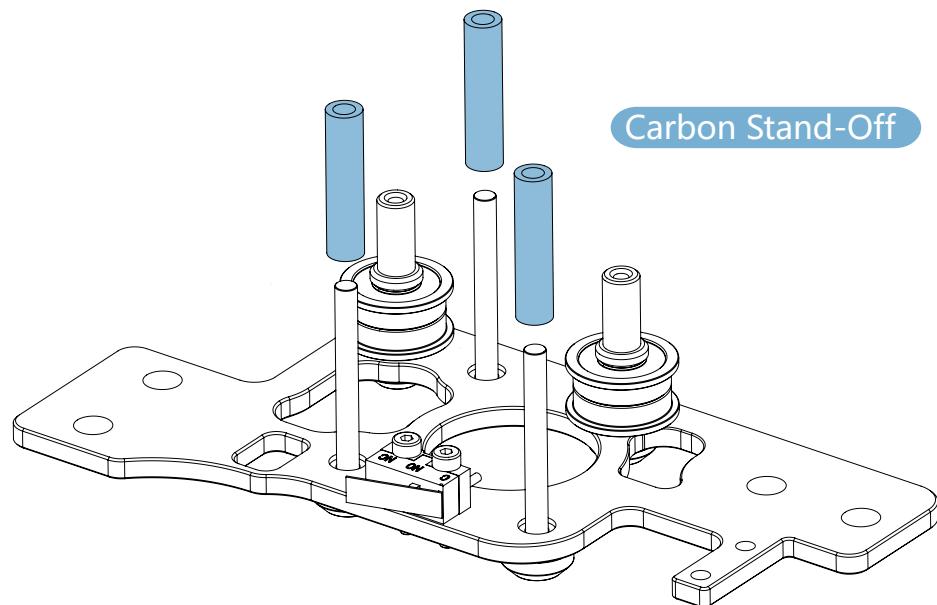
All the stand-off for the Bearing is black.

**NOT INCLUDED**

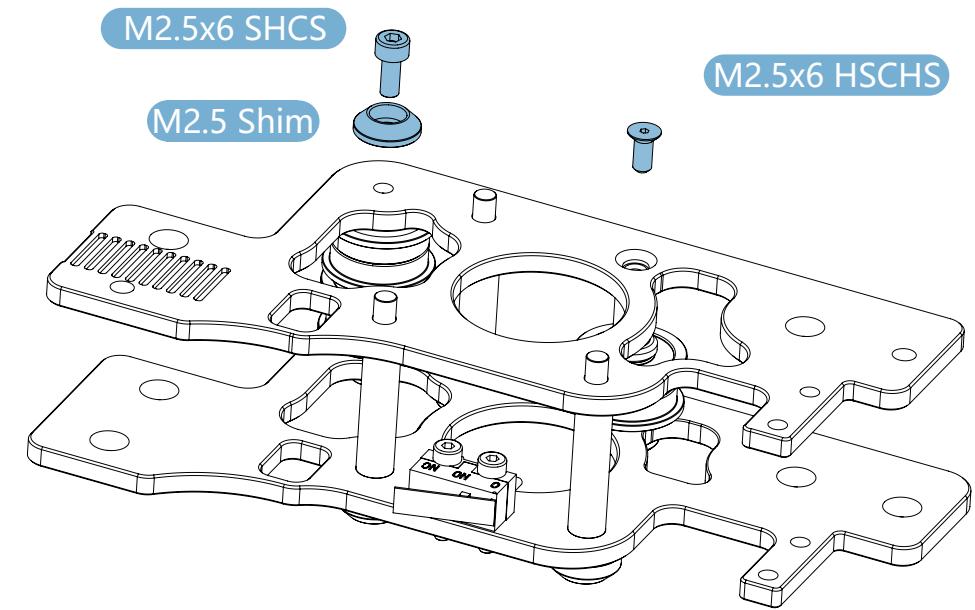
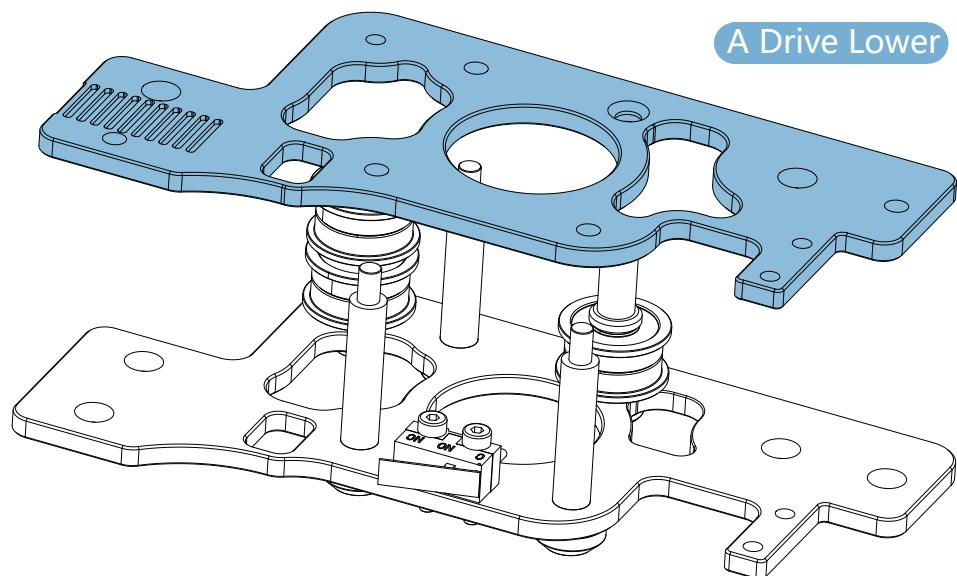
The Bearing is not included in the kit.  
There is only to show the installation steps.

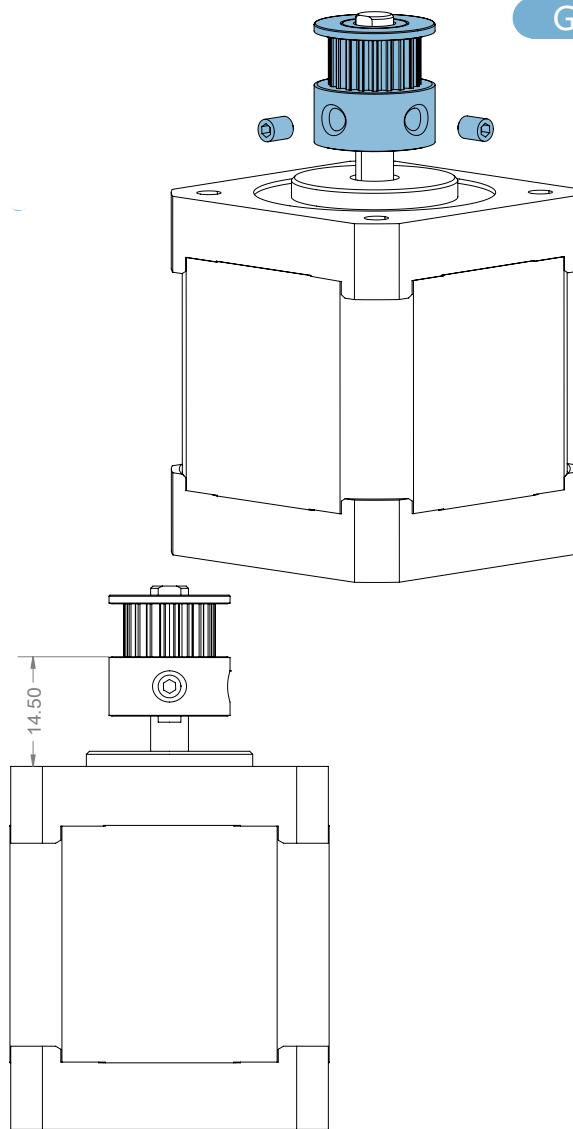




**NOT INCLUDED**

The Bearing is not included in the kit.  
There is only to show the installation steps.

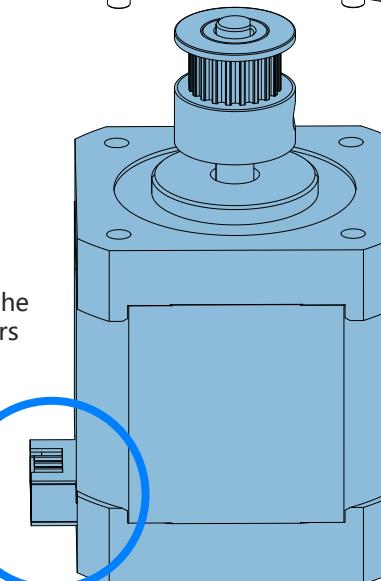
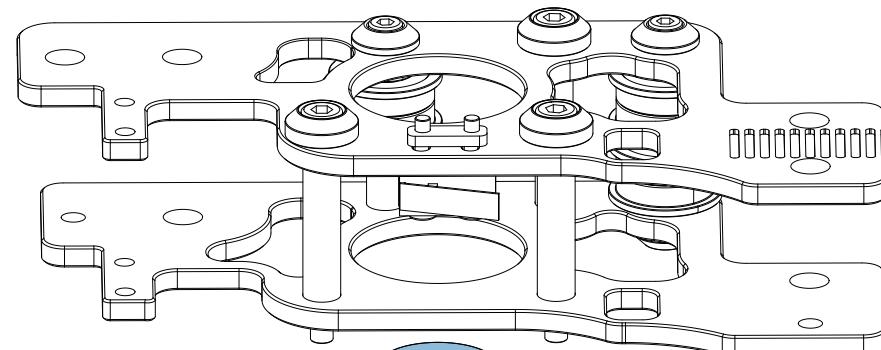




### GT2 20 Tooth Pulley

#### APPLY THREAD LOCKER

Make sure to use thread locker on the set screws.

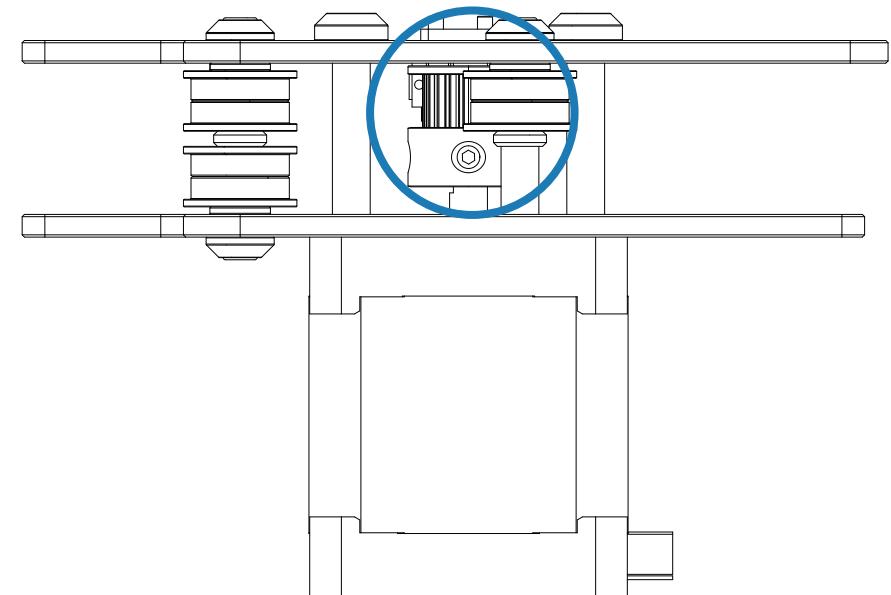
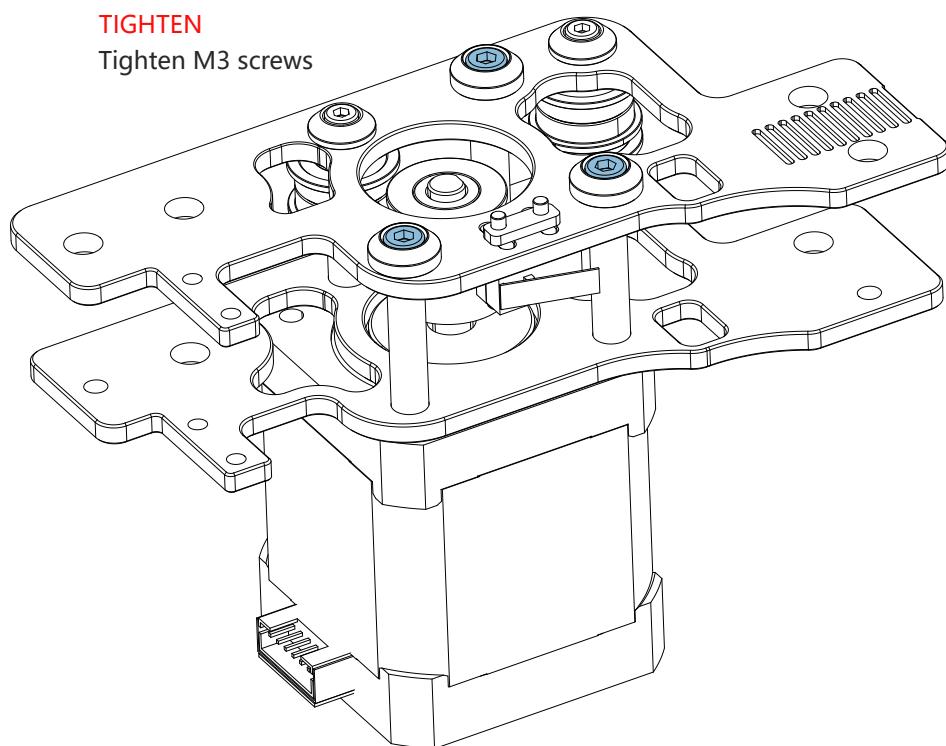


#### MOTOR ORIENTATION

Pay attention to the orientation of the cable exit. The wires from the motors will be pointing towards each other once fully assembled.

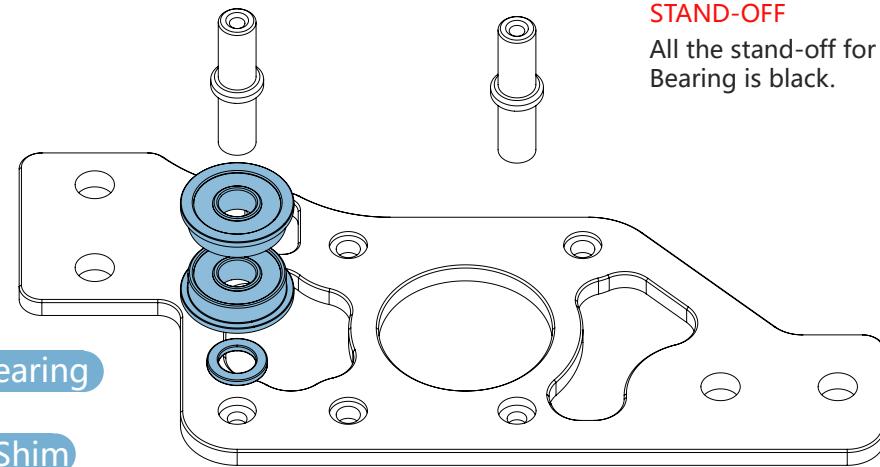
#### NOT INCLUDED

The motor and 2GT tooth pulley are not included in the kit. There is only to show the installation steps.



**CHECK YOUR WORK**

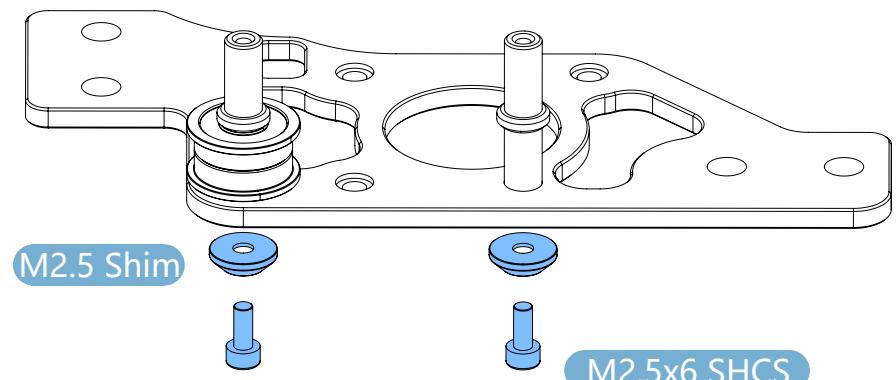
Compare your assembled part to the graphic shown here.  
Pay attention to the pulley orientation and alignment with the bearing stacks.



