

## Steerable Tail Wheel Piston Adjustment

**Note:** You must have the approval of a certified aircraft mechanic (A&P) to perform this procedure. This procedure worked with my tail wheel but yours may differ.

I have looked everywhere for a procedure to adjust the Steerable Tail Wheel Spindle Locking Piston and I can't find it but, using deductive reasoning, the following procedure seems to make sense and seems to work just fine.

### What am I talking about?

Sticking out the back of the tail wheel assembly is a small cylinder with a brass cap over the end of it. Underneath that cap is a spring and piston that "locks" the tail wheel in the steerable position until the turn becomes so sharp that the piston pulls out of the tail wheel spindle and allows the tail wheel to caster freely. It is this "piston" that we need to adjust if it is ever taken apart for maintenance.

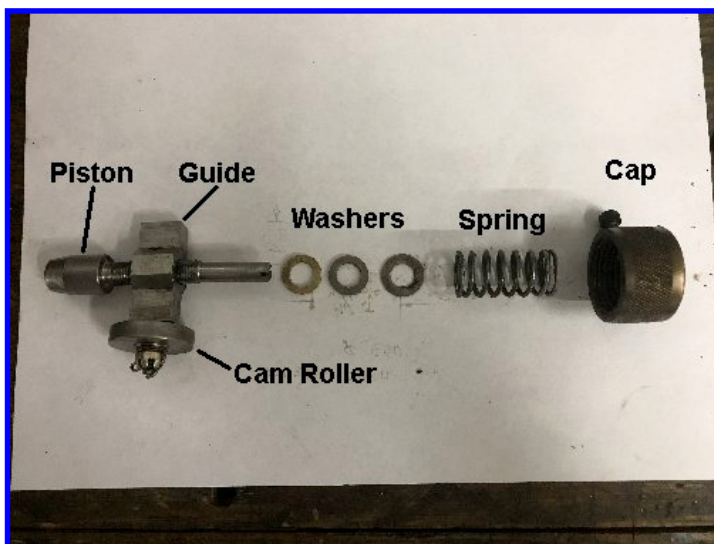
### Overview

Below is a photo of the tail wheel assembly. You can see the brass cap on the end of the "piston" housing. In the center of this cap is an adjustment screw that needs to be turned to the correct position for the piston to work properly. There is a cam (flat plate) attached to the tail wheel yoke that moves a roller aft as turns are made on the ground. As the roller moves the spindle piston aft, it eventually unlocks and allows the tail wheel to swivel unmercifully until it is repositioned after a straight-line taxi is commenced. This procedure should work on ANY steerable tail wheel provided it was modified according to Republic Seabee Service Bulletin #17 (available on the Seabee Club website). This Service Bulletin is very detailed but it doesn't address the adjustment of said spindle piston! Hence the following procedure.



### Procedure

**Note:** There is no need to do this procedure if you are satisfied with your steering. Use this procedure only if you have taken the piston and guide apart for maintenance. This procedure can be accomplished with the tail wheel jacked up and remaining on the Seabee.



**Note:** There are two different lengths of piston rods in various Seabees; from the beginning of the threads to the piston end are the same dimension however, so there is no change in the procedure for the two different piston rods (the shorter rod is shown above). Washers are used as spacers for a shorter spring that some Seabees have installed. Your washer count may be different than shown. There are at least two different lengths of springs in our Seabees.

After jacking the tail up so there is enough clearance to "swing" the tail wheel left and right, remove the lock-screw on the top of the brass cap. Using a rag, grab the brass cap and remove it. It may be necessary to use channel lock pliers to remove it but use some padding around the cap to prevent scratching the cap. With the cap removed pull out the piston-guide assembly. Clean inside the piston housing and remove any grease and foreign objects. Use a flashlight to check for damage inside the piston housing. The piston should move freely in and out and must completely seat itself inside the housing with no restrictions.

To disassemble the piston and guide, first loosen the Allen Set Screw on the top of the guide as shown in the illustration below. There is also a small, thin plastic locking plug between the setscrew end and the piston rod threads. DO NOT TAKE THIS LOCKING PLUG OUT. It is used as a lock to prevent inadvertent loosening of the piston rod and to prevent marring the piston rod threads with the Allen set screw. When the setscrew is loosened, unscrew the piston rod and check for thread damage. Reinstall the piston into the guide but don't tighten anything yet.

**Caution:** The following adjustment must be made with the piston and quadrant collar socket completely dry. Use no grease or lubricants at this point as they could affect the adjustment (see photos below).

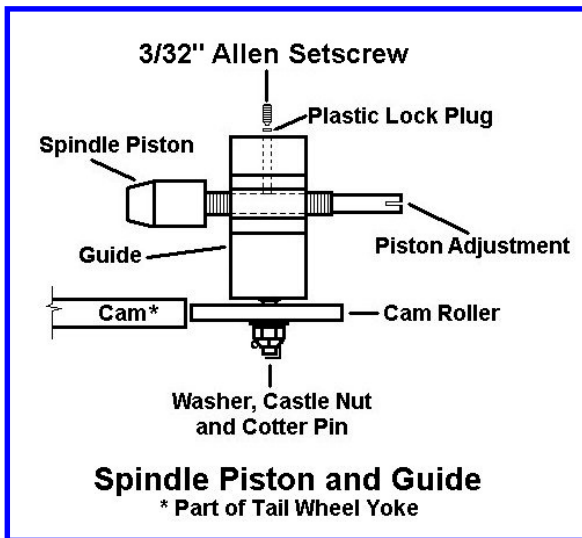


Collar and Piston Assembly-separated



Collar and Piston assembly in "locked" position

Install the piston-guide assembly into the tail wheel cylinder but don't put the brass cap on yet. Using a flat-blade screwdriver, screw the piston shaft clockwise until you see that the piston is bottomed out inside the tail wheel quadrant collar. Then hold forward pressure on the guide and turn the piston rod counter clockwise until the cam roller just makes contact, or is very close, to the cam on the yoke. When you are satisfied the piston is seated correctly, lock the setscrew on the top of the guide. Don't tighten the setscrew too tight; just enough to prevent the piston rod from turning. Remove the piston/guide assembly, grease it then reinstall it. Some Seabees have three washers and some have none so use what was installed in your Seabee unless you see that the spring tension is lacking. Then install the spring and the brass cap. Turn the cap until it seats fully, then back it off until the locking screw lines up with the top gap in the piston housing. Use a jam nut to lock the screw in place (see photo on page 1).



While the tail wheel is still jacked up, turn the tail wheel by hand left and right and make sure the tail wheel unlocks when pressure is applied. You should get about 15-degrees of travel before the cam roller disengages and the tail wheel goes into castering mode. Return the tail wheel to the center position and make sure the piston re-engages. Do this to the left and right a couple of times. Republic Service Bulletin Number 17 says a force of 20-25 pounds applied to the fork should unlock the tail wheel.

When you are happy, get your grease gun out and grease ALL the fittings on the tail wheel. You should move the various parts as you grease the tail wheel to insure good grease coverage. There are four or five grease fittings. Use good waterproof grease.

As usual, I am open to suggestions and always looking for improvements in our techniques so let me know if you find a better way!

Steve  
For the Seabee Club