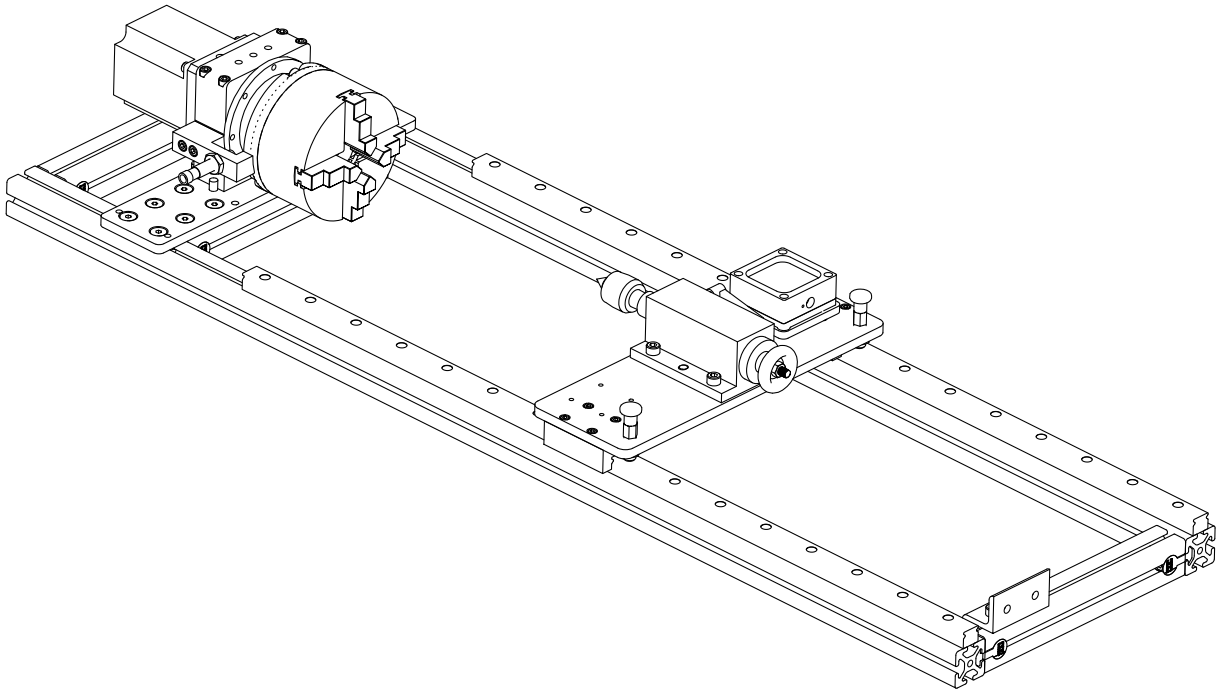
Avid CNC Rotary Axis Assembly Instructions

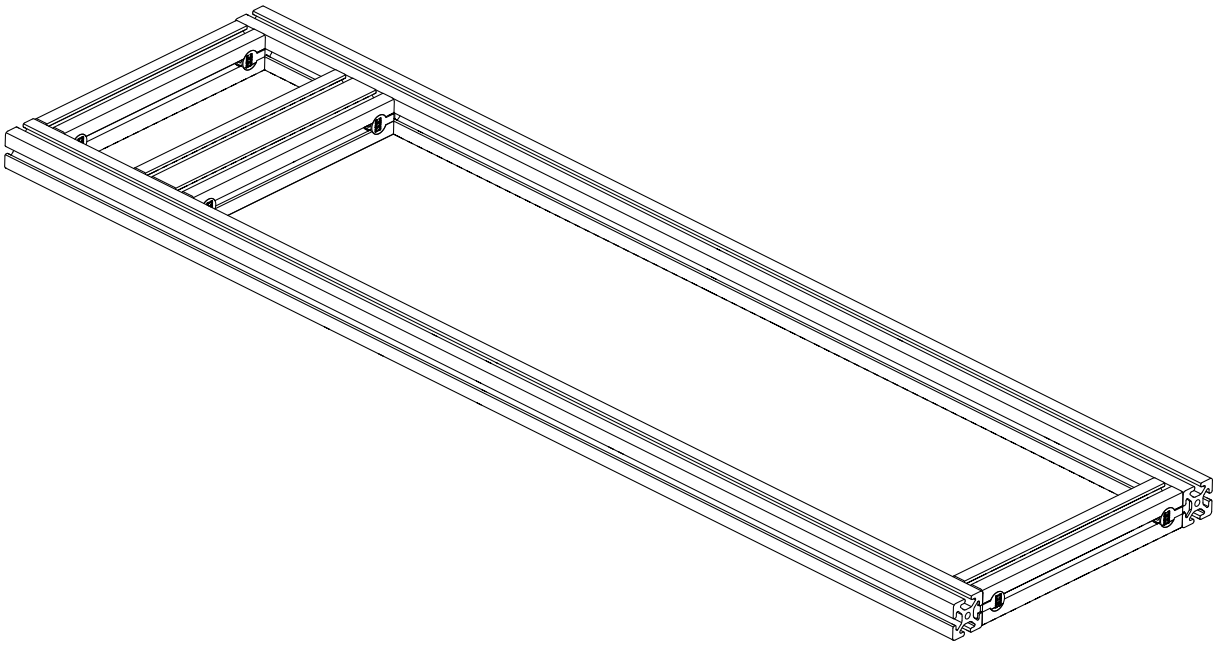
v2021Q1.1



An assembly video is available as a complimentary guide for assembling your Avid CNC rotary axis:
https://youtu.be/Q5iYg01Lw1w

Version 2021Q1.1

1.1 Frame Assembly - Recessed Mounted



Section Note

Skip to Section 1.2 if you are mounting the rotary assembly on top of your table top or spoil board.

Parts and Tools Required

The following parts and tools will be used in Section 1.1

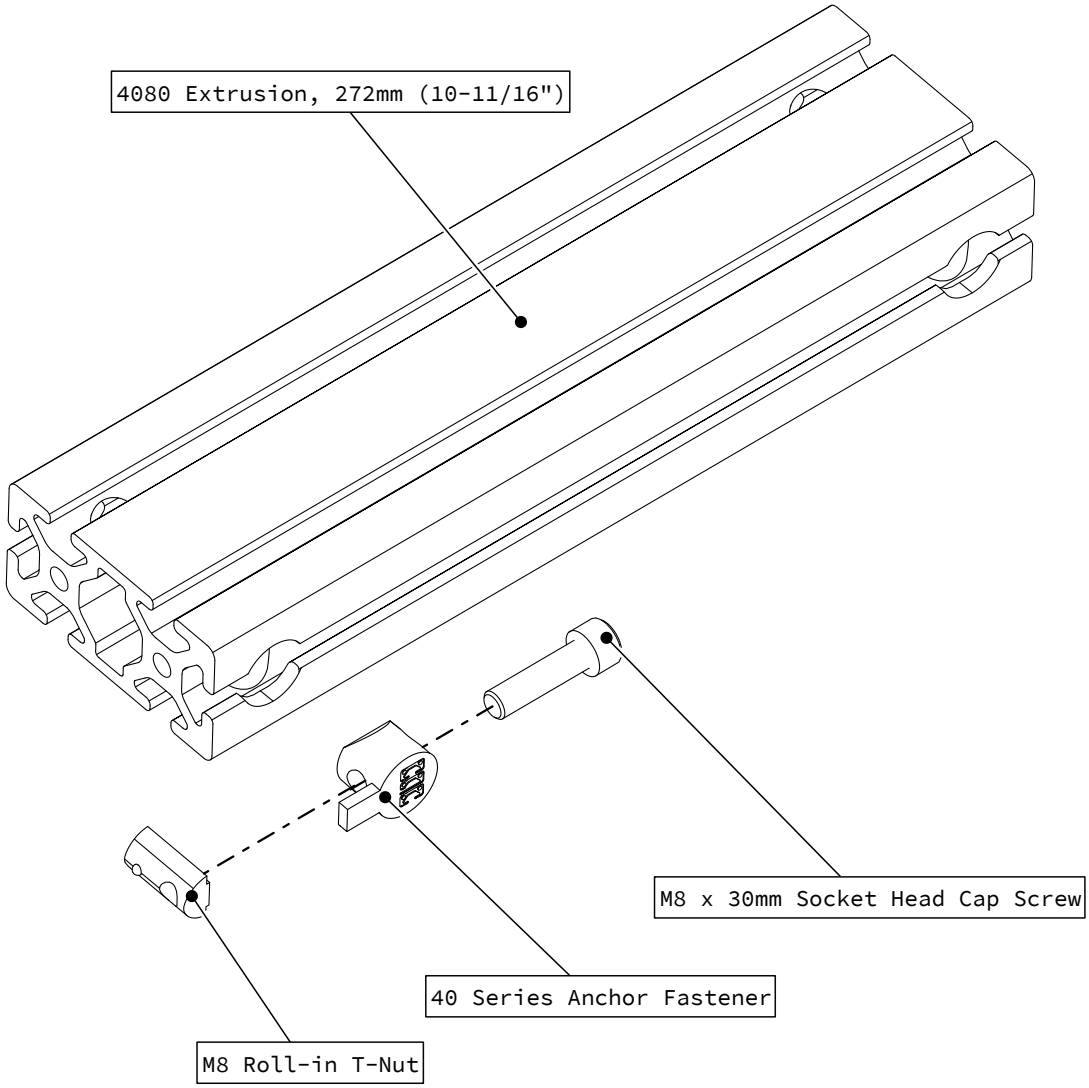
QTY	Part/Description	Packaged In
1	4080 Extrusion, 272mm (10-11/16")	Extrusion Box
2	4040 Extrusion, 272mm (10-11/16")	Extrusion Box
2	4040 Frame Extrusion, (length dependent on rotary size)	Extrusion Box
1	CRP190-00-FAST: - (12) M8 x 30mm Socket Head Cap Screw - (12) 40 Series Anchor Fastener - (4) M8 Roll-in T-Nut - (4) M8 Double Slide-in T-Nut	CRP190-00-BASE

Required Tools:

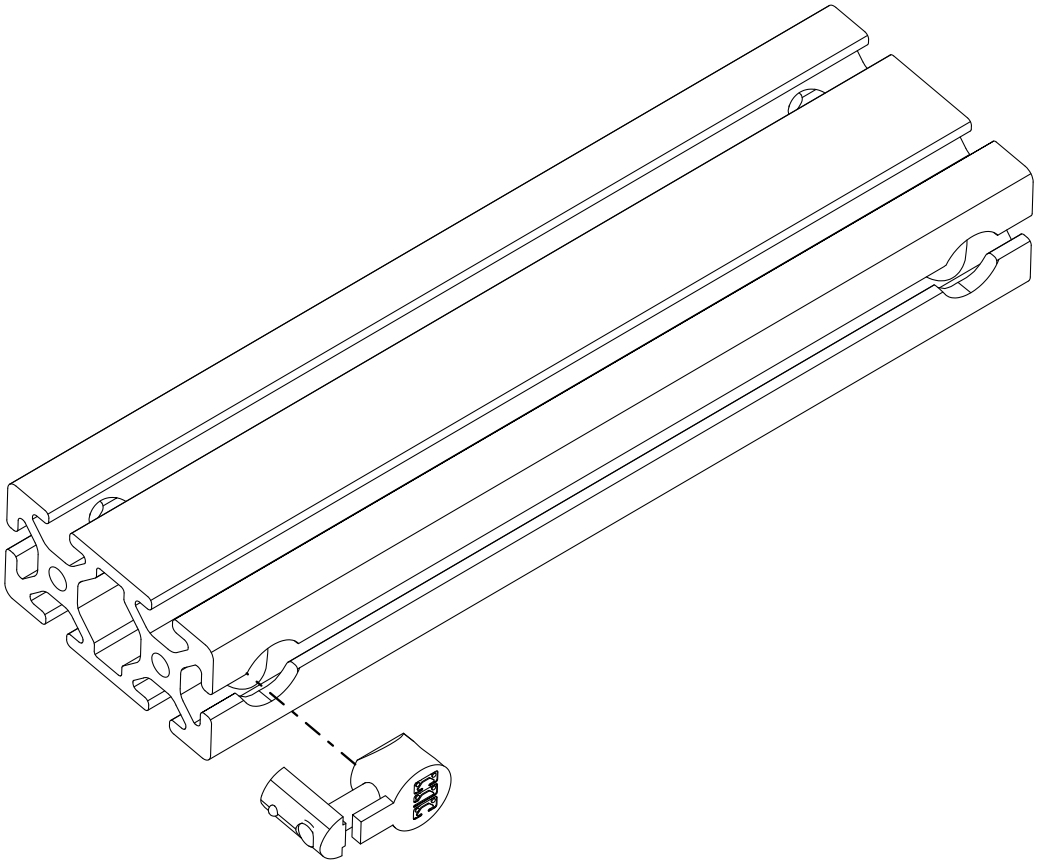
- 6mm Ball-End Allen Wrench
- Tape Measure

1.1.1 Assembly Steps

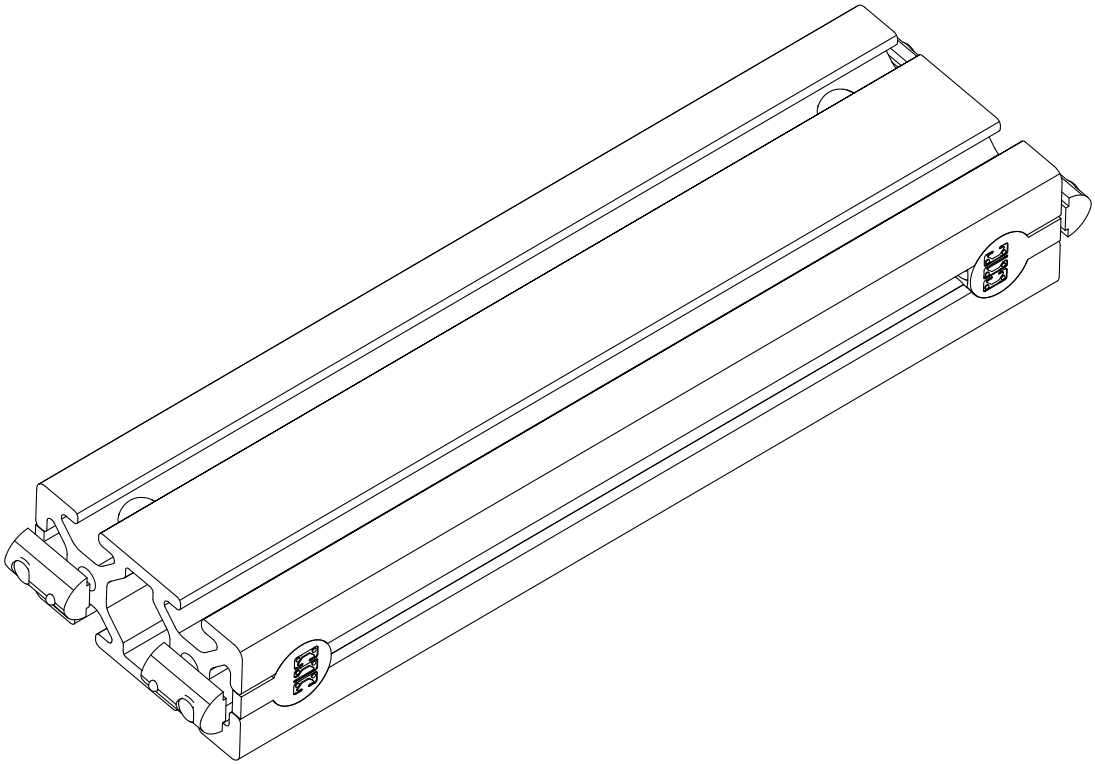
1.1.1.1



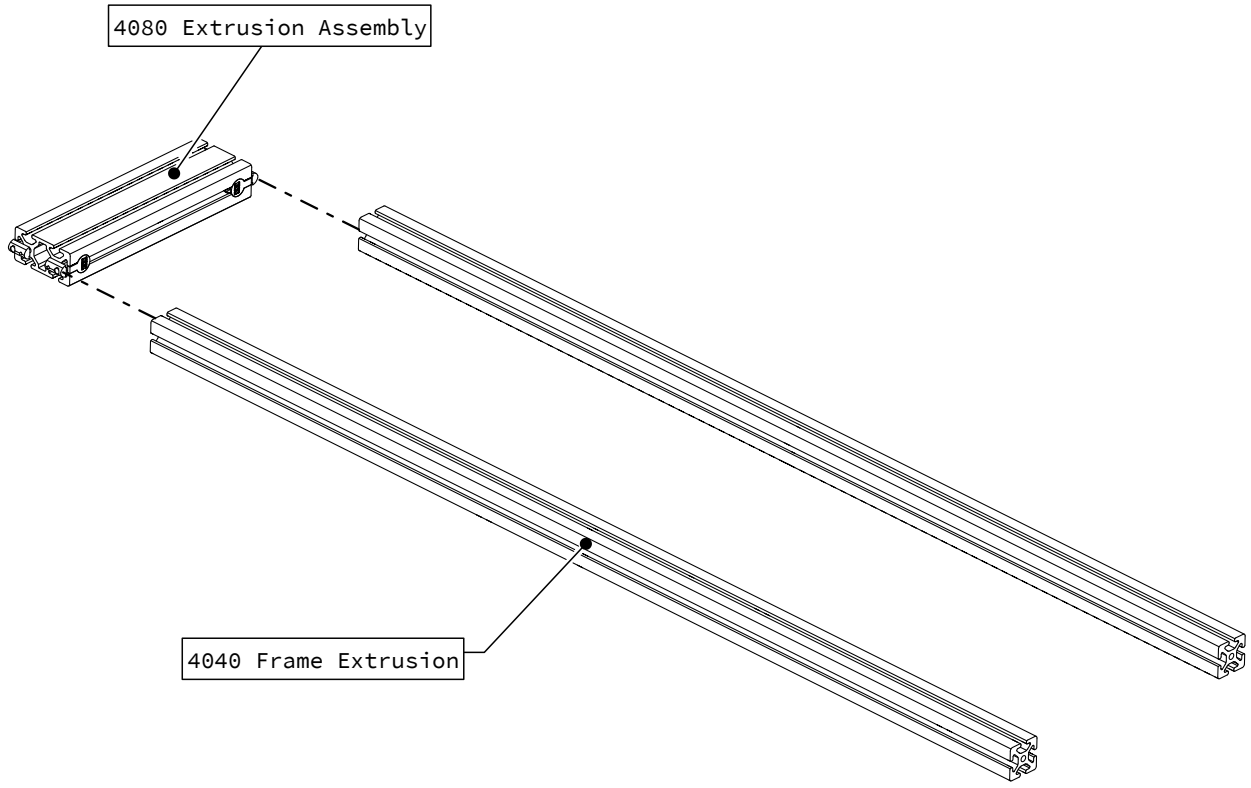
- Thread a socket head cap screw into the T-Nut through the anchor fasteners, as indicated.



- Slide the anchor assembly into the 4080 extrusion.



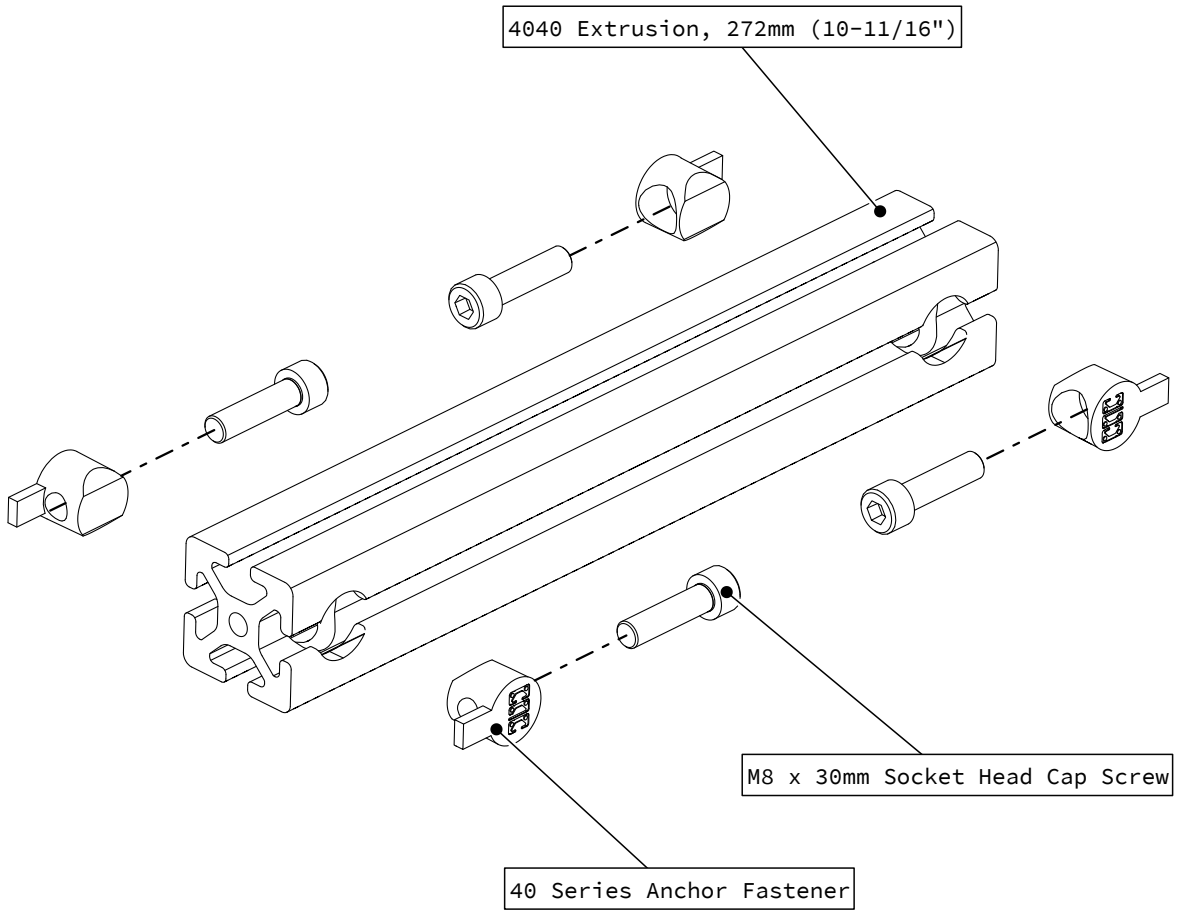
- Repeat this process at each corner of the extrusion.



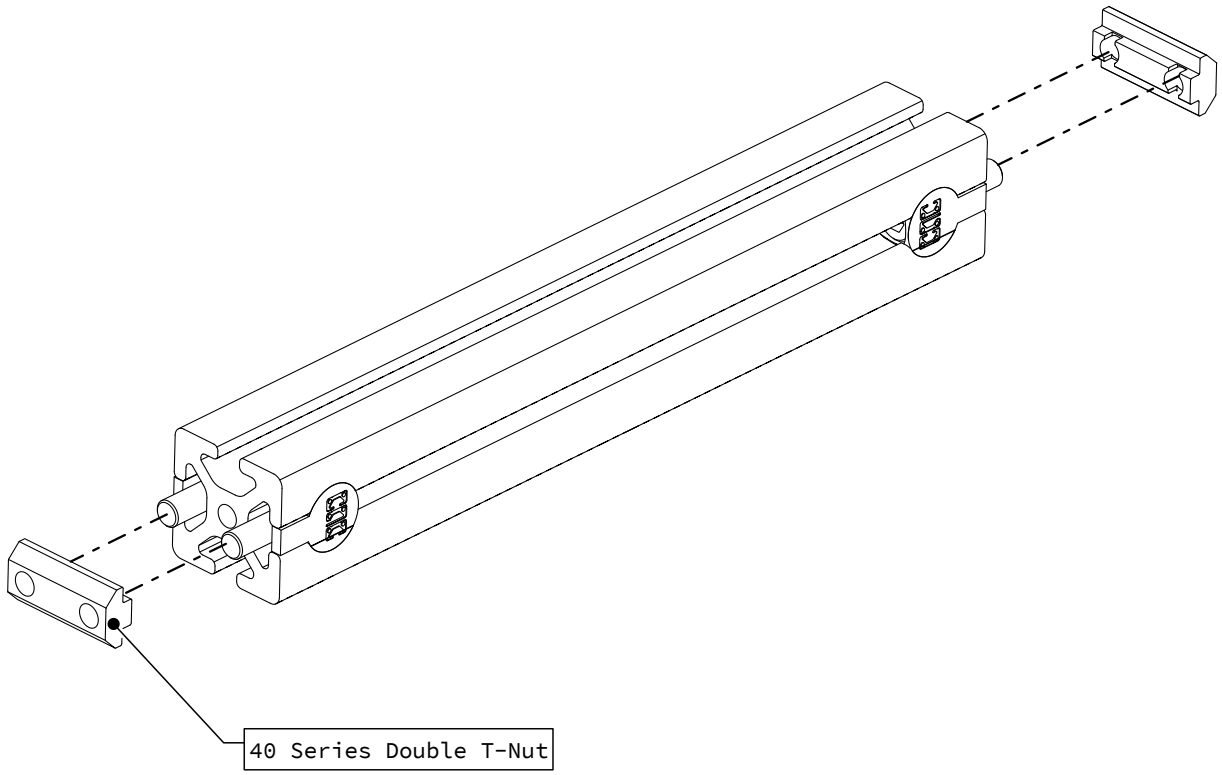
- Slide the 4080 extrusion assembly into the 4040 frame extrusion pieces as indicated.

Assembly Note

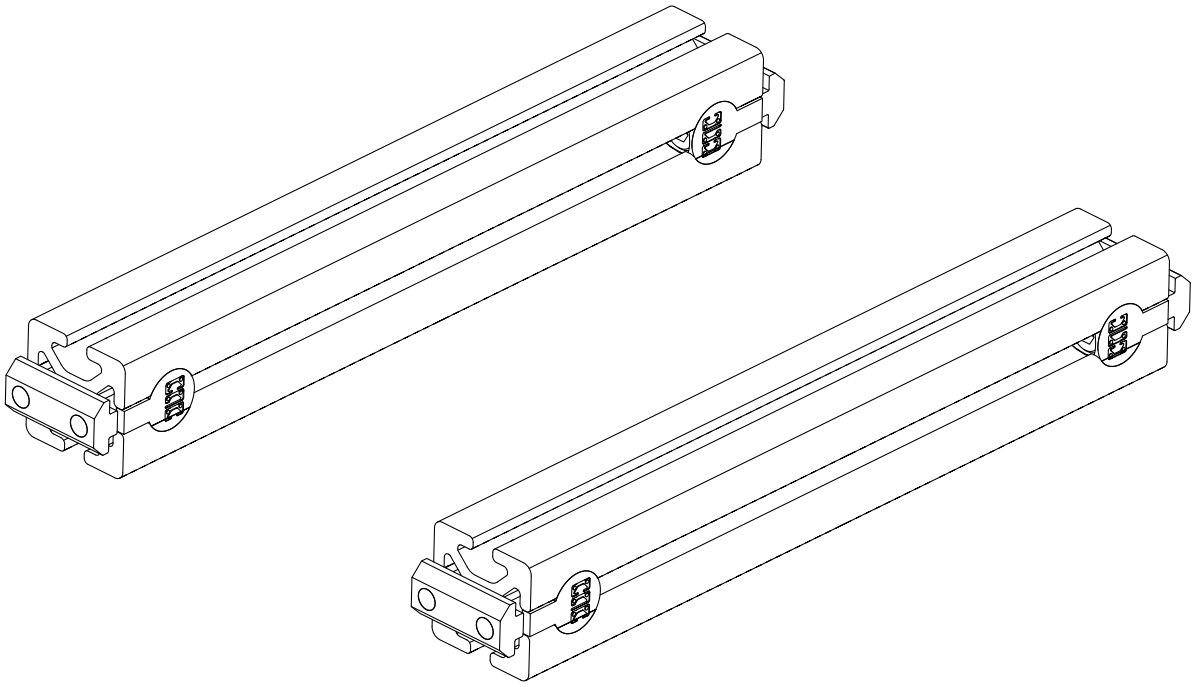
The length of your 4040 frame extrusion will vary depending upon the overall length of your rotary assembly.



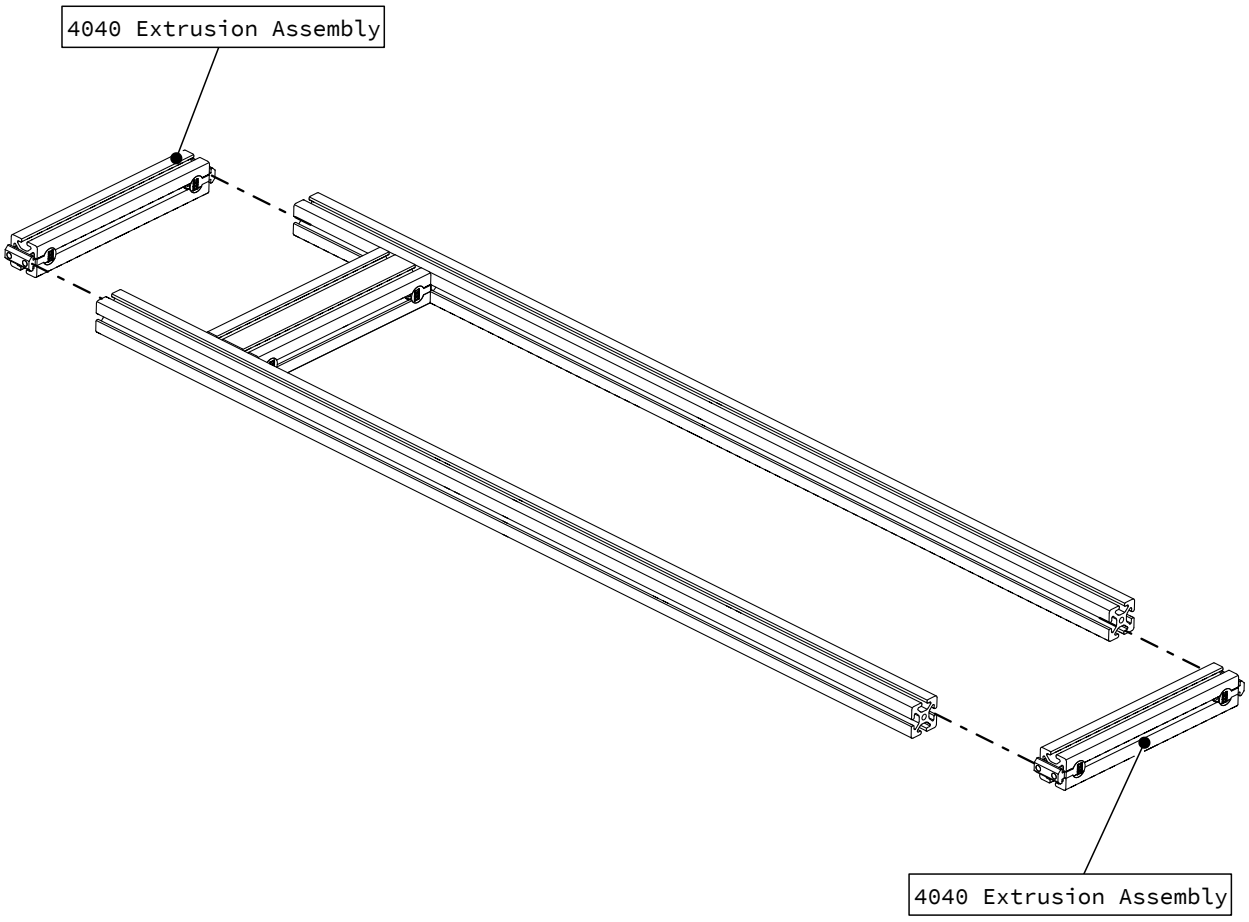
- Insert a socket head cap screw through the anchor fastener as indicated.



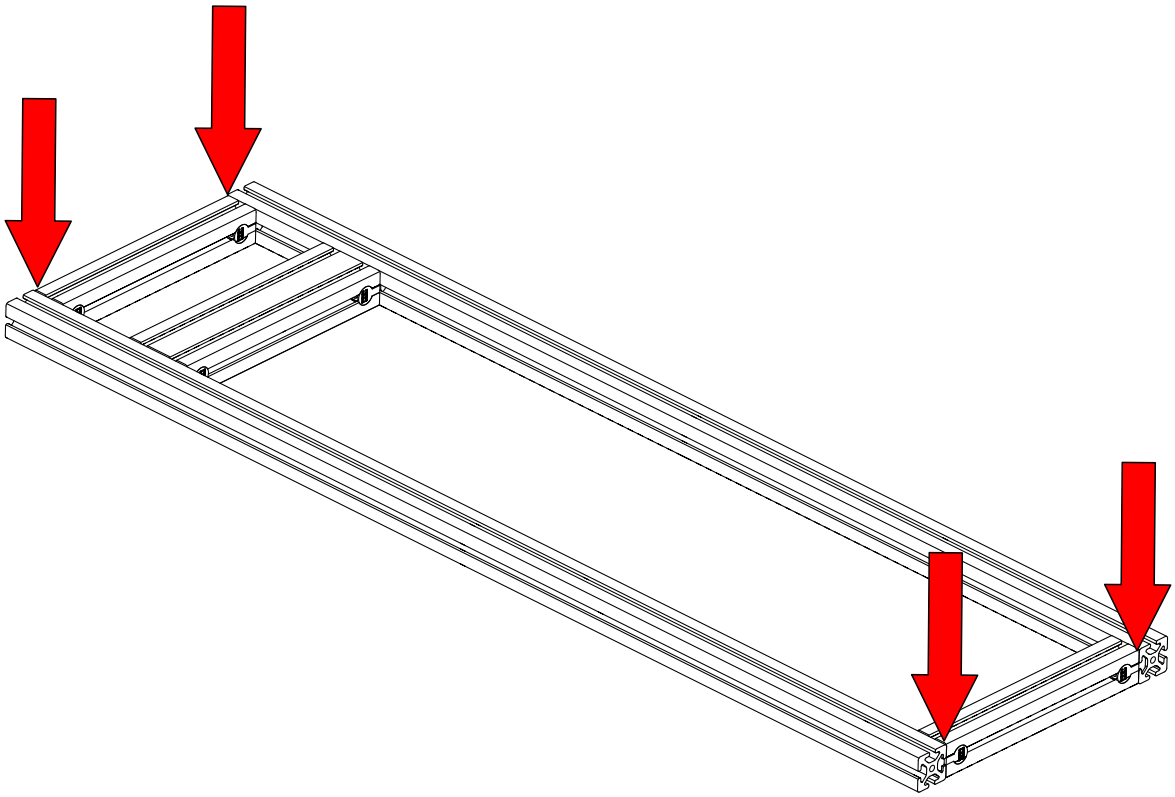
- Slide the anchor fastener into the 4040 extrusion.
- Partially thread the fasteners into the double T-Nut as indicated.



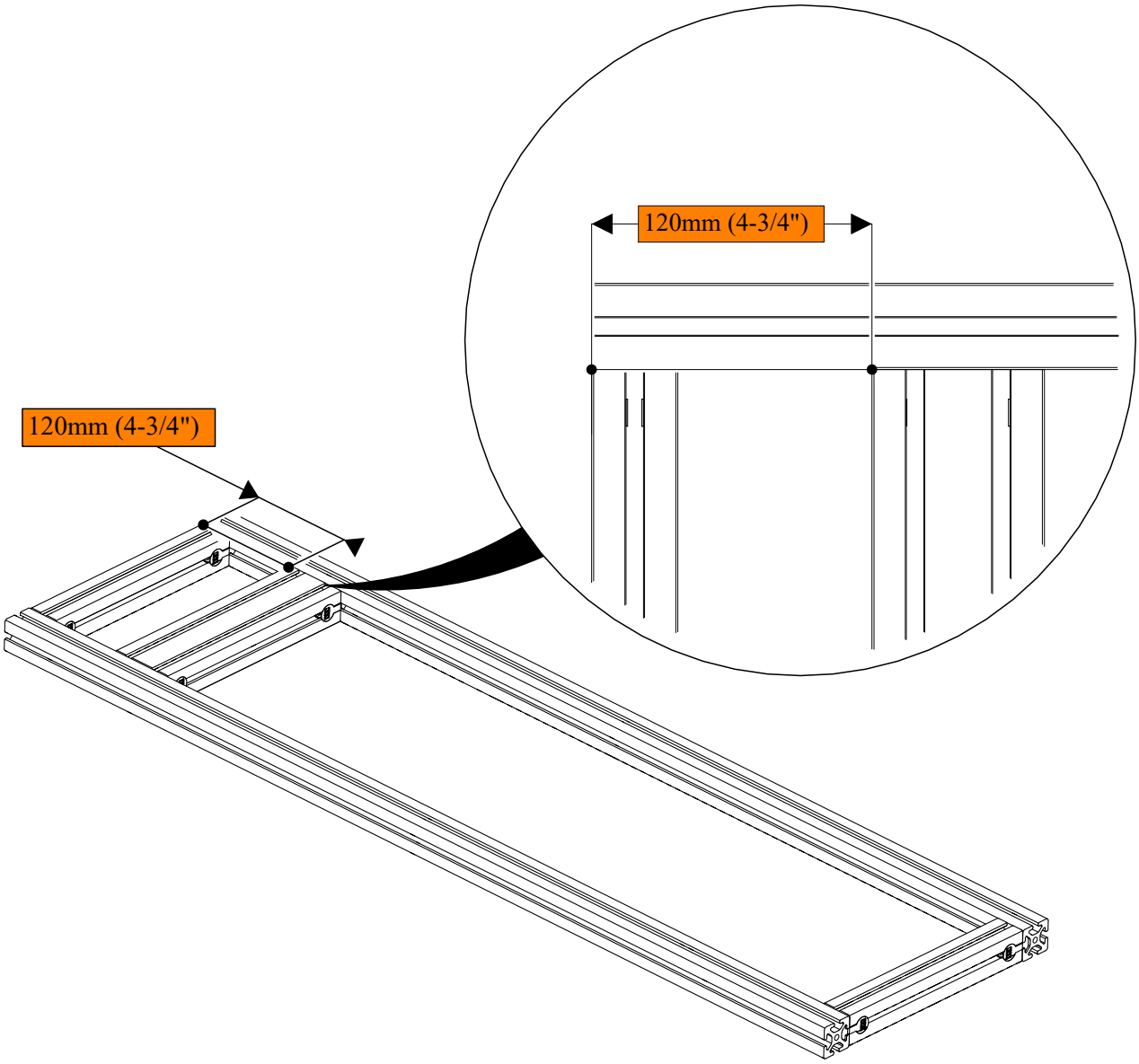
- Repeat this process with the remaining 272mm (10-11/16") piece of 4040 extrusion.



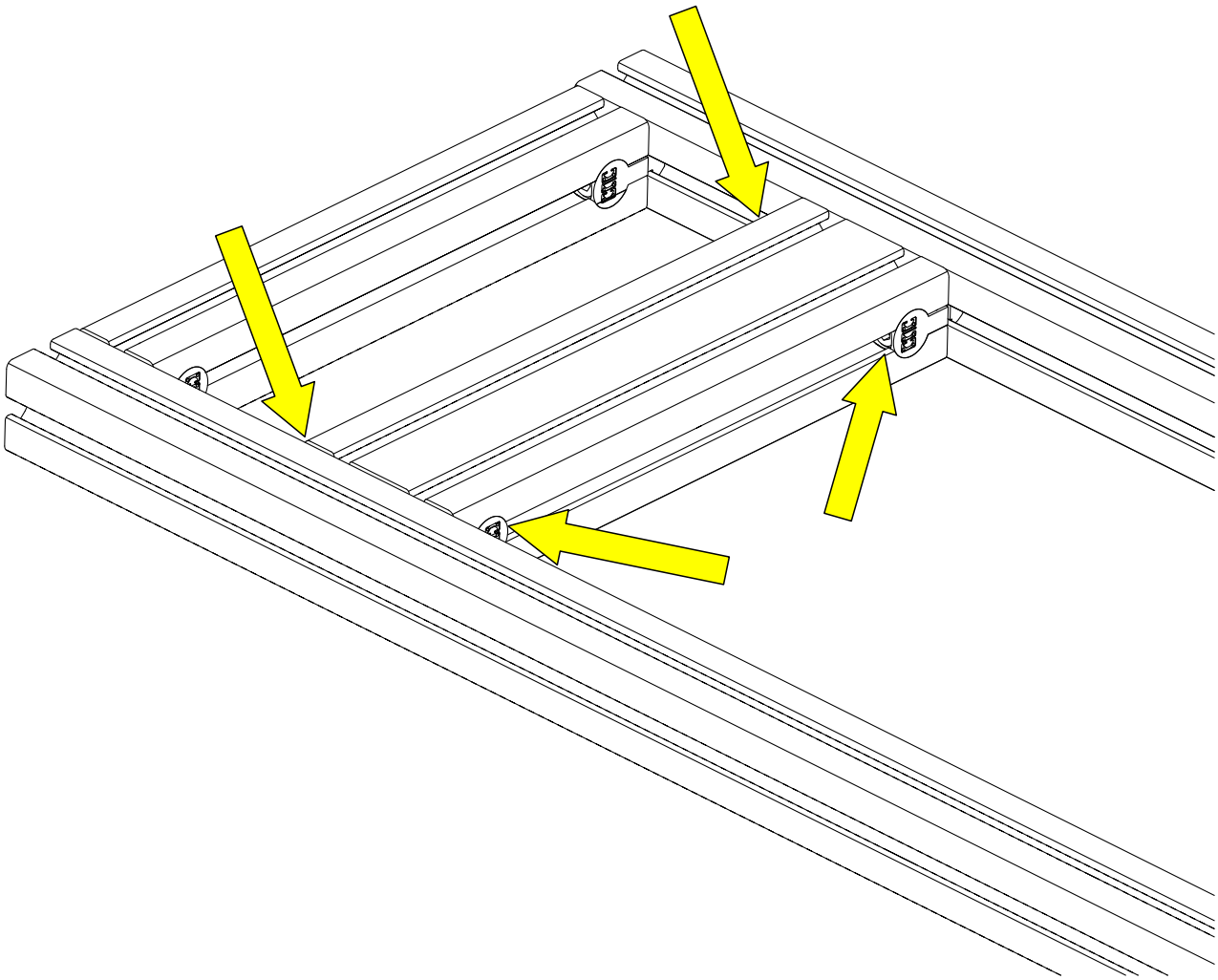
- Slide a 4040 extrusion assembly into the rotary frame on each end as indicated.