F695 Bearing

M5 Shim

**STAND-OFF**  
All the stand-off for the Bearing is black.

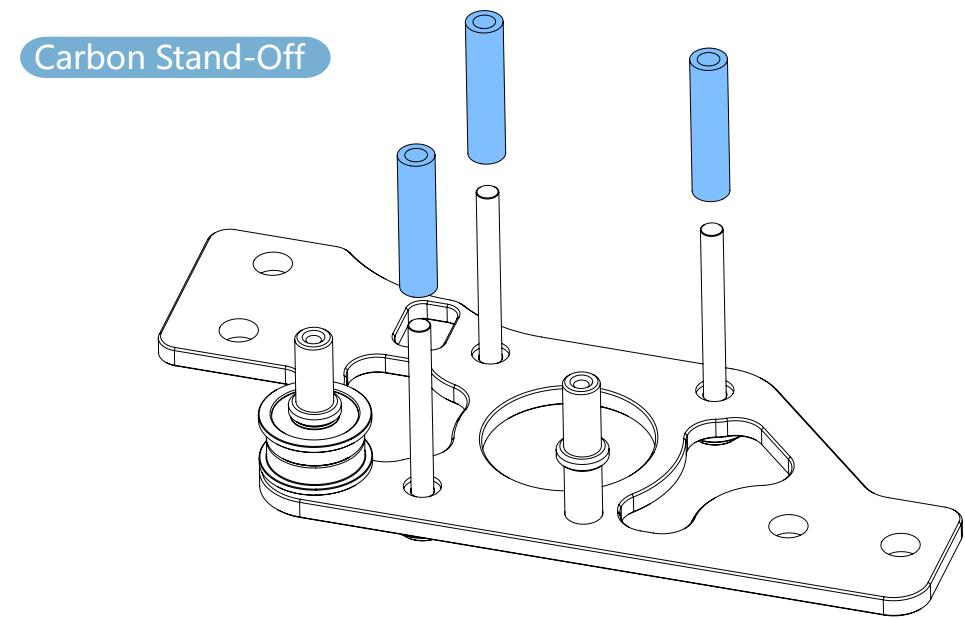
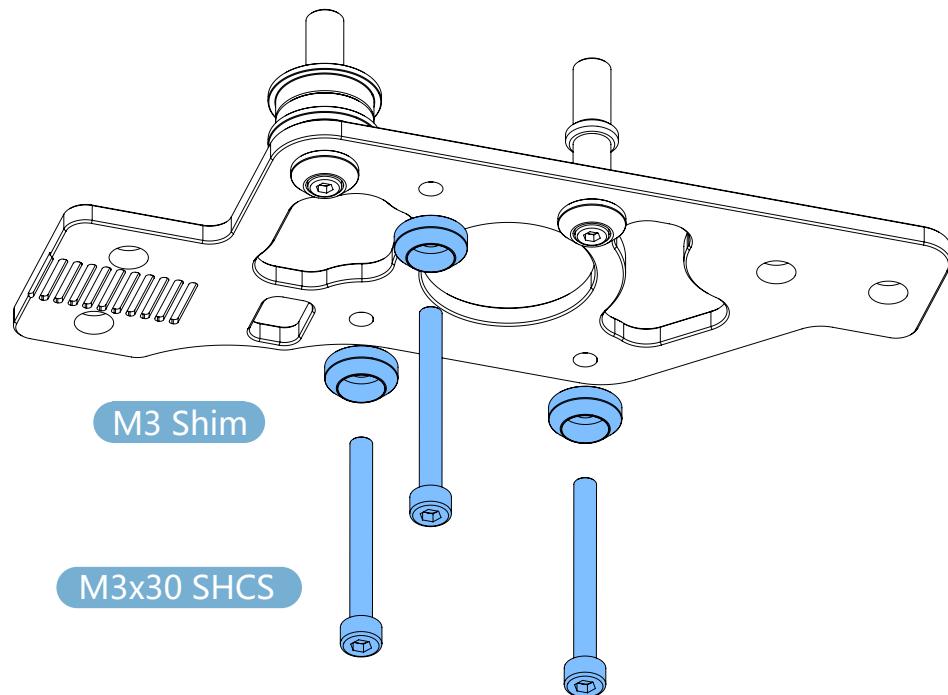


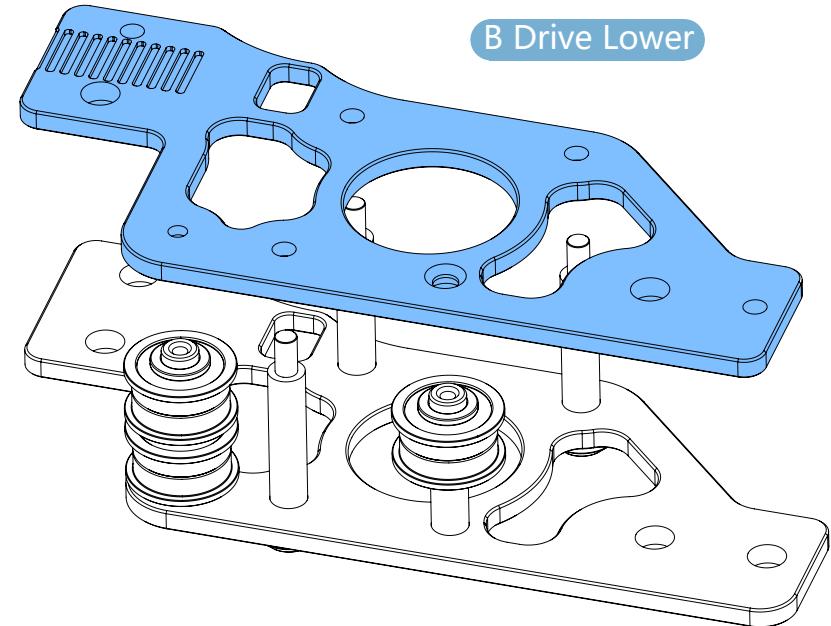
M2.5 Shim

M2.5x6 SHCS

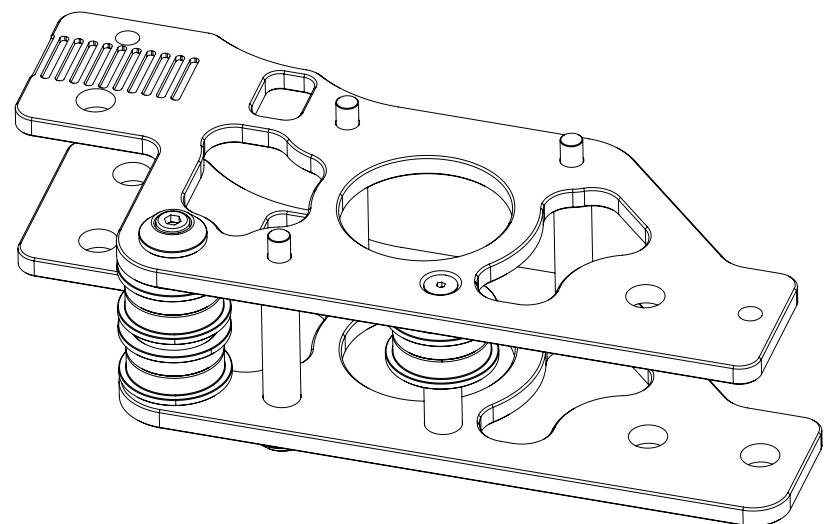
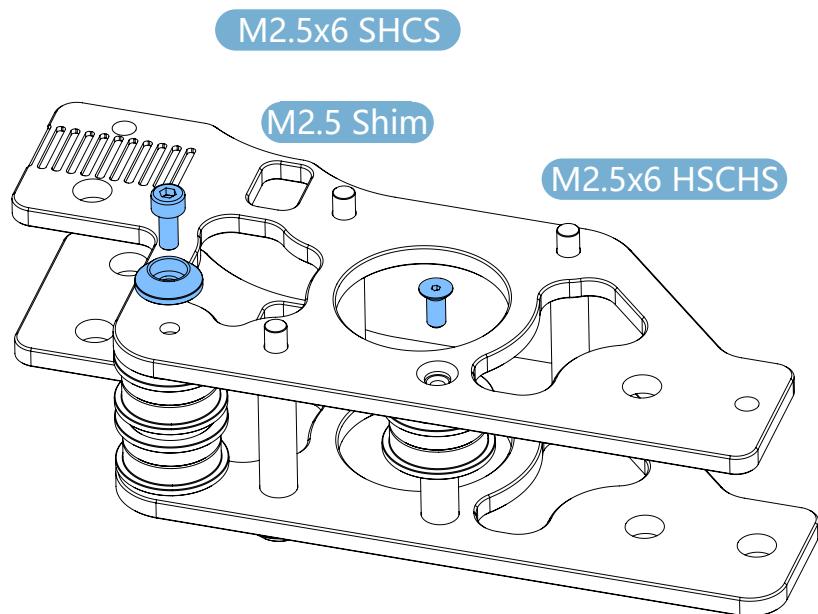
**NOT INCLUDED**

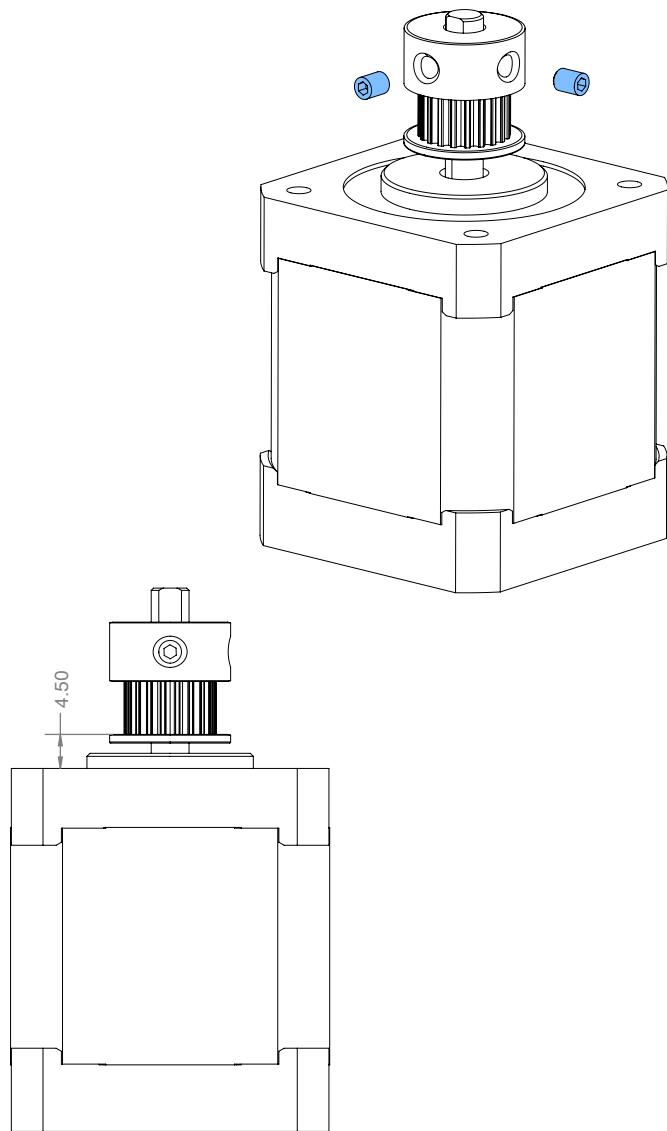
The Bearing is not included in the kit.  
There is only to show the installation steps.



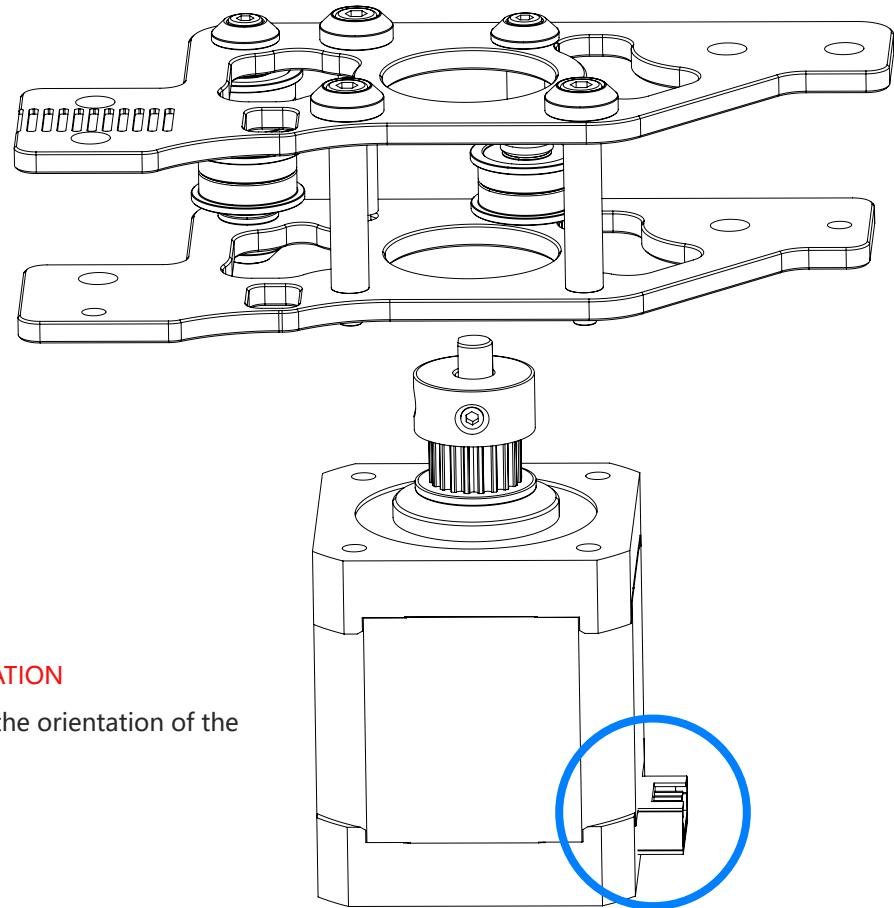
**NOT INCLUDED**

The Bearing is not included in the kit.  
There is only to show the installation steps.

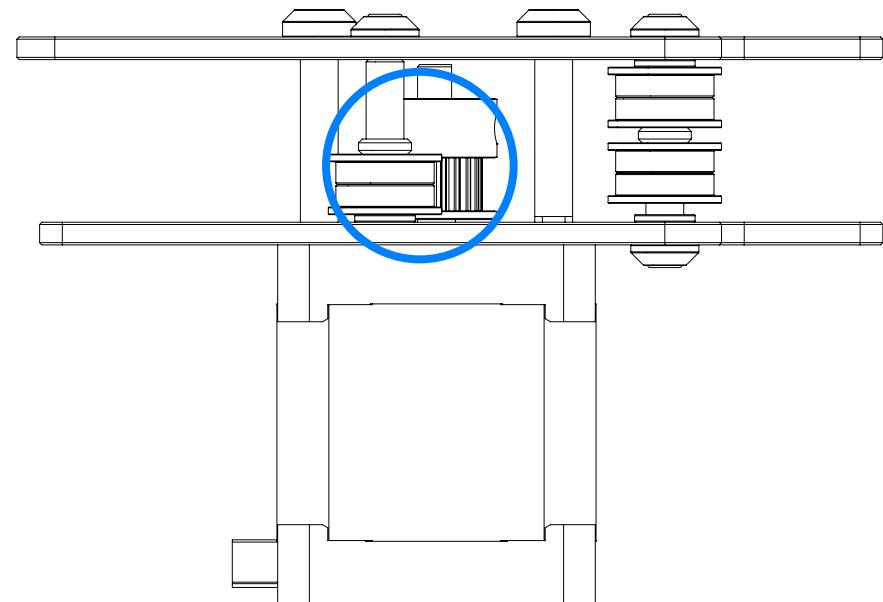
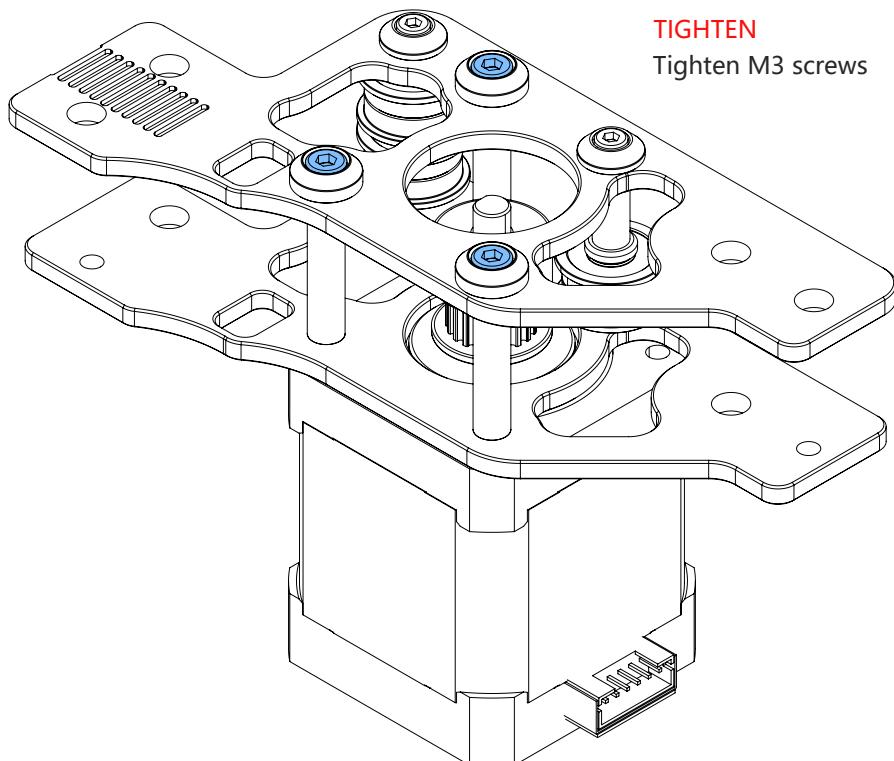


**NOT INCLUDED**

The motor and 2GT tooth pulley are not included in the kit. There is only to show the installation steps.

