PRO Rack and Pinion Drive Assembly Instructions

v2020Q4.2

Tools List

Required tools for assembly and installation of PRO Rack & Pinion Drives:

- Metric Allen Wrenches:

    -3mm, 4mm, 5mm, 6mm

- Imperial Allen Wrenches:

    - 3/32", 1/4"

- 16mm Combination Wrench
- Standard (Flat Tip) Screwdriver
- Tape Measure

Section 1: PRO R&P Drive Assembly

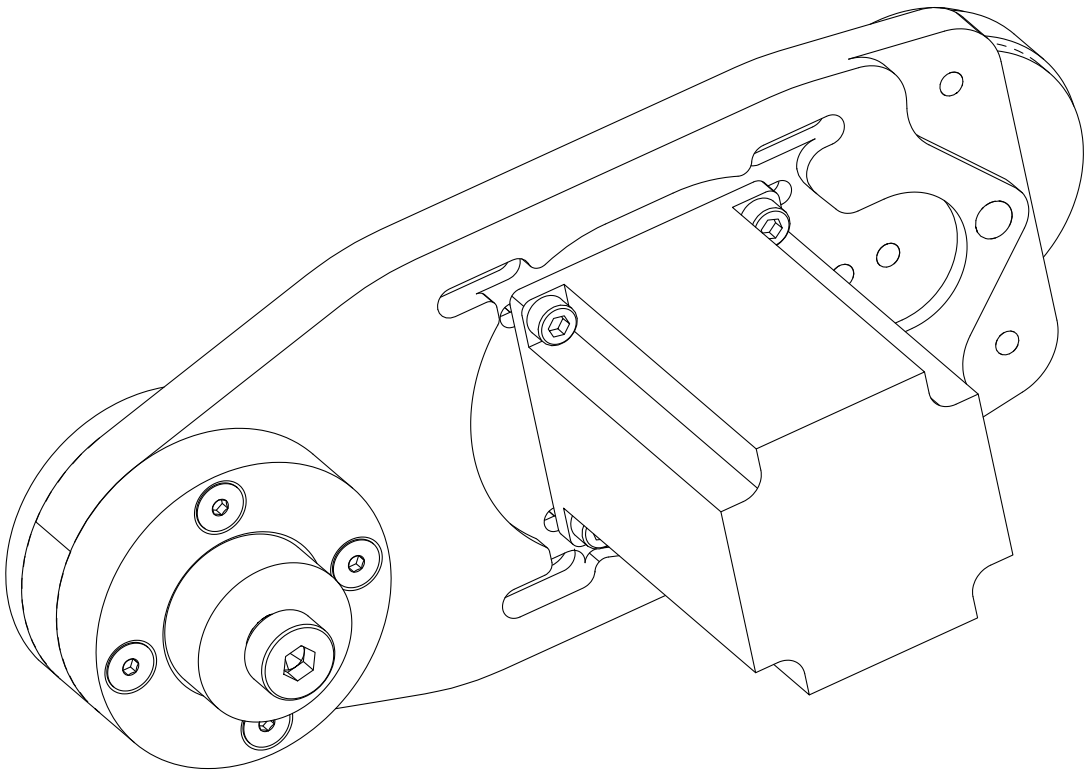
Section Note

Skip to Section 1.2 if you are using a NEMA 34 motor.

Section Note

Simplified models will not depict gear teeth on the motor pulleys or drive spindles

1.1 NEMA 23 Drive Assembly



Parts and Tools Required

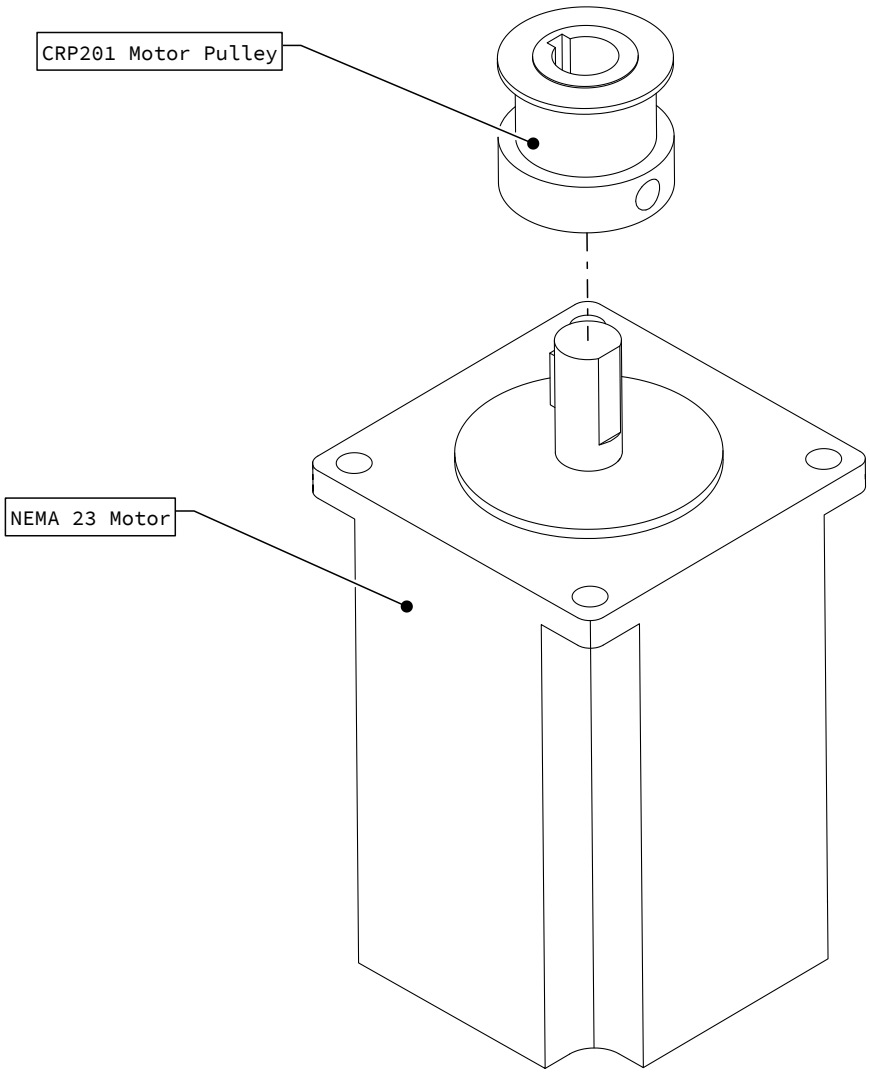
The following parts and tools will be used in Section 1.1

QTY	Part/Description
1	NEMA 23 Motor
1	CRP201-09 - NEMA 23 Motor Pulley
1	R&P Drive Plate
1	CRP325-00 - PRO NEMA 23 Spindle Assembly
1	CRP320-00-FAST-375-19.1: - (4) M5 x 14mm Socket Head Cap Screw - (4) M5 Hex Nut - (1) NEMA 23 R&P Drive Belt - (1) 5/16" Flat Washer - (1) M6 x 22mm Socket Head Cap Screw - (1) Cam Tensioner *Remaining parts from this kit used in during installation*

Note: The fastener kit part number listed above is applicable for NEMA 23's with the default 3/8" shaft. If you purchased the 1/4" shaft version, your fastener kit part number will be CRP320-00-FAST-250-19.1.

1.1.1 Motor Assembly

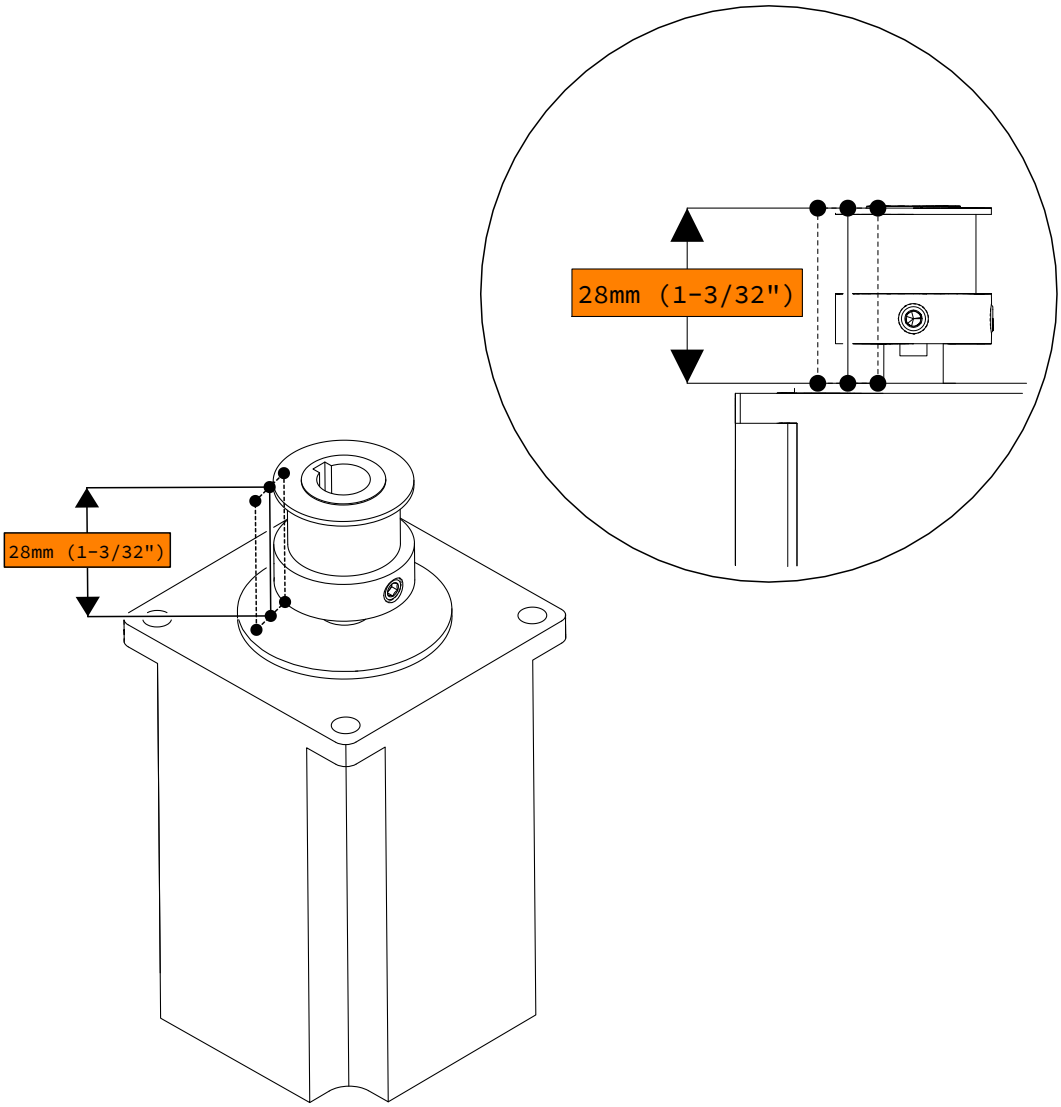
1.1.1.1



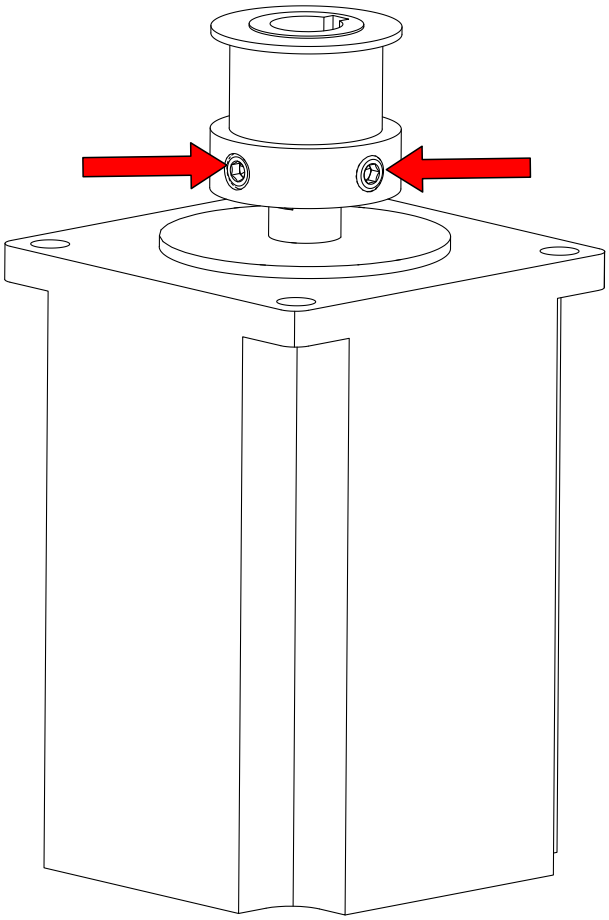
- Slide the motor pulley onto the motor shaft as indicated.

Assembly Note

Ensure the motor keys are installed into the shaft prior to installing the pulley. Motor keys will either be pre-installed or included in a small bag.



- Adjust the motor pulley such that the top of the pulley is 28mm (1-3/32") from the motor flat.



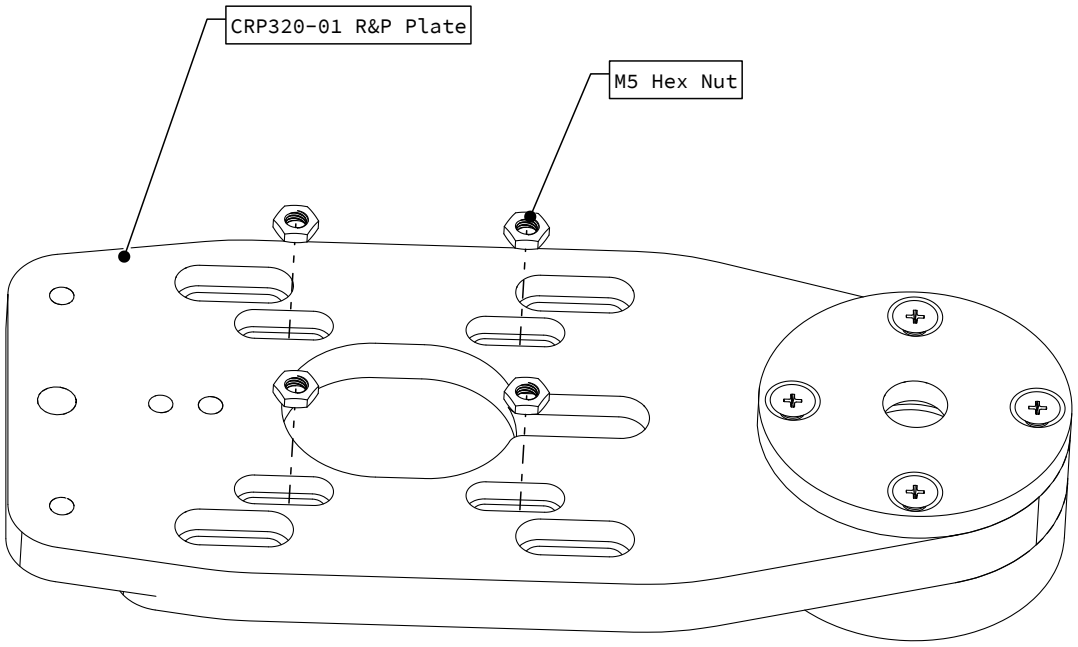
- Apply blue thread locker to the set screws. (Not Included)
- Fully tighten the set screws.

