

Paramount Taurus Equatorial Fork Mount Assembly Instructions




Software Bisque Inc.
Revision 1.4
May 2018

Packing and Screw List

Below is a list of the items you will need to install the Taurus Equatorial Fork Mount. There are six boxes containing each component, there are 37 bolts and wrenches you will need to install the Taurus.

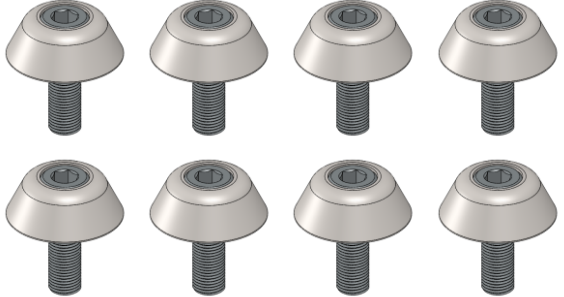
Picture	Description (Taurus 500/600 top, Taurus 400 bottom)
	Pedestal (Optional)


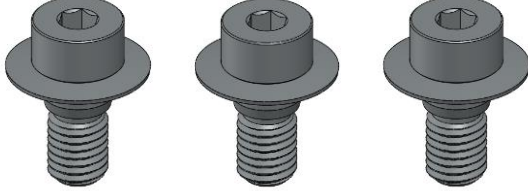
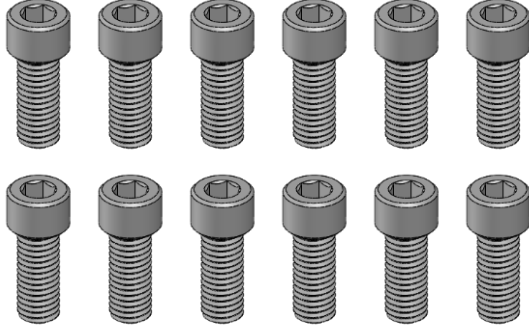
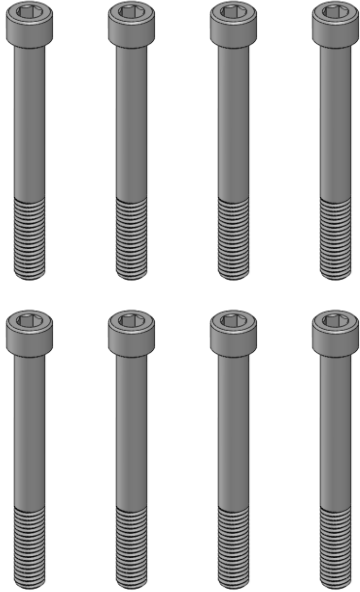
Picture	Description (Taurus 500/600 top, Taurus 400 bottom)
	<p>Wedge Assembly</p>
	<p>RA Assembly</p>

Picture	Description (Taurus 500/600 top, Taurus 400 bottom)
	<p>Fork Base</p>
	<p>Fork Extension* (2 pieces)</p> <p>* Included with the Taurus 600 that will carry wider OTAs.</p>
	<p>Fork With Gear</p>

Picture	Description (Taurus 500/600 top, Taurus 400 bottom)
	<p>Fork Without Gear</p>

Screw List

	<p>Lock nut (8 pieces) $\frac{1}{2}$-inch-20 x 1-1/2-inch SHCS (Taurus 500/600) 3/8-24 x 1-1/2-inch SHCS (Taurus 400)</p>
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	<p>Azimuth Adjustment Anchor (1 piece)</p>
	<p>RA and Azimuth Adjustment Shoulder Bolts with washers (3 pieces)</p>
	<p>Fork Arm Attaching Bolts (12 pieces)</p> <p>½-inch-13 x 1-1/4-inch SHCS (Taurus 500/600)</p> <p>3/8-16 x ¾-inch SHCS (Taurus 400)</p>
	<p>Fork Base Attaching Bolts (8 pieces)</p> <p>½-inch-13 x 4-1/2-inch SHCS (Taurus 500/600)</p> <p>½-13 x 3-inch SHCS (Taurus 400)</p>

Assembly Instructions

Step 1: Mounting Wedge Assembly to the Pedestal

Place the wedge assembly on the pedestal in the orientation shown in Figure 1 with the shoulder bolt on the back side of the pier when the pier appears to be tilted away from you. Install the azimuth adjustment shoulder bolt first. Then ensure the azimuth adjustment bolts are screwed out enough so the threaded hole can be accessed on the pedestal without having to remove the wedge assembly and install the azimuth adjustment anchor second. Last, install the four bolting lock nuts.

