

BETA

VORON

AFTERBURNER

Assembly Manual



File Key / Part Printing Guidelines and Standards

File Key	
Primary Color	nothing at start of file name
Accent Color	_ at start of file name
Quantity Required	_x# near end of file name

Part Printing Guidelines and Standards	
Approved FDM Materials	ABS or ABS+ Only
Layer Height	0.2mm
Extrusion Width	Forced 0.4mm
Infill Percentage	40% minimum
Infill Type	Grid, Gyroid, Honeycomb, Triangle or Cubic
Wall Count	4 minimum
Solid Top/Bottom Layers	5 minimum

Very Important Steps

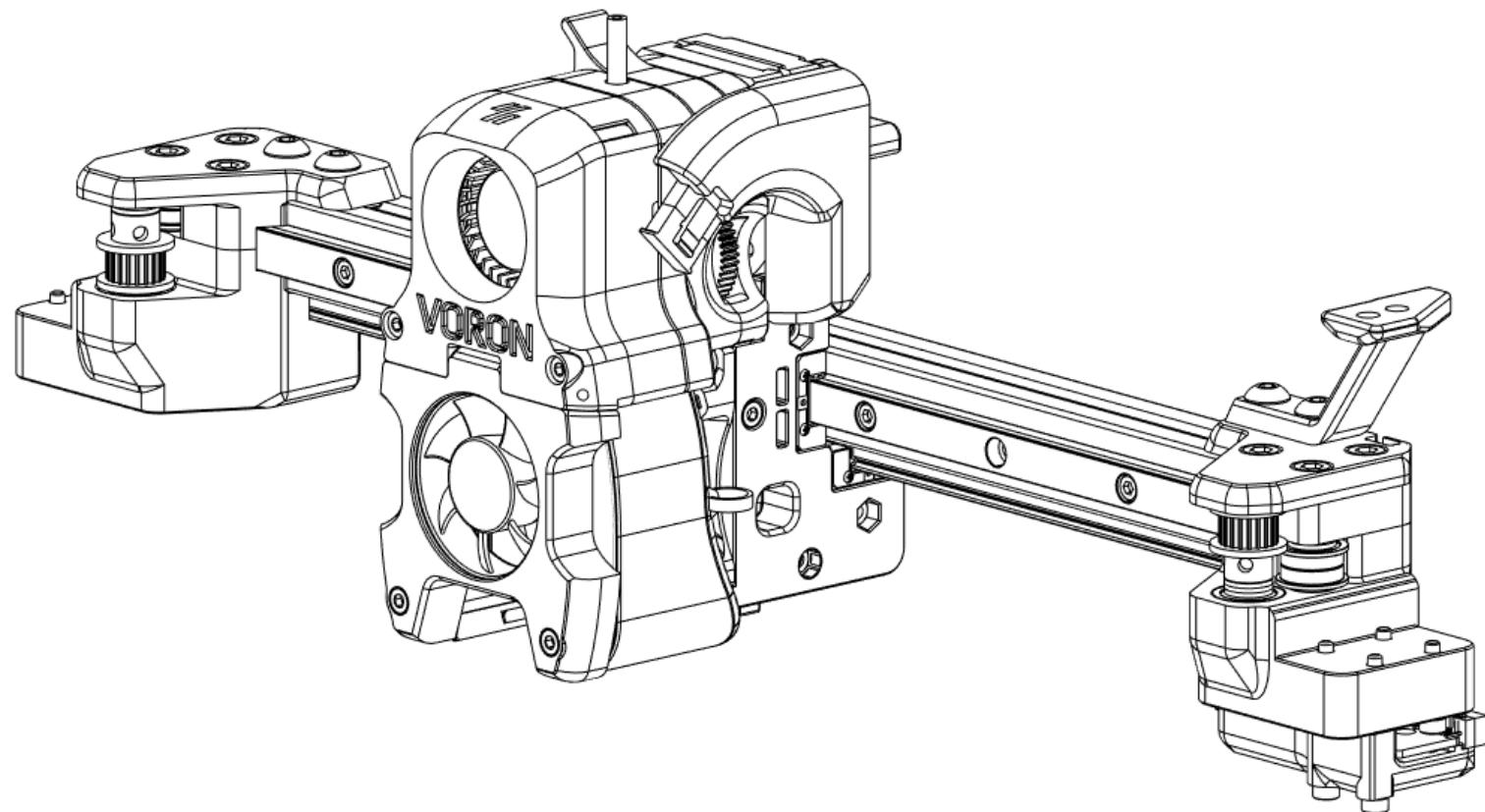
Fastener Size/Type Part

Notes and Tips

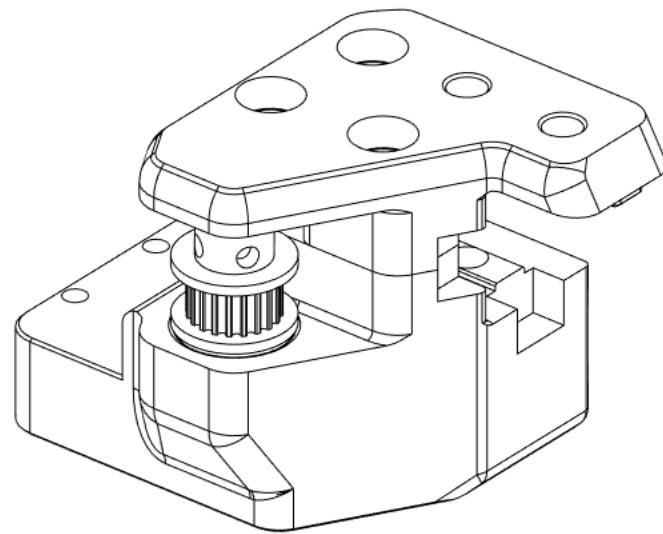
Important Definitions and Adhesives List

Callout	Definition
BHCS	Button Head Cap Screw (ISO 7380-1)
SHCS	Socket Head Cap Screw (ISO 4762/DIN 912)
Plastite	Self-Tapping Screw for Plastics
Shim	Shim Ring (DIN 988)
Nut	DIN934 or equivalent
Lock Nut	DIN985 or equivalent
Low Strength Thread Locker	Loctite 222 (aka "Purple")
Shaft Retaining Compound	Loctite 641 ("Yellow") or 609 ("Light Green")

Finished Product

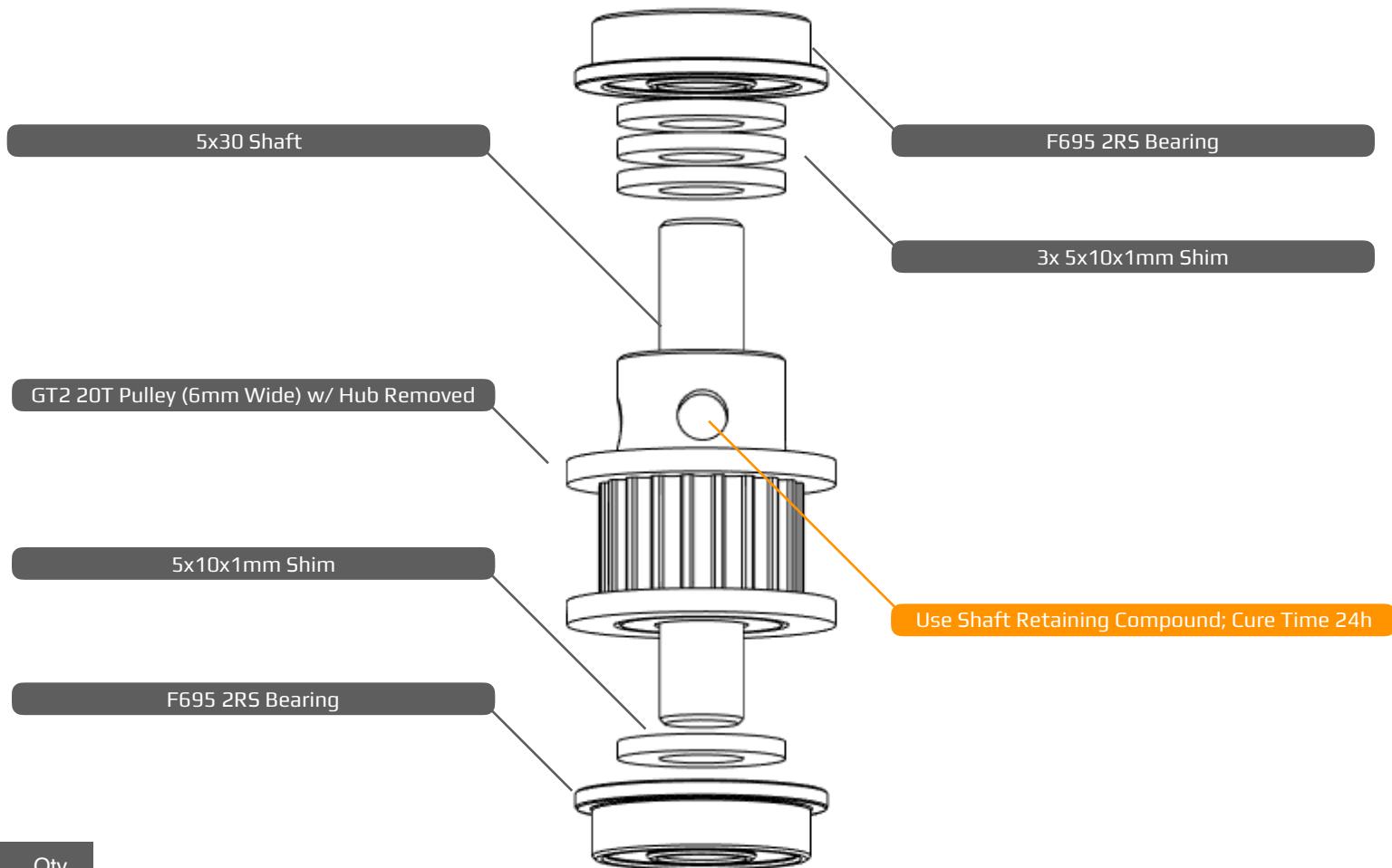


Left XY Joint



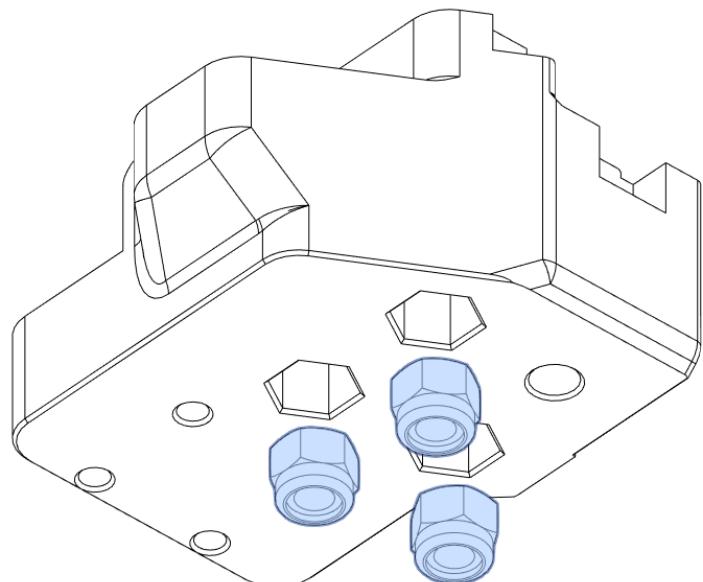
Printed Parts	Part	Qty	Part	Qty	Part	Qty	Tools
Gantry\XY Joints	5x10x1mm Shim	6					4mm Hex Driver
	F695 2RS	4					Hub Puller
	M5x40 SHCS	3					Shaft Retaining Compound
	M5 Lock Nut	3					
	5x30 Shaft	1					
	GT2 20T 6mm	1					

Left XY Joint - Toothed Idler Assembly

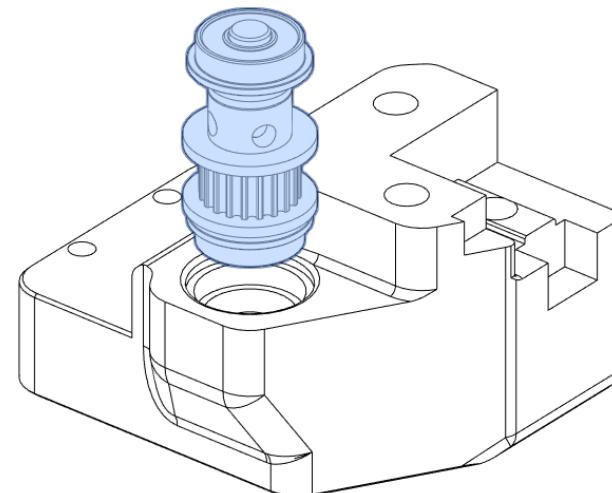


Part	Qty
5x10x1mm Shim	4
F695 2RS	2
5x30 Shaft	1
GT2 20T 6mm Dehubbed	1

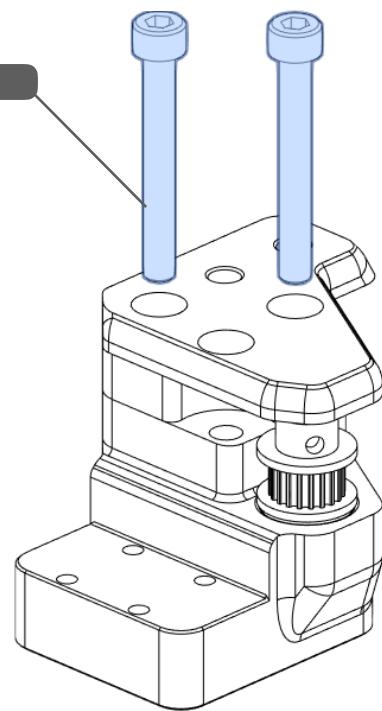
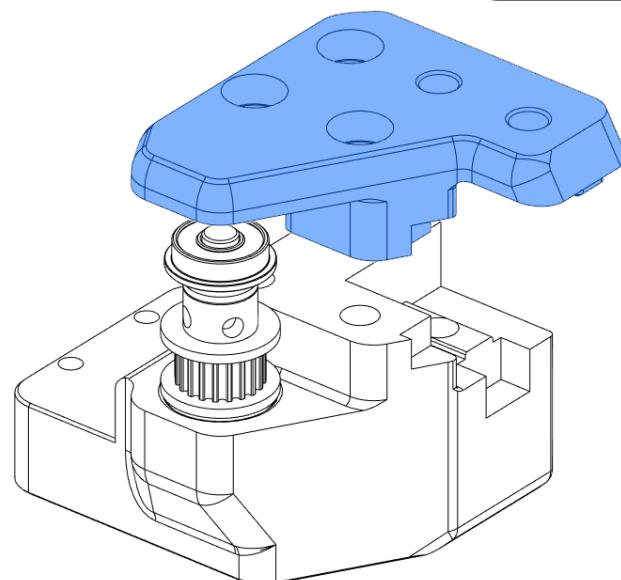
Left XY Joint



M5 Lock Nut

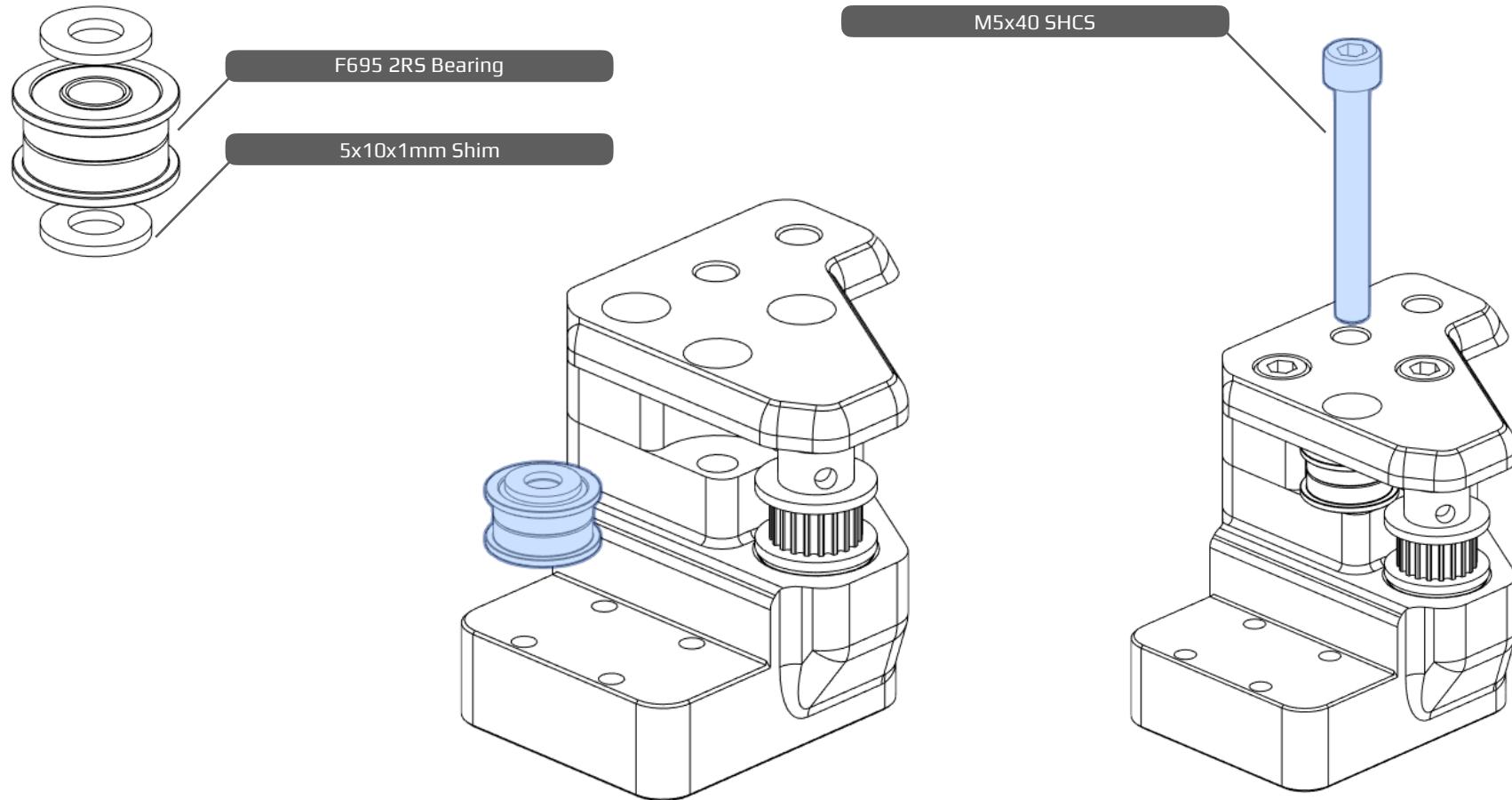


M5x40 SHCS



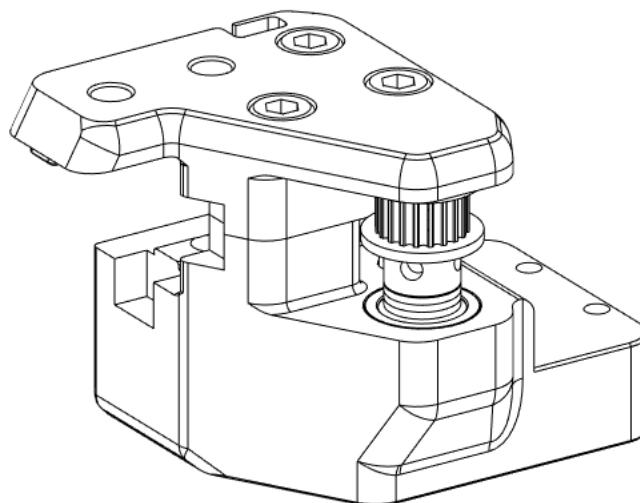
Part	Qty
M5x40 SHCS	2
M5 Lock Nut	3

Left XY Joint



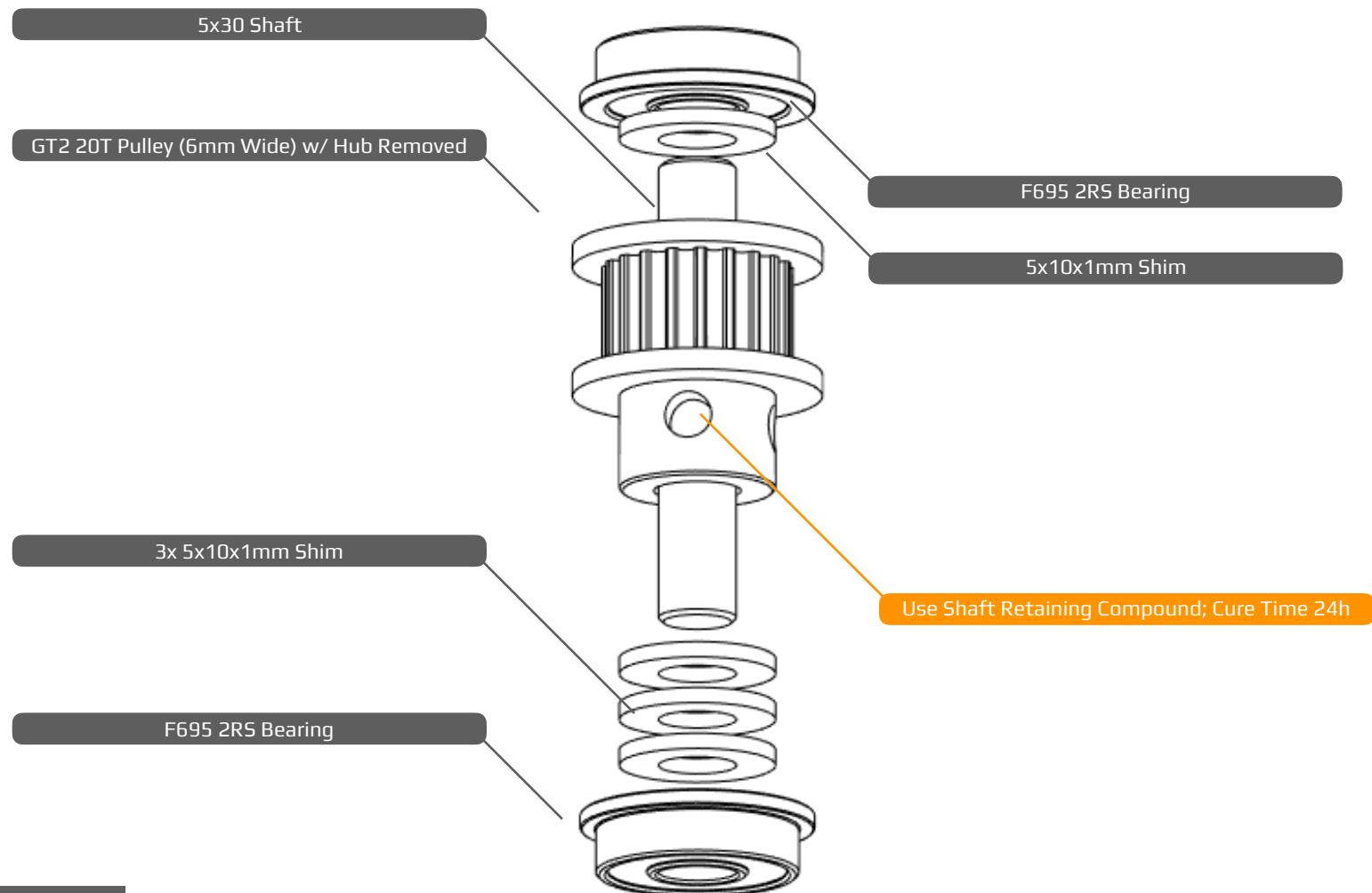
Part	Qty
F695 2RS	2
5x10x1mm Shim	2
M5x40 SHCS	1

