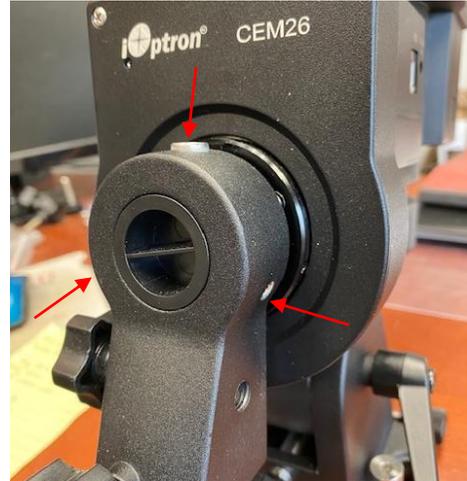


## CEM26/GEM28 Ring Gear Cover Removal

**Tool Needed:** A set of metric Allen wrench, small Phillip screw driver

### CEM26 Mount RA

1. Remove the counterweight shaft housing: 1 hex screw on top and 2 set screws on the side.

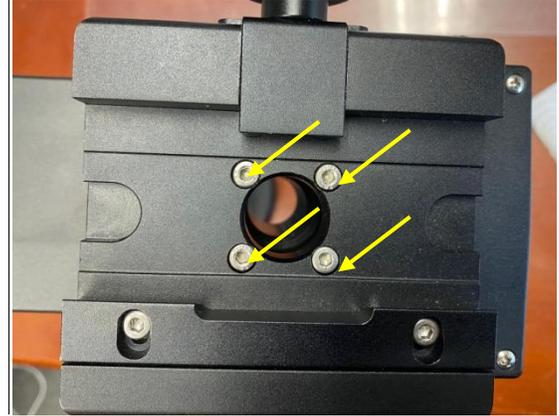


2. Remove three screws and take off the RA ring gear cover.

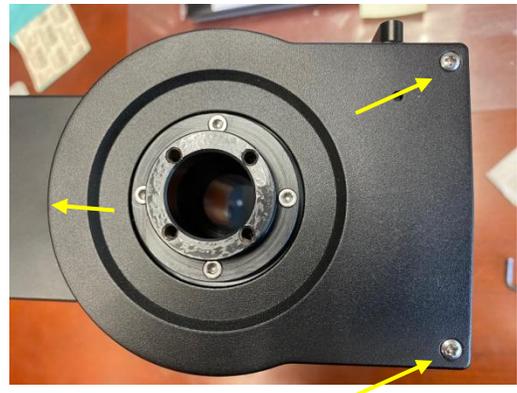


### CEM26 Mount DEC

1. Use a 3.5mm hex wrench to remove 4 socket screws on dovetail saddle. Pull the dovetail saddle off the mount.



2. Remove three screws that hold the gear switch cover.



### CEM28 Mount RA

The design of GEM28 will need to remove the DEC unit from the mount in order to expose the RA ring gear compartment.

1. The DEC unit is connected to the RA axle via 4 socket screws. Two is on side the DC unit. One is on bottom of the DEC unit. The fourth one is inside the mount. Remove front polar scope cover and look into the mount, you should see it.



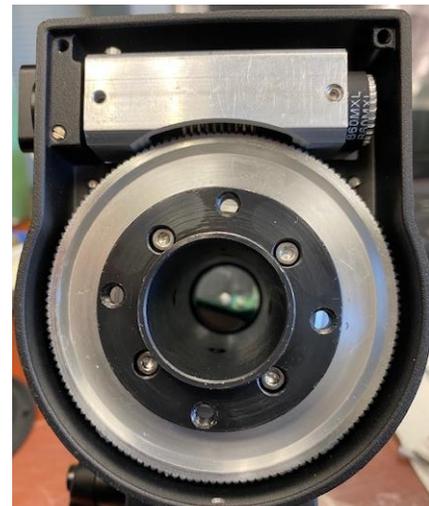
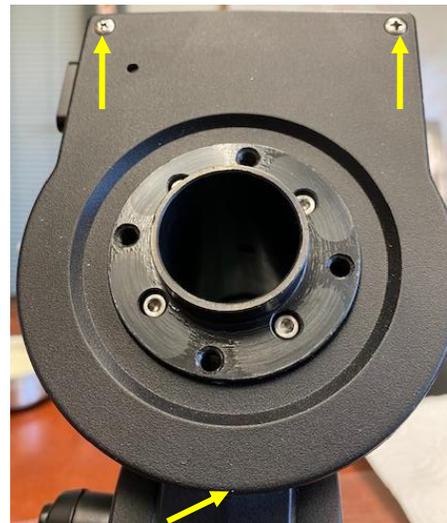
2. Remove red CW shaft mounting adapter from the bottom. The bottom screw now is easy to access.