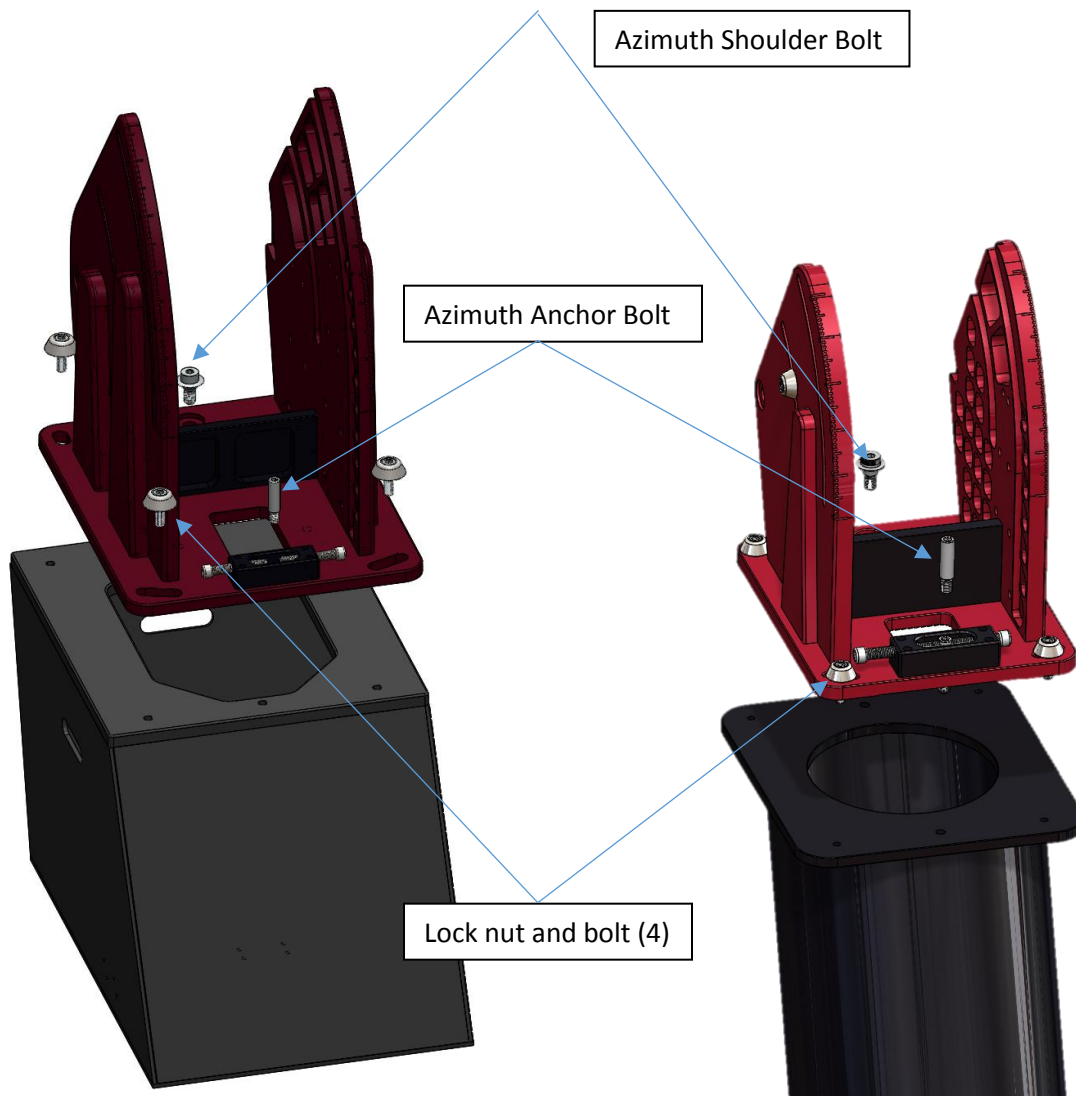


Figure 1: Mounting wedge assembly to pedestal.

Step 2: Installing RA Assembly into Wedge Assembly

Lift the RA tube assembly up into the wedge assembly in the orientation shown in Figure 2. The stainless-steel parts protruding from the tube can be set into a cradle shown again in Figure 2. Once in the cradle, the wedge can hold the weight of the RA assembly but is free to rotate within the wedges.

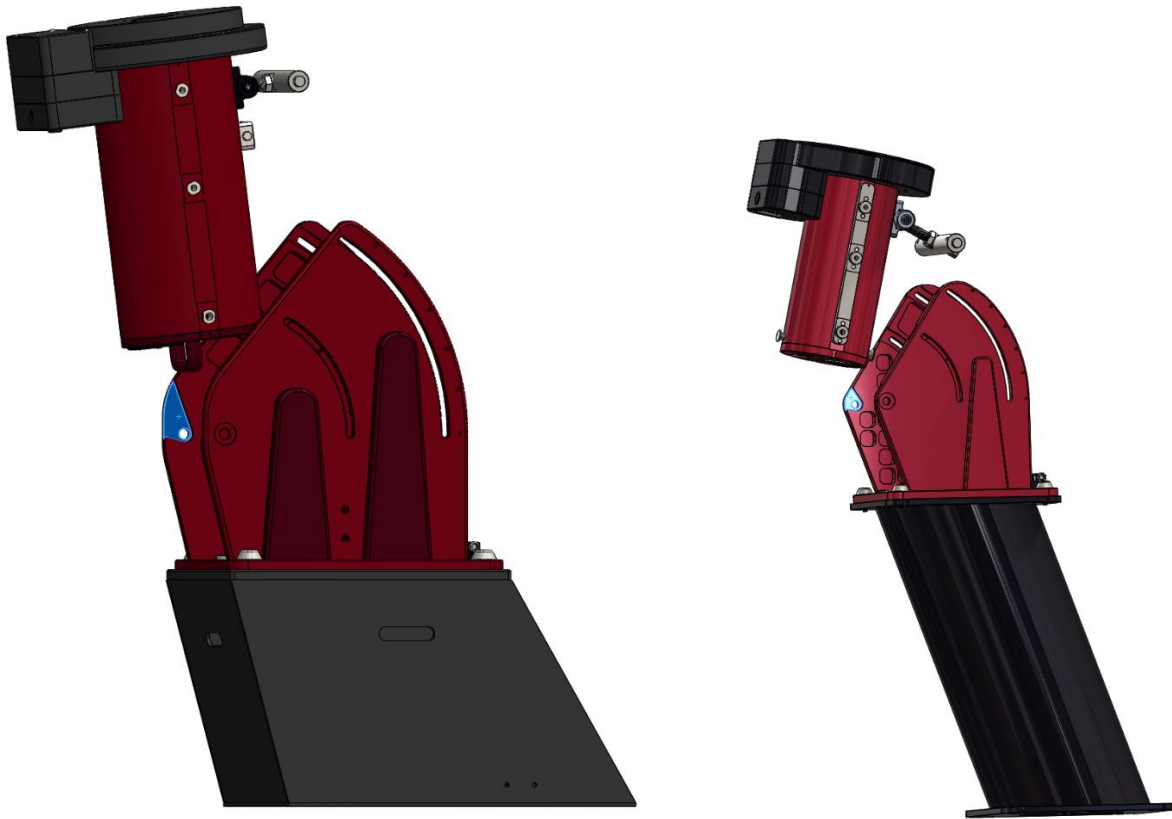


Figure 2: Installing the RA assembly.