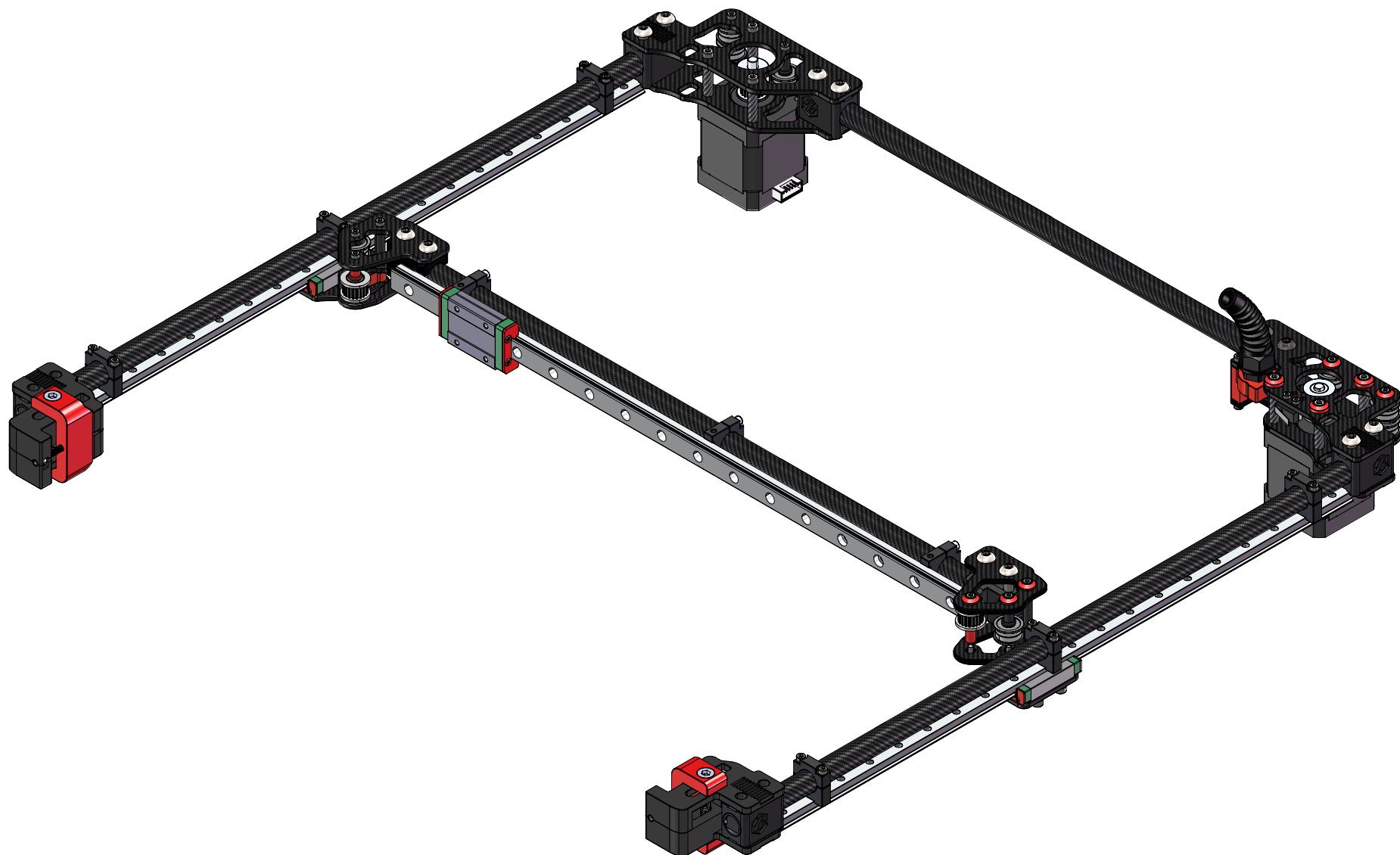
**MOTOR ORIENTATION**

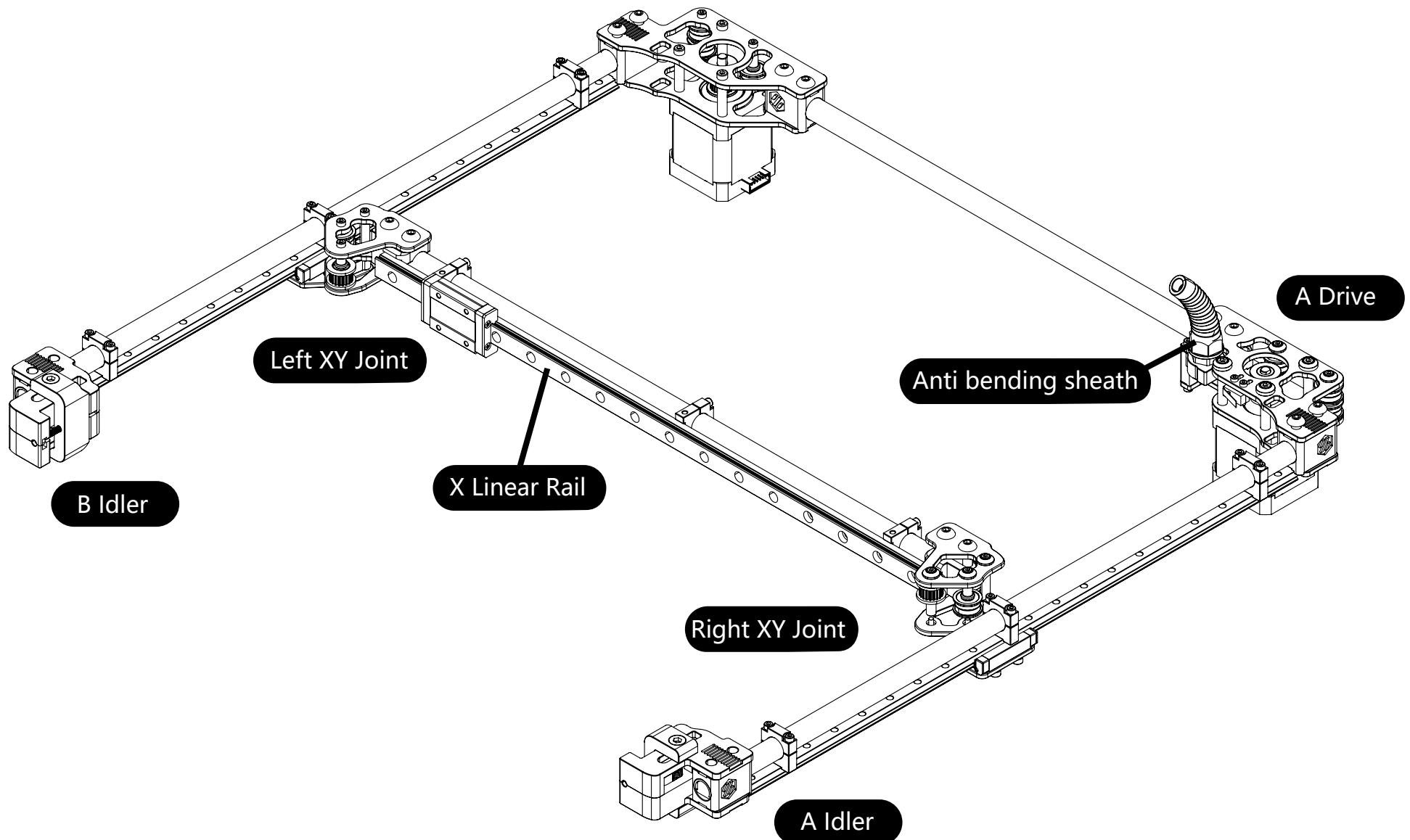
Pay attention to the orientation of the cable exit.

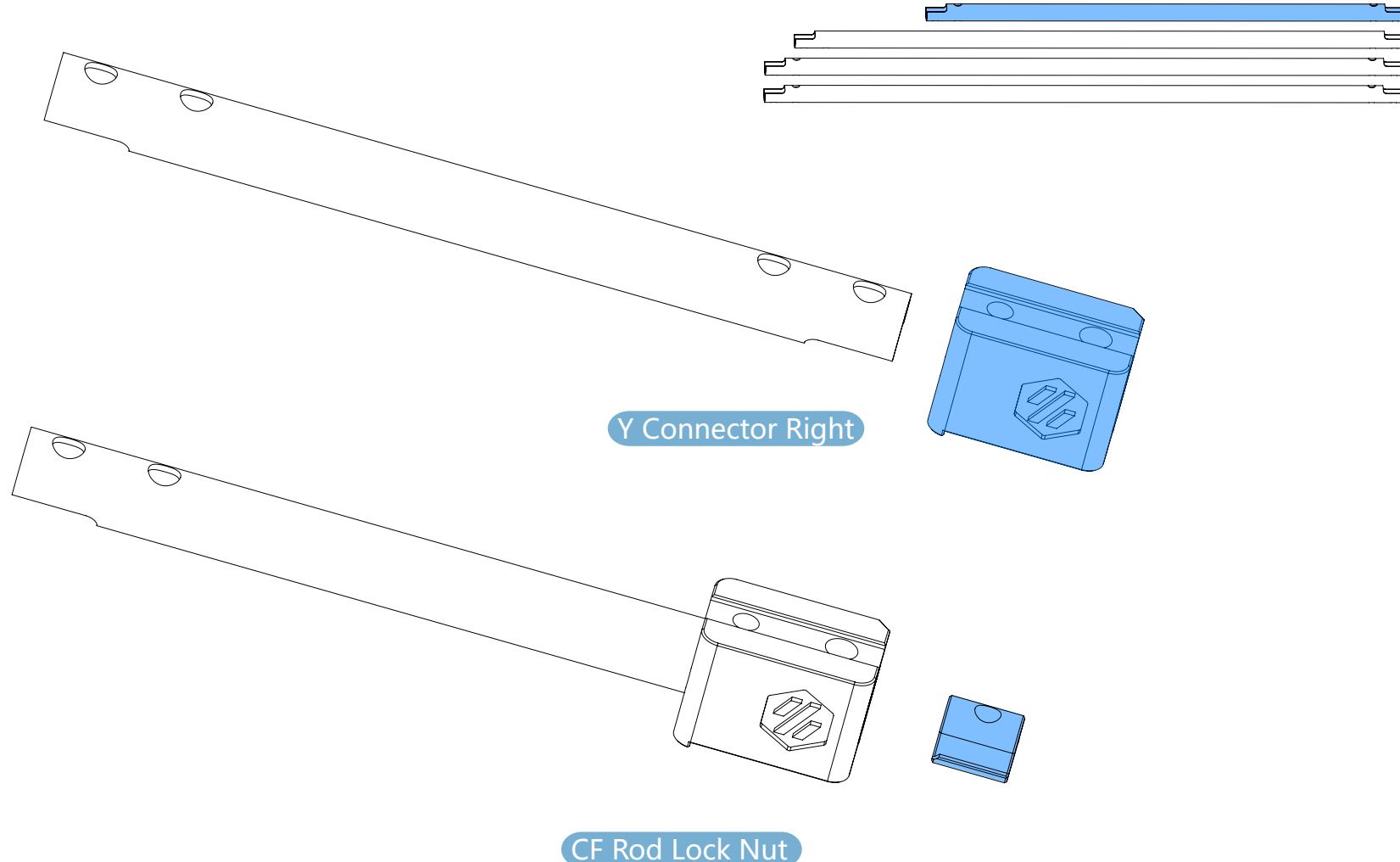


**CHECK YOUR WORK**

Compare your assembled part to the graphic shown here.  
Pay attention to the pulley orientation and alignment with the bearing stacks.

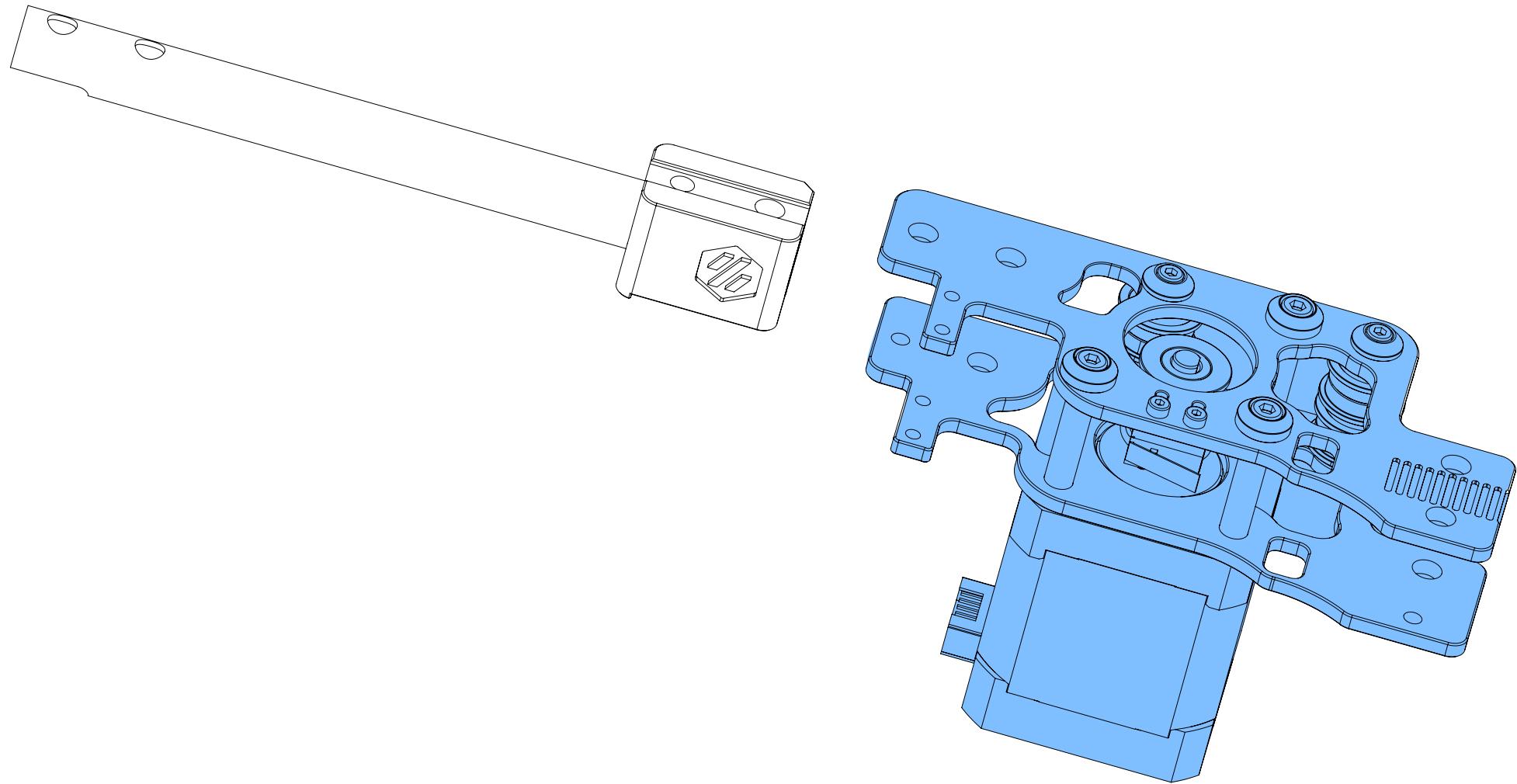


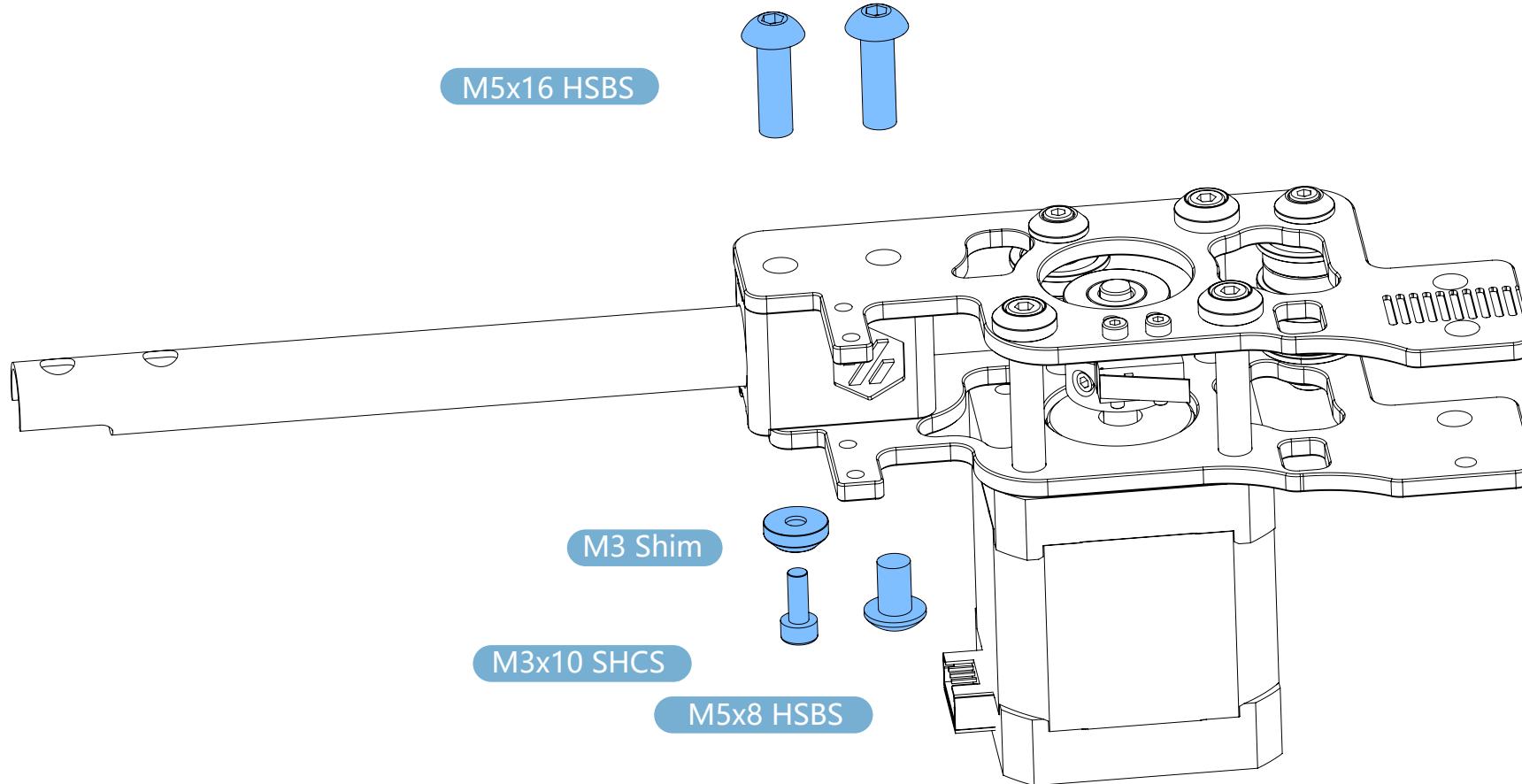




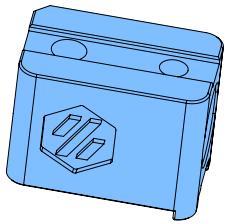
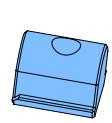
# GANTRY

[WWW.CHAOTICLAB.COM](http://WWW.CHAOTICLAB.COM)