3. To access the top screw, you may use a long arm ball head wrench through the RA axis opening to release it.



4. Pull the DEC unit off from the RA axle. Remove three screws and take off the RA ring gear cover.

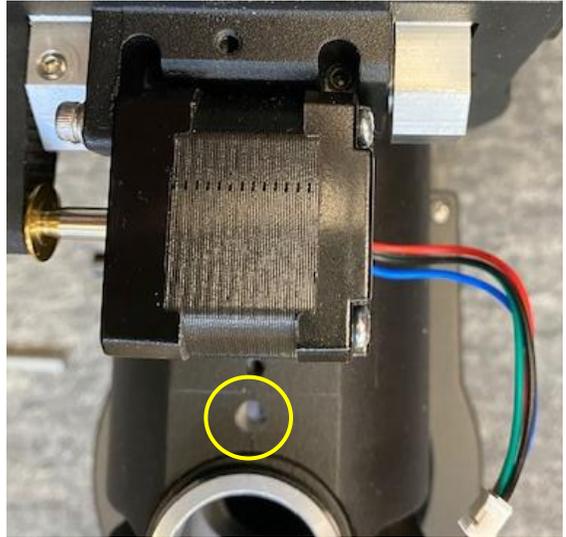


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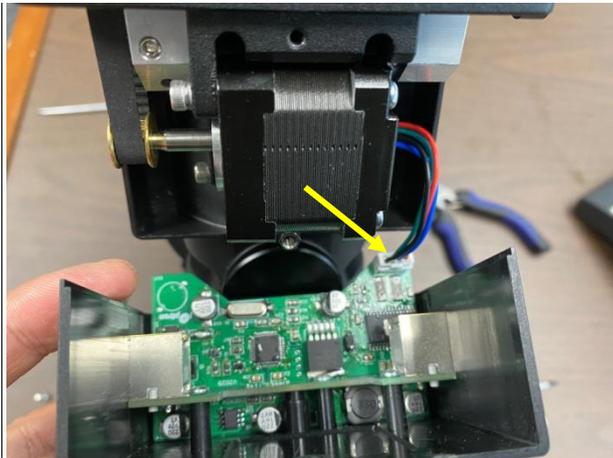
5. If **Step 3 does not work**, we need to remove the DEC motor and control board to access the top screw.
6. Remove mount DEC motor cover.



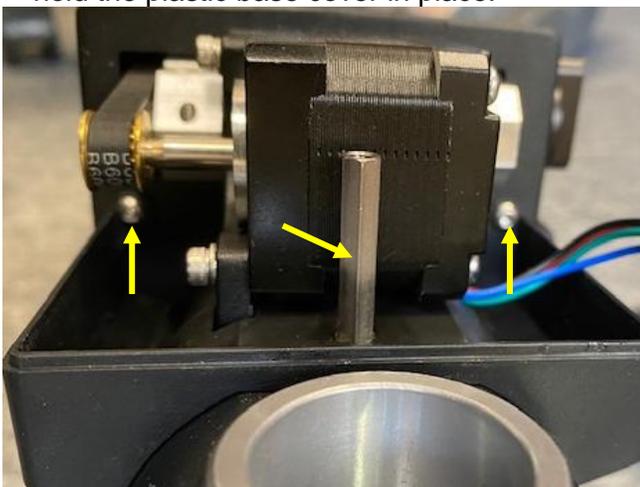
9. Pull the base cover off the mount to expose the top screw access hole