Before rotating too far into the wedge assembly, make sure that the stainless-steel altitude adjustment bar is in the channel for the altitude adjustments. The altitude adjuster is spring loaded so it will need to be pushed “down” in the orientation shown below in order to get the bar into the channel as shown in Figure 4. Since the altitude adjuster is spring loaded, the increase in altitude adjustment will work automatically, however for each lowering adjustment of RA assembly, the stainless steel bar of the altitude adjuster will need to be pushed out of the cradles and into the channel before it can be lowered. It is helpful for the rest of the install to have the RA assembly at a low altitude (recommended lower than the 25 degree channel). To make initial adjustments easiest, ensure the stainless-steel bar is in mid travel of the threads (see Figure 3) before installing the altitude adjuster into the channel.

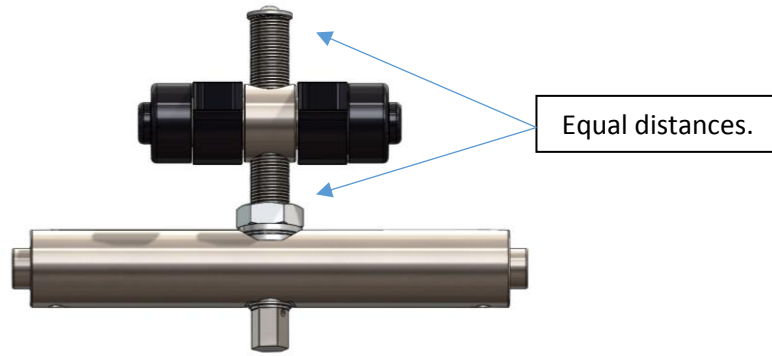


Figure 3: Altitude adjustment stainless-steel bar at the mid-travel position.



Figure 4: Altitude adjuster install position.

Once the altitude adjustment bar is in place and it is lowered to a manageable height, then the RA shoulder bolts should be installed. The stainless steel threads in the tube will need to be lined up with the shoulder bolt area on the wedges so using the handle on the back of the RA assembly is helpful to get the holes central while screwing in the shoulder bolts. After those are both installed, the four remaining lock nuts and bolts can be installed (See Figure 5).

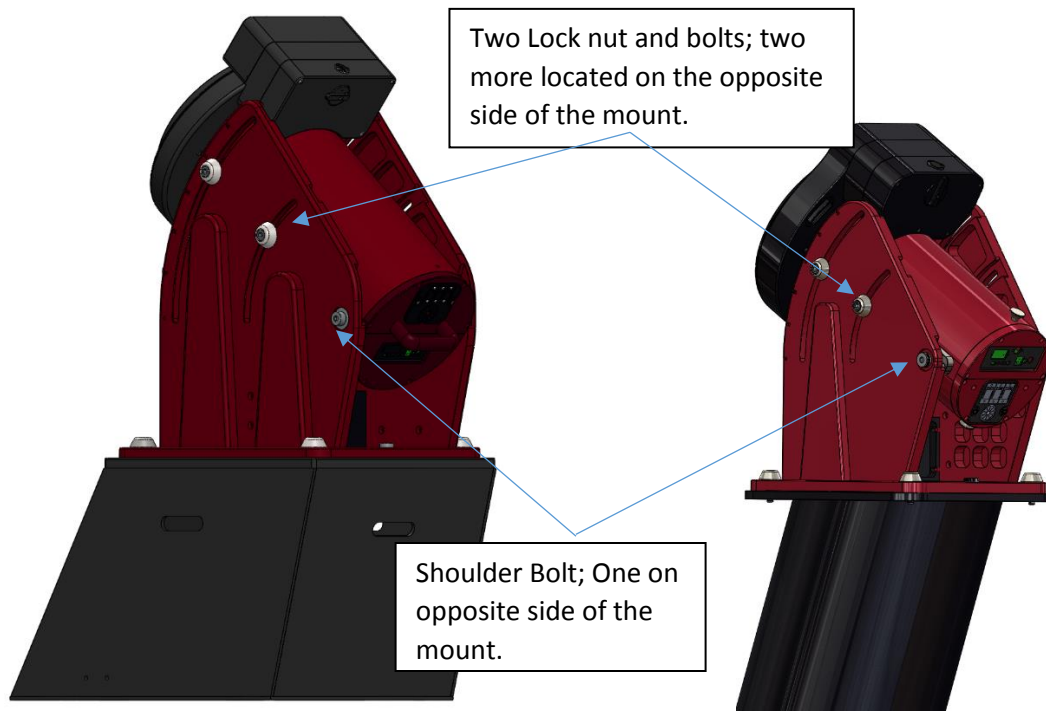


Figure 5: Shoulder bolt and wedge attaching bolts.

Step 3: Installing Fork Base

Fork Base Installation

If the RA assembly isn't lowered to a manageable height to install the fork arms, the RA assembly can also be more easily lowered before the next step of the installation.

The locking bolt as shown in Figure 6 should already be installed during shipping. For the Taurus 500/600, ensure it is installed so the gear does not turn while trying to mount the fork base. The locking bolt has five different locking positions 45 degrees apart to help with both the install of the fork arms and the telescope. For the Taurus 400, there are two locking bolts and both have to be removed before installing the RA fork base. This means the RA axis is free to rotate while installing the fork base and arms. The Taurus 500/600 uses eight ½-inch-13 x 4-½-inch SHCSs fork base and the Taurus 400 uses eight ½-inch-13 x 3-inch SHCSs for mounting. Orient the fork base so the channels and counter bores are facing outwards, the flat part of the fork base should be flush up against the RA gear and each end of the base are on either side of the wedges as shown in Figure 6, with forks oriented as in Figure 9.