- Position the 4040 extrusion flush with the ends of the rotary frame as indicated.
- Fully tighten the 4040 extrusion assembly fasteners.

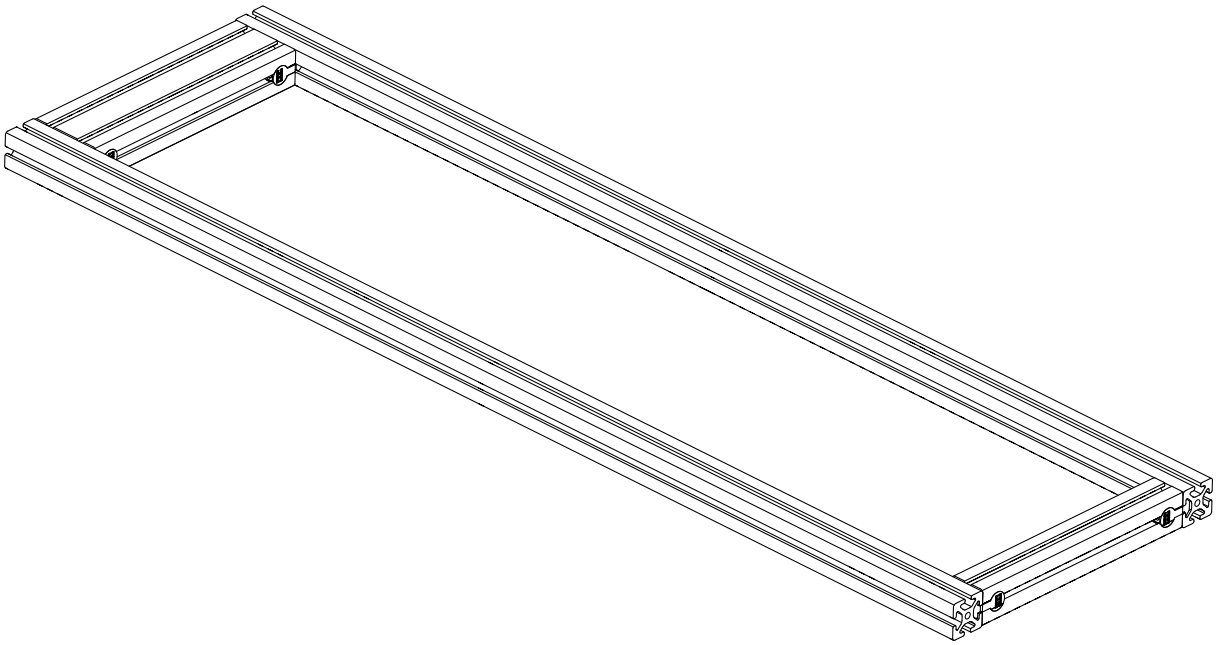


- Position the 4080 extrusion assembly 120mm (4-3/4") from the end of the rotary frame as indicated.



- Partially tighten the 4080 extrusion assembly anchor fasteners.

1.2 Frame Assembly - Table Top Mounted



Section Note

Skip to Section 1.3 if you are recess mounting your rotary assembly.

Parts and Tools Required

The following parts and tools will be used in Section 1.2

QTY	Part/Description	Packaged In
1	4080 Extrusion, 272mm (10-11/16")	Extrusion Box
1	4040 Extrusion, 272mm (10-11/16")	Extrusion Box
2	4040 Frame Extrusion, (length dependent on rotary size)	Extrusion Box
1	CRP190-00-FAST: - (8) M8 x 30mm Socket Head Cap Screw - (8) 40 Series Anchor Fastener - (4) M8 Roll-in T-Nut - (2) M8 Double Slide-in T-Nut *Remaining parts from this kit are not used in spoil board mounted configuration*	CRP190-00-BASE

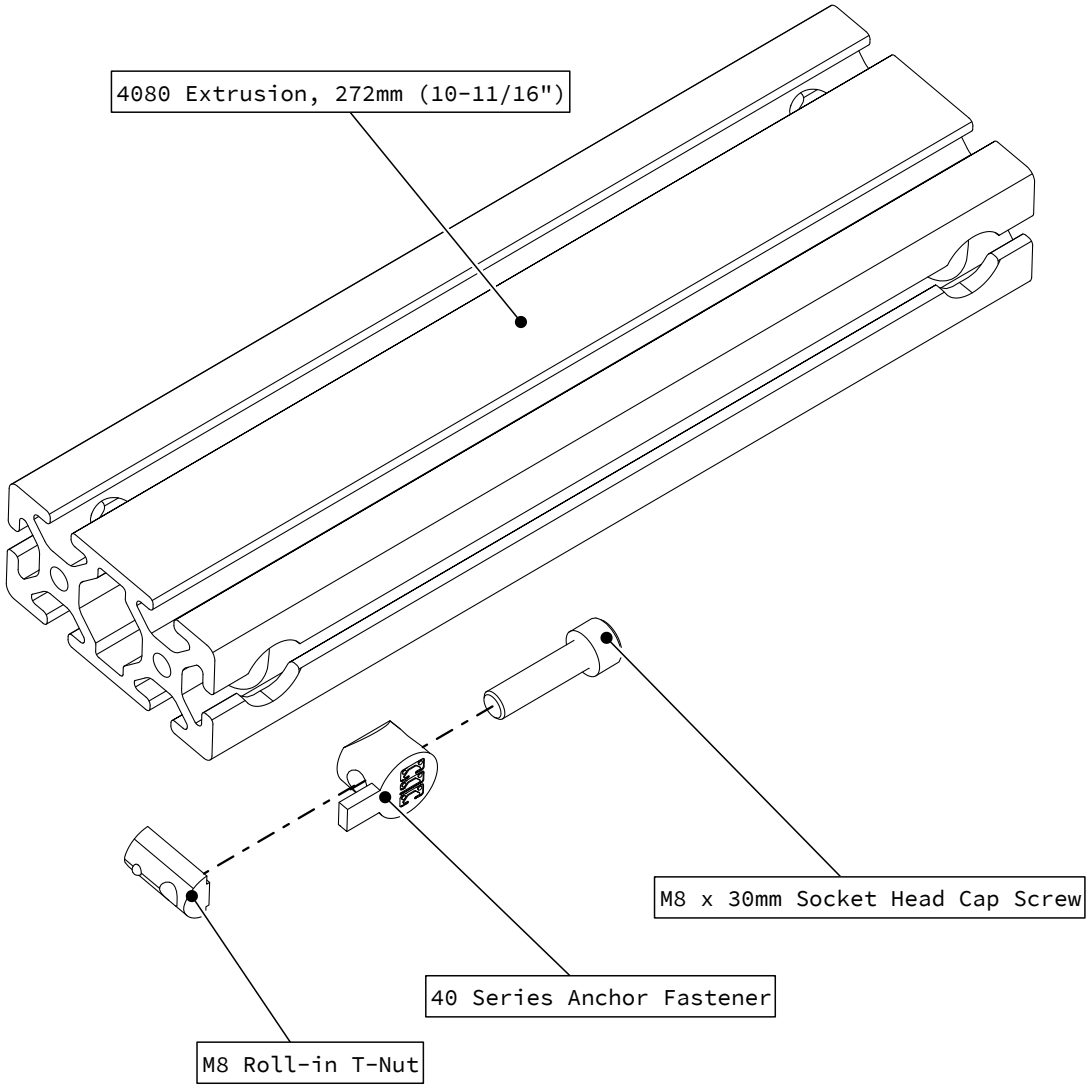
Note: Spoil board mounted configurations will not use the second piece of 4040 extrusion, 272mm (10-11/6")

Required Tools:

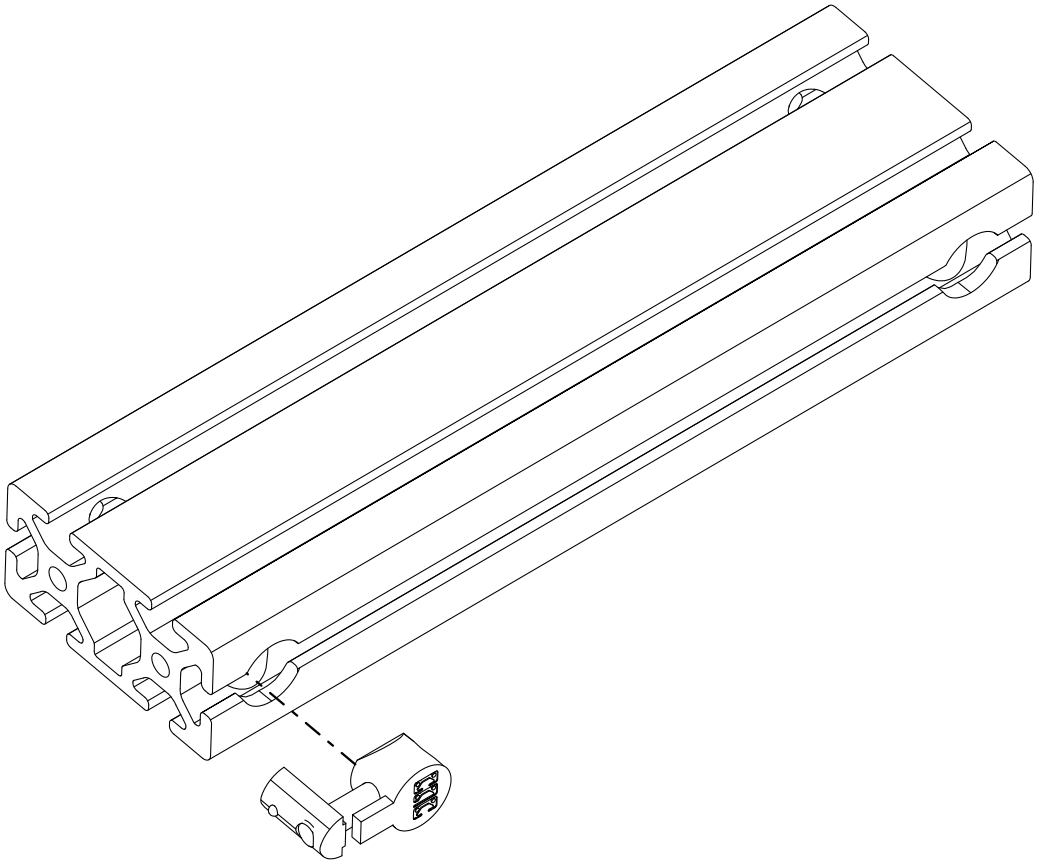
- 6mm Ball-End Allen Wrench

1.2.1 Assembly Steps

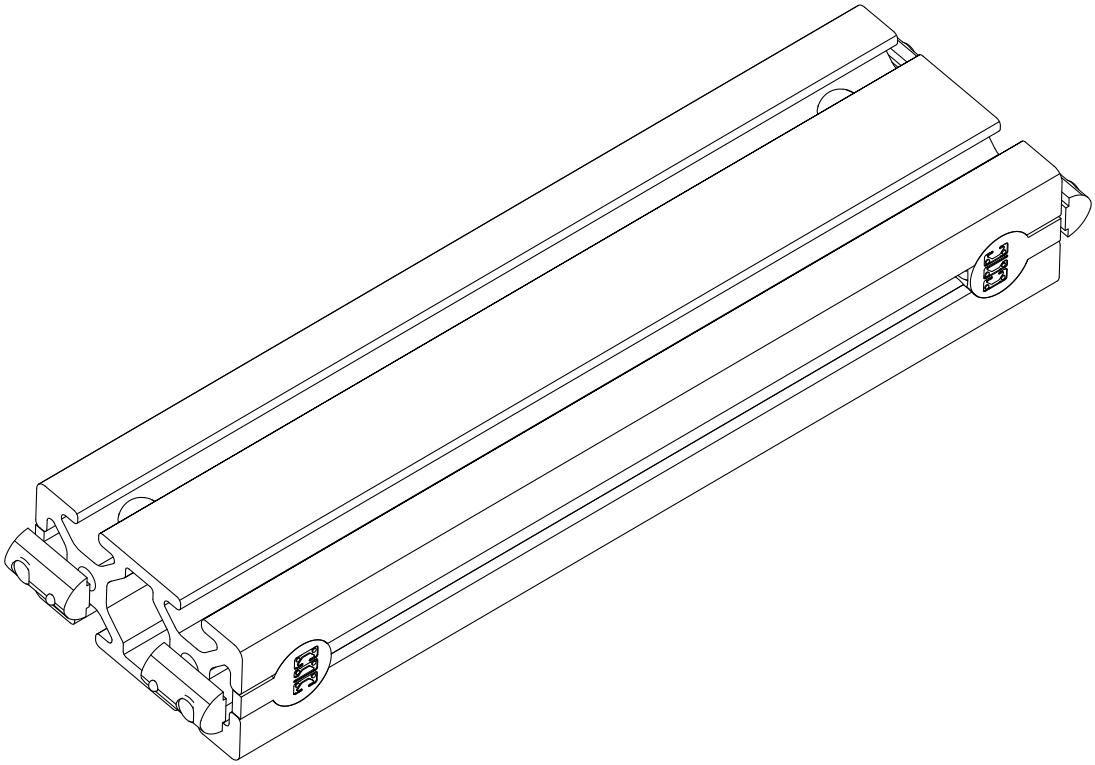
1.2.2.1



- Thread a socket head cap screw into the T-Nut through the anchor fasteners, as indicated.



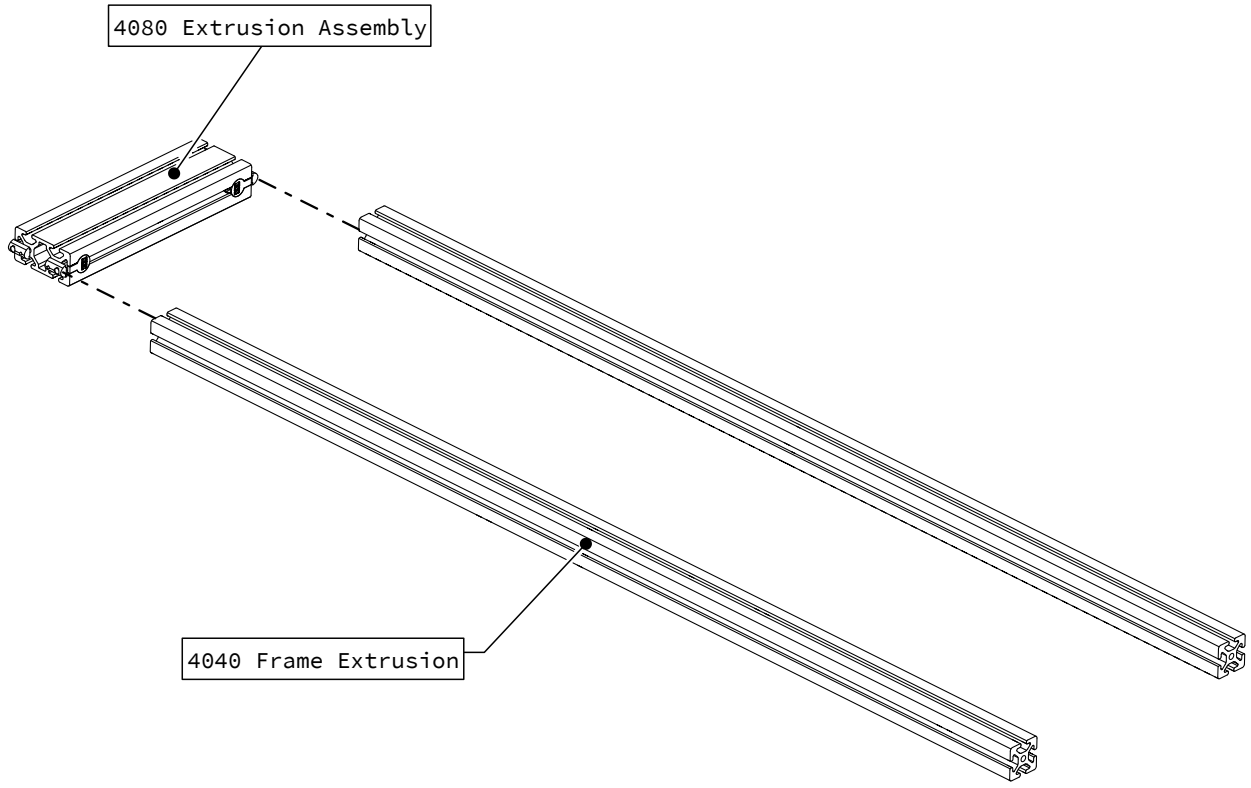
- Slide the anchor assembly into the 4080 extrusion.



- Repeat this process at each corner of the extrusion.

Assembly Note

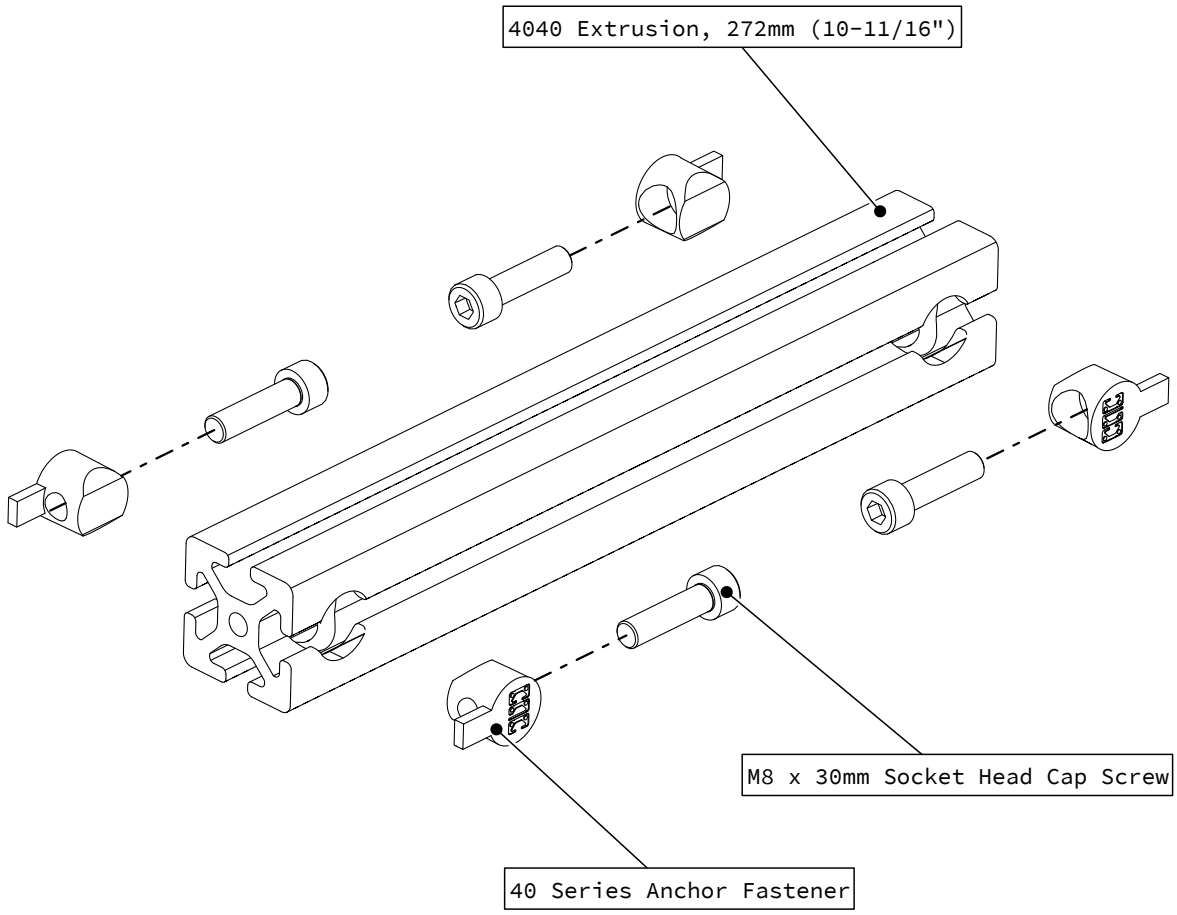
Note the position of the Roll-in T-Nuts, with the long side oriented towards the center of the extrusion.



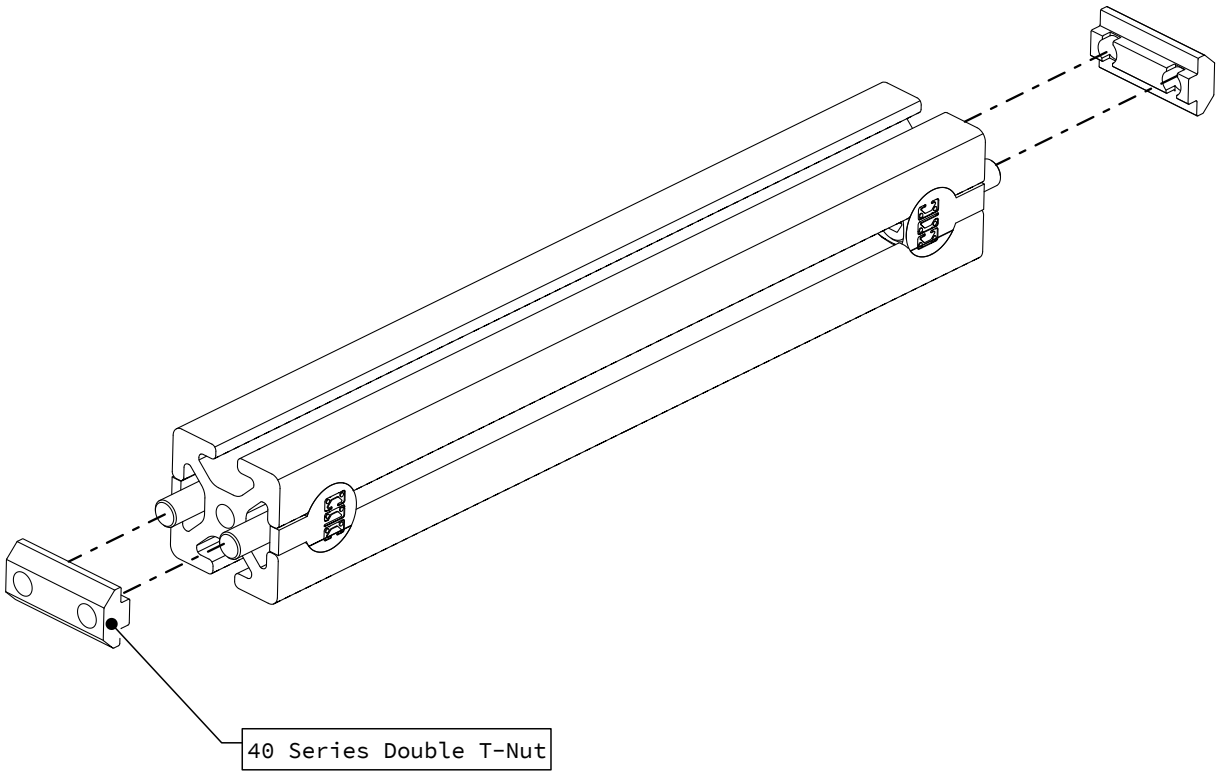
- Slide the 4080 extrusion assembly into the 4040 frame extrusion pieces as indicated.

Assembly Note

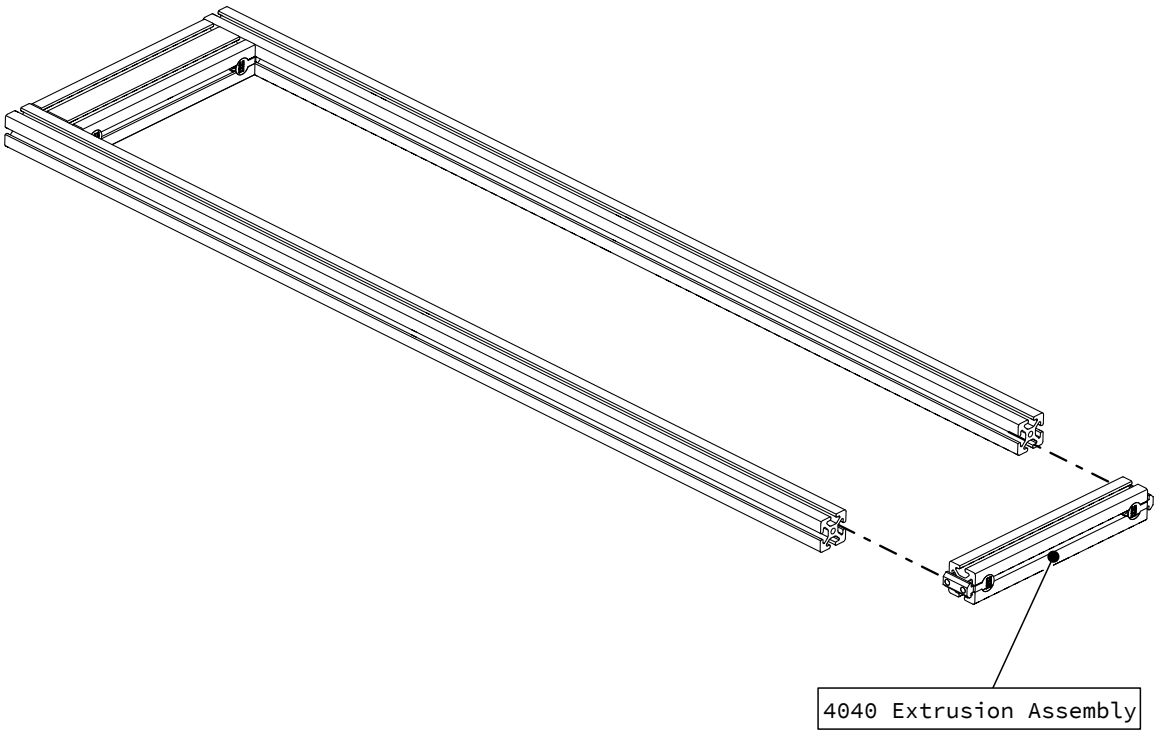
The length of your 4040 frame extrusion will vary depending upon the overall length of your rotary assembly.



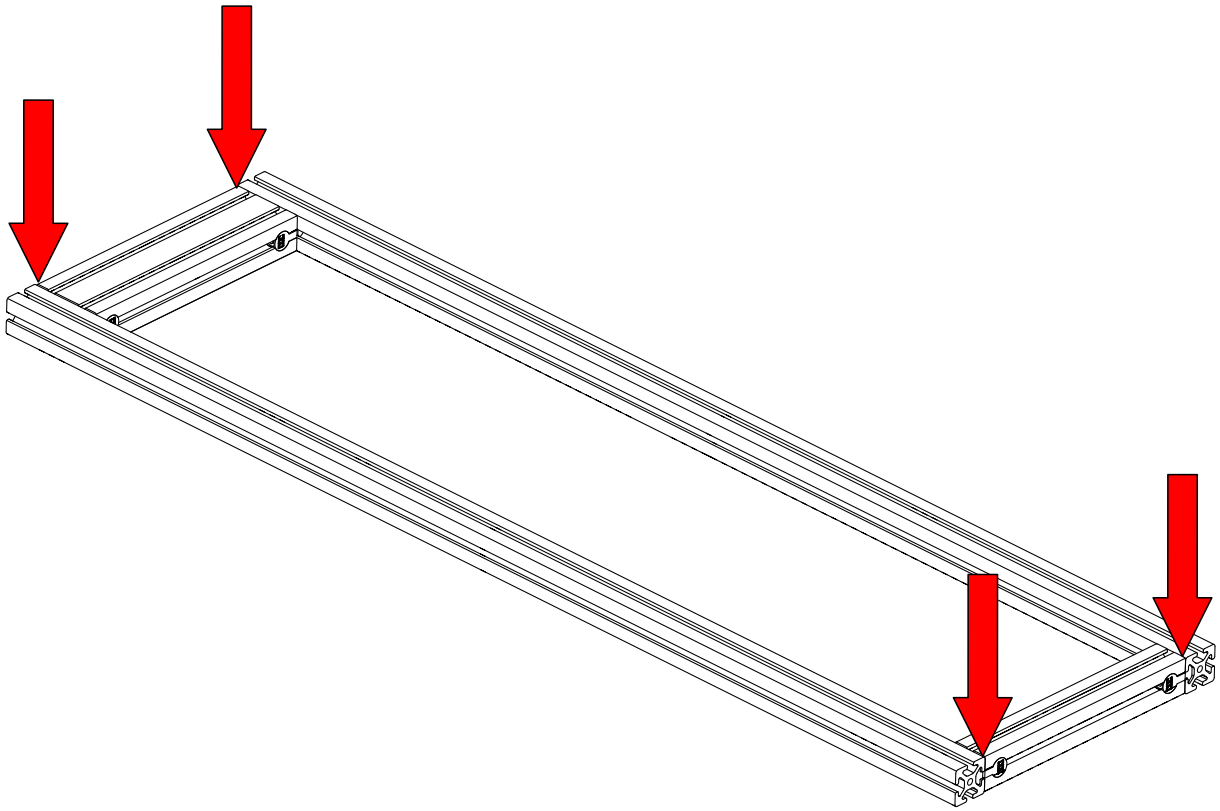
- Insert a socket head cap screw through the anchor fastener as indicated.



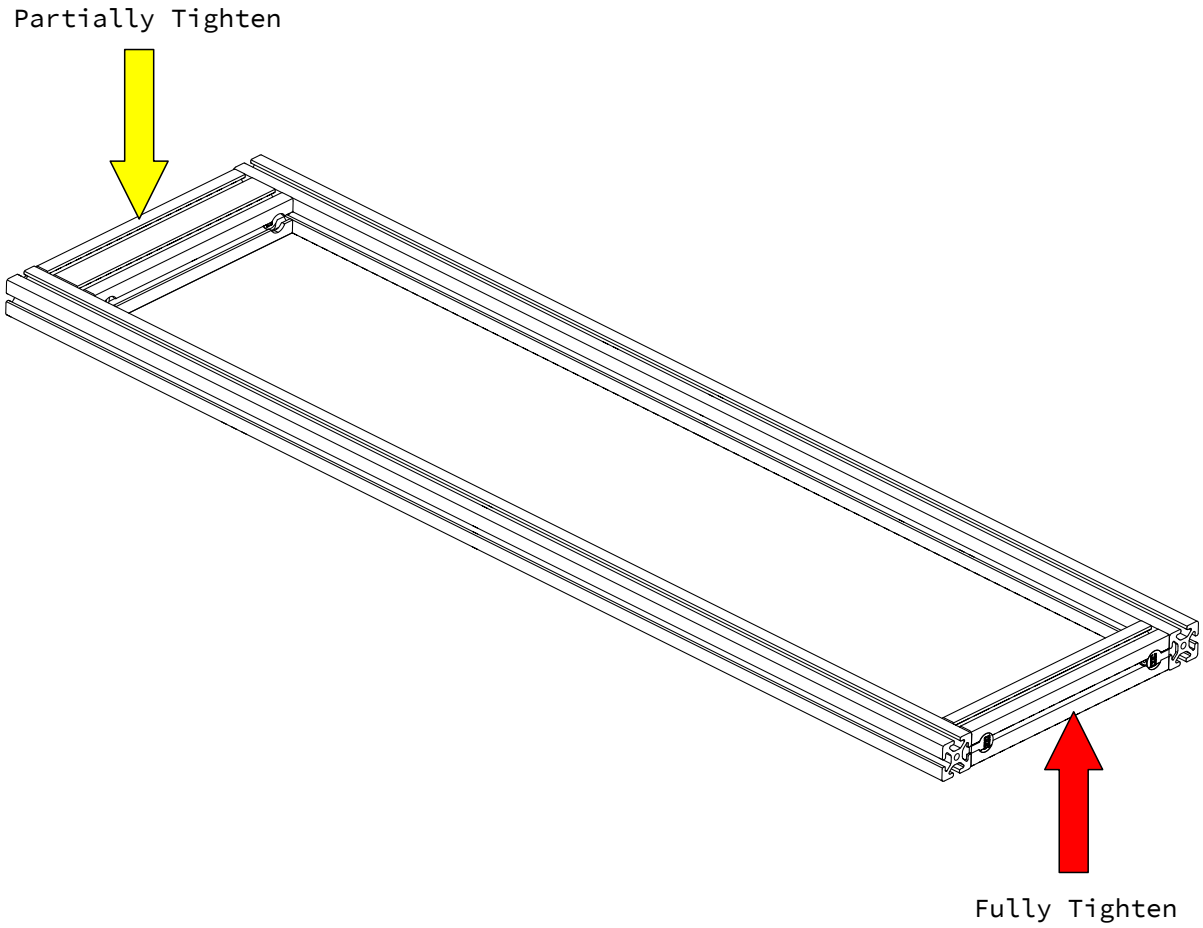
- Slide the anchor fastener into the 4040 extrusion.
- Partially thread the fasteners into the double T-Nut as indicated.



- Slide the 4040 extrusion assembly into the rotary frame as indicated.

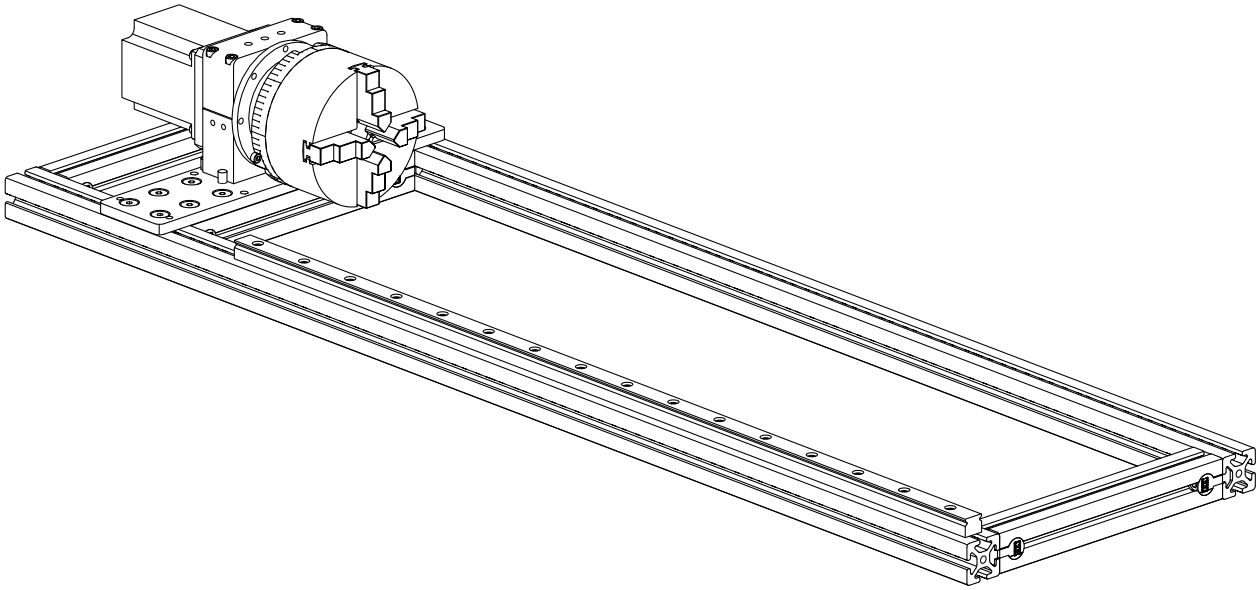


- Position the 4040 and 4080 extrusion assemblies flush with the ends of the rotary frame as indicated.



- Partially tighten the 4080 extrusion fasteners.
- Fully tighten the 4040 extrusion fasteners.

1.3 Chuck Assembly



Section Note

The remaining steps will apply for both recessed and spoil board mounting configurations.

Parts and Tools Required

The following parts and tools will be used in Section 1.3

QTY	Part/Description	Packaged In
1	CRP191-01, Chuck Plate	CRP190-00-HW
1	CRP191-02, Bottom Chuck Clamp	CRP190-00-HW
1	CRP191-03, Top Chuck Clamp	CRP190-00-HW
1	CRP191-05, Adapter Plate	CRP190-00-HW
1	Planetary Reducer	CRP190-00-BASE
1	Four-Jaw Self-Centering Chuck	CRP190-00-BASE
1	NEMA 34 Stepper Motor	Rotary Electronics
2	Linear Rail, (length dependent on rotary size)	Rail Tube
2	GH20-XXXX-FAST, Linear Rail Fastener Kit *	Rail Tube
1	CRP191-00-FAST: - (12) M8 x 20mm Flat Head Cap Screw - (12) M8 Roll-in T-Nut - (3) M5 x 14mm Socket Head Cap Screw - (4) M8 x 16mm Socket Head Cap Screw - (4) M6 x 60mm Socket Head Cap Screw - (1) M5 x 12mm Shoulder Bolt - (7) M6 x 25mm Flat Head Cap Screw - (3) M8 x 20mm Socket Head Cap Screw - (4) M6 x 20mm Socket Head Cap Screw *Remaining parts from this kit used in Section 1.5*	CRP190-00-BASE
1	Linear Rail Setting Jig Kit: - (2) Rail Alignment Jig - (4) M8 x 25mm Socket Head Cap Screw - (4) M8 Roll-in T-Nut	CRP190-00-BASE

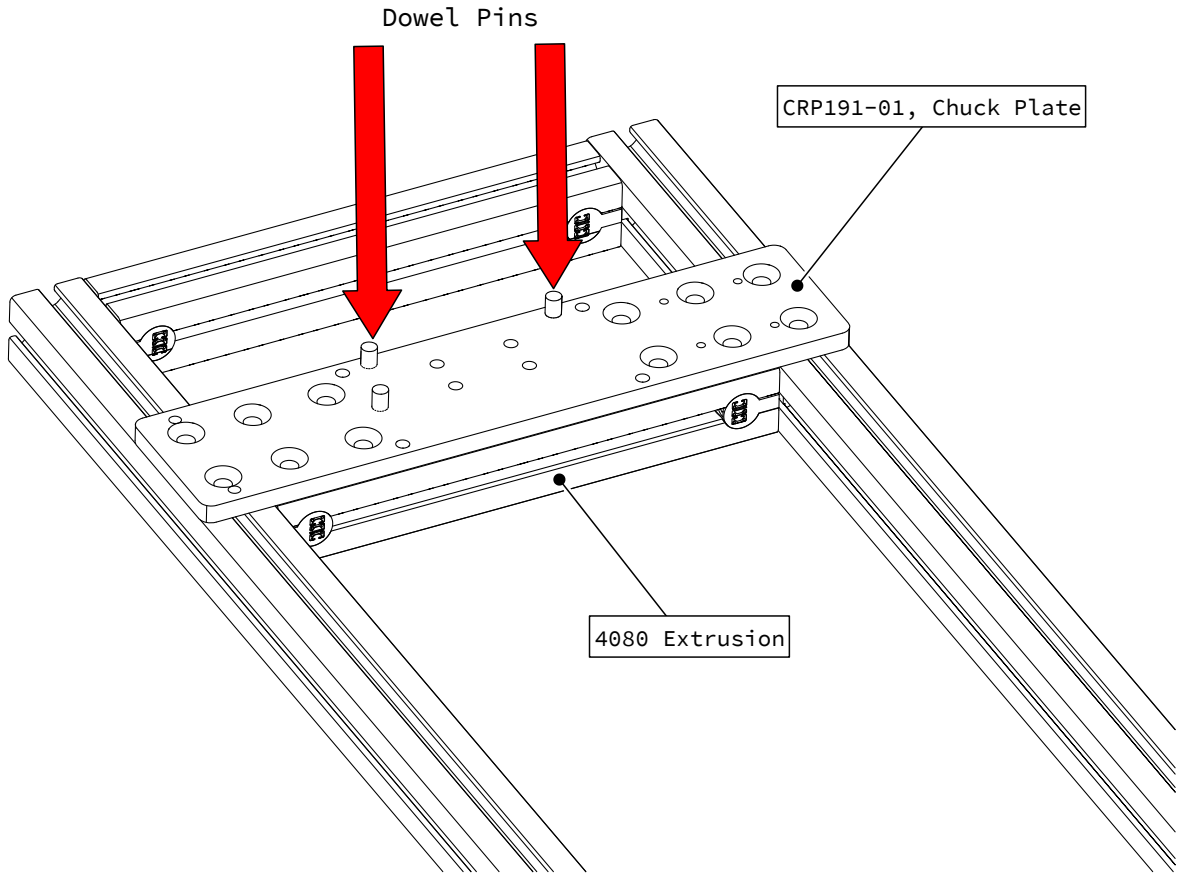
Note: Linear Rail Fastener Kits will vary depending on length of linear rails.