7. Carefully unplug the motor cable from the DEC control board.



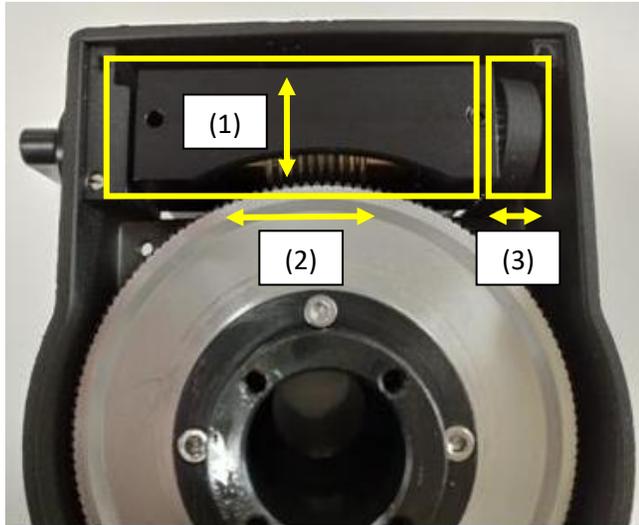
8. Unscrew the screw post and two screws that hold the plastic base cover in place.



## CEM26/GEM28 Worm Play Identification and Adjustment

**Tool needed:** a set of metric Allen wrench and a small flat top screw driver, a pair of nose pliers or tweezers.

1. After open the RA/DEC ring gear cover to expose worm assembly and ring gear, exam the worm assembly movement when hold and rotating the ring gear.

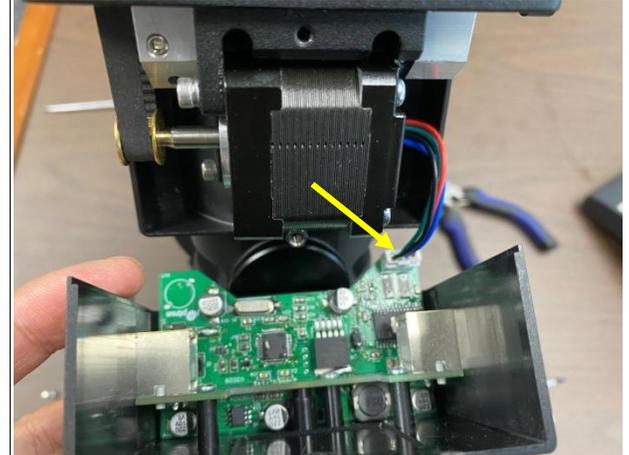


- (1) If the whole worm assembly moves up and springs back down, this is normal for a spring loaded worm/gear system
- (2) If the whole worm assembly moves left/right, or even gets free at one end, the hinge(s) may get loose. Go to next step to fix it.
- (3) If only the worm itself is moving freely, the worm end cap needs be tightened. Please refer to **Step 13** to adjust it.

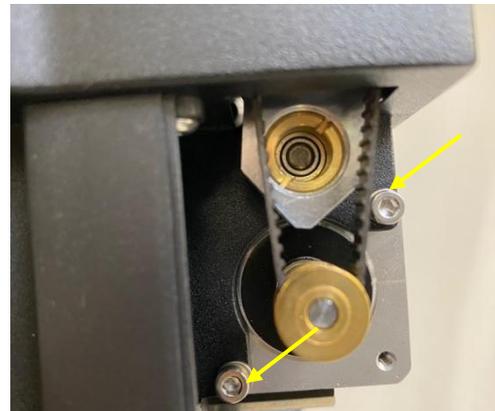
2. Remove mount motor cover.