Assembly Note

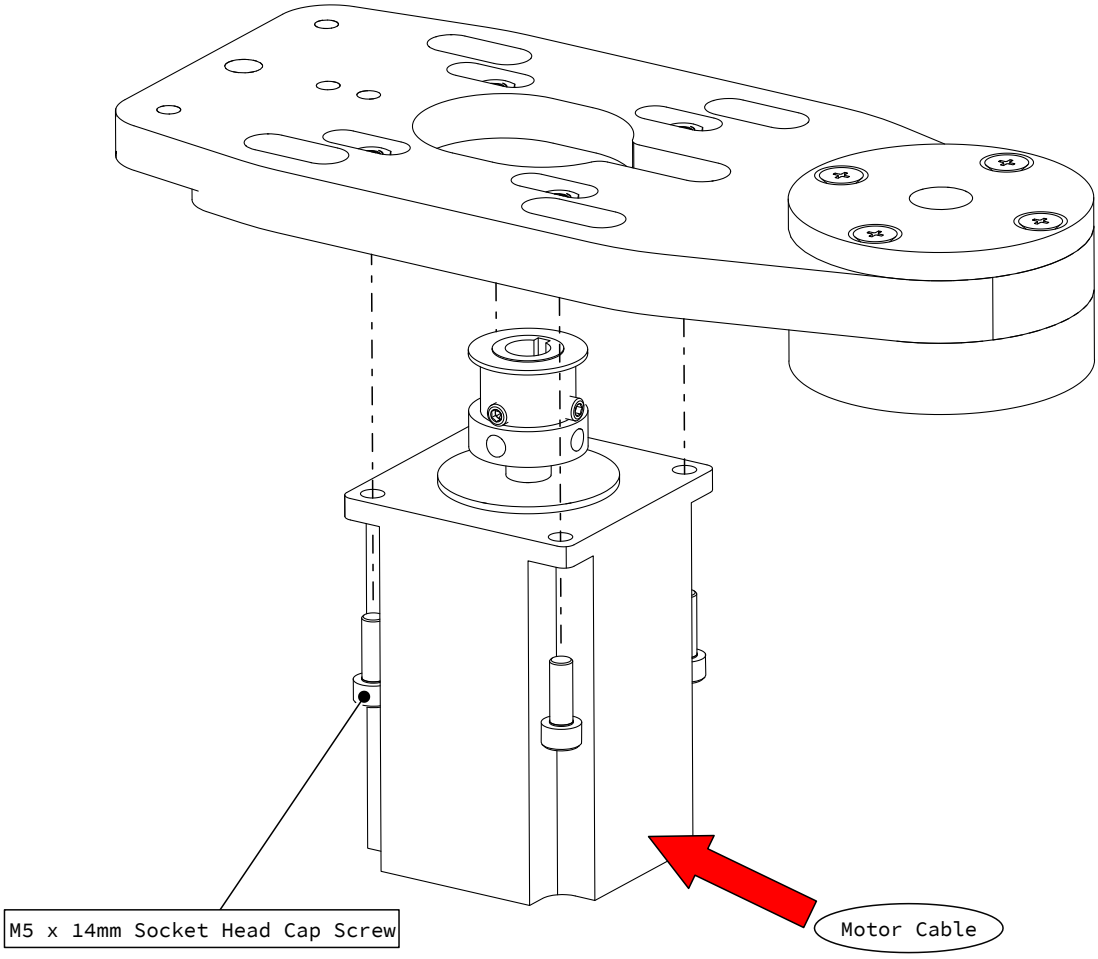
Do not over tighten, but ensure fasteners are completely seated.

1.1.2 Drive Plate Assembly

1.1.2.1



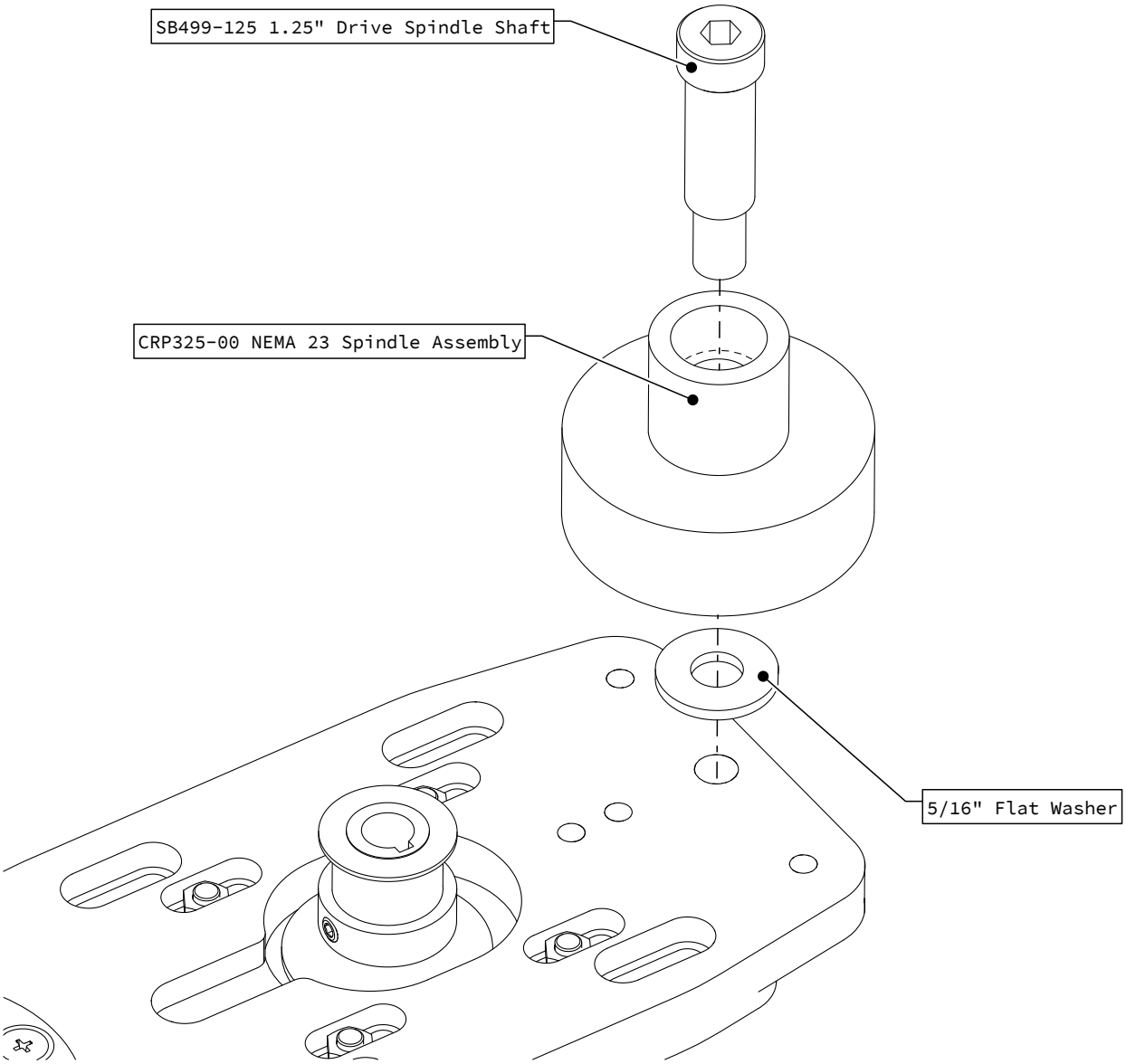
- Carefully set hex nuts in the indicated slots.



- Attach the motor to the R&P plate as indicated.
- Partially tighten the fasteners.

Assembly Note

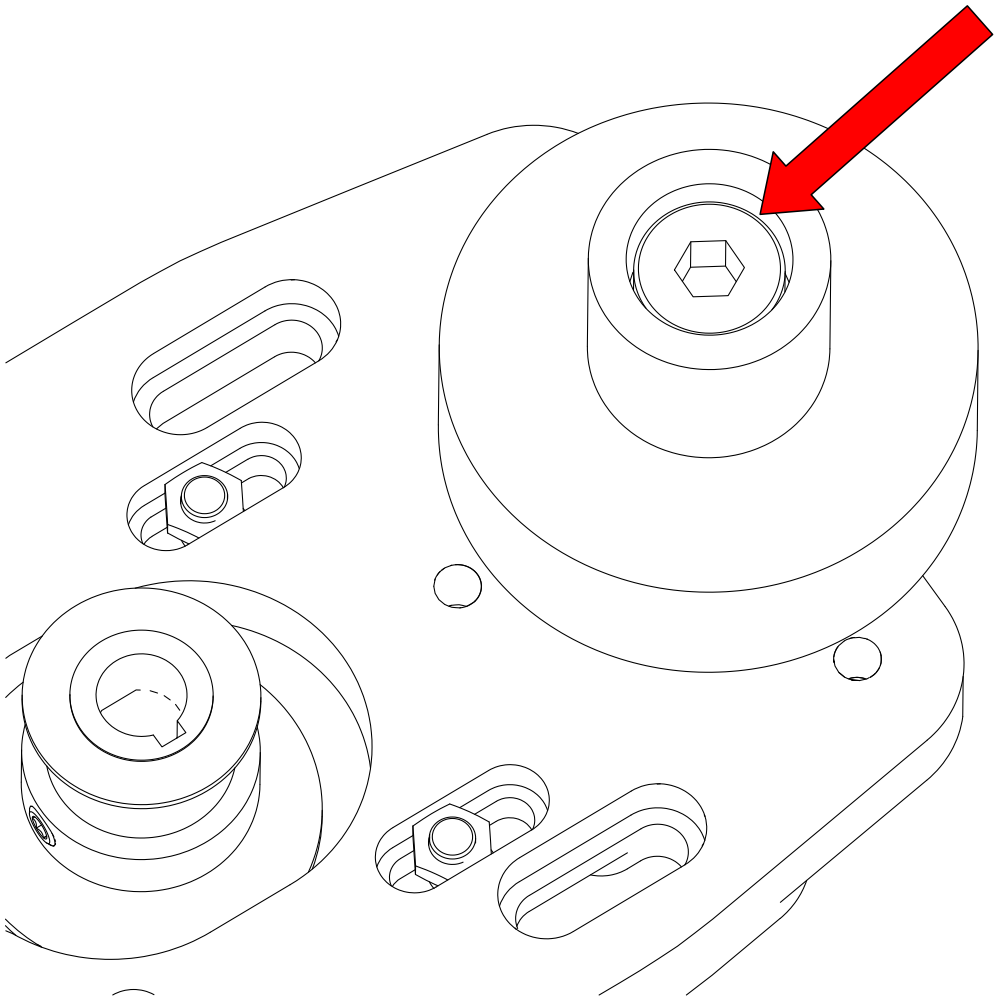
Orient the motor with the cable pointing towards the R&P drive plate bearing cup.



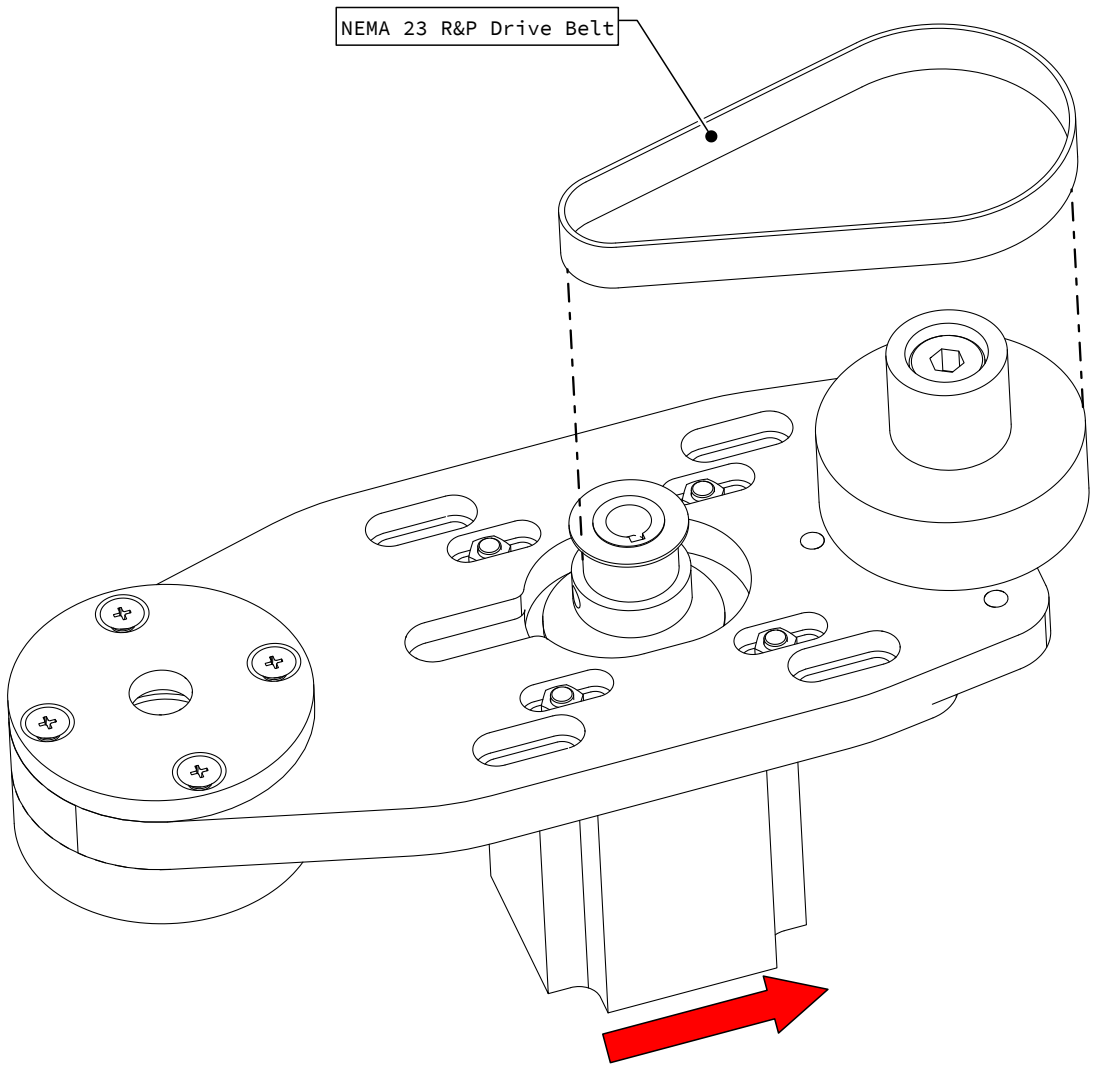
- Attach the drive spindle to the R&P plate as indicated.

Assembly Note

Your spindle may have the shaft installed in the spindle already, held in place with a plastic hex nut for protection during shipping. The plastic hex nut needs to be removed prior to installing the spindle.



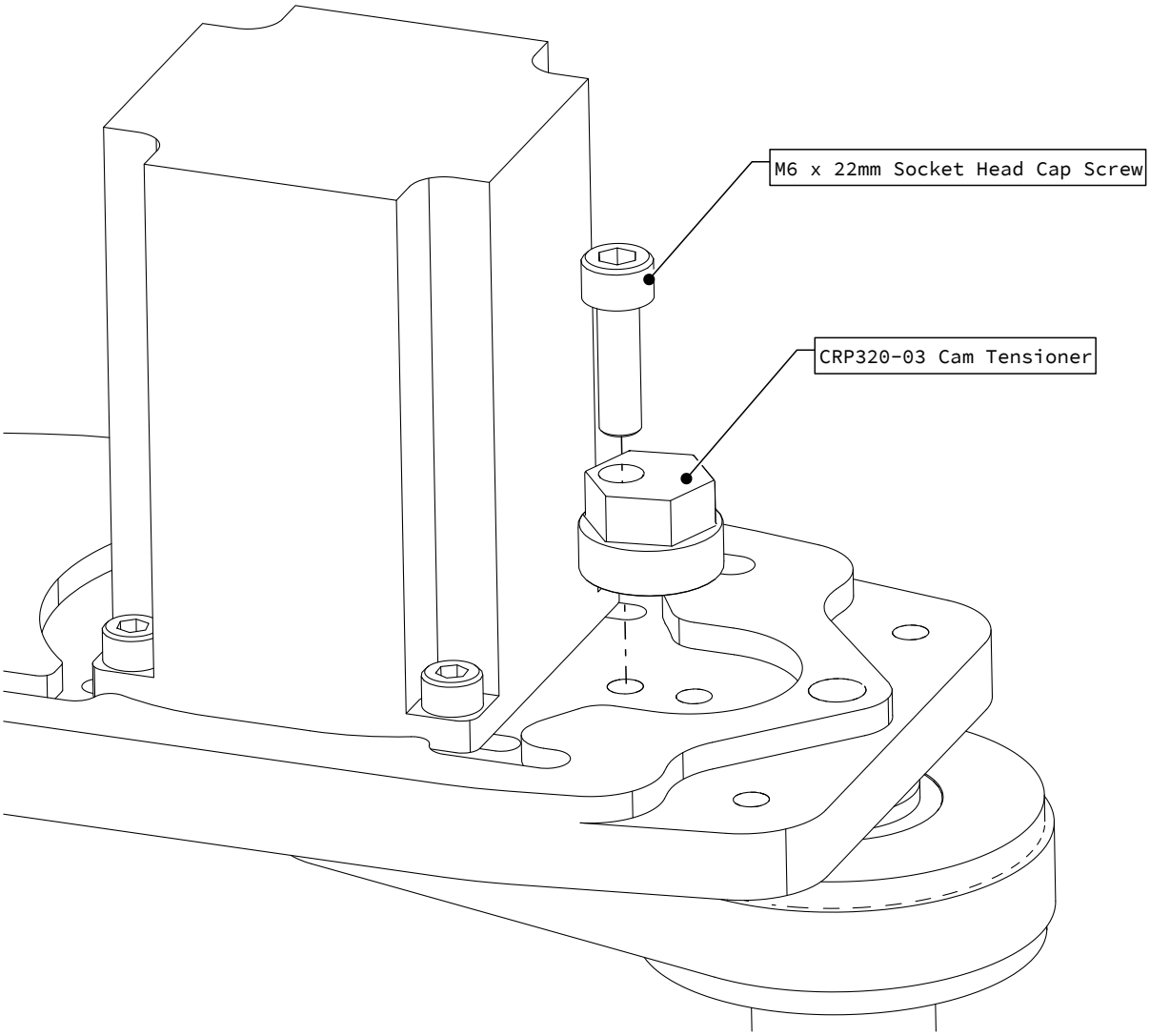
- Tighten the drive spindle shaft.