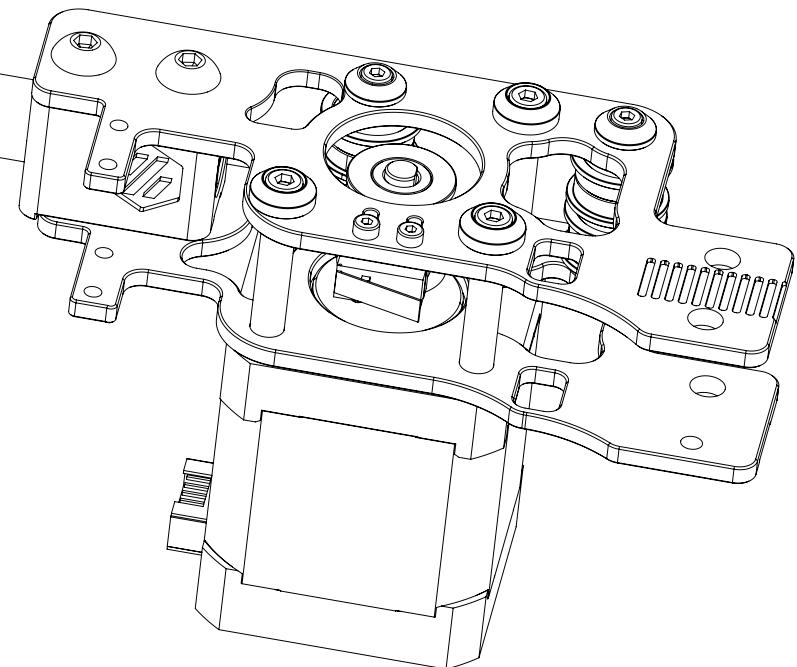


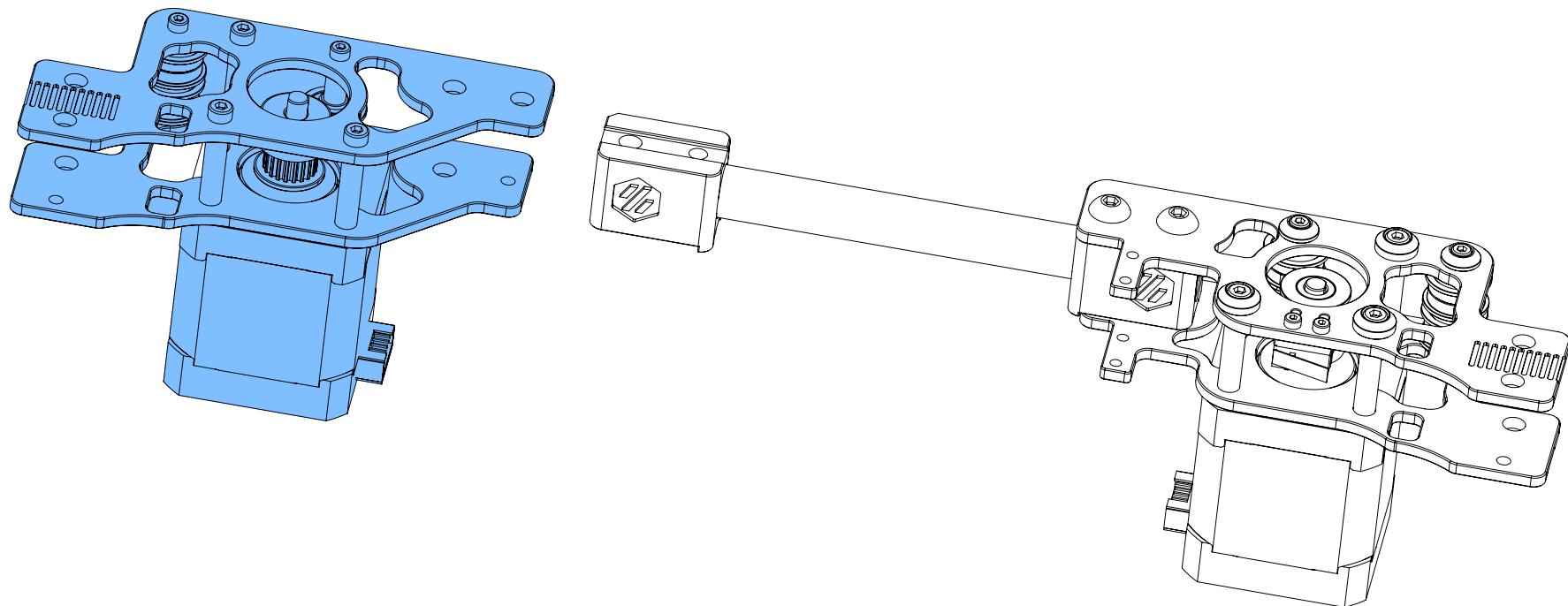


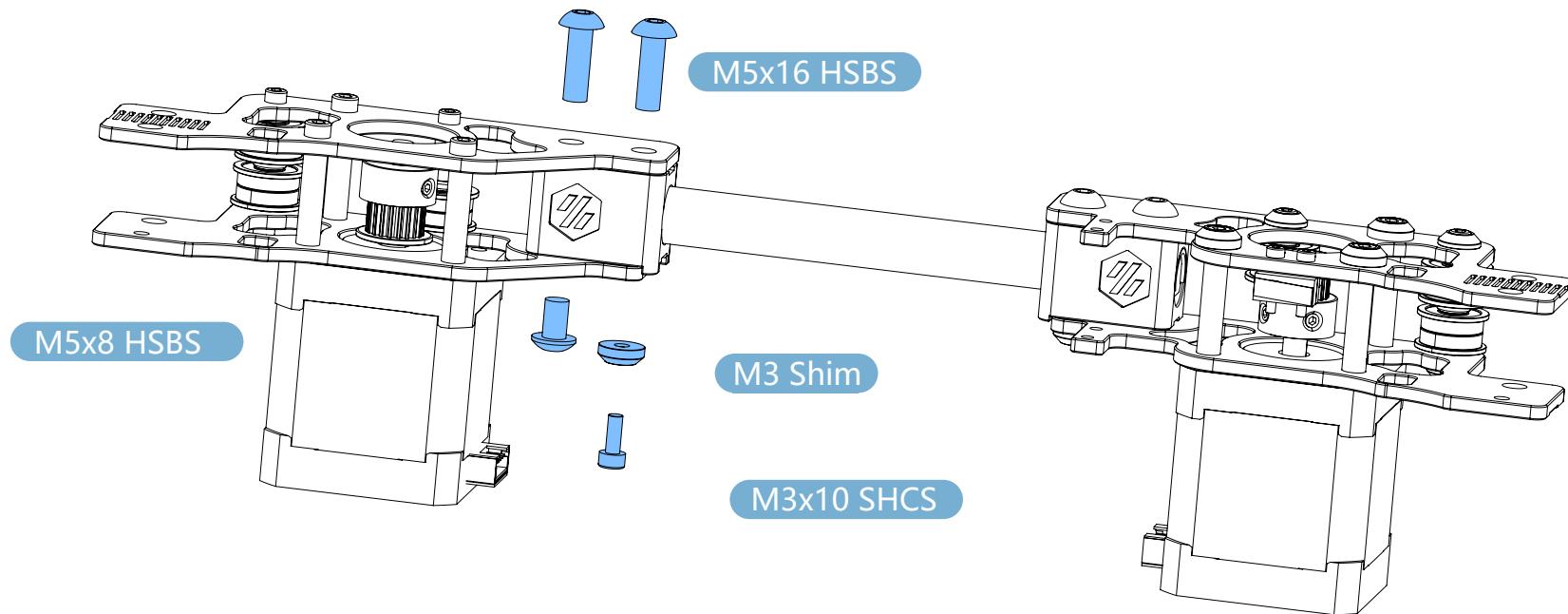
CF Rod Lock Nut

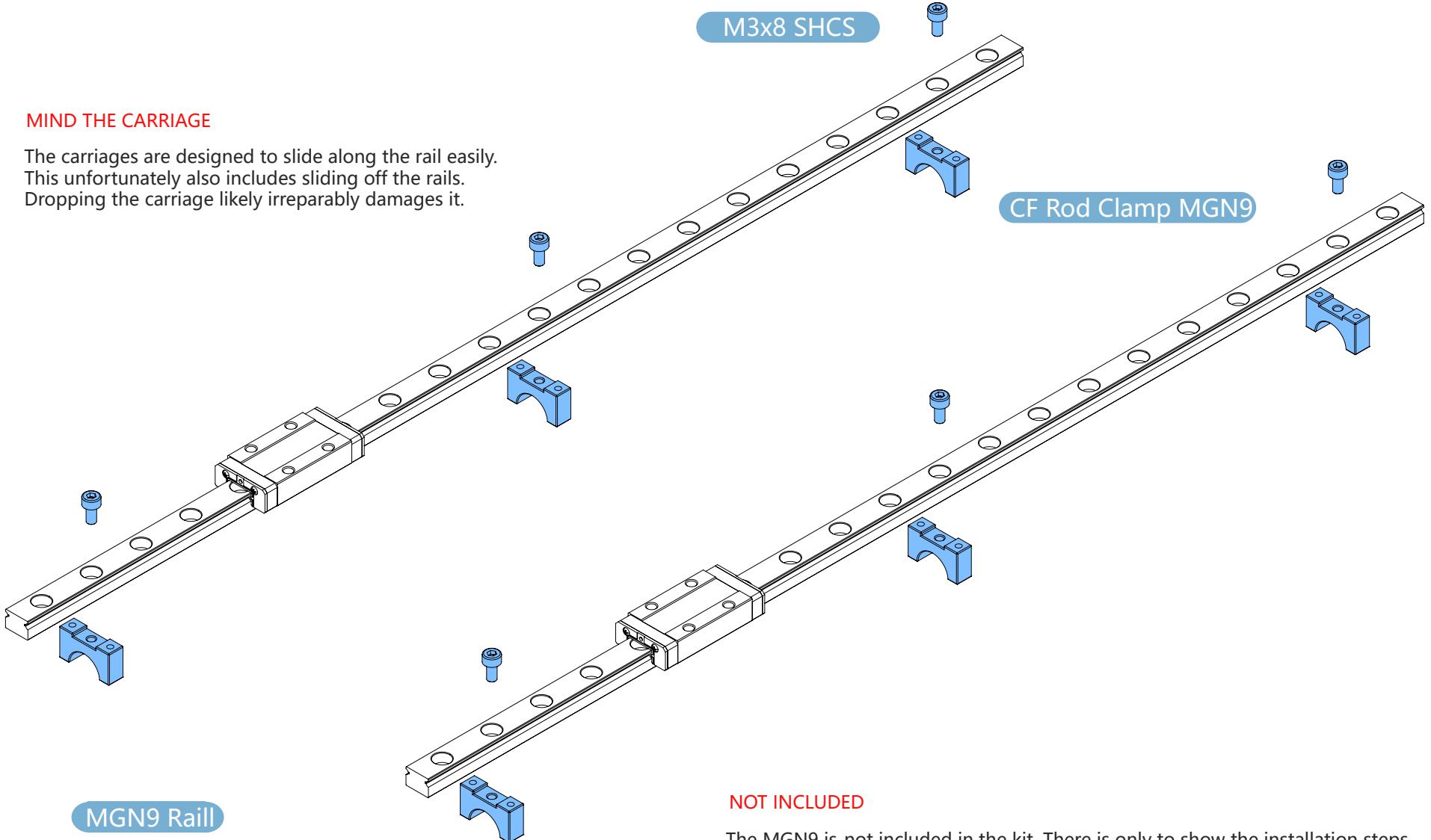


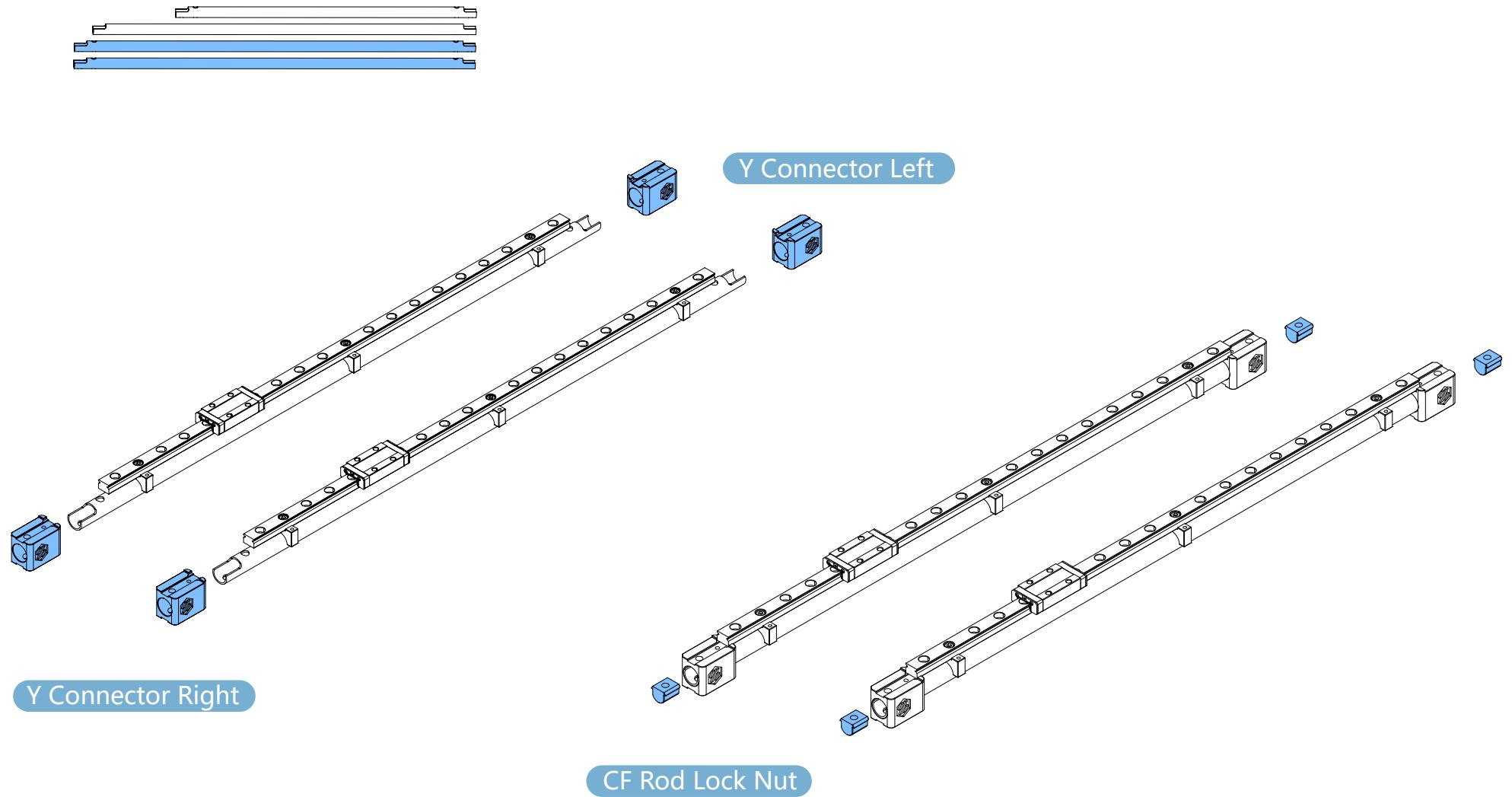
Y Connector Left

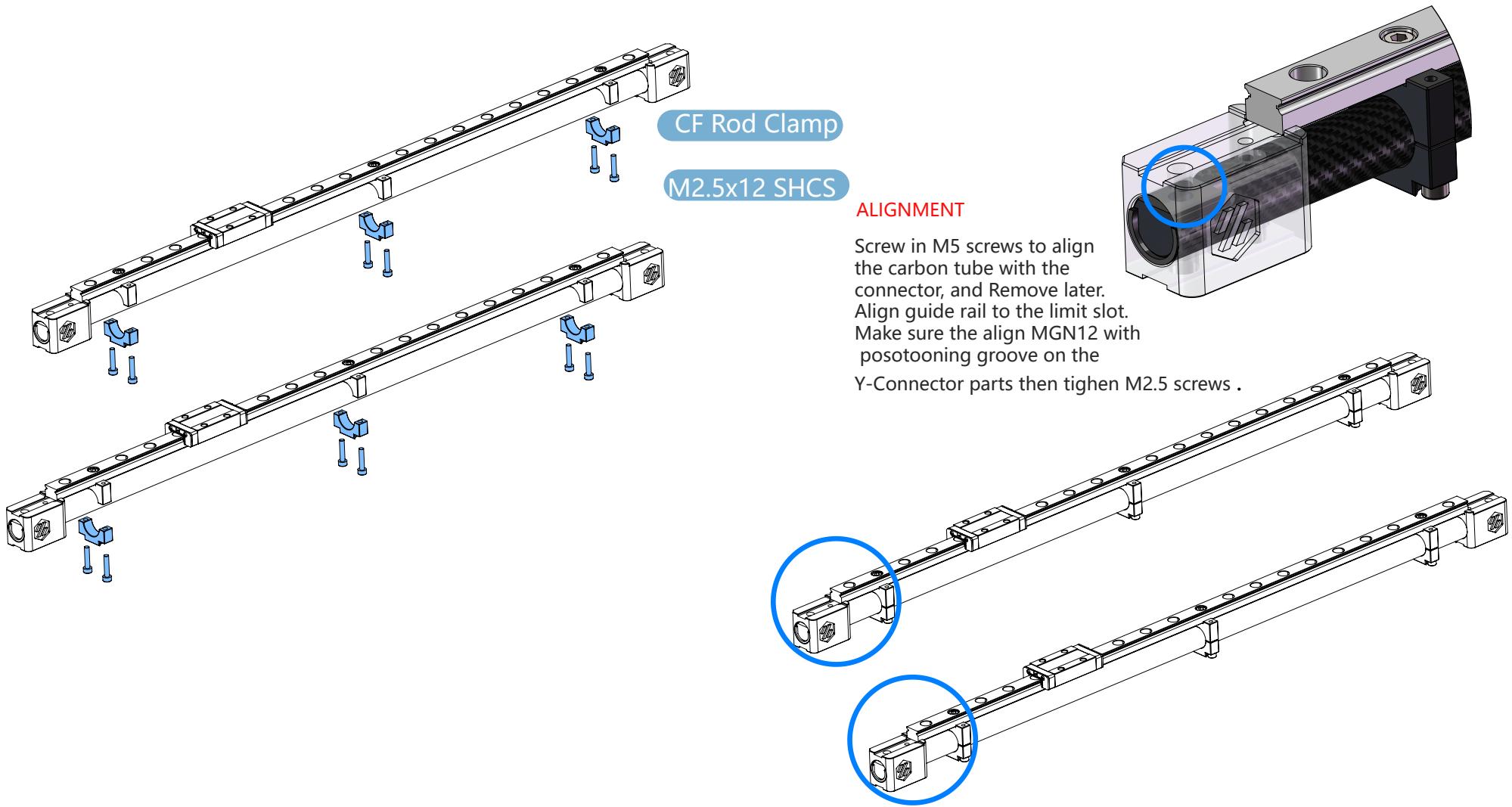


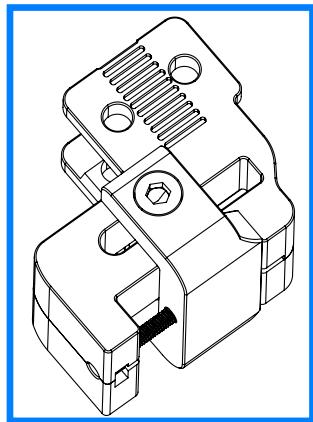




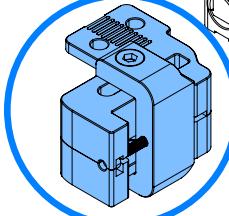
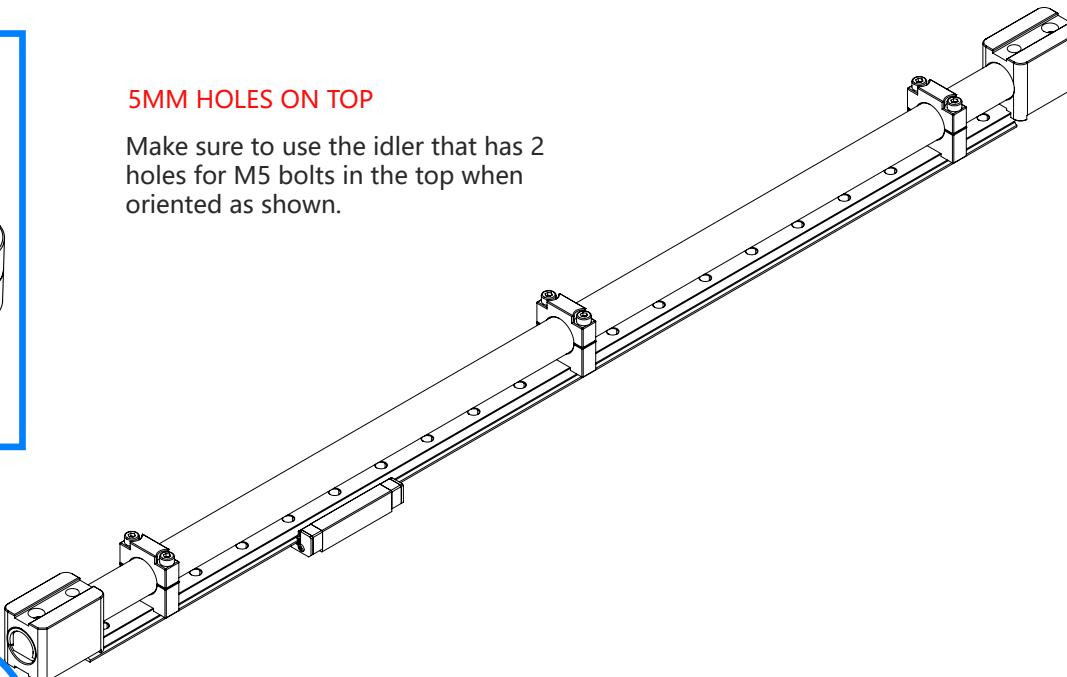


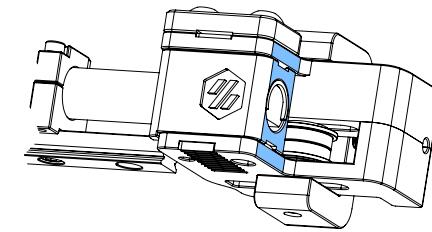
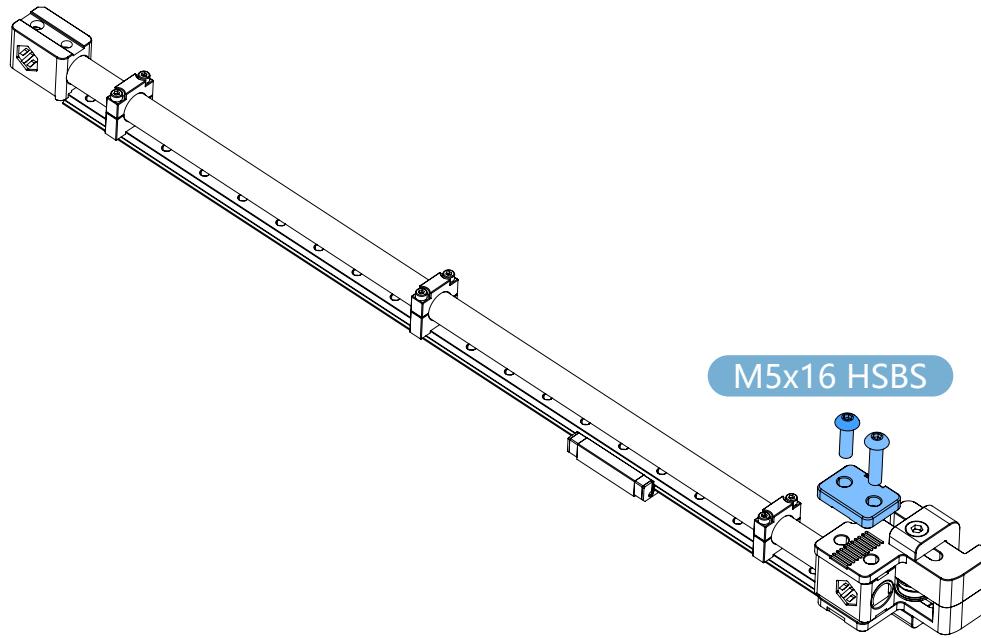




**5MM HOLES ON TOP**

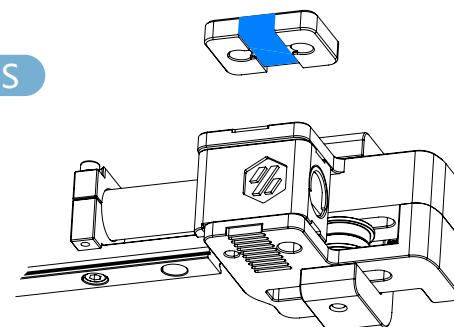