3. Carefully unplug the motor cable from the DEC control board.



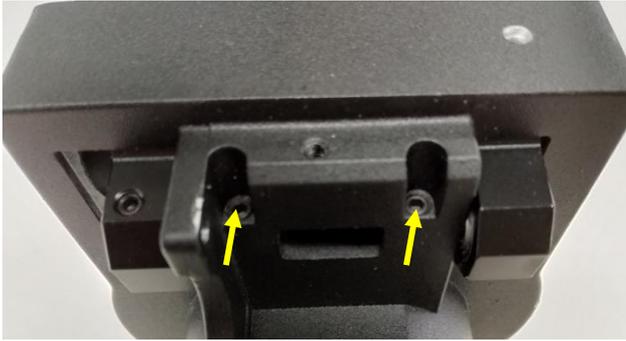
4. Release two screws and remove the motor



5. Check the worm assembly to see if both hinge pins are in position. They should be almost flush with the bearing.



6. Check two hinge locking screws. Make sure they are tightened.



7. Release hinge bearing end cap locking screw half turn.

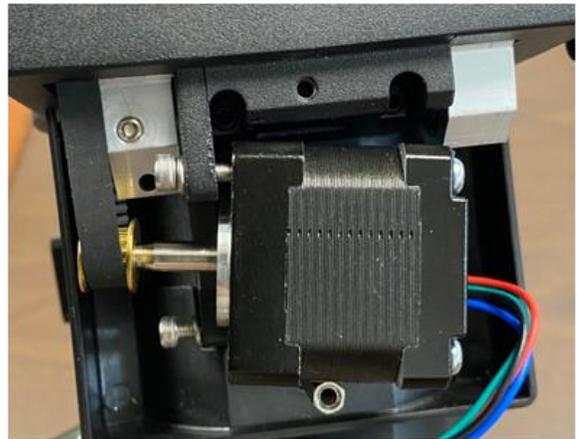


8. Turn the brass end cap clockwise all the way in using a pair of strong tweezers or a screw driver. Rotate the ring gear to confirm the free play is eliminated. Then un-tighten the end cap 1/16-1/8 turn. Check the free play again.

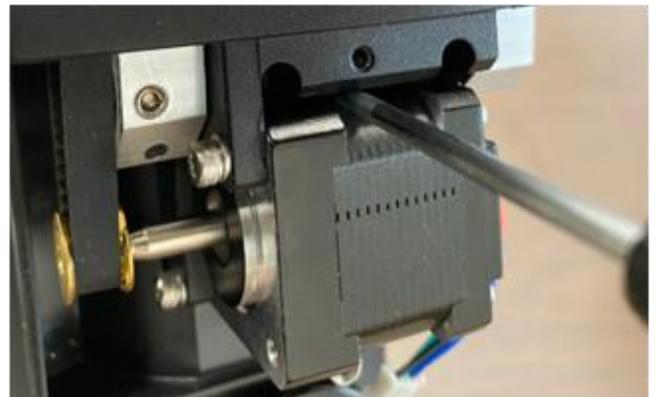


9. Tighten the end cap set screw as in Step 7. Check the play again.

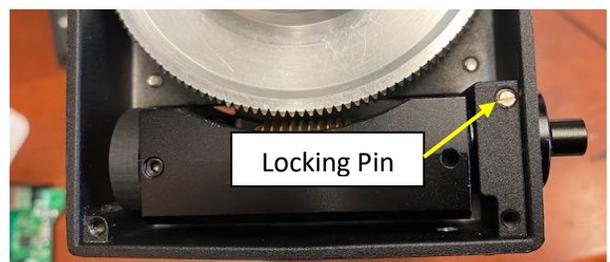
10. Thread the belt over motor pulley and attached the motor to the worm assembly. Tighten the screws slightly.