Right XY Joint



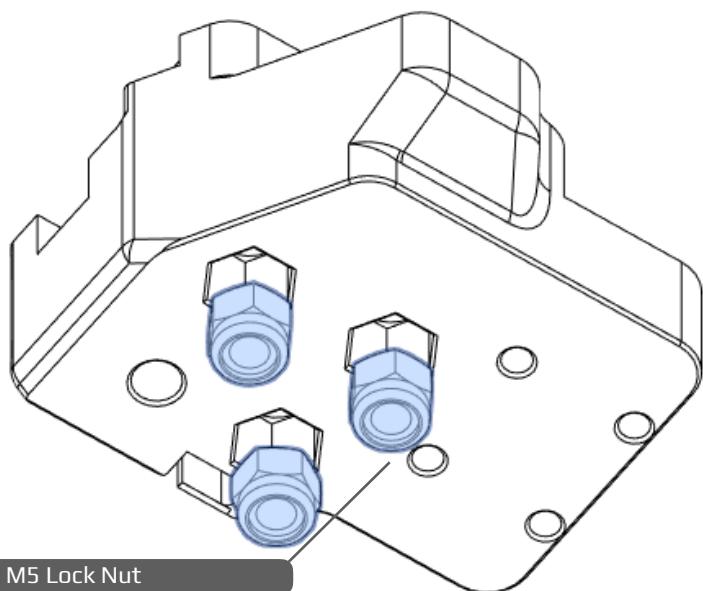
Printed Parts	Part	Qty	Part	Qty	Part	Qty	Tools
Gantry\XY Joints	5x10x1mm Shim	6					4mm Hex Driver
	F695 2RS	4					Hub Puller
	M5x40 SHCS	3					Shaft Retaining Compound
	M5 Lock Nut	3					
	5x30 Shaft	1					
	GT2 20T 6mm	1					

Right XY Joint - Toothed Idler Assembly

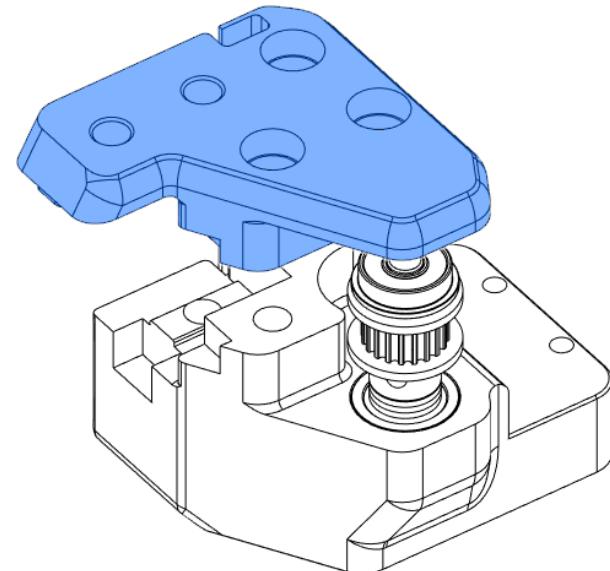
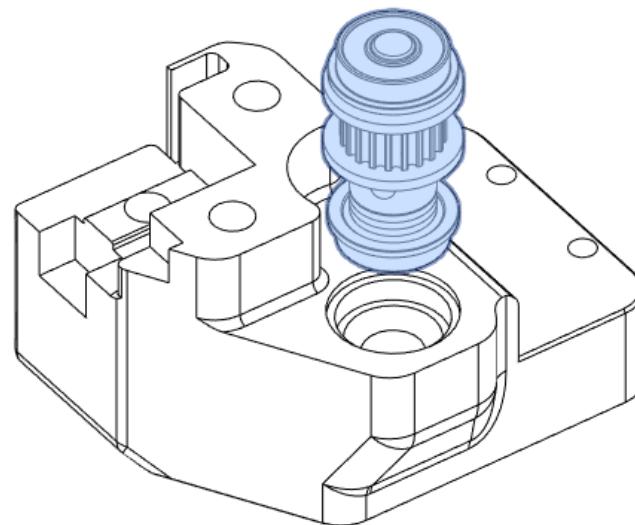


Part	Qty
5x10x1mm Shim	4
F695 2RS	2
5x30 Shaft	1
GT2 20T 6mm Dehubbed	1

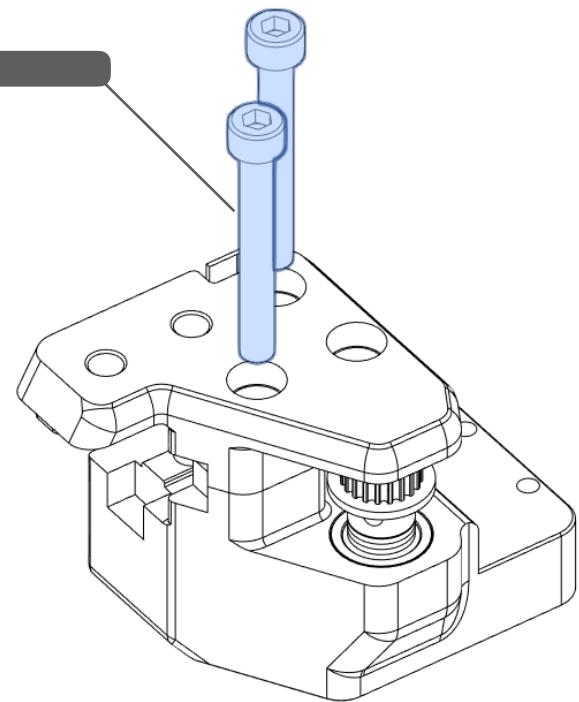
Right XY Joint



M5 Lock Nut

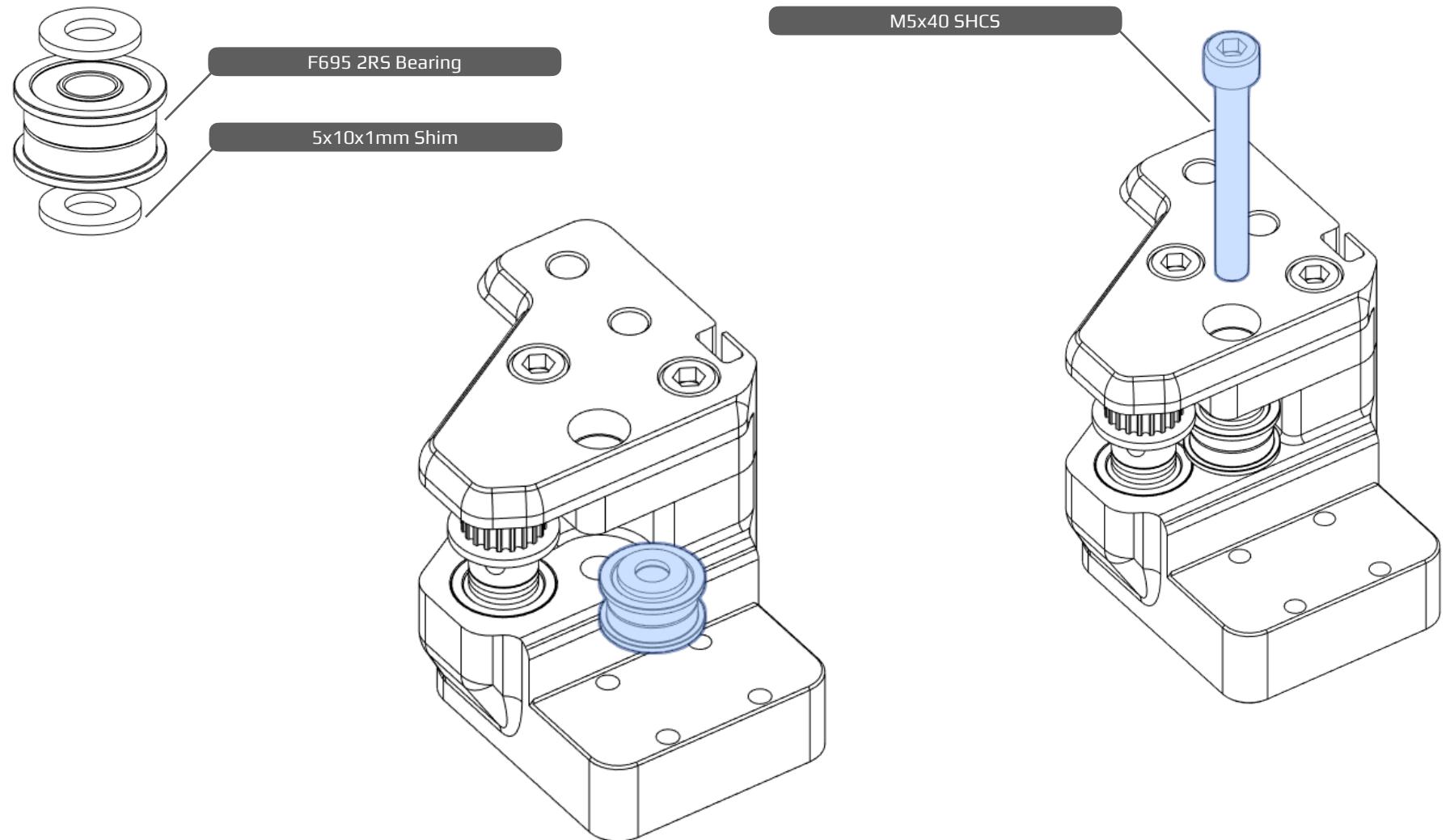


M5x40 SHCS



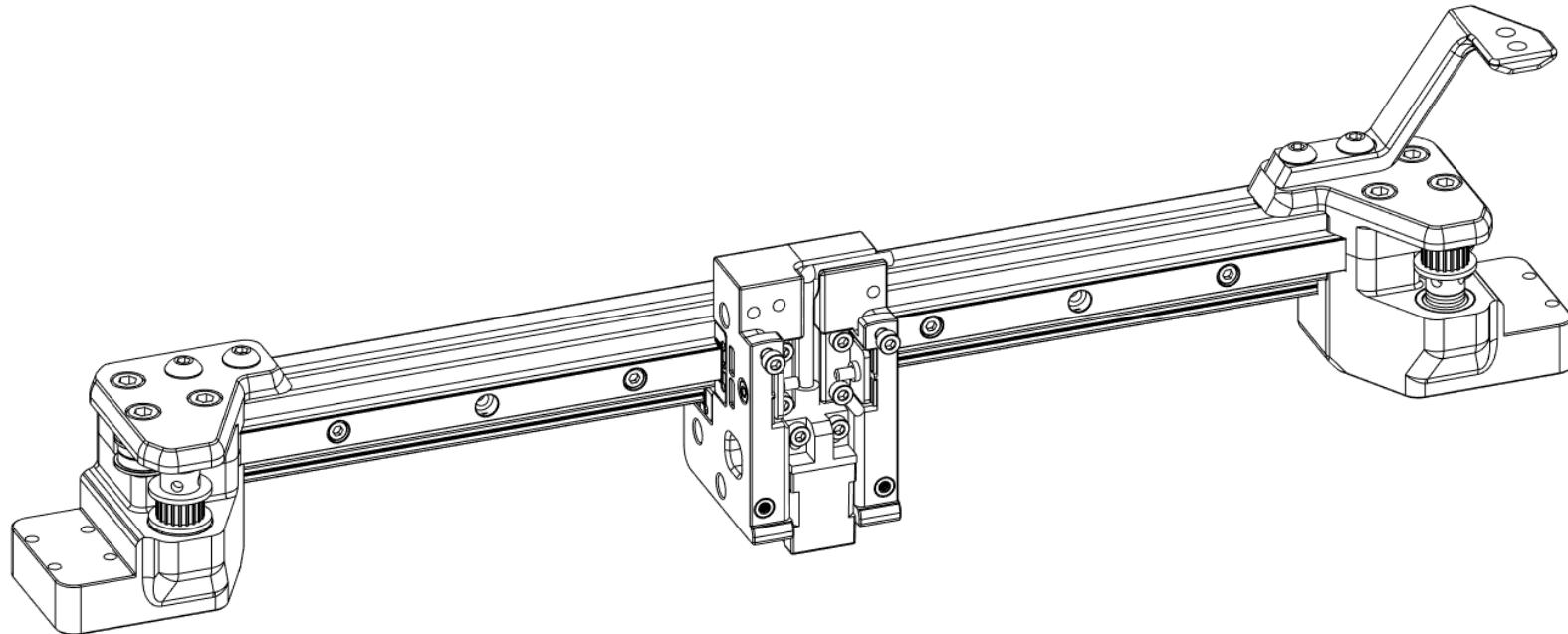
Part	Qty
M5x40 SHCS	2
M5 Lock Nut	3

Right XY Joint



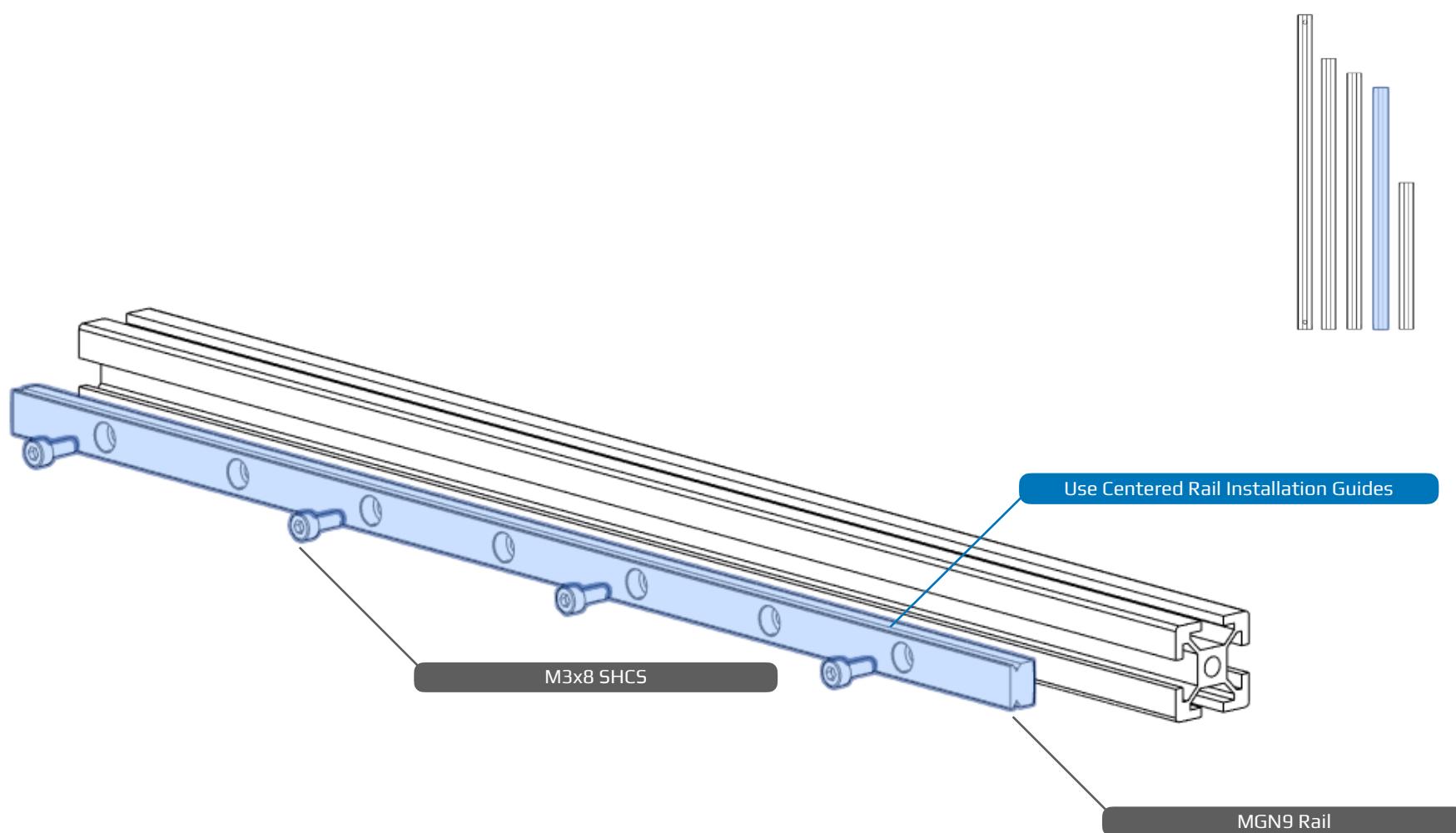
Part	Qty
F695 2RS	2
5x10x1mm Shim	2
M5x40 SHCS	1

X Axis



Printed Parts	Part	Qty	Part	Qty	Part	Qty	Tools
Gantry\XY Joints	M3x8 SHCS	8+	M3x30 SHCS	3	M5x30 BHCS	2	2.5mm Hex Driver
Gantry\X Carriage	M3 T-Nut	8+	M3 Nut	3	MGN9 Rail	2	4mm Hex Driver
	M5 T-Nut	6	M3x12 SHCS	2	PL-0XN Probe	1	Soldering Iron
	M3x10 SHCS	4	M3x20 SHCS	2	M3 OpenBuilds T-Nut	2	
	M3x16 SHCS	6	M5x10 BHCS	2			
	M3 Insert Short	4	M5x16 BHCS	2	X Extrusion		
	M3 Insert Long	2					