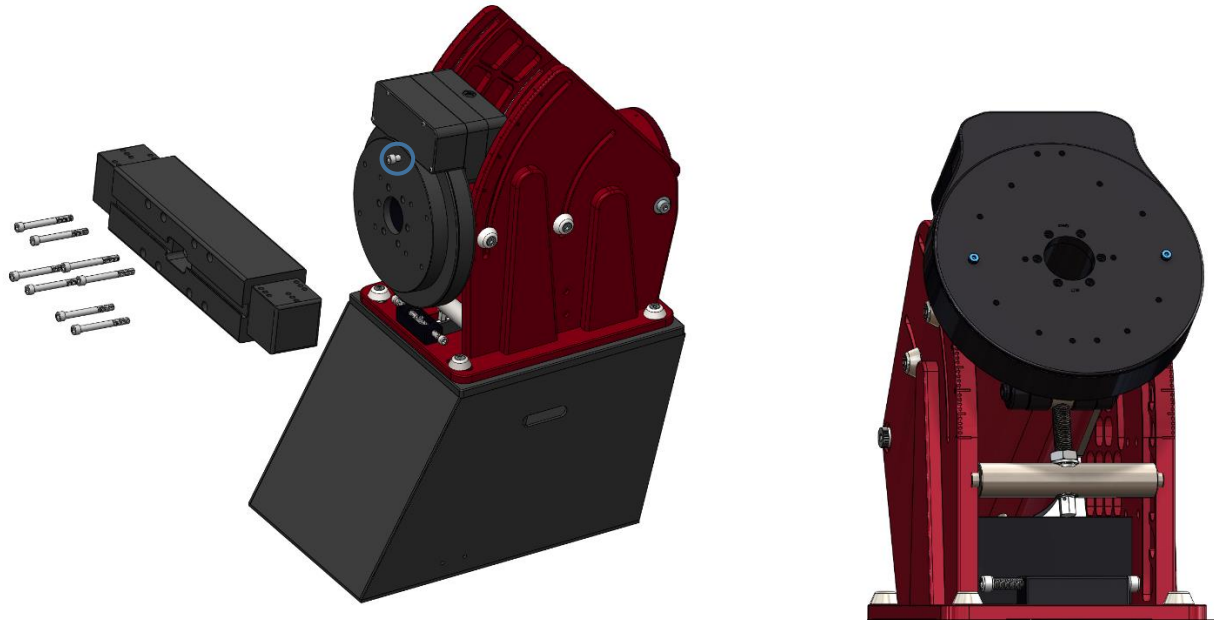


Figure 6: Installing fork base (locking bolts in blue).

Fork Extensions Installation

For some larger scopes, fork base extensions are needed. There is one for each side of the fork base and are installed with six ½-inch-13 x 1-1/4-inch SHCS, three on each side (top and bottom). Both parts are identical, so orientation is determined by lining up the cabling passages before installing the screws. See Figure 7 below. As also described in the Step 4: Installing Fork Arm without Gear below, the three screws on the bottom can be hard to reach so start by installing the top three screws not all the way tight and then ensure the RA gear is free and rotate it for easier access to the bottom screws. Once all six screws have been installed tighten them with the short end of the hex wrench.

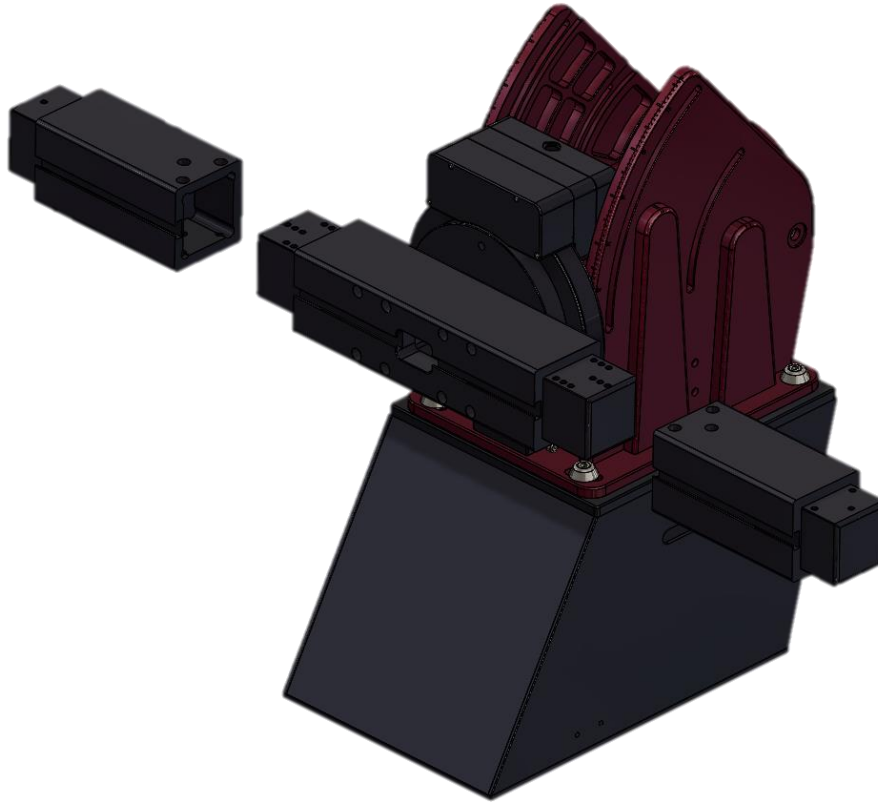


Figure 7: Installing fork base extensions.

Step 4: Installing Fork Arm without Gear

The fork arms have to be on a certain side of the mount, so start with the fork arm without the gear. This one has just a rotating cylinder and no gear or drive system with cables and therefore will be a little lighter than the arm with the gear. This arm needs to be installed on the left side of the mount when oriented as shown in Figure 8. Locate the six 3/8-16x3/4-inch SHCSs that are used to hold this fork in place, then slide the arm onto the fork base end. Install the top three 3/8-16x3/4-inch SHCSs first and don't tighten them down all the way. If you have a hard time reaching the three on the bottom you can install the second arm with its top three screws and then rotate the RA gear to more easily reach the bottom screws. Once all six screws have been installed tighten them with the short end of the hex wrench.