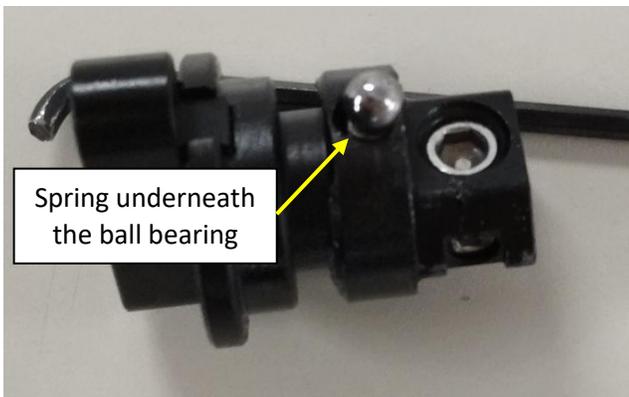
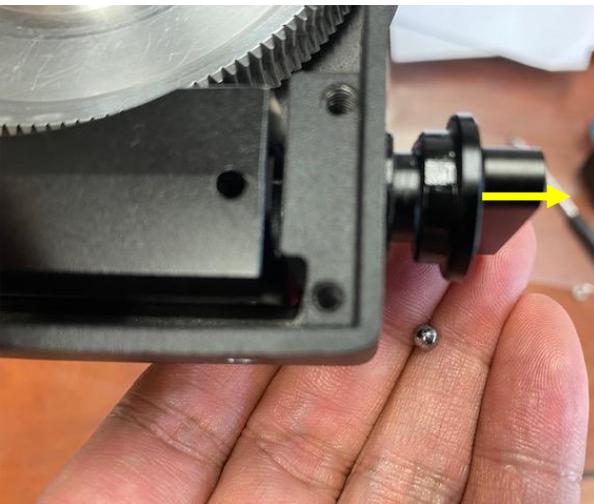
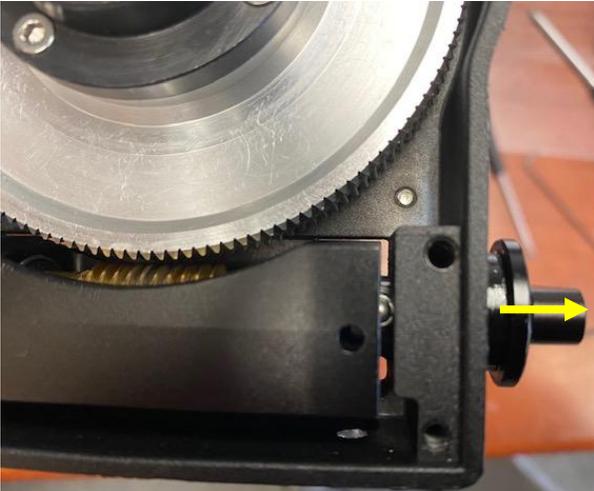
11. Tension the belt while tighten the motor mounting screws.



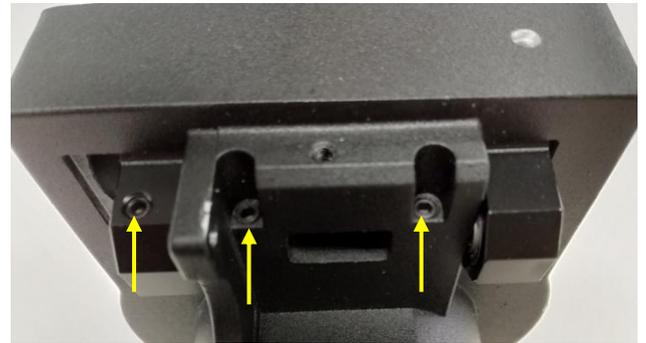
12. Reconnect the cable and put the cover back.  
13. The worm/worm pulley lateral movement is cause by a loose worm bearing end cap. It is not accessible without remove the worm assembly from the mount. Follow **Step 2** to **Step 4** to remove motor cover, cable, control board and motor.  
14. Set the Gear Switch to locking position. Carefully remove the gear switch locking pin.



15. SLOWLY Pull the gear switch knob outwards. Put your palm underneath to collect the little spring and the ball bearing. The ball bearing is spring loaded and very easy to be sprung off.



16. Release two set screws on mount assembly: two for locking assembly hinge pins and one for hinge bearing end cap.



17. Remove the hinge pin bearing end cap. Use a small screw driver to push the hinge pins inward. It will drop off from the center slot. There are small washers as well. Pull the worm assembly from top of the ring gear compartment.