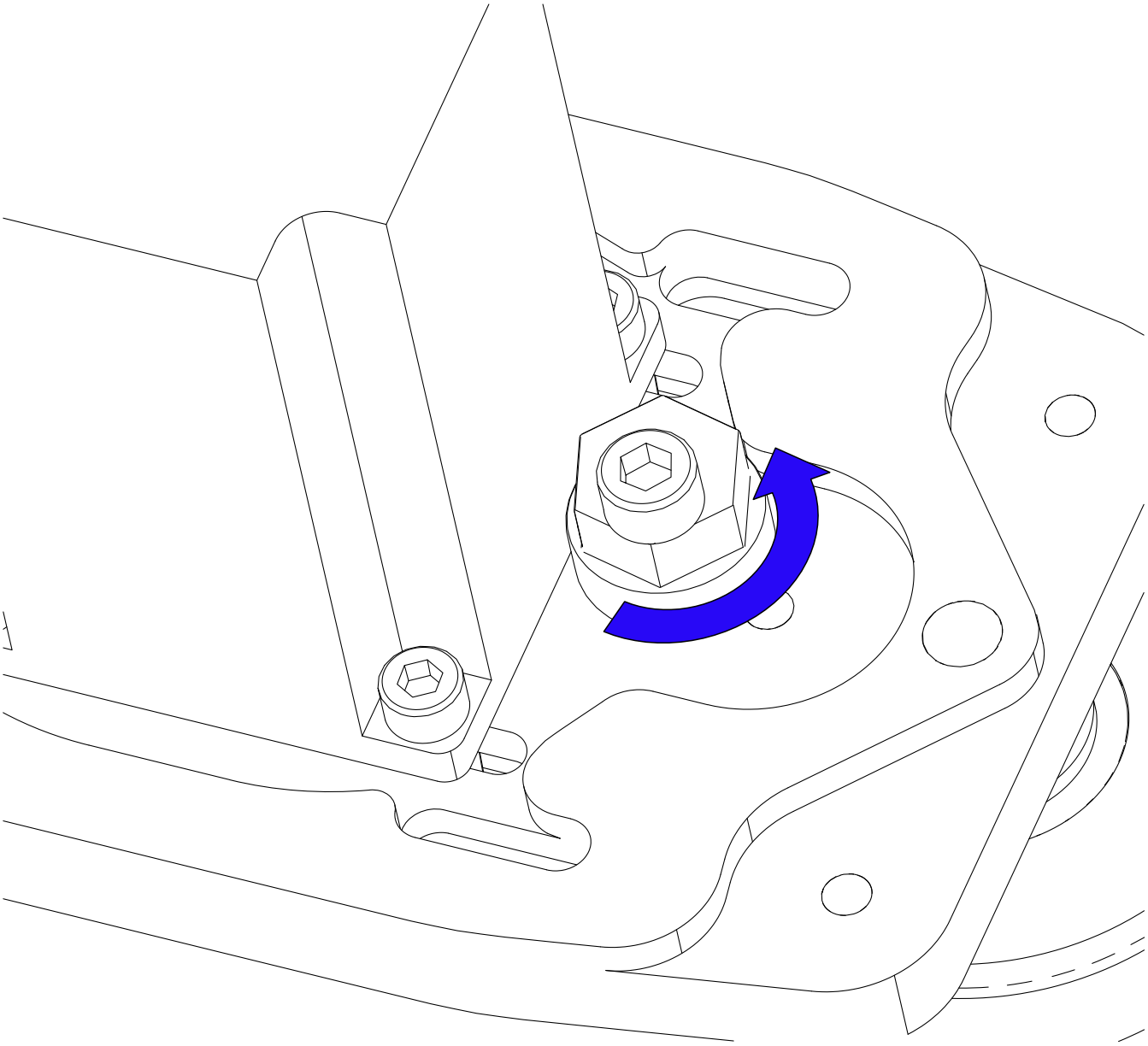
- Slide the drive belt around the motor pulley and drive spindle.

Assembly Note

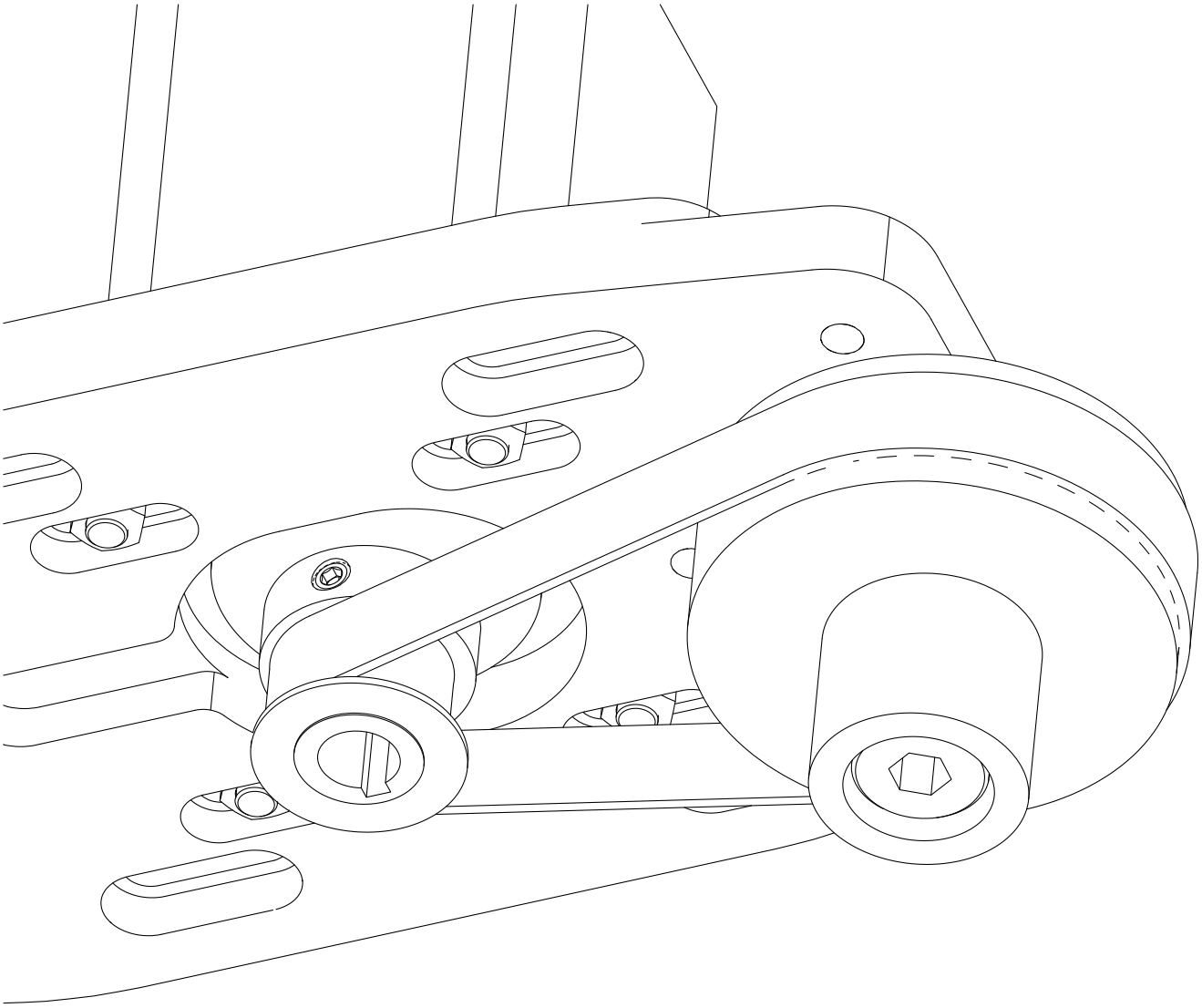
It may be necessary to slide the motor closer to the drive spindle as indicated.



- Attach the tensioner cam to the R&P drive plate as indicated.



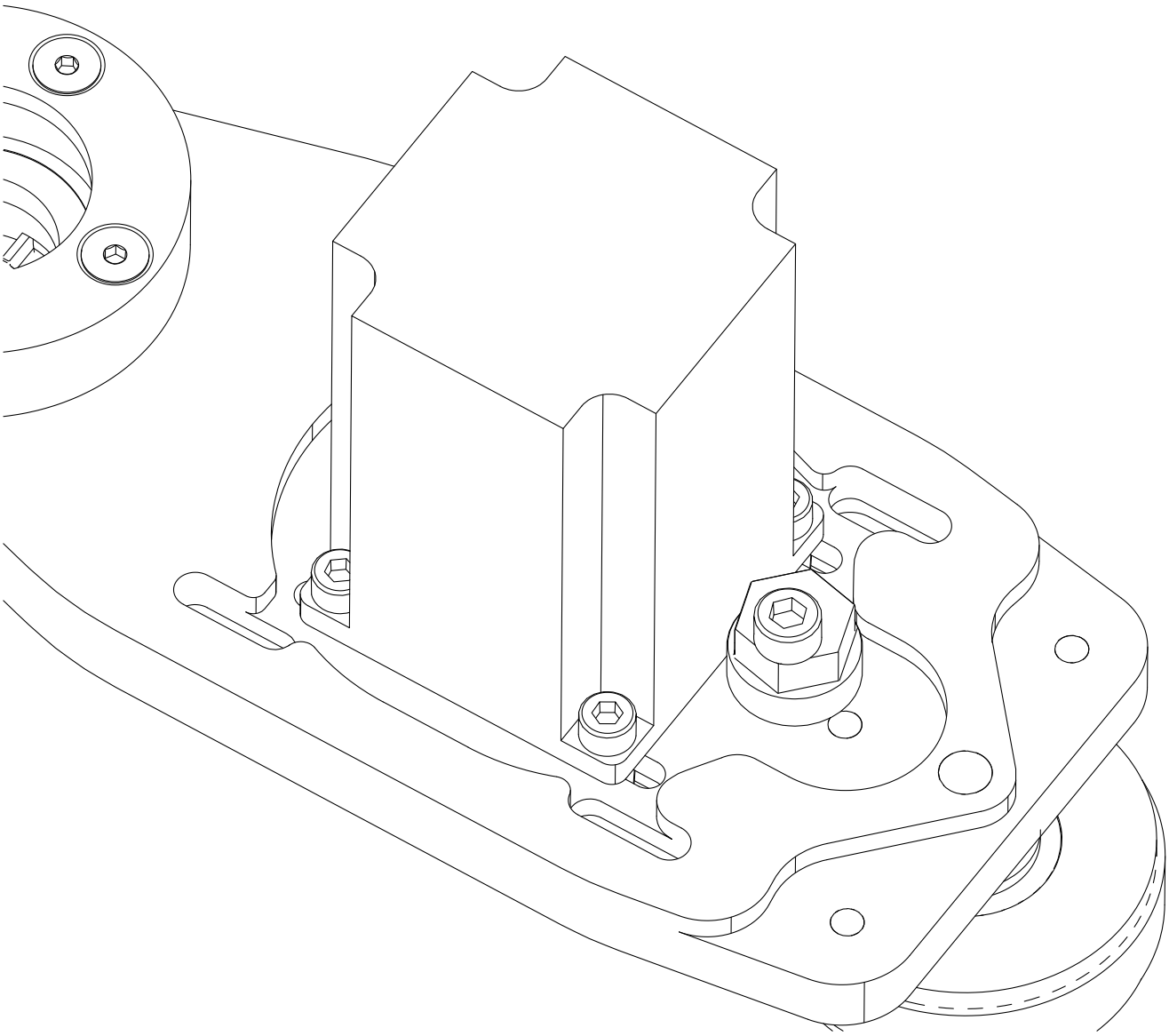
- Use a 16mm wrench to turn the tensioner cam against the motor.



- Hold the tensioner cam against the motor to generate belt tension.

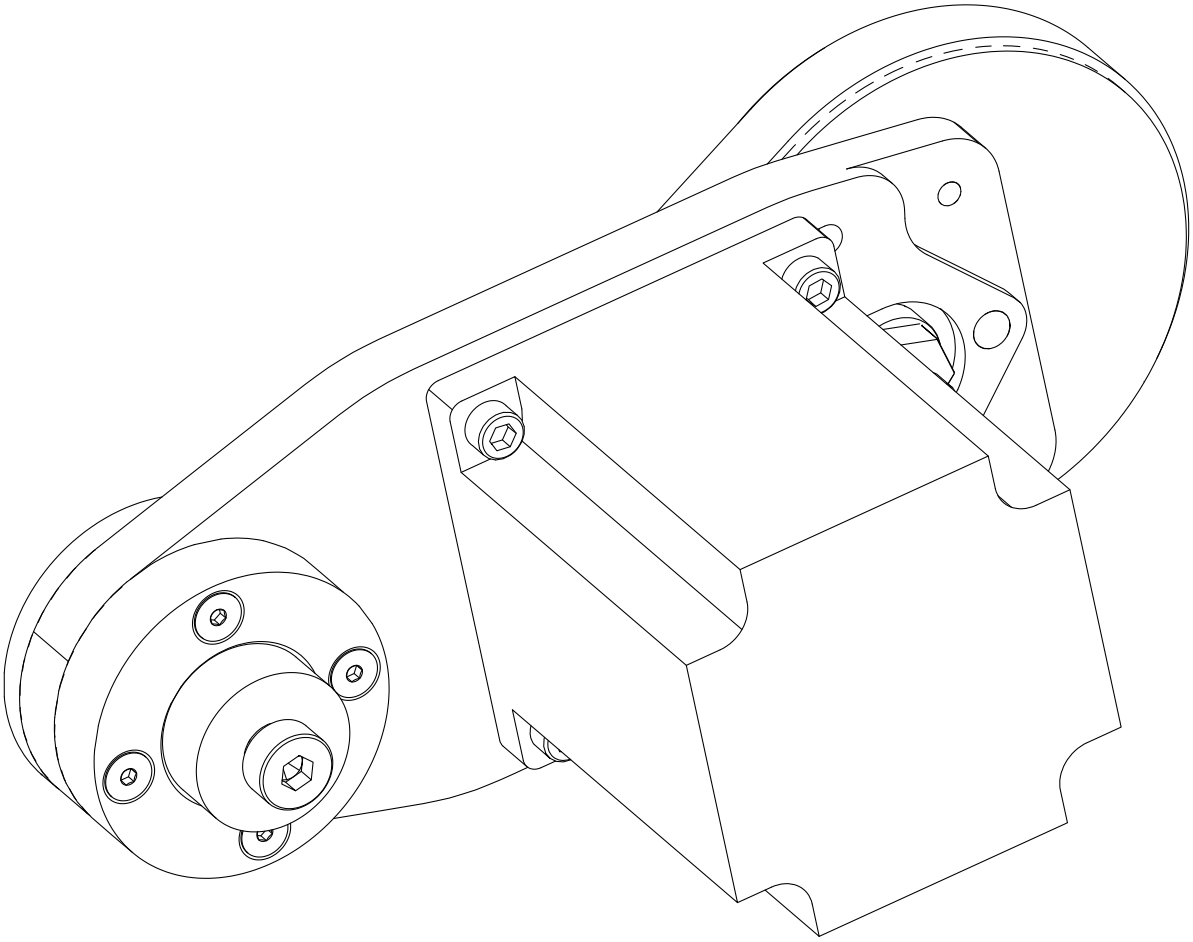
Assembly Note

The belt should be tight enough such that the belt cannot be squeezed more than 3mm (1/8") with your fingers.



- With the belt tensioned, fully tighten the cam tensioner and motor fasteners.

1.2 NEMA 34 Drive Assembly



Section Note

Skip this section if you are using a NEMA 23 motor.