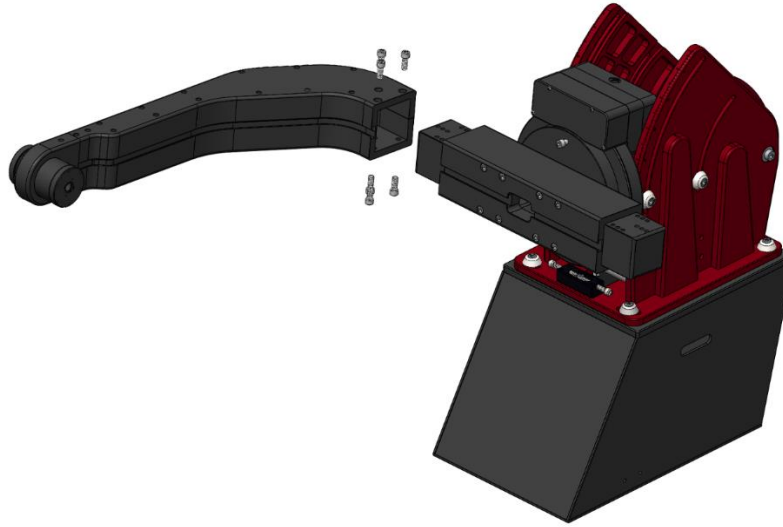


Figure 8: Installing fork without gear (fork base extensions not pictured).

Installing Fork Arm with Gear

Install the second arm just as the first ensuring that the cables coming from the Declination axis are hanging out of the way and don't get pinched anywhere. Screw in at least the top three 3/8-16x3/4-inch SHCSs as shown in Figure 9.

To access the screws holes on the bottom first ensure the RA axis is in the **balance** position, then the locking bolt can be removed (Taurus 500/600). The arms may need to be lifted up and down to make sure there is no bearing weight on the bolt while unscrewing the lock bolt.

Once the locking bolt is removed the arms are free to rotate and will be slightly out of balance. Make sure the area is clear for rotation and that they don't swing freely.

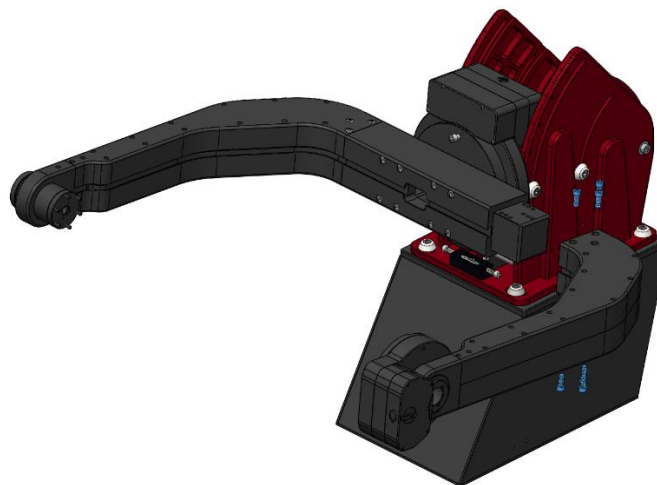


Figure 9: Installing fork with gear (fork base extensions not pictured).

Running Dec Axis Cables

In order to have access to the MKS 5000 printed circuit board (PCB) and L-Com plate, the rear top plate can be removed. When installing the standard Software Bisque cables it is easiest to remove the entire rear top plate. There are four ¼-inch-20 screws holding the plate on (see Figure 10). Once removing the top plate, you can see the MKS 5000 PCB and the RA shaft (see Figure 11). The shaft is where any cables used on the forks can be ran and either plugged in (the motor, sensor and encoder cables) or fed out the back of the mount for individual systems.

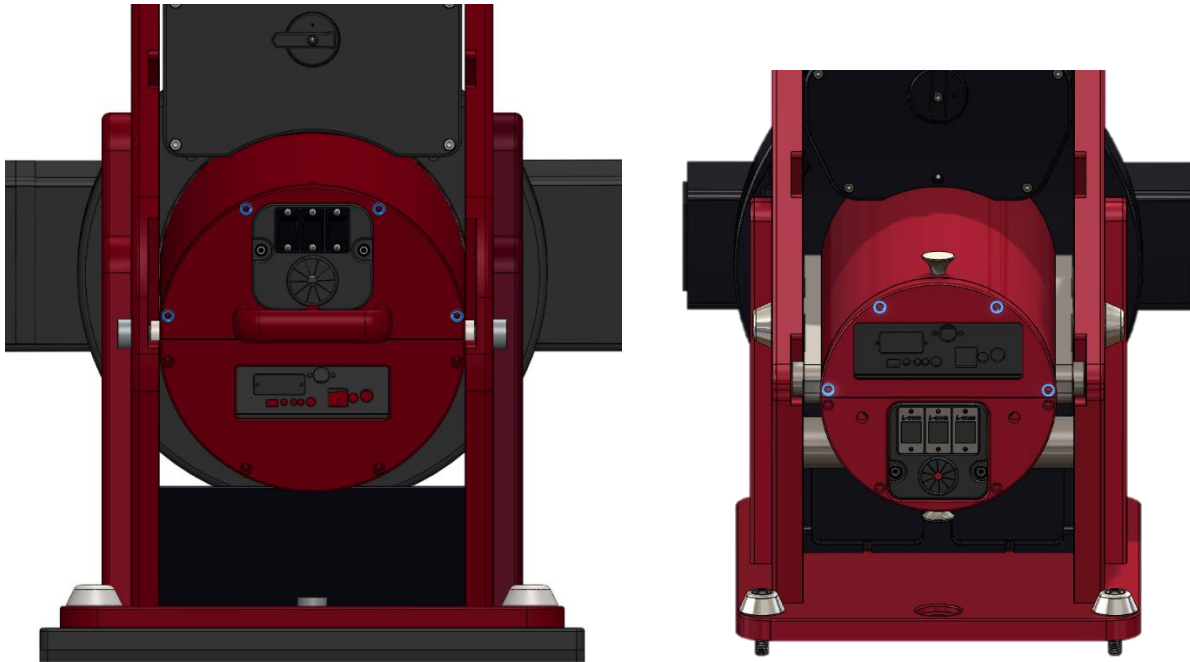


Figure 10: Removing rear top plate.