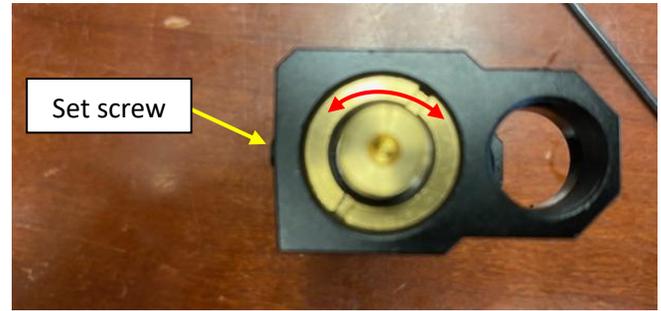
18. Tap the bearing out of the housing if needed. The following is a set of a bearing, a washer and a hinge pin.



The following shows the relative position of the end cap, hinge pin/bearing and a worm assembly.



19. Release a small set screw on Worm pulley and remove the worm pulley.



22. Put the worm pulley back on to the worm shaft. Locate the flat surface on the shaft and tighten the set screw onto it. Make sure that the worm shaft end is aligned flush to the pulley surface.

23. Before install the worm assembly, insert one hinge bearing into the bearing housing without the locking end cap.



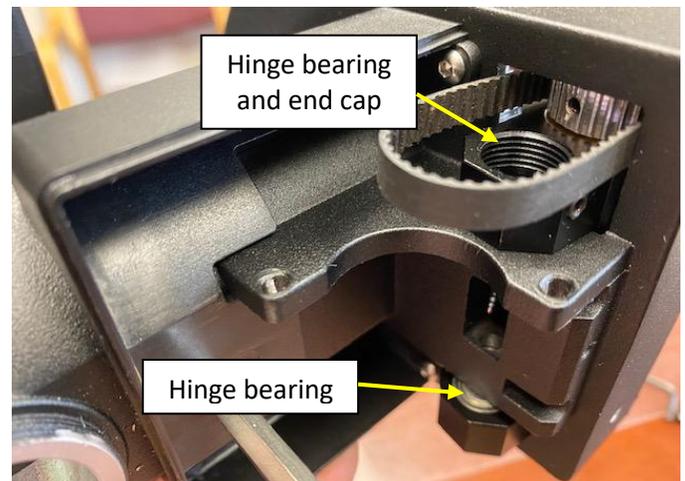
20. Check the worm by pulling-pushing the shaft. You should see/feel the lateral movement if there is free play.



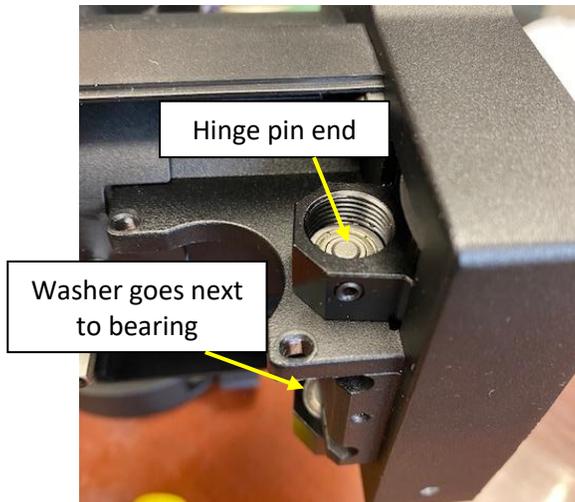
24. Wrap the belt over the worm pulley and insert the worm assembly back into the ring gear compartment. You may rotate the mount head 90 degree so the worm pulley and open-ended hinge pin bearing house is on top.



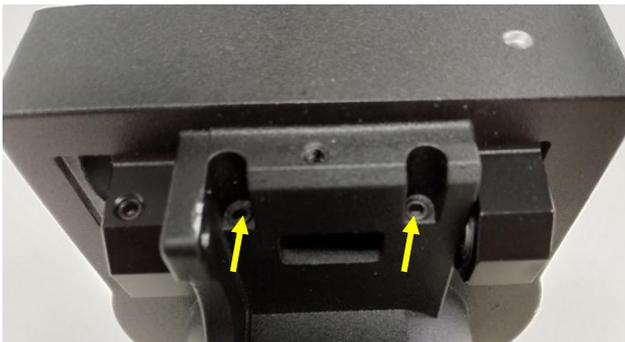
21. Release worm end cap set screw a little. Tighten the brass end cap by using a pair of nose pliers or a pair of strong tweezers. Back out the end cap 1/16-1/8 turn. Turn the worm shaft with fingers. There should be no stiffness. Check if the lateral free movement is eliminated. Tighten the set screw. Check the worm smoothness again. If there is any stiffness exists, you need to readjust the worm end cap. Until there is no lateral play, or worm stiffness.