Required Tools:

- 4mm Allen Wrench
- 5mm Allen Wrench
- 6mm Allen Wrench
- 6mm Stubby Allen Wrench *(provided with rotary kit, located in CRP193-00)*
- Framing Square
- (2) Clamps
- Tape Measure

1.3.1 Chuck Plate Assembly

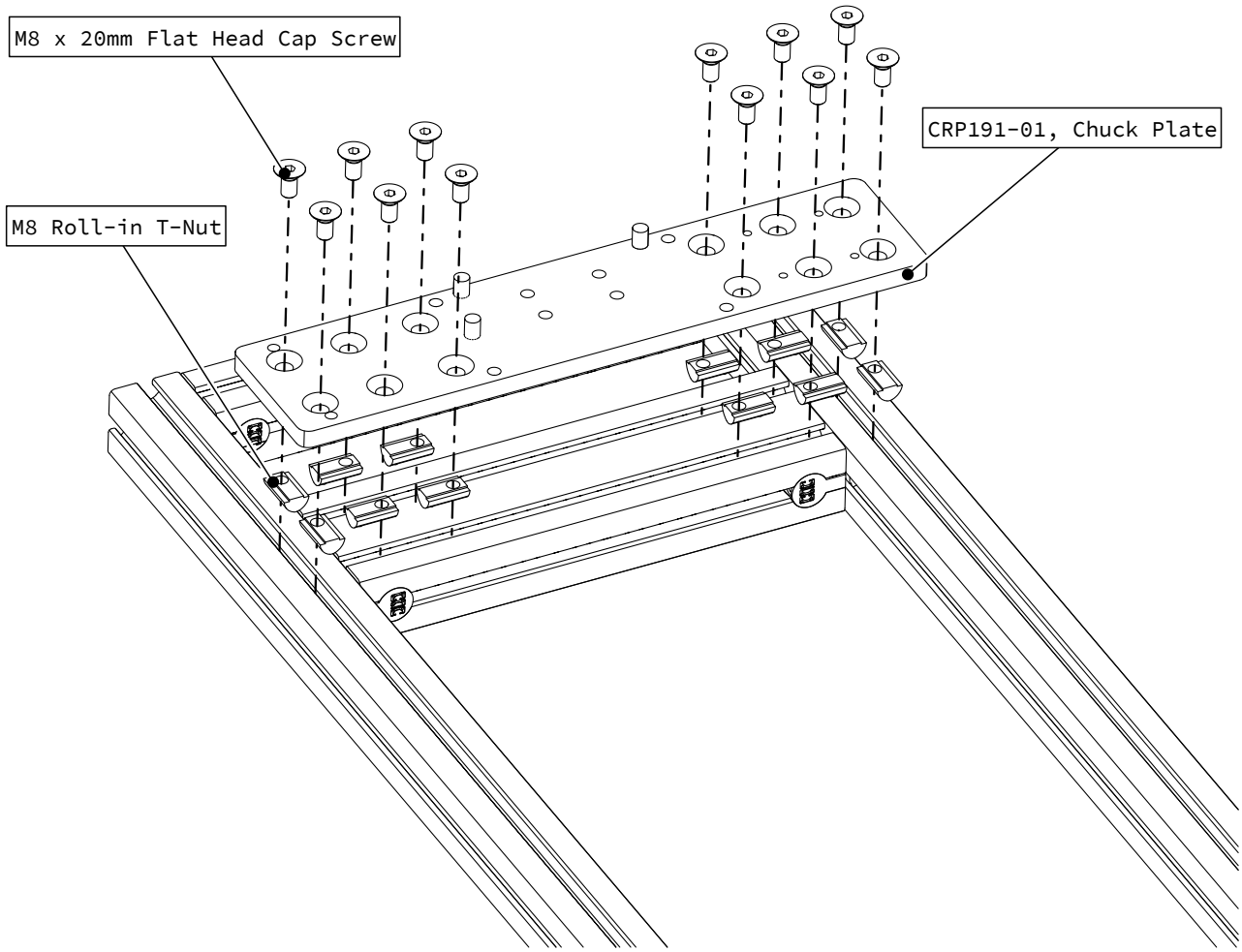
1.3.1.1



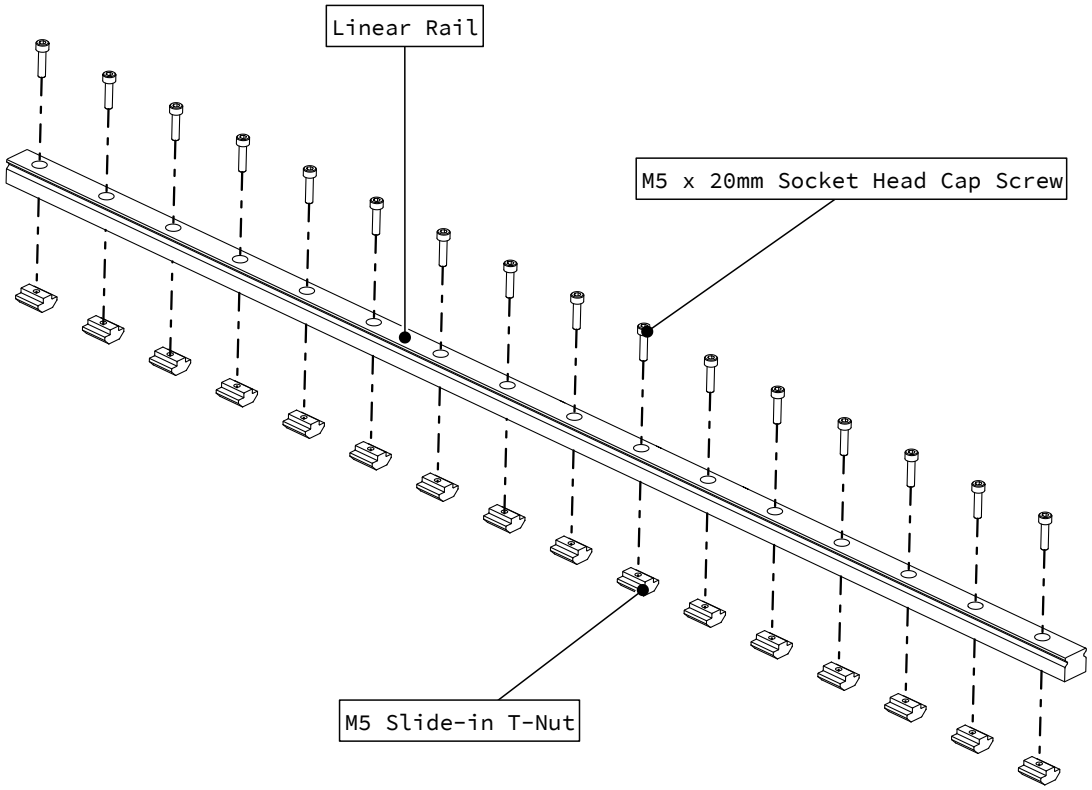
- Place the chuck plate on top of the 4080 extrusion as indicated.

Assembly Note

Note the orientation of the chuck plate, with dowel pins towards the end of the rotary frame.

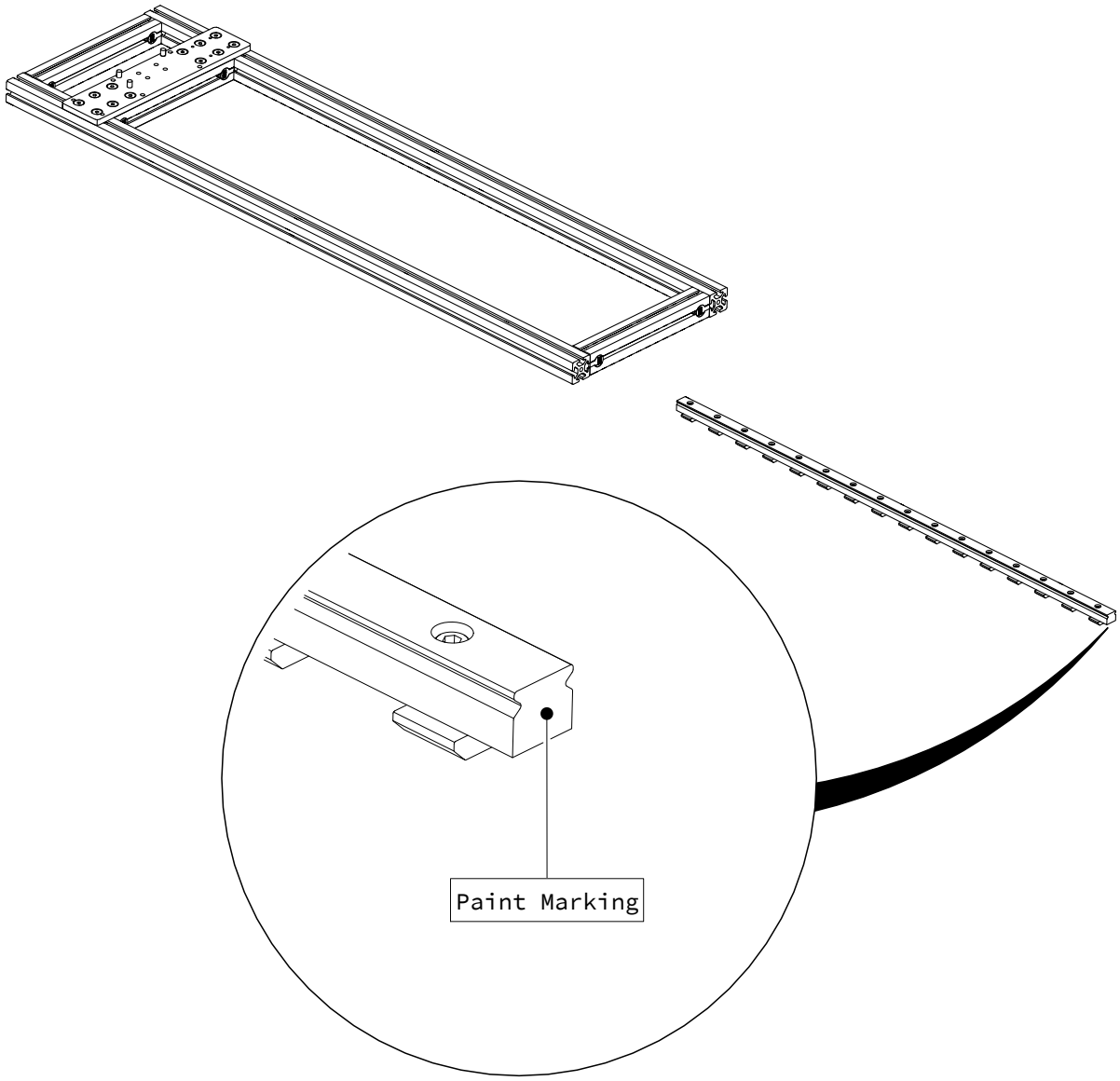


- Attach the chuck plate to the 4080 extrusion as indicated.
- Partially tighten the fasteners.

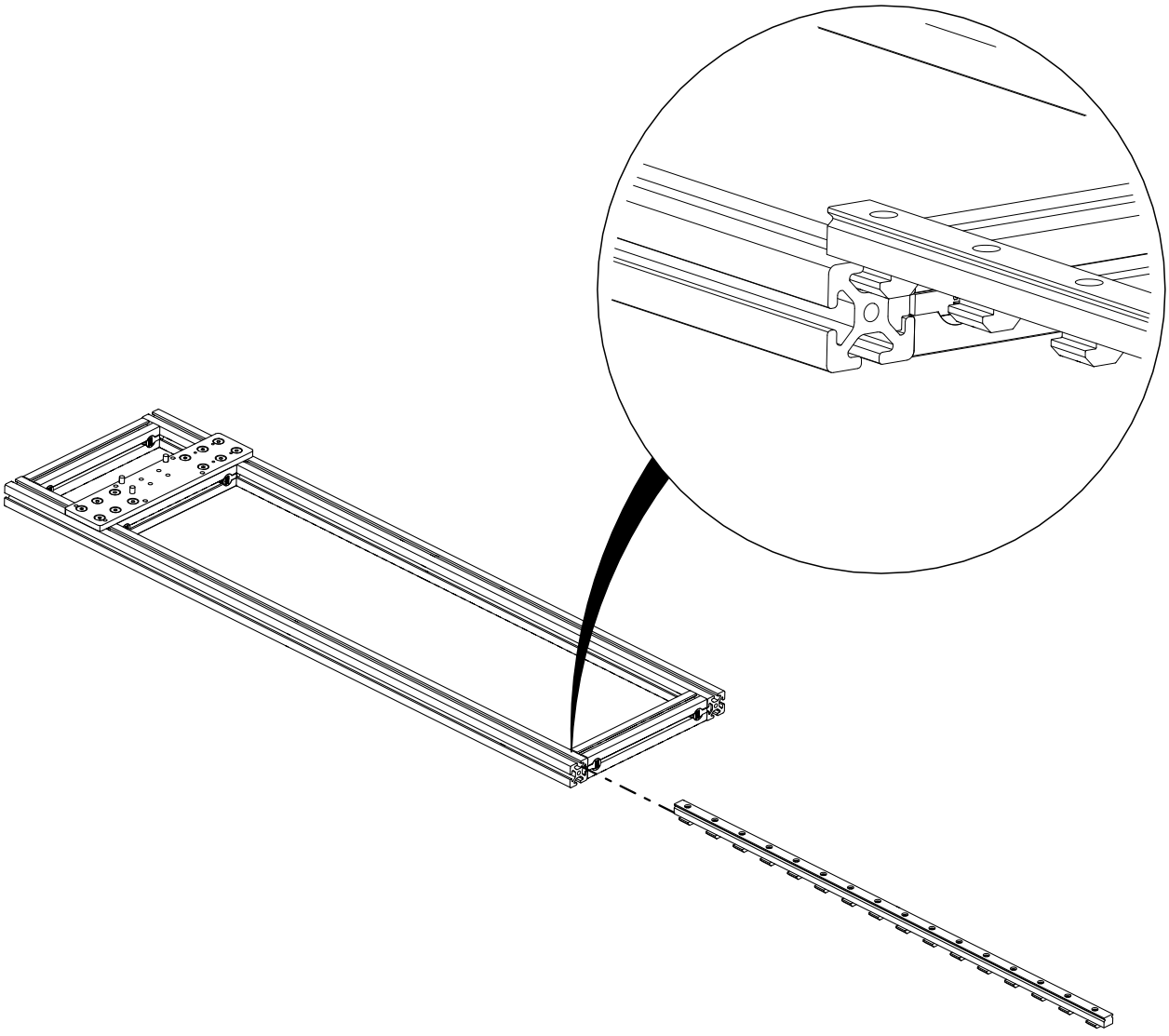


- Partially thread fasteners into the linear rail as indicated.

- Repeat this step with the second linear rail.



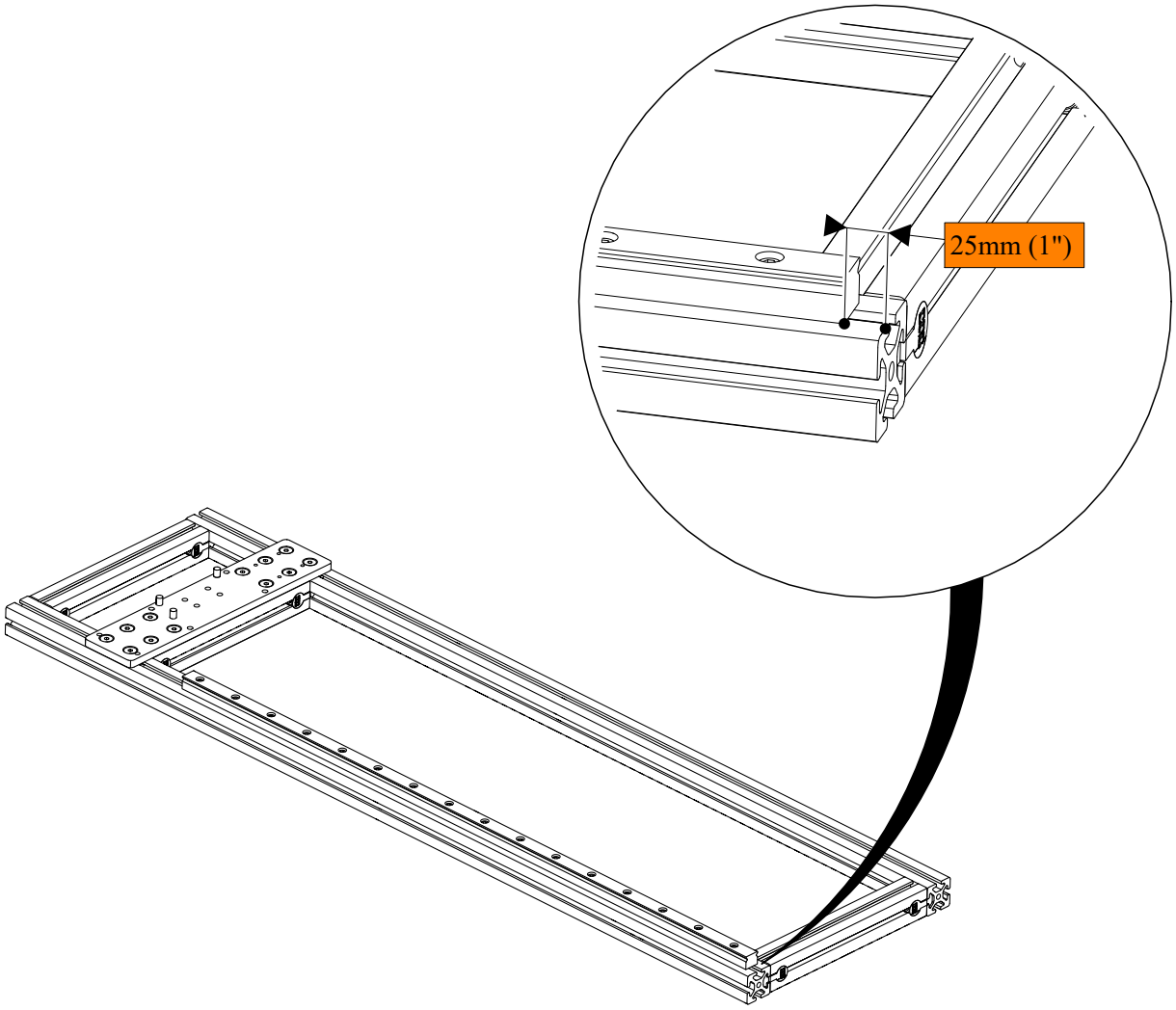
- Each linear rail will have a paint marking on one end.
- Orient the linear rail as indicated, with the marking facing away from the rotary frame.



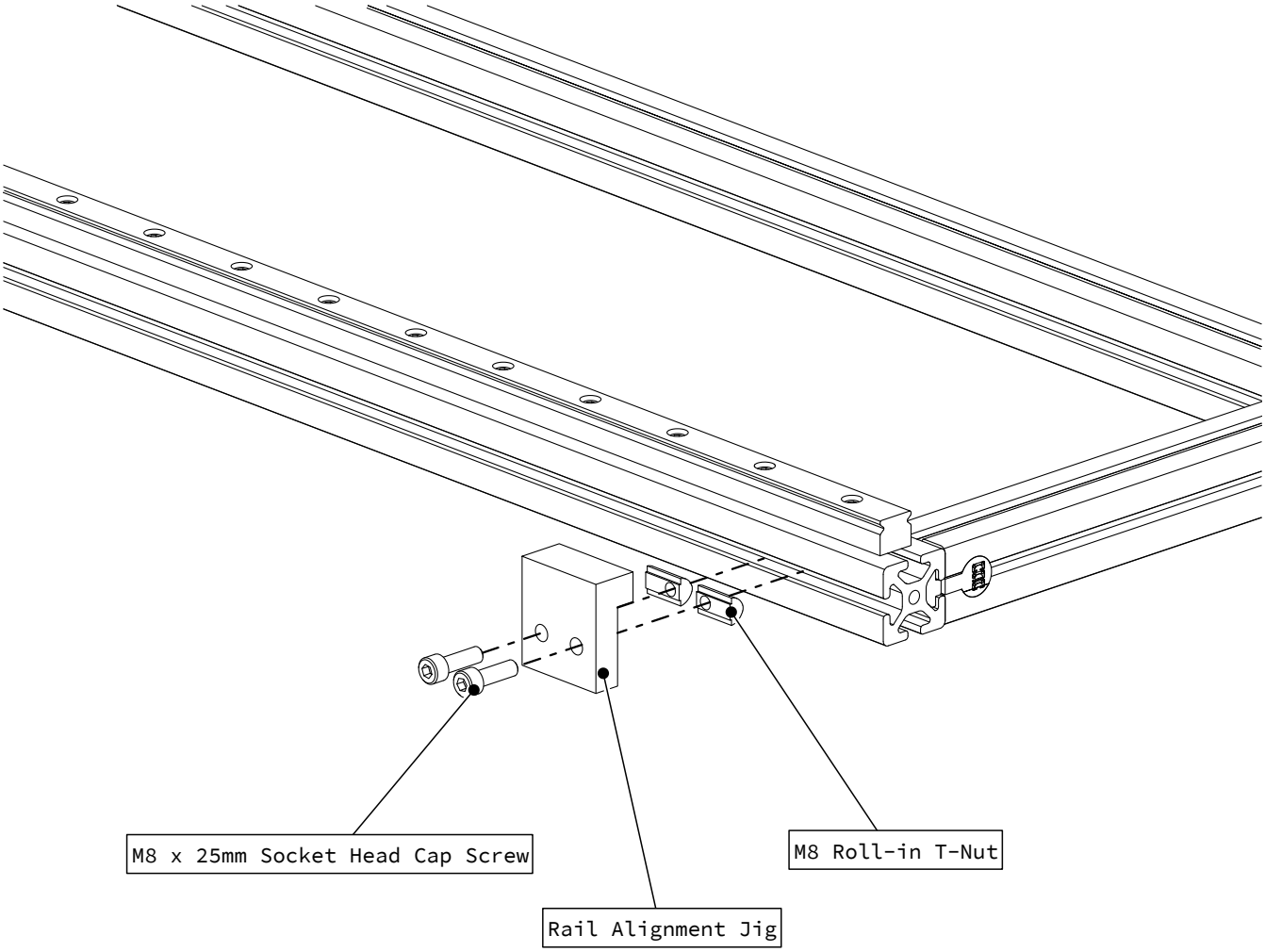
- Slide the linear rail into the frame extrusion as indicated.
- Partially tighten the fasteners.

Assembly Note

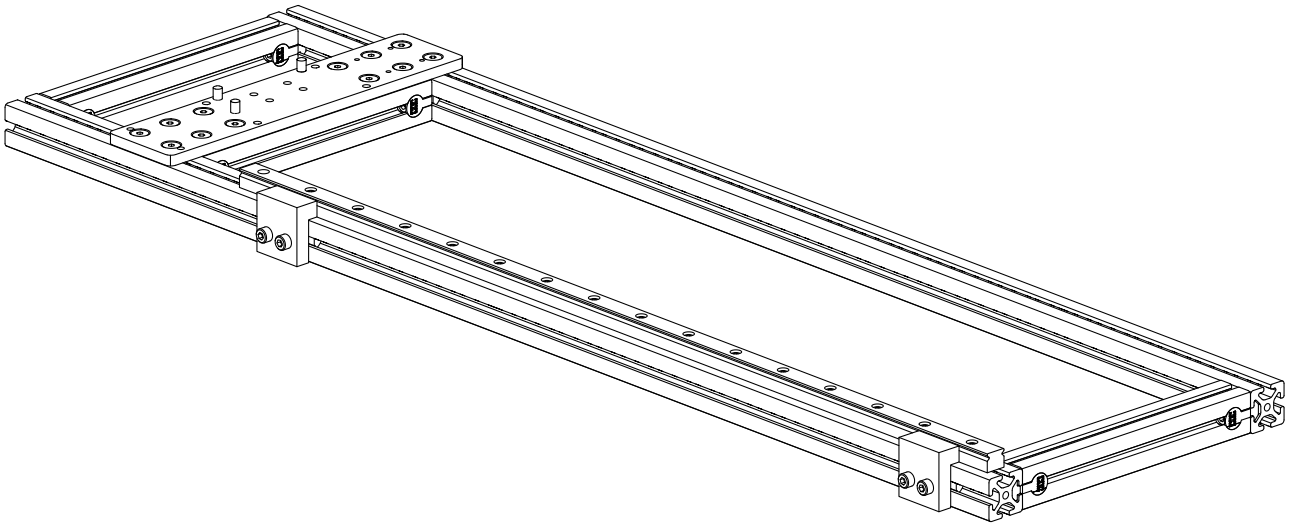
The second linear rail will be installed in Section 1.4.



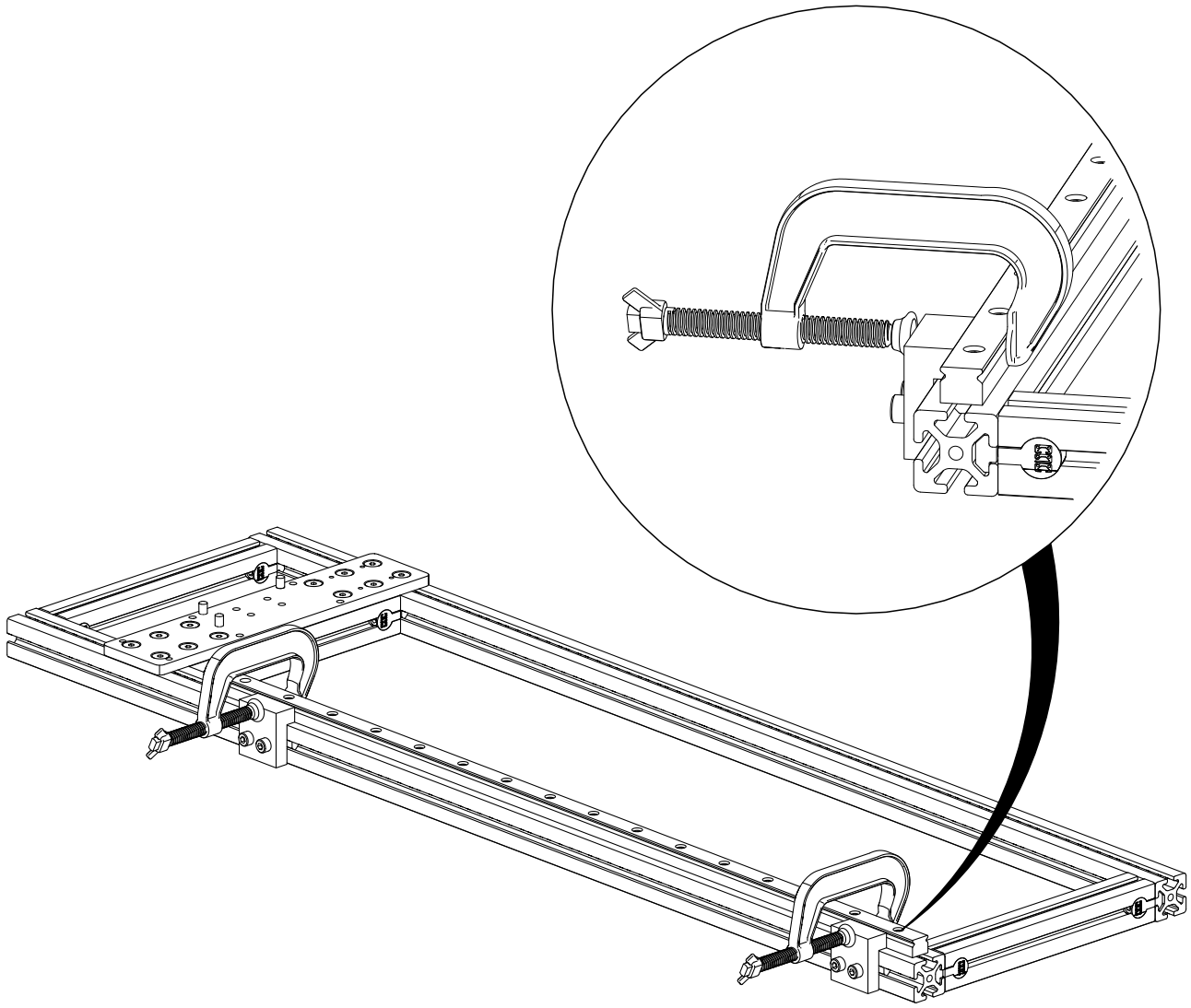
- Position the rail 25mm (1") from the end of the rotary frame as indicated.



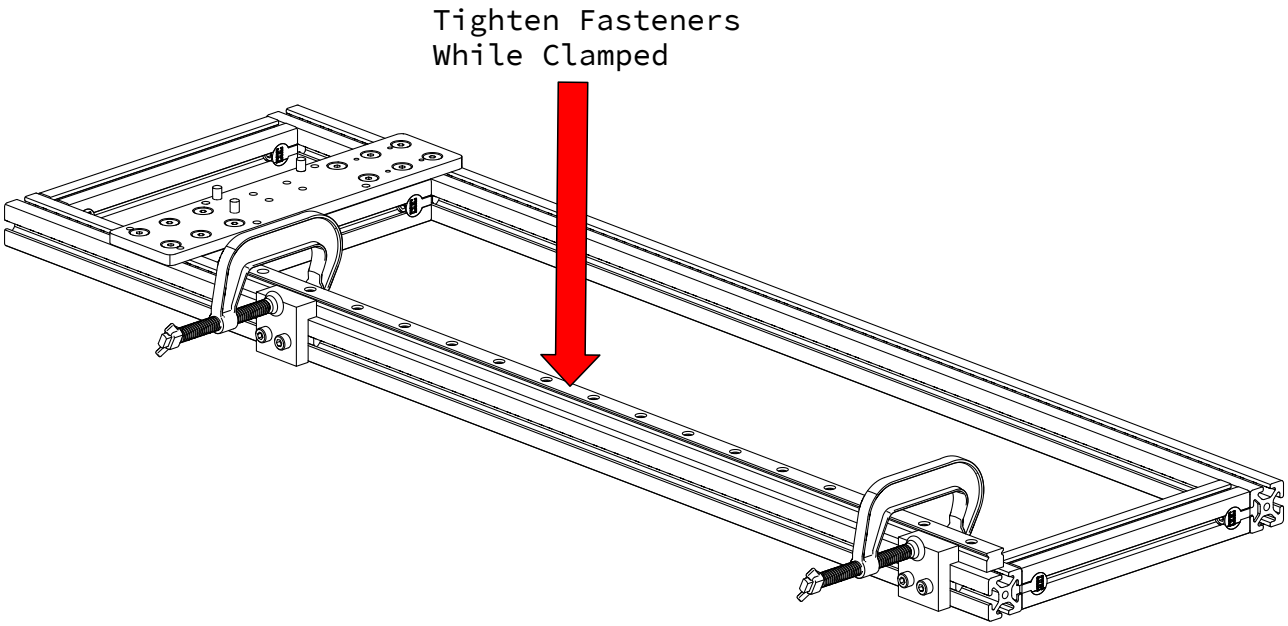
- Attach the rail alignment jig to the extrusion as indicated.
- Fully tighten the two fasteners.



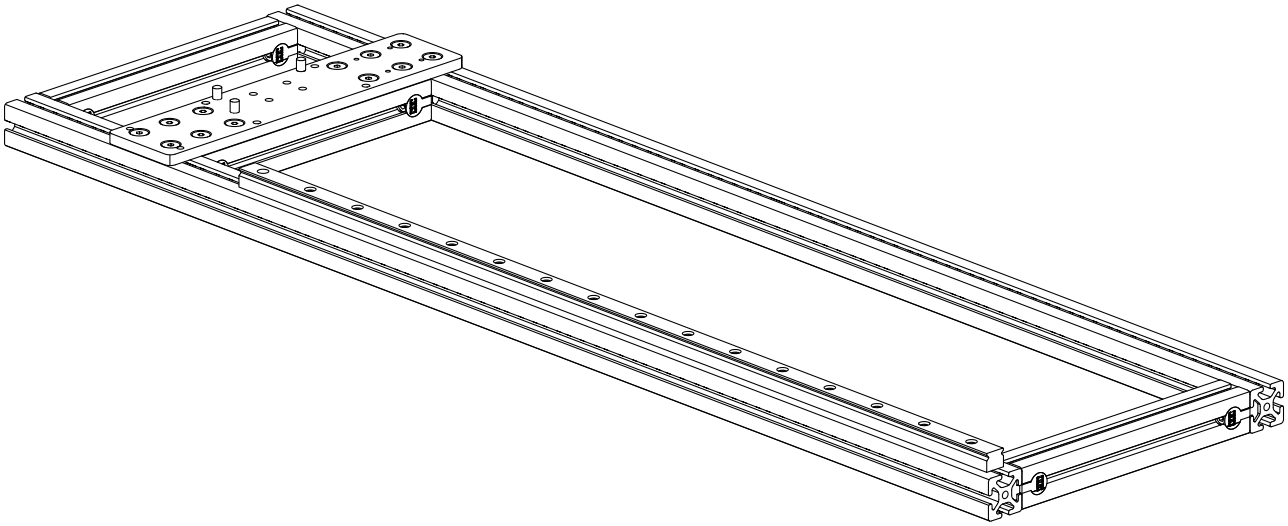
- Repeat this process at the other end of the linear rail.



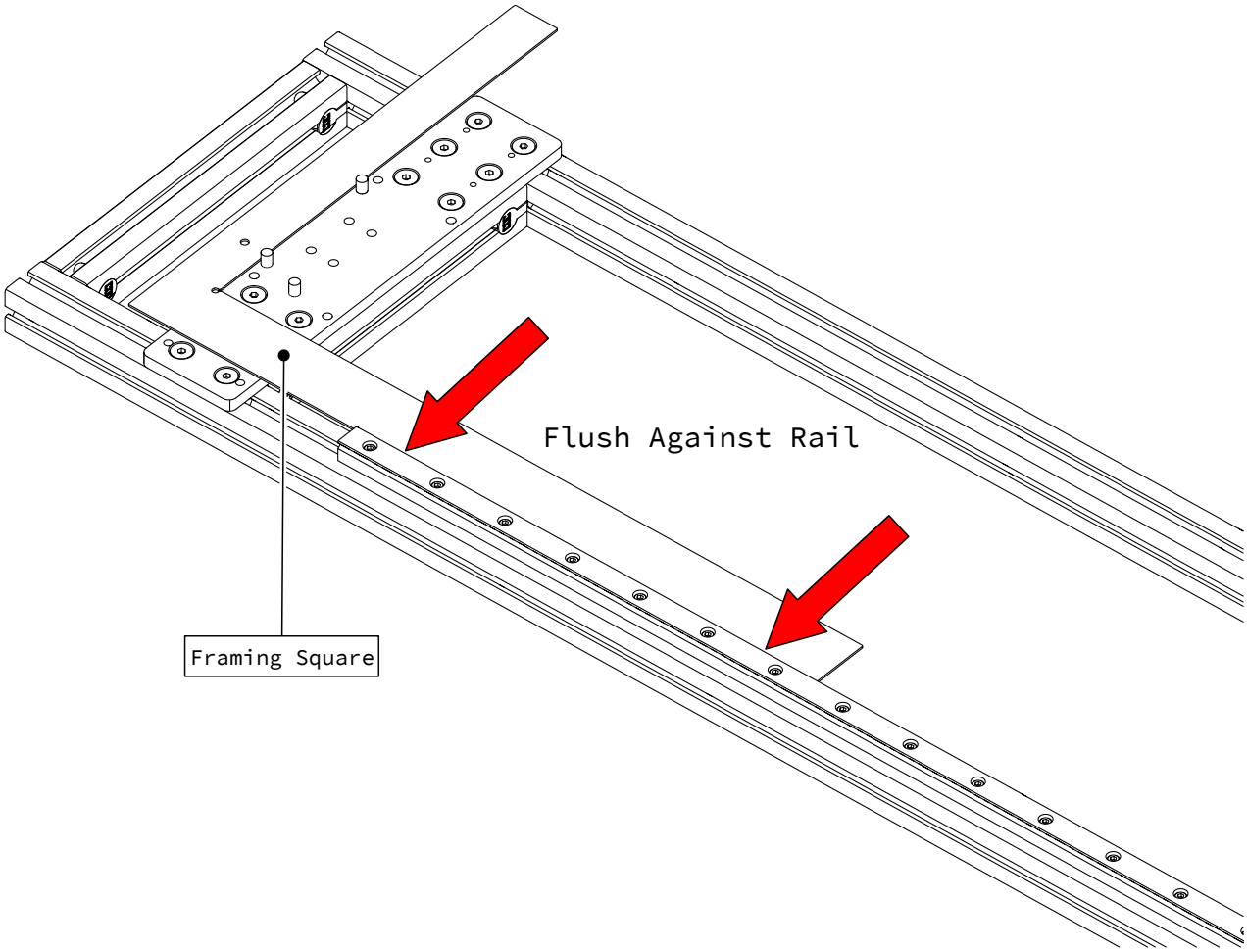
- Clamp the linear rail to the jigs as indicated.



- Tighten the rail fasteners while clamped.



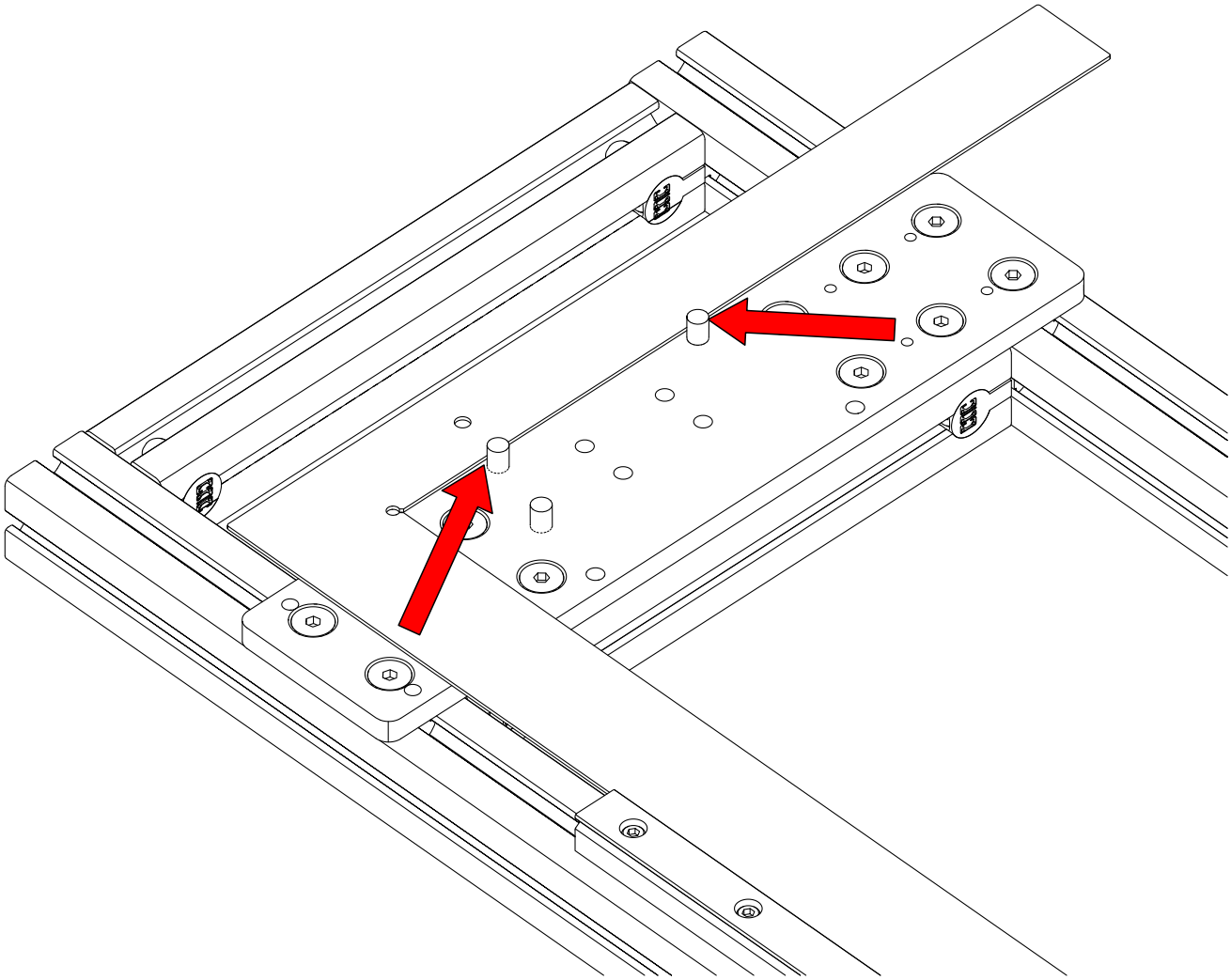
- Remove the clamps and rail alignment jigs.



- Place a framing square flush against the linear rail as indicated.