Figure 11: Electronics and RA shaft for cabling.

There are either two or three cables coming out of the declination axis on the fork with gear depending on if the mount has encoders. The sensor cable is a 4-wire ribbon cable with a black connector. The motor extension cable is two grey cables with a large white connector. And last, the encoder cable is a single dark grey cable with a small white connector, labeled “Dec”. Each of these cables needs to be ran down to the MKS 5000 PCB through the RA shaft as shown in Figure 17. The sensor cable has a junction with matching connector which after installation is probably sitting in the electronics box. These black connectors should be fed into the RA shaft and meet in the middle to be plugged in, see Figure 12 below.

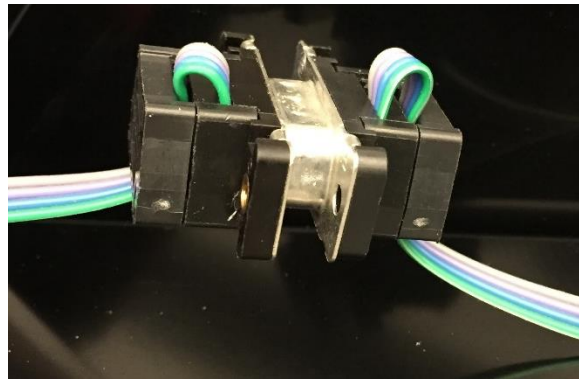


Figure 12: Declination sensor cable connectors (wire colors may vary).

The motor cable also has a junction and is either in the RA tube or electronics box after shipping, see below in Figure 13.

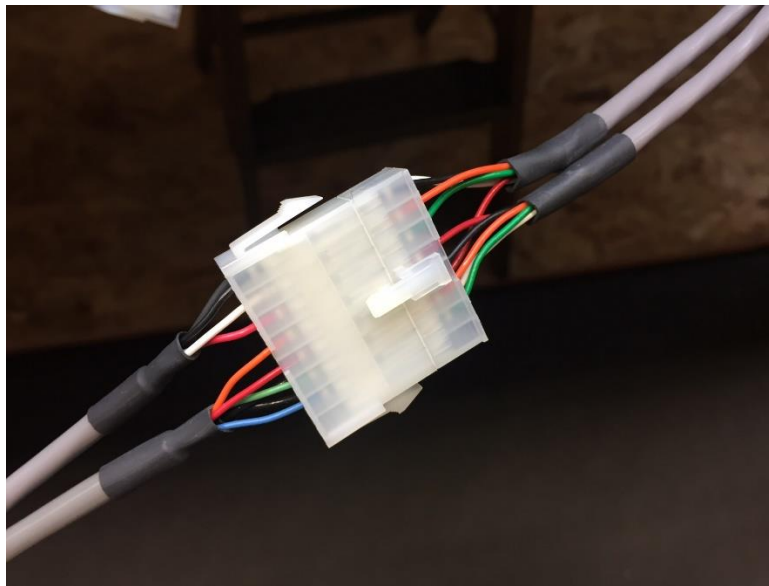


Figure 13: Declination motor connectors.

The encoder cables need to be fed all the way through the RA shaft just like the others, to be plugged in to the MKS 5000 PCB. The encoder cable is then plugged into the daughter (WiSky) PCB in the port labeled “Dec” on the PCB. The RA encoder cable already has a grey elastic strain relief wrapped around it (see Figure 14).



Figure 14: Right Ascension encoder cable strain relief.

The declination encoder cable also needs to be installed into the strain relief to keep the fragile wires from being pulled on. To do this you pull the elastic out of the plastic connector channel then wrap it around both cables and insert the elastic back into the channel (see Figure 15). Both elastic cords can be pushed into the channel to keep it from “popping out”.

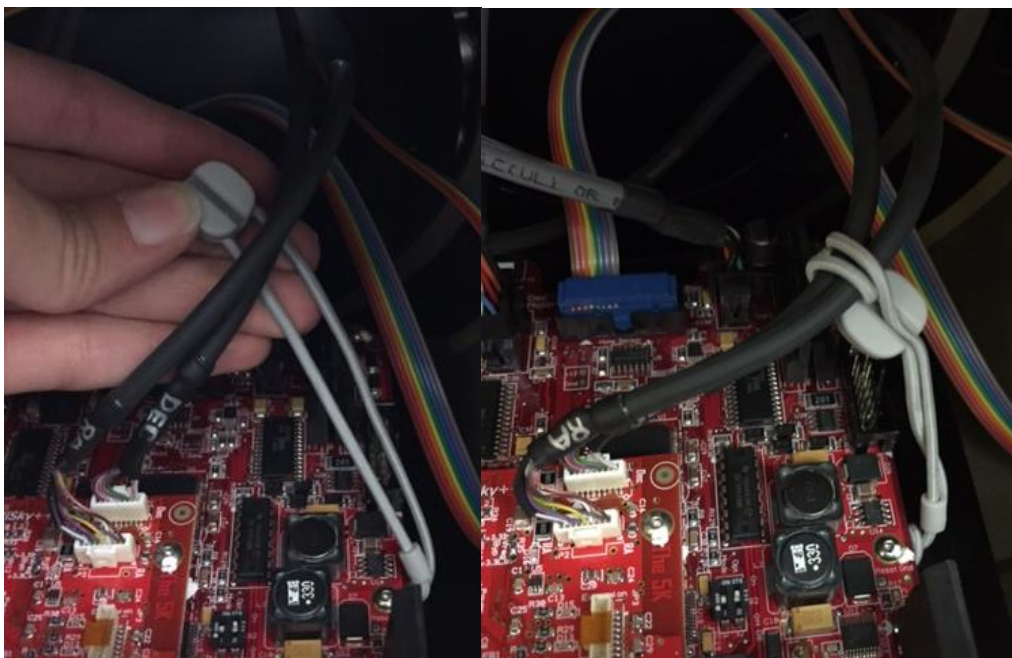


Figure 15: Encoder cable strain relief.

