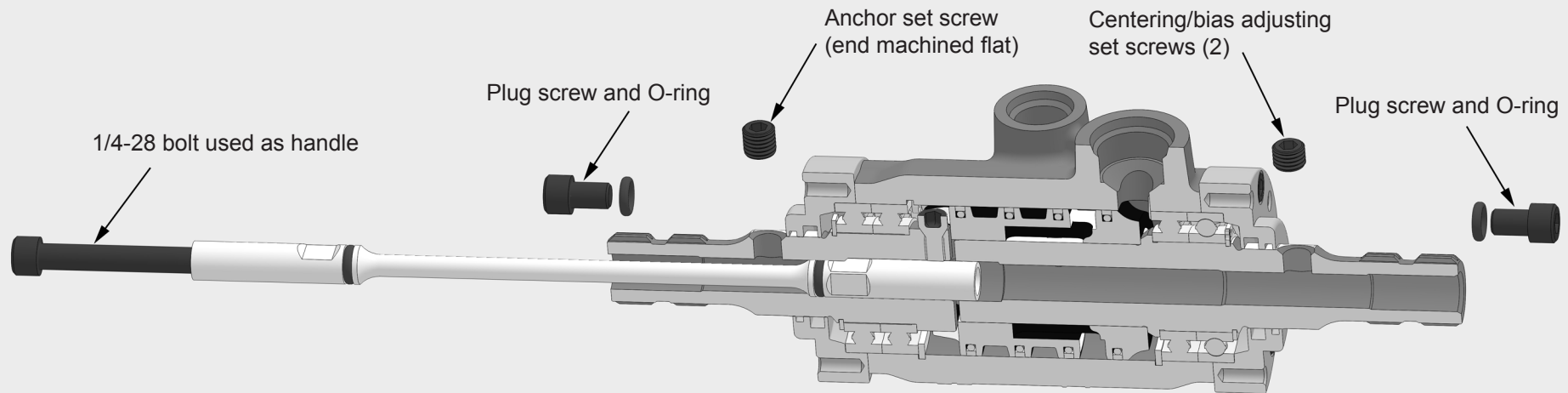


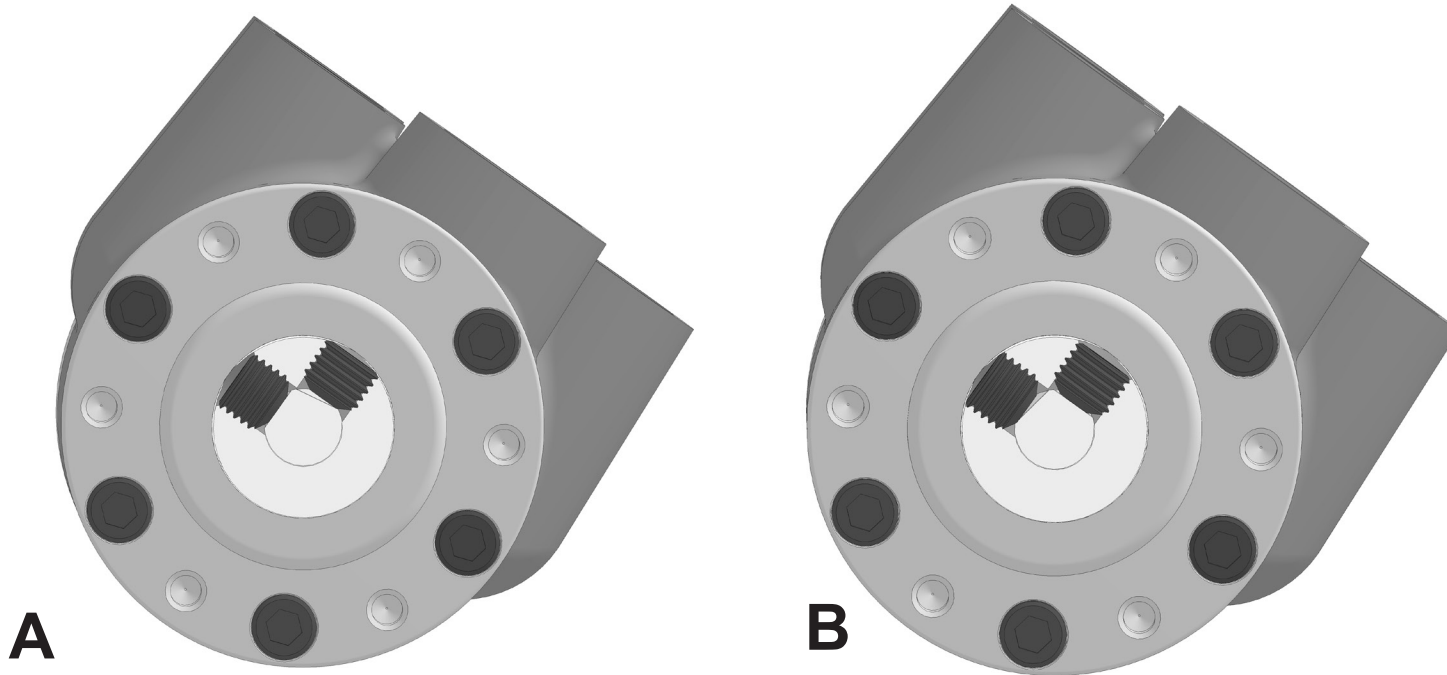
# Changing out the torsion bar (applies to all servos with splined output shaft)