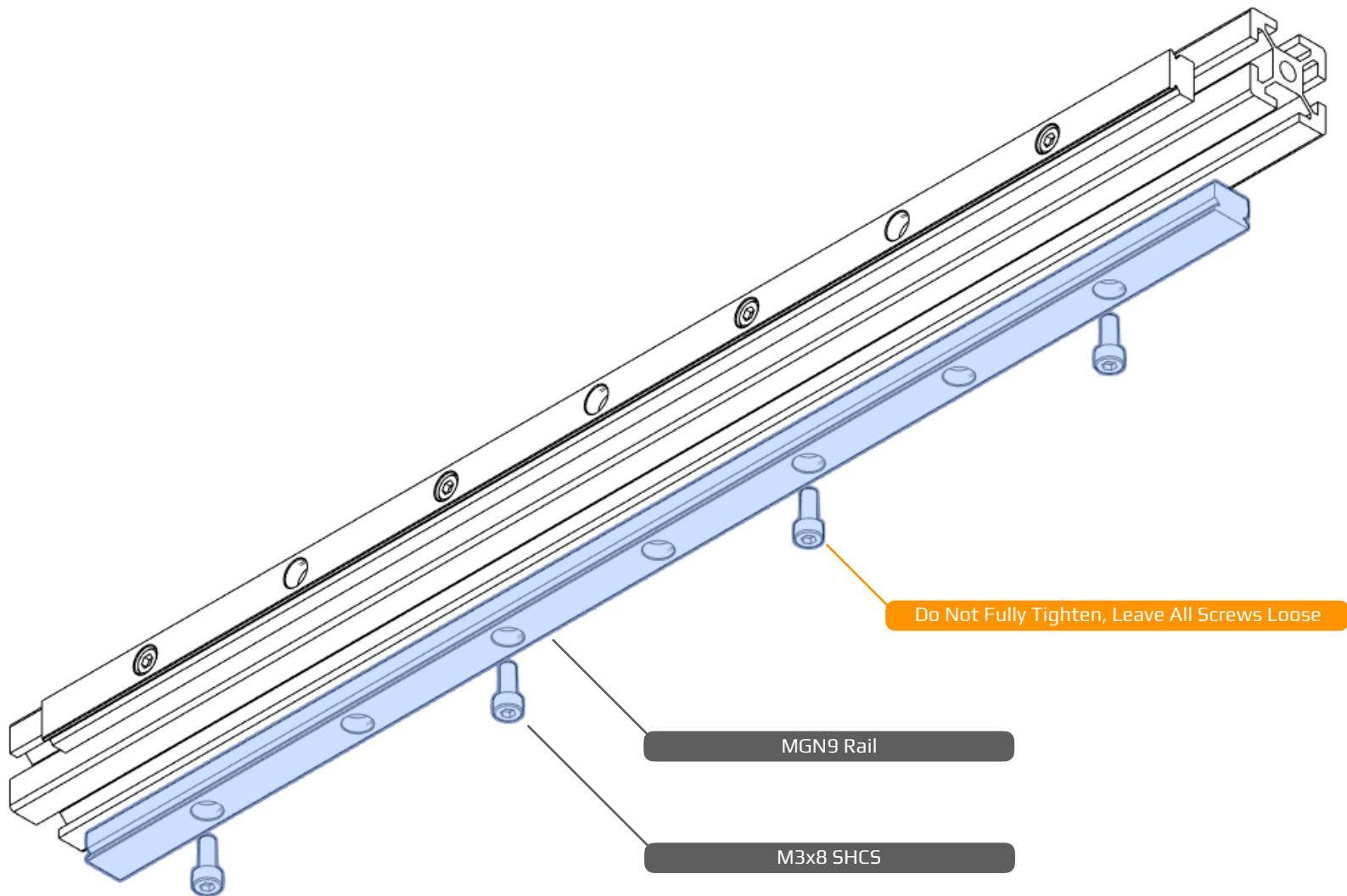
X Axis



Part	Qty
M3x8 SHCS	4+
M3 T-Nut	4+
MGN9 Rail	1

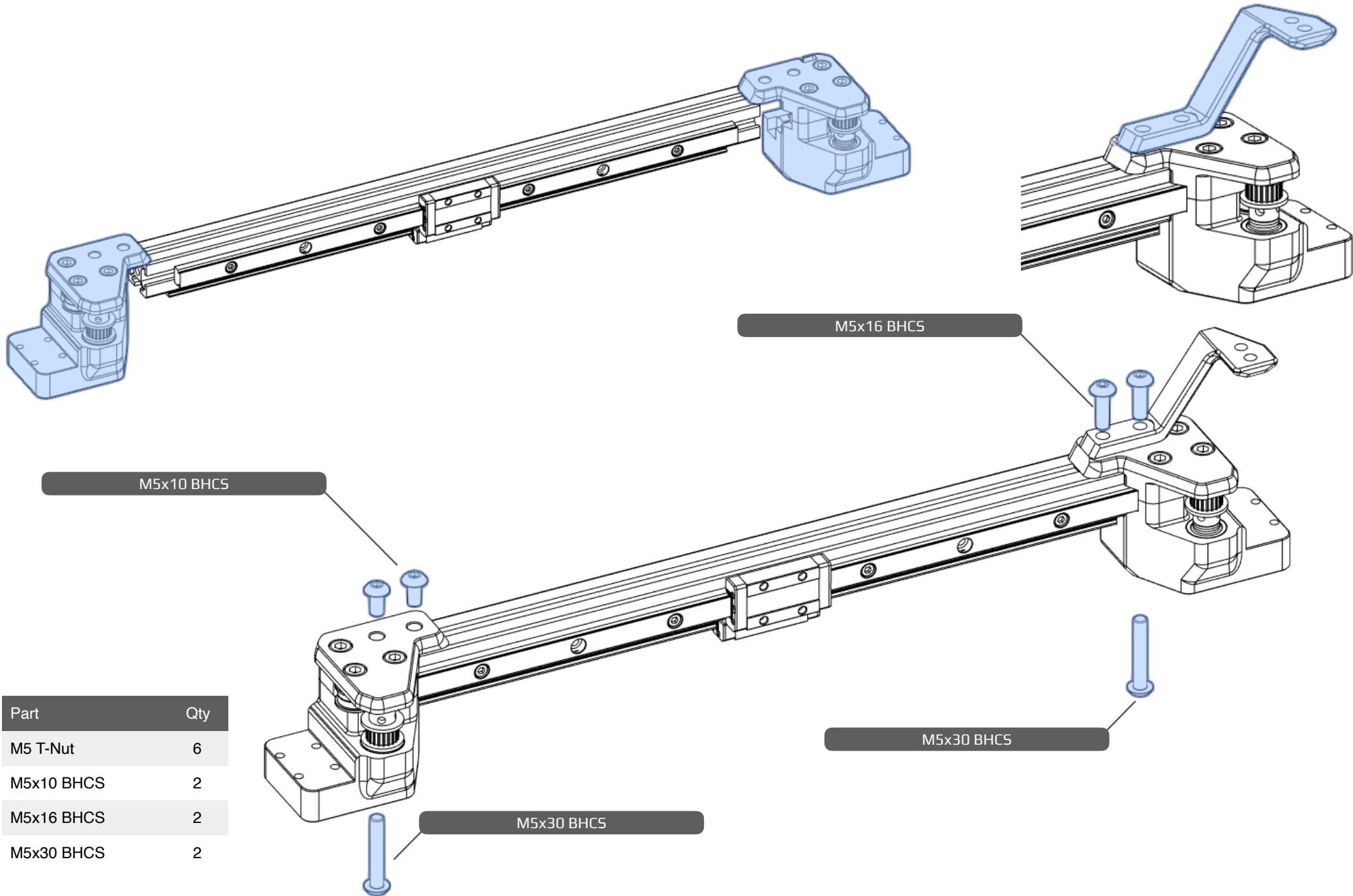
X Extrusion

X Axis

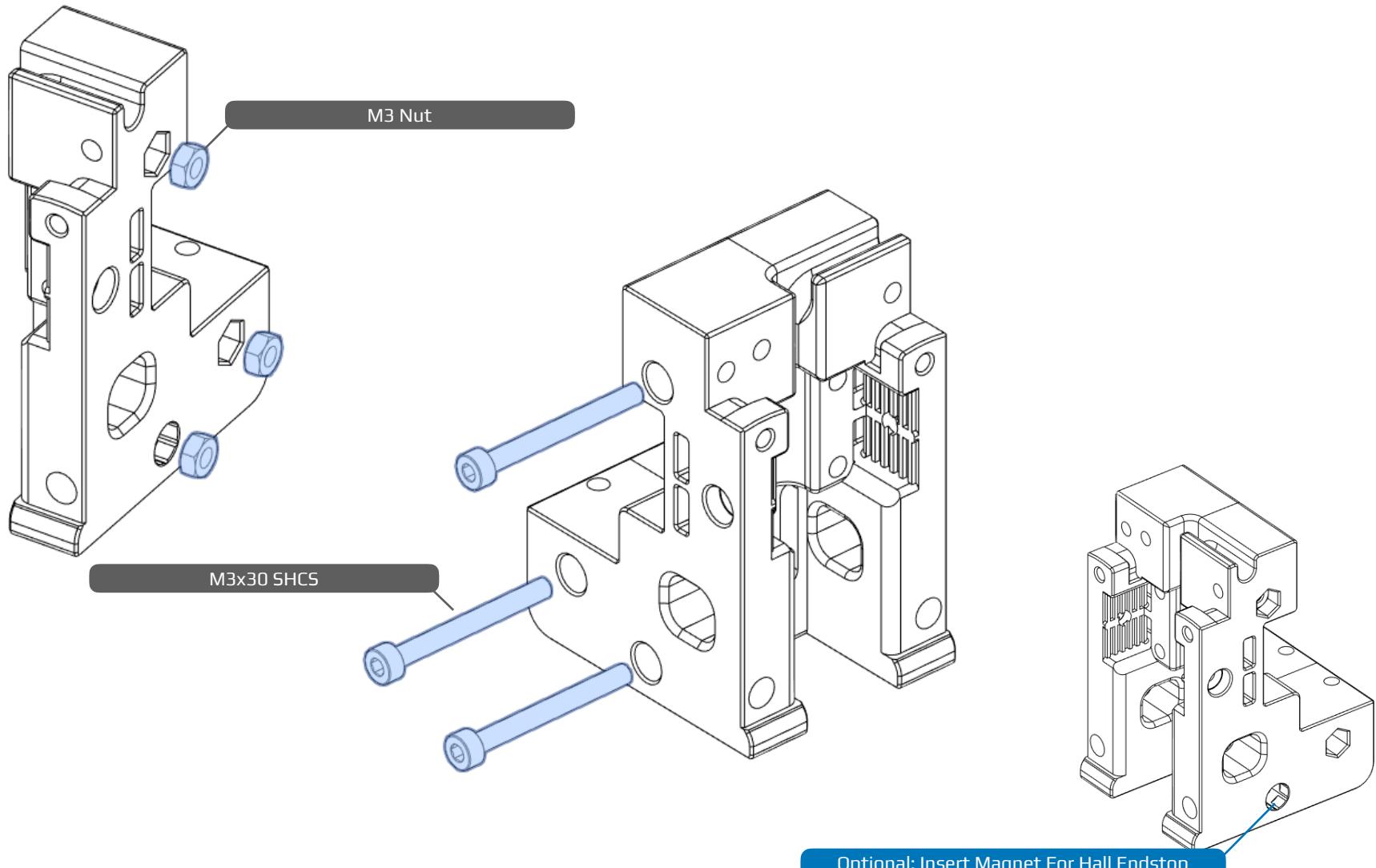


Part	Qty
M3x8 SHCS	4+
M3 T-Nut	4+
MGN9 Rail	1

X Axis

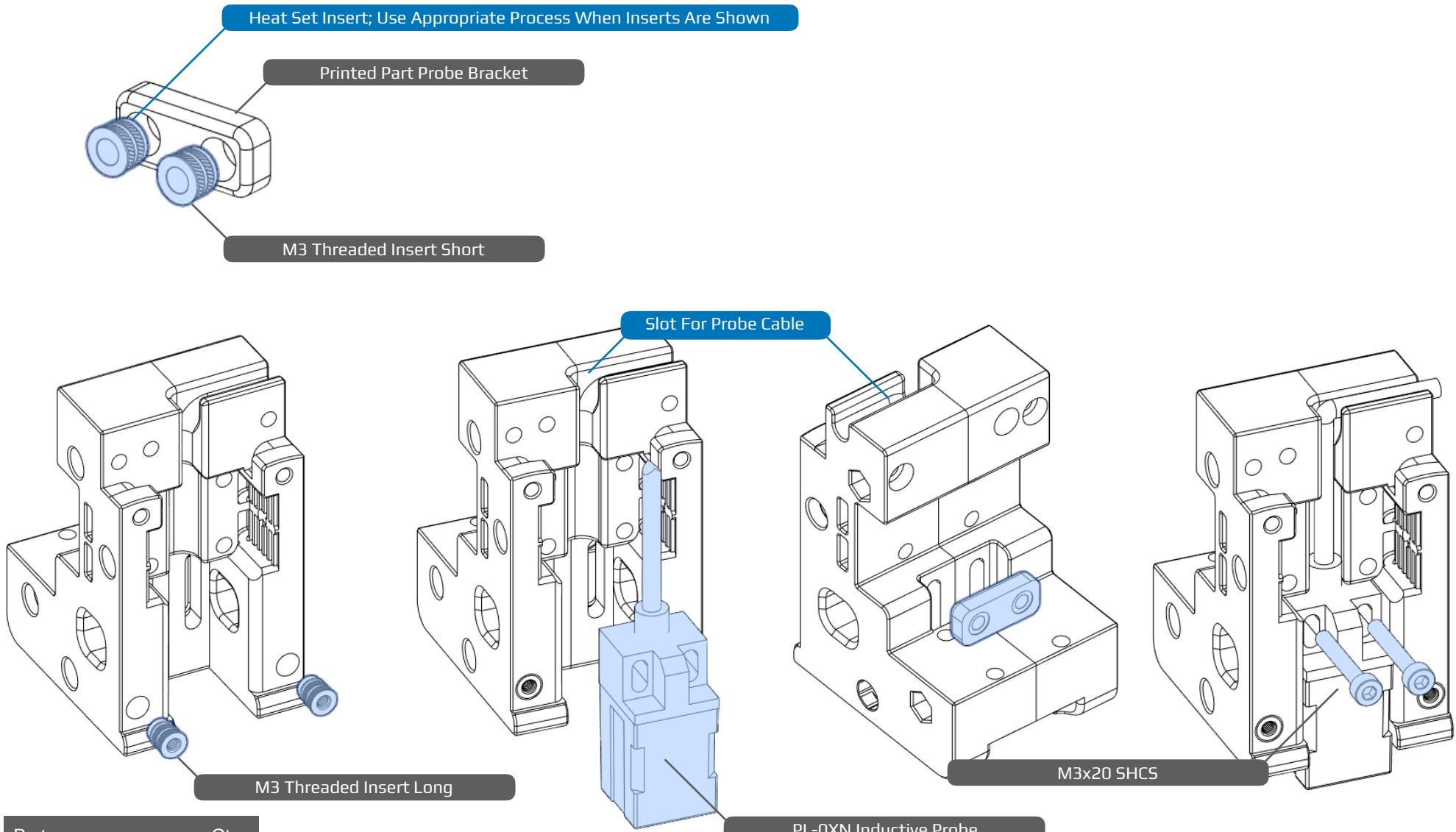


X Axis - X Carriage



Part	Qty
M3x30 SHCS	3
M3 Nut	3

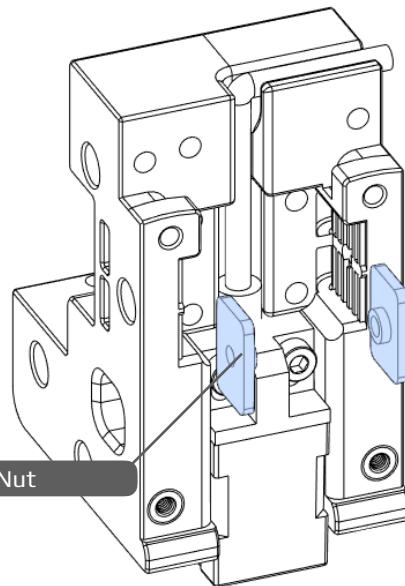
X Axis - X Carriage



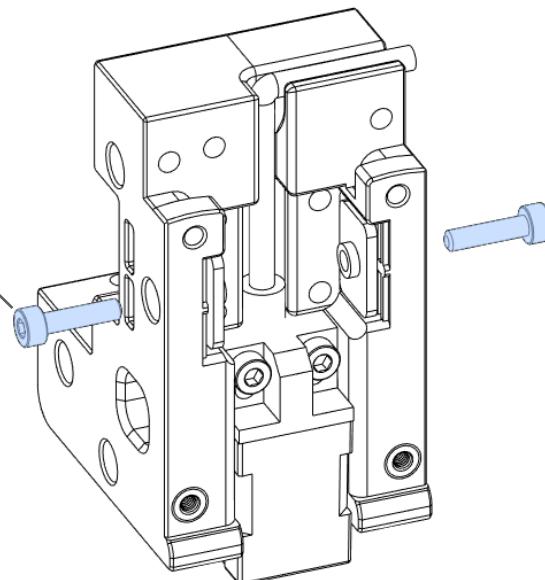
Part	Qty
M3 Insert Short	2
M3 Insert Long	2
M3x20 SHCS	2
PL-OXN Probe	1