All the cables coming from the declination axis can then be “stuffed” into the cable channel the whole way down. The cable channel is shown in Figure 16 for the standard Software Bisque cables. The other arm has a matching channel that can be used for individual system wiring.

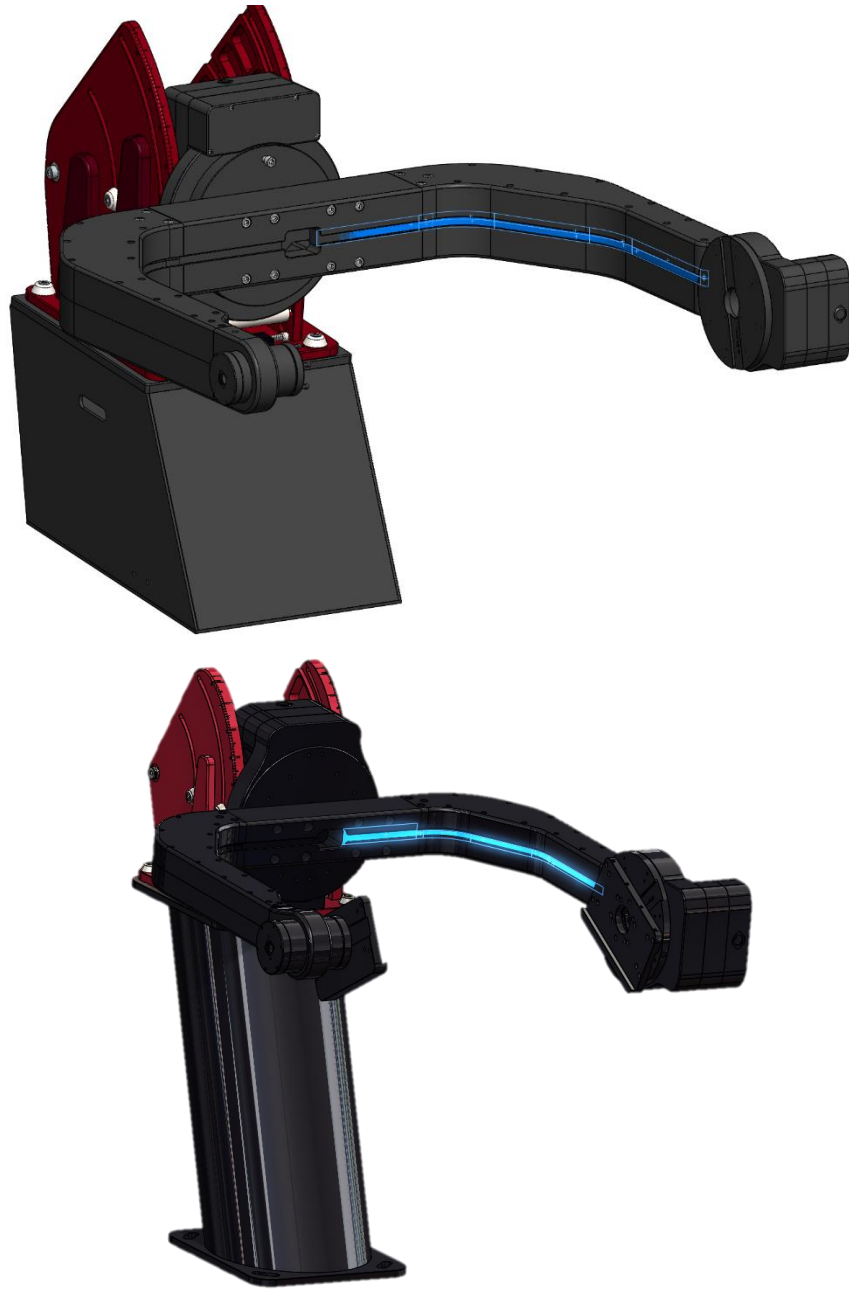


Figure 16: Fork arm with highlighted declination gear cable channel.