Make sure to use the idler that has 2 holes for M5 bolts in the top when oriented as shown.





#### FLUSH INSTALL

Make sure the plastic part sits flush with the end of the extrusion. If not flush check if you installed the correct idler

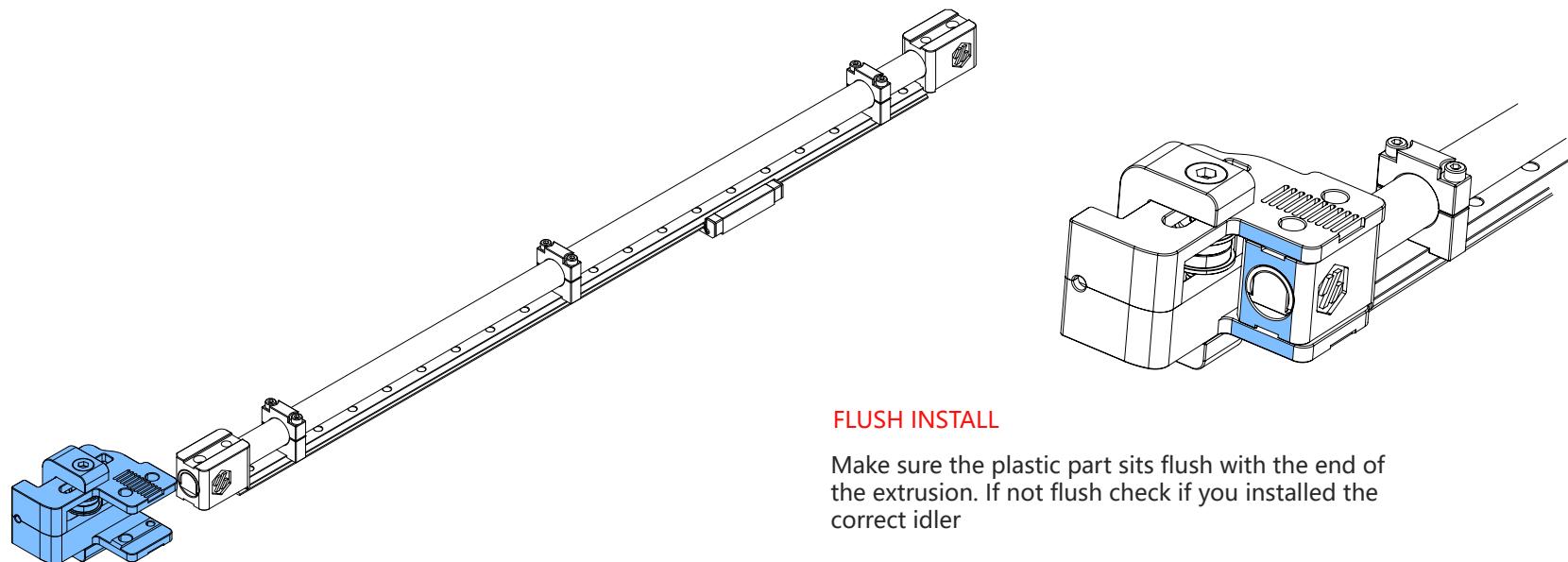


#### NOTCH ORIENTATIO

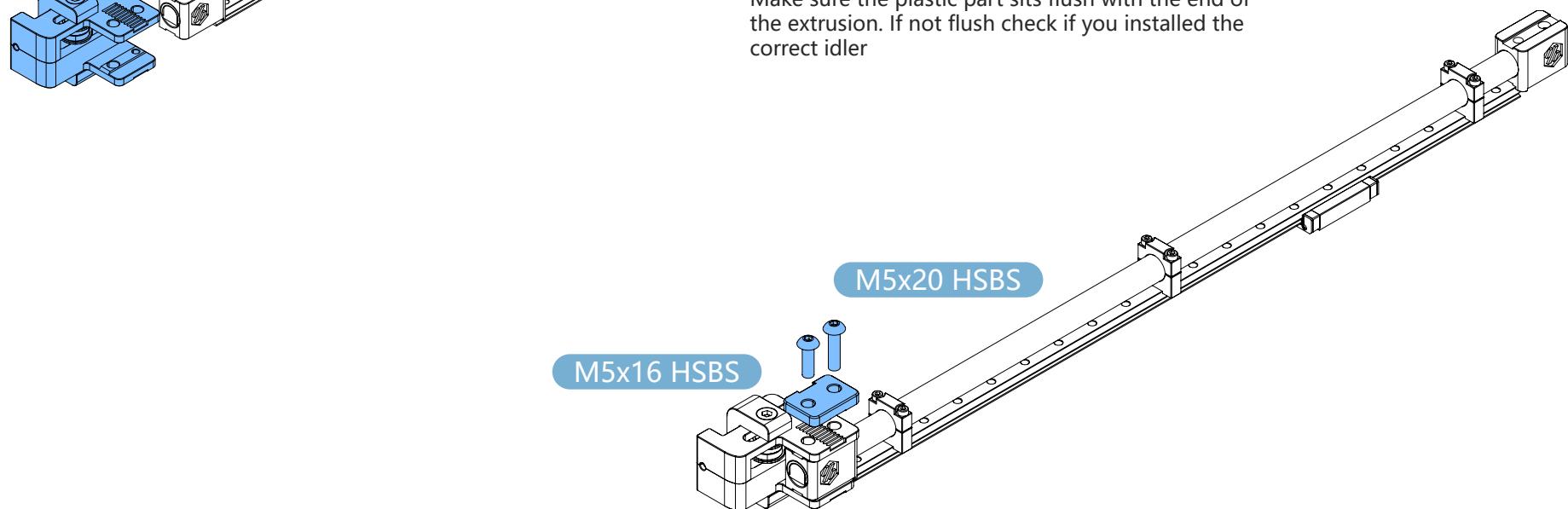
The indentation along the part is designed to clamp on the belt. The notch points away from the idler assembly.

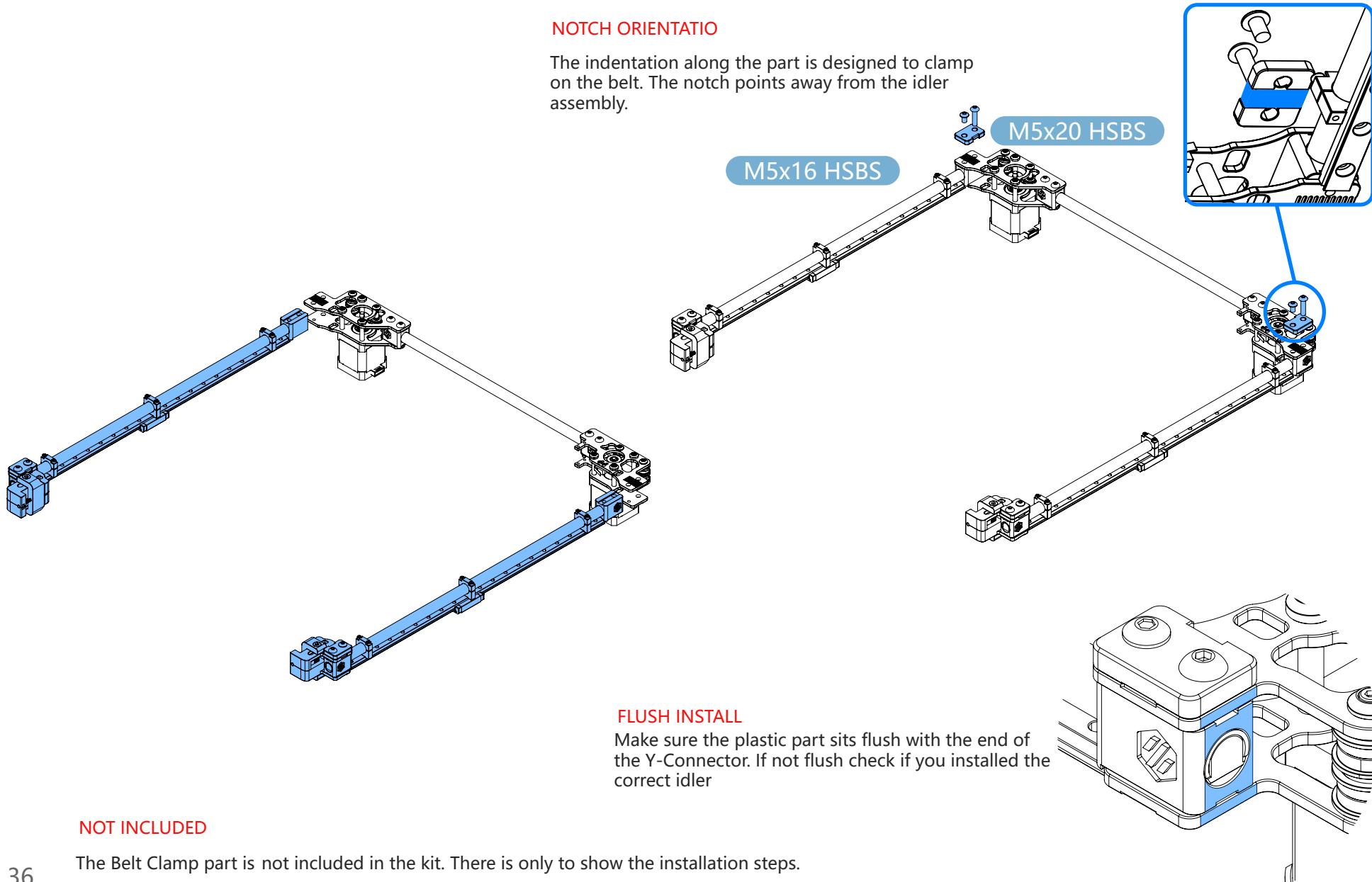
#### NOT INCLUDED

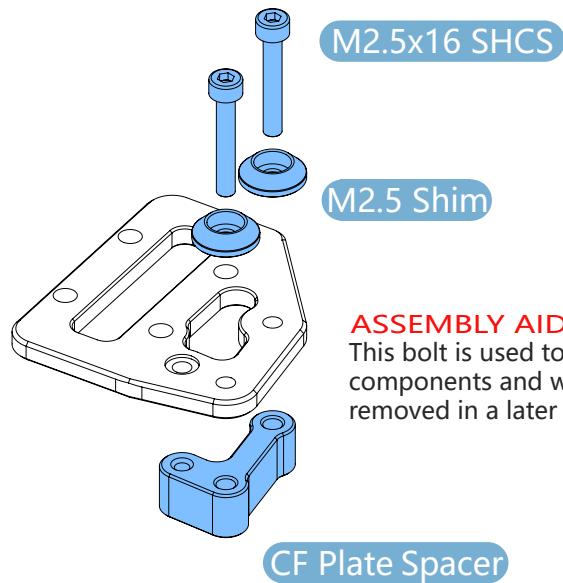
The Belt Clamp part is not included in the kit. There is only to show the installation steps.