X Axis - X Carriage

OpenBuild T-Nut



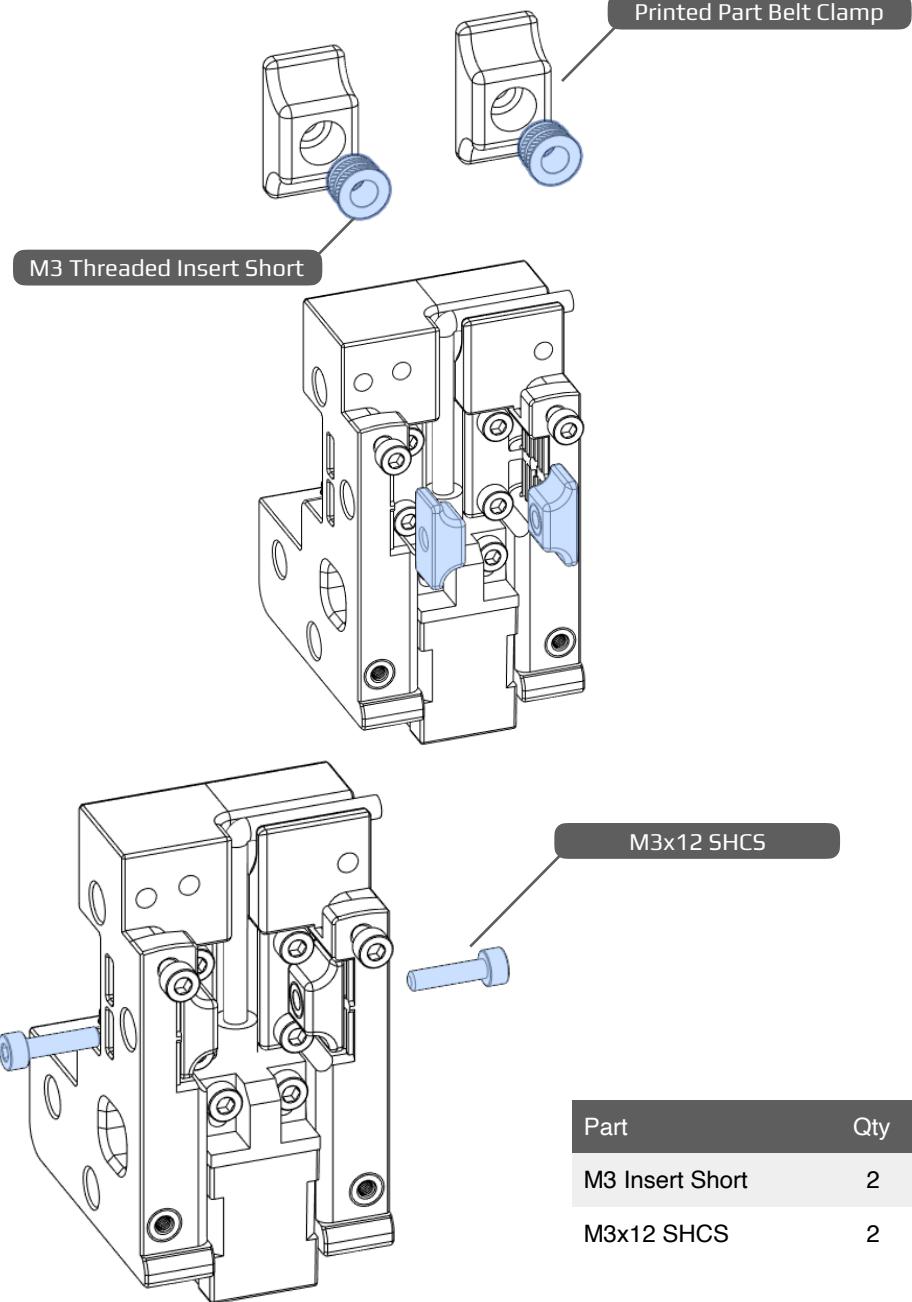
M3 OpenBuilds T-Nut



Qty

Part	Qty
M3 OpenBuilds T-Nut	2
M3x12 SHCS	2

Printed Belt Clamps



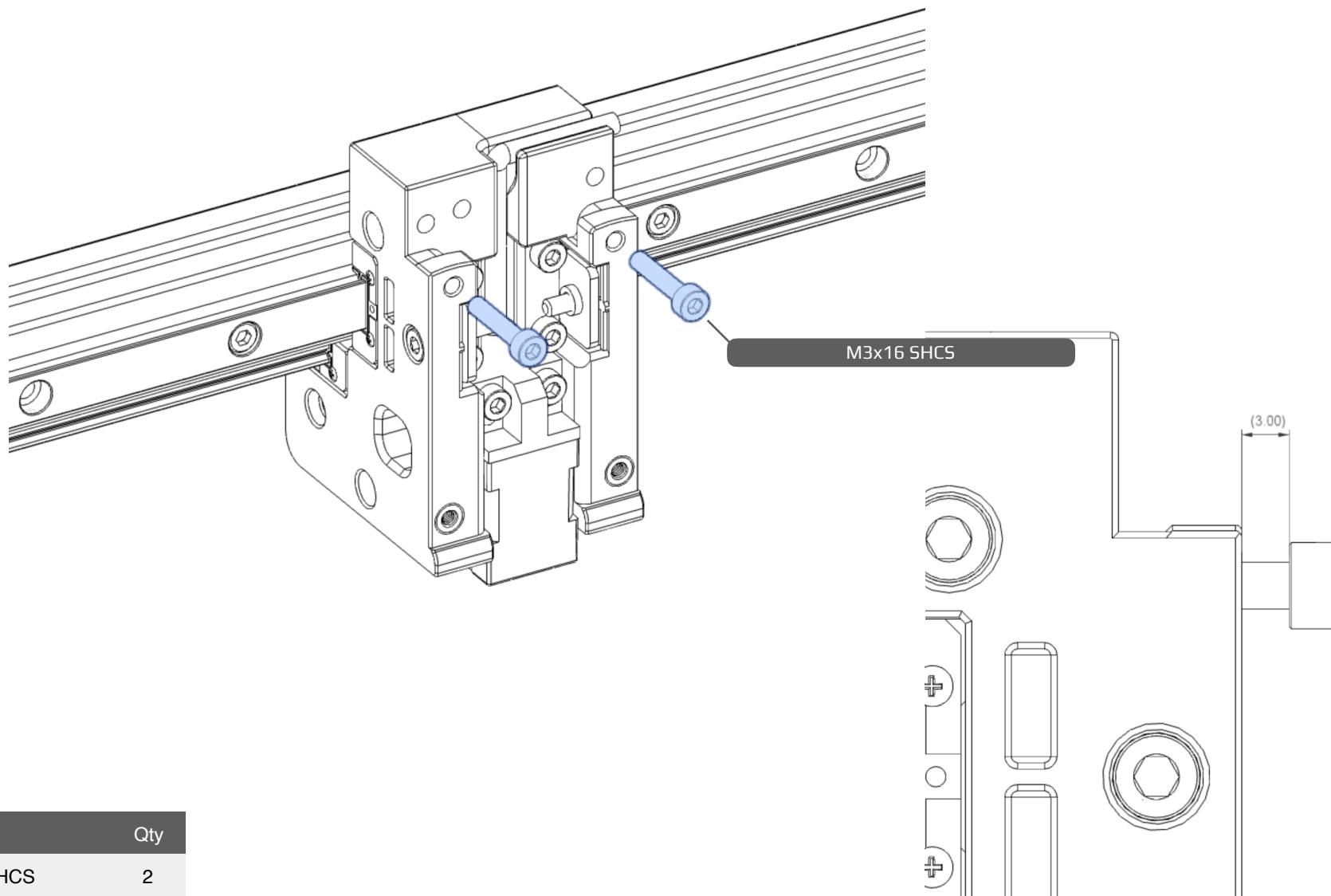
Printed Part Belt Clamp

M3 Threaded Insert Short

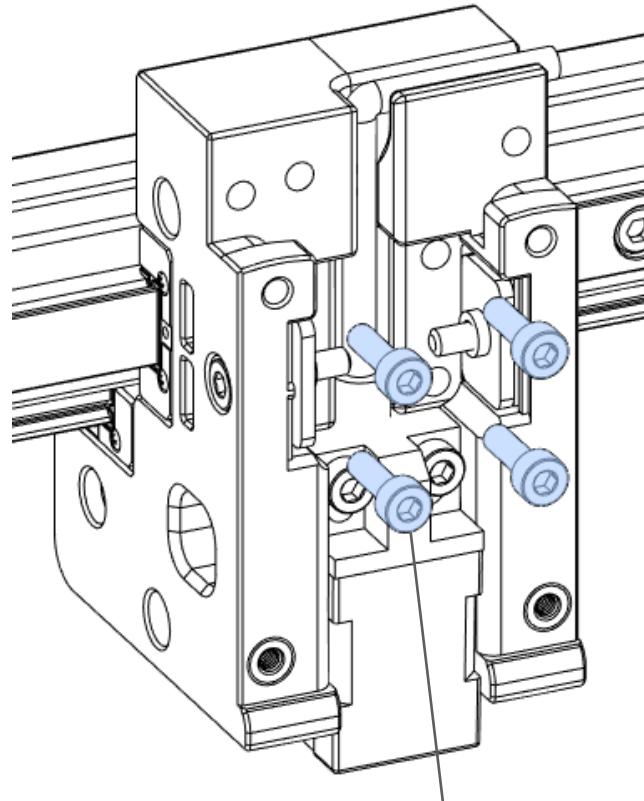
M3x12 SHCS

Part	Qty
M3 Insert Short	2
M3x12 SHCS	2

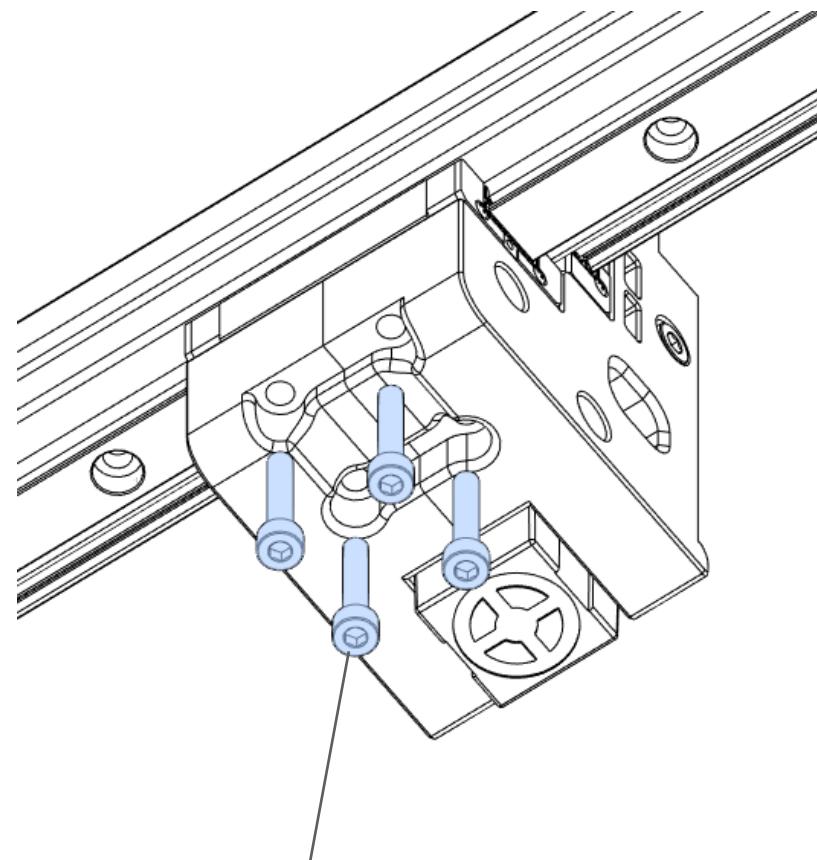
X Axis - X Carriage



X Axis - X Carriage



M3x10 SHCS

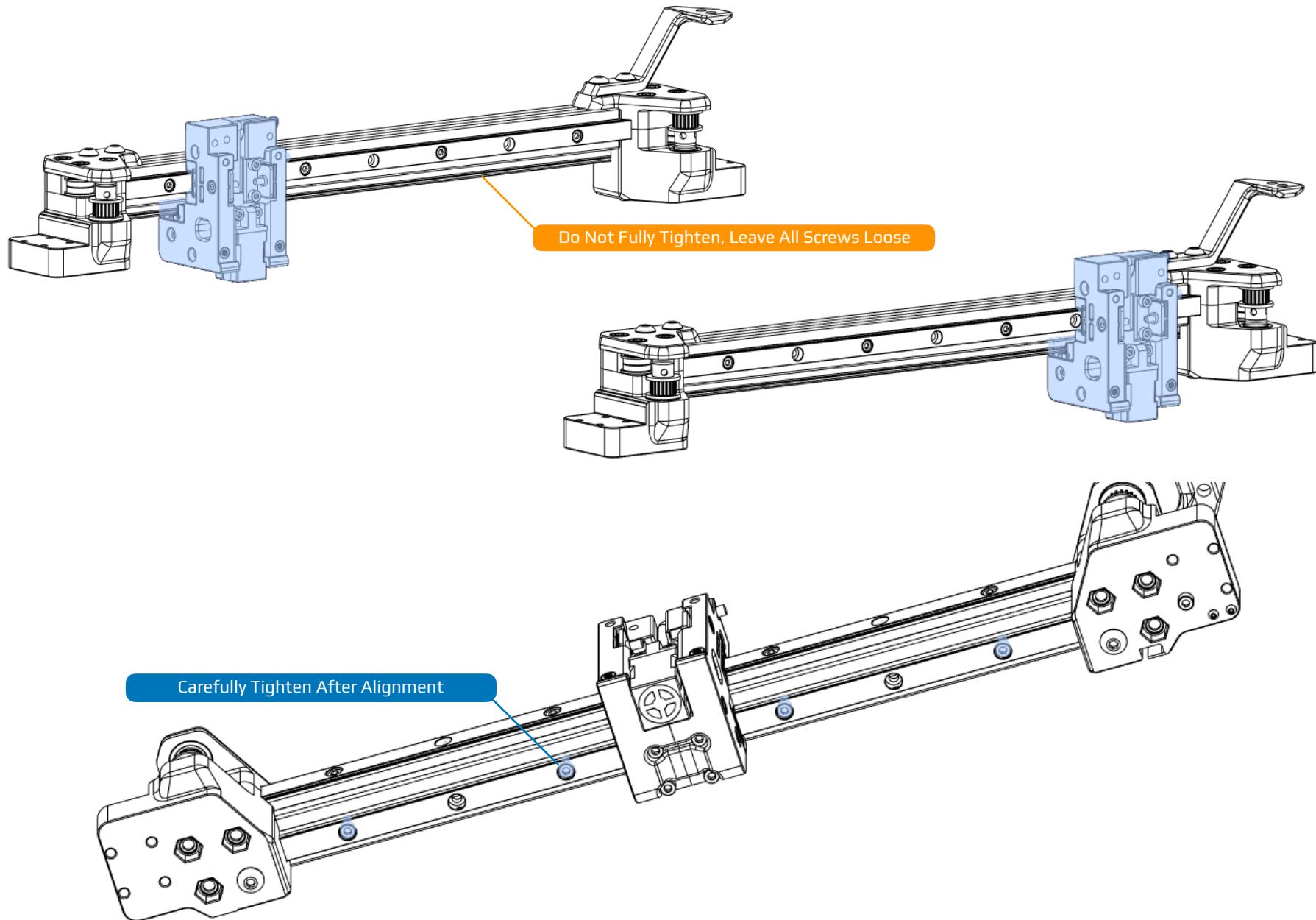


M3x16 SHCS

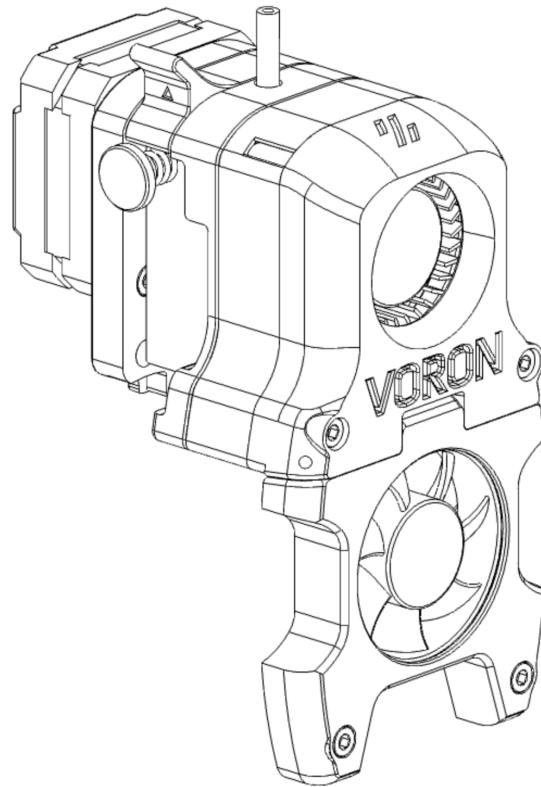
Part	Qty
M3x10 SHCS	4
M3x16 SHCS	4

X Axis - X Carriage

Repeatedly Move Carriage To Align Bottom Rail



3D Puzzle

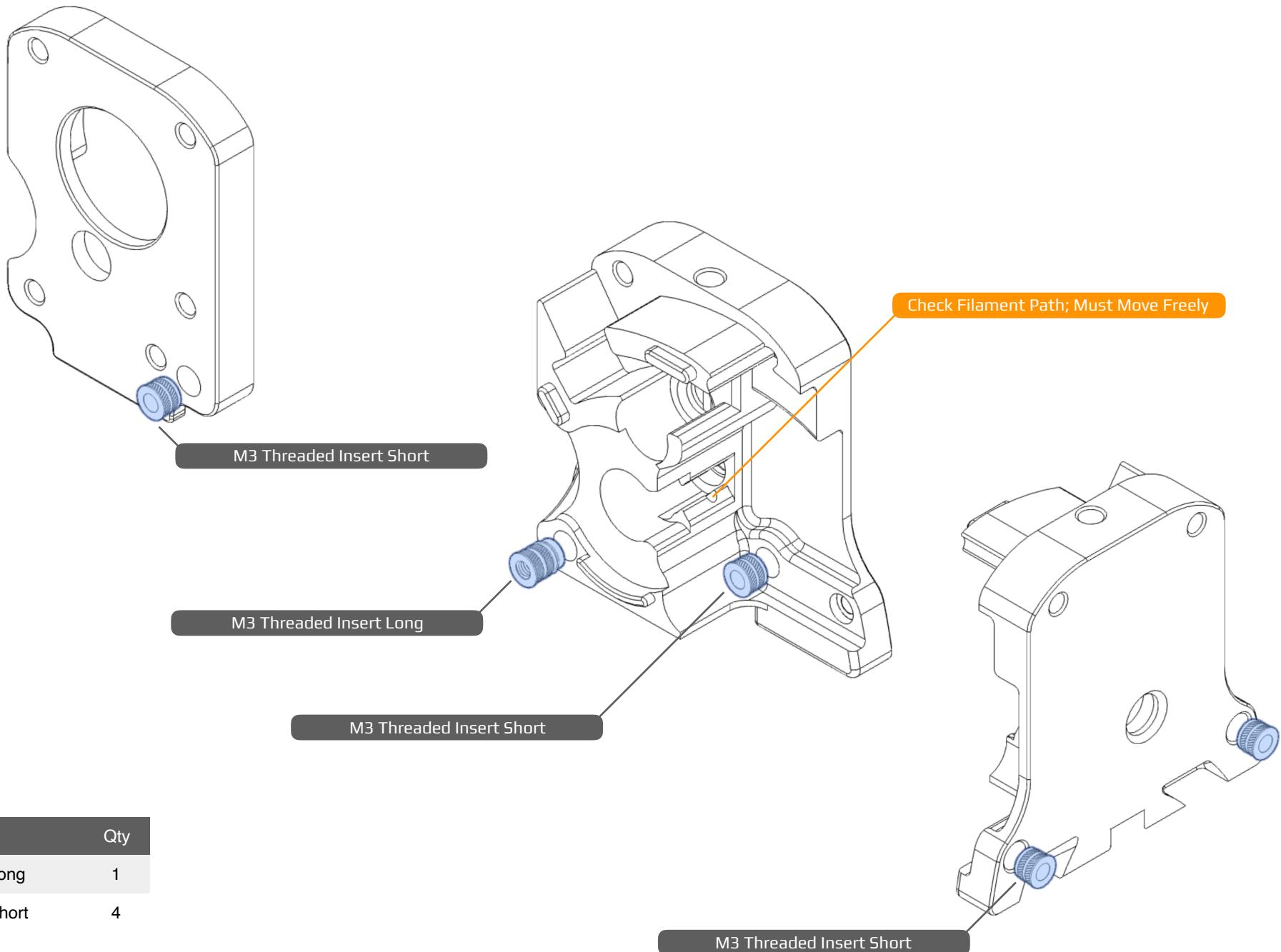


Printed Parts
Gantry\X Carriage

Part	Qty	Part	Qty	Part	Qty
M3 Insert Long	1	BMG Drive Gear	1	Filament	
M3 Insert Short	5	BMG Drive Shaft	1	PTFE Tube	
M3x30 SHCS	2	BMG Idler Gear	1		
M3x35 SHCS	2	BMG Pinion Gear	1		
MR85 Bearing	2	BMG Tensioner	1		
40x10 Axial Fan	1	M3x8 SHCS	1		
40x20 Radial Fan	1	NEMA17	1		

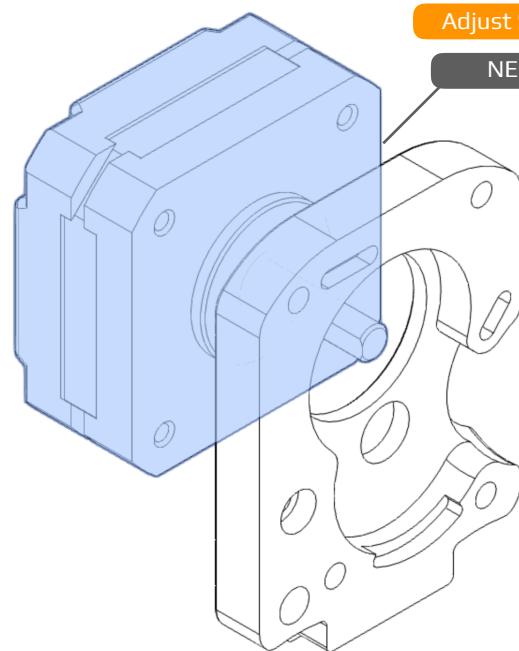
Tools
2.5mm Hex Driver
4mm Hex Driver
Soldering Iron

3D Puzzle



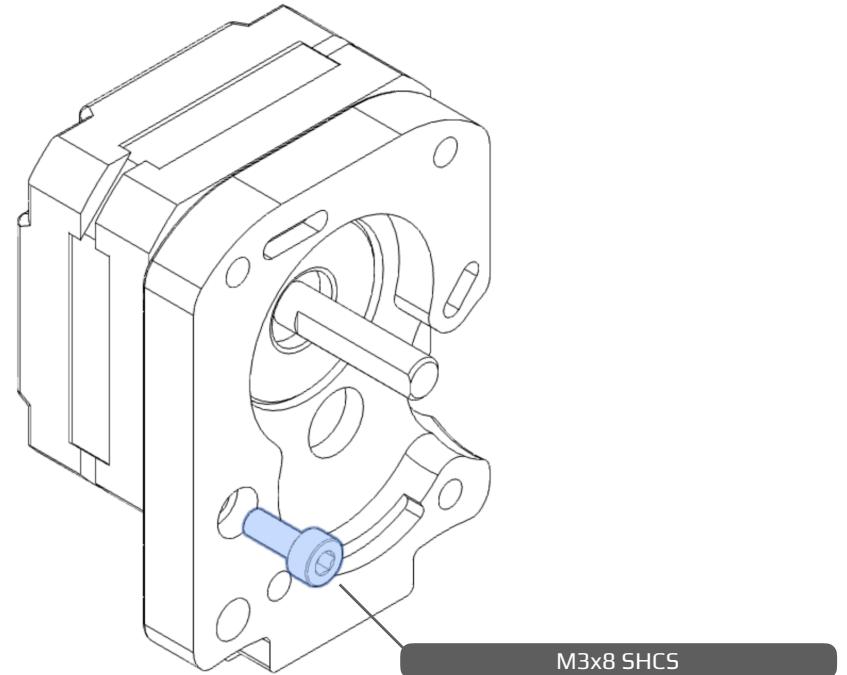
Part	Qty
M3 Insert Long	1
M3 Insert Short	4

3D Puzzle

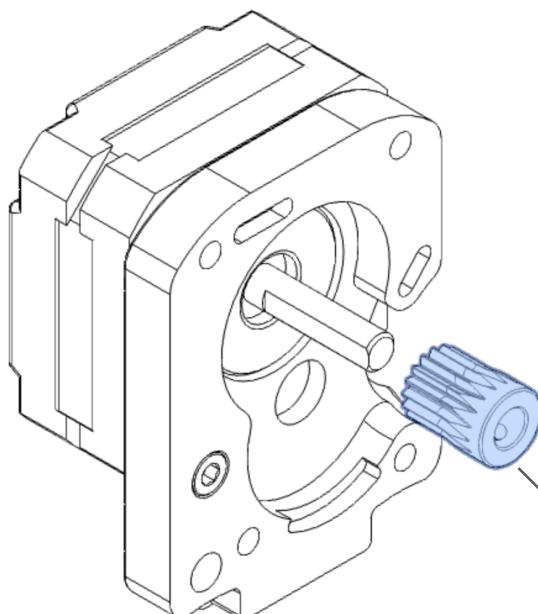


Adjust Stepper Current Before Printing!