Assembly Note

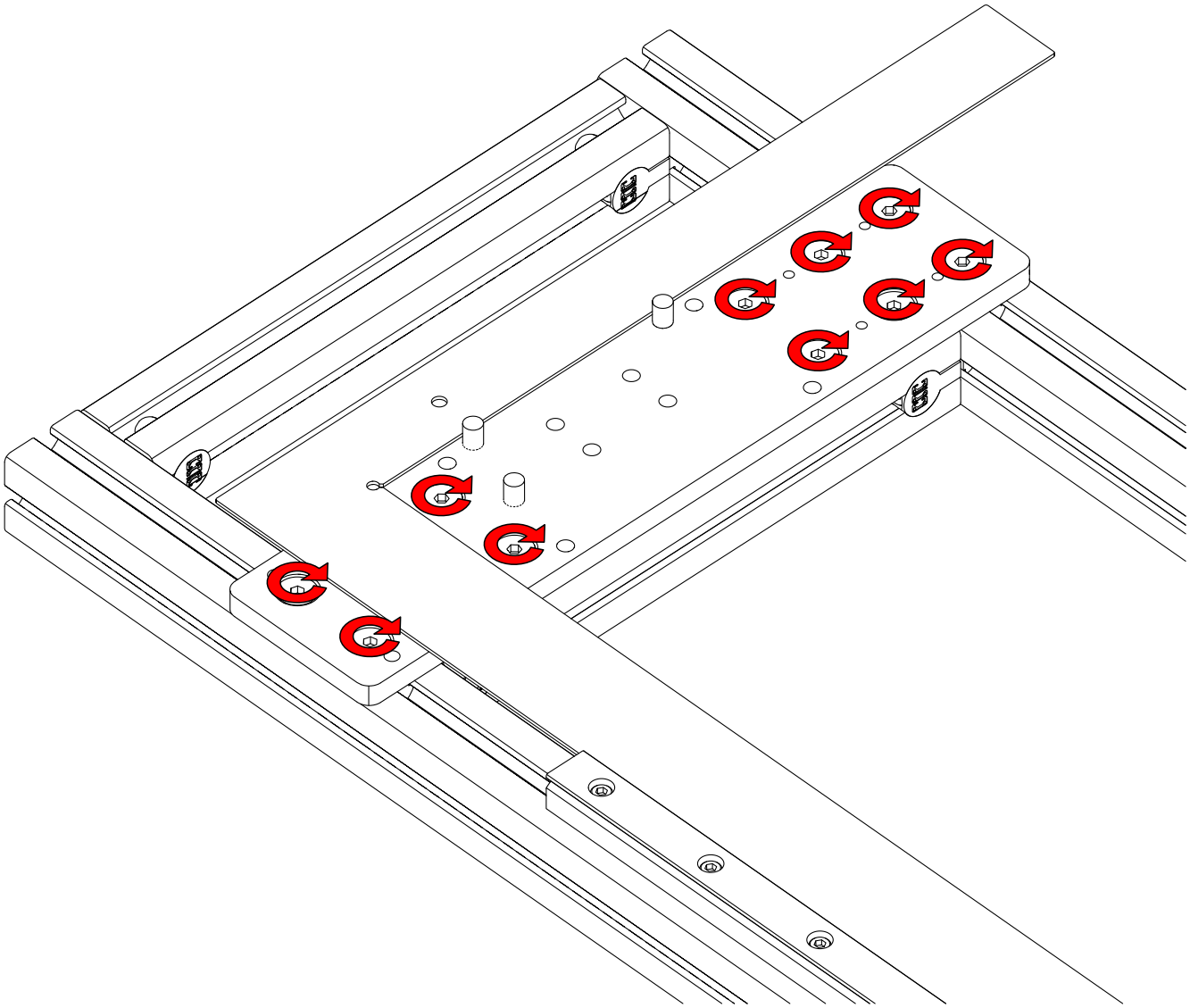
These alignment steps can effect the tolerances of parts cut on your rotary unit. Take your time to ensure your rotary unit is assembled correctly!



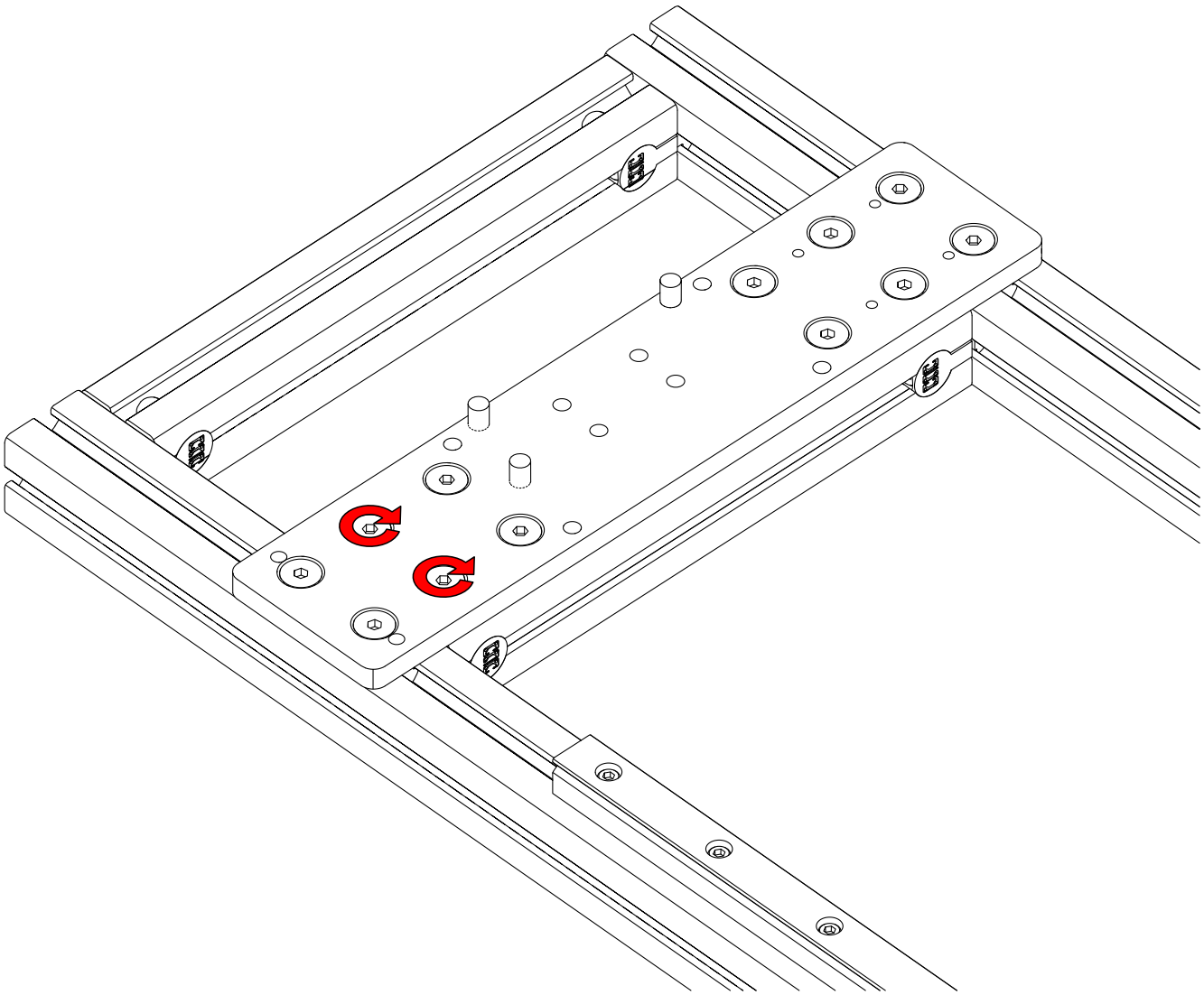
- Adjust the chuck plate until the indicated dowel pins are flush against the framing square.

Assembly Note

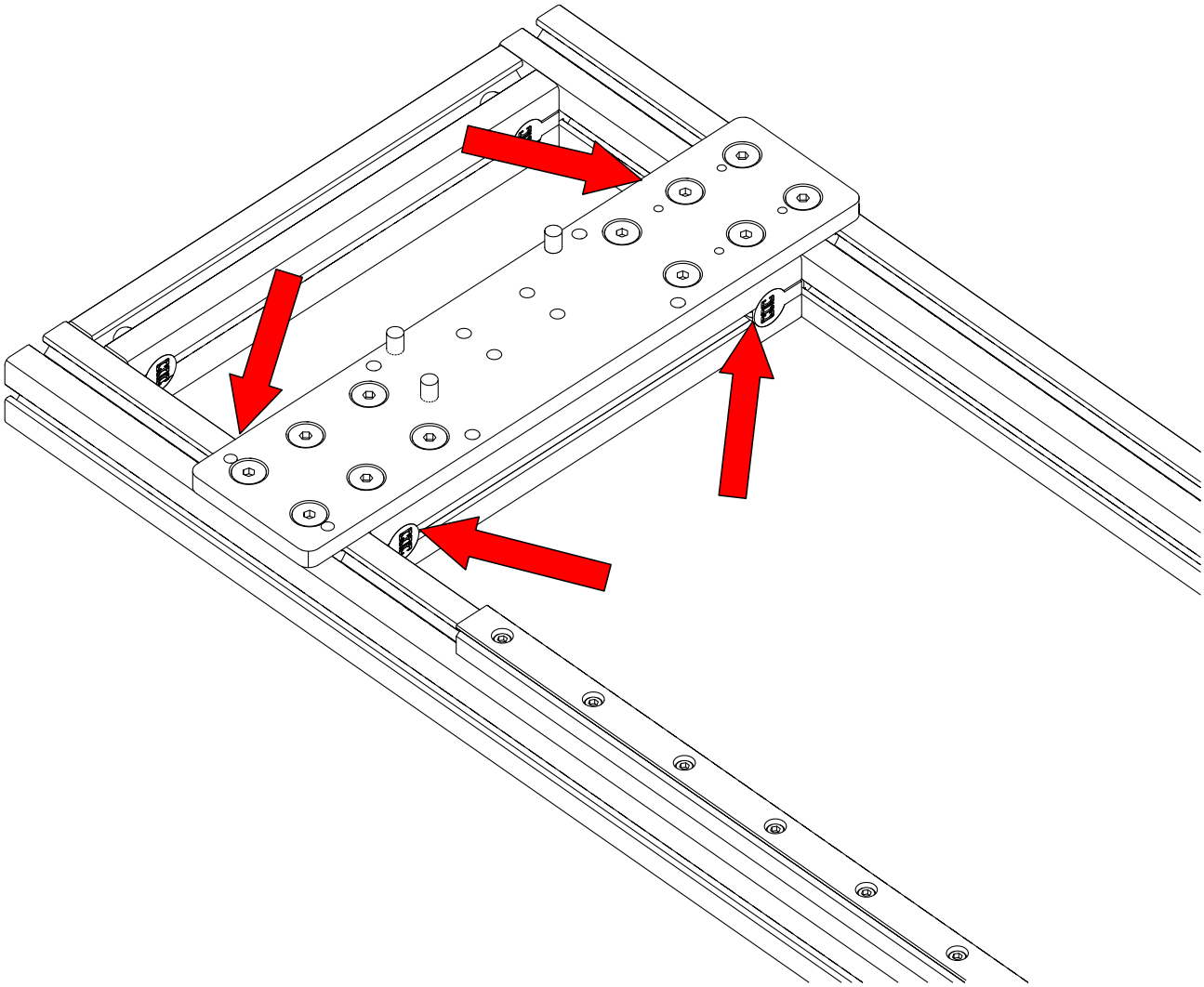
When the chuck plate is properly adjusted, the framing square will be flush against the dowel pins and linear rail



- With the chuck plate adjusted correctly, tighten the chuck plate fasteners.



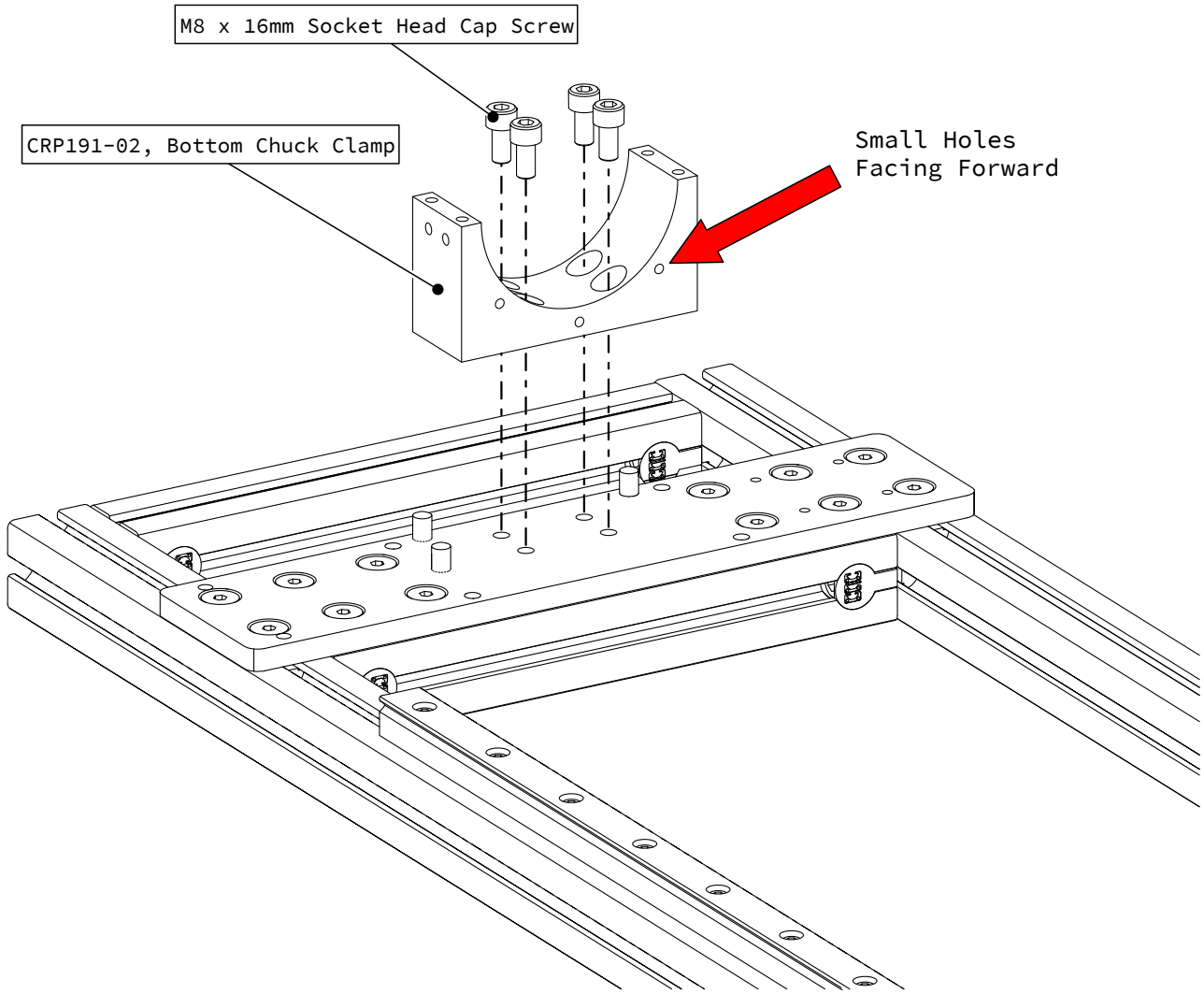
- Remove the framing square.
- Tighten the remaining fasteners.



- Fully tighten the (4) 4080 extrusion anchor fasteners.

1.3.2 Chuck Installation

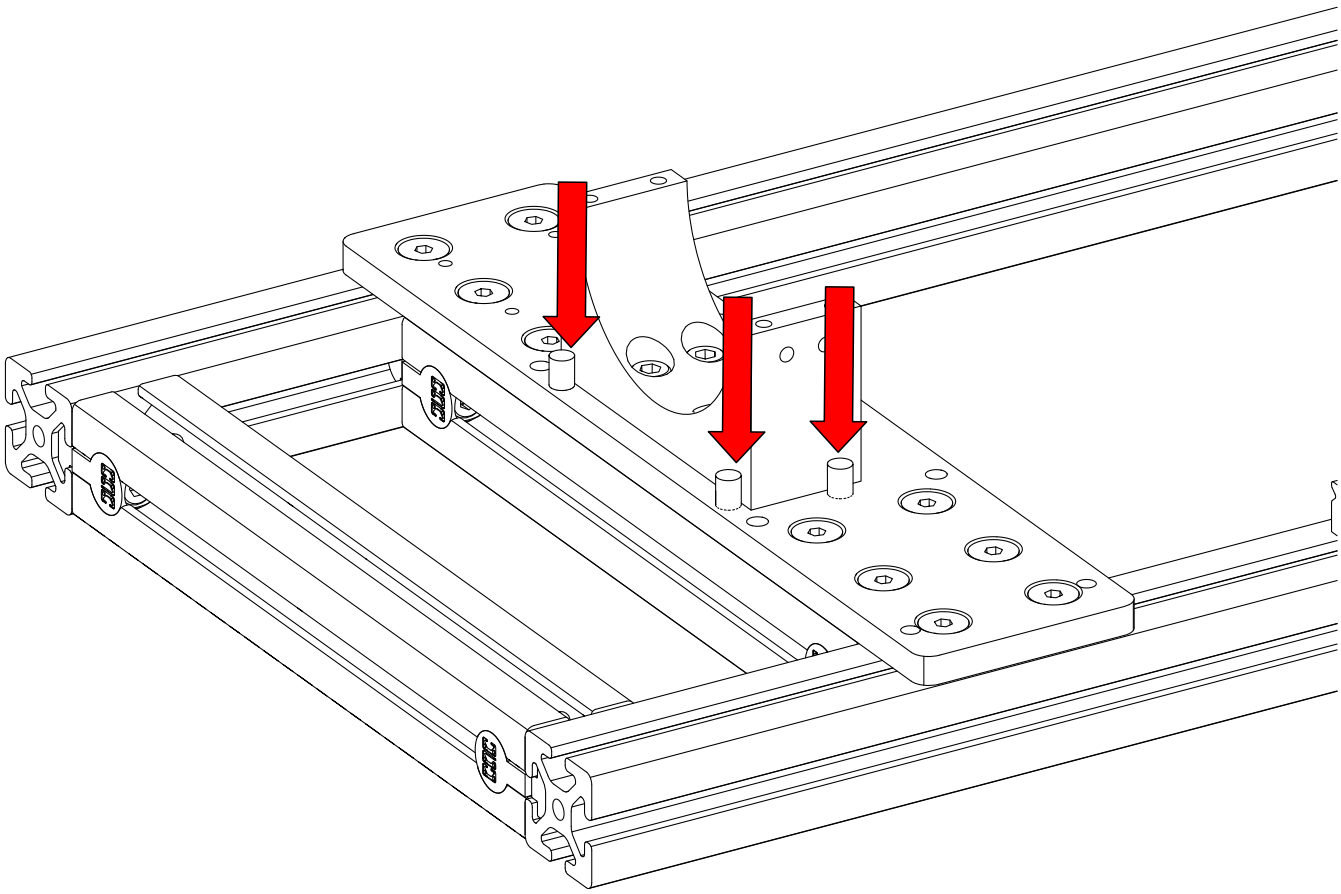
1.3.2.1



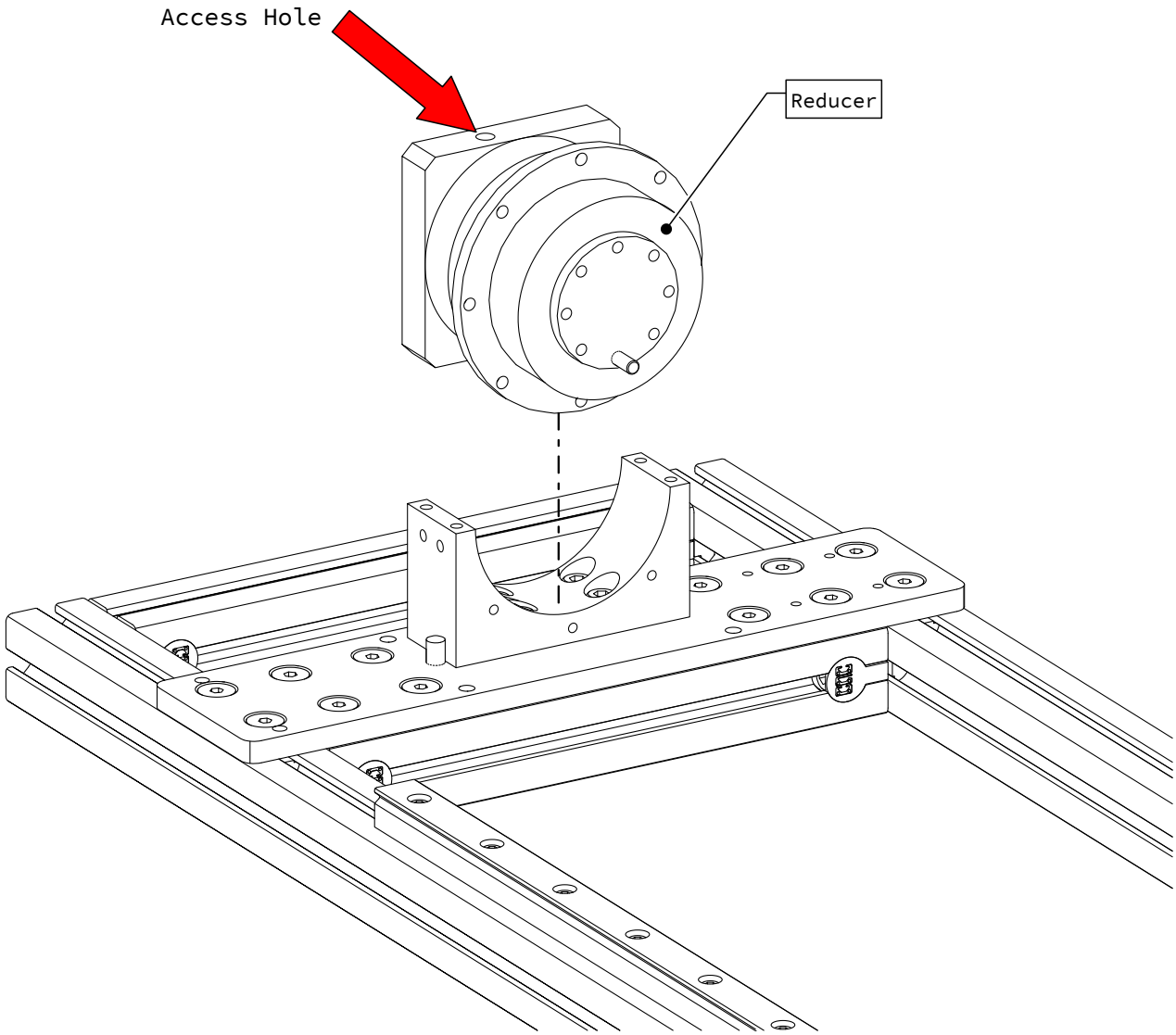
- Attach the bottom chuck clamp to the chuck plate as indicated.
- Do not tighten the fasteners.

Assembly Note

Orient the bottom chuck clamp with the small holes facing forward. Ensure you use the M8 x16mm Socket Head Cap Screws. These will be located in a separately labeled bag.



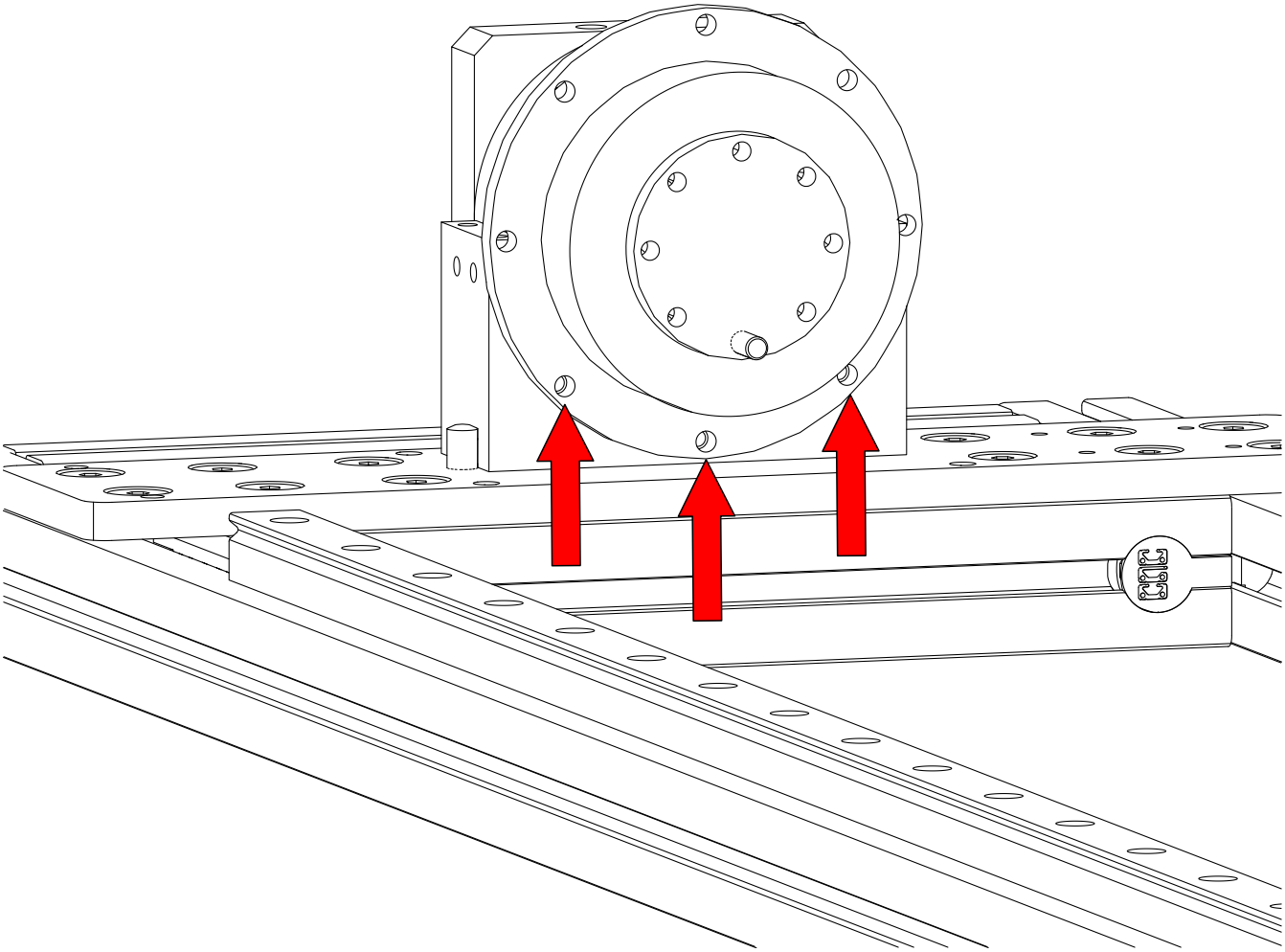
- Position the bottom chuck clamp flush against the dowel pins.
- Fully tighten the fasteners.



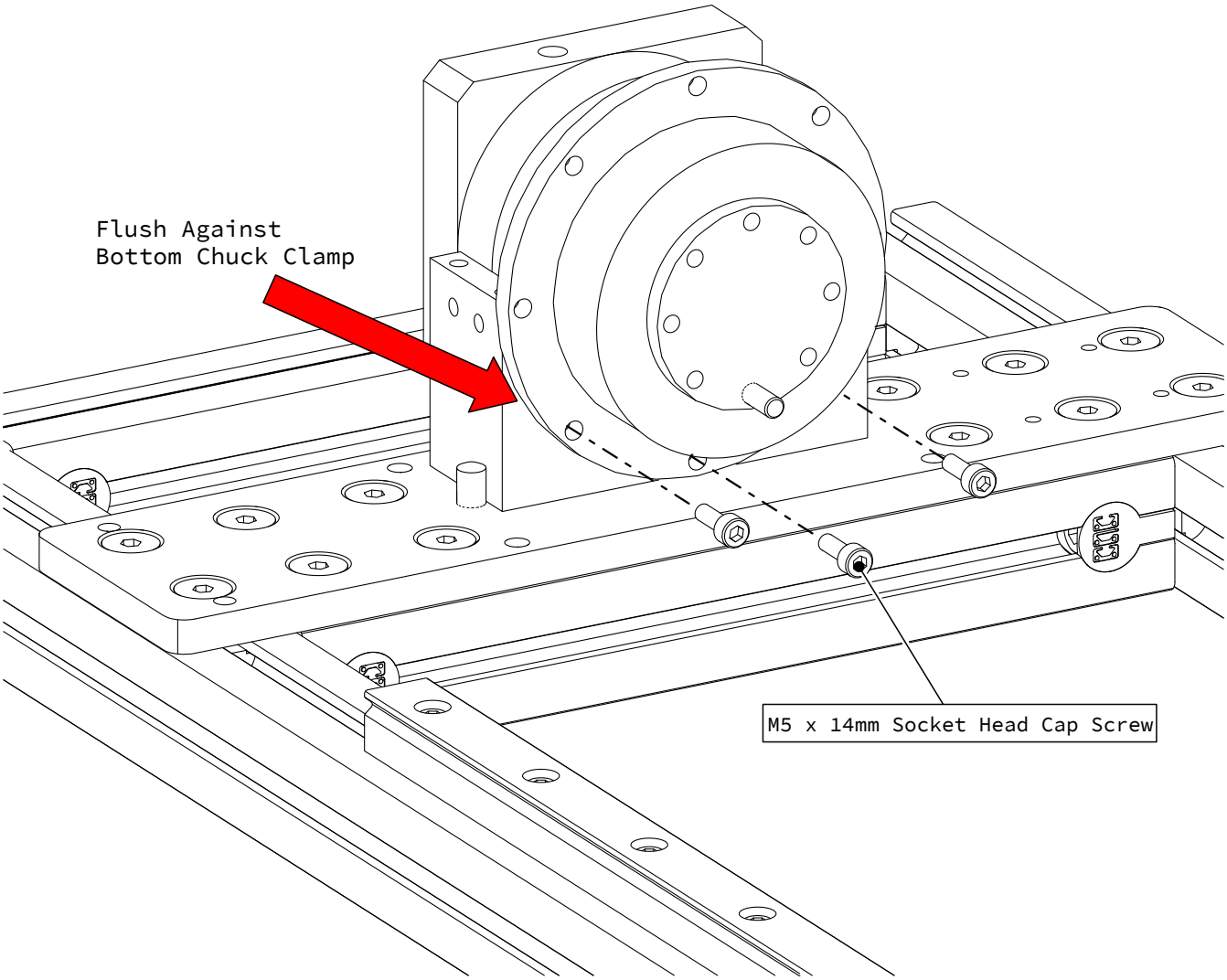
- Place the reducer in the bottom chuck clamp.

Assembly Note

Orient the reducer with one of the access holes facing up as indicated.



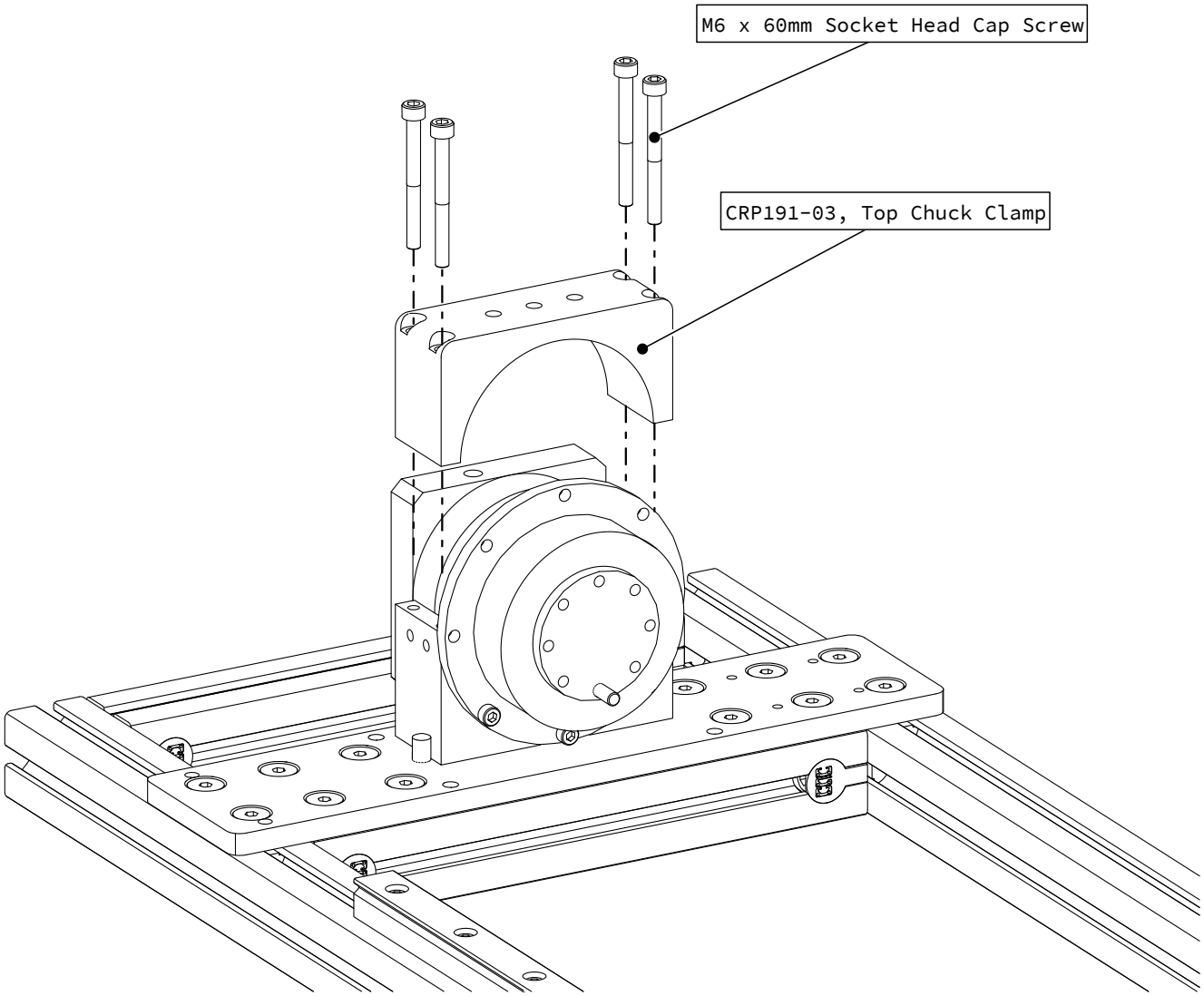
- Align the holes shown in the reducer with the holes on the front of the bottom chuck clamp.



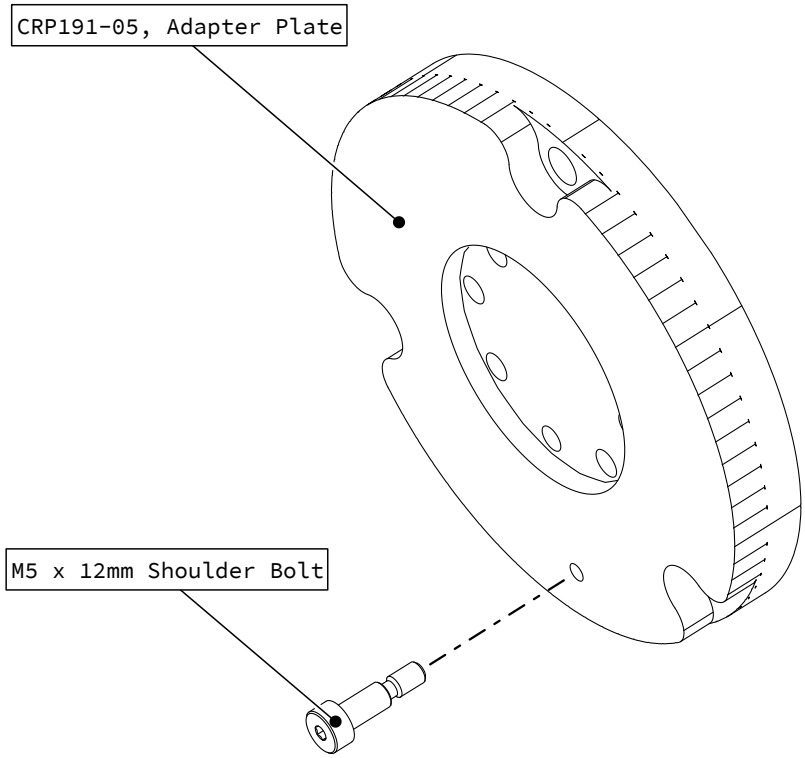
- Attach the reducer to the bottom chuck clamp as indicated.

Assembly Note

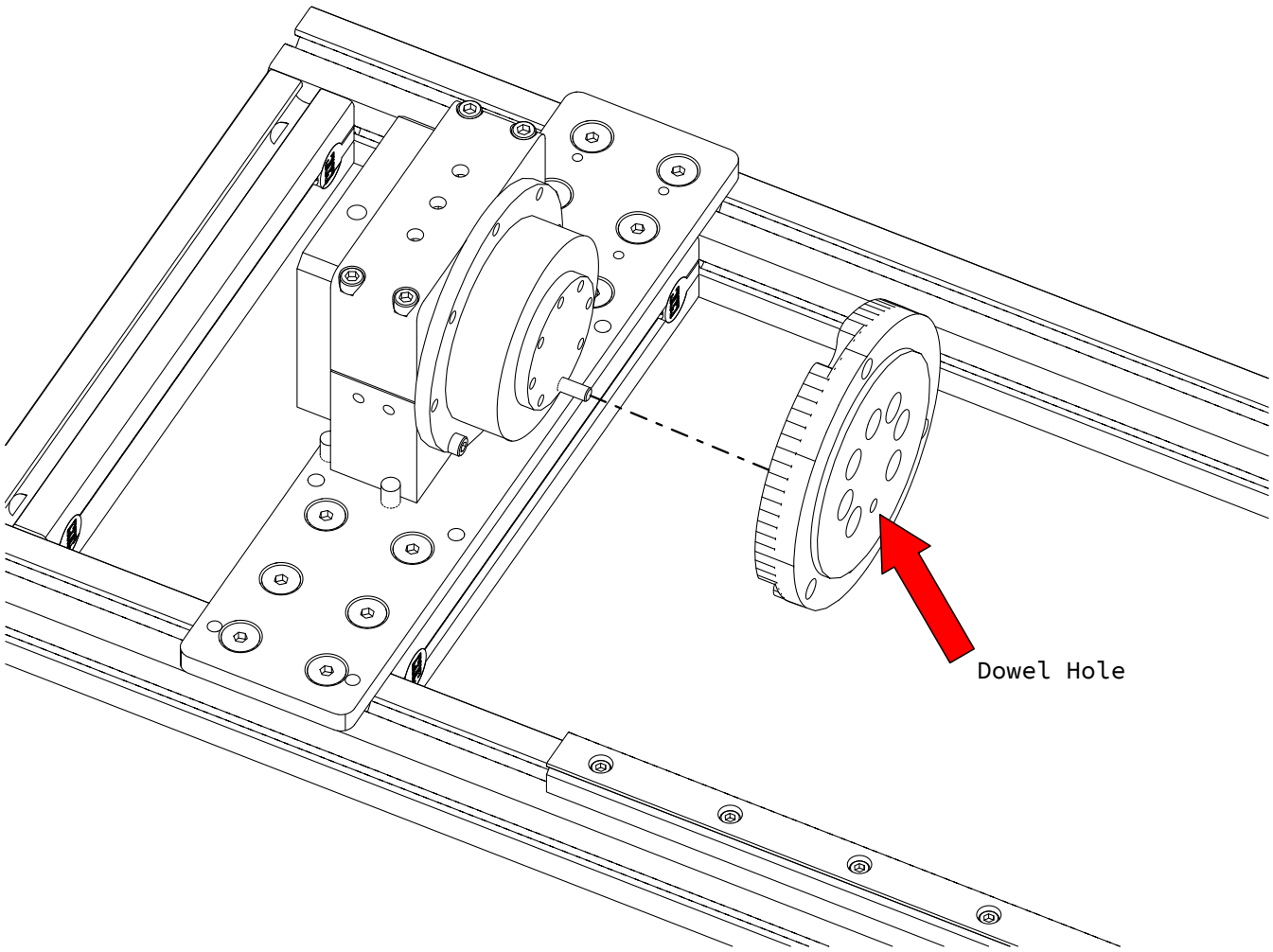
Keep the reducer flush against the bottom chuck clamp.