**FLUSH INSTALL**

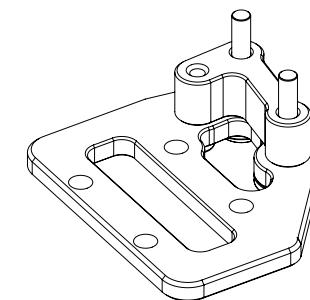
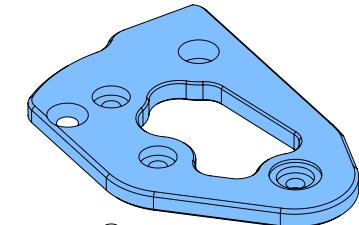
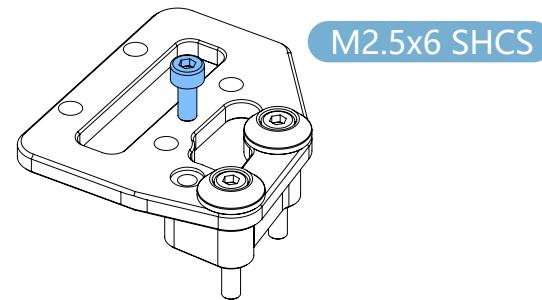
Make sure the plastic part sits flush with the end of the extrusion. If not flush check if you installed the correct idler

**NOT INCLUDED**

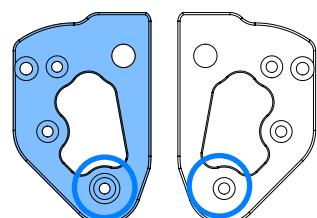




**ASSEMBLY AID**  
This bolt is used to align components and will be removed in a later step.

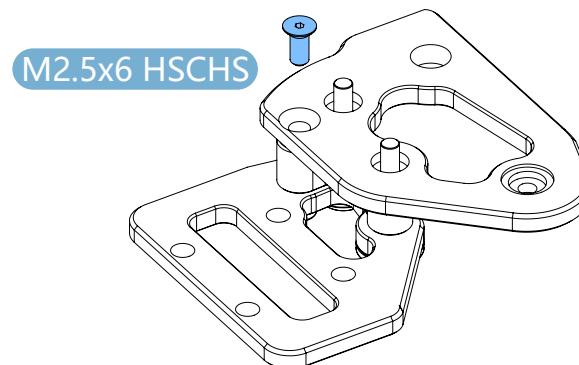


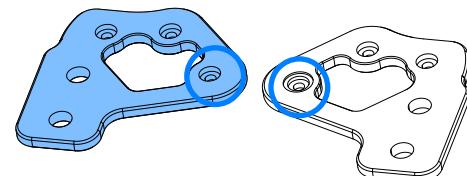
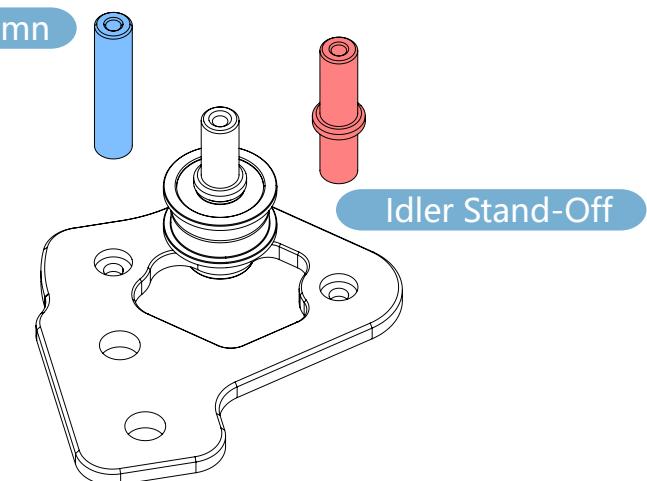
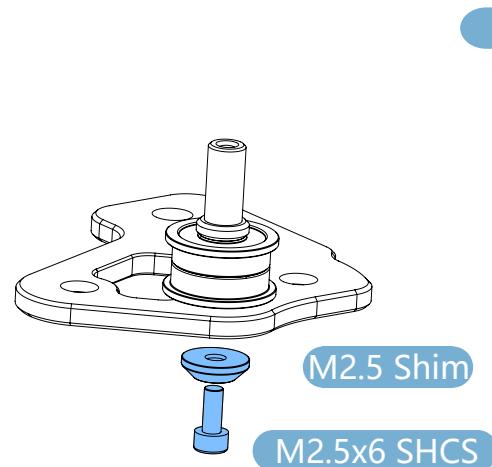
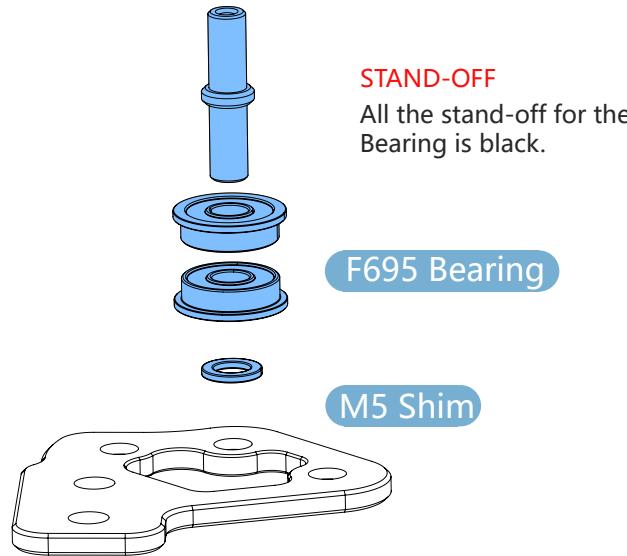
Y Joint Carbon Part



Counterbore

Counterbore diameter on the XY-Joint-upper Left parts is larger.

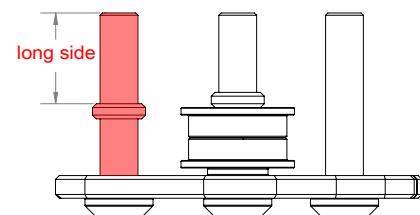


**Counterbore**

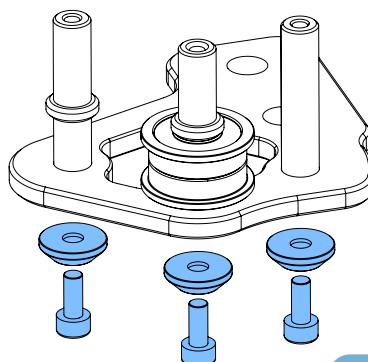
Counterbore diameter on the XY-Joint-upper Left parts is smaller.

**STAND-OFF**

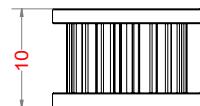
The stand-off for the Idler is red.

**NOT INCLUDED**

The Bearing is not included in the kit. There is only to show the installation steps.

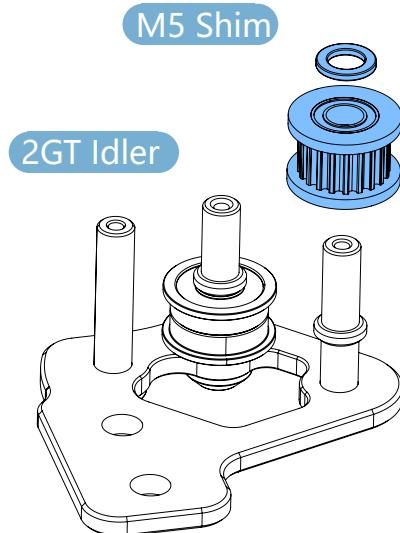


M2.5 Shim  
M2.5x6 SHCS



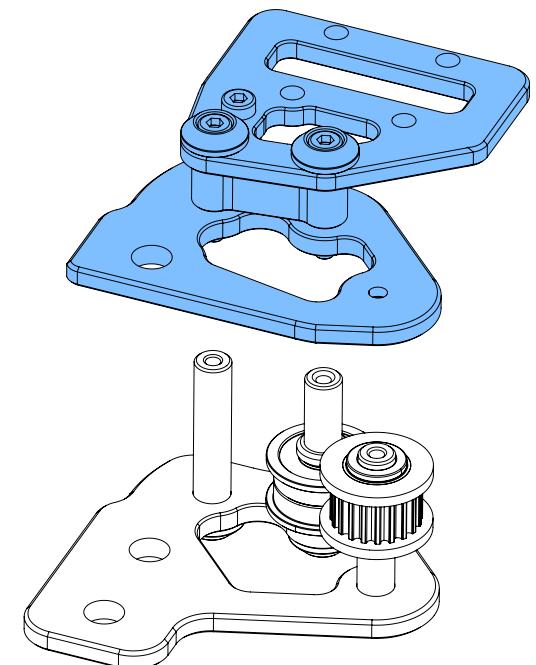
2GT IDLER

The 2GT 20 tooth Idler have multiple specifications. It is recommended to use one with a height of 10mm. If the height is 8.5mm, additional gaskets need to be added at both ends of the idler gear.



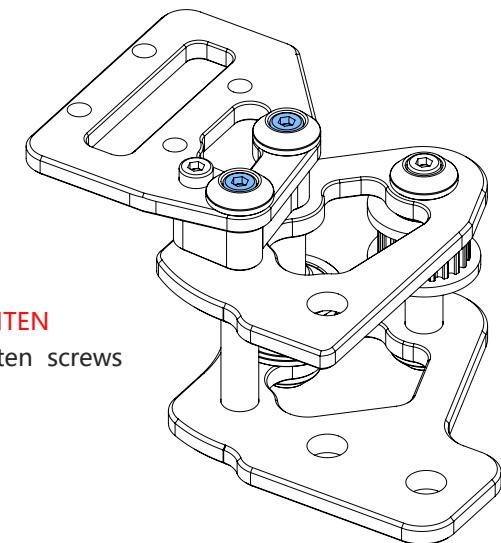
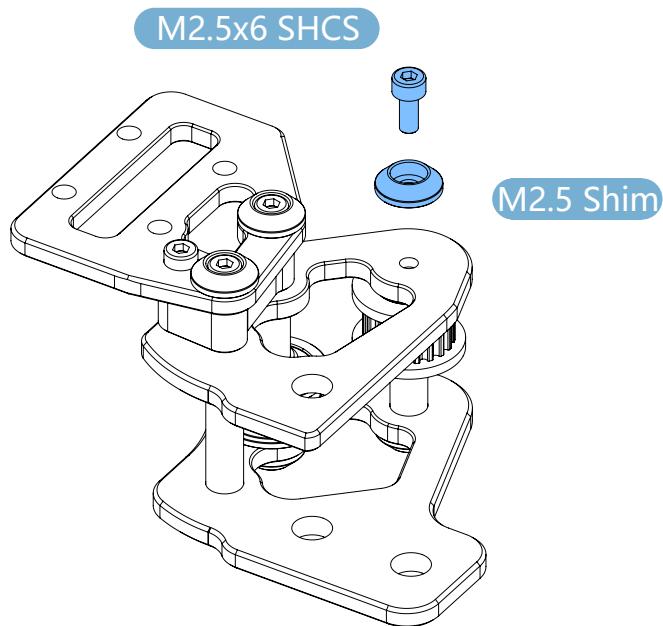
M5 Shim

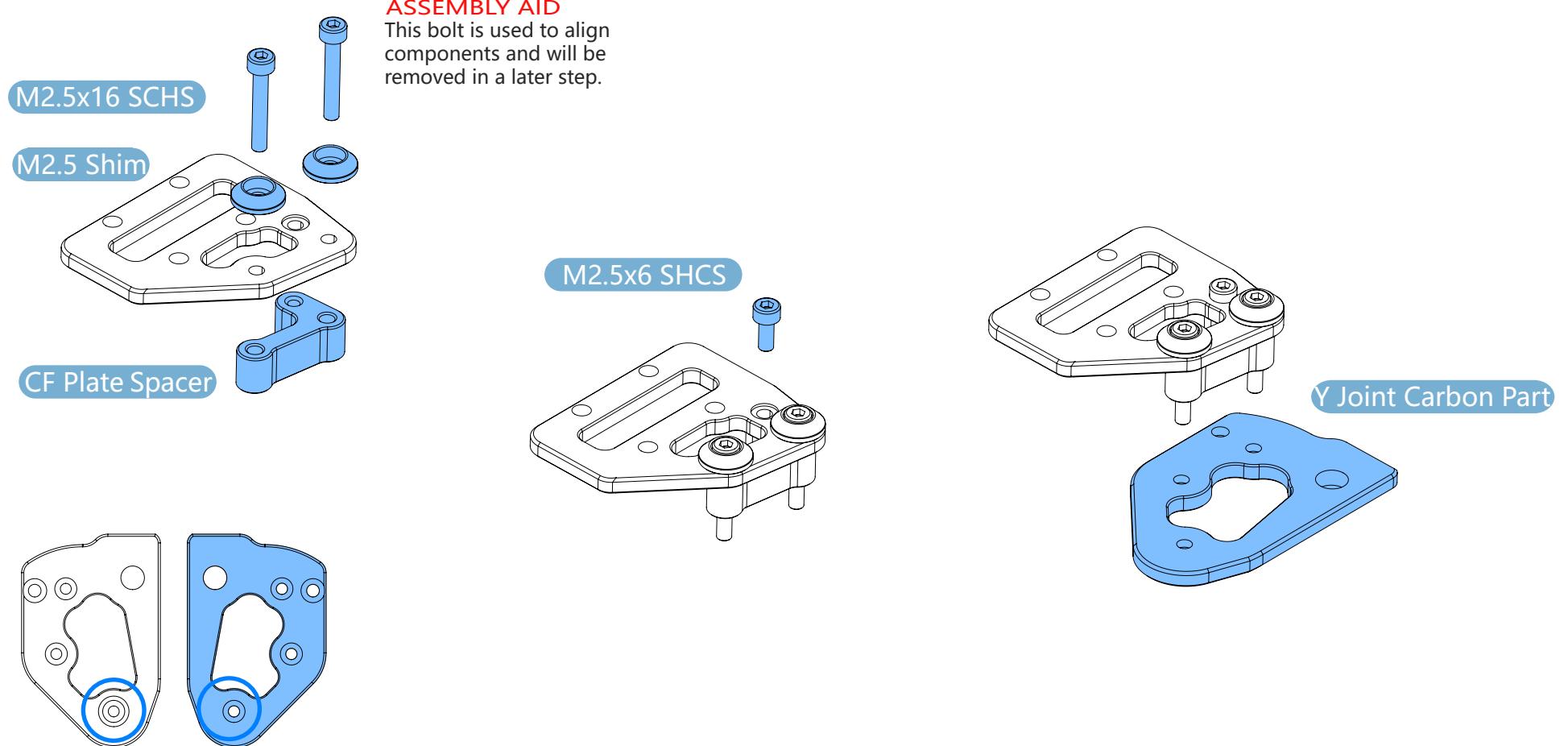
2GT Idler



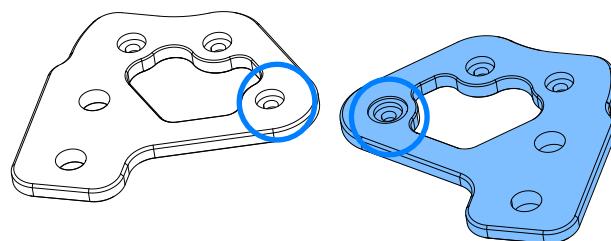
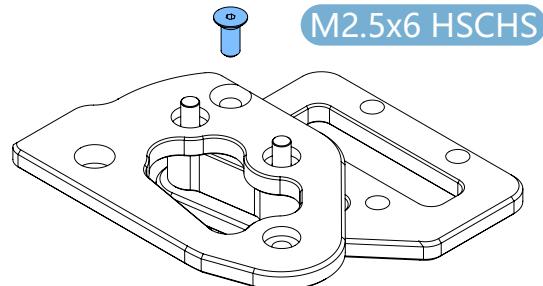
#### NOT INCLUDED

The 2GT Idler is not included in the kit. There is only to show the installation steps.



**Counterbore**

Counterbore diameter on the XY-Joint-upper Right parts is smaller.

**Counterbore**

Counterbore diameter on the XY-Joint-upper Right parts is larger.

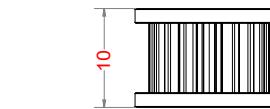
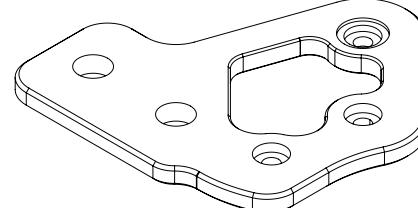
M2.5x6 HSCHS

**STAND-OFF**

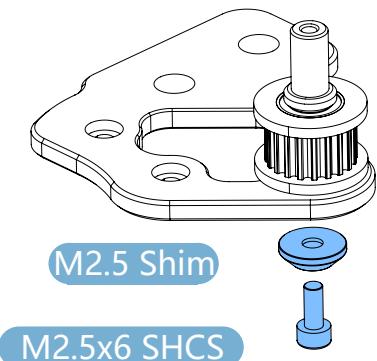
All the stand-off for the Idler is red.

2GT Idler

M5 Shim

**2GT IDLER**

The 2GT 20 tooth Idler have multiple specifications. It is recommended to use one with a height of 10mm. If the height is 8.5mm, additional gaskets need to be added at both ends of the idler gear.