Section Note

Simplified models will not depict gear teeth on the motor pulleys or drive spindles

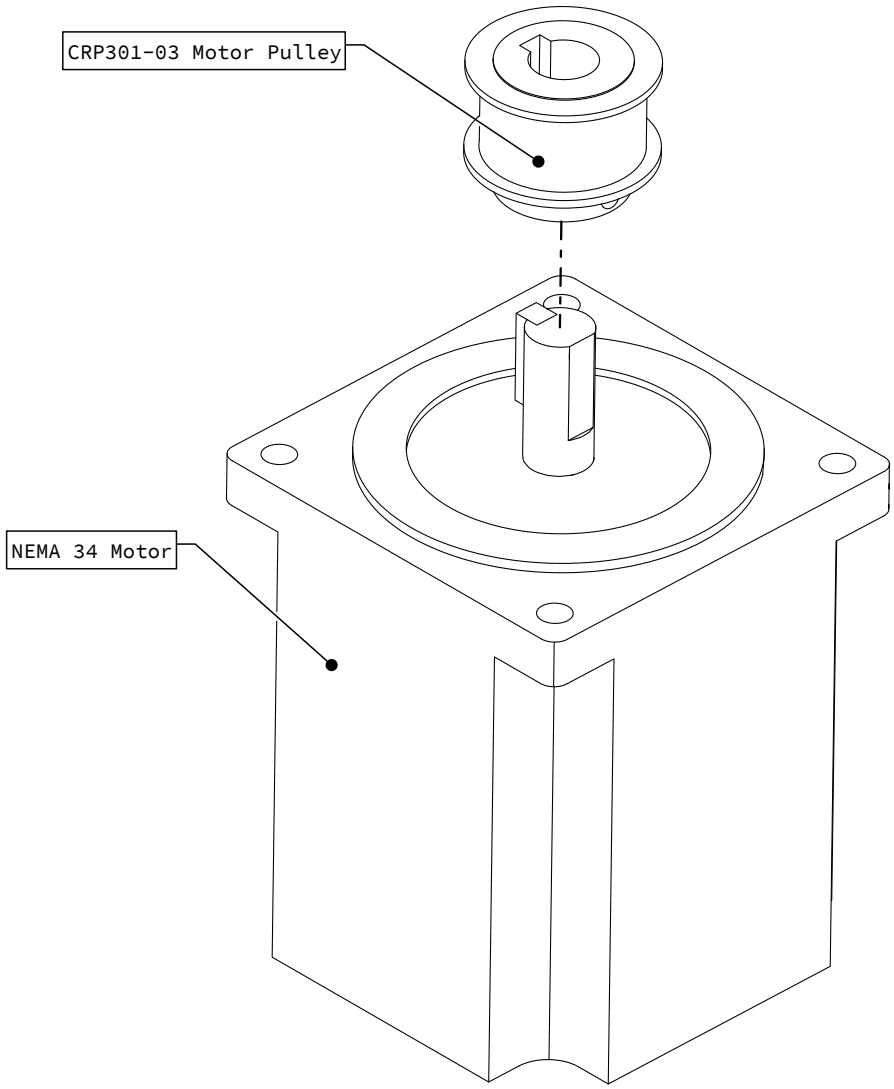
Parts and Tools Required

The following parts and tools will be used in Section 1.2

QTY	Part/Description
1	NEMA 34 Motor
1	CRP301-03 - NEMA 34 Motor Pulley
1	R&P Drive Plate
1	CRP324-00 - PRO NEMA 34 Spindle Assembly
1	CRP320-00-FAST-500: - (4) M6 Hex Nut - (1) NEMA 34 R&P Drive Belt - (1) 5/16" Flat Washer - (5) M6 x 22mm Socket Head Cap Screw - (1) Cam Tensioner *Remaining parts from this kit used during installation*

1.2.1 Motor Assembly

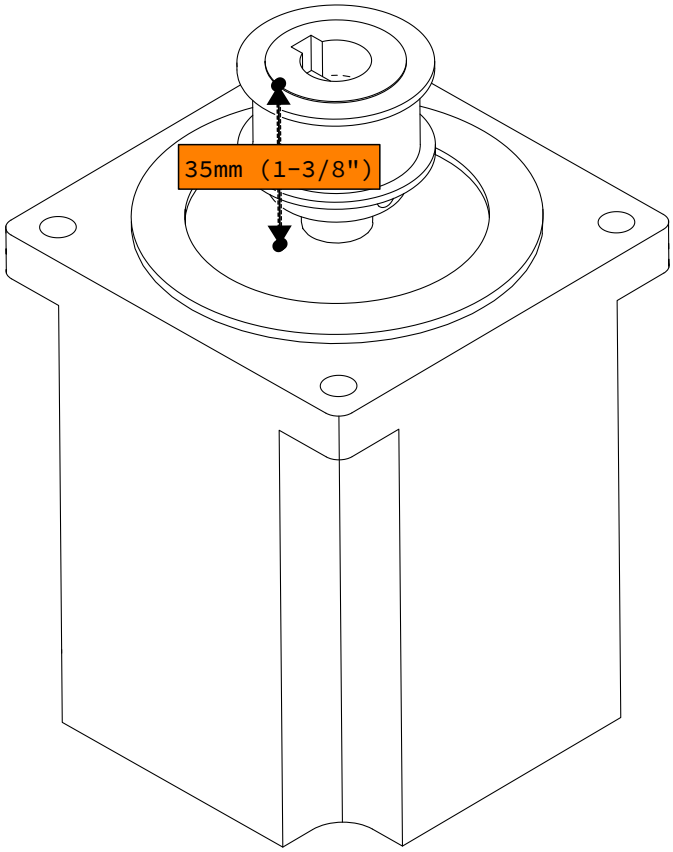
1.2.1.1



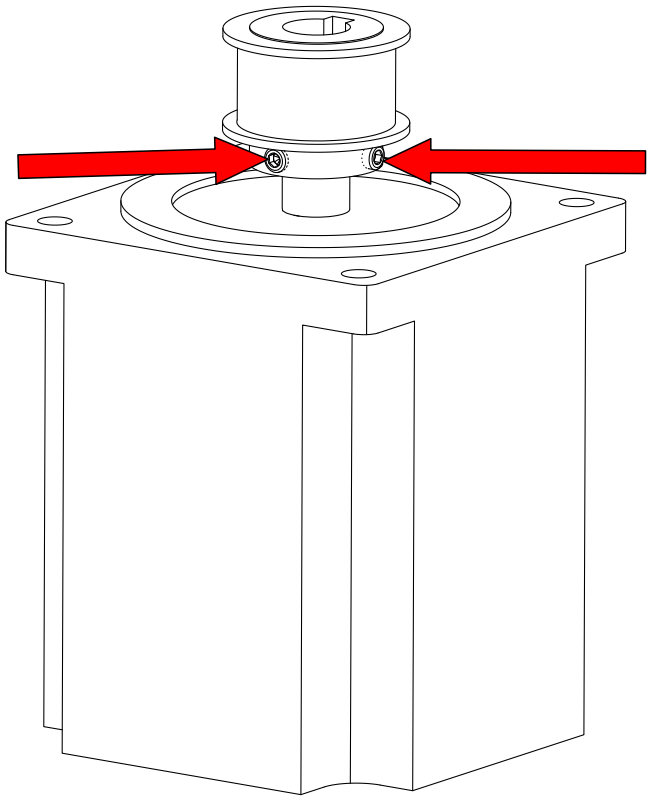
- Slide the motor pulley onto the motor shaft as indicated.

Assembly Note

Ensure the motor keys are installed into the shaft prior to installing the pulley. Motor keys will either be pre-installed or included in a small bag.



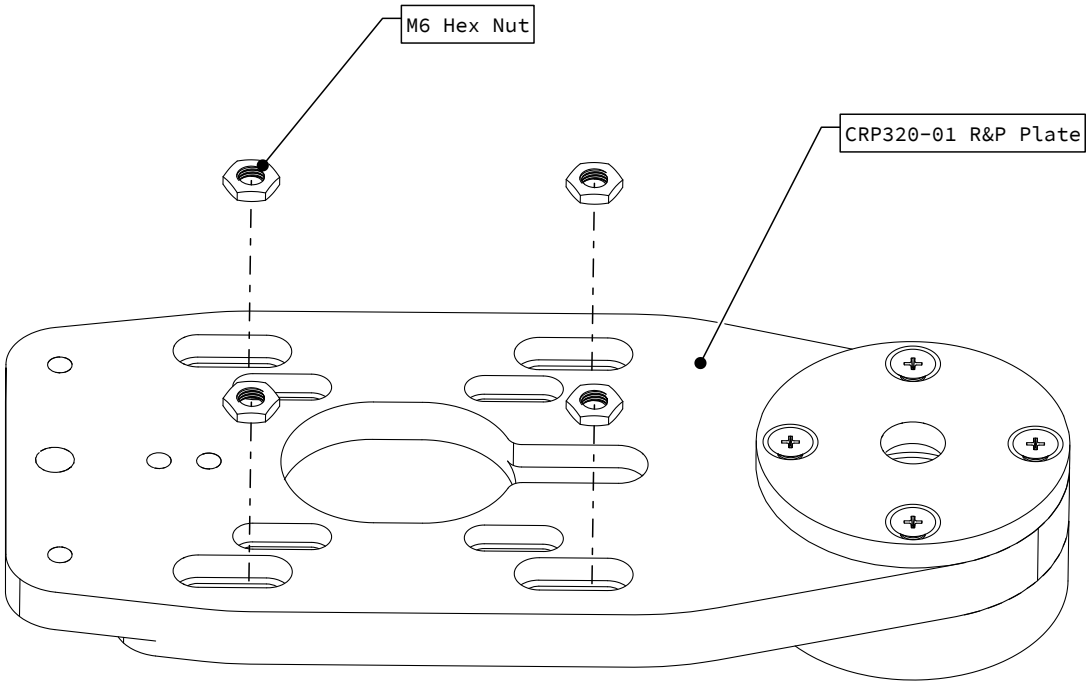
- Adjust the motor pulley such that the top of the pulley is 35mm (1-3/8") from the bottom of the motor flat.



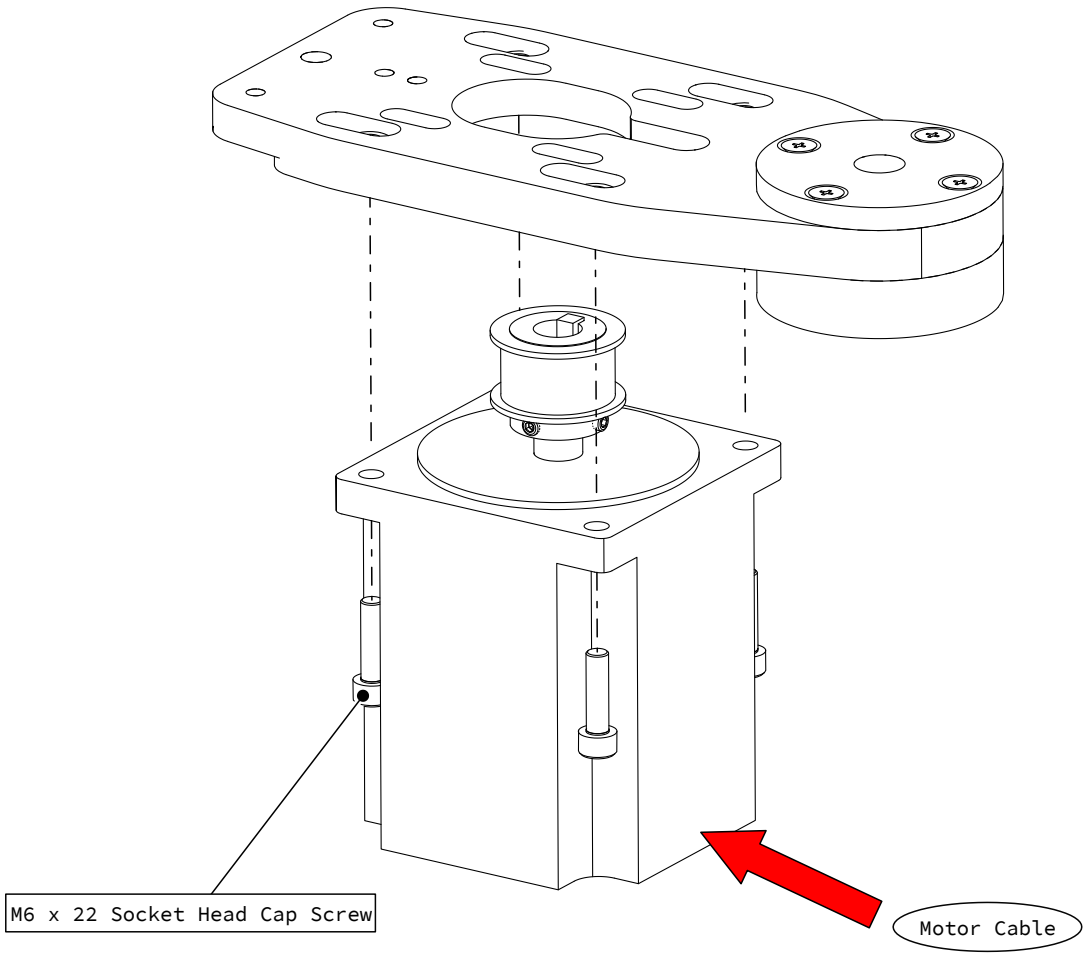
- Apply blue thread locker to the set screws. (Not included)
- Fully tighten the set screws.

1.2.2 Drive Plate Assembly

1.2.2.1



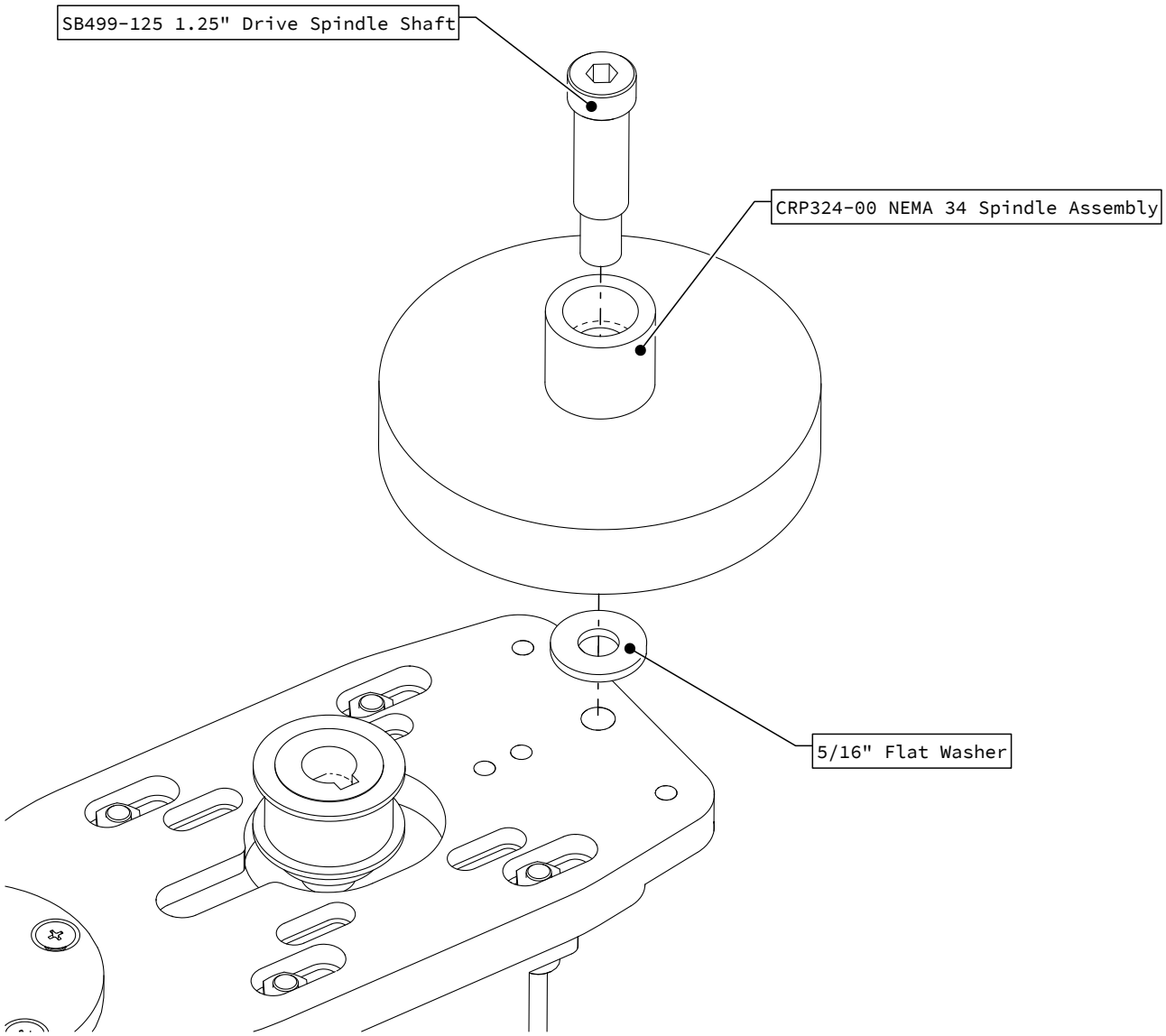
- Carefully set hex nuts in the indicated slots.



- Attach the motor to the R&P plate as indicated.
- Partially tighten the fasteners.