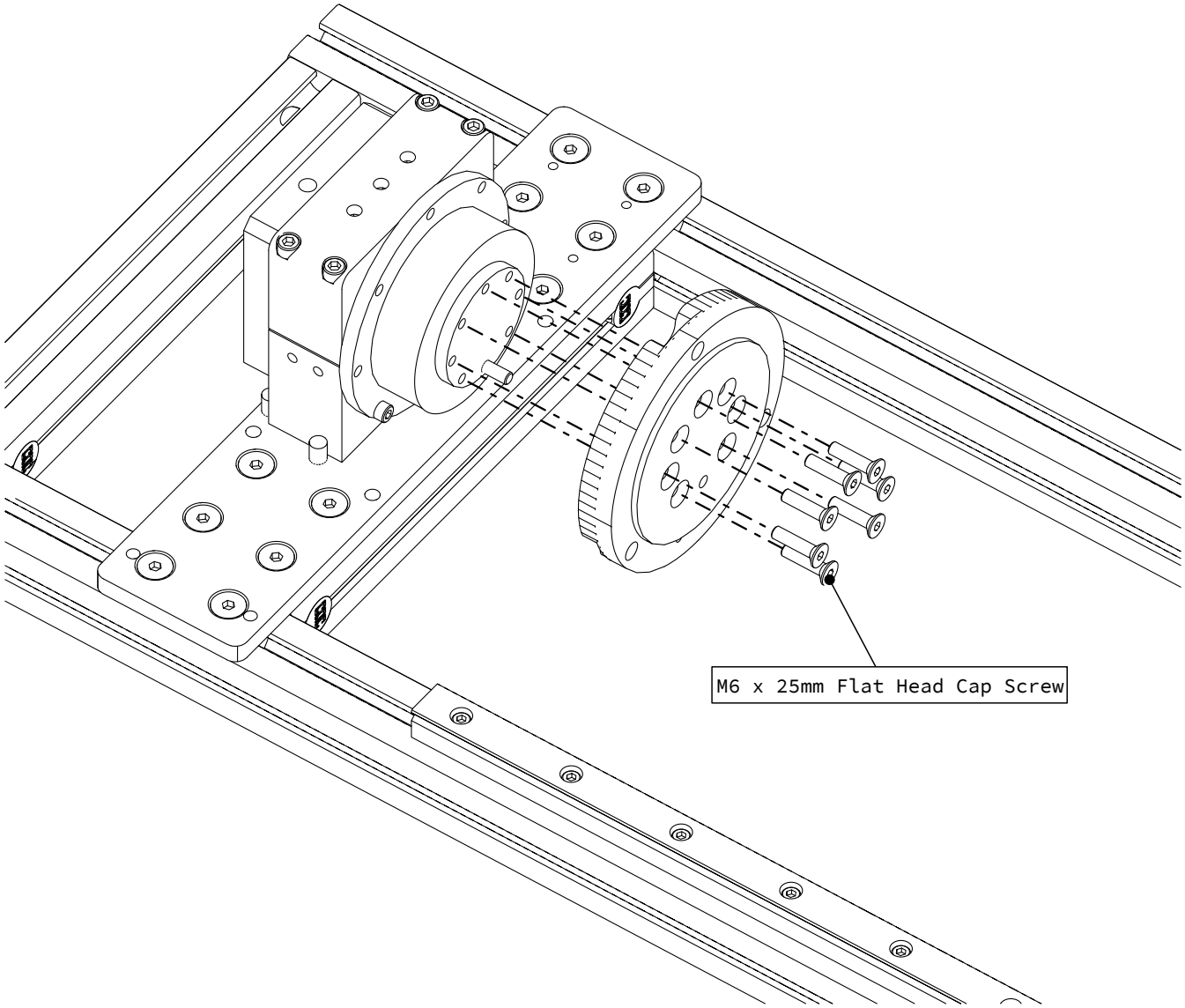
- Attach the top chuck clamp as indicated.
- Tighten the fasteners incrementally, alternating between fasteners.



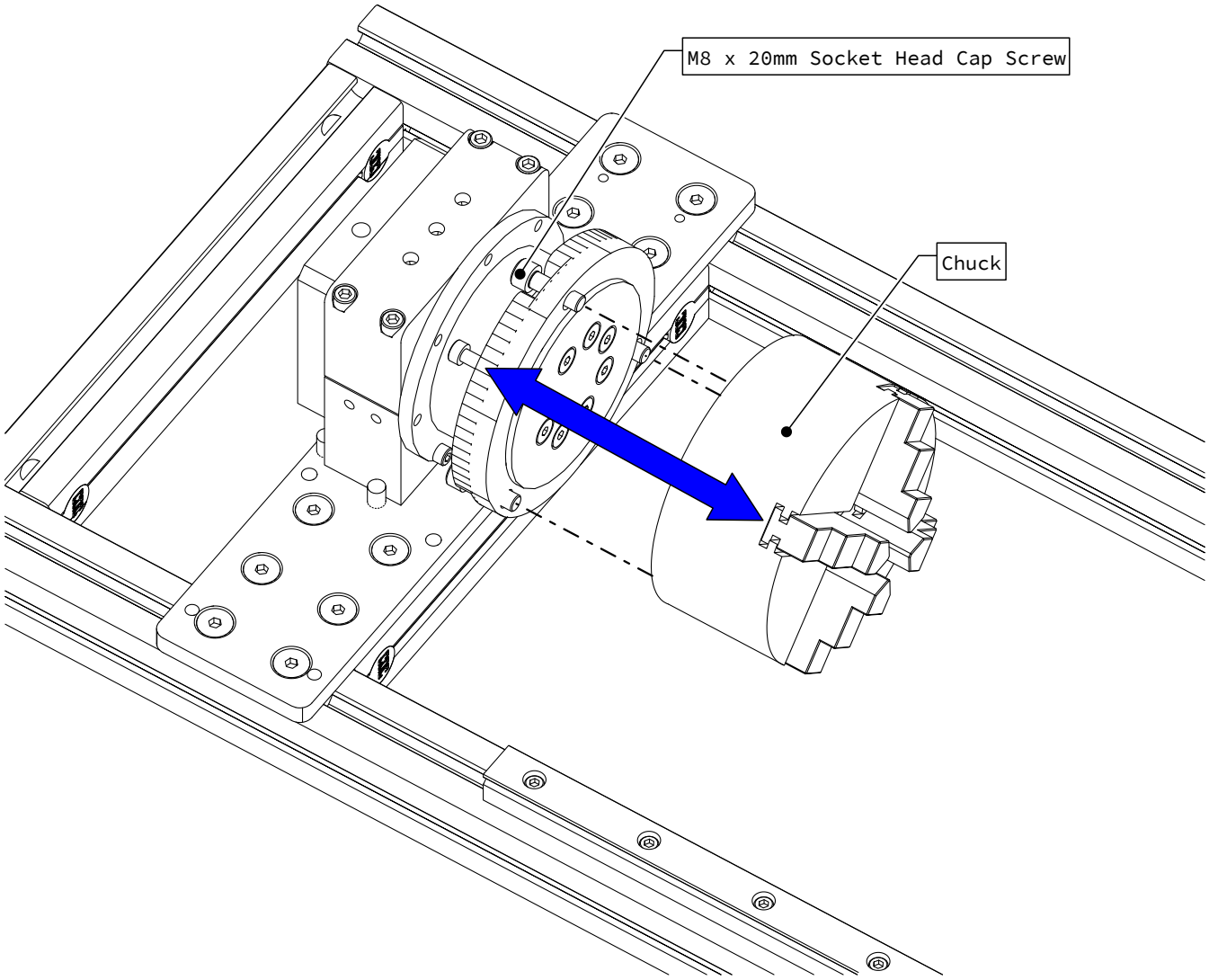
- Attach the M5 shoulder bolt to the adapter plate as indicated.



- Align the dowel pin in the reducer with the hole shown in the adapter plate.



- Attach the adapter plate to the reducer as indicated.
- Tighten the fasteners incrementally, alternating between fasteners.



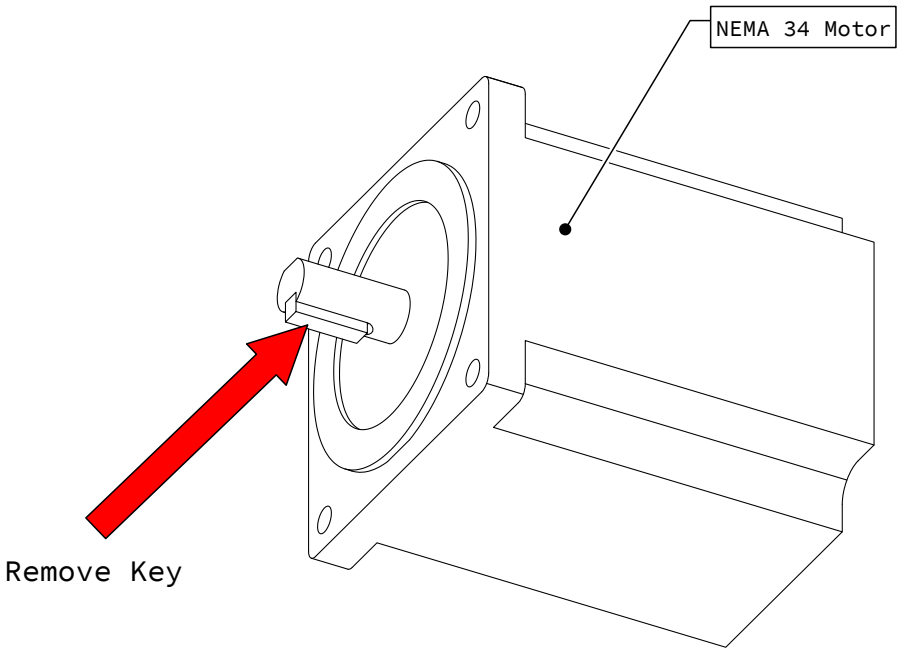
- Align one of the jaws with the shoulder bolt on the adapter plate.
- Attach the chuck to the adapter plate as shown.

Assembly Note

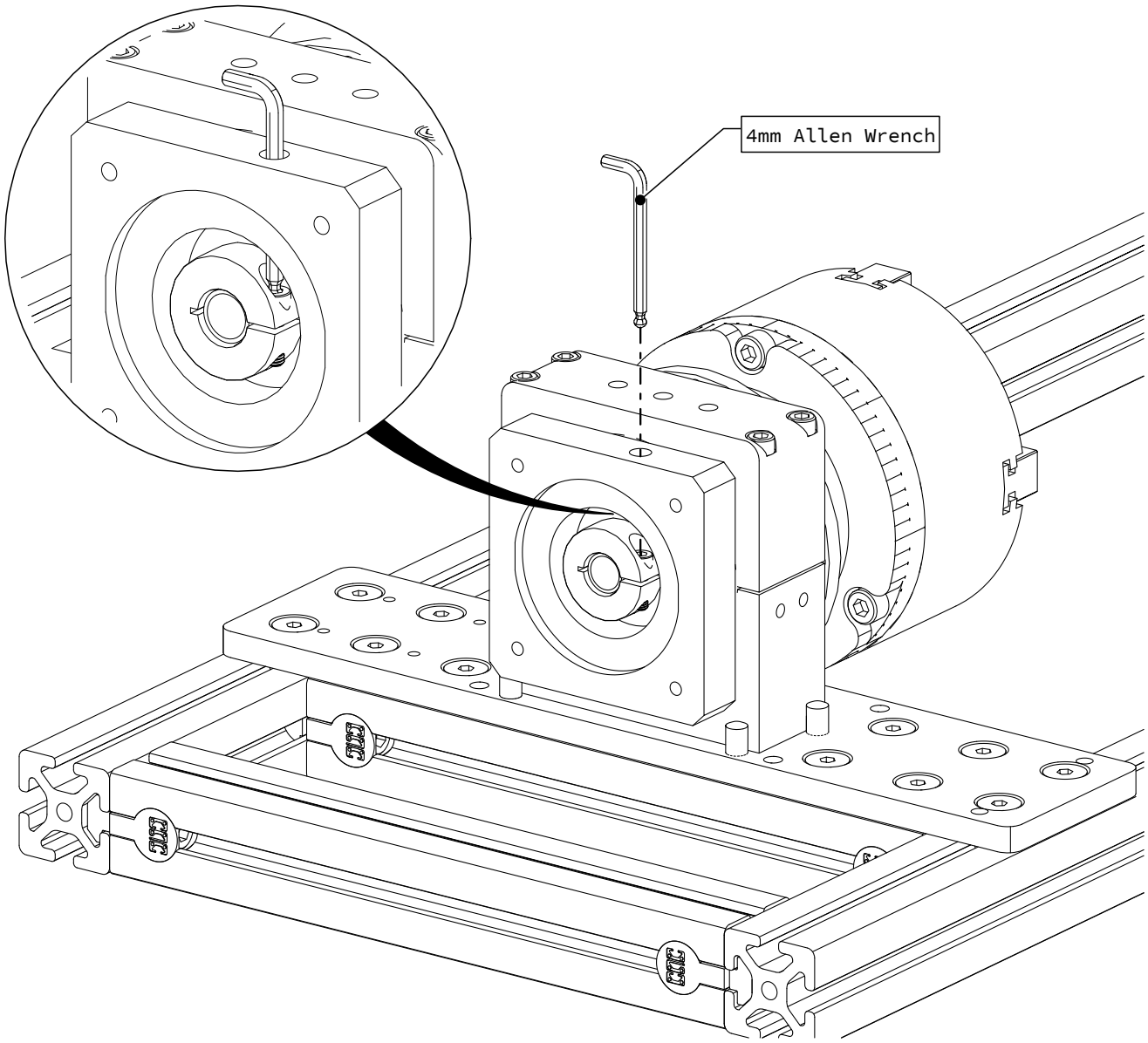
Use the 6mm stubby allen wrench included in your rotary kit.

1.3.3 Motor Installation

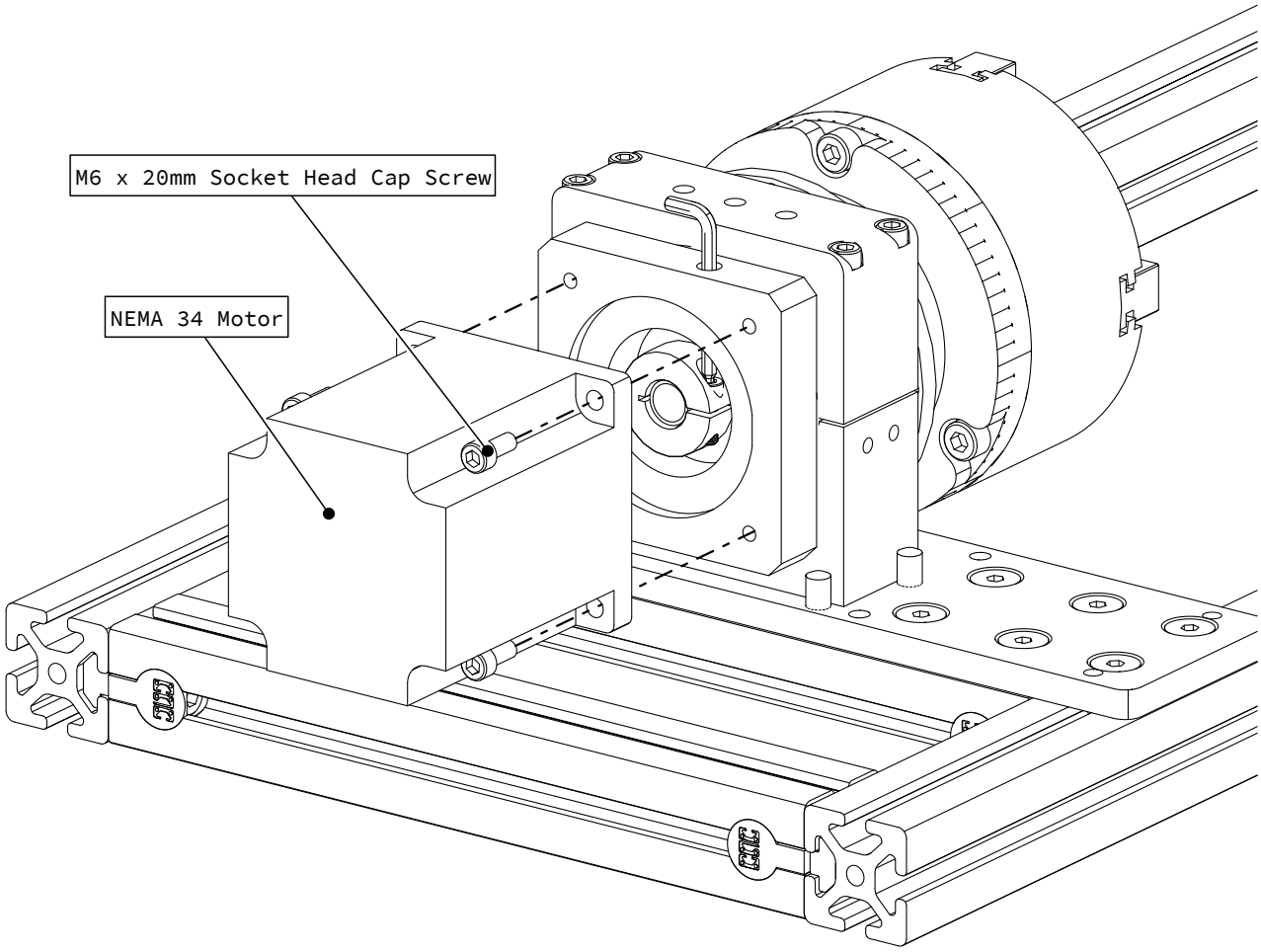
1.3.3.1



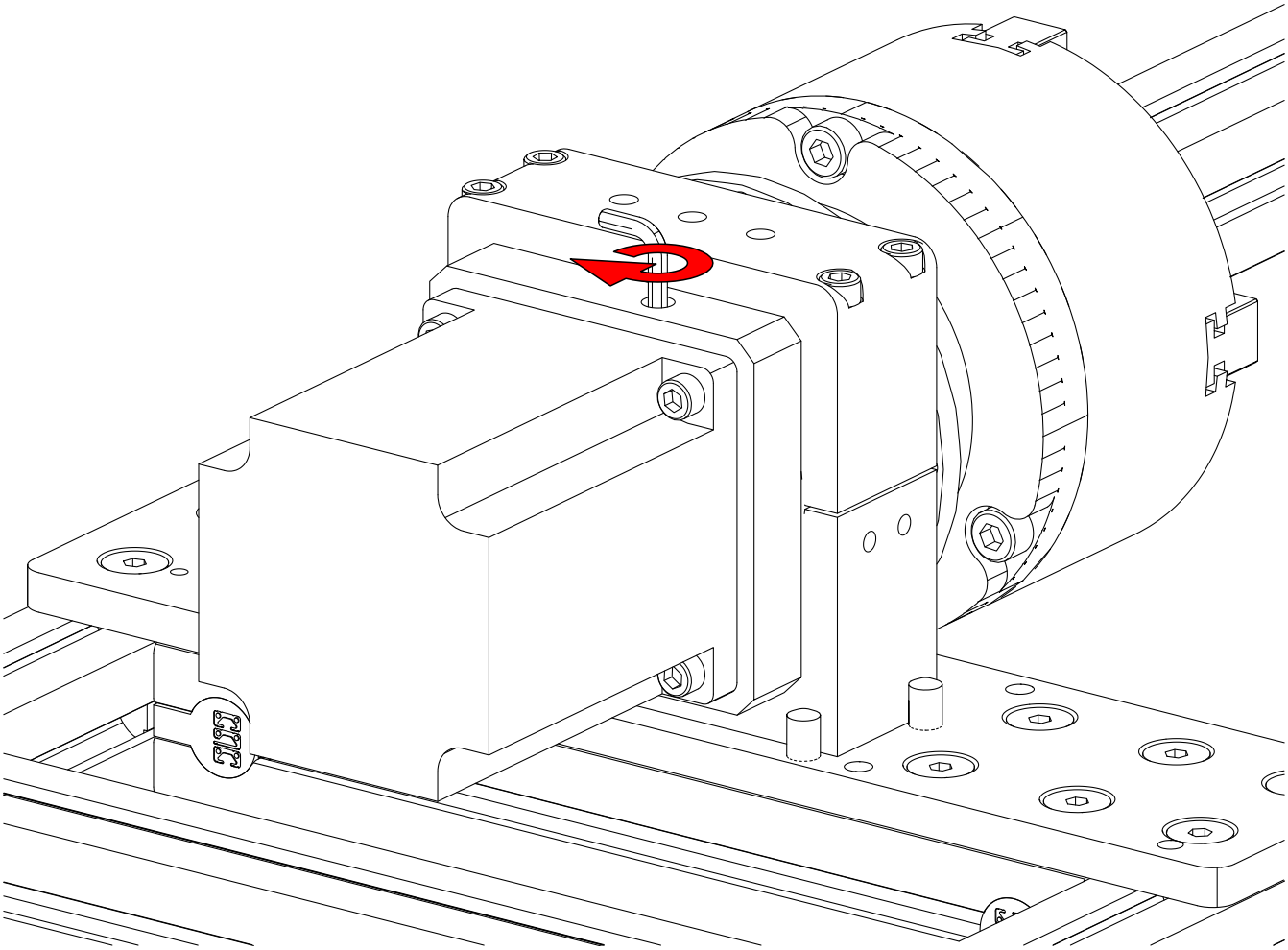
- Remove the motor key.



- Insert a 4mm allen wrench through the reducer access hole, into the shaft collar as indicated.



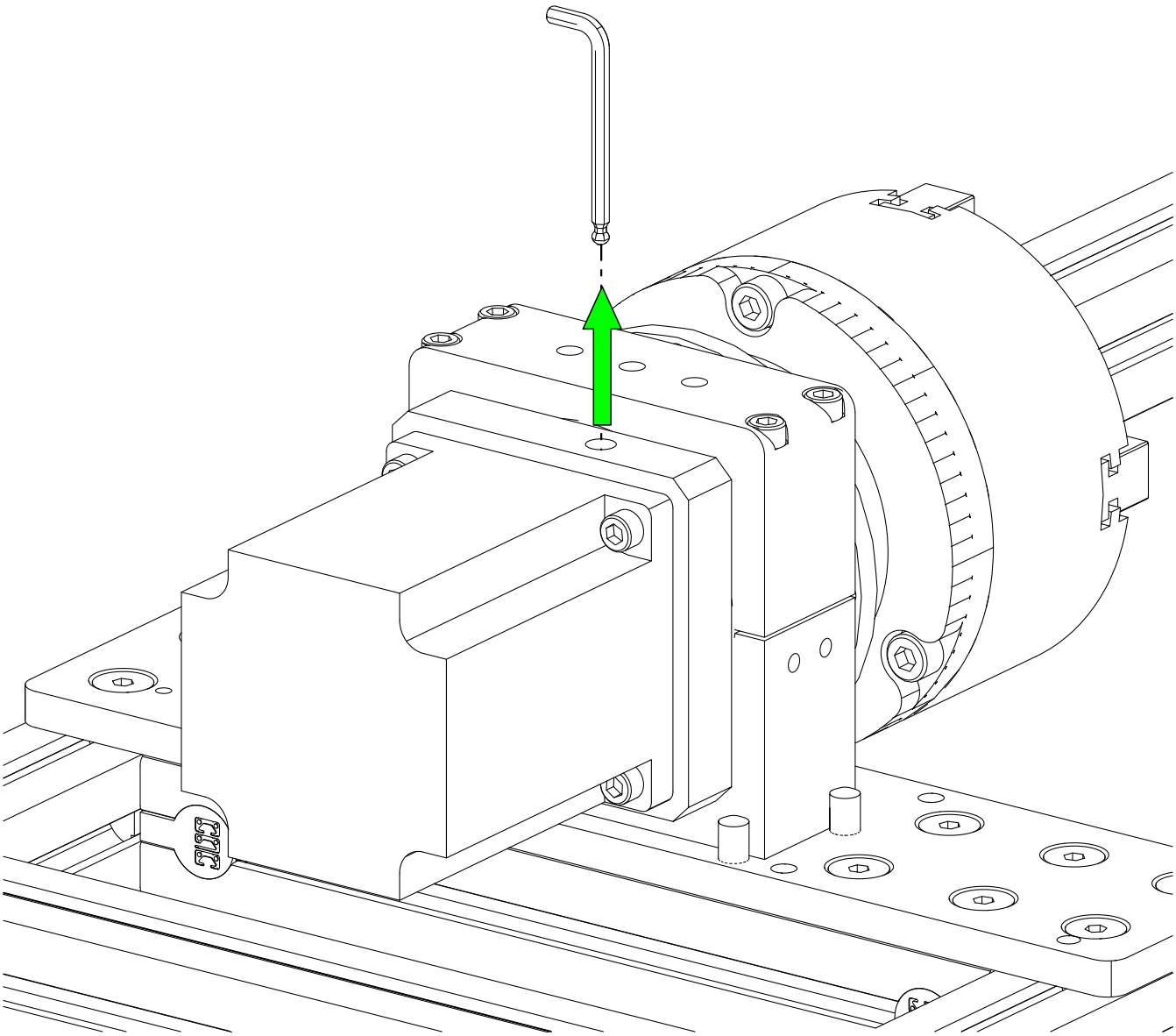
- Attach the motor to the reducer as indicated.



- Fully tighten the shaft collar using the 4mm allen wrench.

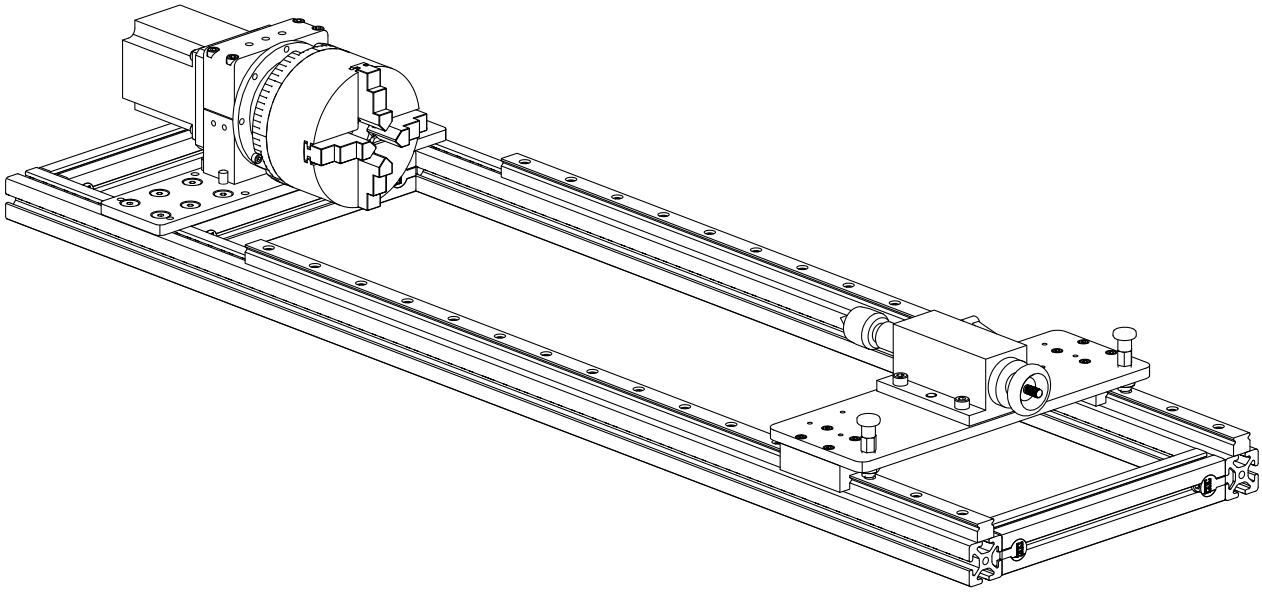
Assembly Note

Ensure the shaft collar is fully tightened.



- Remove the allen wrench.

1.4 Tailstock Assembly



Parts and Tools Required

The following parts and tools will be used in Section 1.4

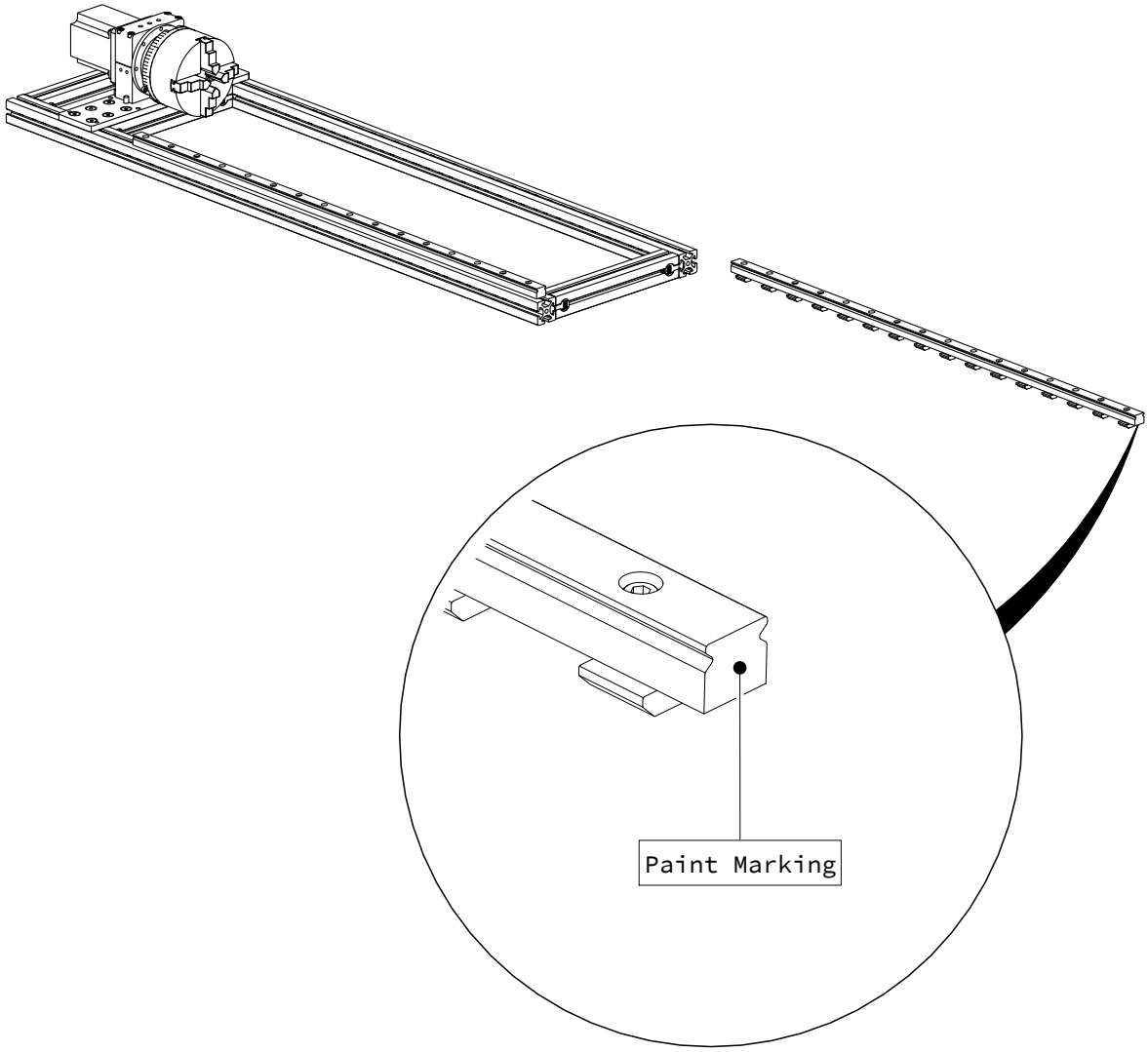
QTY	Part/Description	Packaged In
1	CRP192-01 - Tailstock Plate	CRP190-00-HW
1	CRP192-02 - Rotary Tailstock	CRP190-00-BASE
2	GHH20CA - Linear Bearing Block	CRP190-00-BASE
2	Grease Fitting for Linear Bearing Block	CRP190-00-BASE
1	CRP192-00-FAST: - (1) M8 x 20mm Dowel Pin - (4) M8 x 16mm Socket Head Cap Screw - (8) M5 x 10mm Socket Head Cap Screw - (2) Spring Plunger (with hex jam nut)	CRP190-00-BASE

Required Tools:

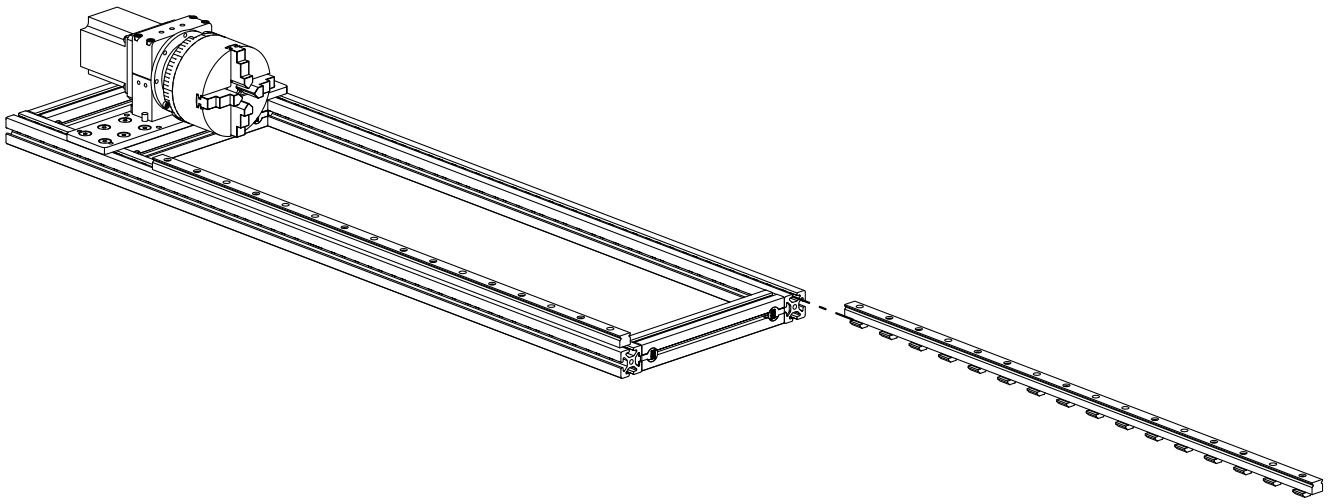
- 17mm Combination Wrench
- 4mm Allen Wrench
- 6mm Allen Wrench
- Tape Measure

1.4.1 Rail Installation

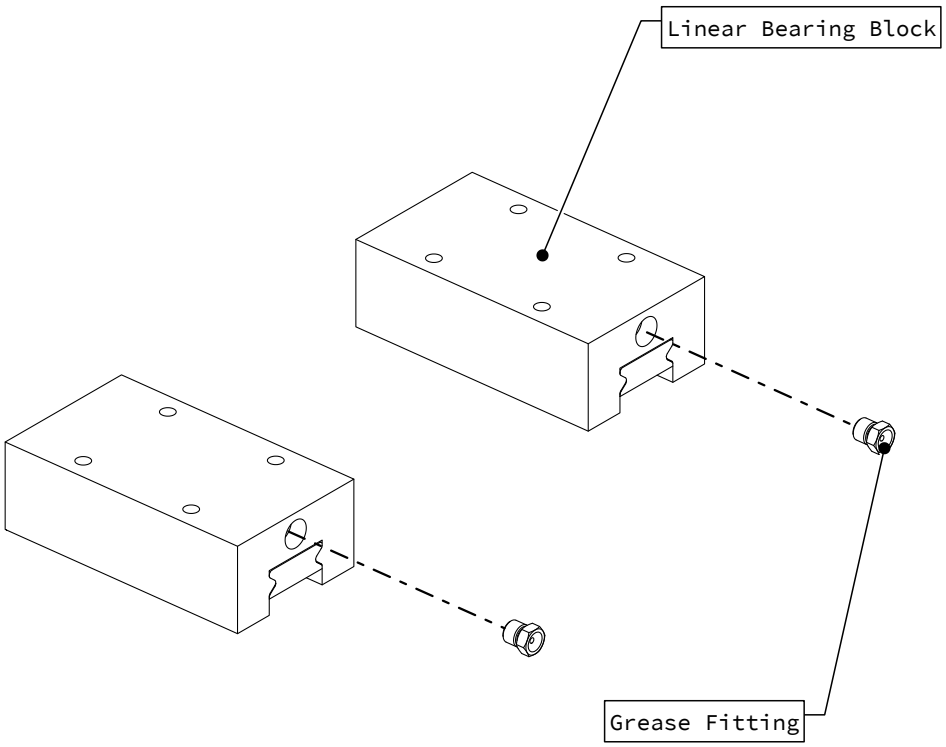
1.4.1.1



- Orient the second linear rail as indicated, with the marking facing away from the rotary frame.



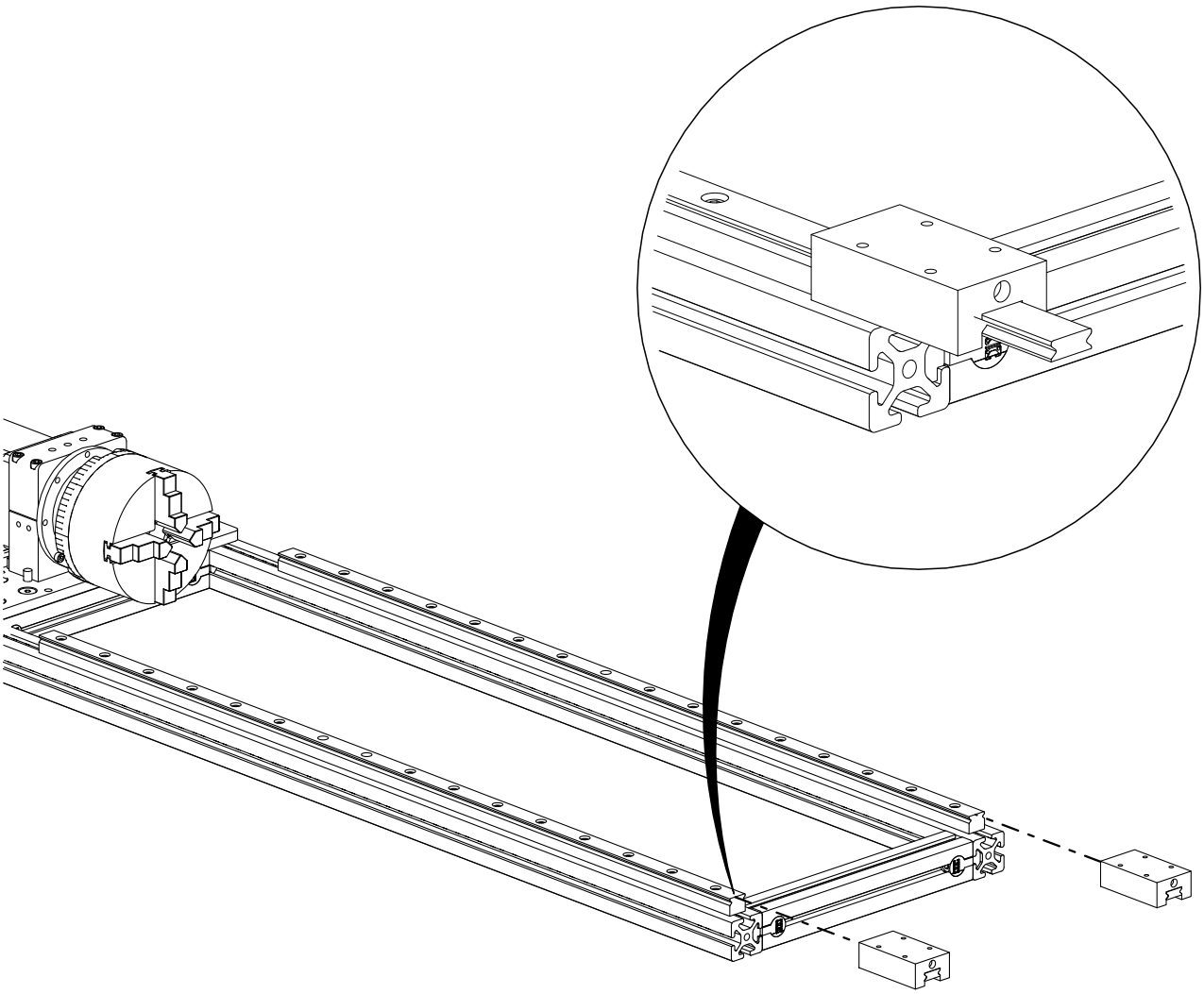
- Slide the linear rail into the extrusion as indicated.
- Partially tighten the fasteners.



- Install grease fittings in the linear bearing blocks.