NEMA17 Short Stepper Motor



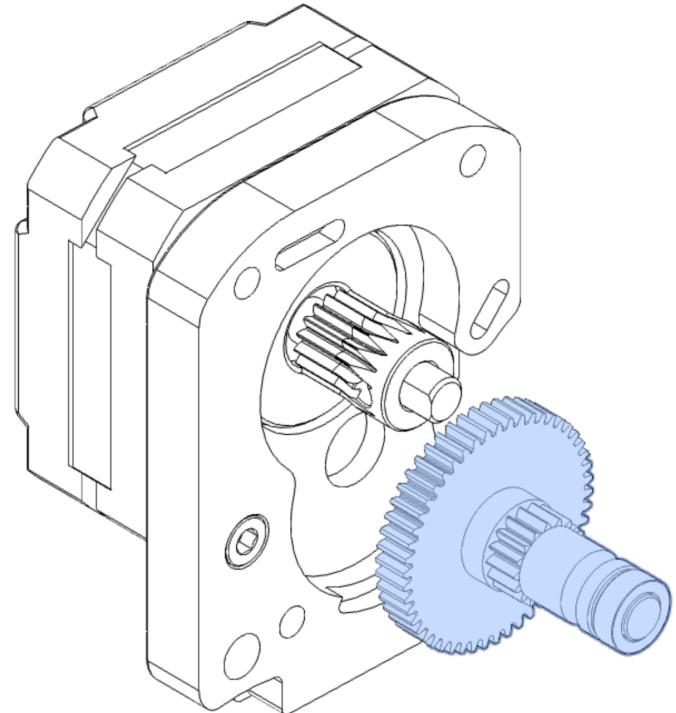
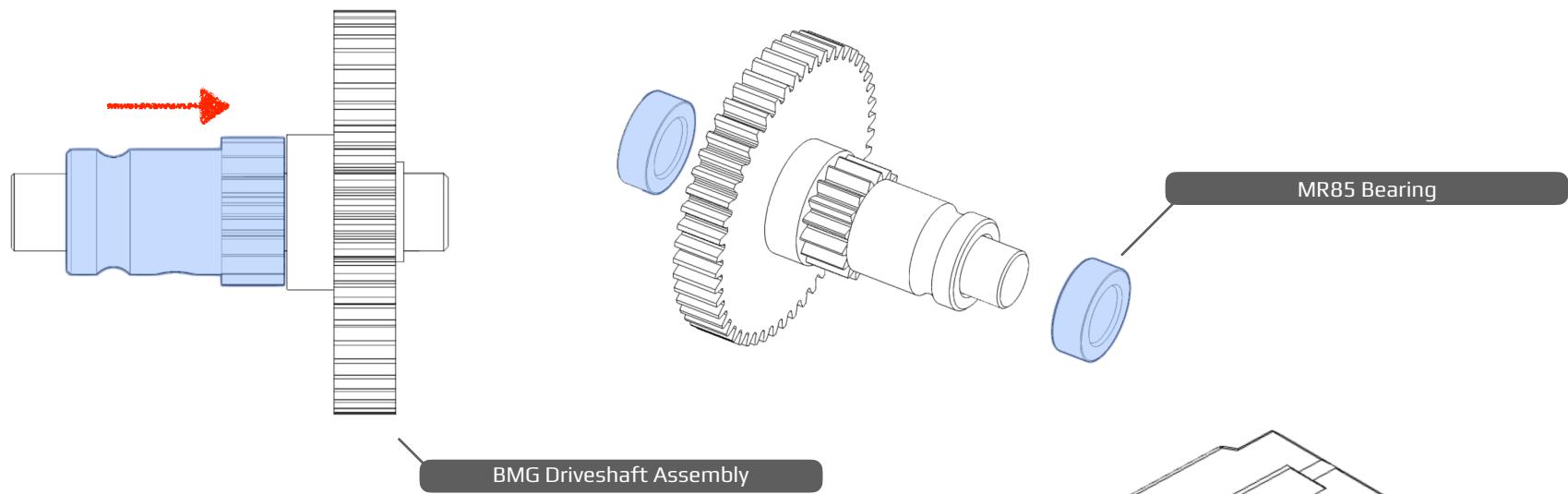
M3x8 SHCS



BMG Pinion Gear

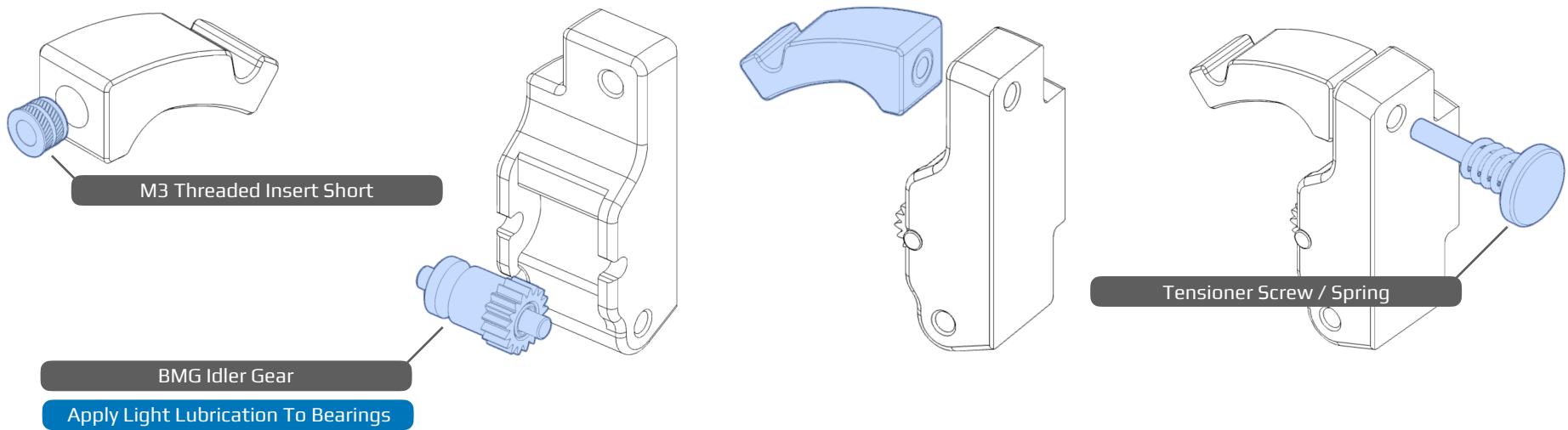
Part	Qty
M3x8 SHCS	1
NEMA17	1
BMG Pinion Gear	1

3D Puzzle

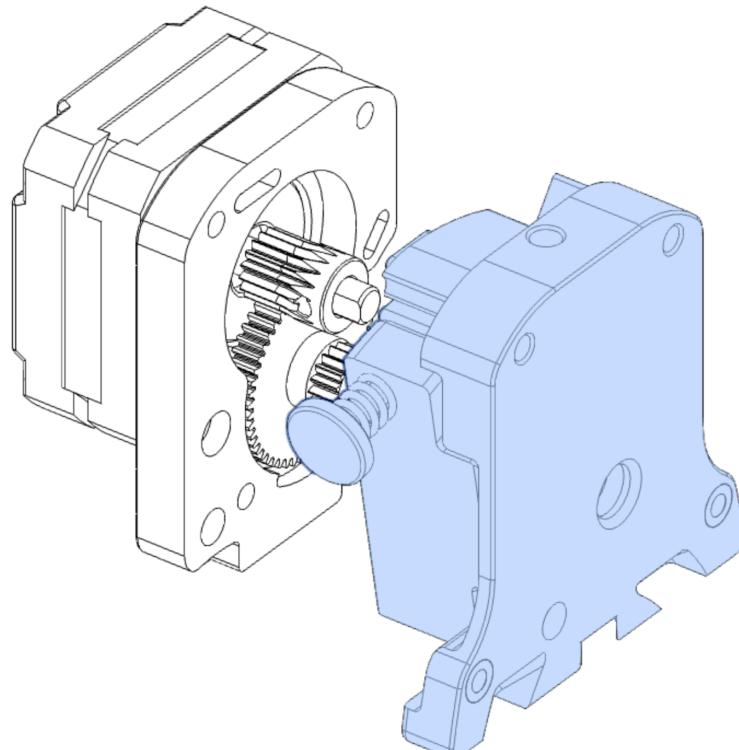
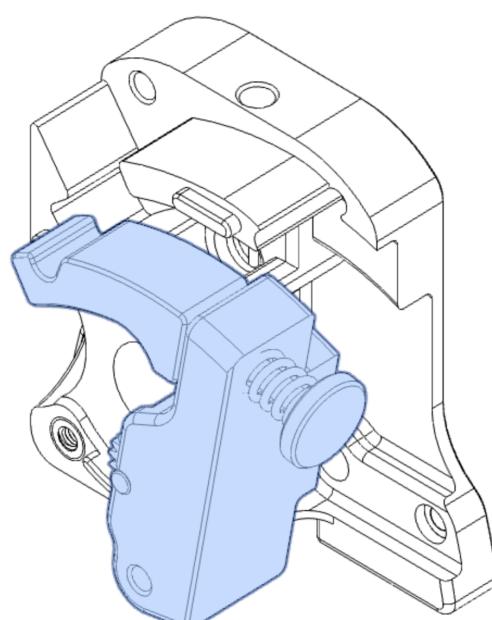


Part	Qty
MR85	2
BMG Drive Shaft	1
BMG Drive Gear	1

3D Puzzle

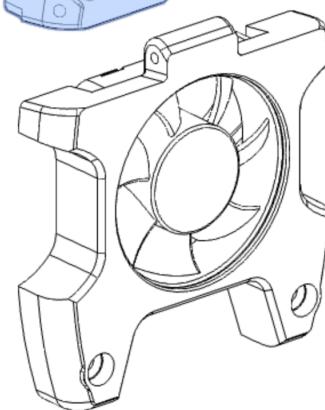
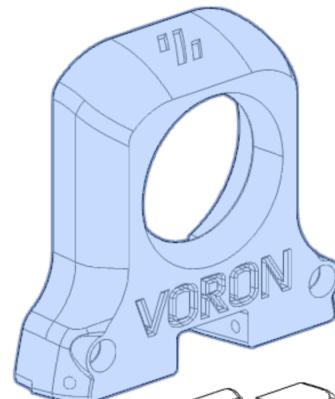
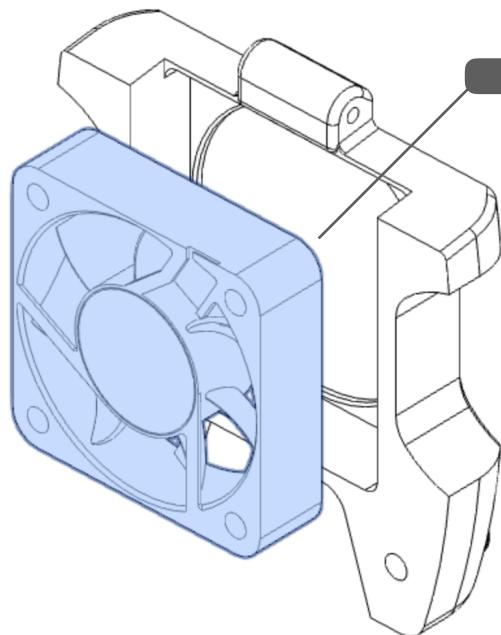


Apply Light Lubrication To Bearings

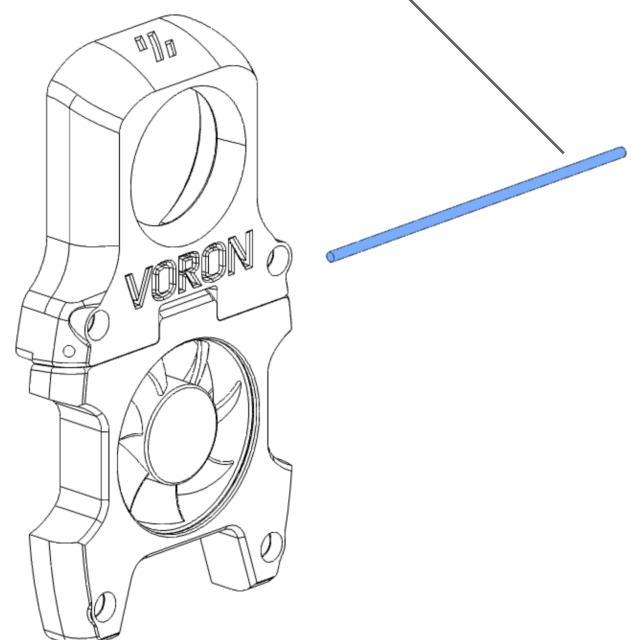


Part	Qty
BMG Idler Gear	1
BMG Tensioner	1
M3 Insert Short	1

3D Puzzle

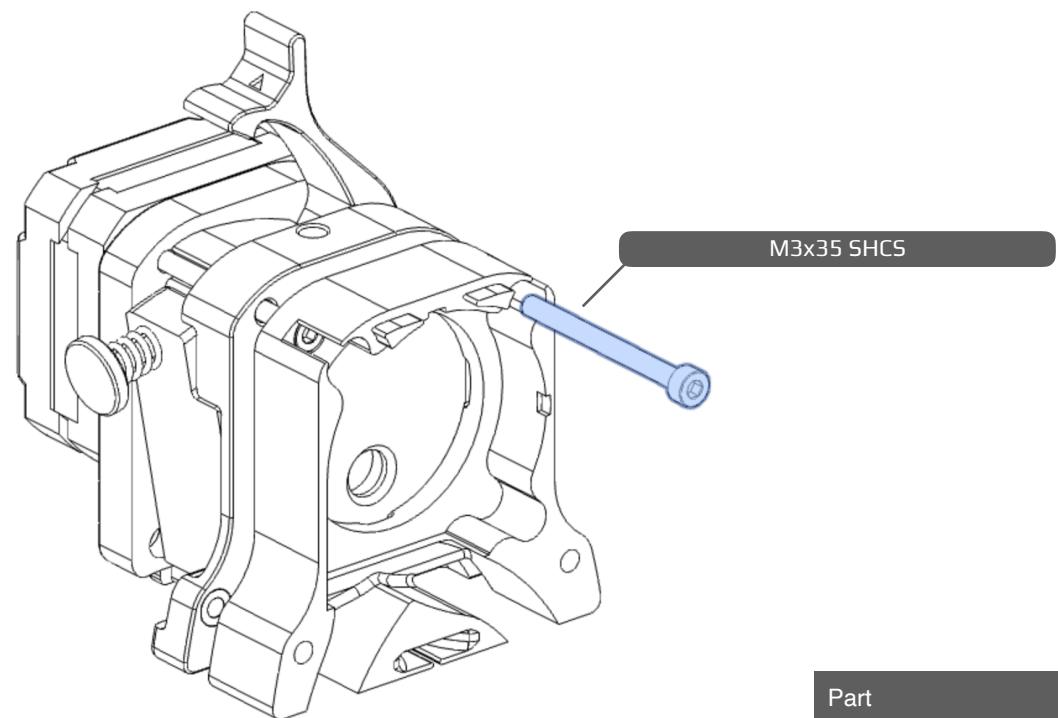
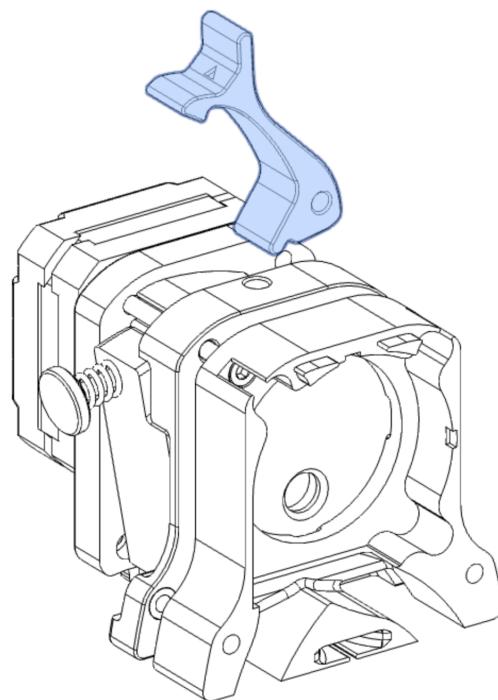
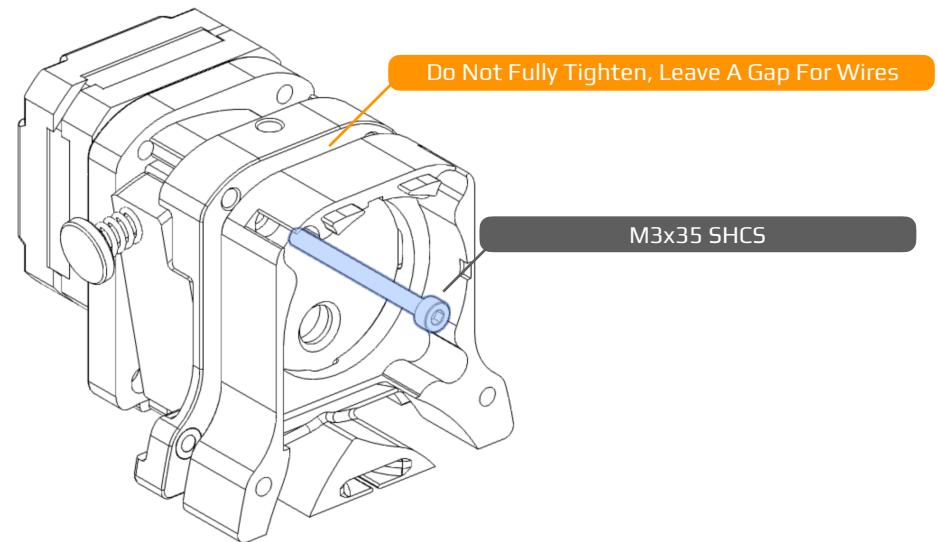
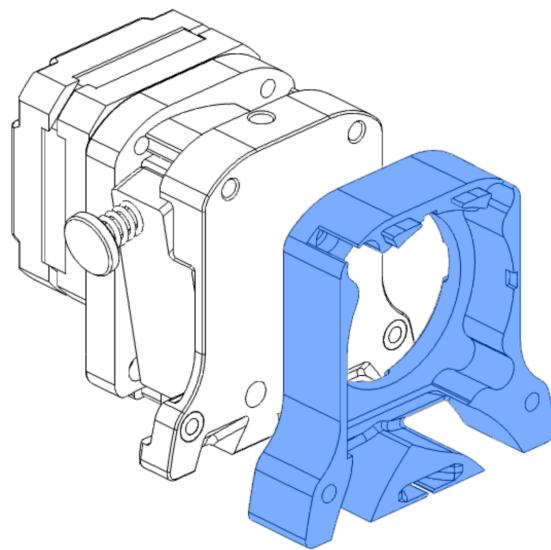