1. Remove the plug screws and their O-rings (requires 3/16 hex key).
2. Remove the centering/adjusting set screws (requires 5/32 or 4mm hex key). Note that with these screws removed there will be about ten degrees rotational play between the input and output shafts. It is essential that the screws be checked between races against loosening from vibration. ANY free play in the torsion bar connection will cause the steering to wander.
3. Remove the anchor set screw (requires 5/32 or 4mm hex key) *Caution:* the anchor set screw is TIGHT. Use a new, unworn hex key and pad your hand with a shop rag to avoid injury when the set screw breaks loose.
4. Install a 1/4-28 x 2 bolt in the end of the torsion bar. Using this bolt as a handle, extract the torsion bar (preferably toward the output end) while *carefully* easing the O-rings past the set screw holes.
5. The diameter of the T-bar is marked on the end with the two flats. A smaller bar gives lighter steering and a larger bar gives heavier steering.
6. Install a T-bar by reversing the sequence. Be careful not to cut the O-rings when pushing them past the hole. The O-rings prevent spiral leakage around the screws. Be sure the flats are aligned directly under their respective set screws.



7. Seat the anchor screw squarely on its flat and tighten it enough that it will make a hard “snap” when broken loose. Blue Loctite® 242 or 243 may be used on the threads.
8. Install the two adjusting screws to approximately equal depth and snug them against the T-bar After the servo is installed in the car these screws will be used to set the neutral or centered position of the valve as described on the next page.

**To center the steering (or to adjust the directional bias)** The two set screws at the input end of the servo jack against the two flats on the torsion bar as illustrated in the cutaway views below. With the car off the ground, the neutral or centered position of the valve can be quickly determined by trial settings until the steering does not drift with the engine running. On oval track cars with unequal caster it may be advantageous to bias the steering. For example, on dirt where the car is countersteered most of the time, less muscular effort will be needed if the neutral point is offset to the right.



*(Note: left and right are as seen by the driver, assuming the screws are visible from above. If the adjustment is done from underneath, left and right will be reversed)*

View **A** shows the left screw all the way in and the right screw against the top of its ramp. In this position the steering will go all the way to right lock by itself as soon as the engine is started. View **B** shows the opposite adjustment, with the right screw all the way in. It will take off to the left. The available range is fairly large and will allow hands-off steering with as much as 10 degrees of caster stagger. It will also allow the steering to be perfectly centered using a single-rod cylinder where the blind side can be as much as 25% more powerful owing to the extra piston area not occupied by a rod.

When centering the steering for the first time, it is best to try large changes which will make the correction very obvious. When approaching center, only small adjustments should be taken until you cannot make the steering drift either direction by flicking the steering wheel. A 1/12 turn of the wrench (the distance between numbers on a clock face) will make a difference. Remember that BOTH set screws must be locked tight against the torsion bar. Check the screws between races; any play will cause the steering to wander and vibrate. A separate locking collar, p/n V588, can be used to secure the set screws. If you apply Loctite®, use only blue 242 or 243, or the green wicking 290. *Caution: DO NOT adjust the directional bias while the engine is running.*