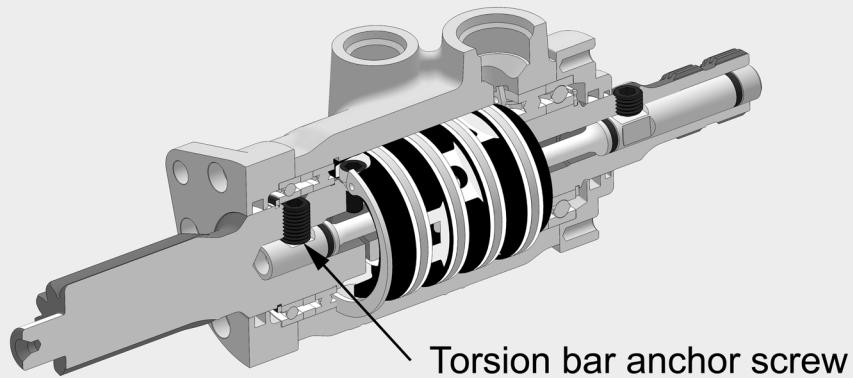


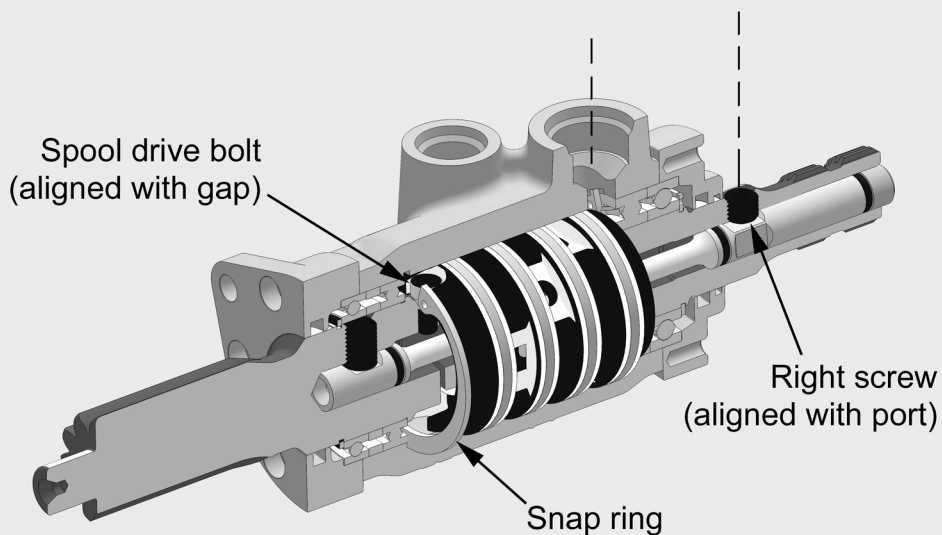
Changing the torsion bar in the type CF servovalve

The principal difference between the CF type and other Woodward servos is that the anchor screw is covered by the CF pinion bearings. To access the set screw, the pinion assembly must be removed and the bearings pressed off. *Removing the pinion is not difficult if these steps are followed and the cautions observed.*



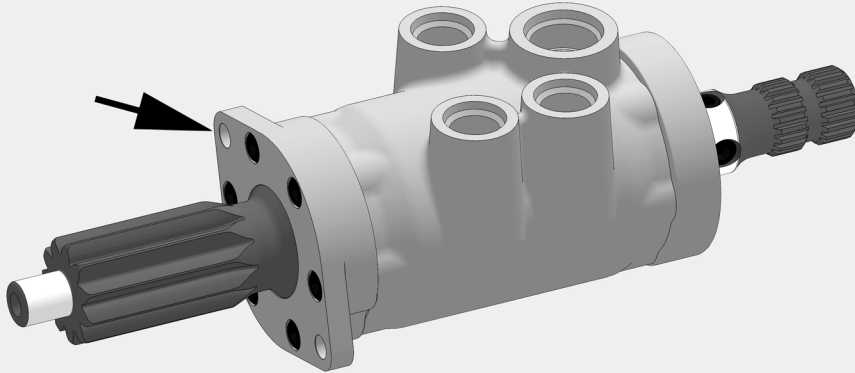
CAUTION before attempting disassembly:

When the right centering screw is aligned parallel to the nearest fluid port, the spool drive bolt inside the valve will be centered on the gap in the snap ring. Maintain this alignment while removing the pinion assembly. If the drive bolt cannot pass through it will damage the housing.