1.75mm Filament



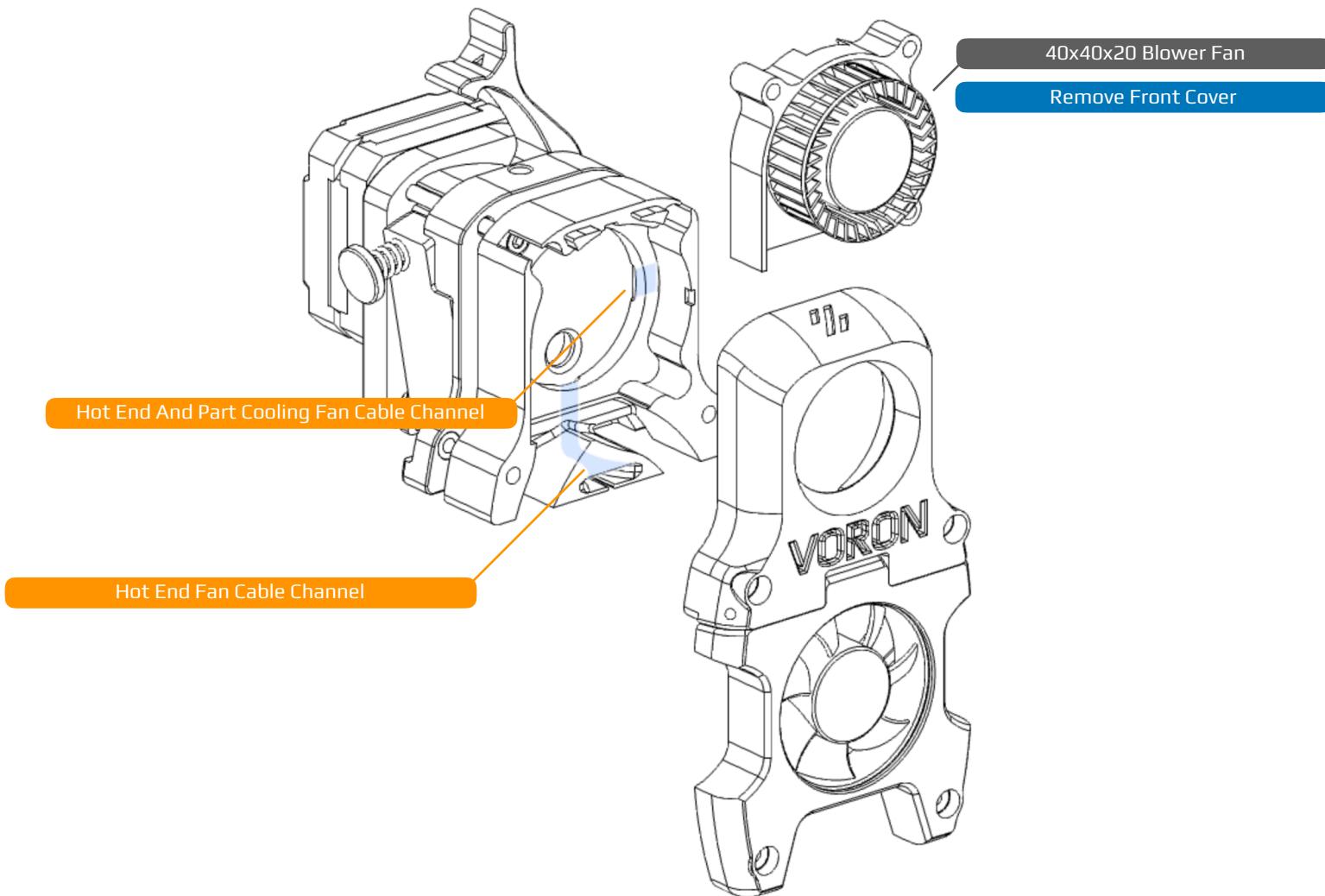
Part	Qty
40x10 Axial Fan	1

3D Puzzle

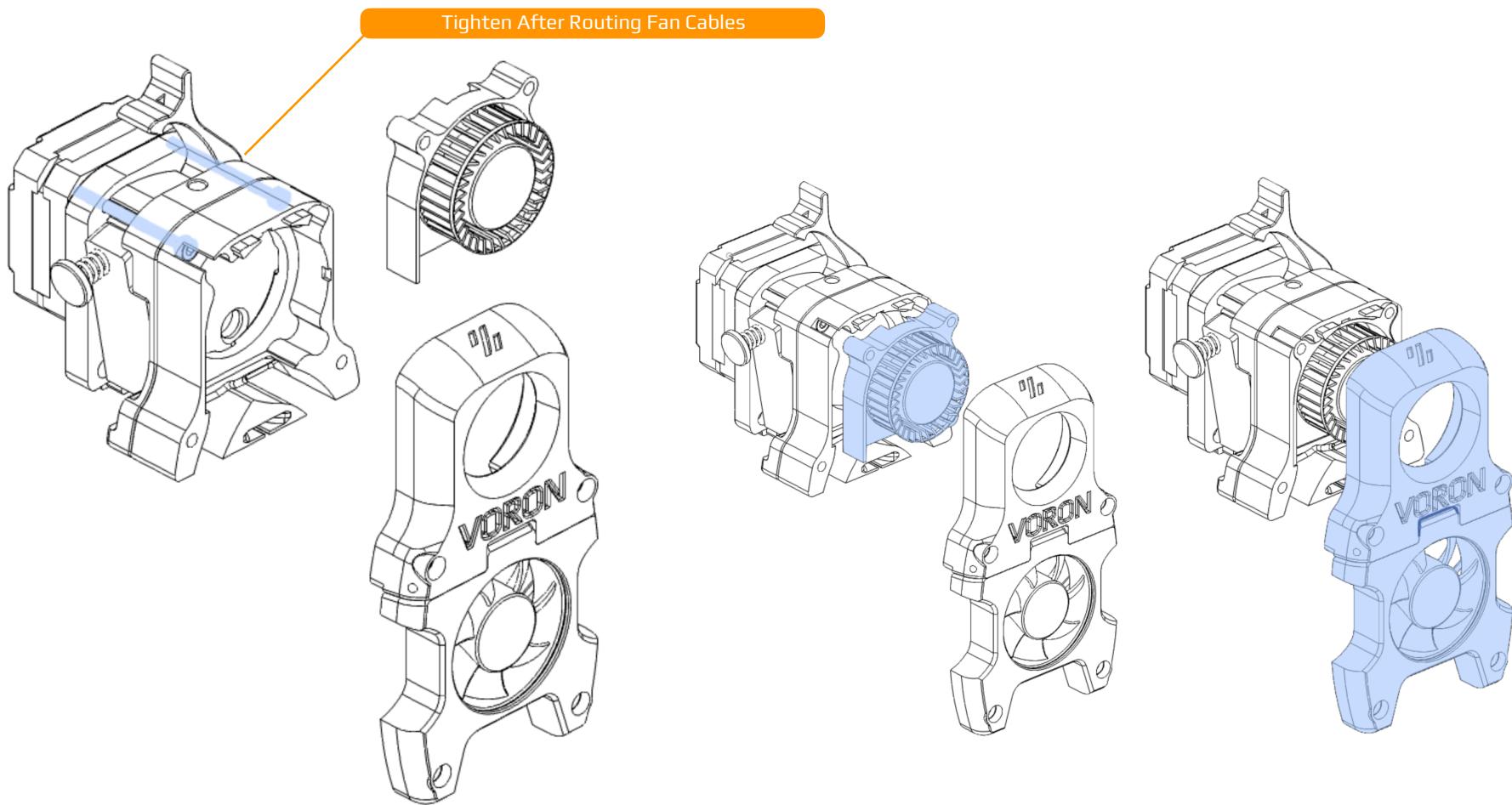


Part	Qty
M3x35 SHCS	2

3D Puzzle

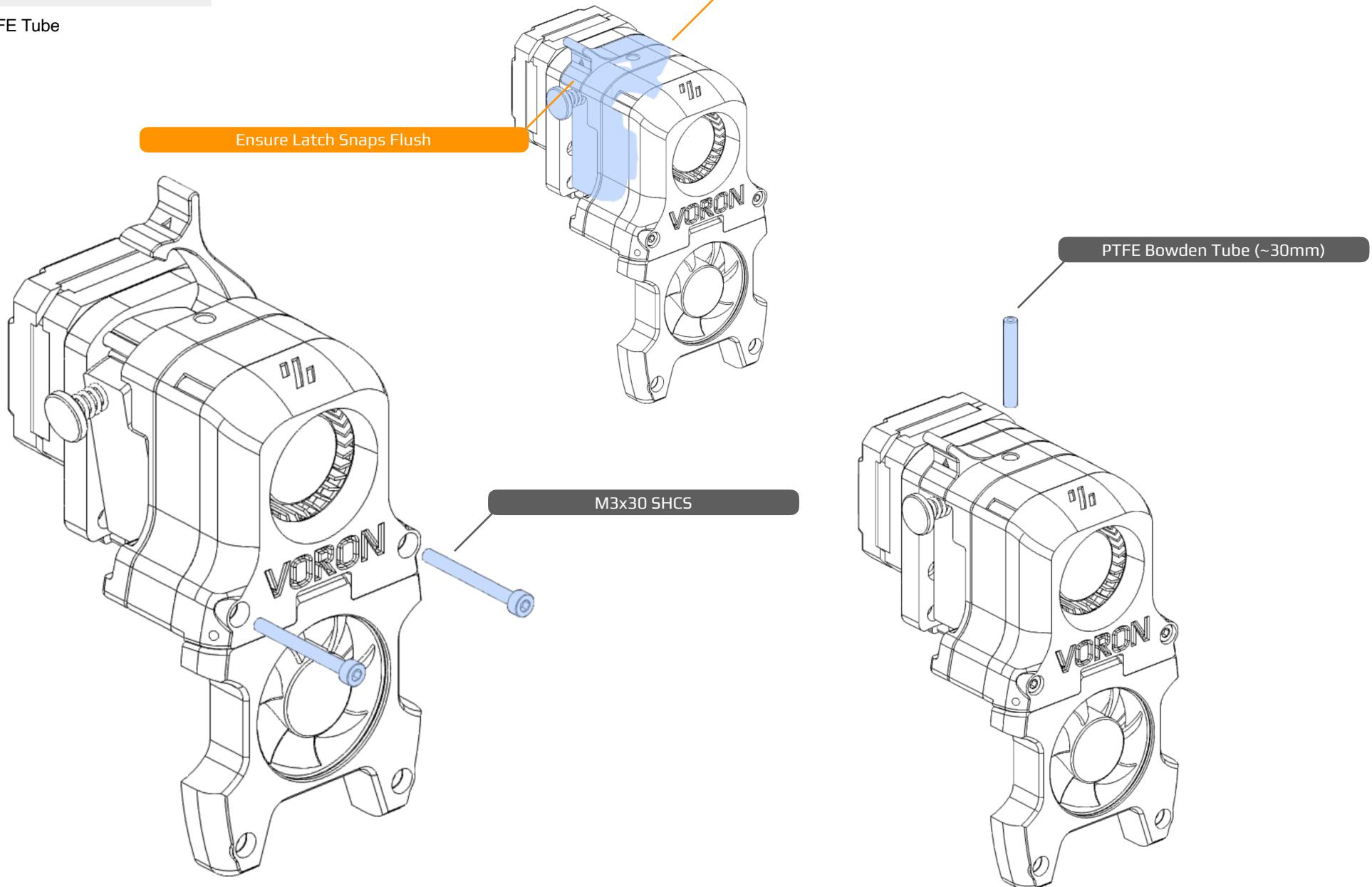


Part	Qty
40x20 Radial Fan	1

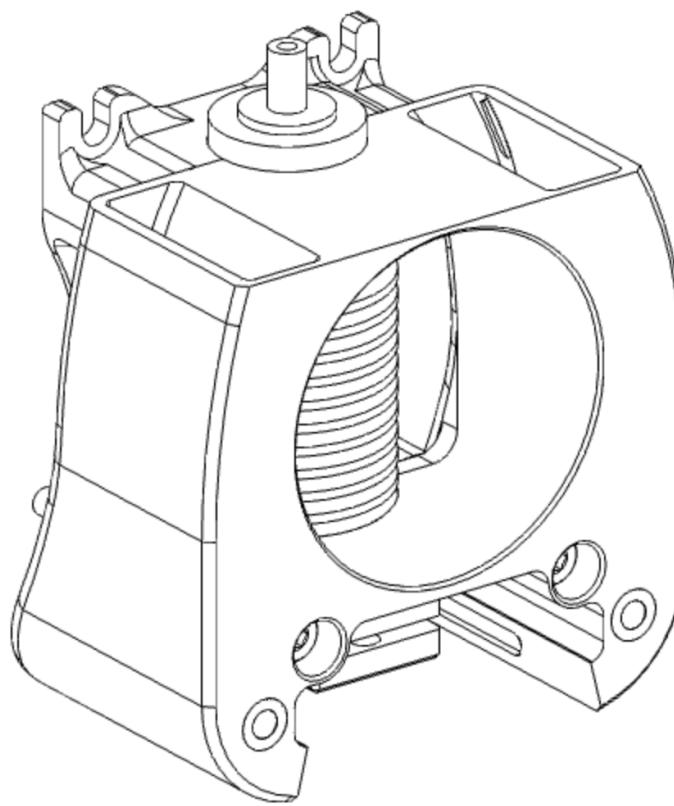


3D Puzzle

Part	Qty
M3x30 SHCS	2
PTFE Tube	



Printhead - E3D V6



Printed Parts

Printhead Front E3D V6

Printhead Rear E3D V6

Part

Qty

M3x16 SHCS

2

M3x40 SHCS

2

M3 Insert Short

2

M3 Insert Long

2

E3D V6

1

PTFE 40mm

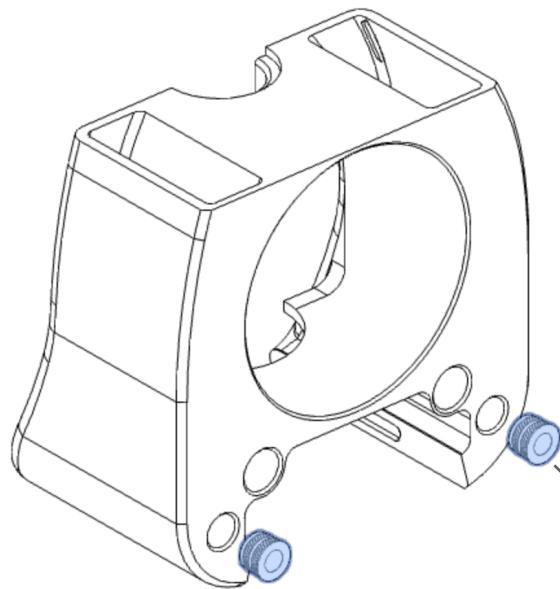
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Tools

2.5mm Hex Driver

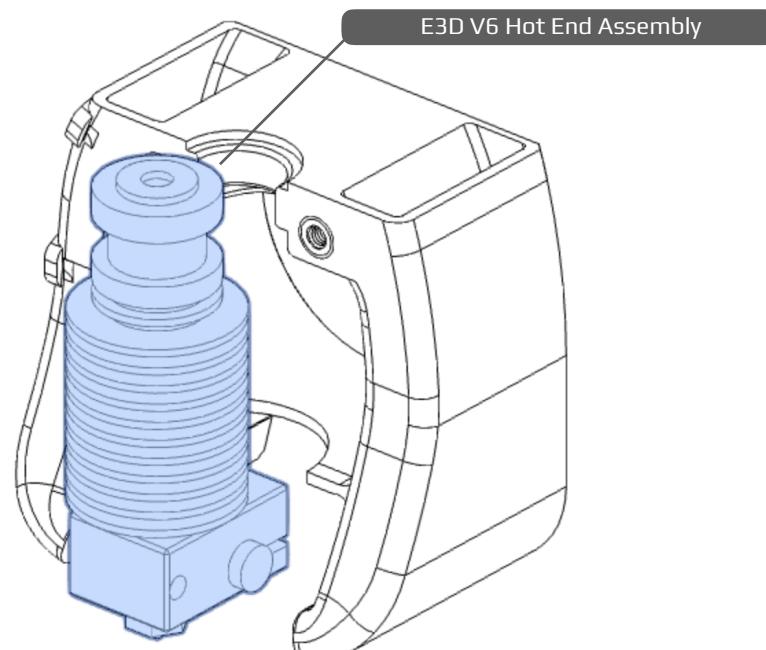
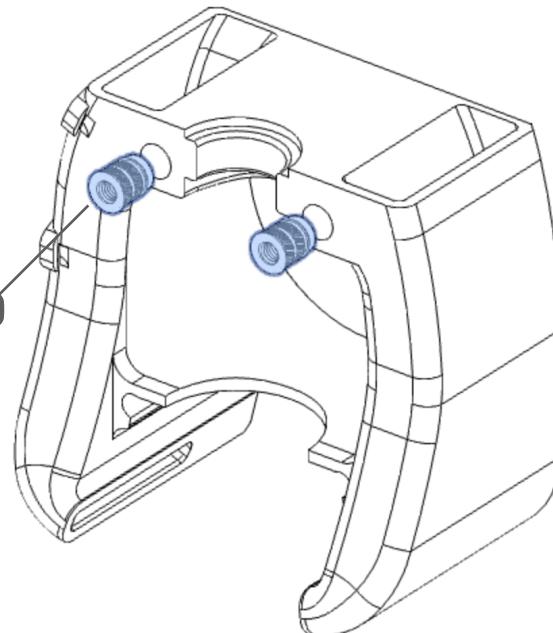
Soldering Iron

Printhead - E3D V6



M3 Threaded Insert Long

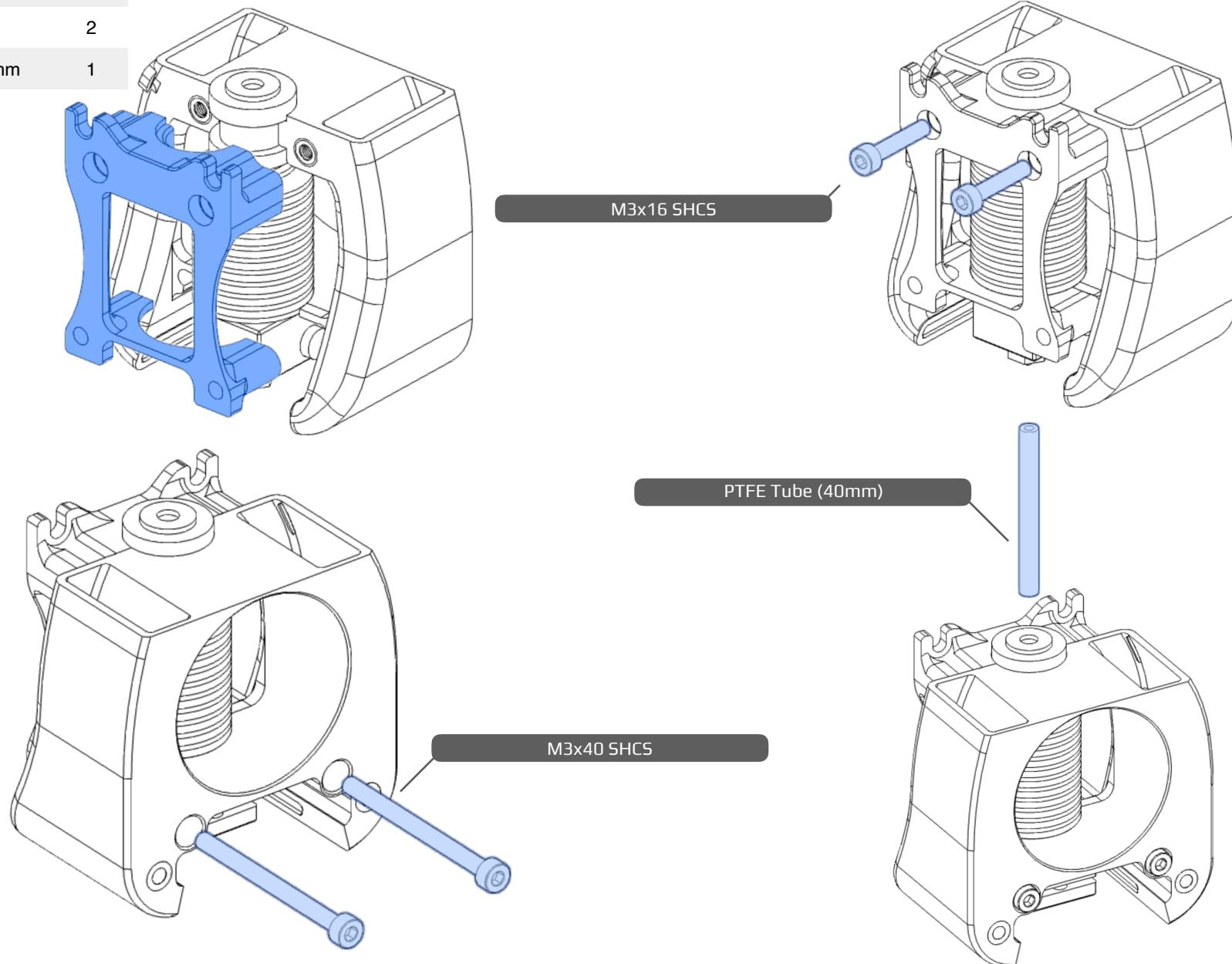
M3 Threaded Insert Short



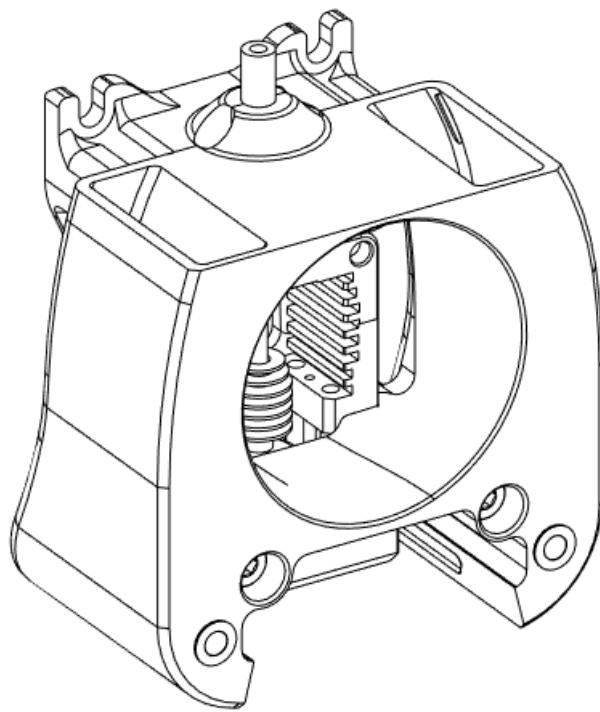
Part	Qty
M3 Insert Long	2
M3 Insert Short	2
E3D V6	1