Assembly Note

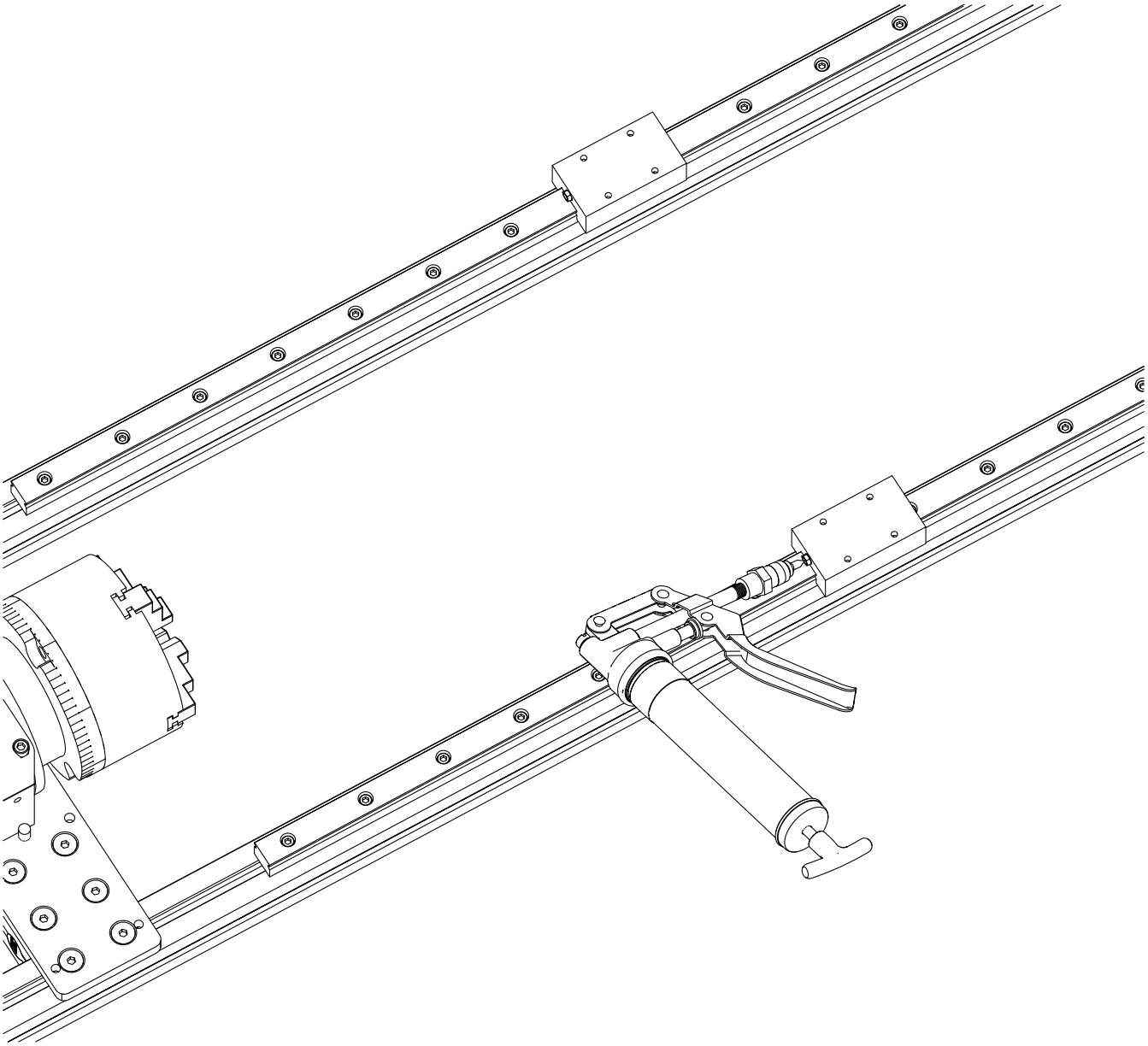
DO NOT remove the plastic bearing retainers at this time.



- Slide a linear bearing block on each rail.
- Use the rail to push the plastic retainer out of the block as indicated.

Assembly Note

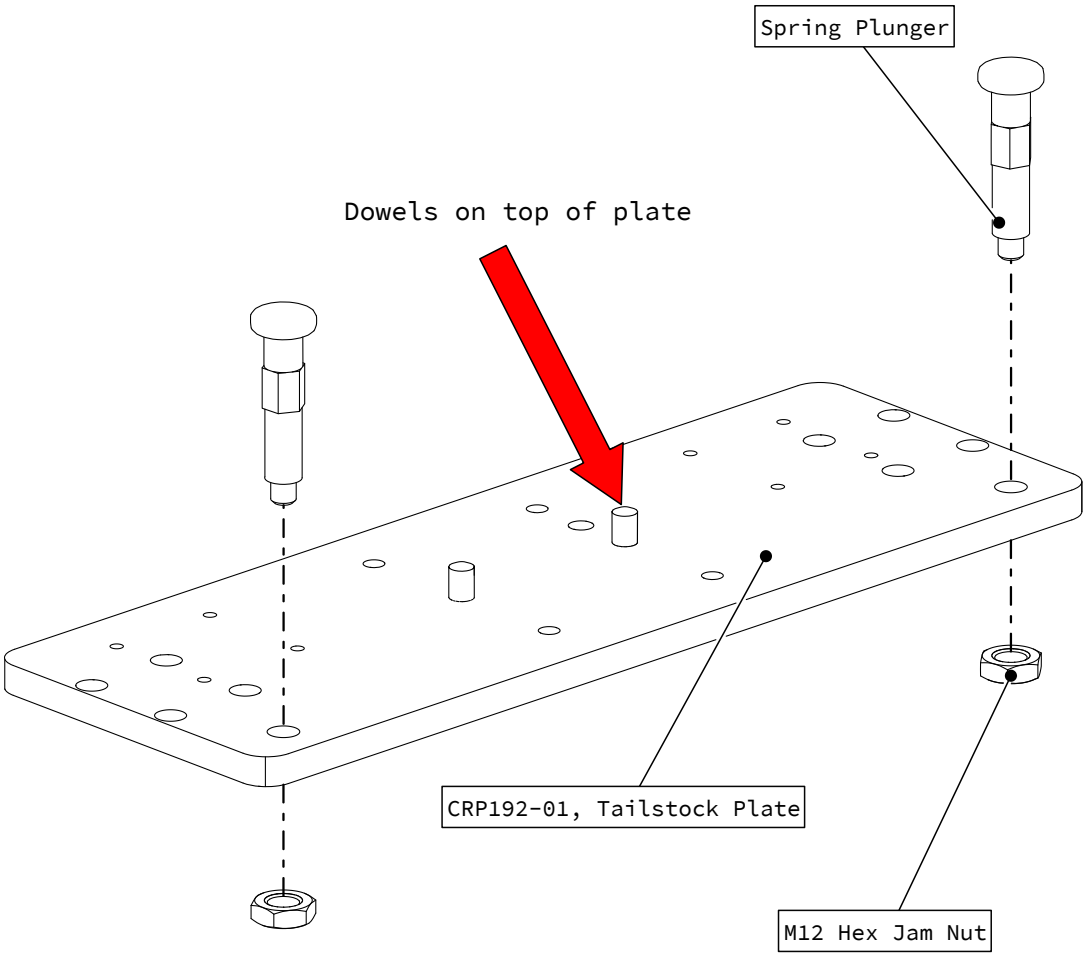
Orient the blocks with the grease fittings facing towards the chuck.



- Lubricate the linear bearing blocks with three pumps of grease per block.

1.4.2 Tailstock Plate Assembly

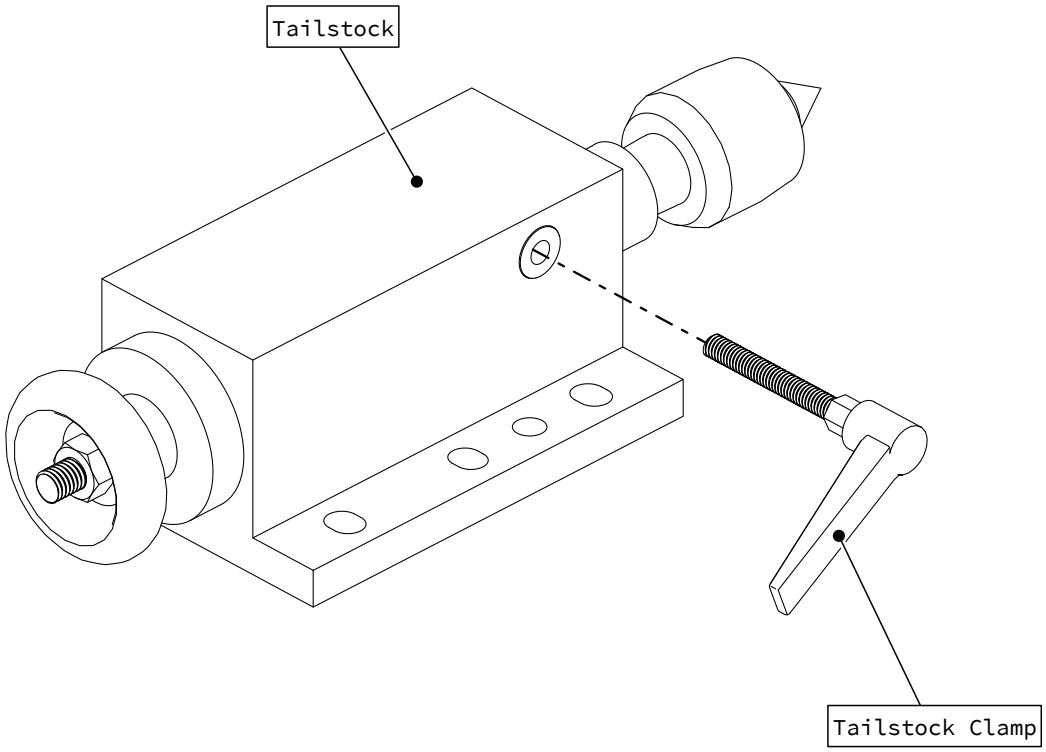
1.4.2.1



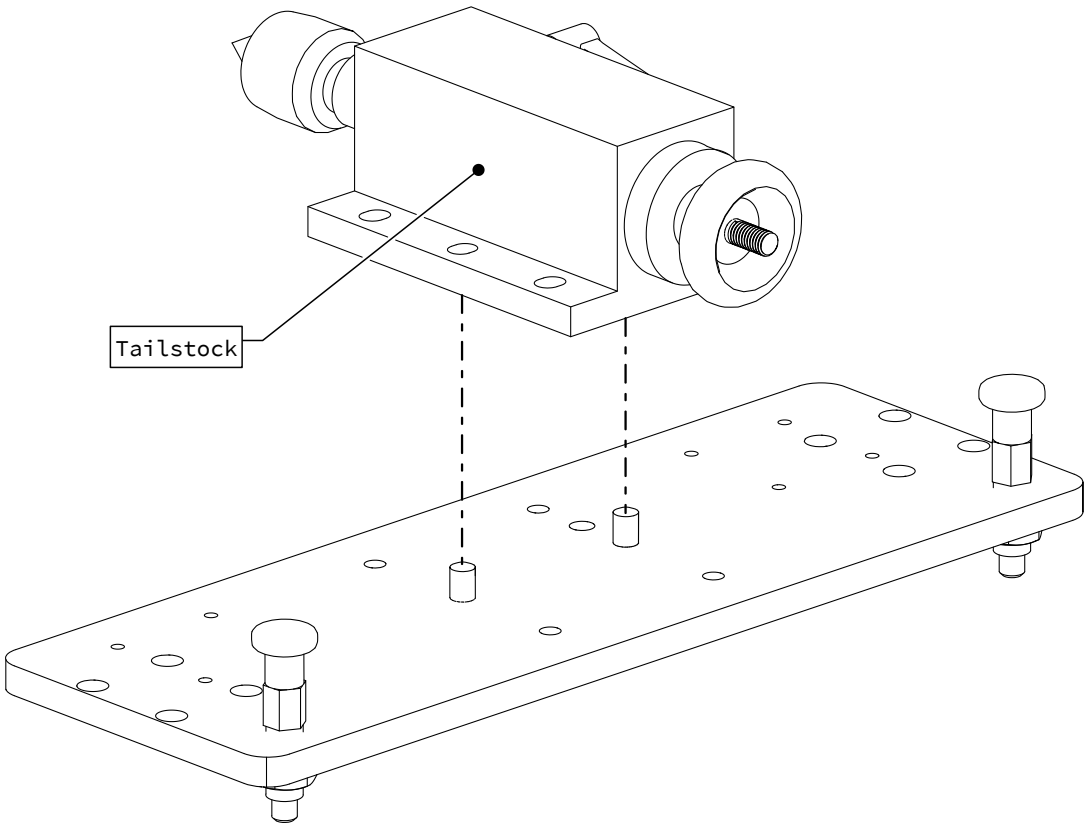
- Attach spring plungers to the tailstock plate as indicated.

Assembly Note

Fully thread the spring plungers into the tailstock plate and tighten jam nuts with a wrench.



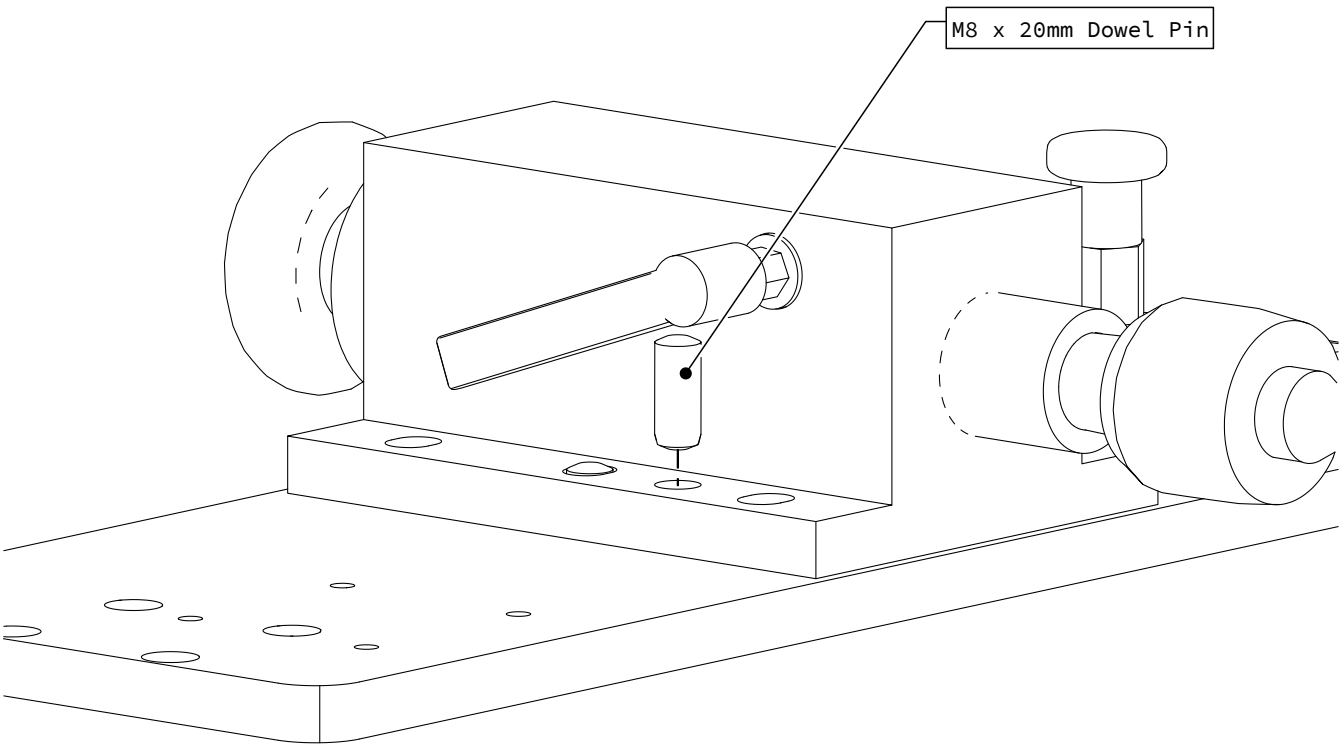
- Attach the tailstock clamp to the tailstock.



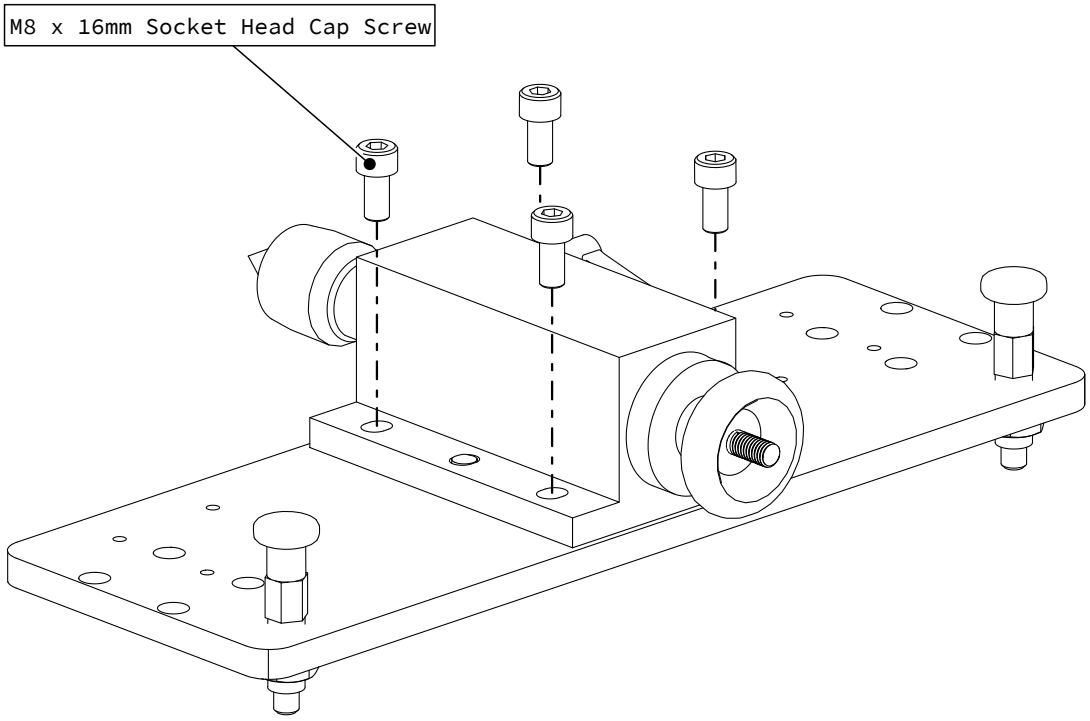
- Set the tailstock on the tailstock plate as indicted.
- Orient the tailstock with the live center facing away from the spring plungers.

Assembly Note

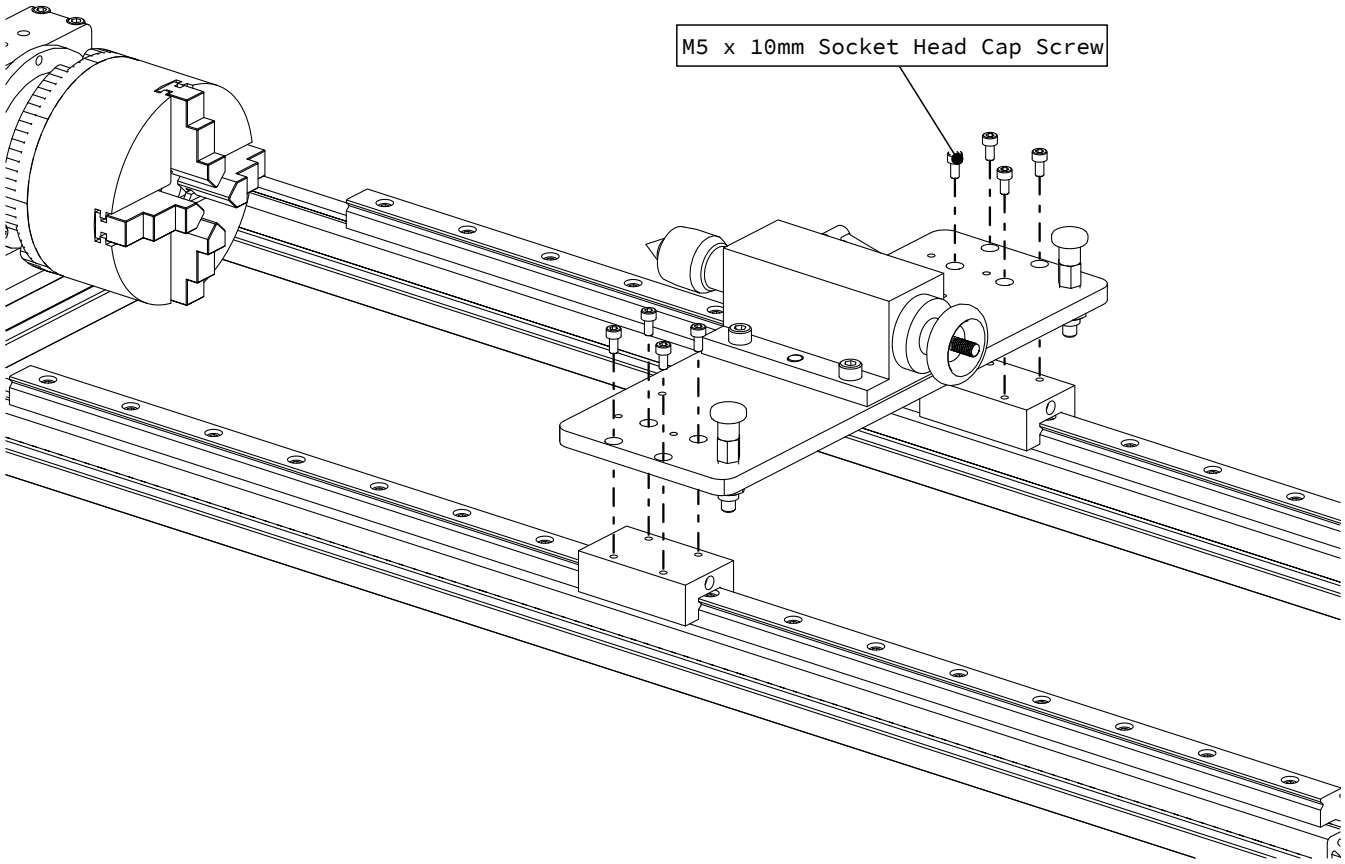
The tailstock will locate on the two pre-installed dowel pins.



- Insert a dowel pin as indicated.



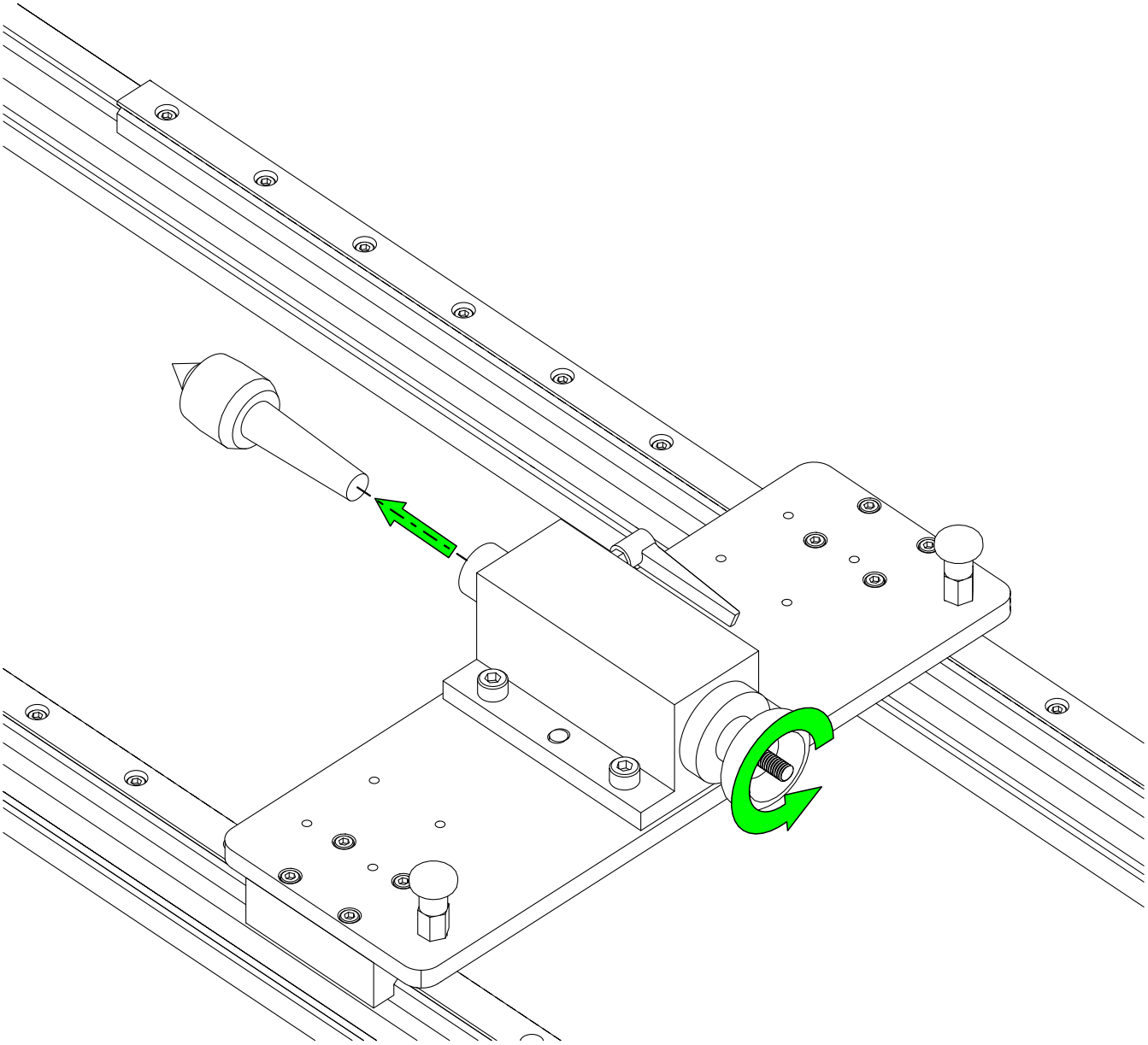
- Fasten the tailstock to the tailstock plate as indicated.



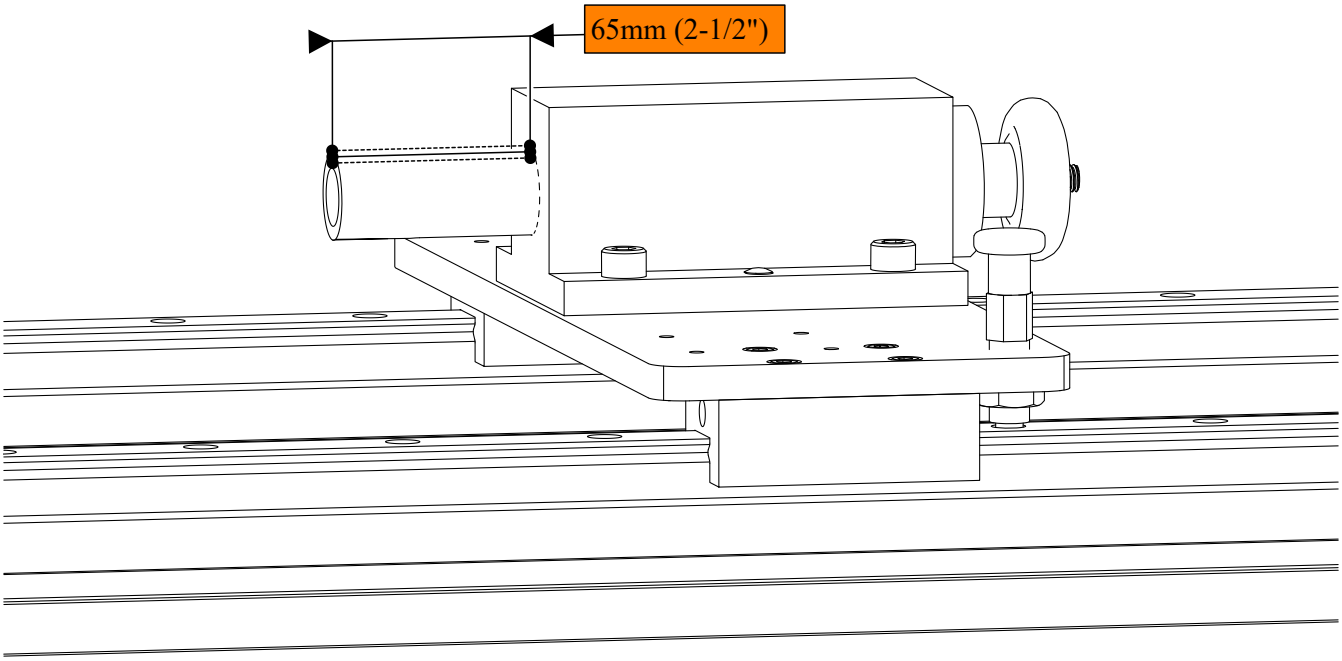
- Attach the tailstock assembly to the bearing blocks as indicated.
- Partially tighten the fasteners.

1.4.3 Tailstock Alignment

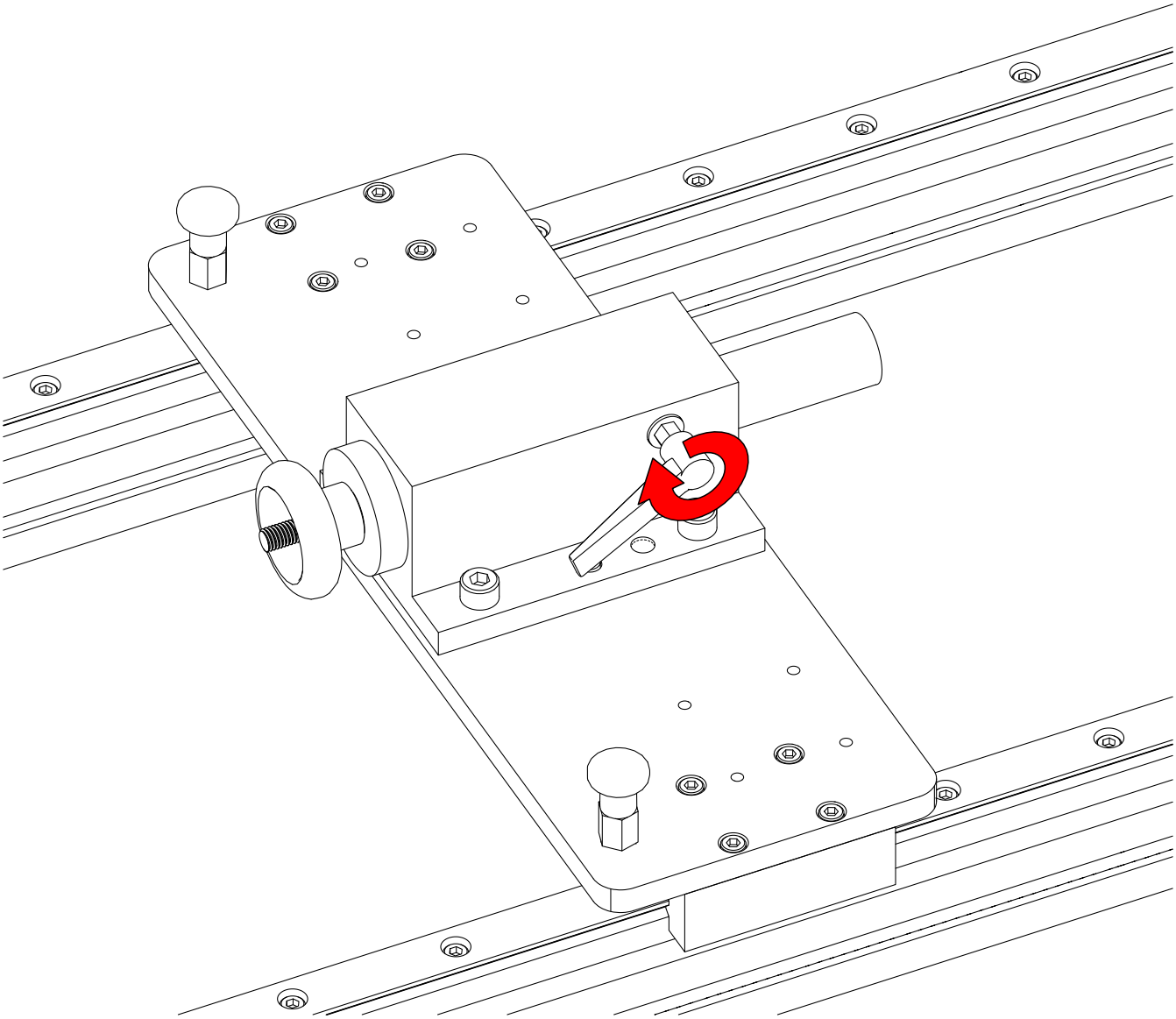
1.4.3.1



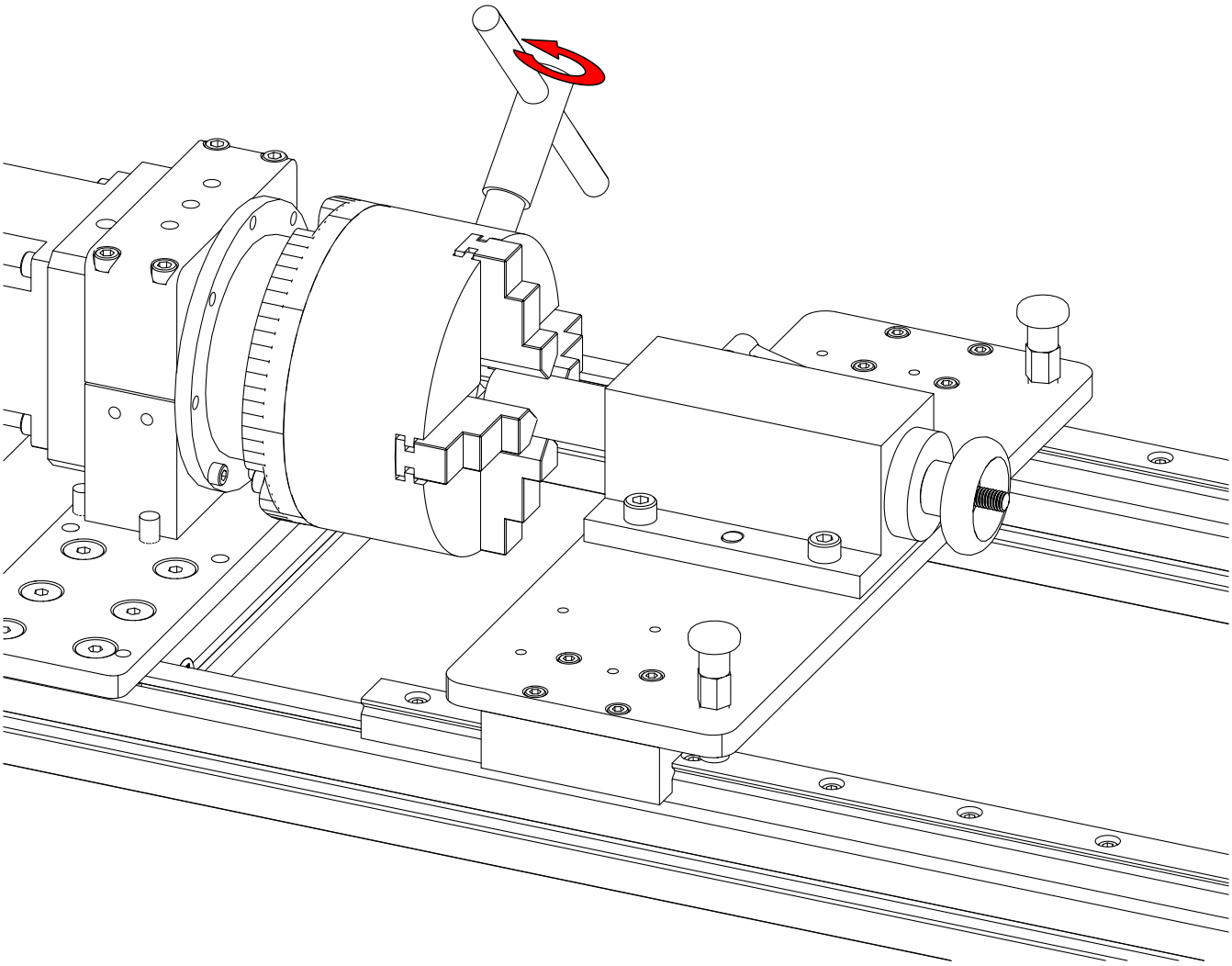
- Turn the tailstock handle counter-clockwise to remove the live center.



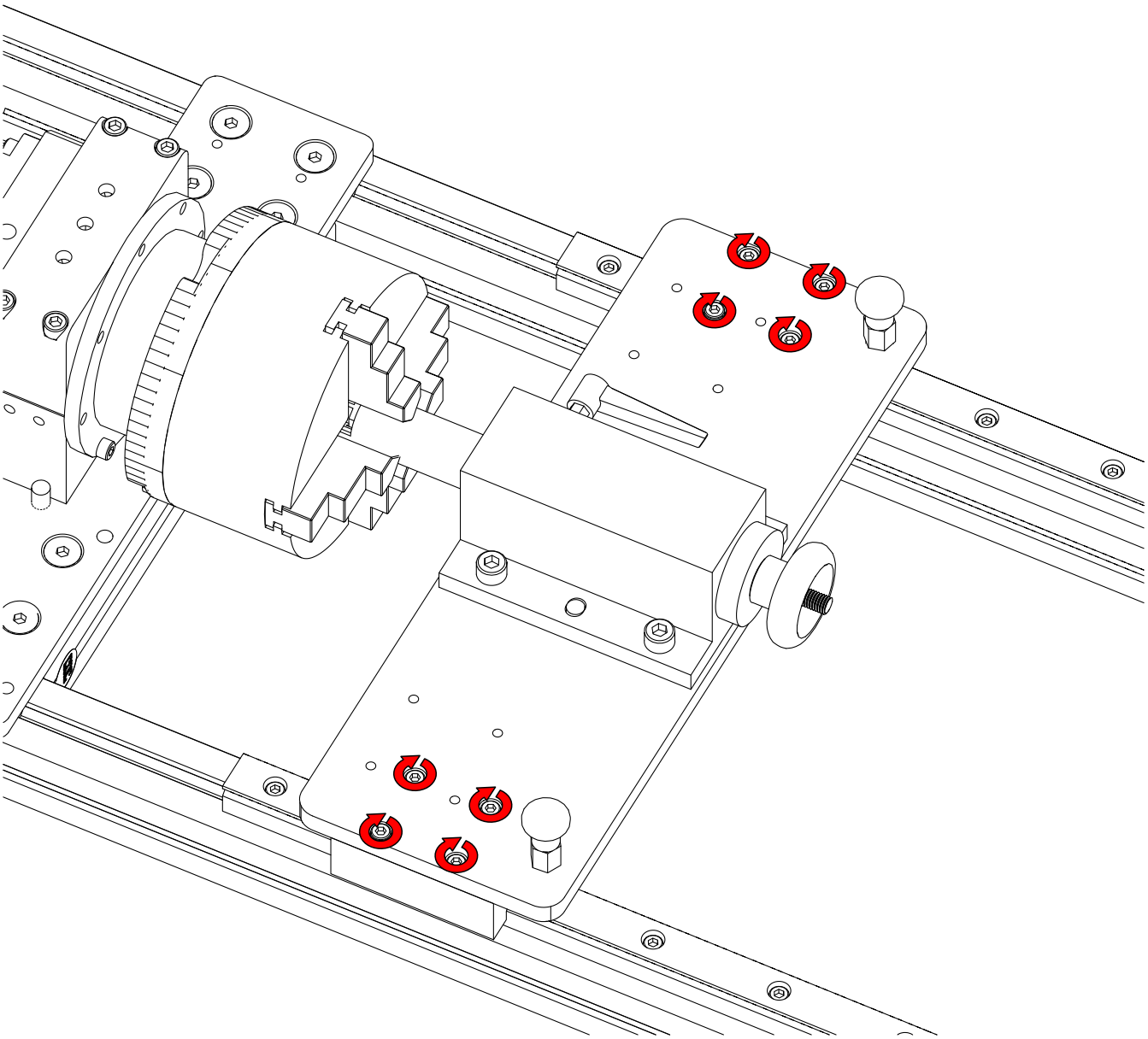
- Extend the tailstock 65mm (2-1/2") from the tailstock housing as indicated.



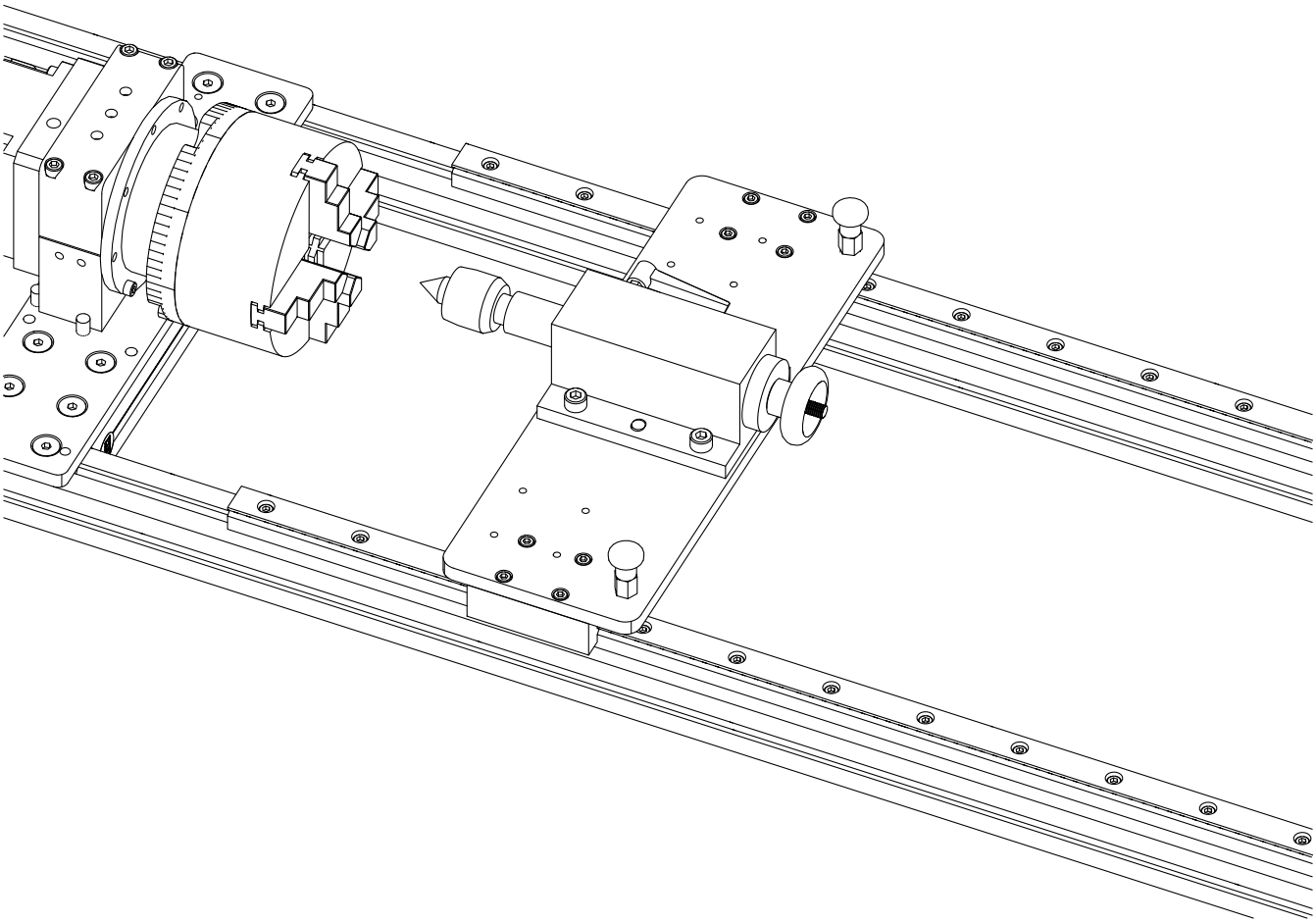
- Lock the tailstock as indicated.