Assembly Note

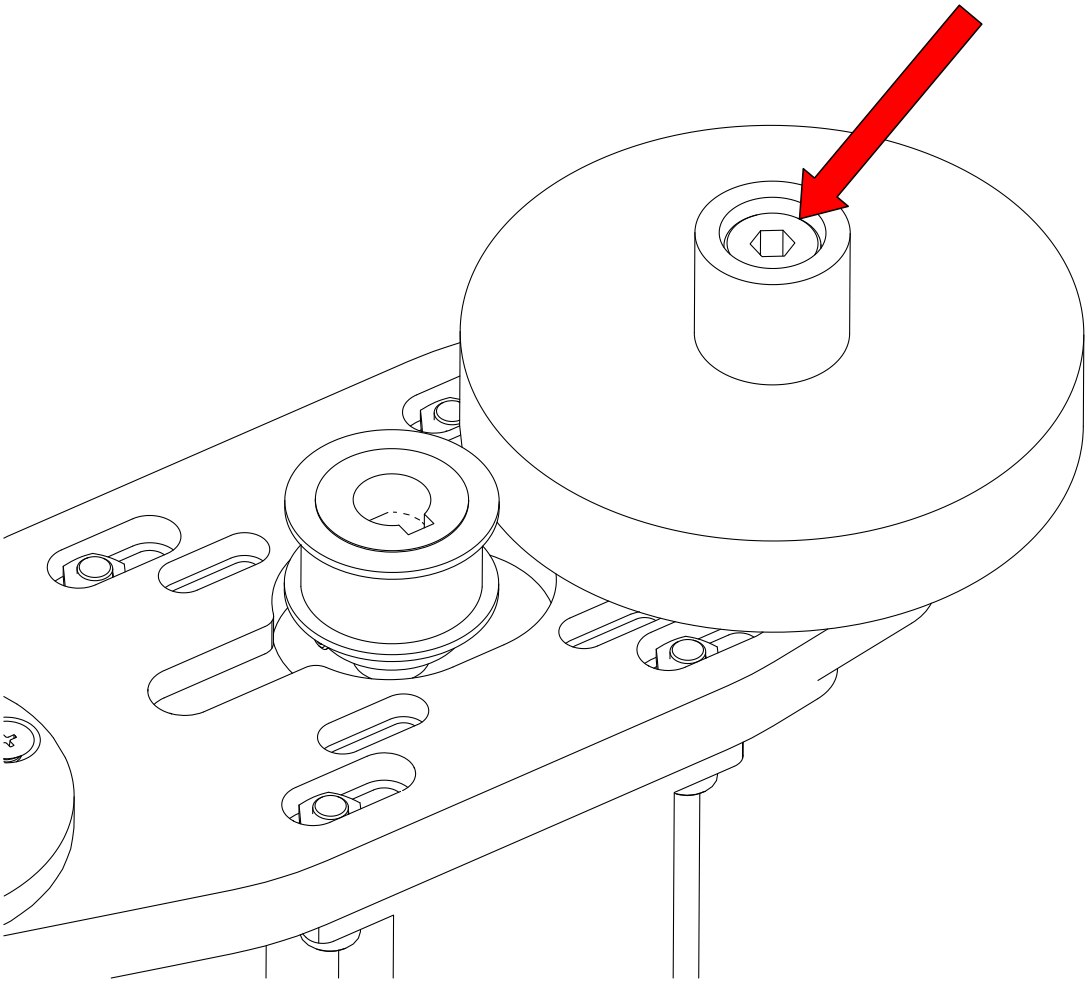
Orient the motor with the cable pointing towards the R&P drive plate bearing cup.



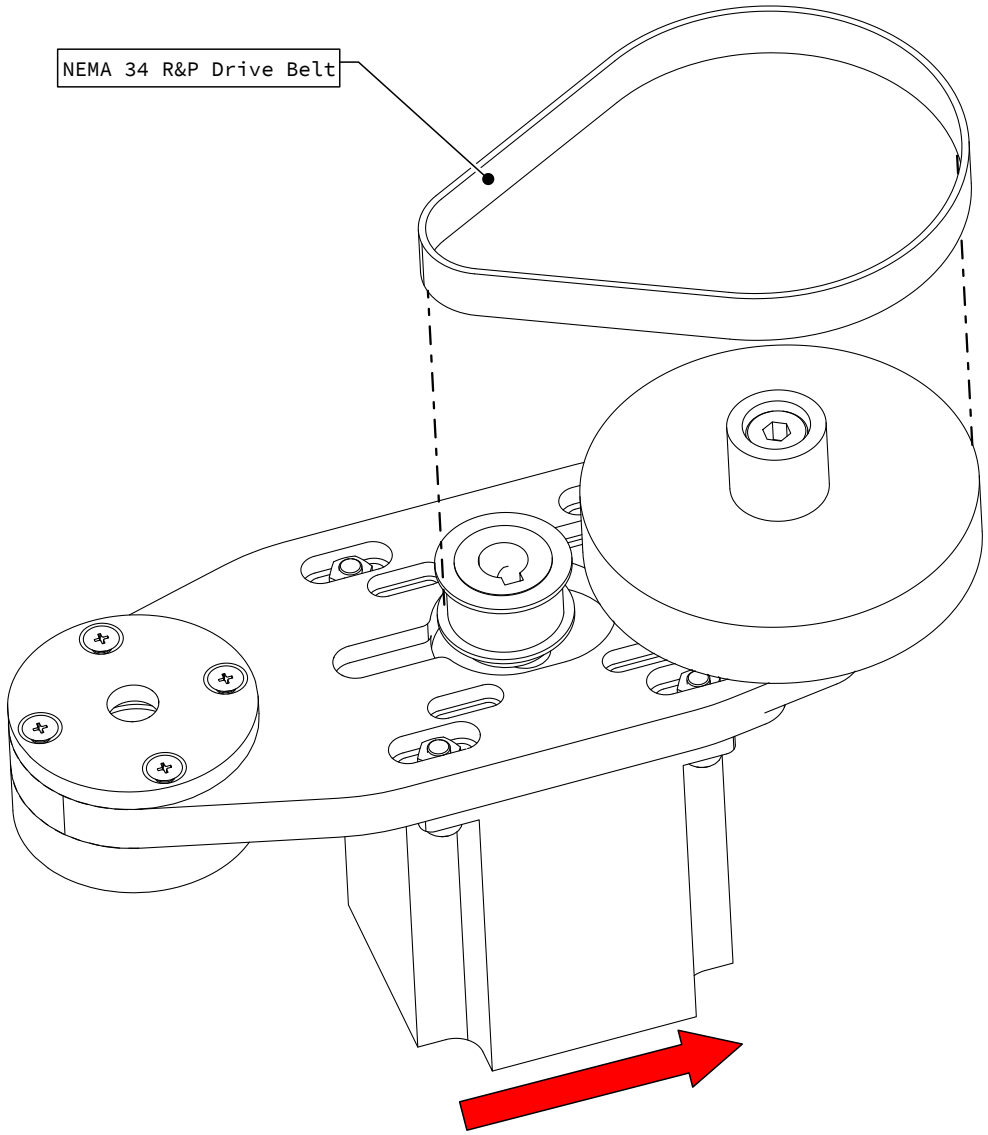
- Attach the drive spindle to the R&P plate as indicated.

Assembly Note

Your spindle may have the shaft installed in the spindle already, held in place with a plastic hex nut for protection during shipping. The plastic hex nut needs to be removed prior to installing the spindle.



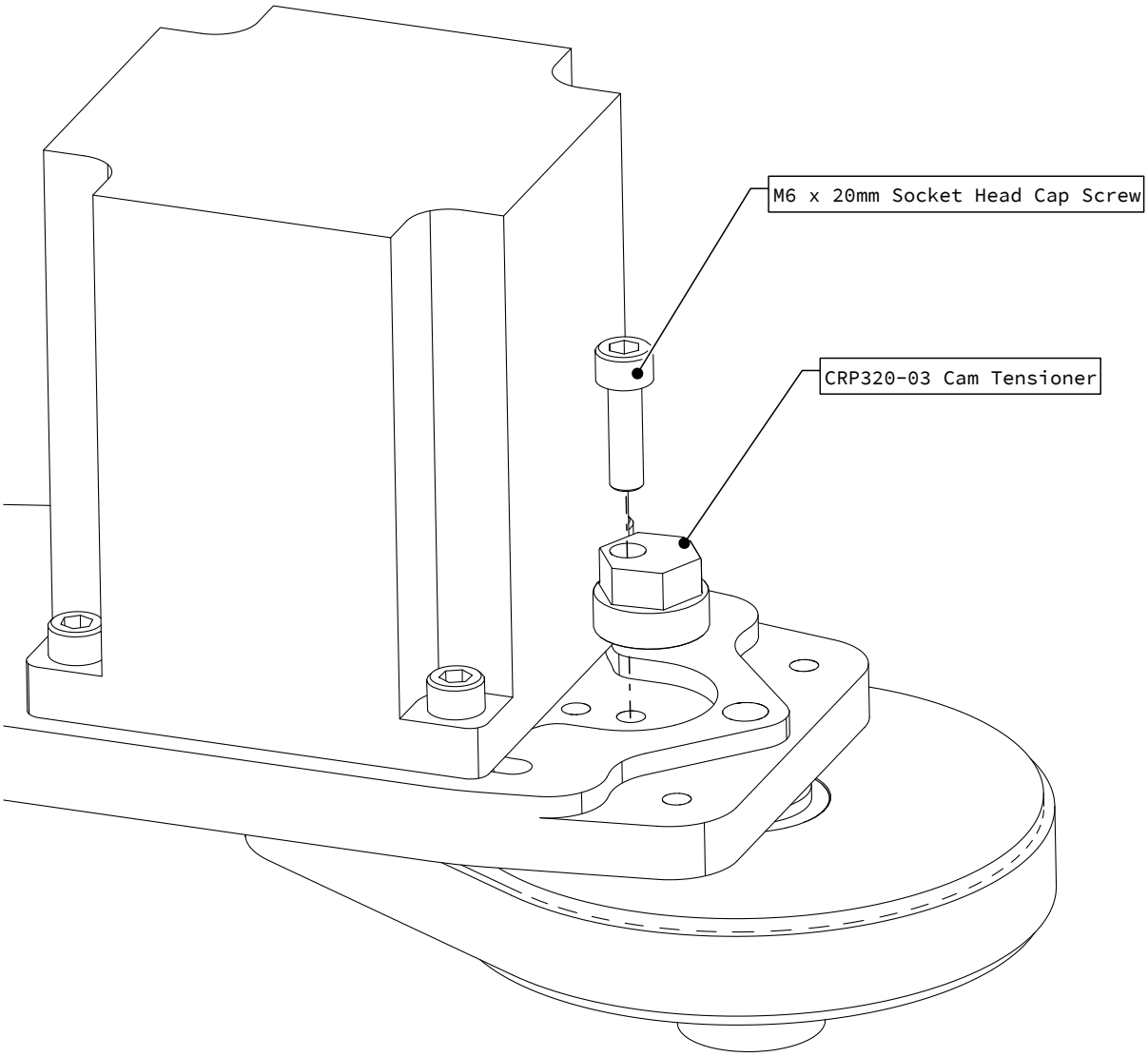
- Tighten the drive spindle shaft.



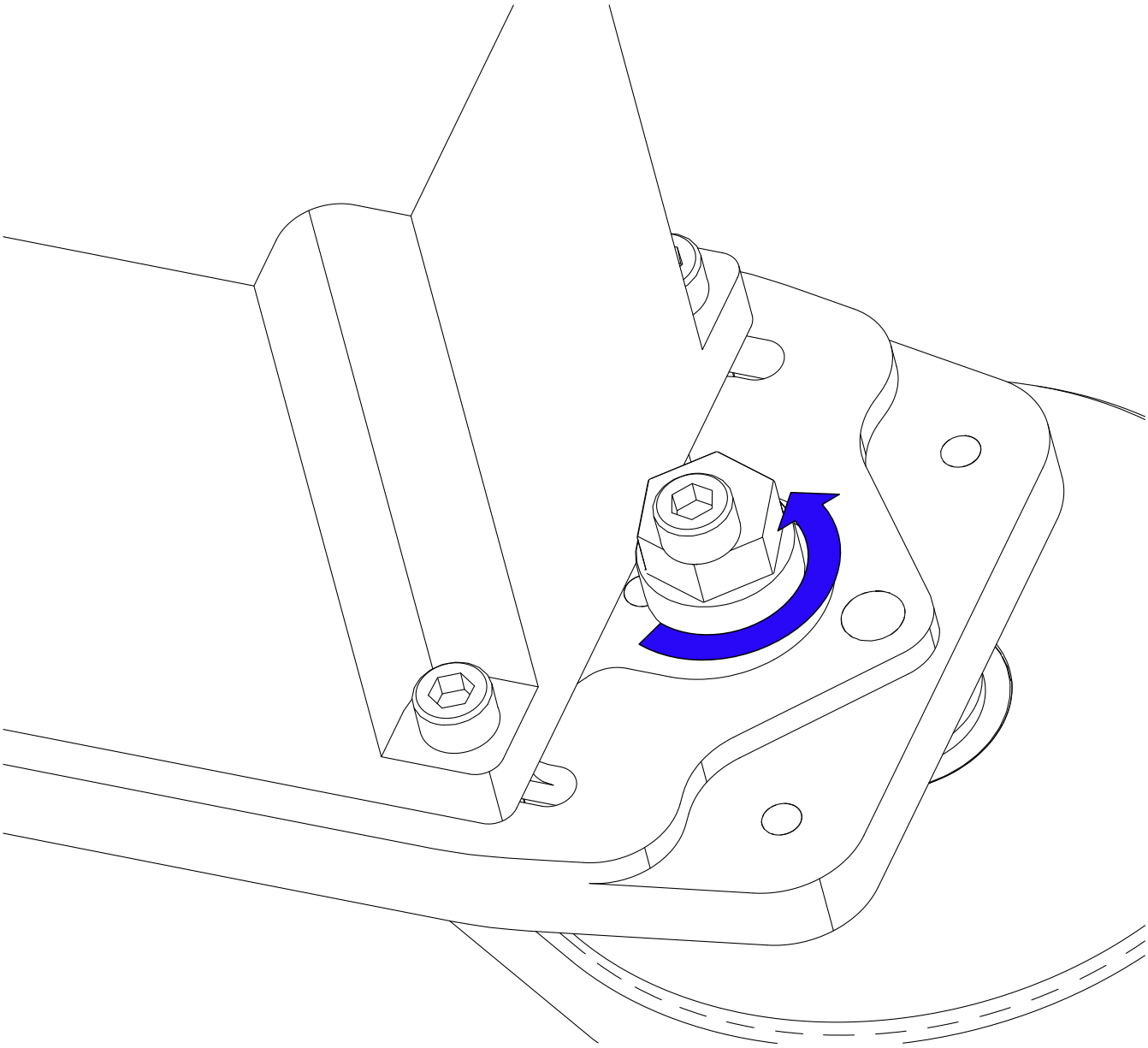
- Slide the drive belt around the motor pulley and drive spindle.

Assembly Note

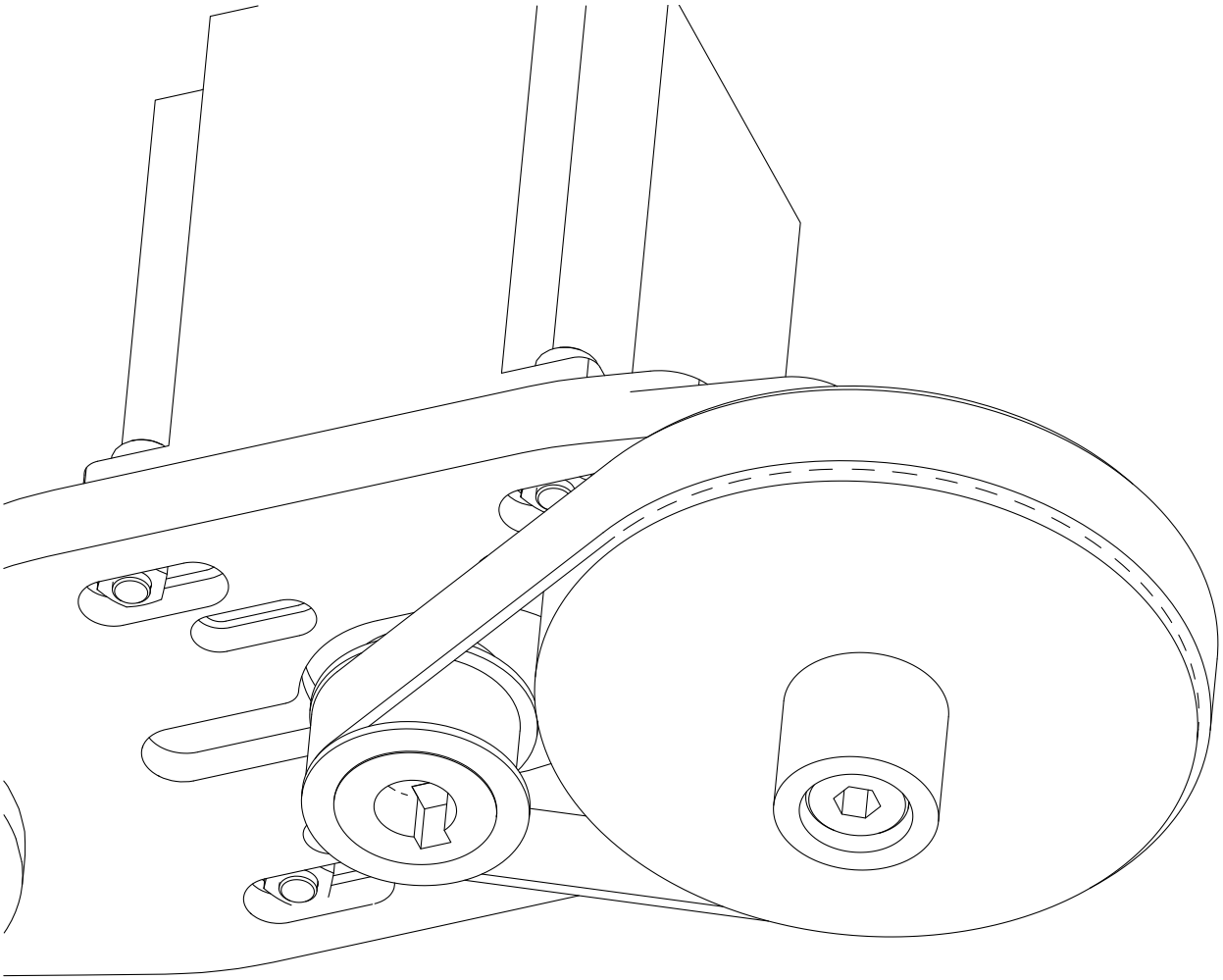
It may be necessary to slide the motor closer to the drive spindle as indicated.