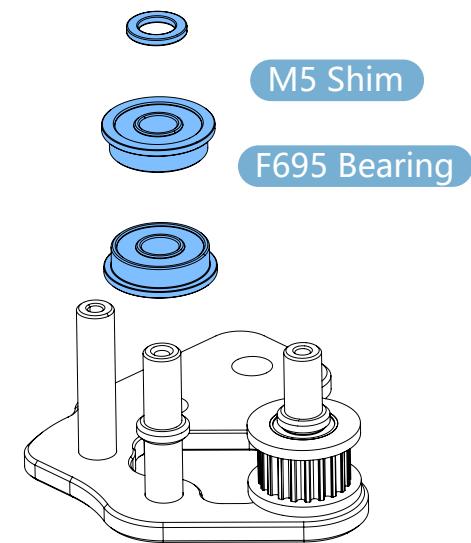
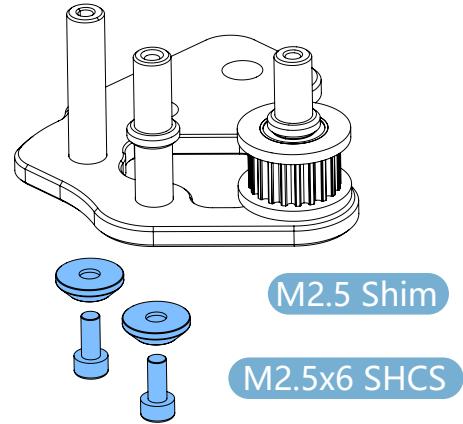
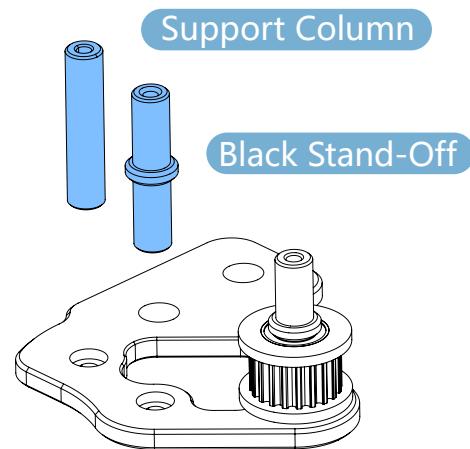


M2.5 Shim

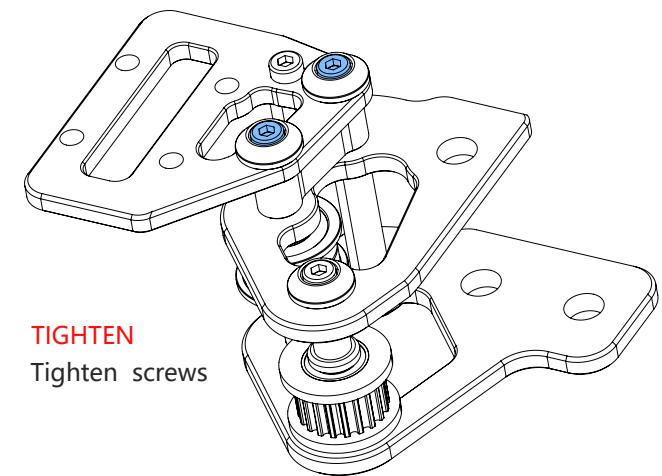
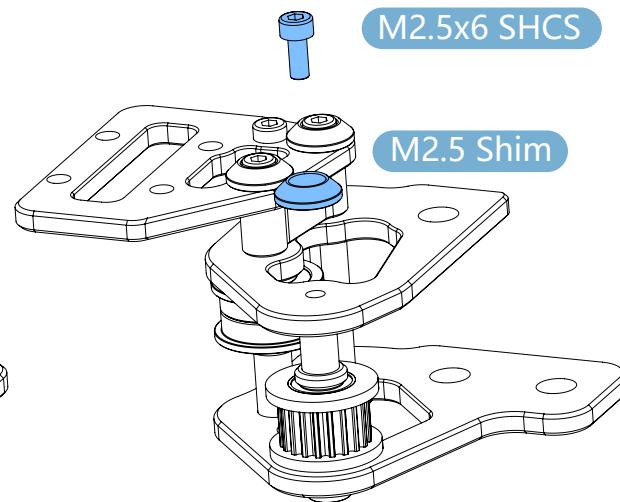
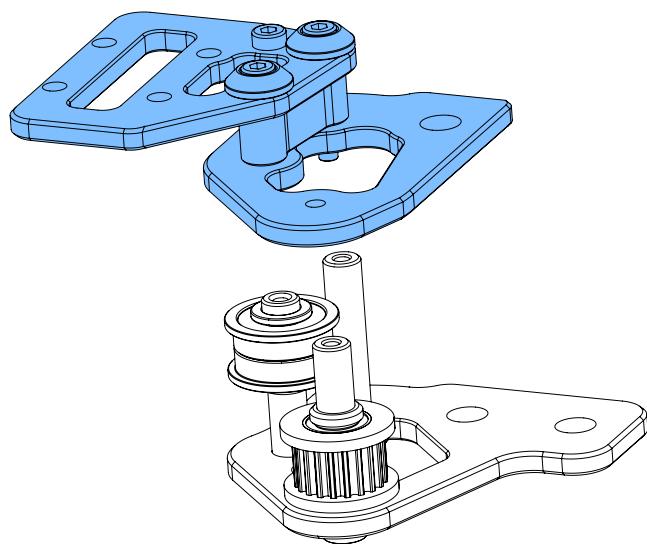
M2.5x6 SHCS

**NOT INCLUDED**

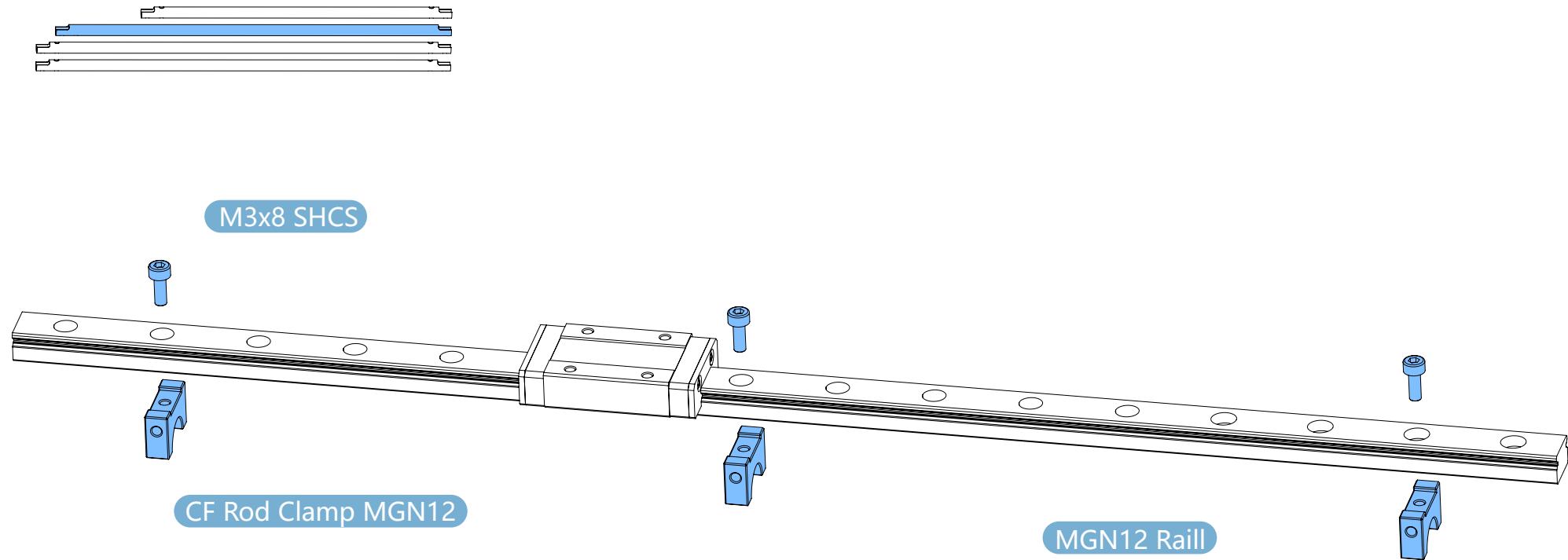
The 2GT Idler is not included in the kit. There is only to show the installation steps.

**NOT INCLUDED**

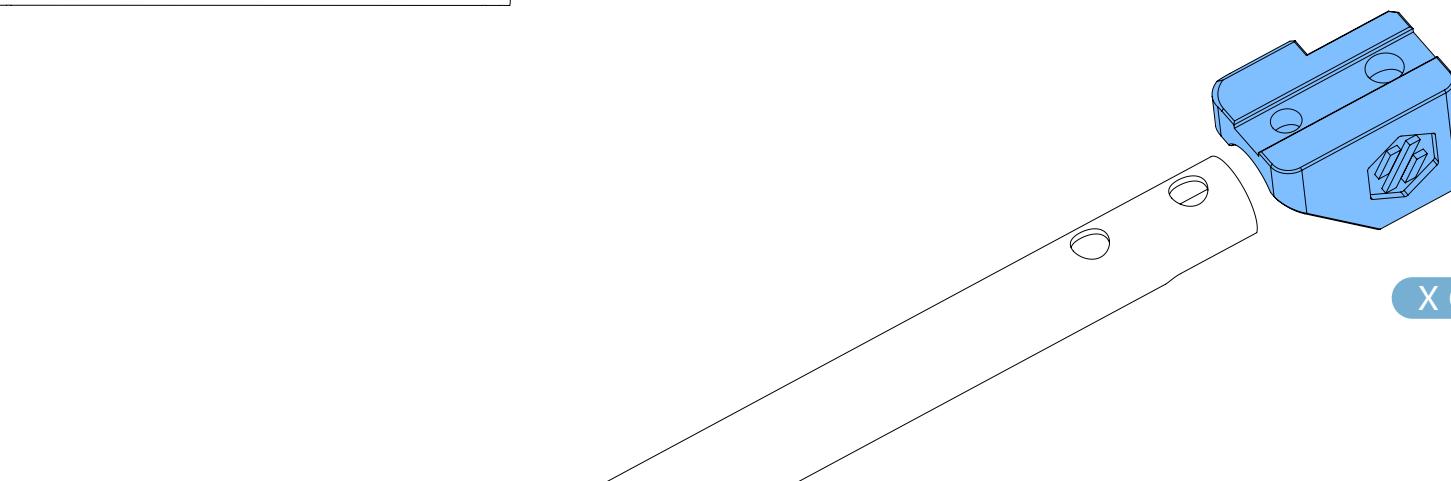
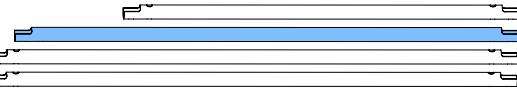
The Bearing is not included in the kit. There is only to show the installation steps.



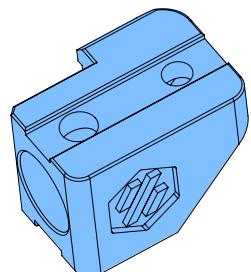
**TIGHTEN**  
Tighten screws

**NOT INCLUDED**

45 The MGN12 is not included in the kit. There is only to show the installation steps.

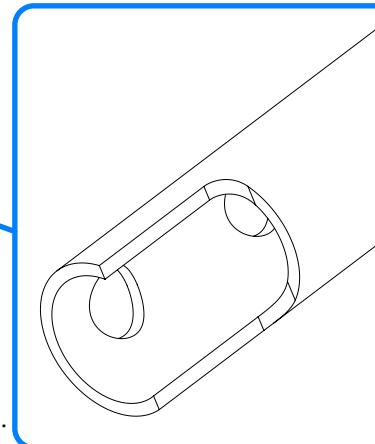


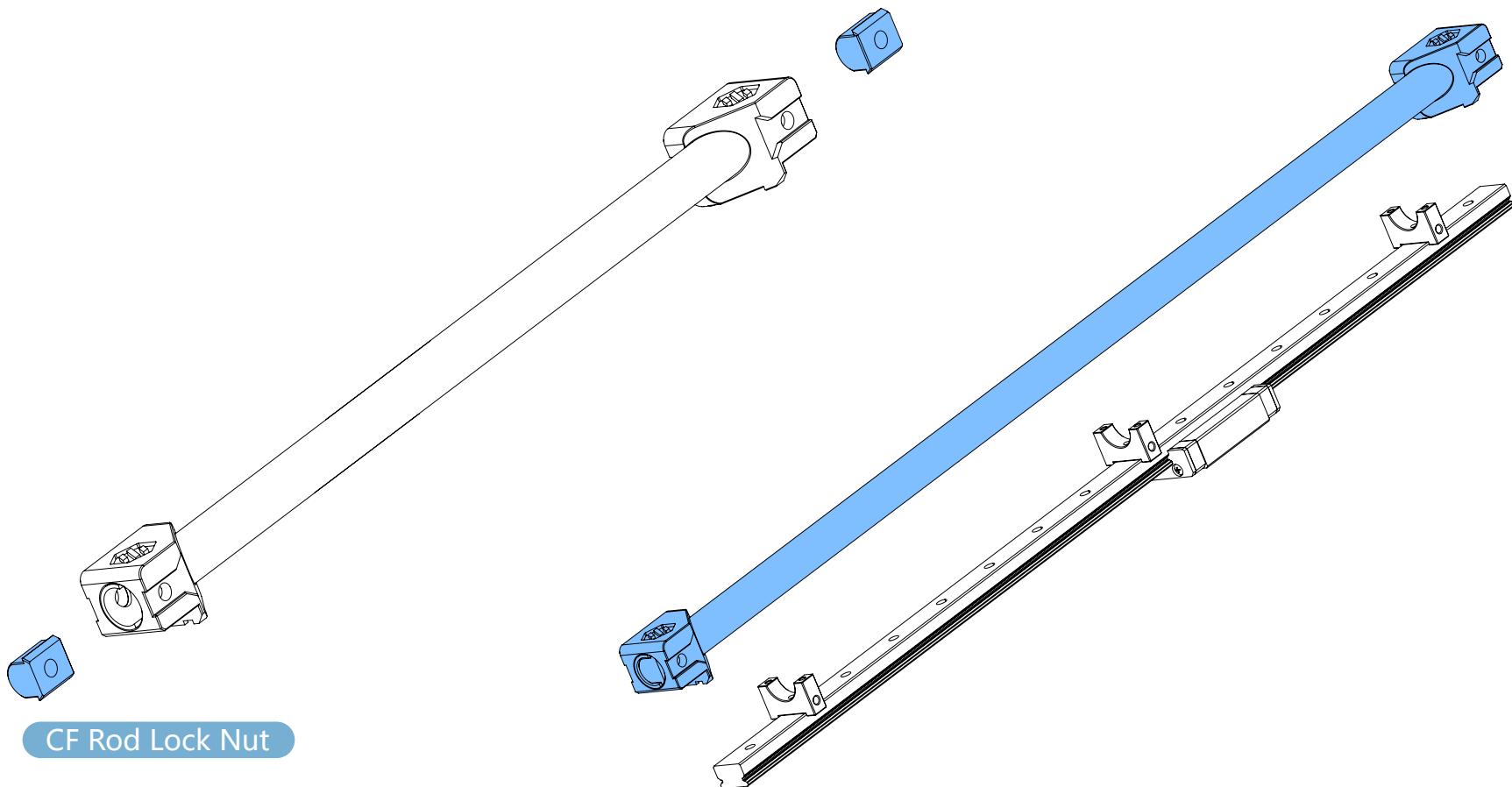
X Connector Right

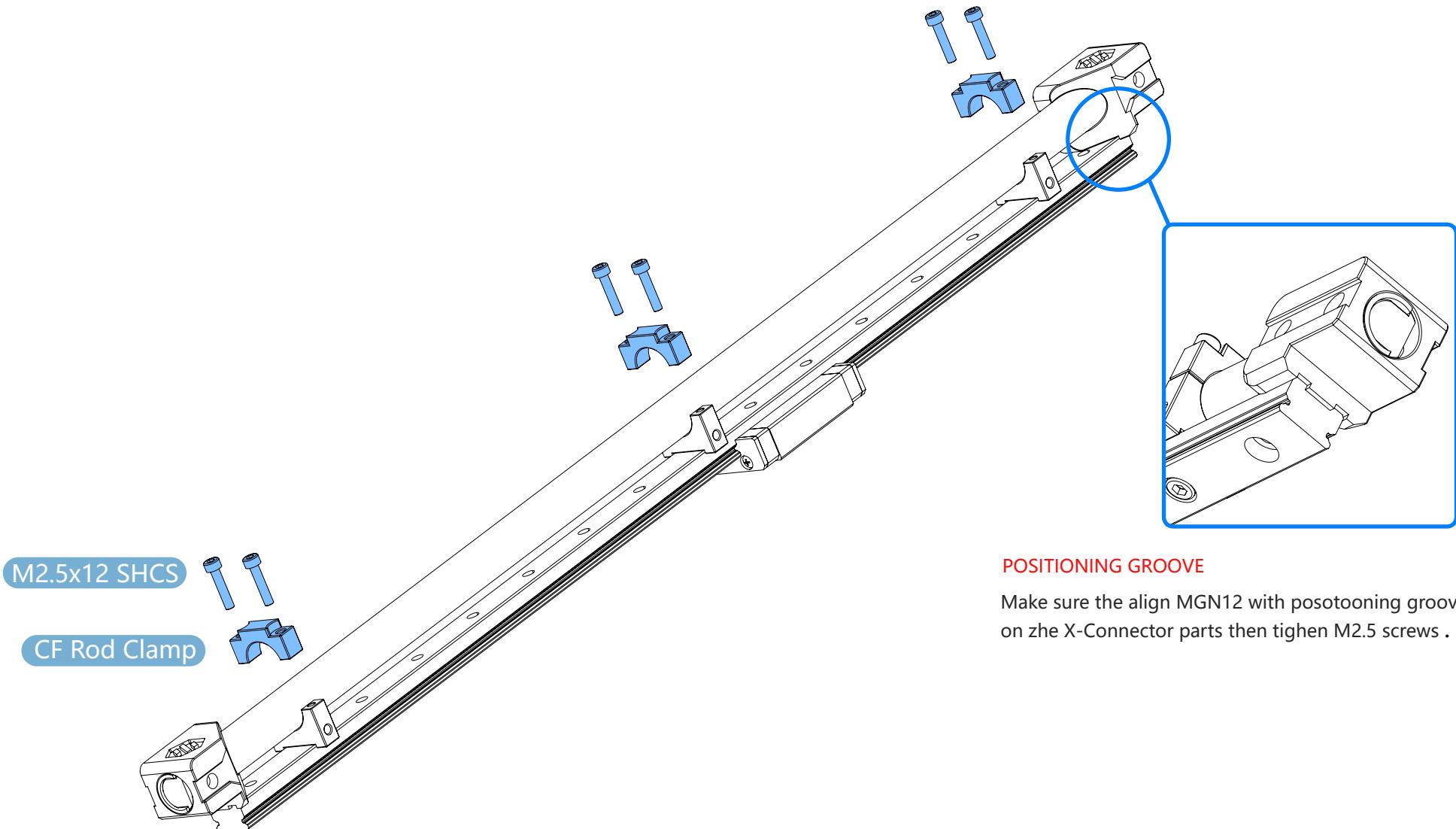


X GANTRY CF

The mounting holes on the X gantry CF rod is not machined all the way through.