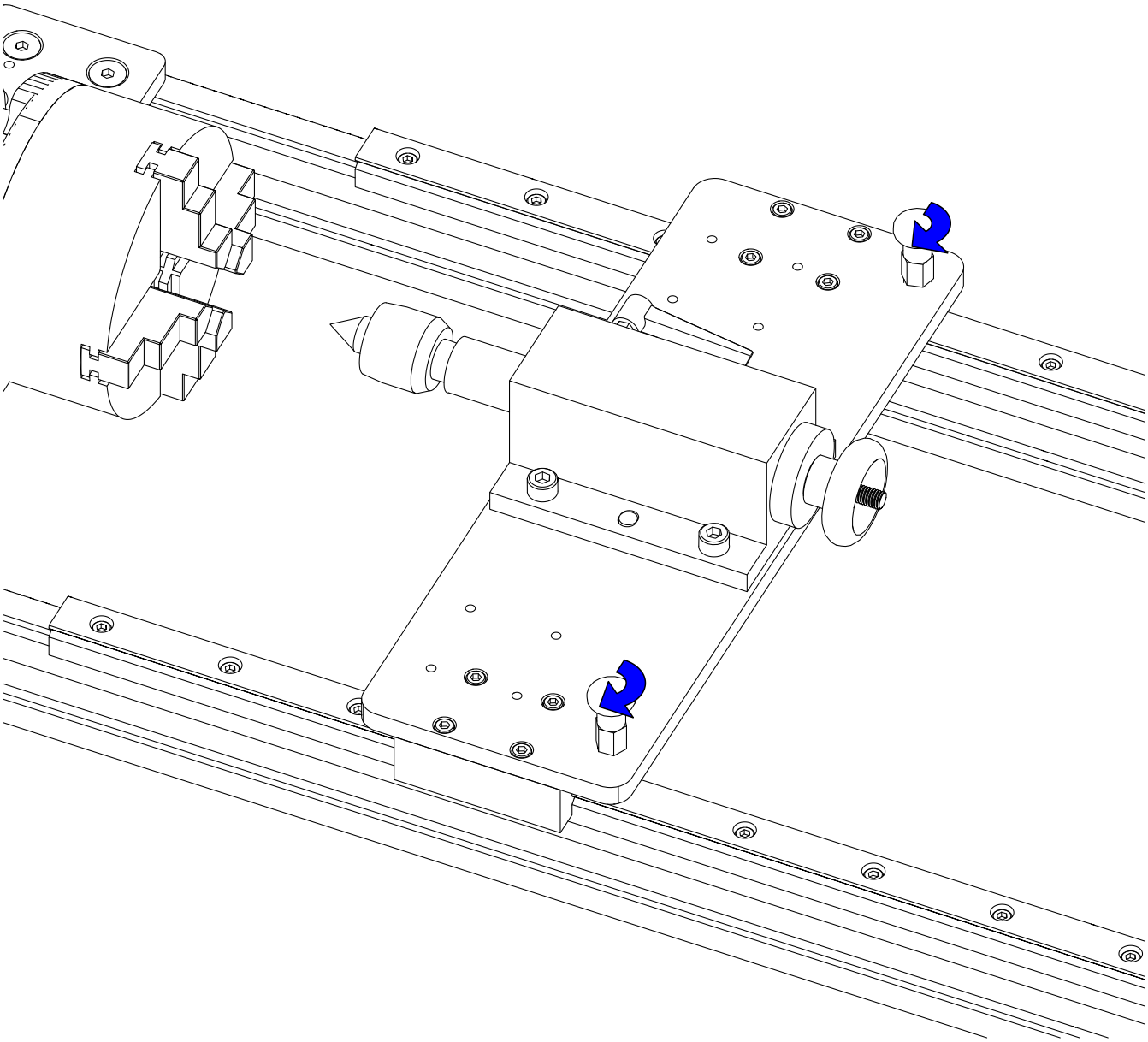
- Insert the tailstock into the chuck 25mm (1").
- Tighten the chuck as indicated.



- With the tailstock clamped in the chuck, tighten the tailstock plate fasteners as indicated.



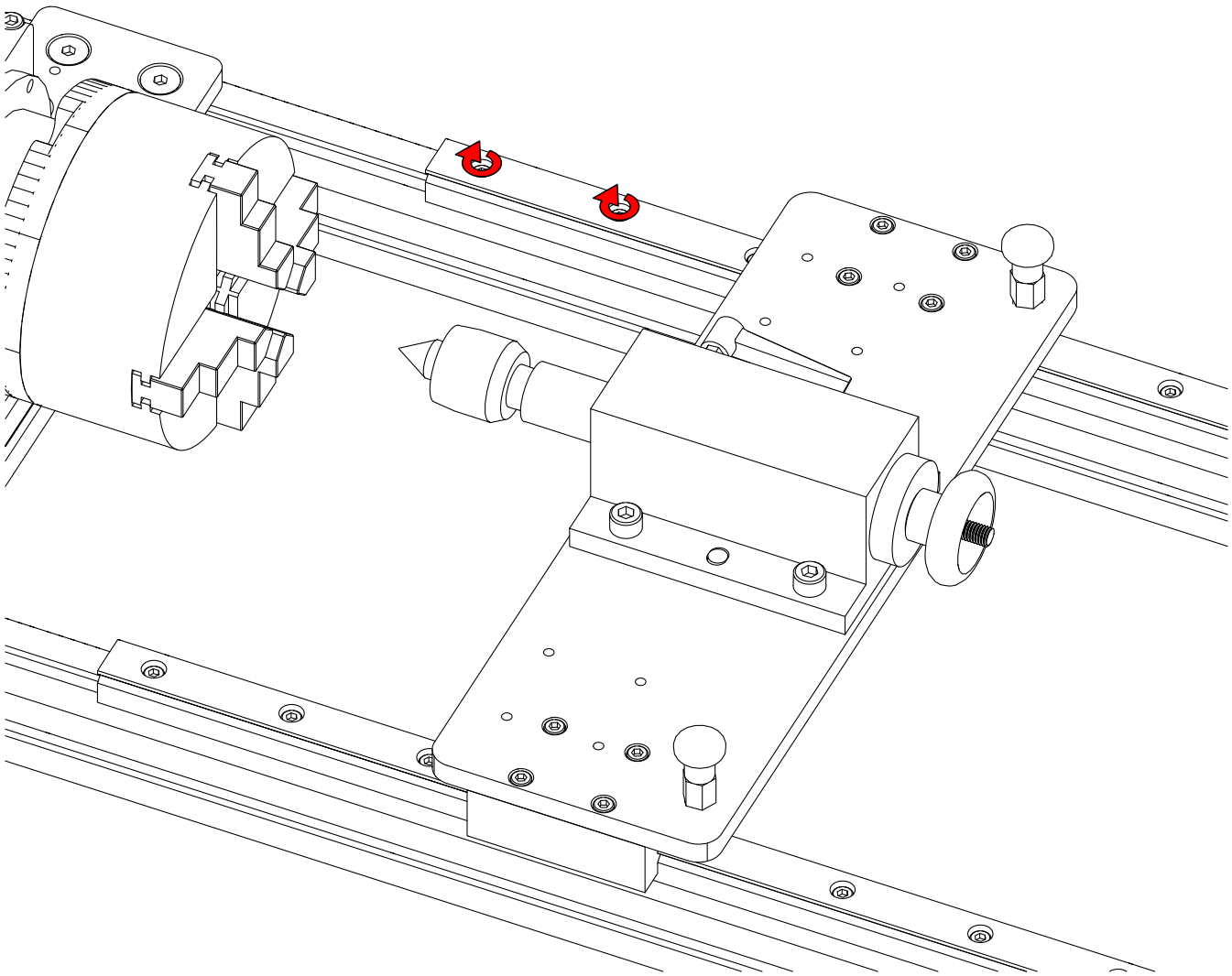
- Remove the tailstock from the chuck.
- Insert the live center back into the tailstock.



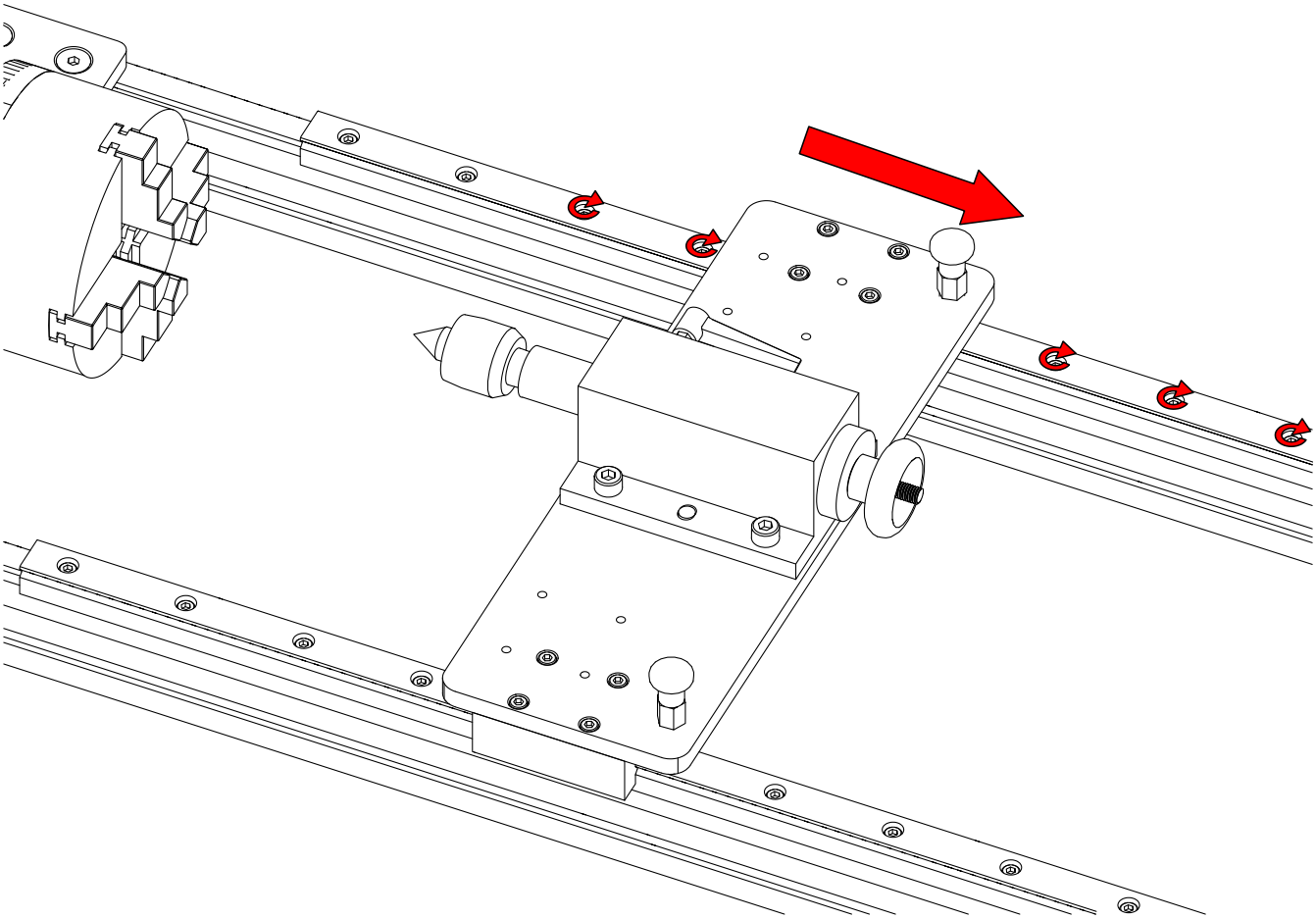
- Rotate the spring plunger handles to lock the tailstock in place.

Assembly Note

The spring plungers will lock into the counterbores on the linear rails. You may need to adjust the position of the second linear rail for both spring plungers to lock in place.

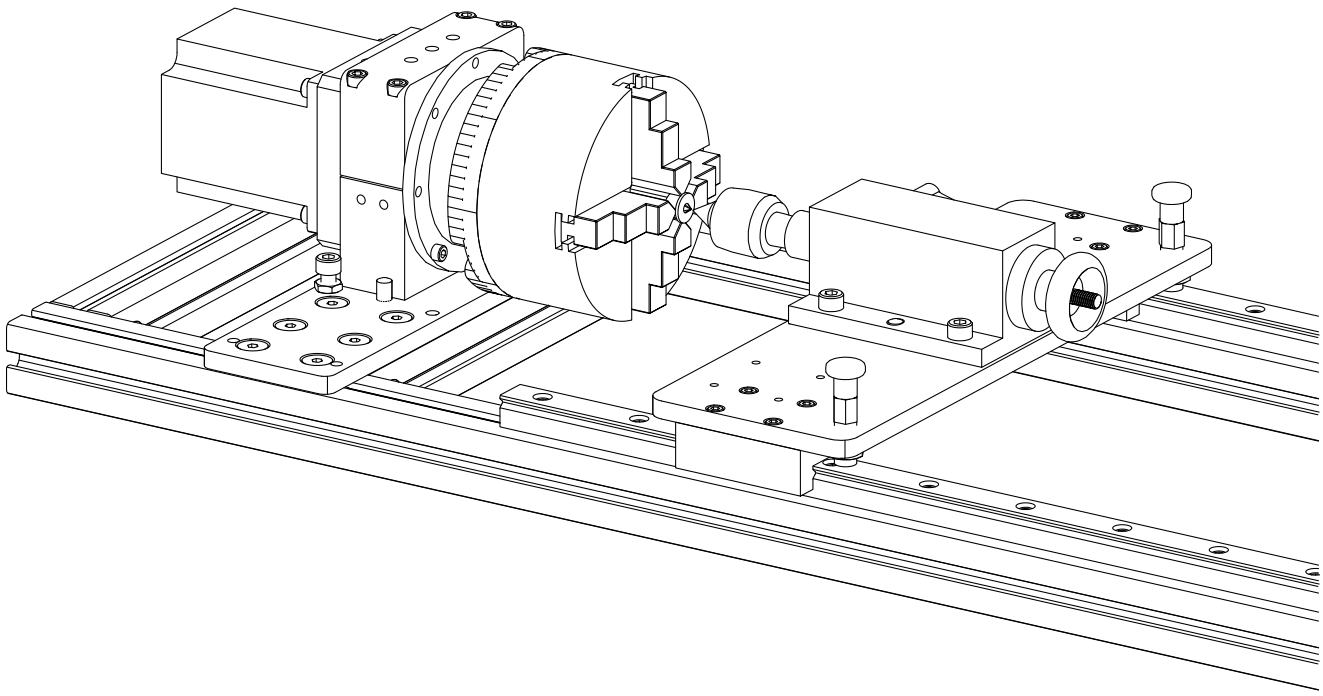


- With the tailstock locked in place, tighten the indicated fasteners on the second linear rail.



- Unlock the spring plungers.
- Tighten the remaining linear rail fasteners while moving the tailstock down the rail.

1.5 Chuck Alignment



Parts and Tools Required

The following parts and tools will be used in Section 1.5

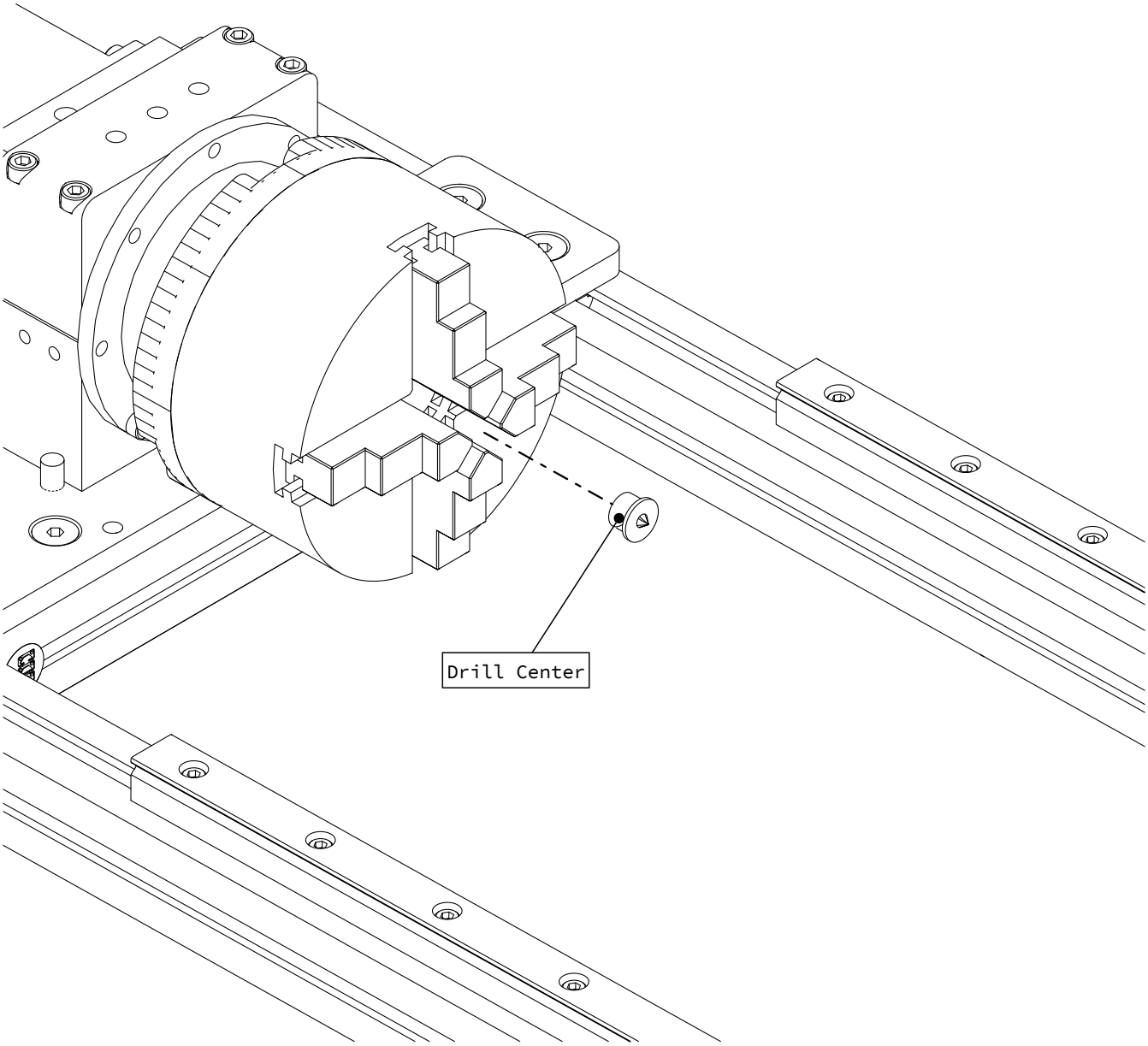
QTY	Part/Description	Packaged In
1	CRP193-00: - (1) Drill Center *Remaining parts from this kit used in Section 1.6 and during calibration*	CRP190-00-BASE
1	CRP191-00-FAST: - (2) M8 x 20mm Socket Head Cap Screw - (2) M8 Hex Jam Nut *Remaining parts from this kit used in Section 1.6*	CRP190-00-BASE

Required Tools:

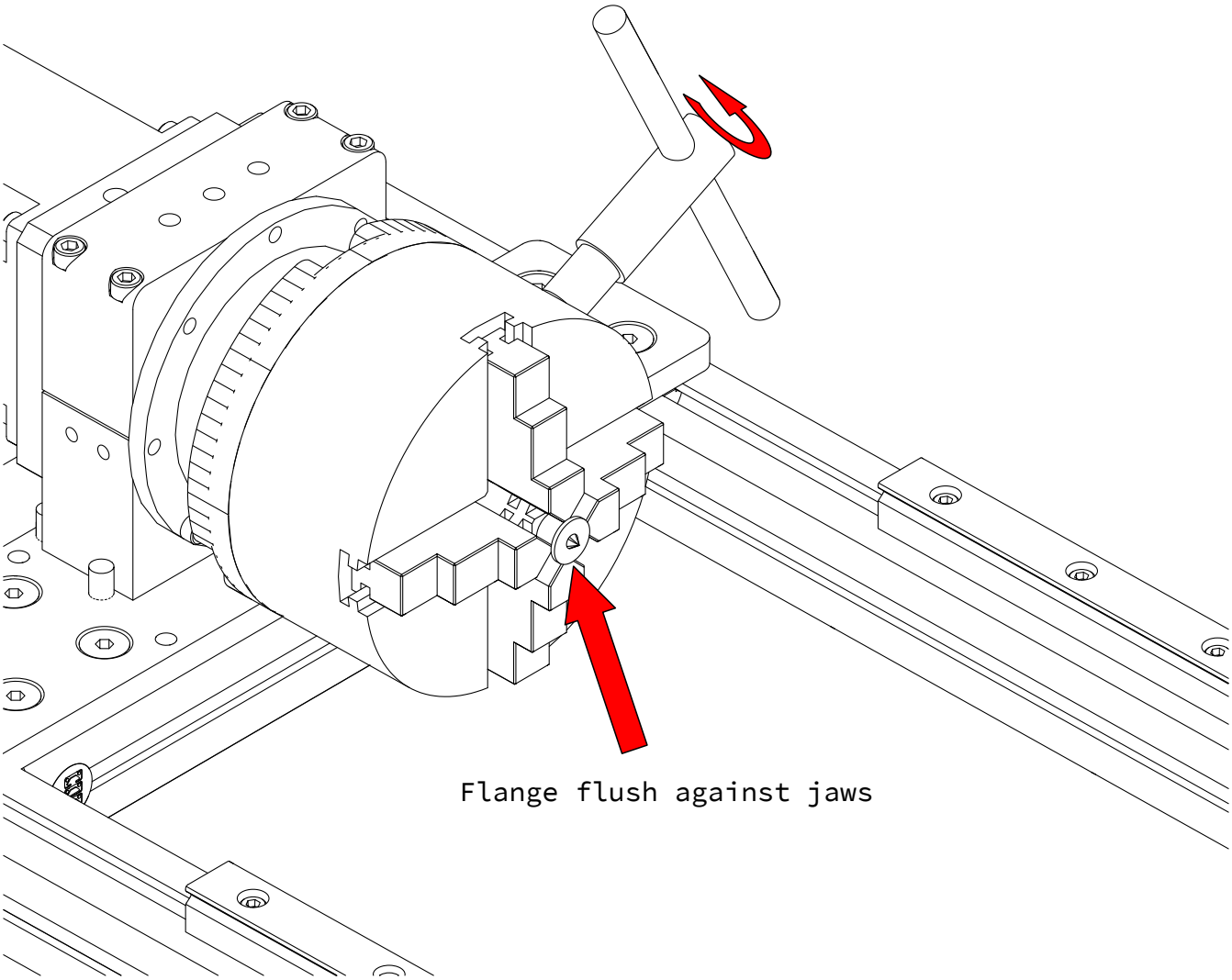
- 5mm Allen Wrench
- 6mm Allen Wrench
- 13mm Combination Wrench

1.5.1 Alignment Steps

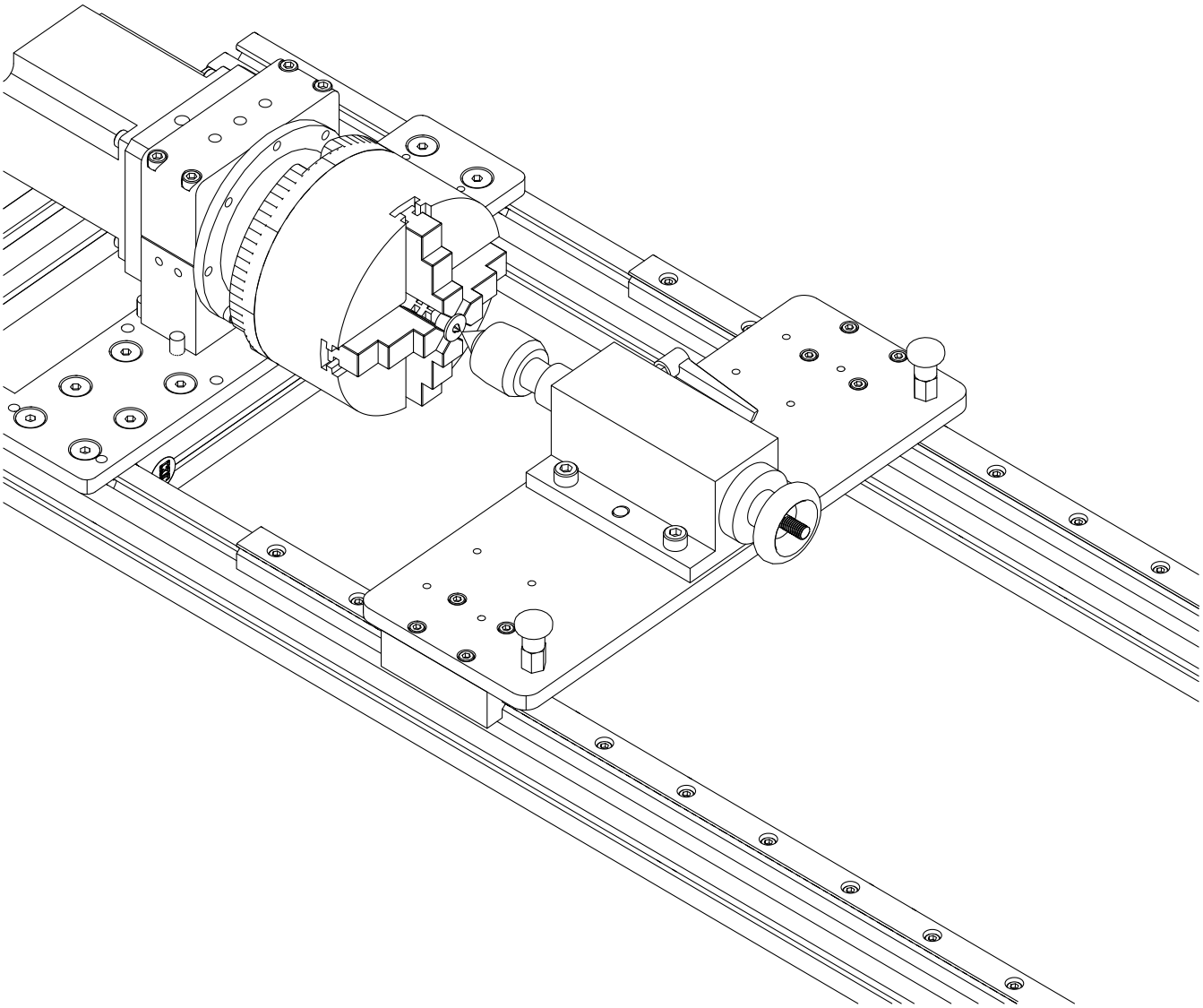
1.5.1.1



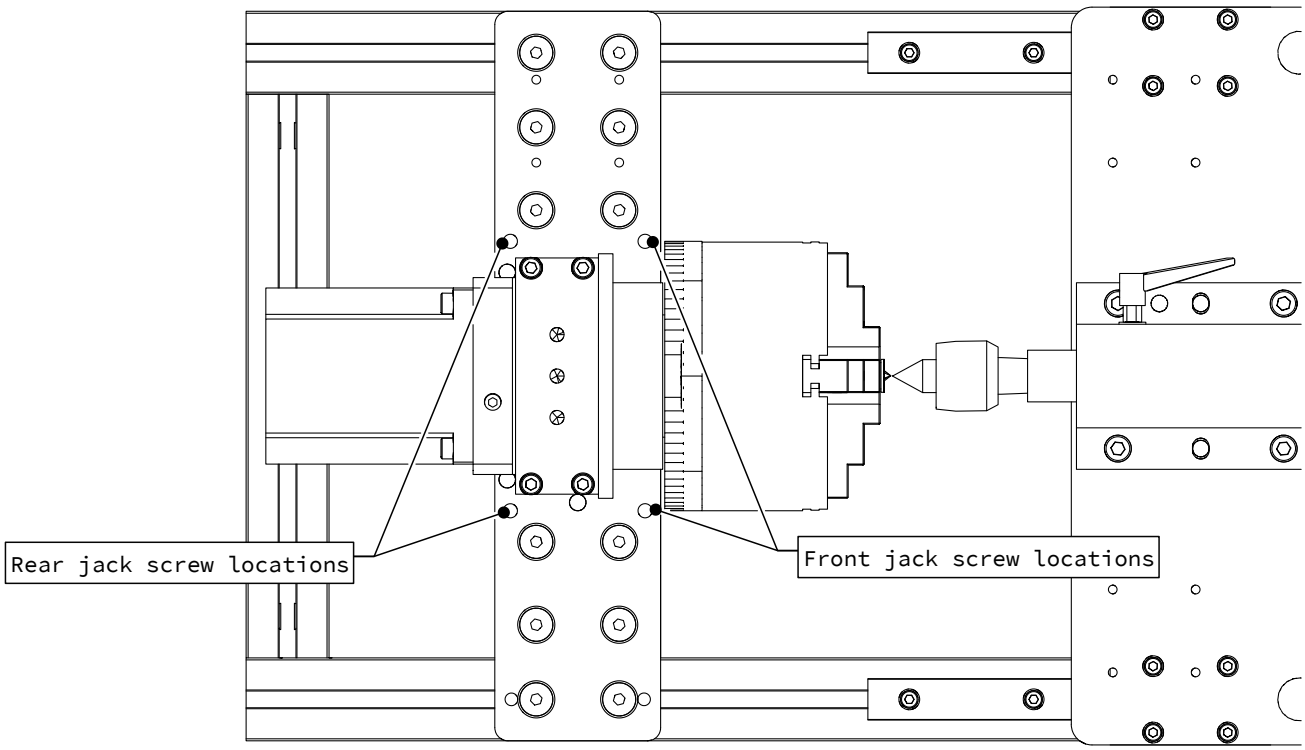
- Insert the drill center into the chuck as indicated.



- Tighten chuck with the drill center flush against the jaws.

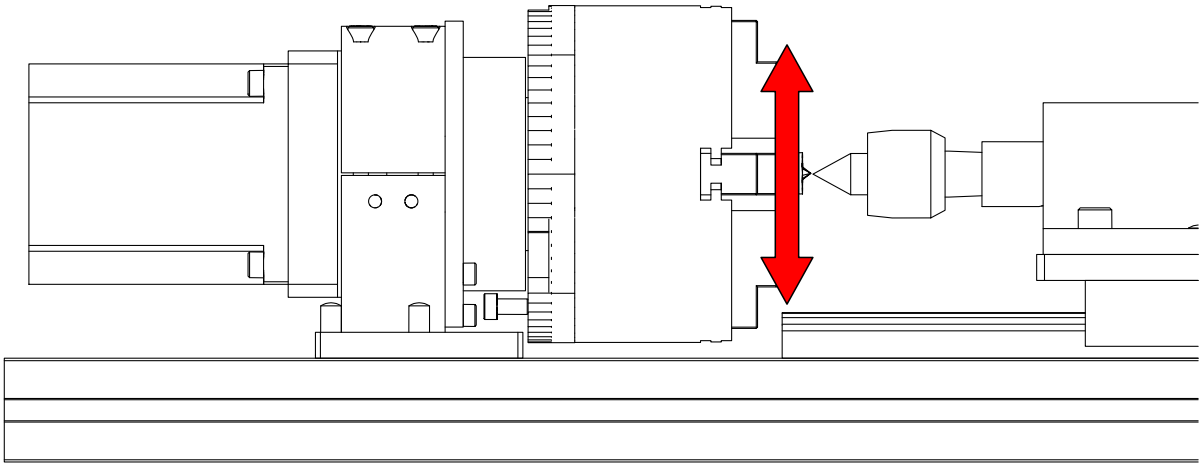


- Position the tailstock next to the chuck as indicated.
- Use the adjustment procedure in the following steps to align the tip of the drill center with the tip of the tailstock's live center.



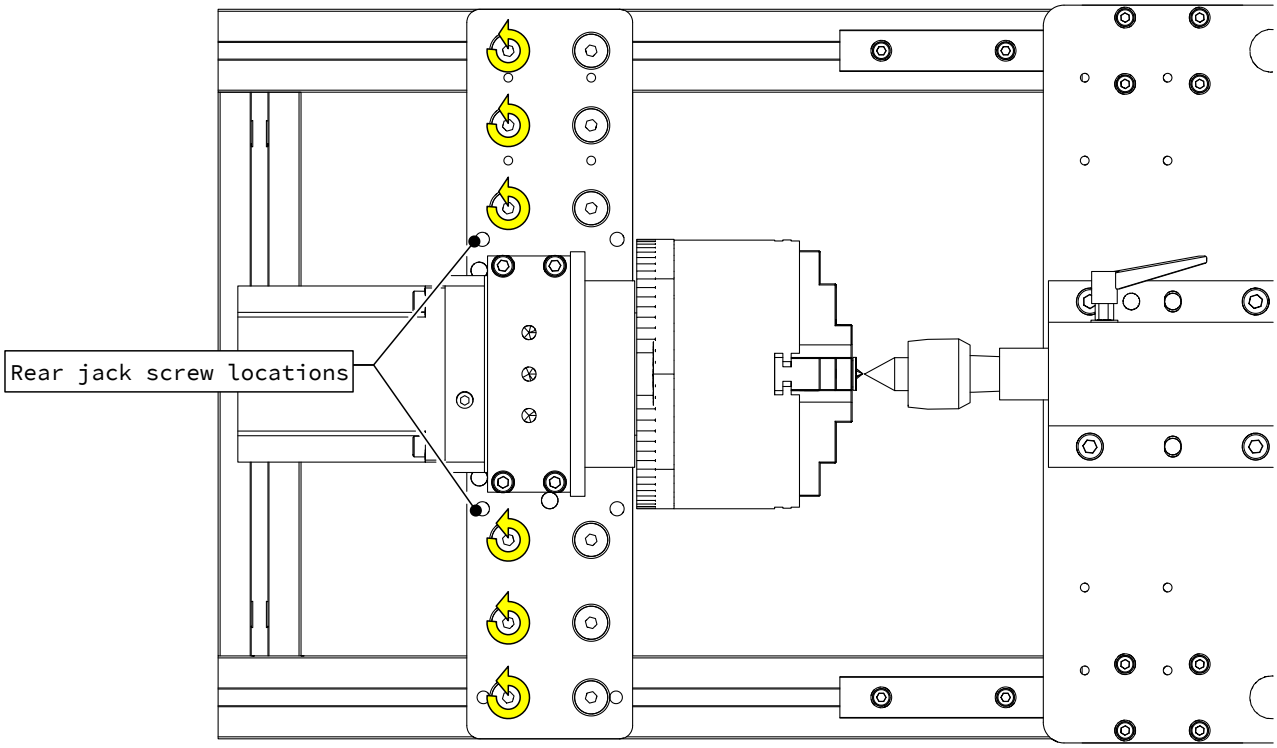
Top View

- Either the front or rear jack screw locations will be used, depending on which way the chuck needs to be adjusted..



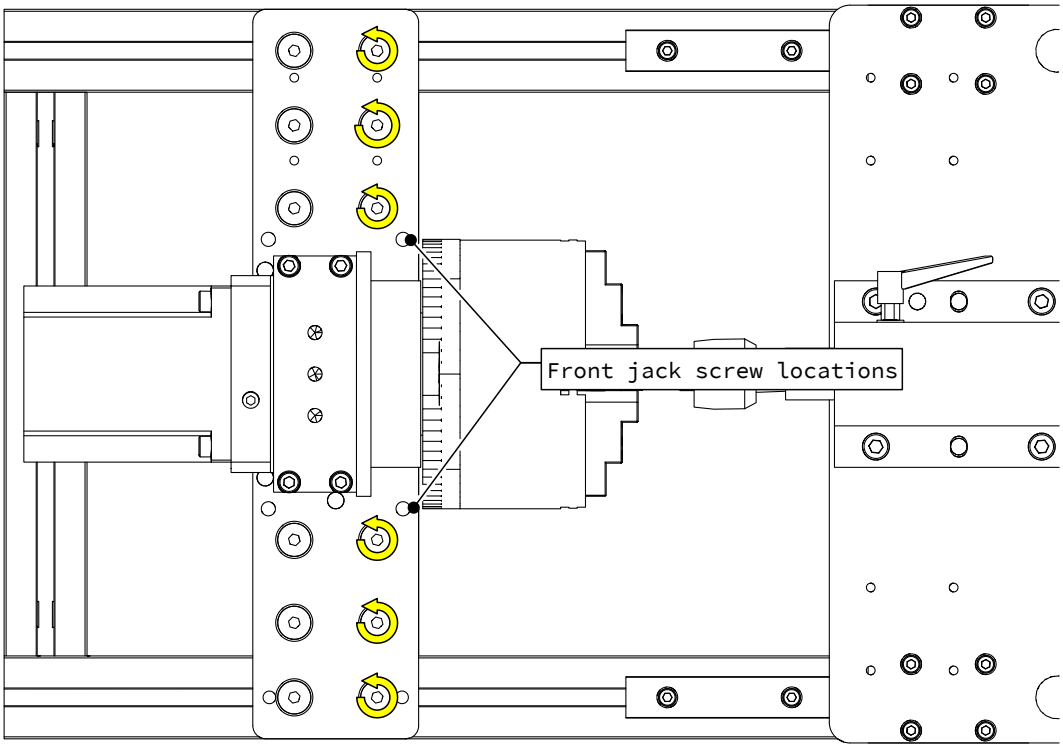
Front View

- The front jack screw locations will adjust the front of the chuck up.
- The rear jack screw locations will adjust the front of the chuck down.



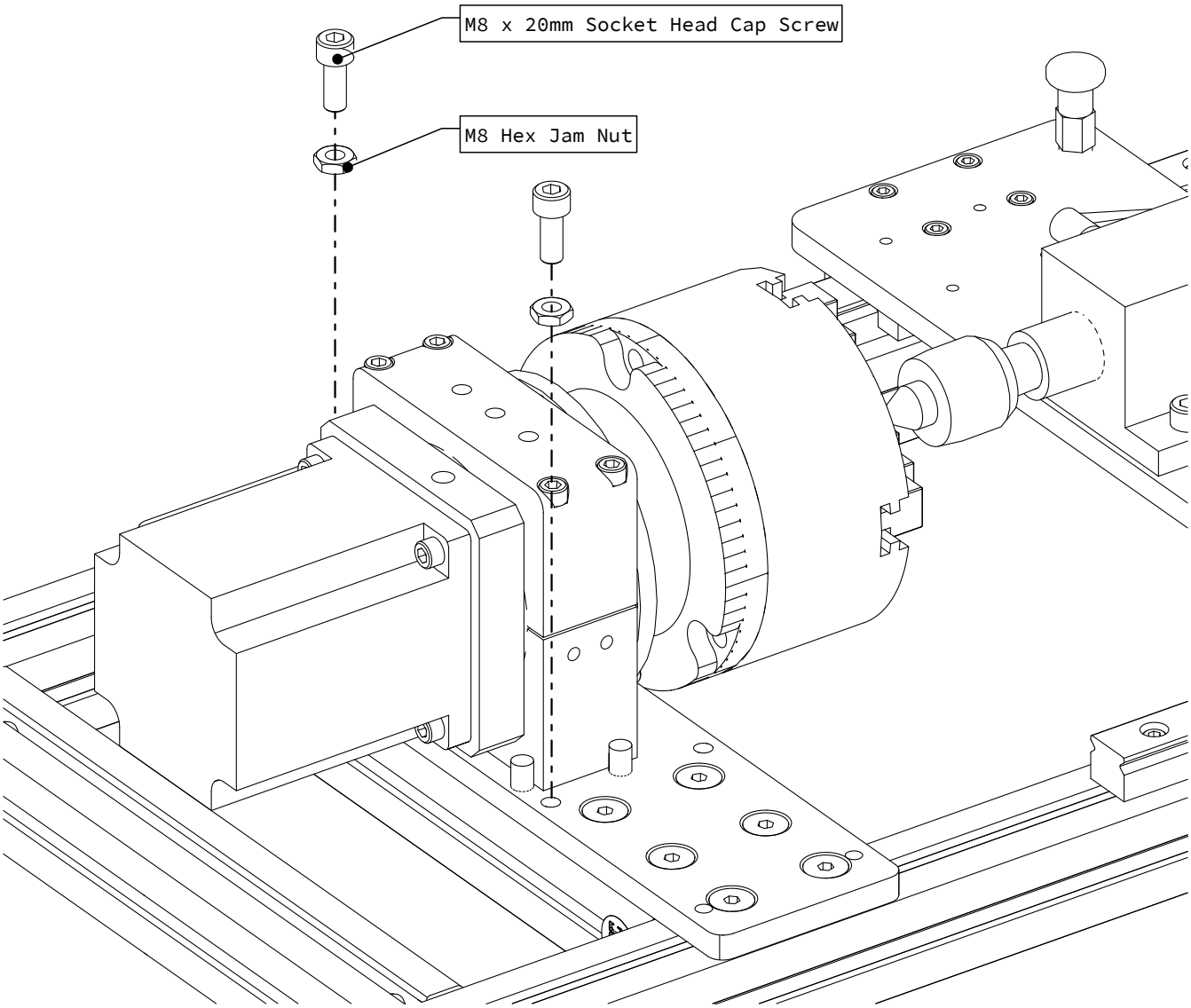
Top View

- If the rear jack screw locations are to be used, loosen **ONLY** the indicated fasteners.