- Attach the tensioner cam to the R&P drive plate as indicated.



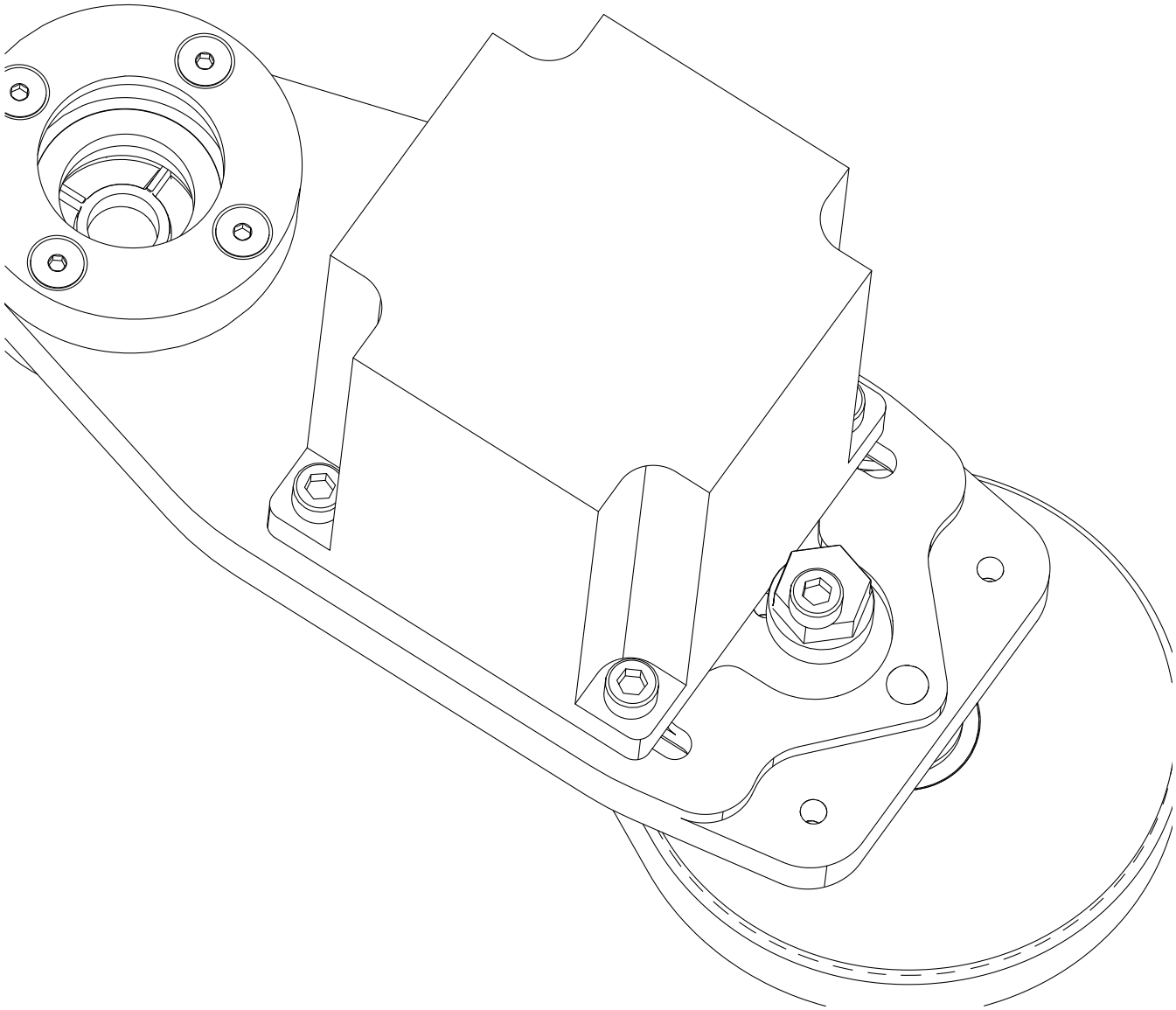
- Use a 16mm wrench to turn the tensioner cam against the motor.



- Hold the tensioner cam against the motor to generate belt tension.

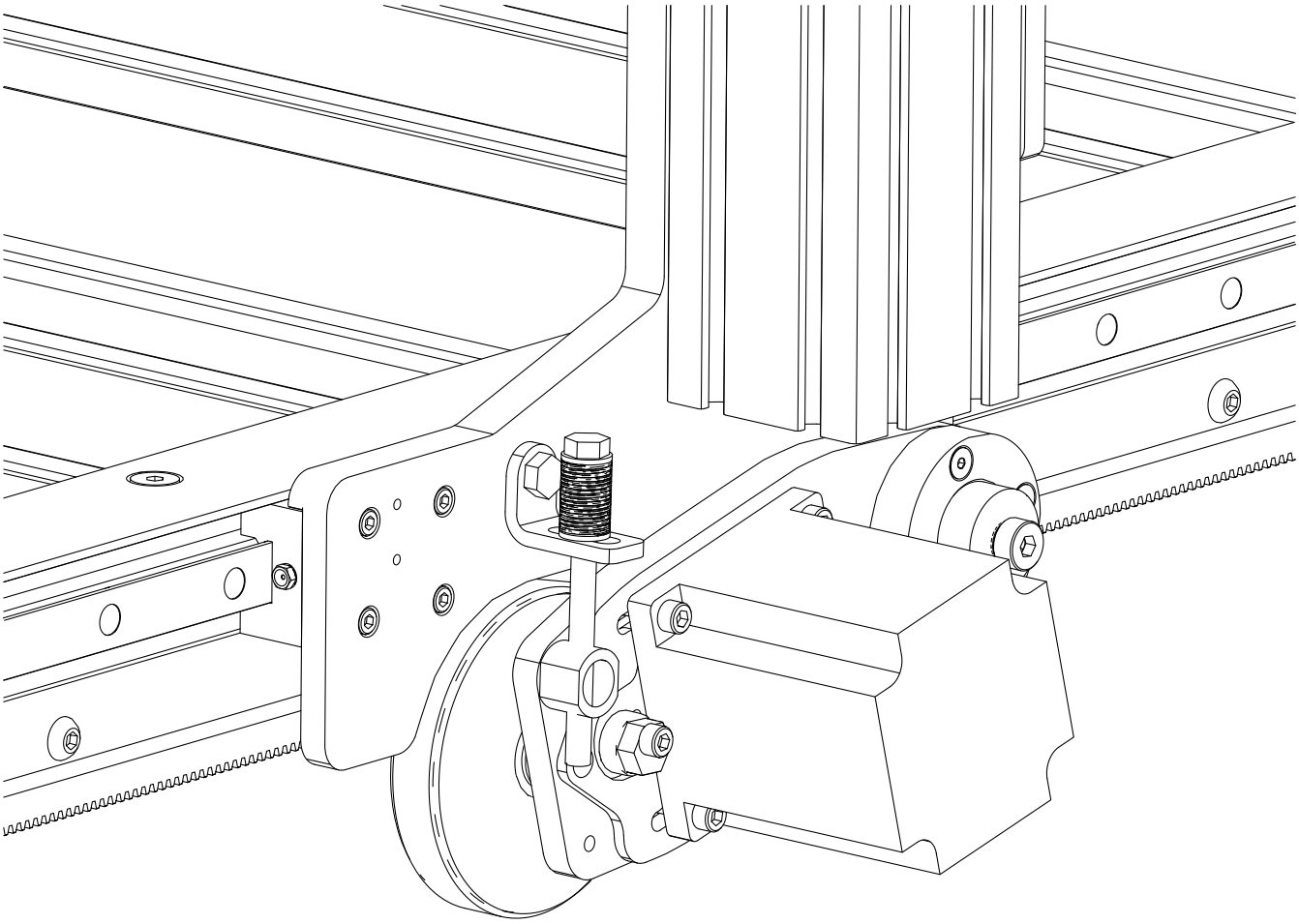
Assembly Note

The belt should be tight enough such that the belt cannot be squeezed more than 3mm (1/8") with your fingers.



- With the belt tensioned, fully tighten the cam tensioner and motor fasteners.

Section 2: PRO R&P Drive Installation



Section Note

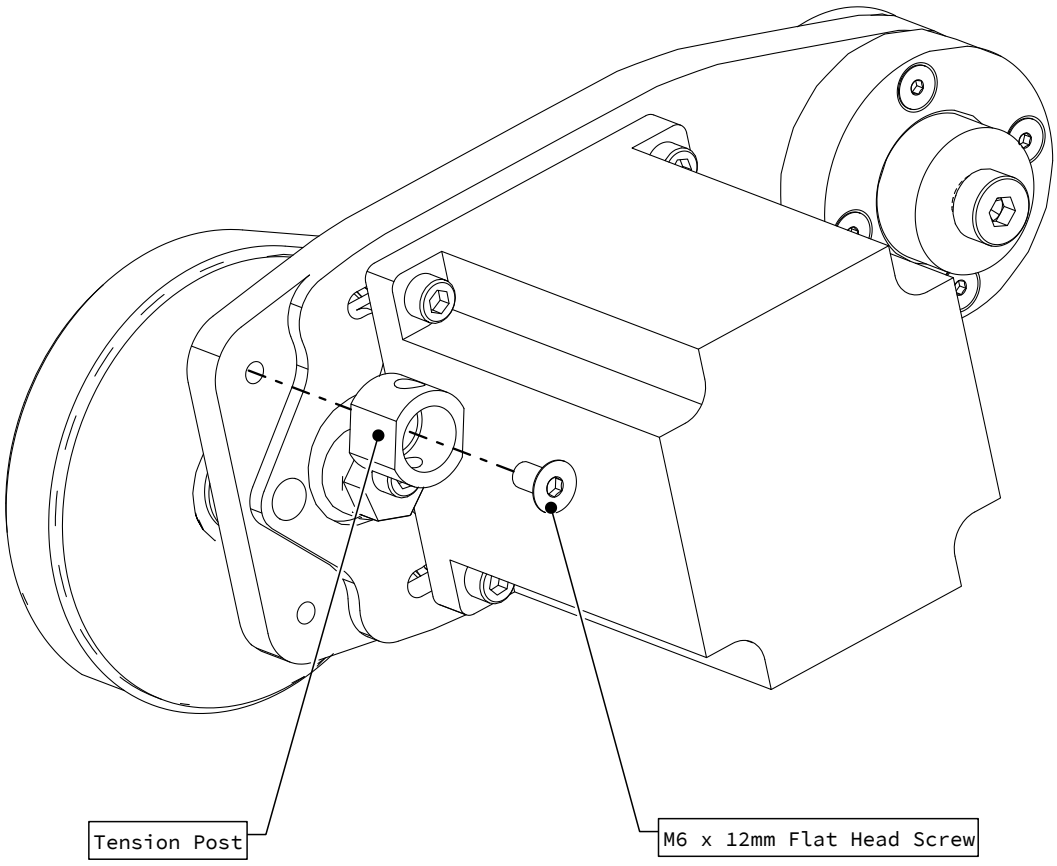
Installation is shown using PRO CNC machine risers. You're specific application may differ.

Parts and Tools Required

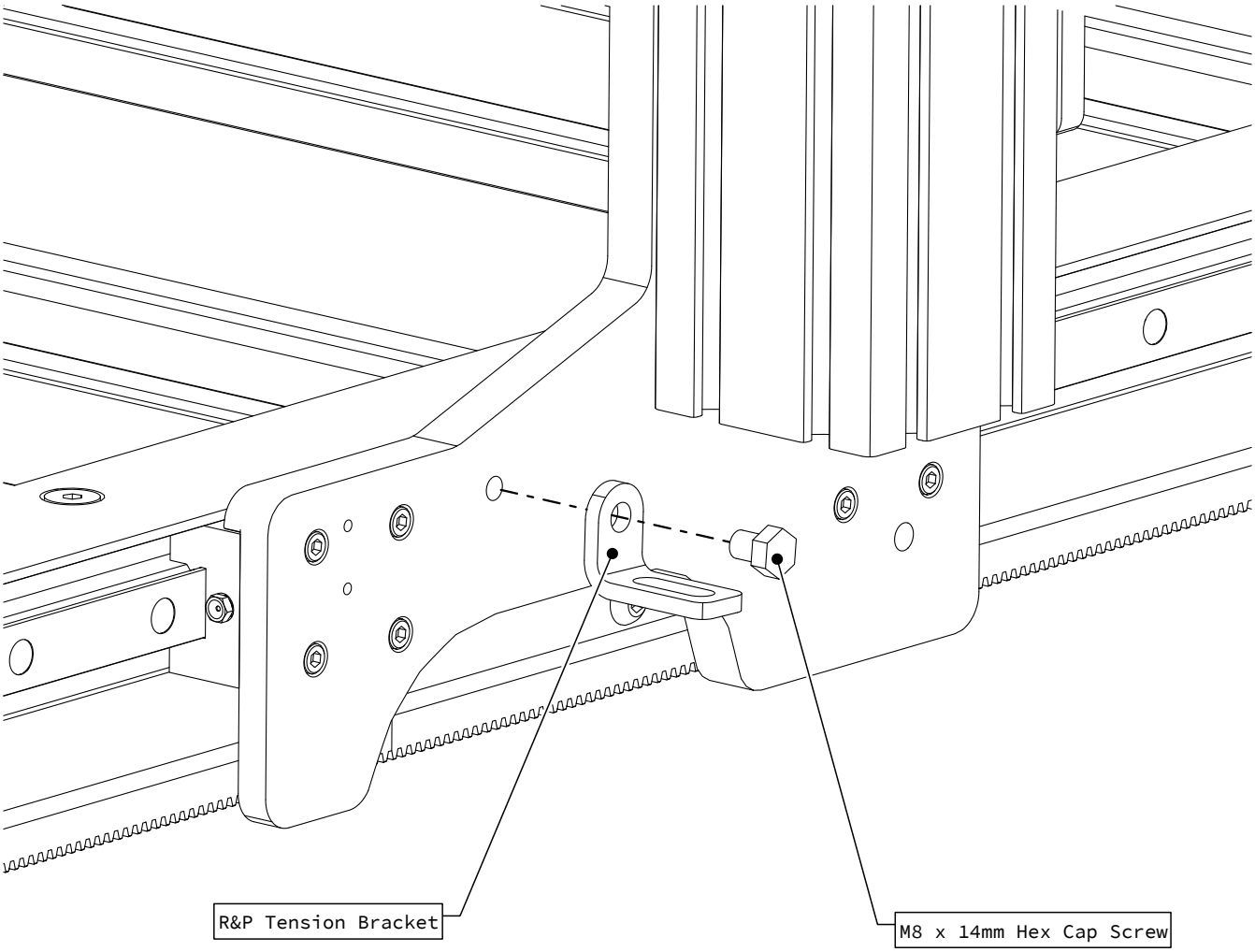
The following parts and tools will be used in Section 2

QTY	Part/Description
1	CRP320-00-TEN-19.1: - (1) R&P Tension Post - (1) R&P Tension Bracket - (1) M6 x 12mm Flat Head Screw - (1) M8 x 14mm Hex Cap Screw - (1) M8 x 90mm Hex Cap Screw - (2) M8 Flat Washer - (1) Die Spring
1	CRP320-00-FAST-XXX: - (1) Eccentric Collar Bearing Cap - (1) Pivot Shaft