Printhead - E3D V6

Part	Qty
M3x16 SHCS	2
M3x40 SHCS	2
PTFE Tube 40mm	1



Printhead - Slice Mosquito

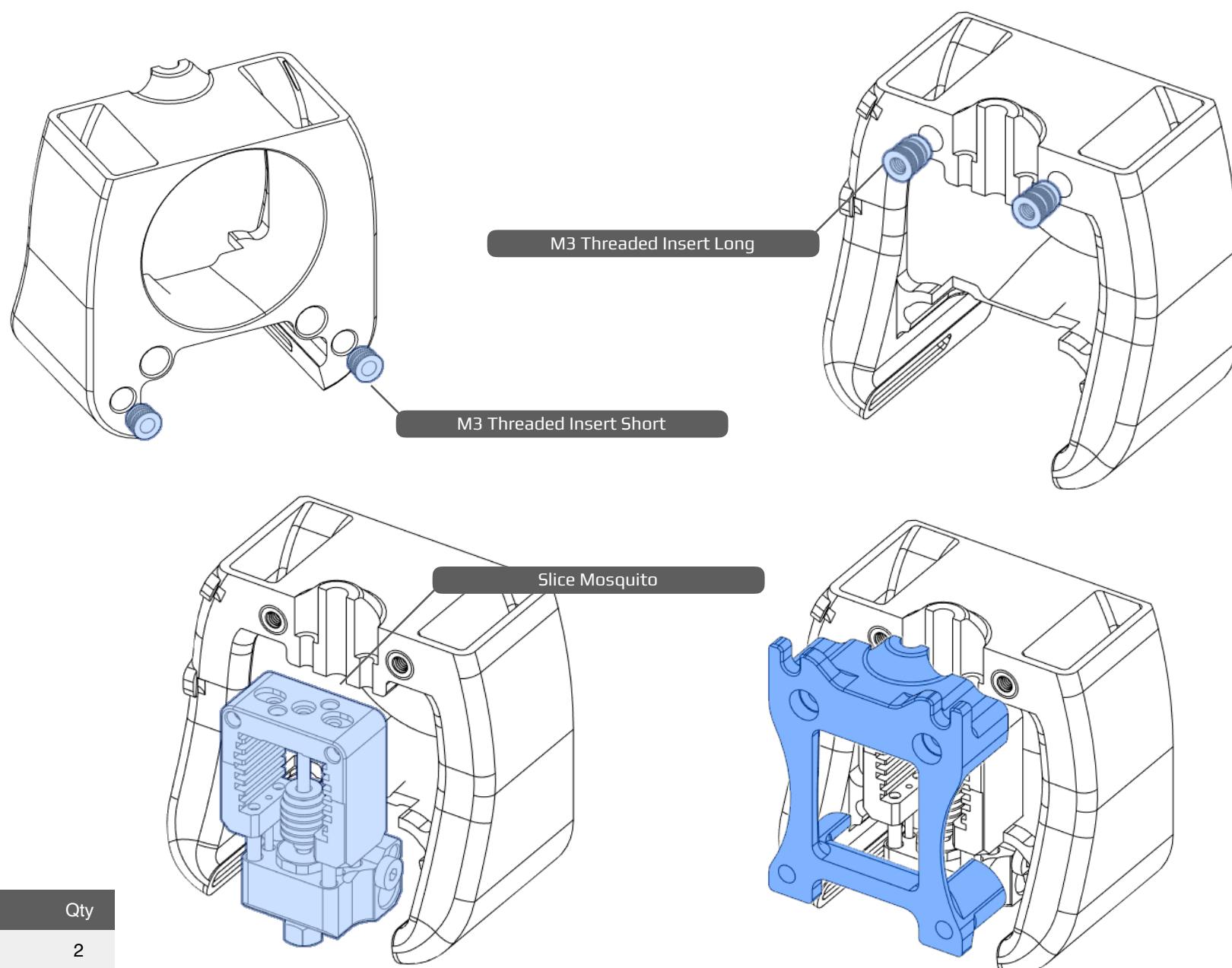


Printed Parts
Printhead Front Mosquito
Printhead Rear Mosquito

Part	Qty
M2.5x10 SHCS	2
M3x16 SHCS	2
M3x40 SHCS	2
M3 Insert Short	2
M3 Insert Long	2
Mosquito	1
PTFE 24mm	1

Tools
2mm Hex Driver
2.5mm Hex Driver
Soldering Iron

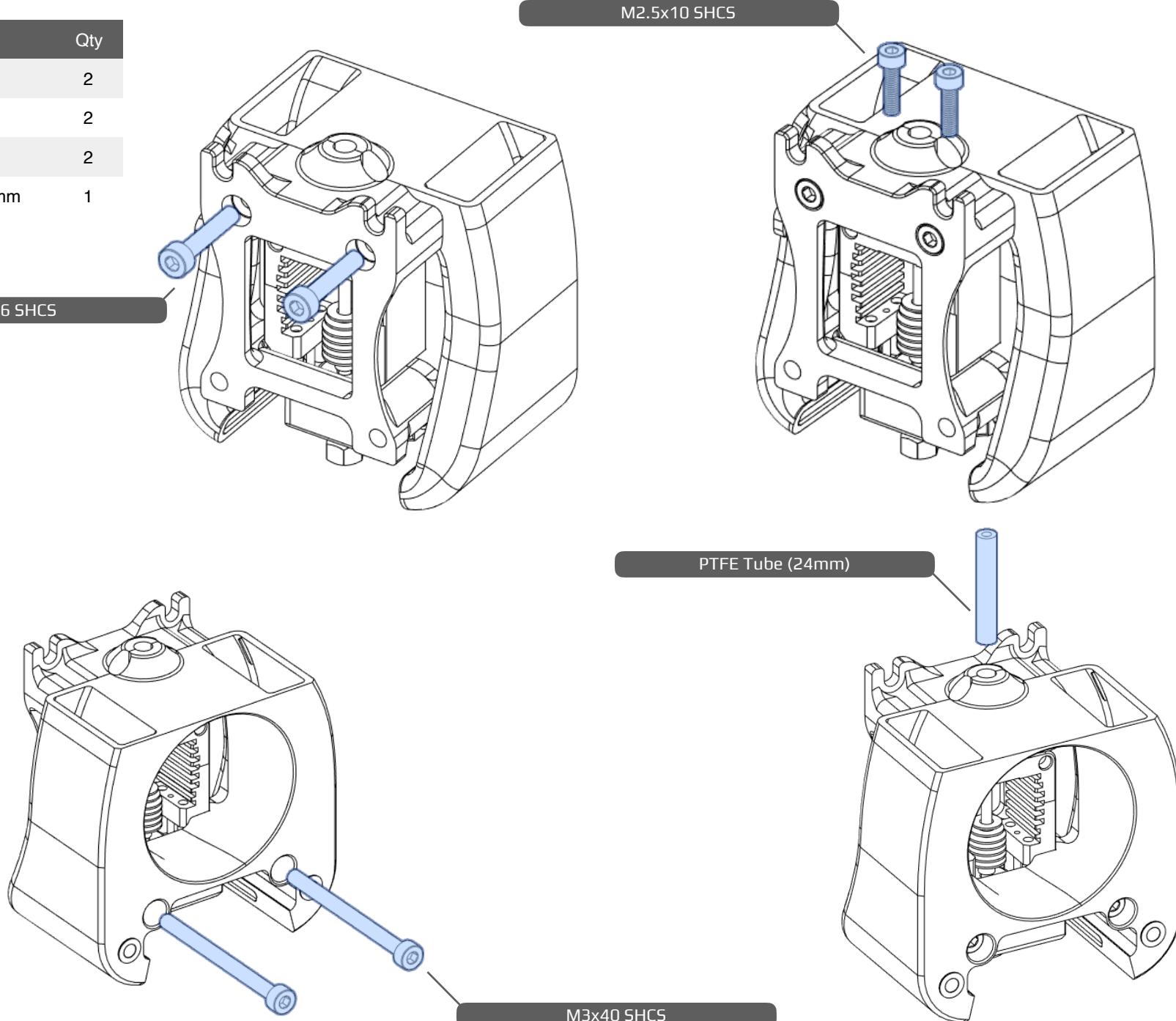
Printhead - Slice Mosquito



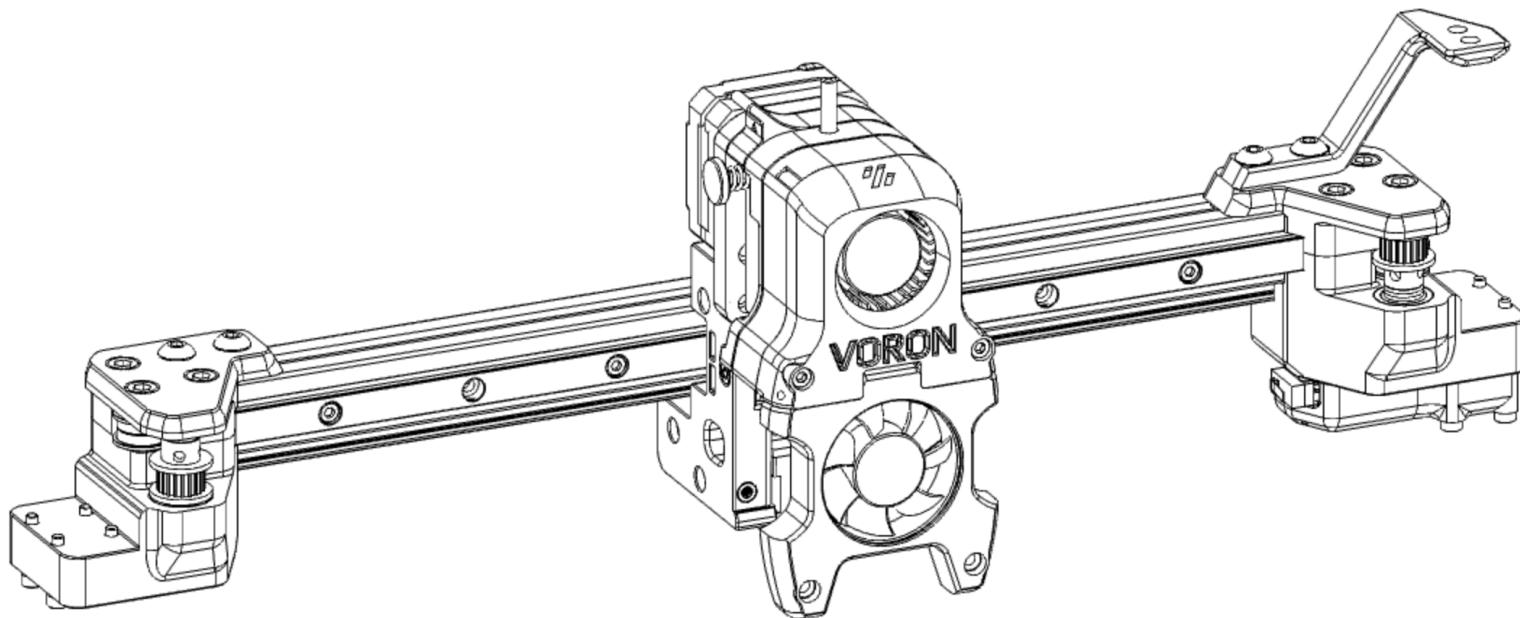
Part	Qty
M3 Insert Long	2
M3 Insert Short	2
Slice Mosquito	1

Printhead - Slice Mosquito

Part	Qty
M2.5x10 SHCS	2
M3x16 SHCS	2
M3x40 SHCS	2
PTFE Tube 24mm	1



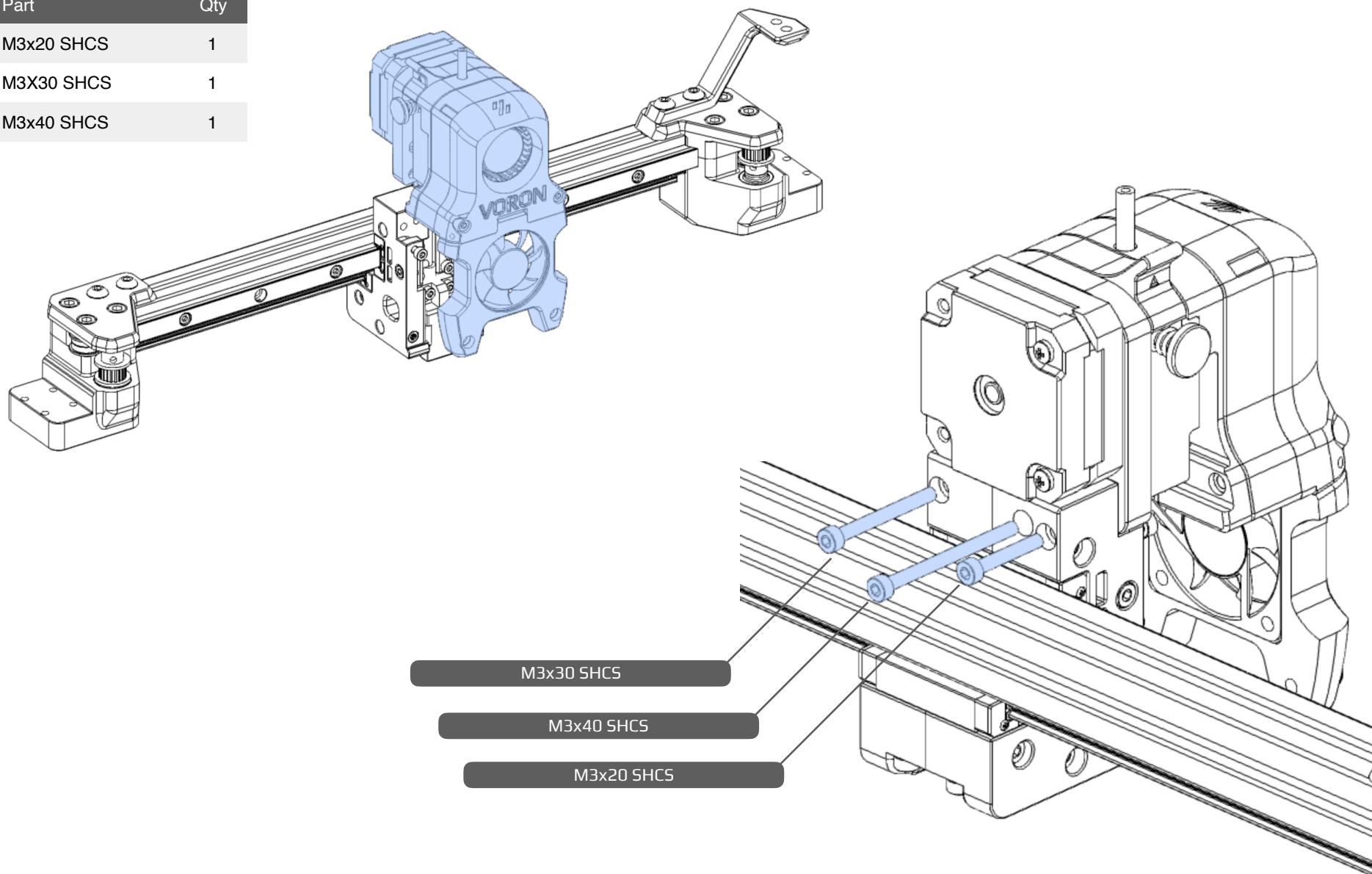
X Axis - X Carriage (Cont)



Printed Parts	Part	Qty	Tools
Gantry\XY Joints\endstop_pod	M3x16 SHCS	6	2.5mm Hex Driver
Gantry\X Carriage	M3x20 SHCS	3	Soldering Iron
	M3x30 SHCS	3	
	M2x12	2	
	M3 Insert Short	2	
	M3x12 SHCS	2	
	Microswitch	2	
	M3x40 SHCS	1	

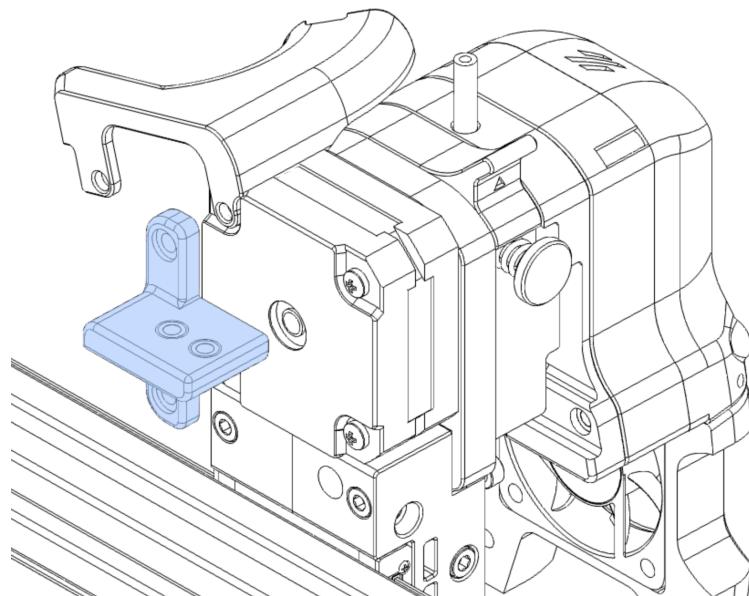
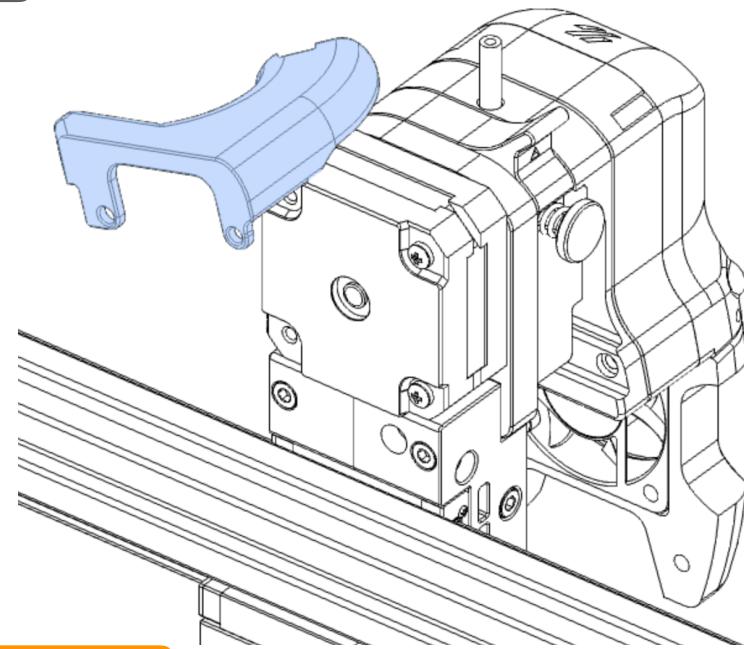
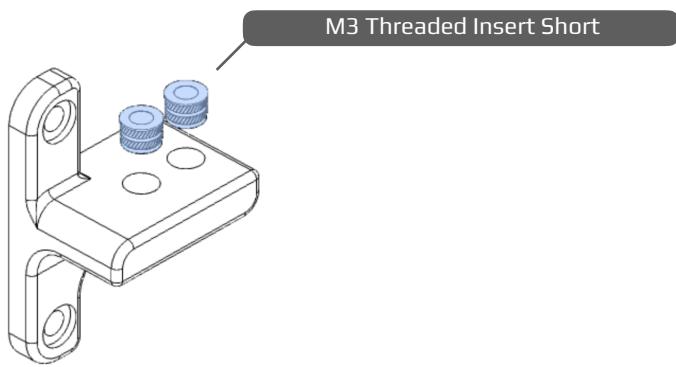
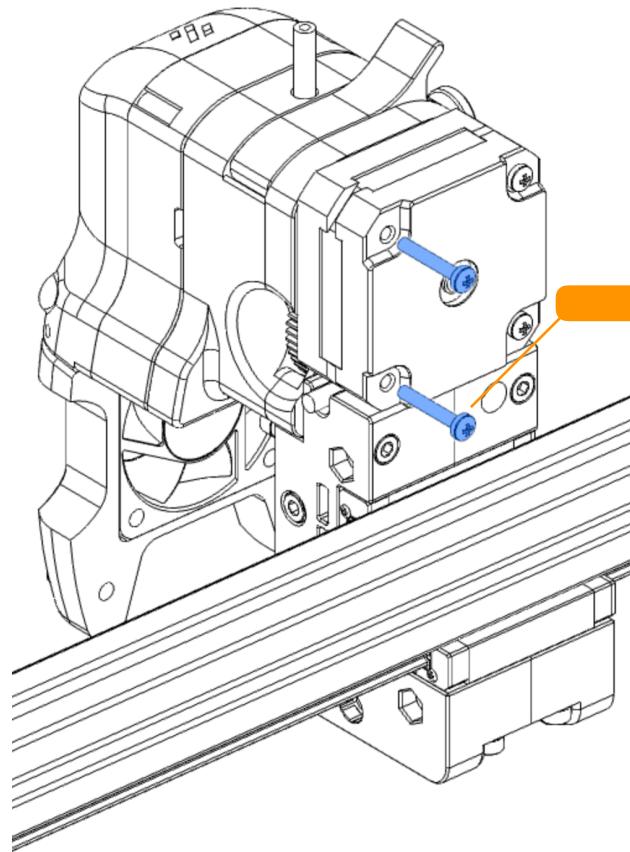
X Axis - X Carriage (Cont)