Top View

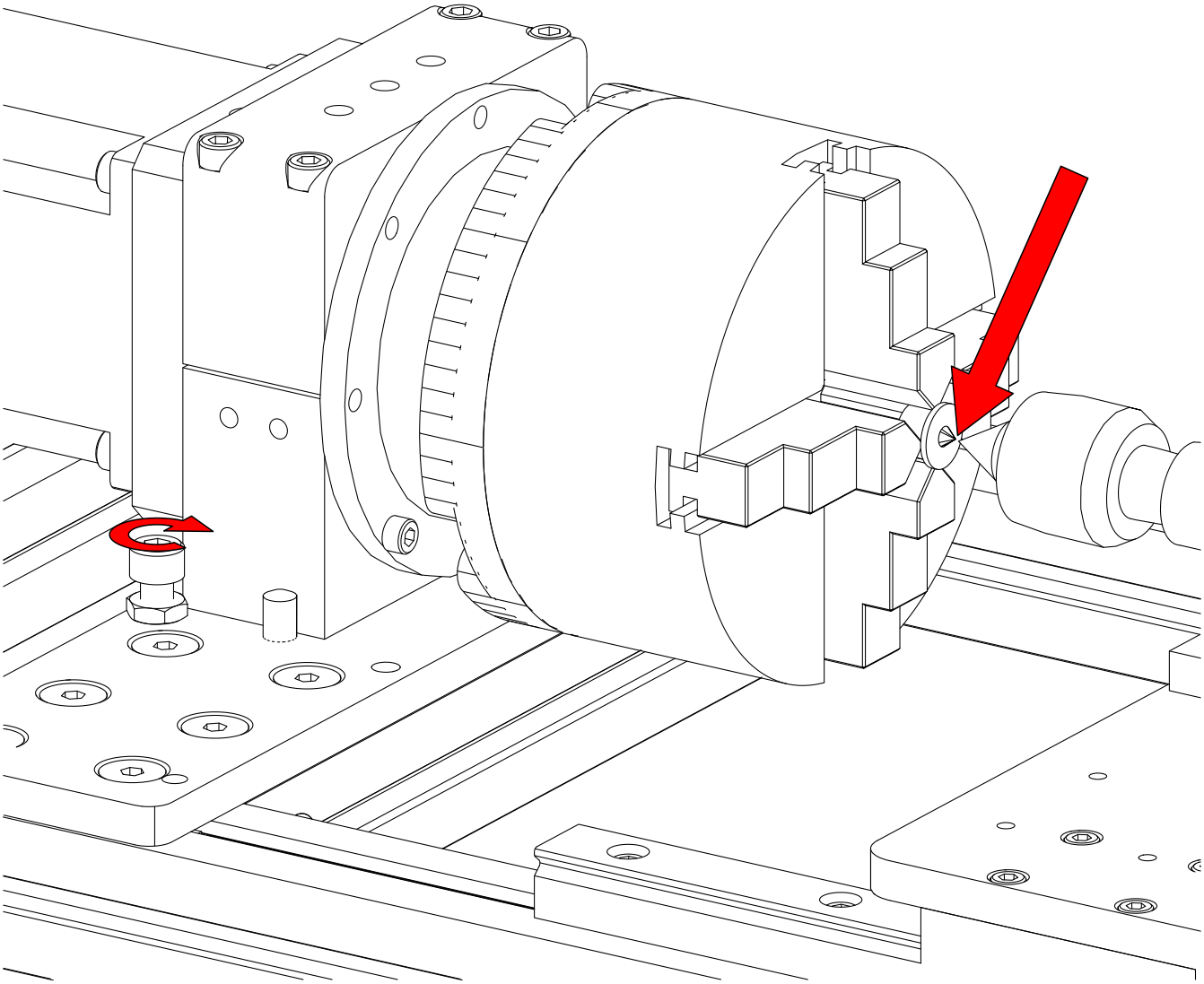
- If the front jack screw locations are to be used, loosen **ONLY** the indicated fasteners.



- Insert the jack screws and jam nuts into the front or rear locations.

Assembly Note

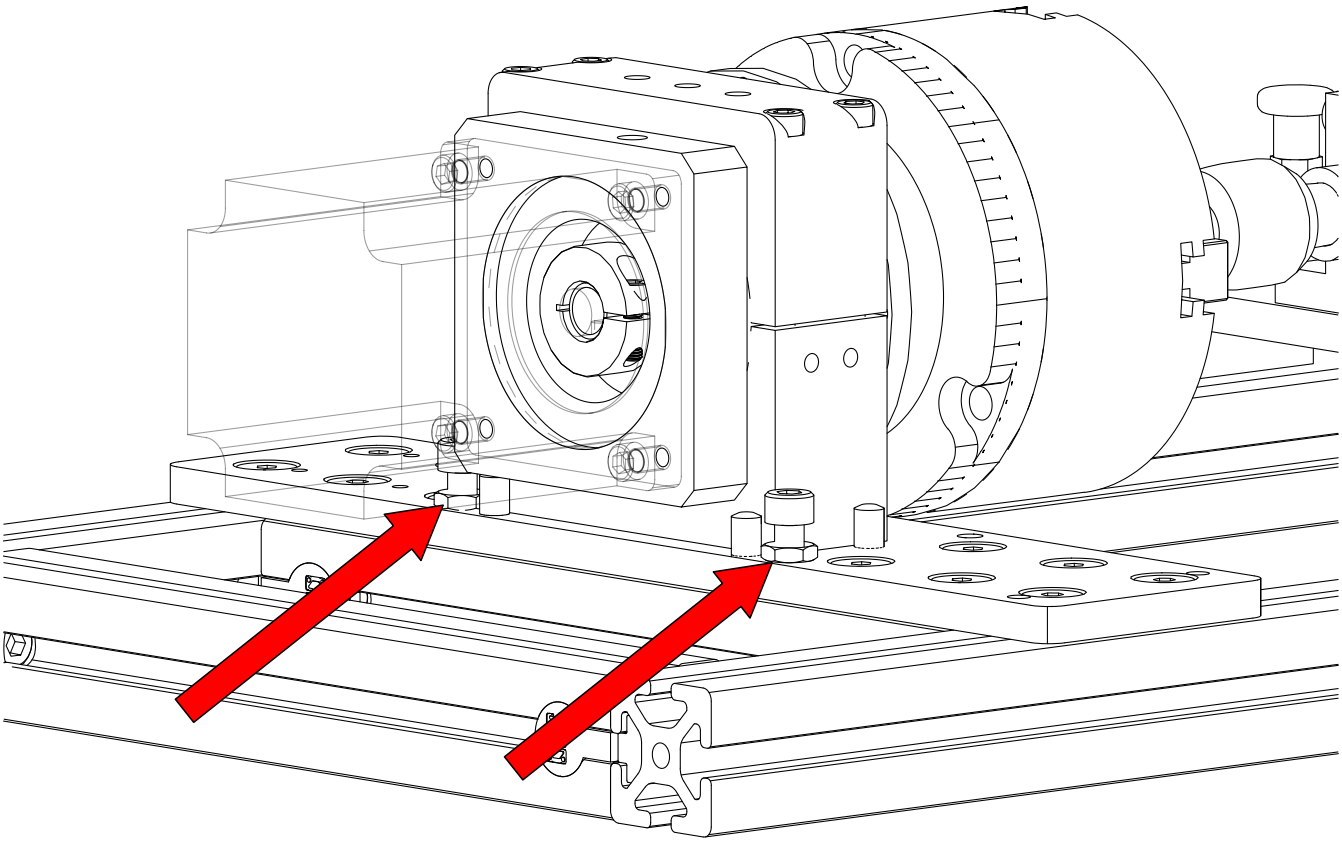
The remaining images will only show use of the rear jack screw locations. The process is the same if using the front locations.



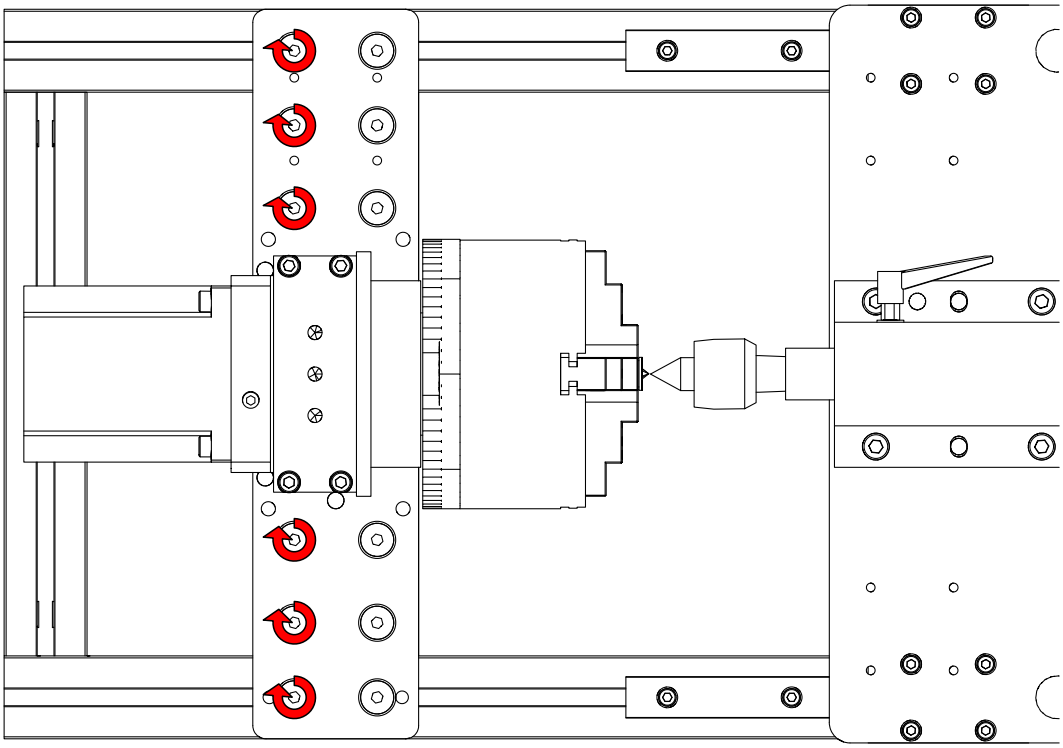
- Tighten the jack screws to align the points between the chuck and tailstock.

Assembly Note

Tighten both jack screws the same amount.

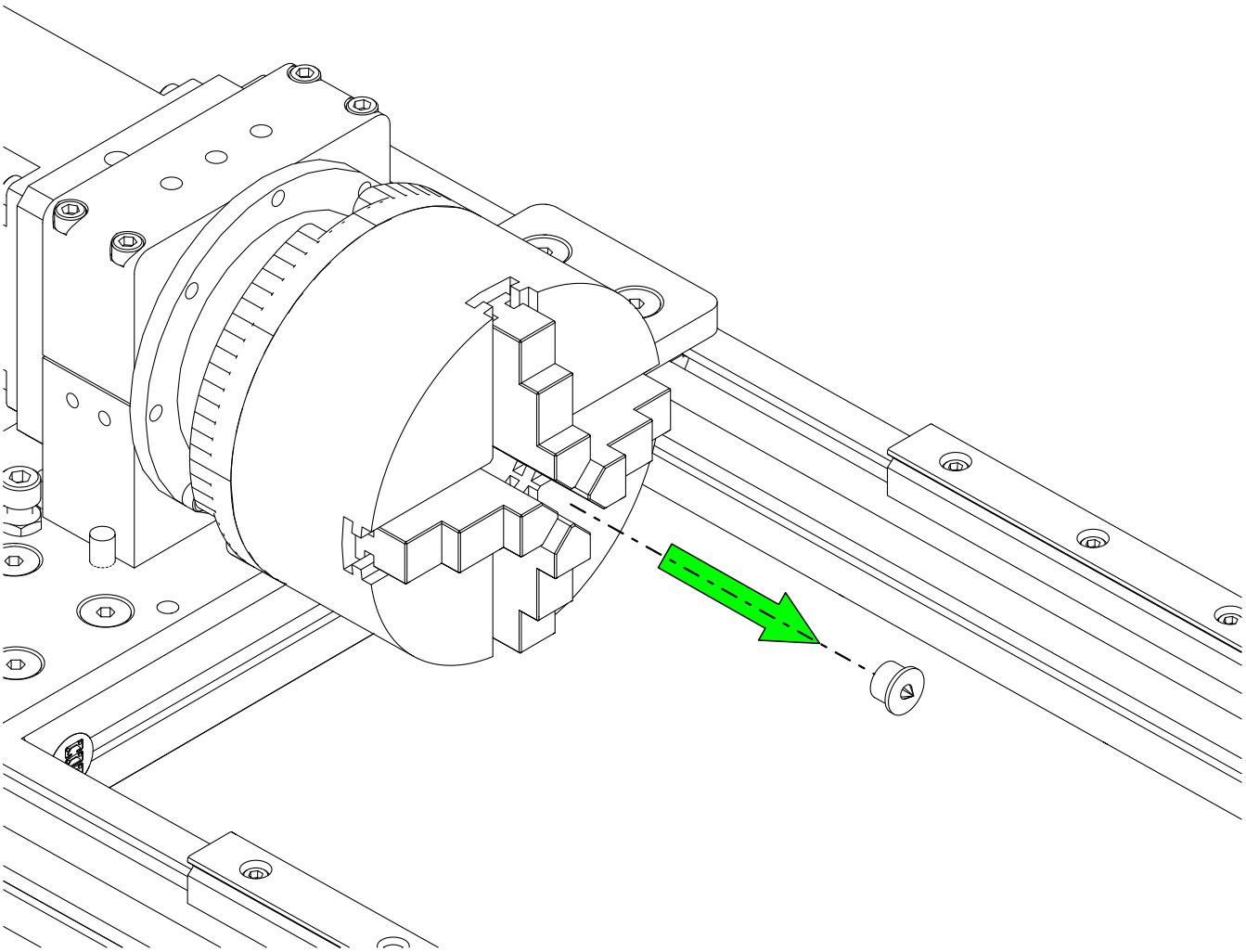


- Tighten the two jam nuts.



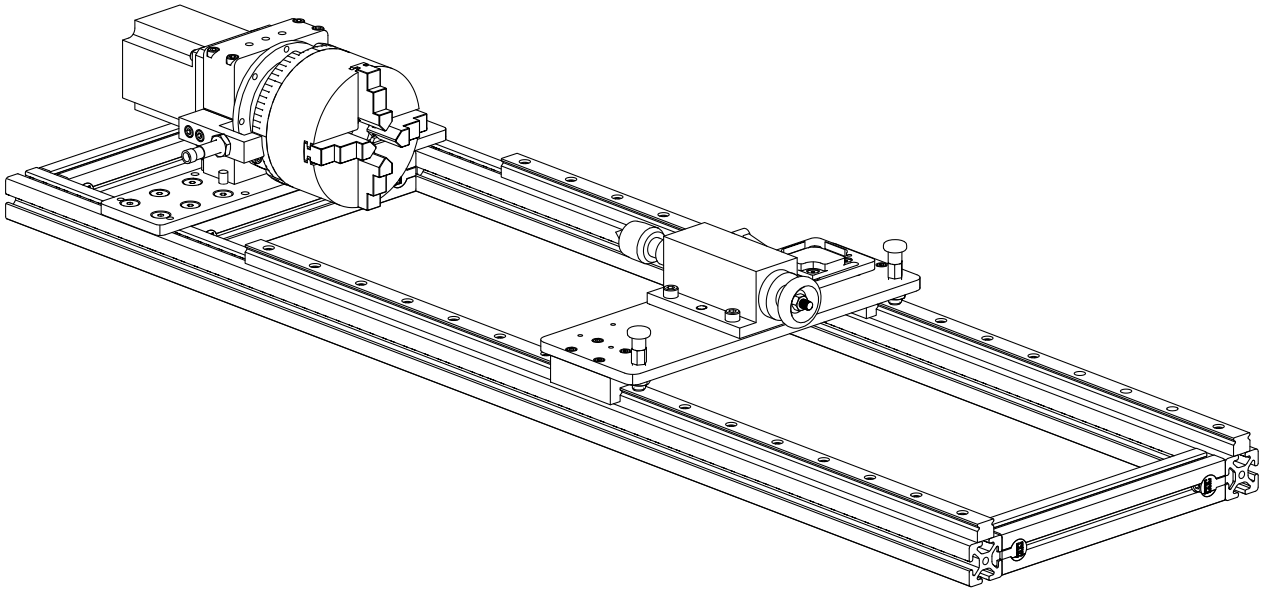
Top View

- Tighten the fasteners that were loosened in previous steps.



- Remove the drill center from the chuck.

1.6 Touch Plate & Sensor Installation



Parts and Tools Required

The following parts and tools will be used in Section 1.6

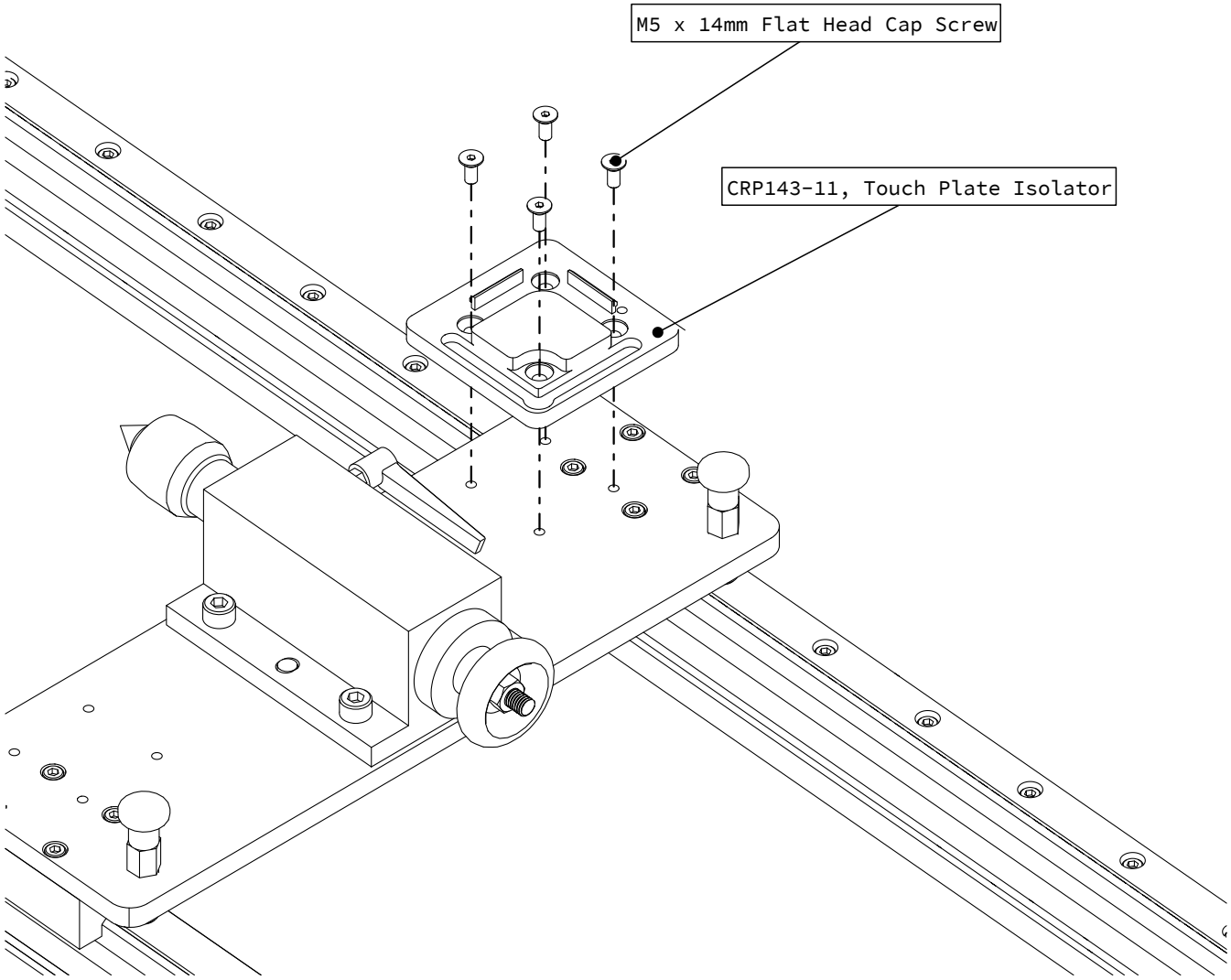
QTY	Part/Description	Packaged In
1	CRP143-11, Touch Plate Isolator	CRP190-00-HW
1	CRP191-04, Rotary Sensor Bracket	CRP190-00-HW
1	Cylindrical Proximity Sensor	CRP190-00-BASE
1	CRP193-00: - (4) M5 x 14mm Flat Head Cap Screw *Remaining parts from this kit used in calibration section*	CRP190-00-BASE
1	CRP191-00-FAST: - (2) M6 x 30mm Socket Head Cap Screw	CRP190-00-BASE

Required Tools:

- 4mm Allen Wrench
- 5mm Allen Wrench
- 17mm Combination Wrench

1.6.1 Touch Plate Installation

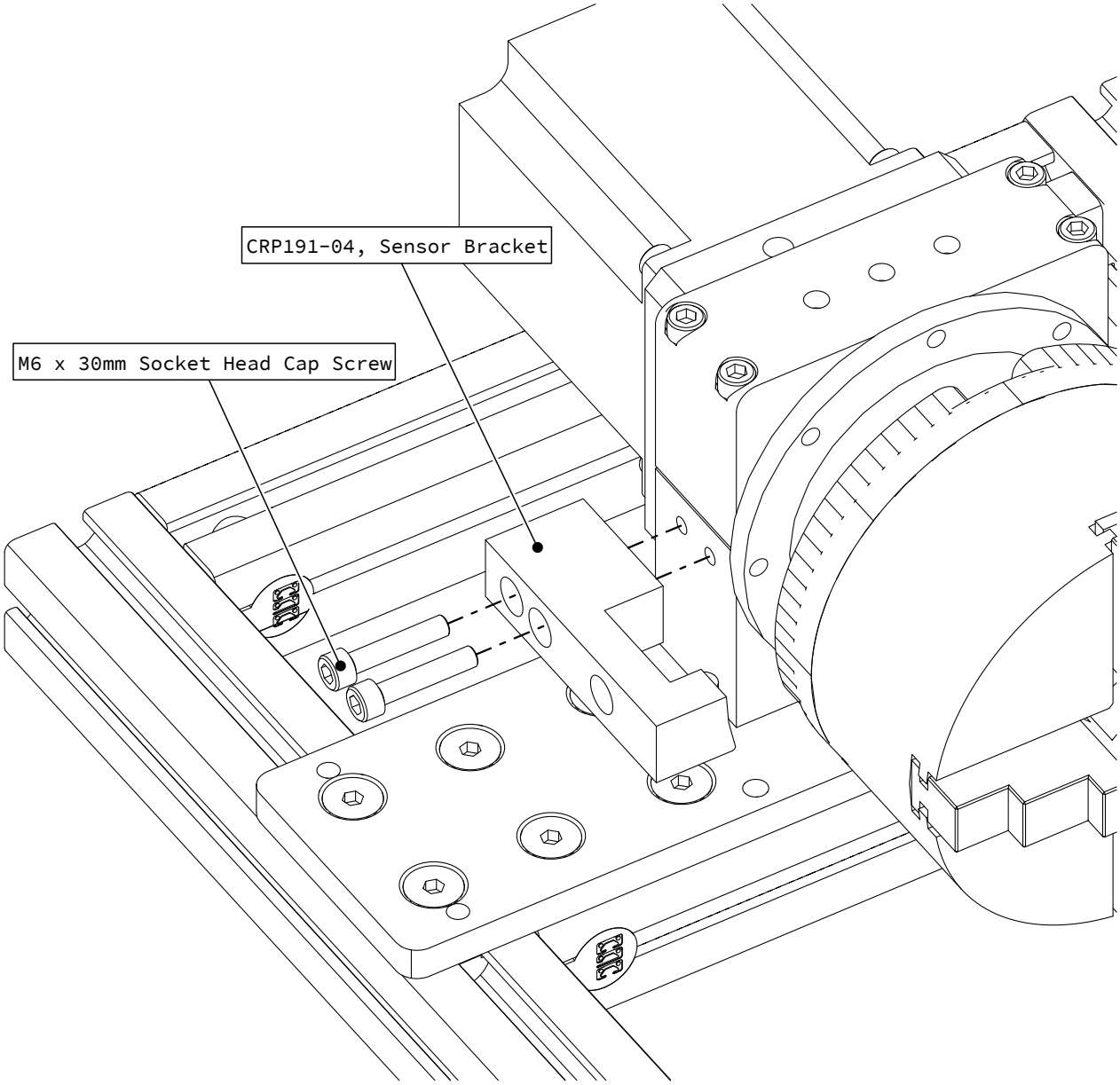
1.6.1.1



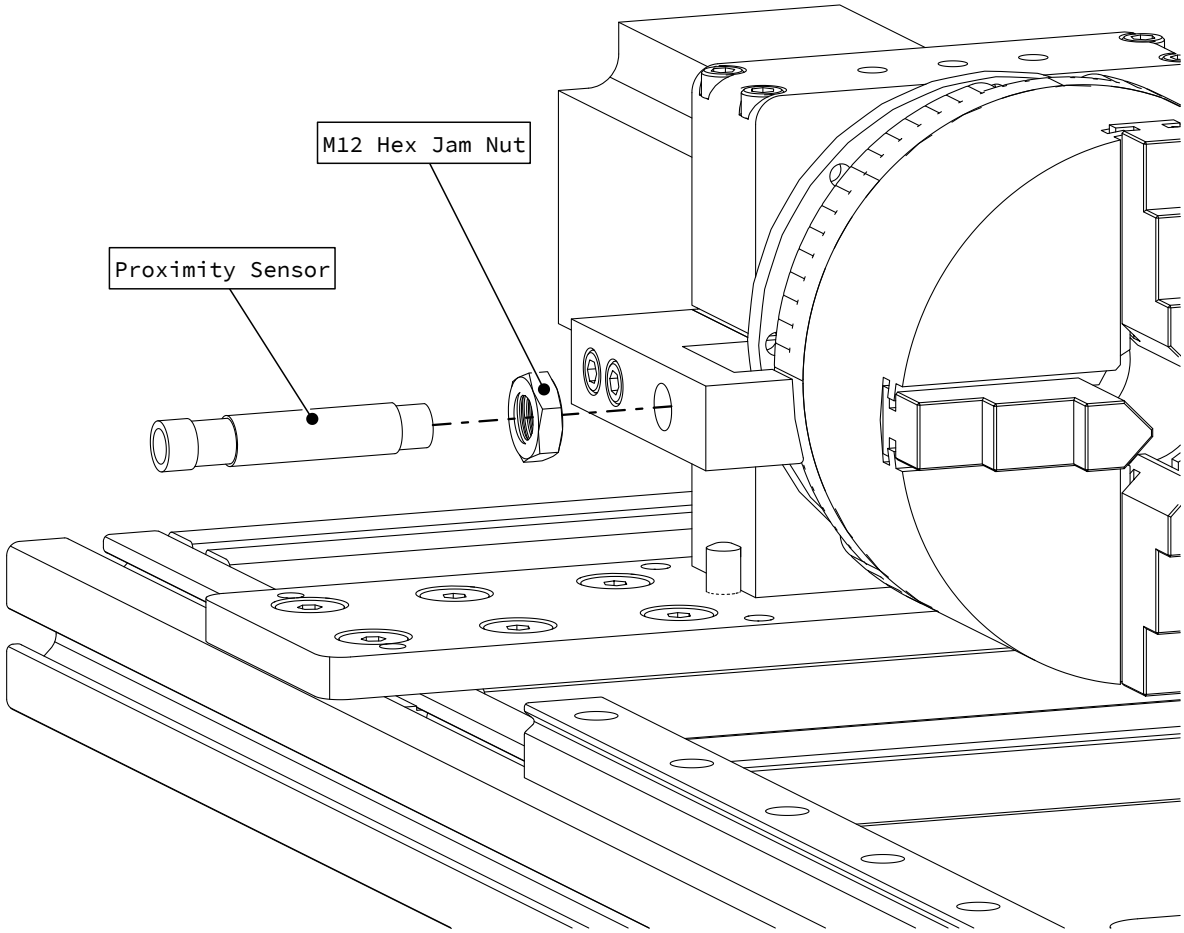
- Attach the touch plate isolator to the tailstock plate as indicated.

1.6.2 Sensor Installation

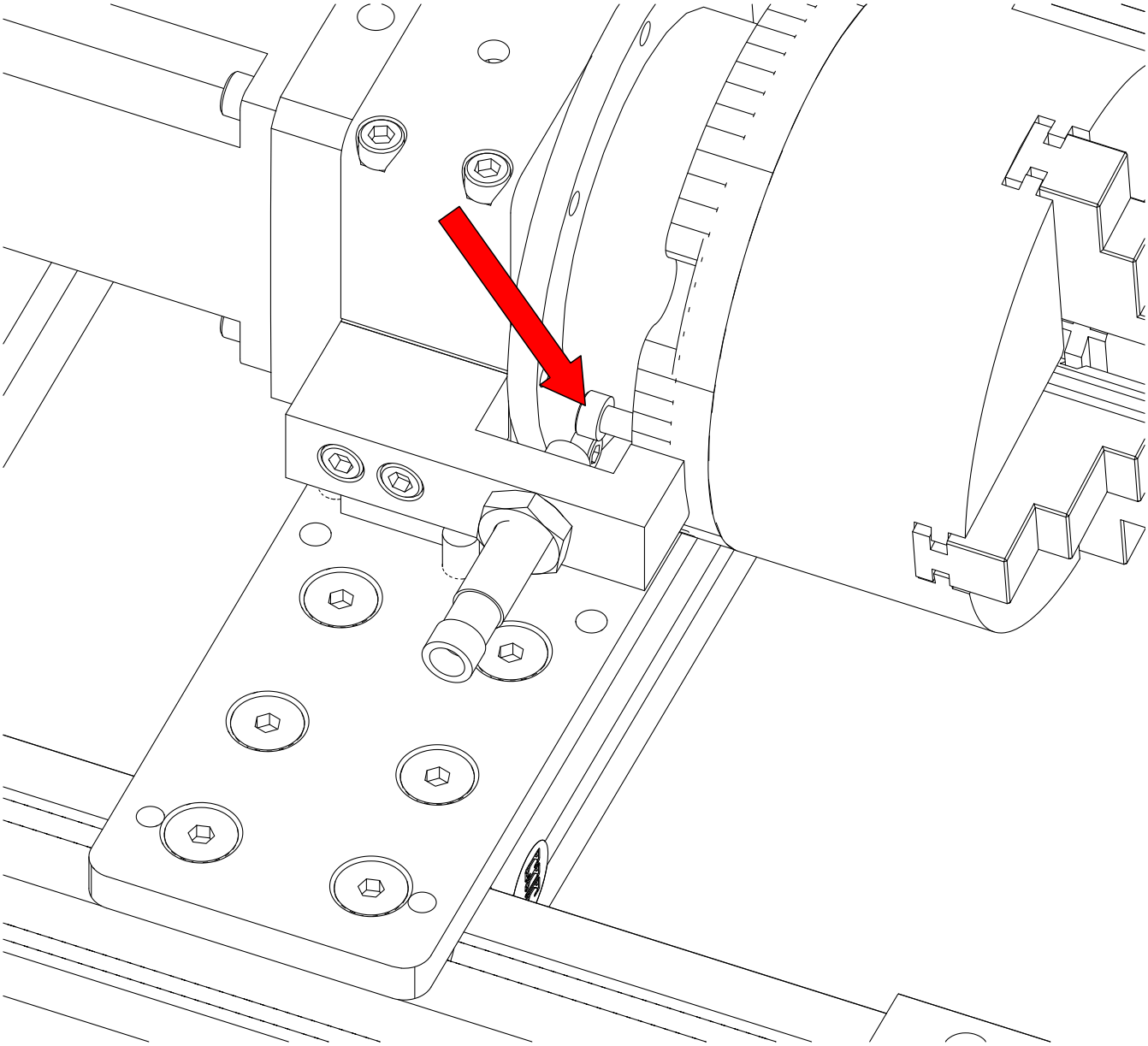
1.6.2.1



- Attach the sensor bracket to the bottom chuck clamp as indicated.

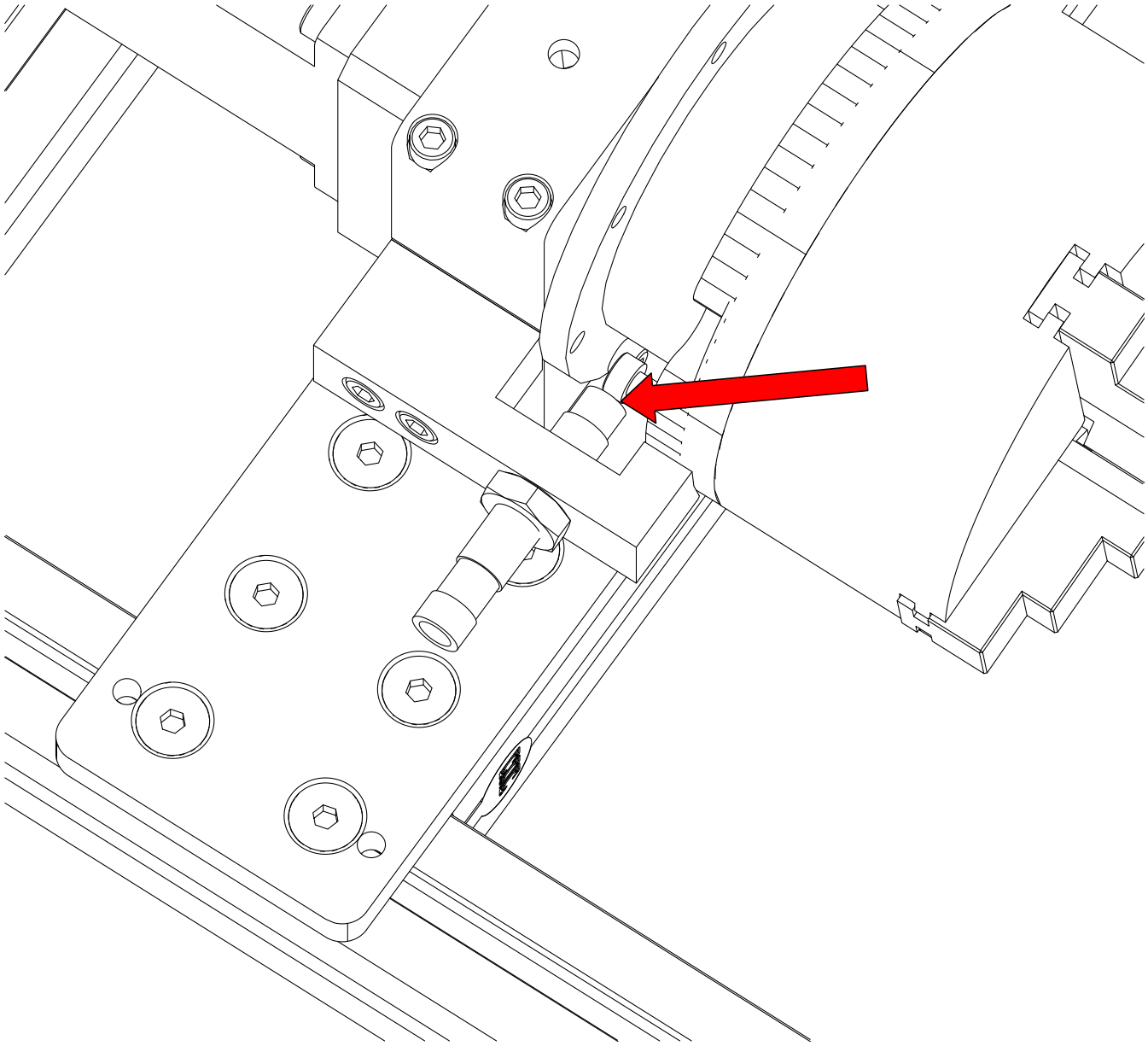


- Attach the proximity sensor as indicated.

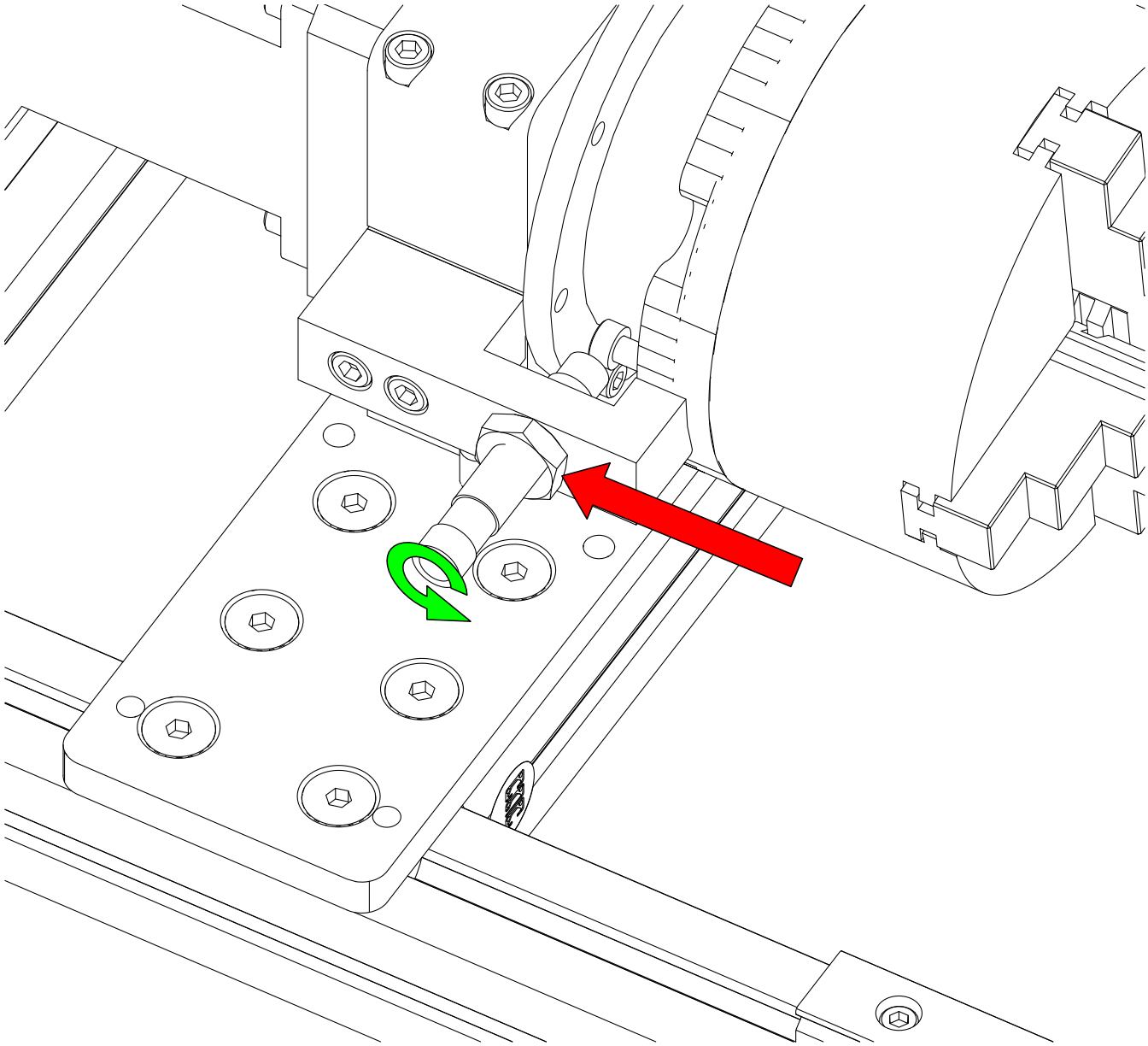


- Rotate the chuck to align the shoulder bolt with the sensor.

1.6.2.4



- Thread the sensor in until it touches the shoulder bolt.



- Back the sensor out one full turn.
- Tighten the sensor jam nut.