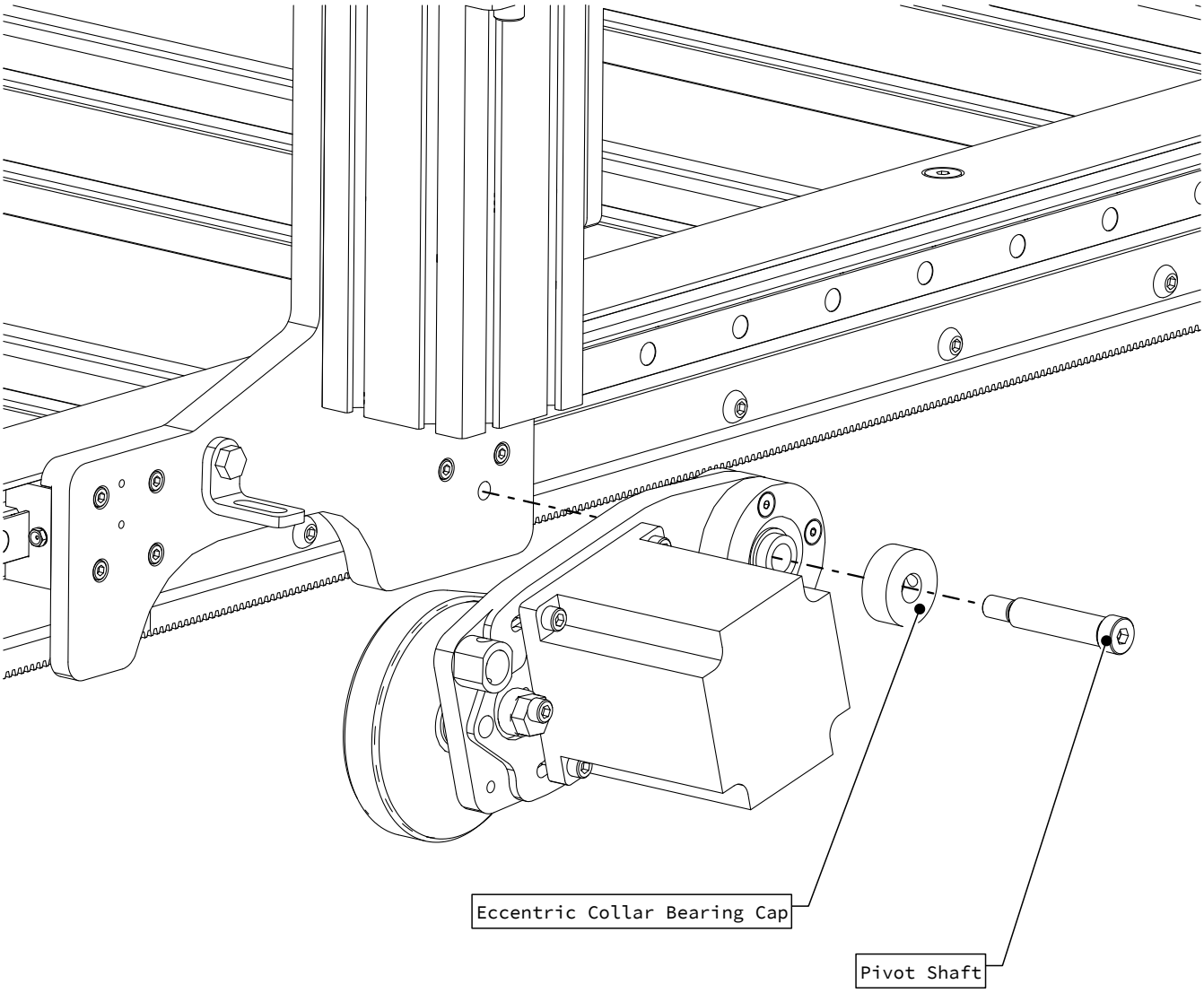
2.1.1



- Attach the tension post to the R&P plate as indicated.
- Partially tighten the fastener.



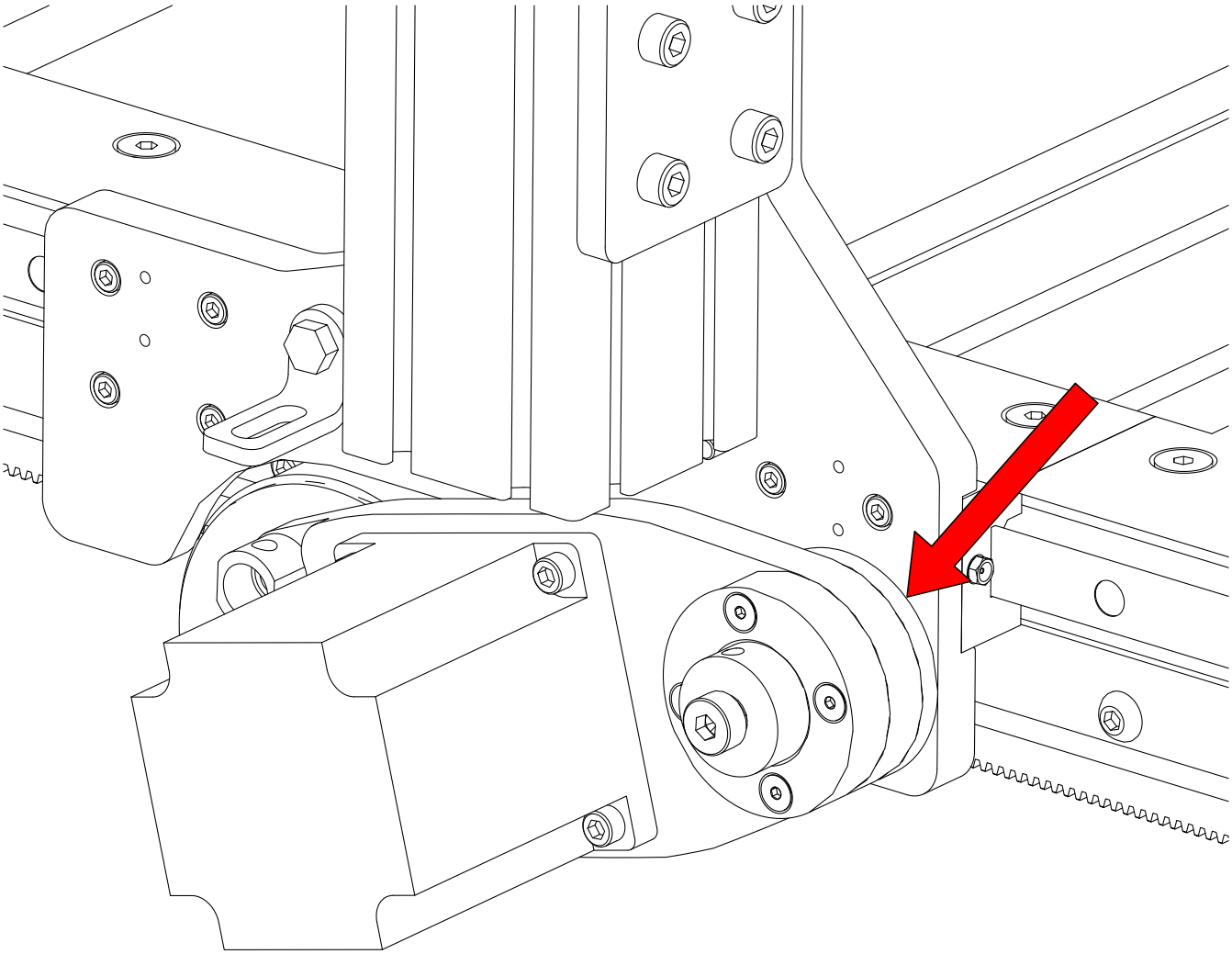
- Attach the tension bracket to the riser plate as indicated.
- Partially tighten the fastener.



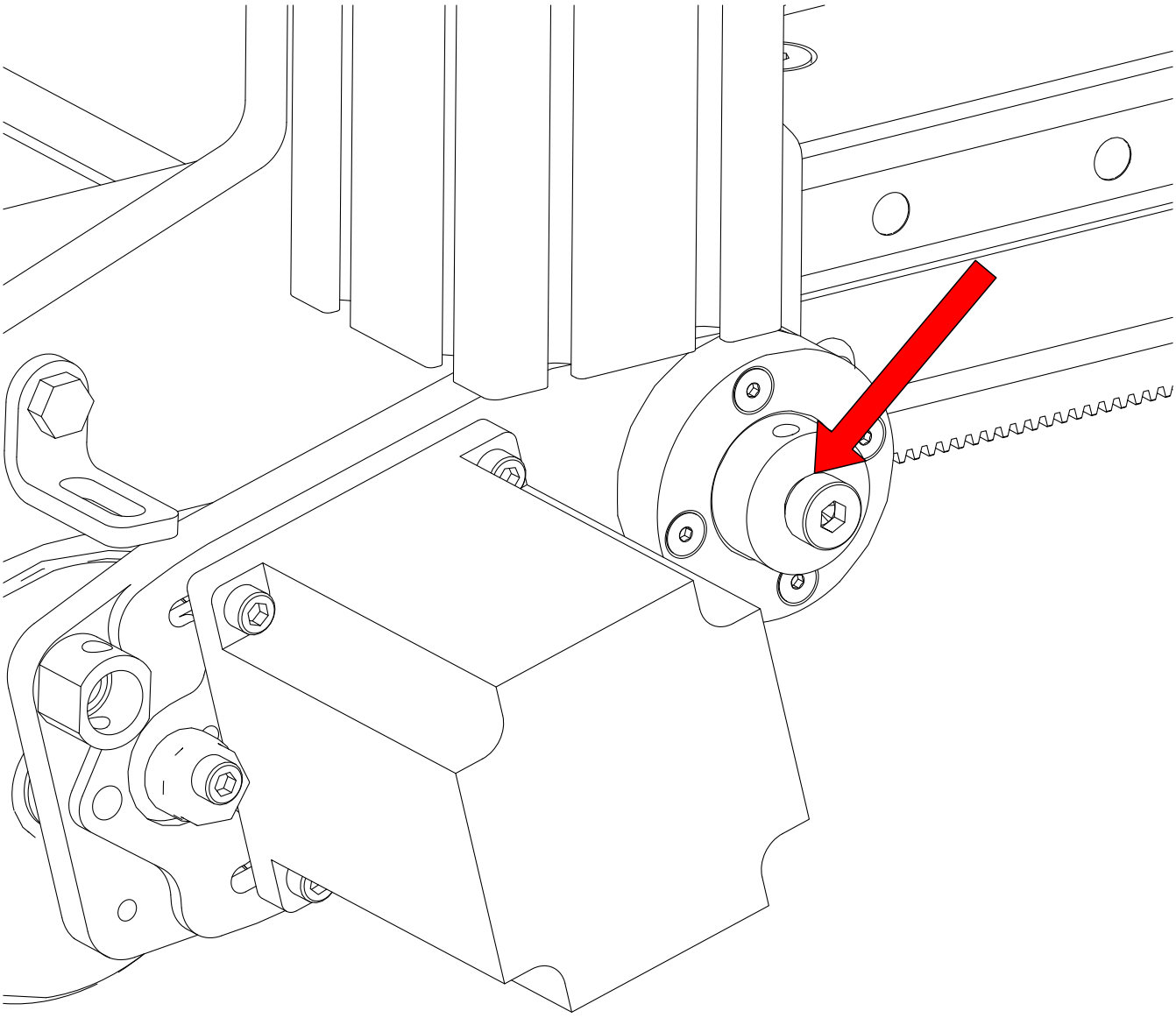
- Attach the R&P assembly to the riser plate as indicated.

Assembly Note

Ensure the eccentric collar bearing cap is oriented correctly. It will fit over the eccentric collar bearing pre-installed in the R&P drive plate.



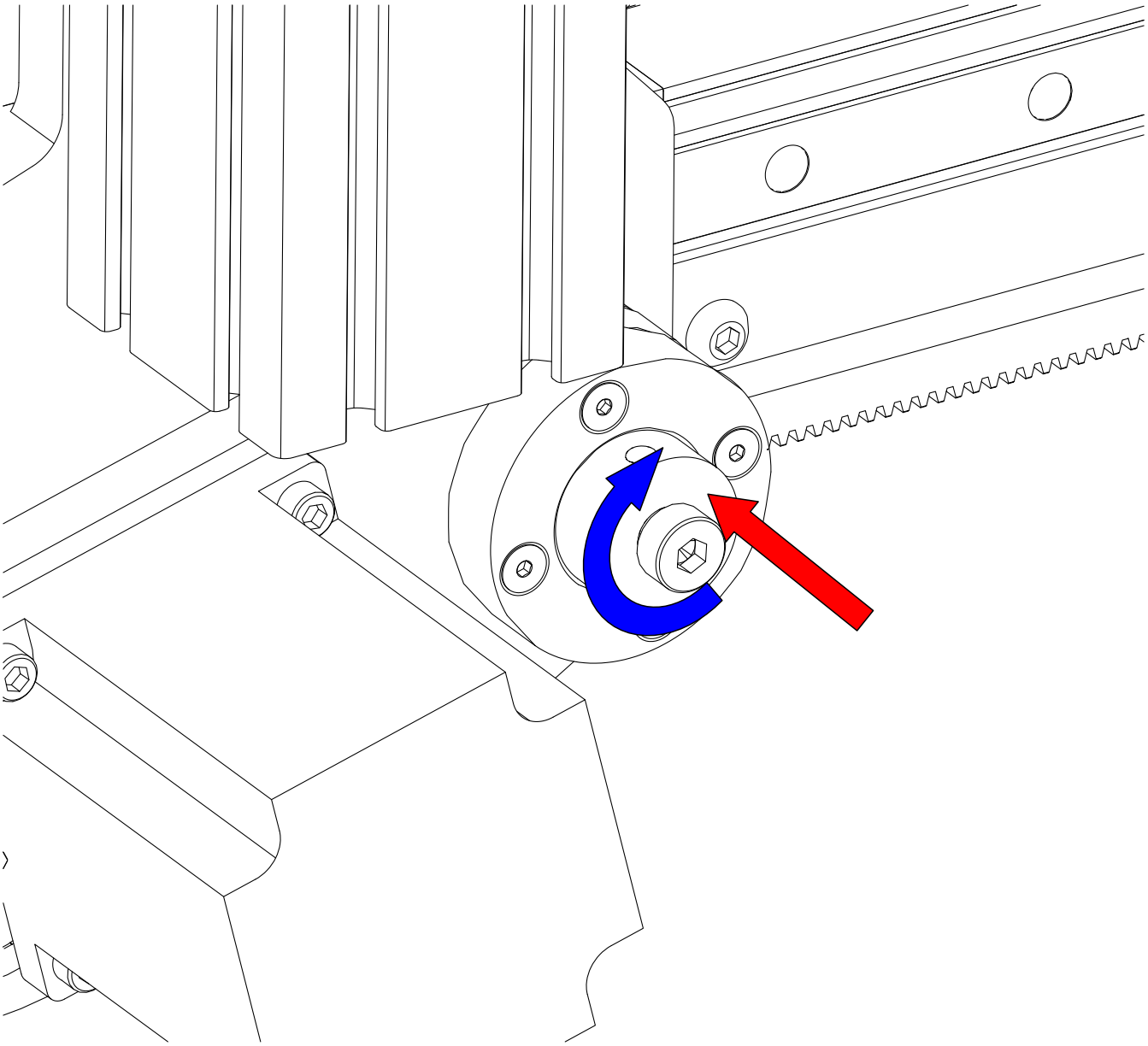
- Ensure the R&P assembly is fully seated on the riser plate as indicated.



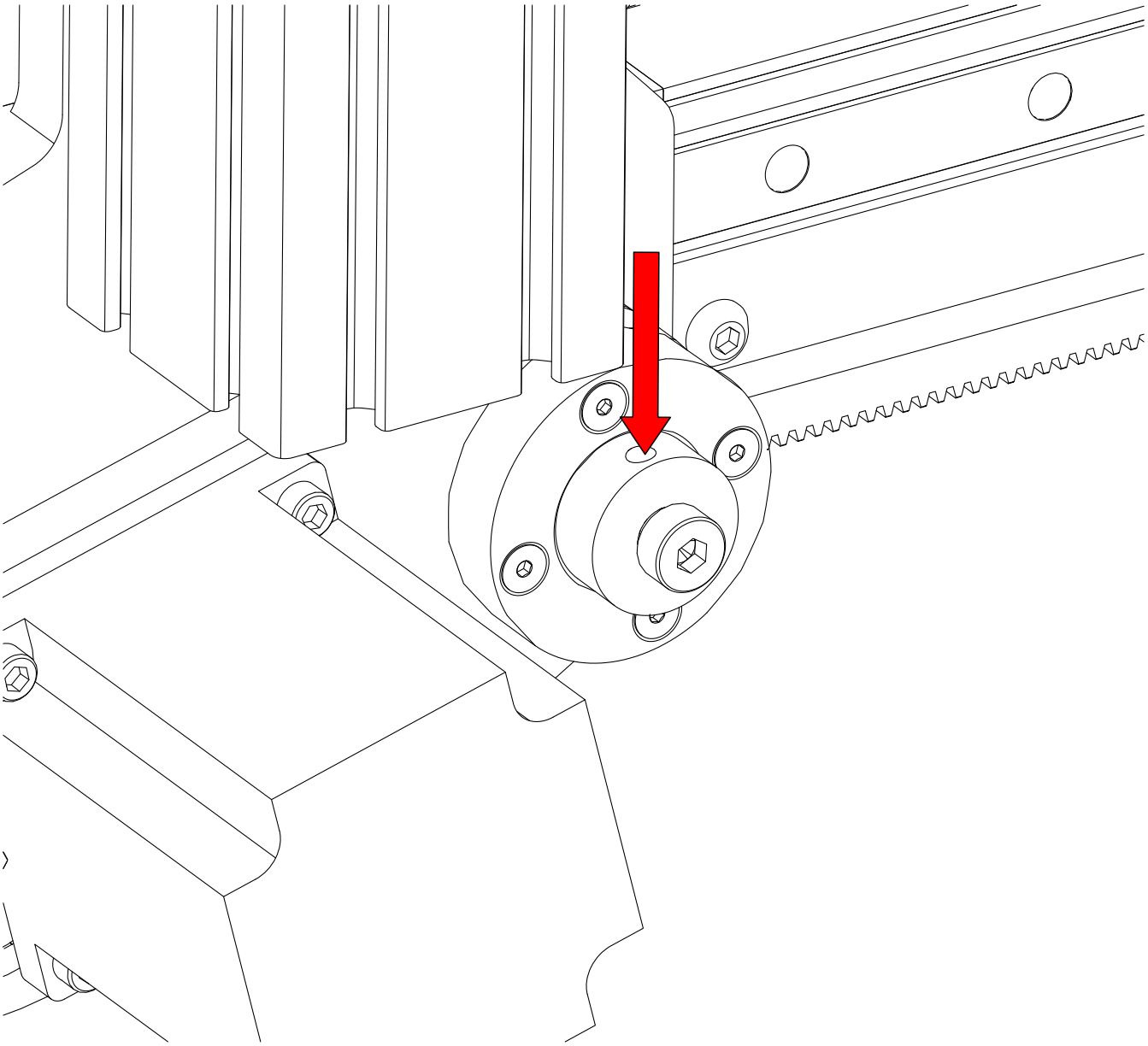
- Fully tighten the pivot shaft.