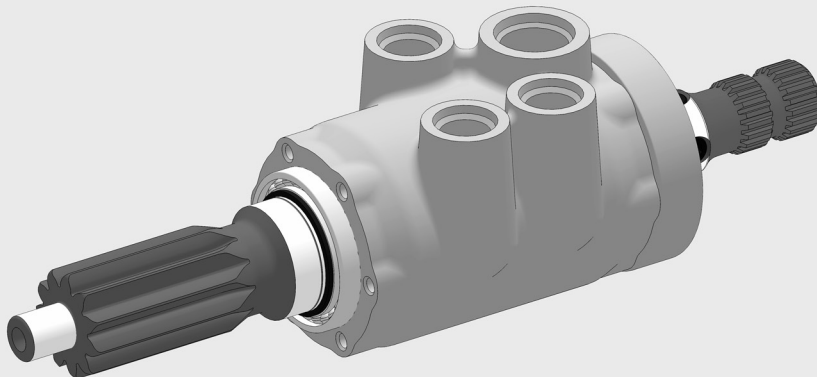
1. Remove the servo from the steering rack

The flange bolt holes (arrow) are lined with eccentric bushings which positively locate the pinion and maintain the gear lash adjustment. *To preserve the adjusted position, do not disturb the lower bearing cap; leave it bolted to the rack housing.*



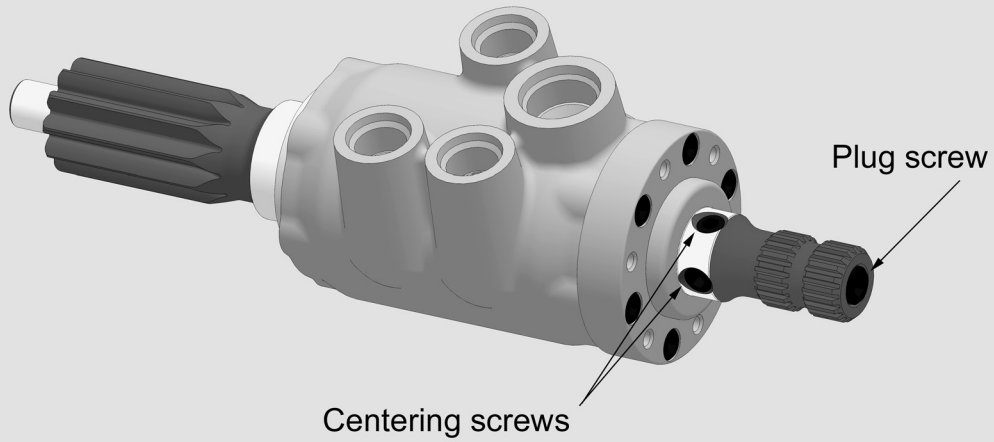
NOTE: the number of teeth on the pinion, its helix angle and hand, and the orientation of the hose ports relative to the mounting flange may be different from these illustrations, but the procedure for changing out the valve torsion bar is the same for all CF models.