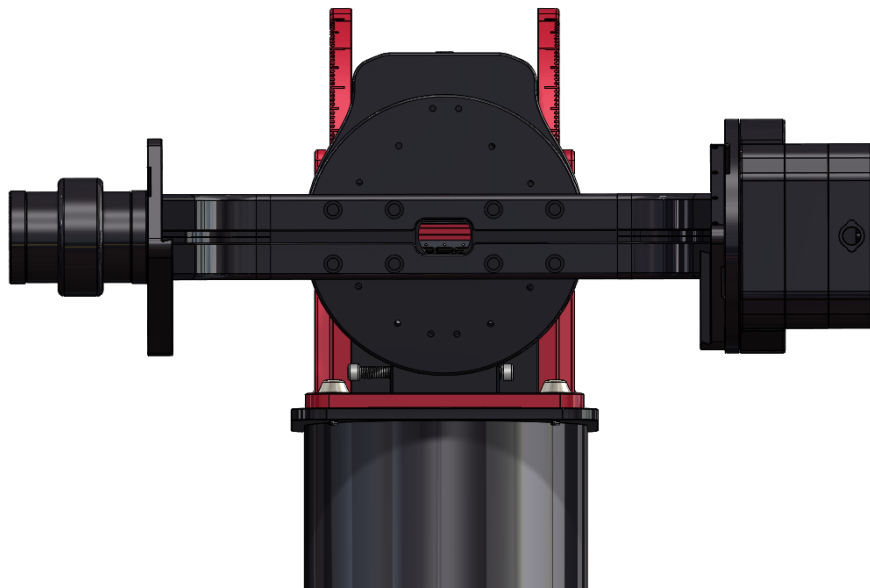
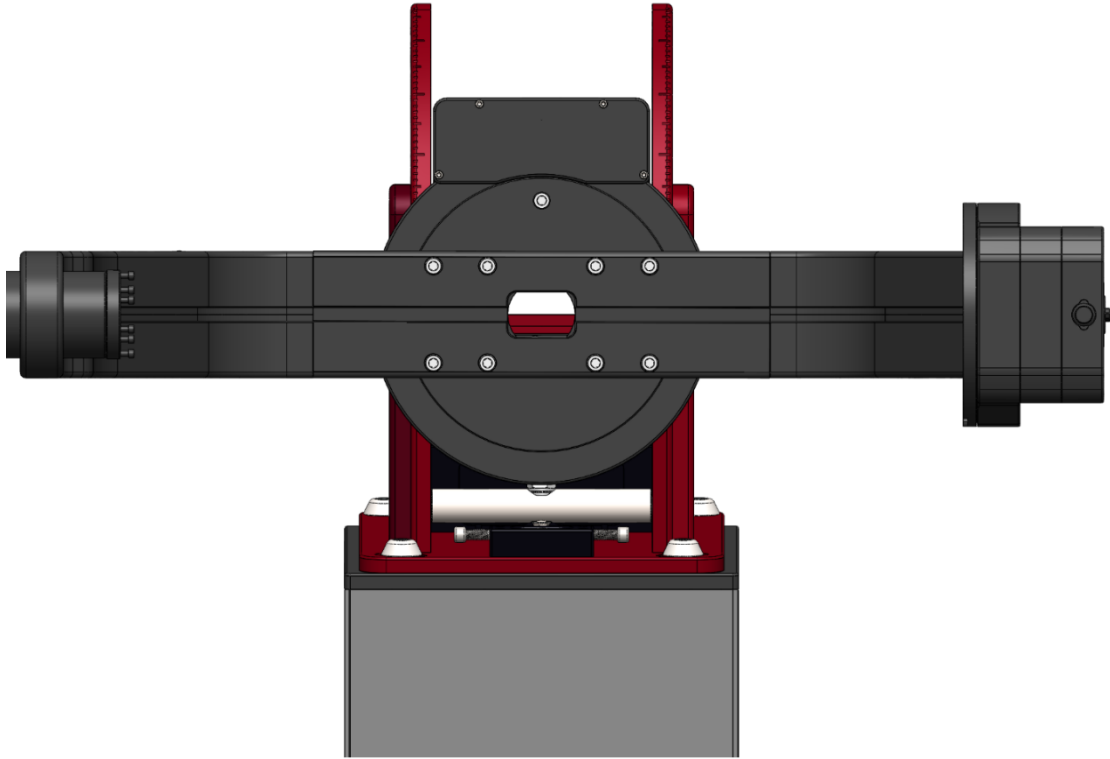


Figure 17: RA shaft for running cables.

Altitude Adjustment

Step 2: Installing RA Assembly into Wedge Assembly, it is described how to lower the altitude adjustment during installation. This is also true for when the Taurus is completely assembled and can be aided with a rope or bungee cable so no one has to be underneath the mount while it is being lowered.

In order to raise the altitude adjuster, it is easiest to have two people, one on each arm lifting up to raise it to the perspective major altitude slot. For fine adjustments, a 5/8-inch wrench can then be used on the nut (shown in blue in Figure 18) to move the stainless-steel bar up and down the threads.

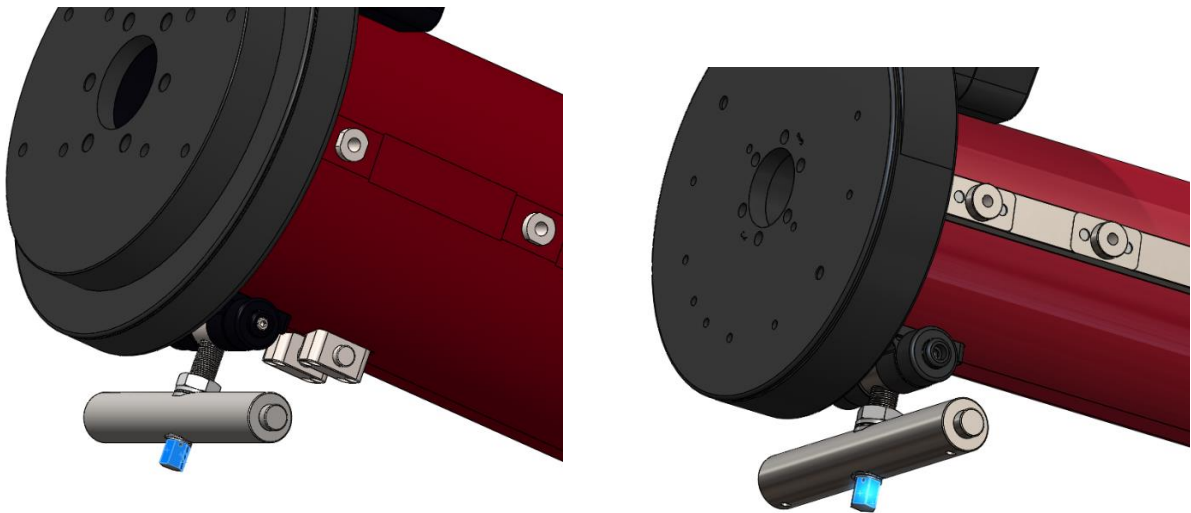


Figure 18: Altitude adjuster fine adjustment.

Appendix A: Revision History

The table below lists this document's revision history.

Table 1: Document Revisions

Revision Number	Addition or Change
1.1	<ul style="list-style-type: none">Paramount Taurus 500/600 Equatorial Mount Assembly Instructions.
1.2	<ul style="list-style-type: none">Paramount Taurus 400 Assembly instructions now included.
1.3	<ul style="list-style-type: none">Added instructions to install fork base extensions which are required for larger telescopes on the Taurus 600.
1.4	<ul style="list-style-type: none">Minor grammatical corrections.