Assembly Note

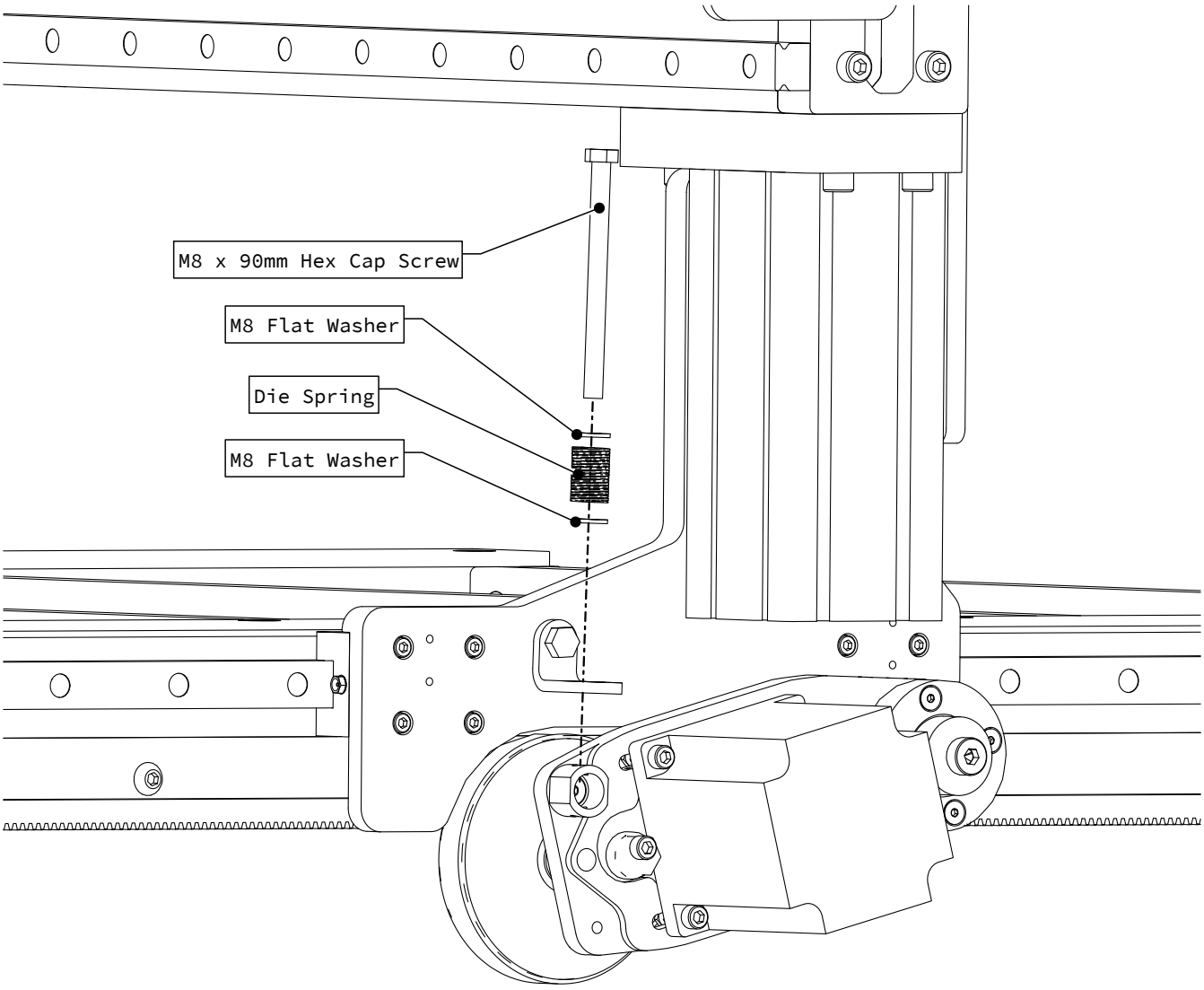
There will be a gap between the head of the pivot shaft and the eccentric collar bearing, as shown by the arrow.



- While pushing in on the eccentric collar bearing, rotate it in the clockwise direction until it starts rotating inside the R&P plate.
- Hold the eccentric collar bearing in this position while proceeding to the next step.



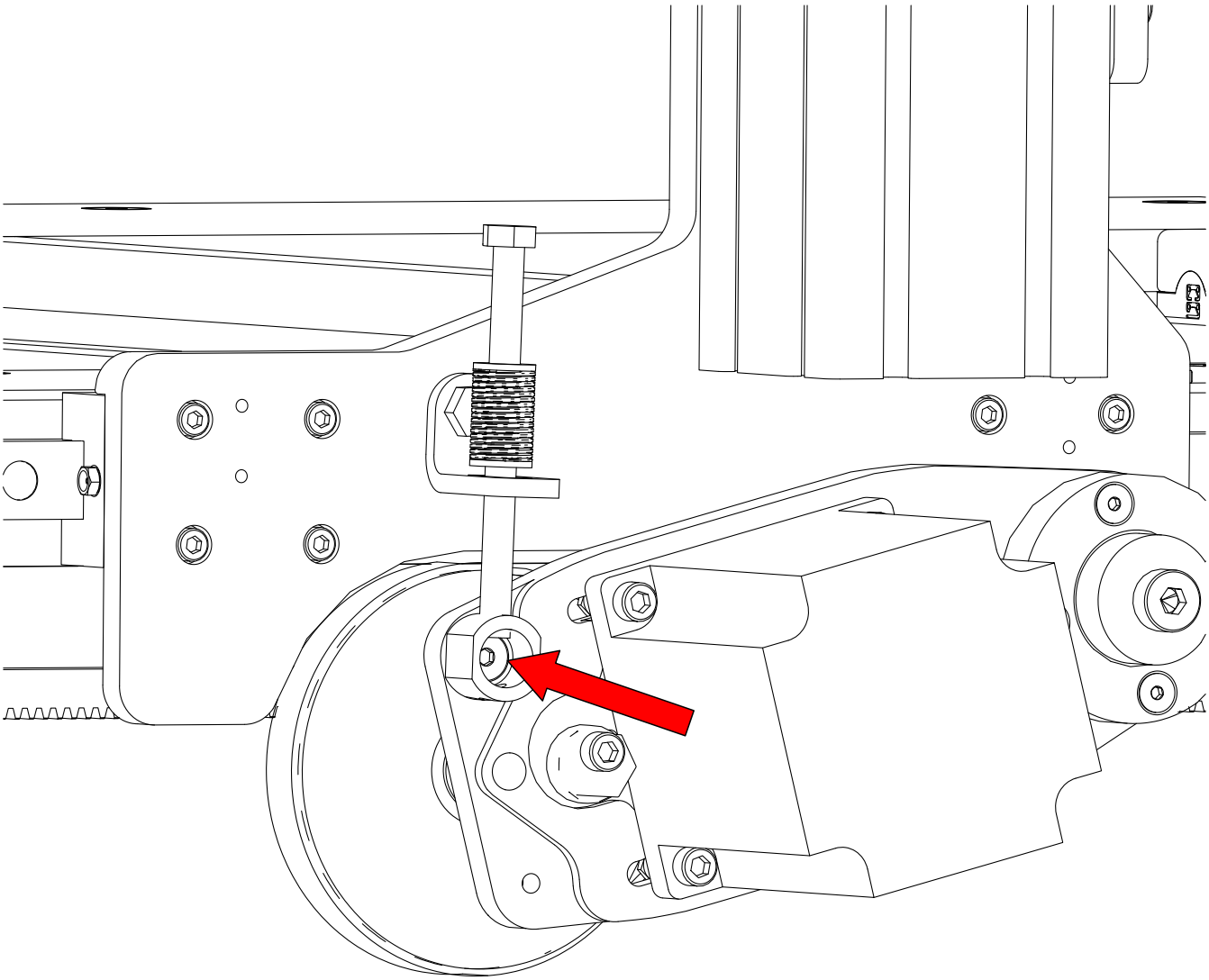
- Tighten the set screw on the side of the eccentric collar bearing.



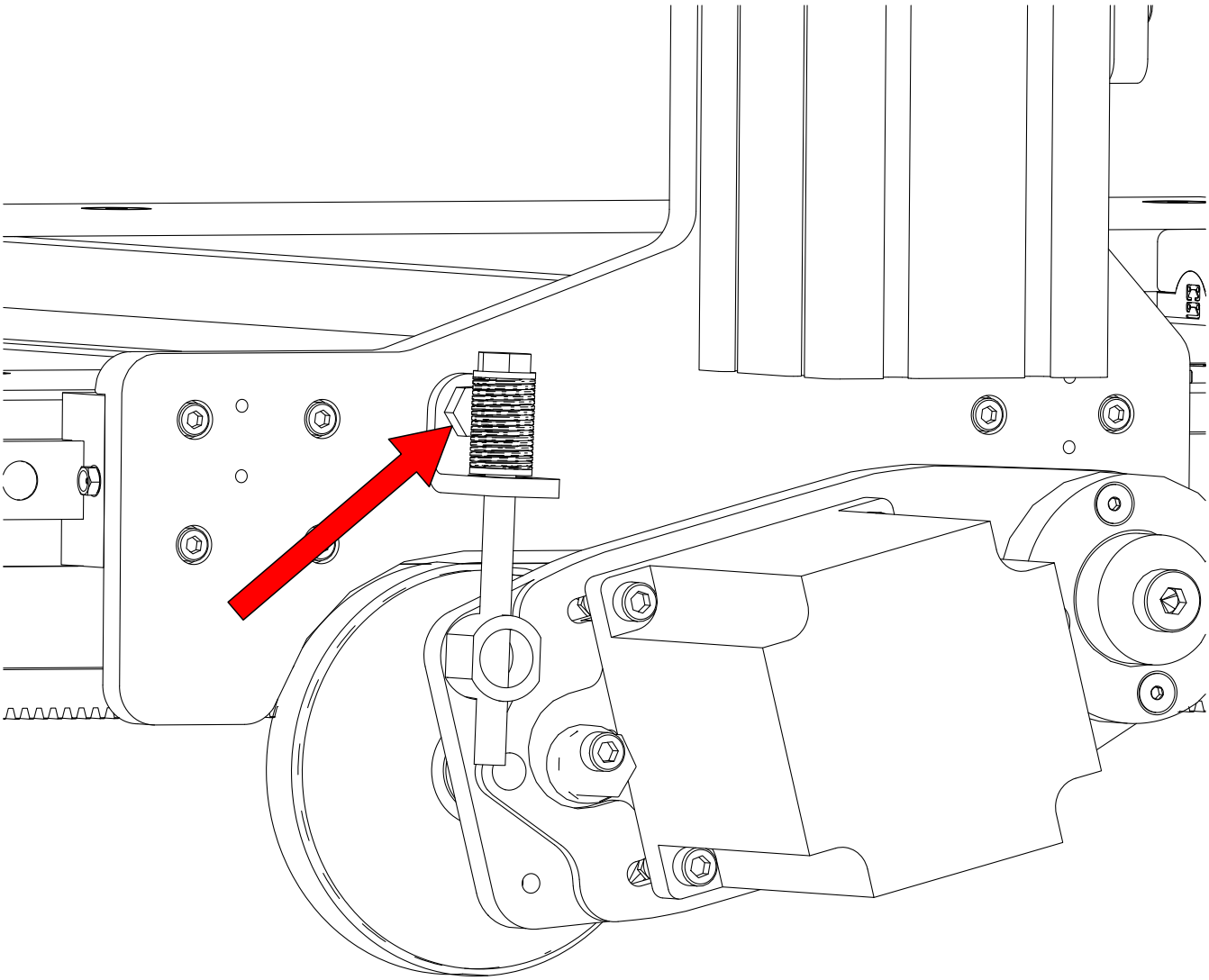
- Install the tension bolt, washers, and spring as indicated.

Assembly Note

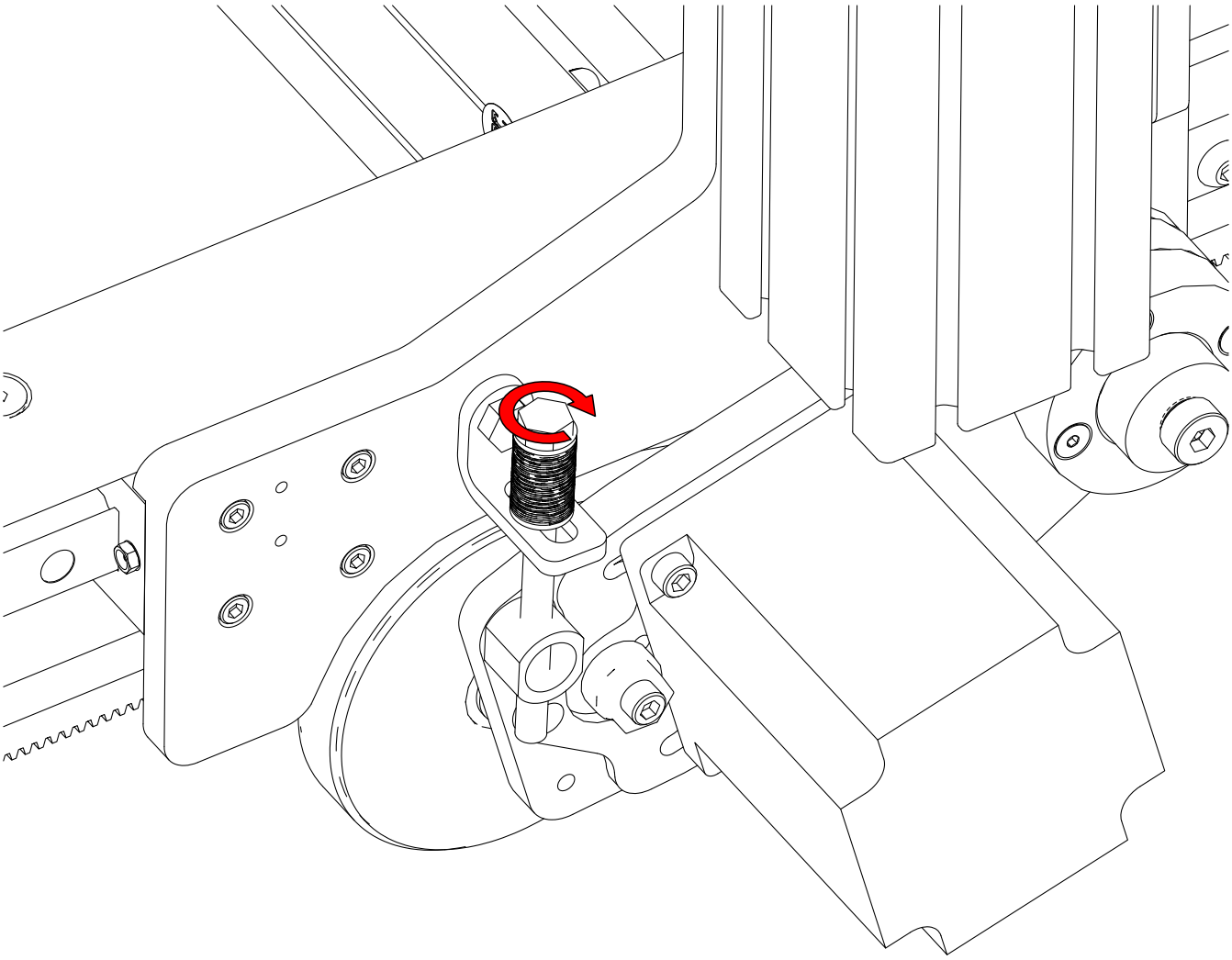
Only thread the bolt through the first hole of the tension post.



- Tighten the tension post fastener



- Continue threading in the tension bolt until the spring is seated, but not compressed.
- Fully tighten the tension bracket fastener.



- Tighten the tension bolt 3 revolutions to tension the R&P Assembly.