2. Remove the mounting flange

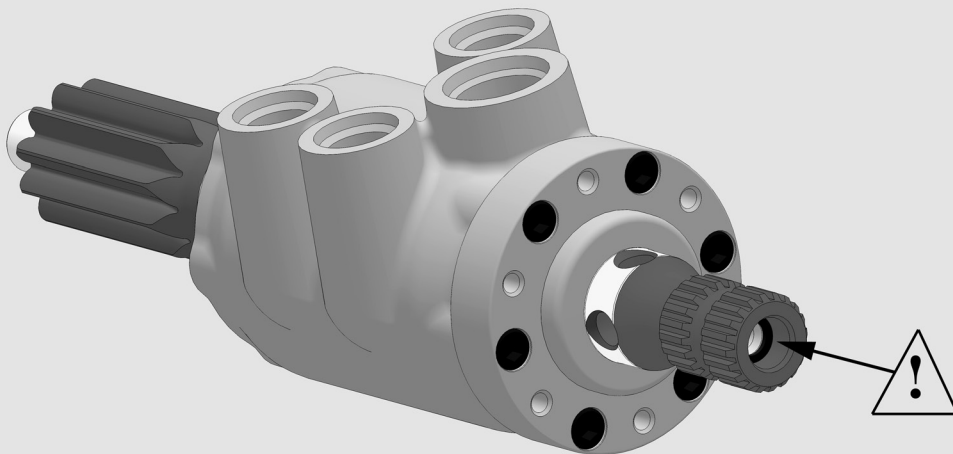


Mark its position for reassembly.

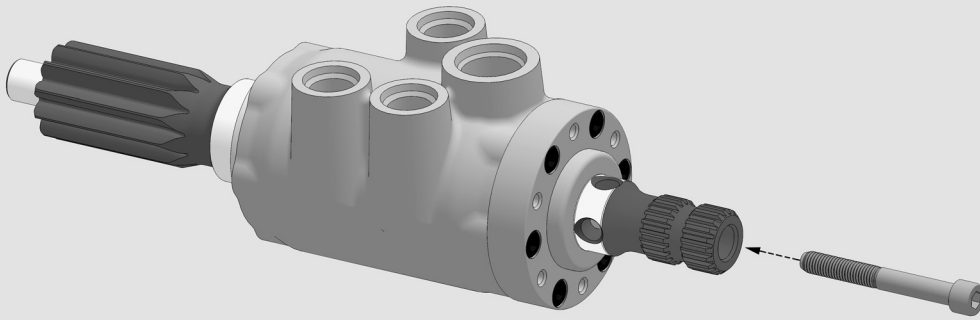
3. Remove the centering screws and the plug screw



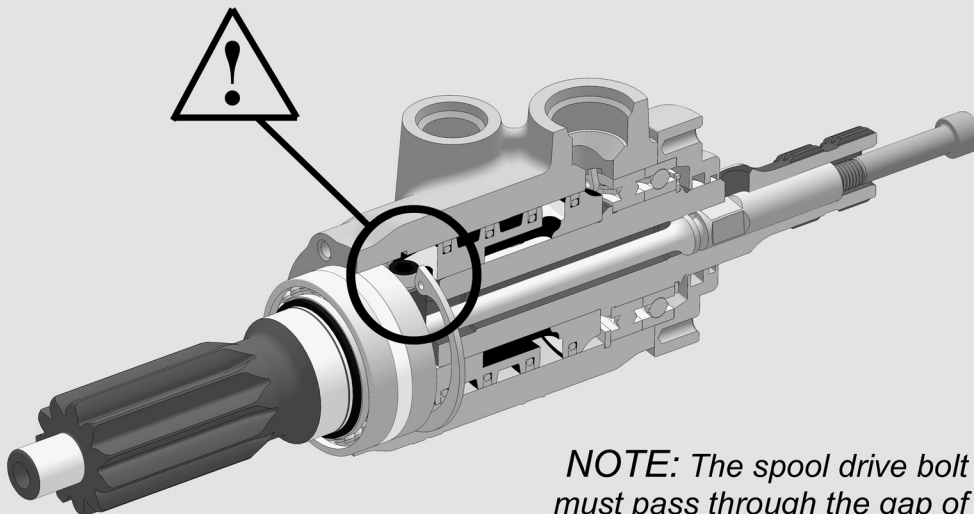
3a. Remove the plug O-ring
(if it did not come out with the plug screw)