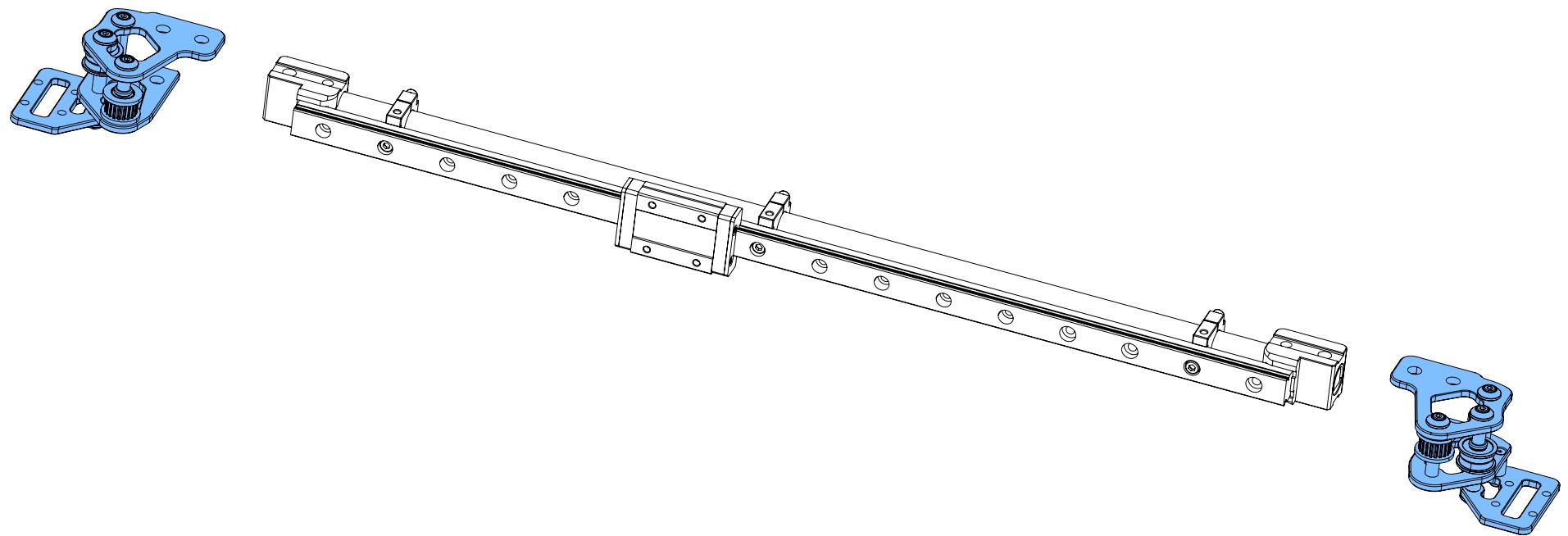


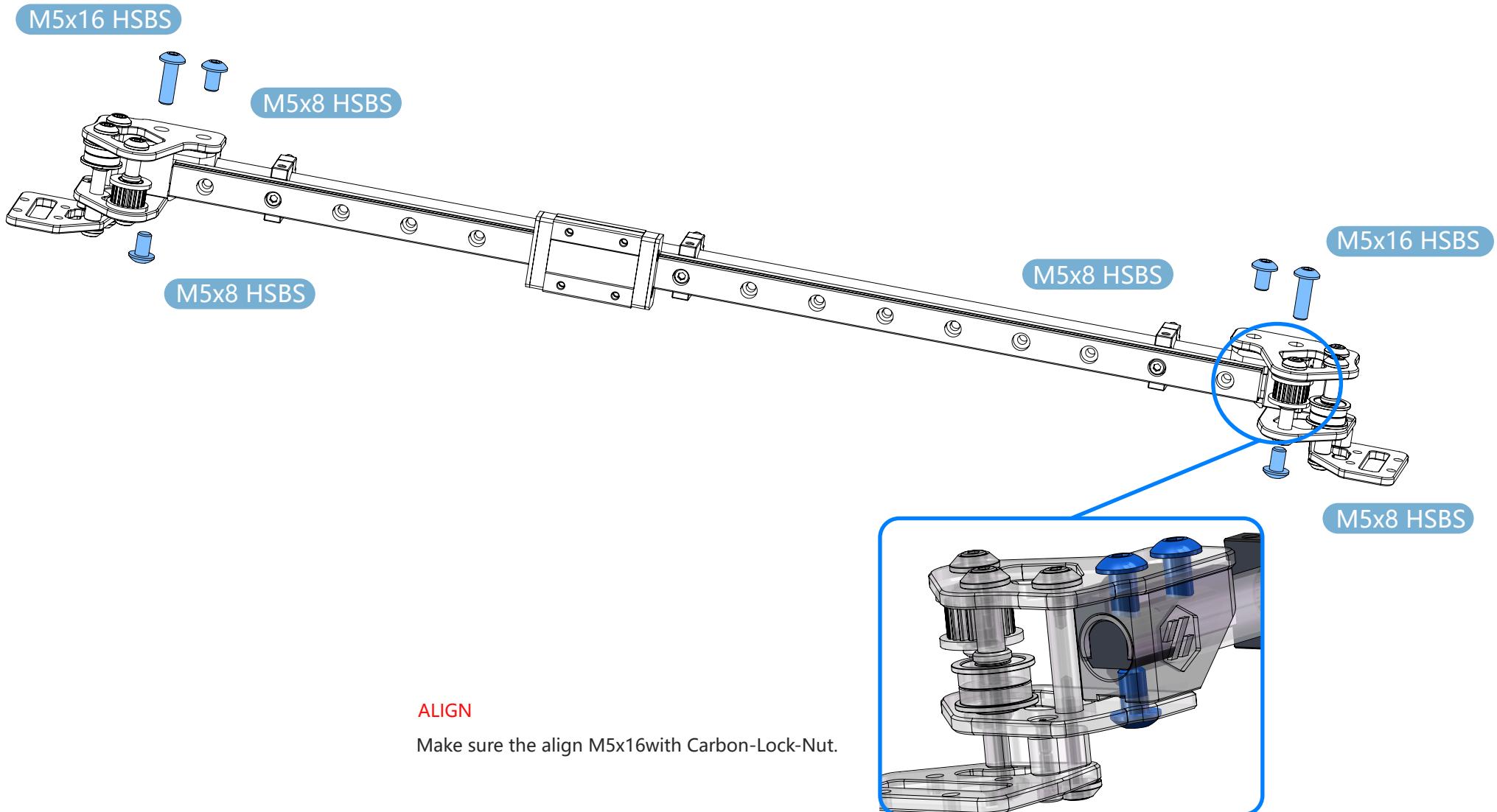


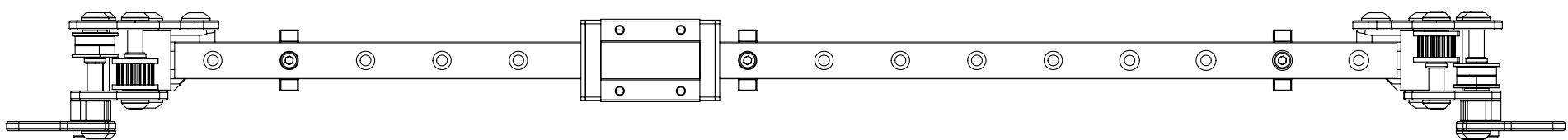


X AXIS

WWW.CHAOTICLAB.COM





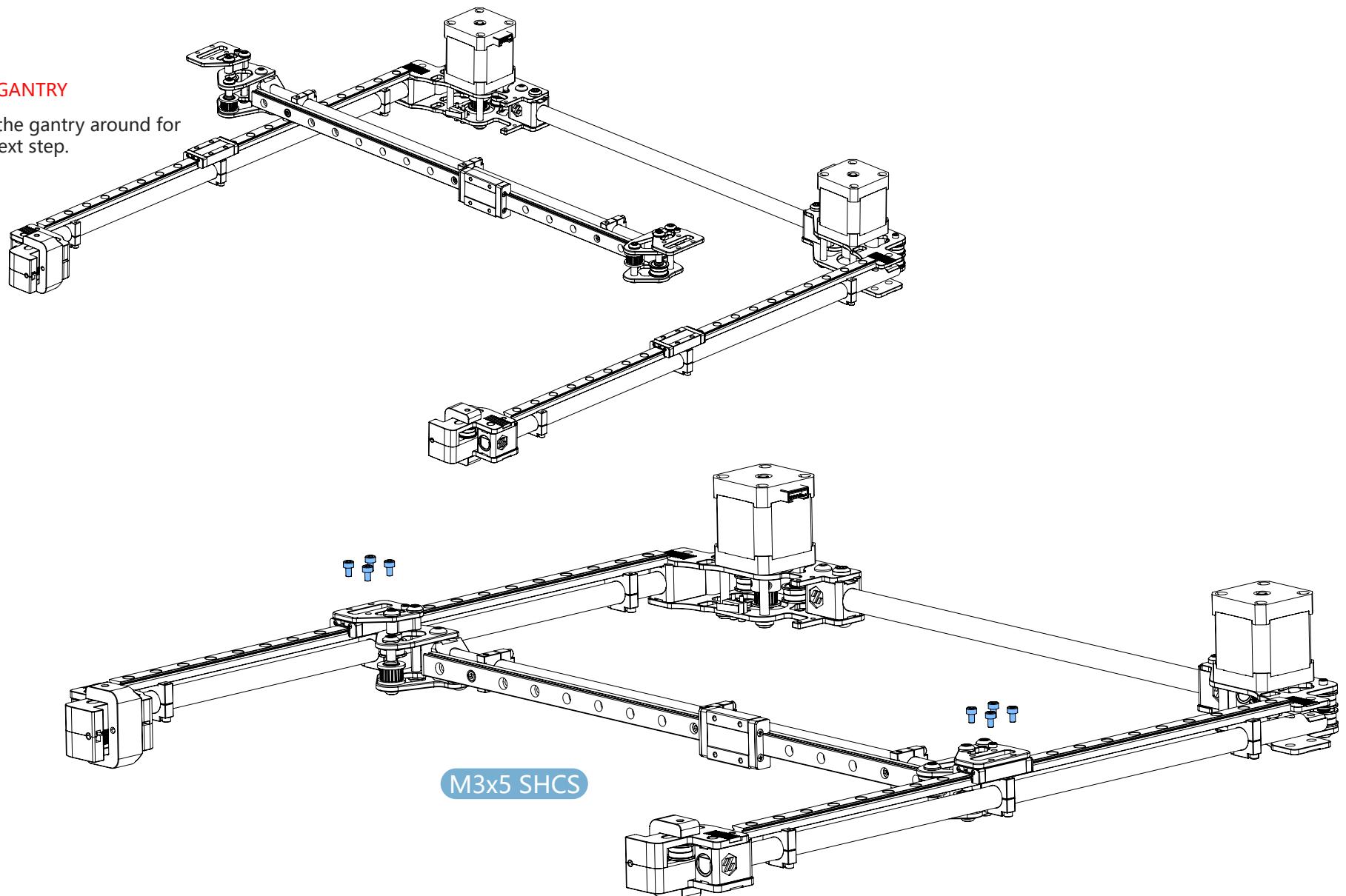


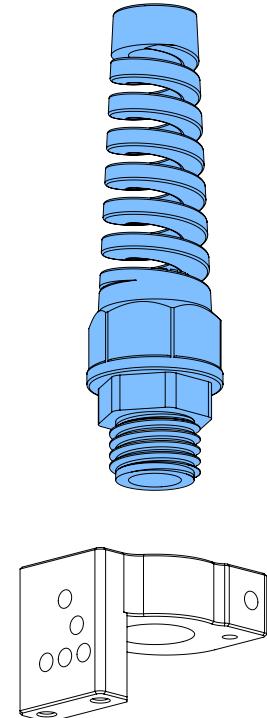
**CHECK YOUR WORK**

Compare your assembled part to the graphic shown here.  
Pay attention to the pulley orientation  
and alignment with the bearing stack  
ups.

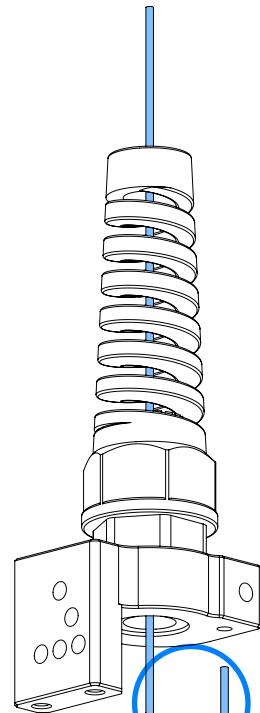
**FLIP GANTRY**

Turn the gantry around for the next step.





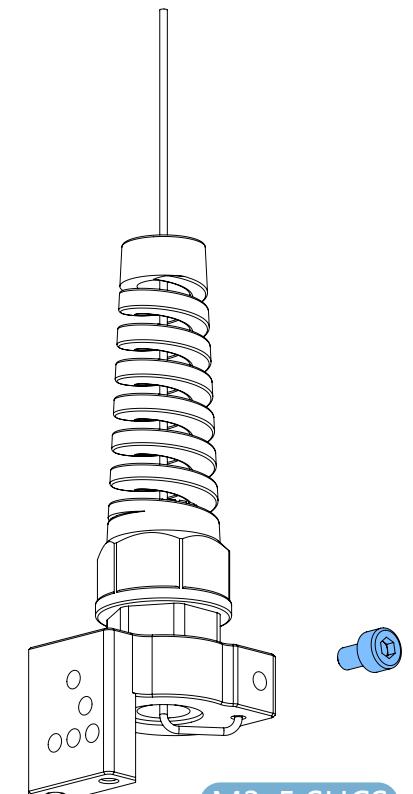
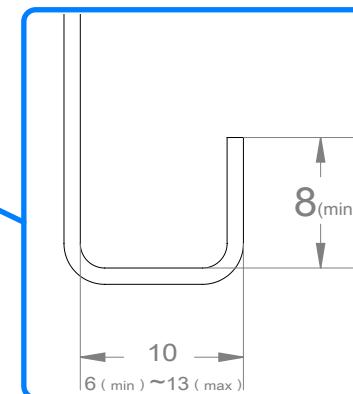
Anti bending cable sleeve



steel wire

CAT TEASER STICK

Cat Teaser stick or steel wire diameter not greater than 2mm.



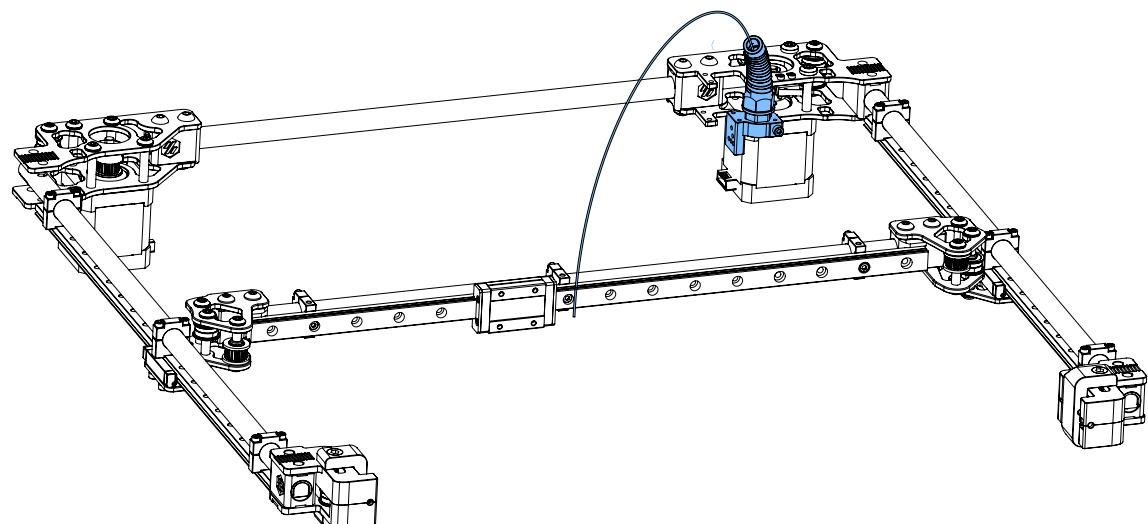
M3x5 SHCS

NOT INCLUDED

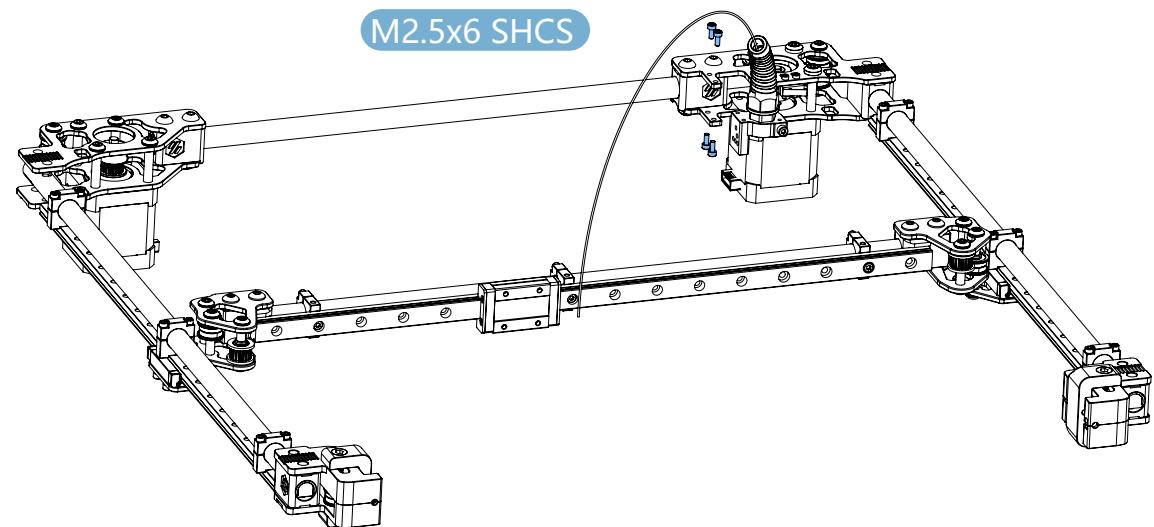
The Cat Teaser stick or steel wire is not included in the kit. There is only to show the installation steps.

CABLE

WWW.CHAOTICLAB.COM



M2.5x6 SHCS



# CHAOTICLAB



---

**Website**  
[www.chaiticlab.com](http://www.chaiticlab.com)

**Github**  
[github.com/chaoticlab](https://github.com/chaoticlab)

**Docs**  
[docs.chaiticlab.com](https://docs.chaiticlab.com)

**Discord**  
[discord.gg/chaoticlab](https://discord.gg/chaoticlab)

---