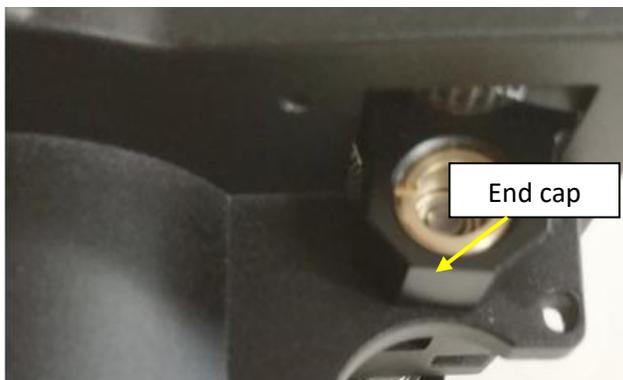
25. Insert hinge pins while insert the washer between the bearing and worm assembly body. Tap the hinge pin inward to make sure its end flash with the bearing surface.



26. Lock hinge pin by tightening the locking set screws.



27. Turn the brass end cap clockwise all the way in using a pair of strong tweezers or a screw driver. Then un-tighten the end cap 1/16-1/8 turn. Check the worm assembly that it can moved freely and no free play.



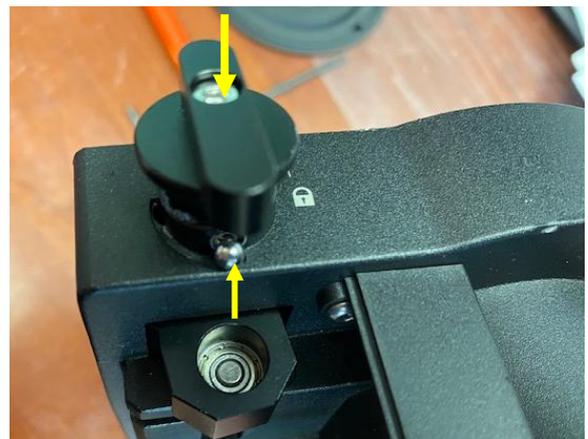
28. Tighten the hinge end cap set screw. Check the play again.



29. Now install the gear switch back.

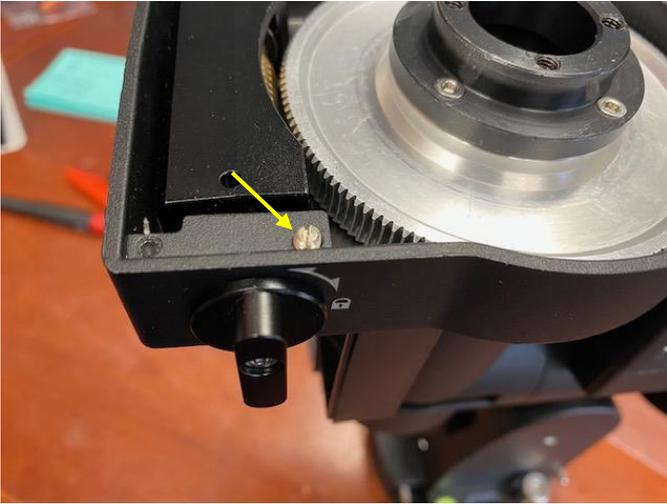


30. Insert the spring into the gear switch hole. Put the ball bearing on top of it. Insert gear switch into the worm assembly while align the ball bearing to the slot. Push ball into the switch body while push the gear switch into the worm assembly. Need be very careful not to spring away the ball and spring.



31. Turn the gear switch while push it inward to check if it is smooth. Then insert the gear switch locking pin and secure it.

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32. Check the play with worm/ring gear engaged while rotating the ring gear.
33. Follow steps 10-12 to put the motor, control board and cover back.