4. Install a 1/4-28 x 2 bolt in the end of the torsion bar

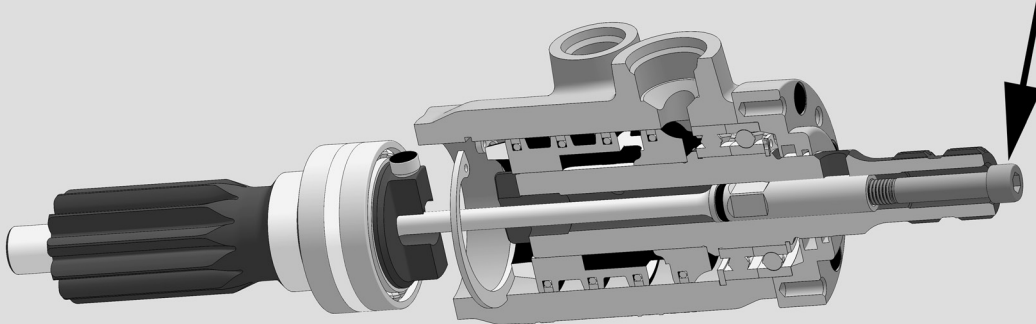


5. Press (or drive) the pinion assembly out of the housing



NOTE: The spool drive bolt must pass through the gap of the large snap ring in the housing!

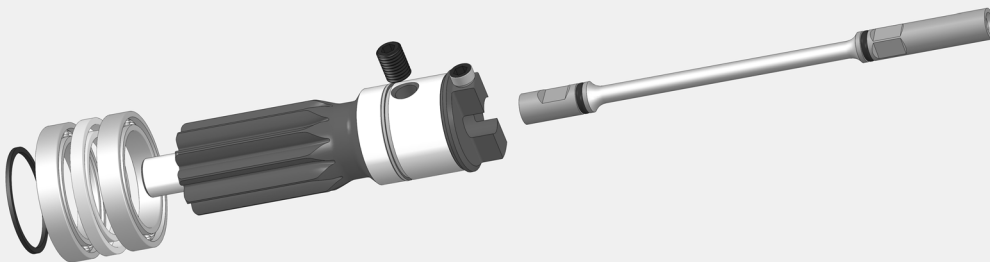
6. When the pinion is free of the housing, remove the bolt



7. Press off the bearings and remove the anchor screw.
The T-bar will pull easily out of the pinion.

Torsion bar diameters for the CF servovalve are .175, .180, .185, .190, .195, .200, .205, .210, .215, 220, and .225. The torsion bars from other types of Woodward servos such as Inline, HE and MR will not fit the CF.

To reassemble, reverse the steps. After the rack is reinstalled in the car it will be necessary to rebalance or recenter the valve (see step 8).

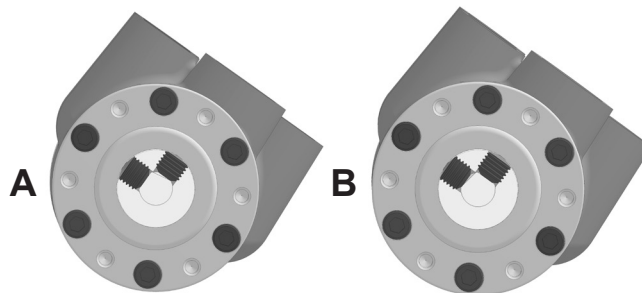


(The ball bearings shown are representative but will vary according to the pinion used in the rack.)

8. Recentering: The valve may be easily balanced by adjusting the screws until a position is found where the steering does not drift, *with the engine running and the wheels off the ground*. You can speed up the process by presetting the screws to approximately equal depth while the rack is still on the bench.



8a. Recentering: The set screws jack against the two flats or ramps on the torsion bar as shown in the cutaway views below:



In view **A** the **left screw is all the way in** and the right screw is against the top of its ramp. This position will send the steering **all the way to right lock** as soon as the engine is started. View **B** shows the opposite adjustment, with the **right screw all the way in**, which will send it to the **left**. When adjusting for the first time, it is best to try large changes which will produce a very obvious result. As your setting approaches neutral, make very small adjustments until you cannot make the steering drift either direction by flicking the steering wheel. When that point is reached the steering is balanced. Last, remember to tighten **BOTH** set screws securely against the torsion bar, as any play will cause the steering to wander. Check the screws between races. A separate locking collar, p/n V588, can be used to further secure the set screws. If you apply Loctite®, use only blue 242 or 243, or the green wicking 290. **CAUTION: NEVER ADJUST THESE SCREWS WHILE THE ENGINE IS RUNNING.**