Part	Qty
M3x20 SHCS	1
M3X30 SHCS	1
M3x40 SHCS	1



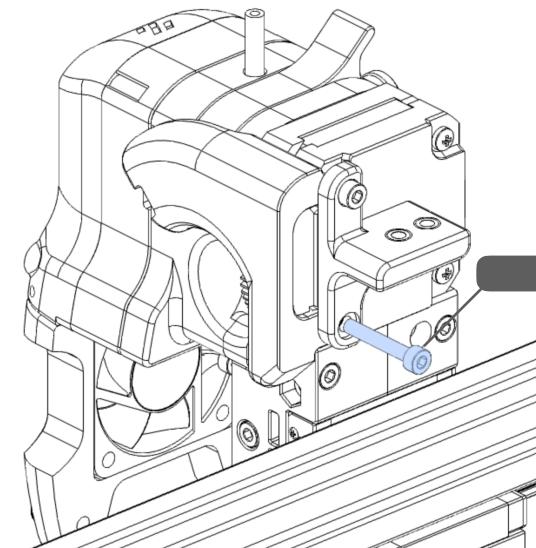
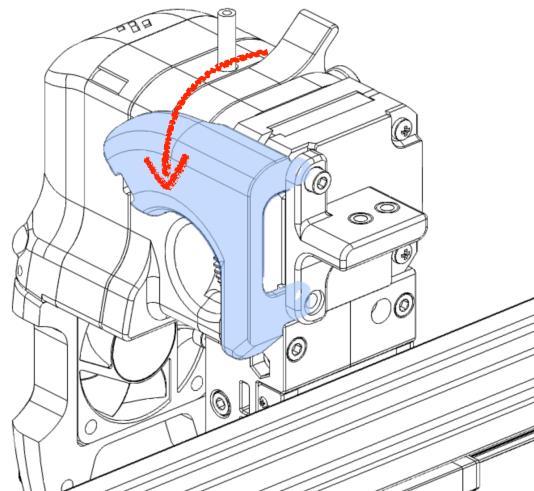
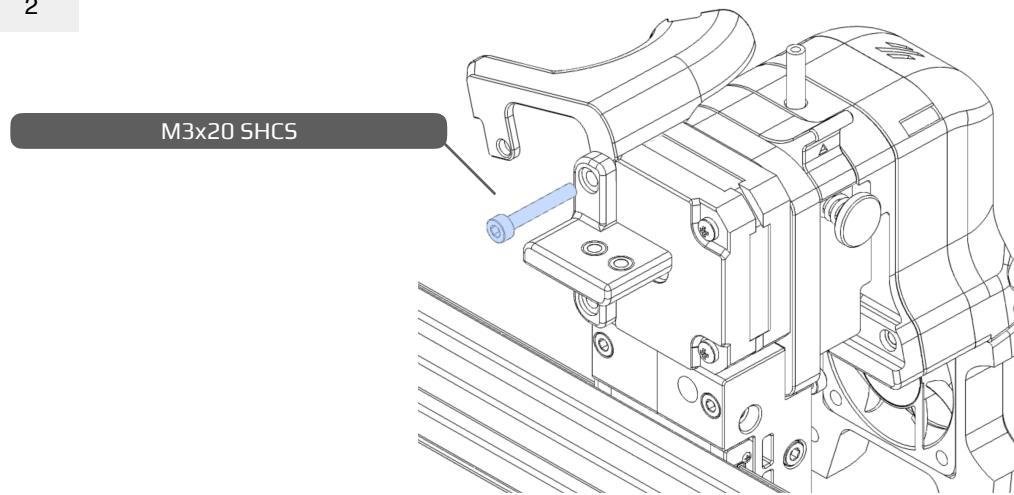
X Axis - X Carriage (Cont)

Part	Qty
M3 Insert Short	2



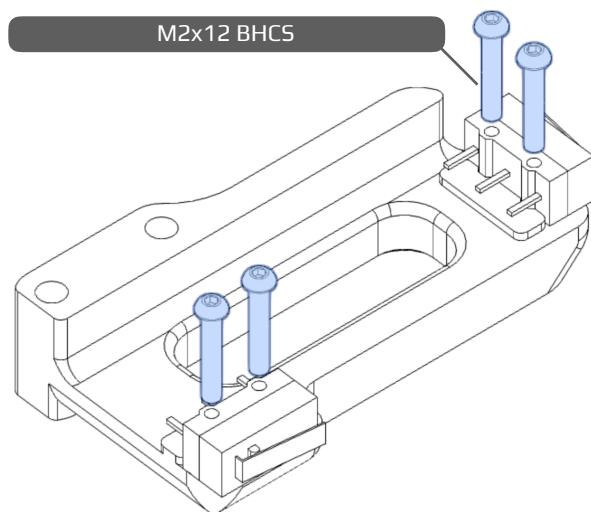
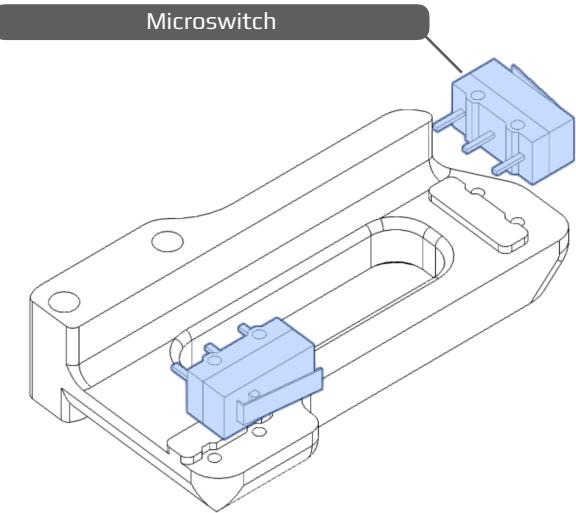
X Axis - X Carriage (Cont)

Part	Qty
M3x20 SHCS	2



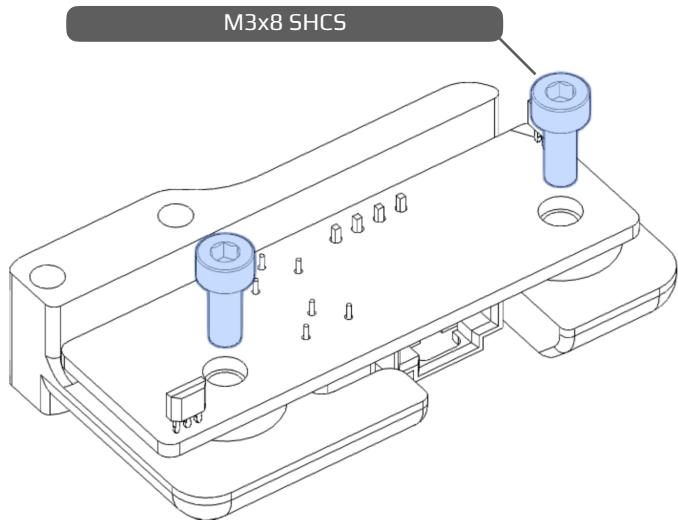
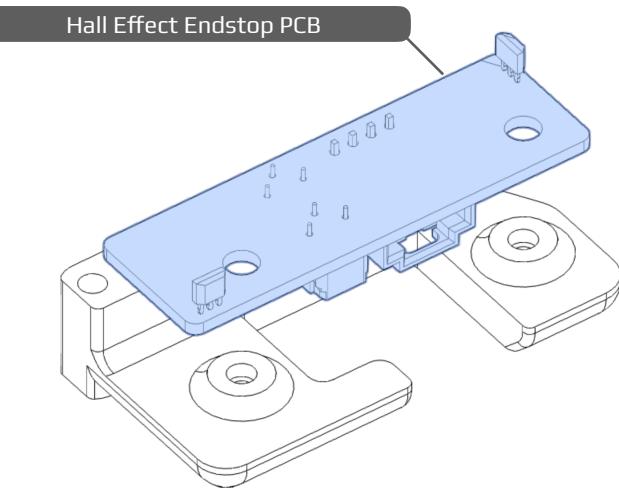
XY Endstop Pod

Microswitch Endstop Pod



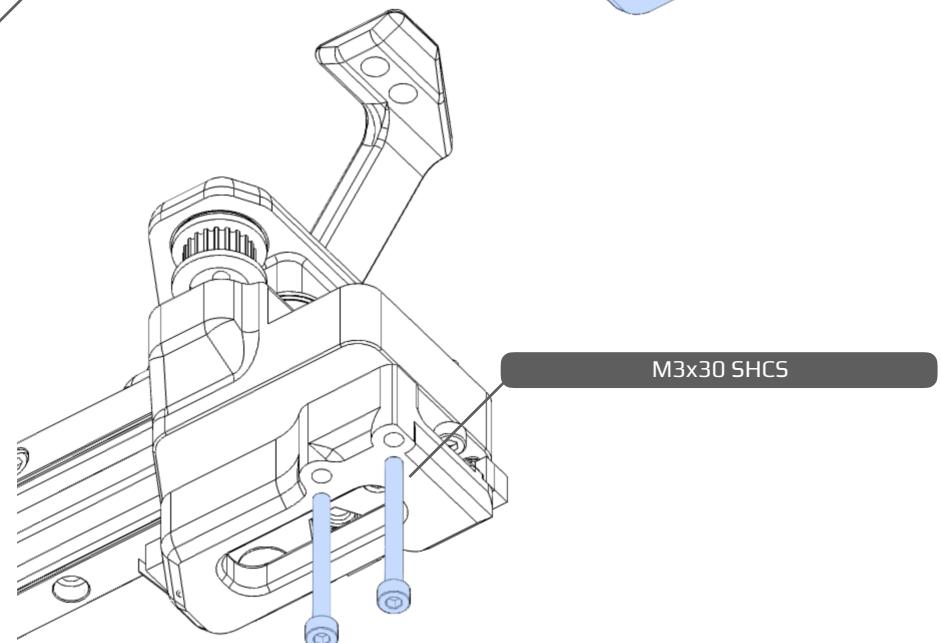
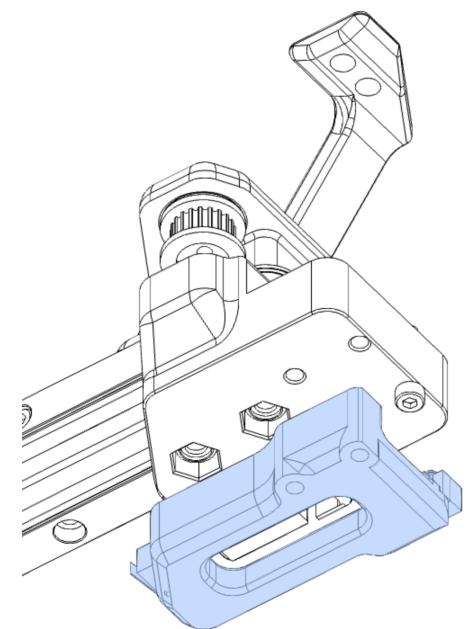
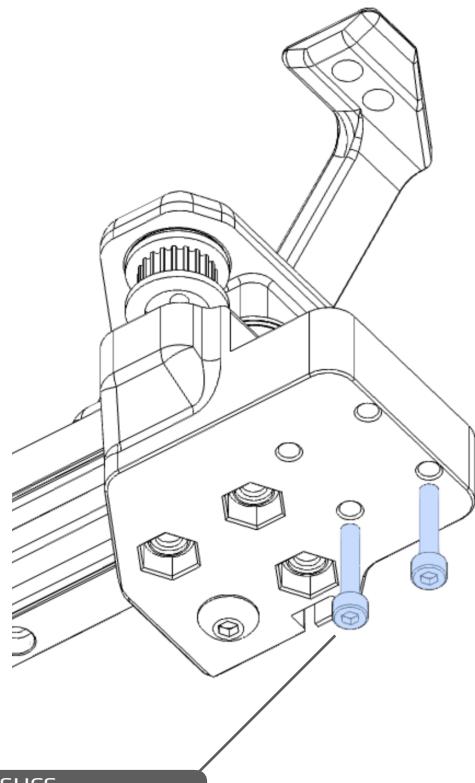
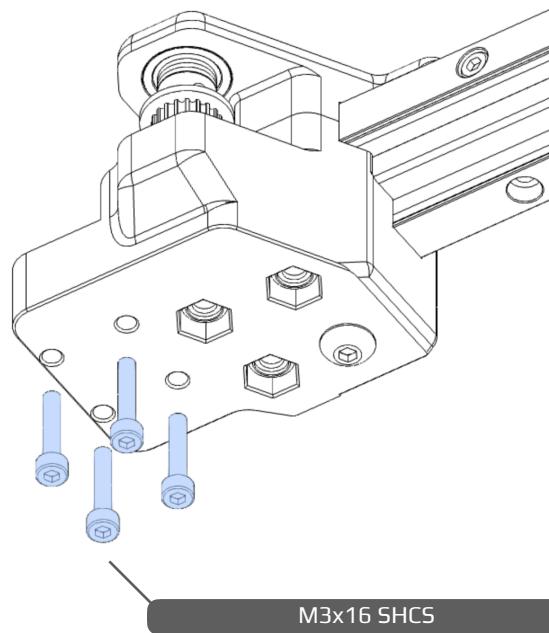
Part	Qty
M2x12	2
Microswitch	2

Hall Effect Endstop Pod



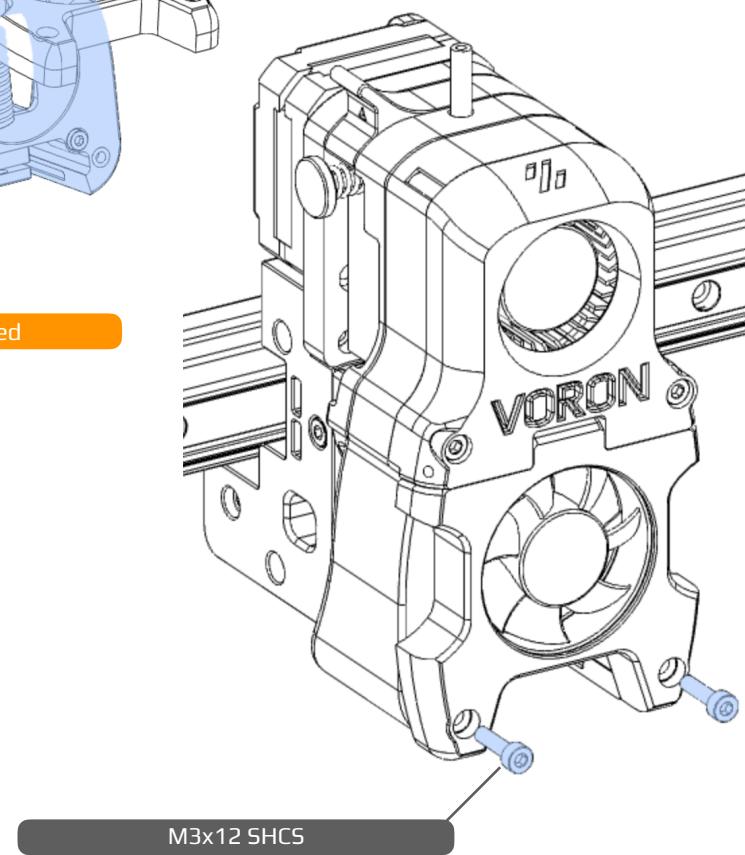
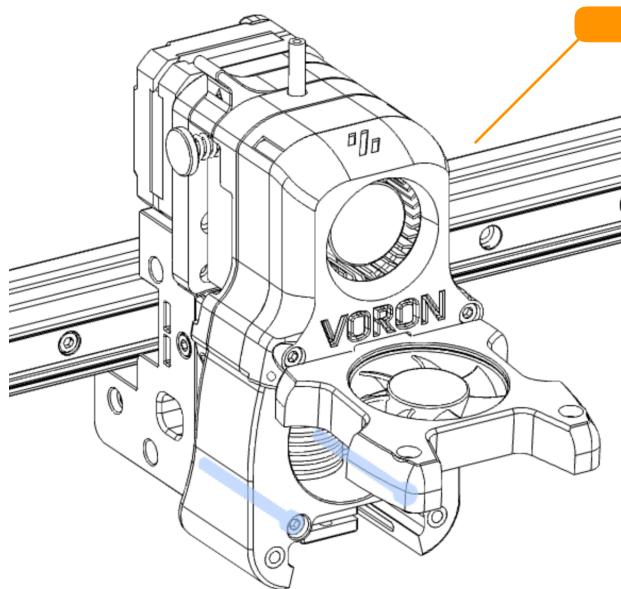
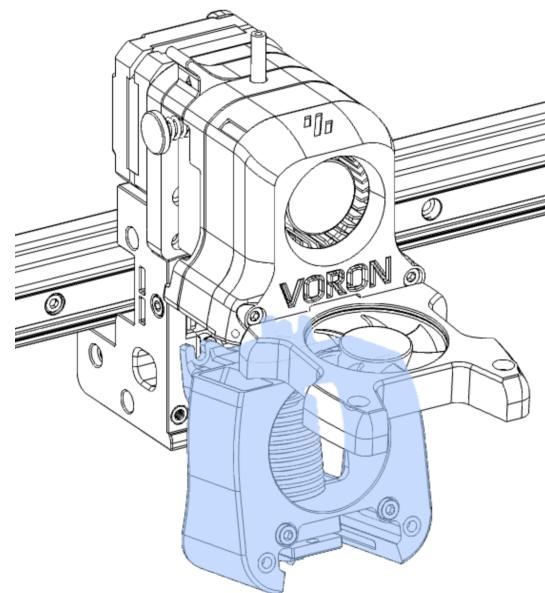
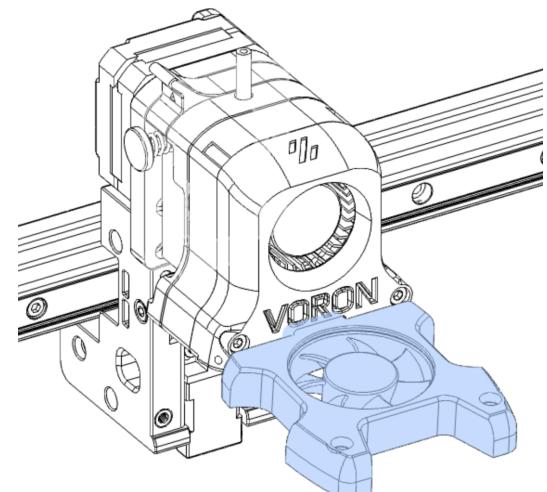
Part	Qty
M3x8 SHCS	2
Hall Endstop	1

X Axis - X Carriage (Cont)



Part	Qty
M3x16 SHCS	6
M3x30 SHCS	2

Printhead Installation



Slicer/Print Settings Baseline (adjust as required)	
Retraction Length	0.8mm
Retraction Speed	35mm/s
Insertion Speed (if available)	30 mm/s

Firmware Settings Baseline (adjust as required)	
Driver Current	0.4 ... 0.6 A
Step Distance	0.0024
PA (Klipper)	0.08

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Happy Printing



Spool Holder

Part	Qty
M5x40 SHCS	2
M5 T-Nut	2
Bowden Tube	

