



Air Rudder Locks

Description:

In more than one occasion, the air rudder has sustained substantial damage (not the FAA "substantial" damage) which could have been avoided by locking the air rudder as close to the air rudder hinge line as possible. The following air rudder lock is simple and prevents any movement of the air rudder at all.

Starting with Republic Aviation in 1947, many air rudder locks have been designed and work pretty well except they would still allow the air rudder to move slightly in a strong wind and if the rudder cables happen to be slack or break (unlikely I know), the air rudder could be slammed back and forth against the stops that are located at the fitting inside the air rudder. If this condition is allowed to progress the socket that slips over the rudder control horn could be damaged causing "substantial" damage. The air rudder would have to be taken apart completely to fix it. We had a member with that exact problem.

Keep in mind the process below is not fail-proof. If, for example, the rudder is hit by a moving object hard enough it will be damaged regardless of the air rudder locks installed. Other than that these locks should work very well for you.

Construction:

All you need is about \$10 worth of hardware (what is your air rudder worth?). The parts are listed below:

Qty

2 – Red flags at least 2 feet long. I bought the ones below at Oshkosh for \$5.

2 – AN4-22 bolts. Can be used. (free if you have them, \$1 if you don't)

2 – 1/4" Lock nuts. About 20 cents a piece.

4 – 1/4" Steel washers. About 2 cents a piece.

1 – Hacksaw

1 – Bench grinder or a really good file.

- ✓ Start by cutting the head off the AN-4 bolts. You now have a "pin". AN bolts are hardened and take a little effort to cut with a hacksaw. Make sure you keep the threaded end of the bolt intact. The length of the pin should be long enough to go through the aft section of the rudder control horn. See photo on page 4.
- ✓ Use a strong soldering iron or propane torch to solder one washer on each pin keeping the washer as close to 90-degrees to the pin as you can.
- ✓ Use your grinder or really good file and file a flat on one side of the "pin" and a blunt point on the end. This will take some time and many trial and error fits will be necessary. See photo on page 3.
- ✓ If you are lucky enough to get the red flags shown below, they will have brass grommets installed on one end. If your flags do not you can simple punch a hole

through the fabric or install the grommets yourself. Grommet kits are sold at most hardware stores and are very useful for other jobs you may do. Check the “swap shop” areas at any fly-in and they should have some red flags. Yours may vary.

- ✓ Make sure the bolts fit through the grommets. If not, enlarge the grommet to fit.
- ✓ Put the “pin” in your vise and install the red flag, washer and lock nut.
- ✓ Check the fit a final time and your done!



View of air rudder locks installed



All the hardware required (except the red flags). Completed “pin” shown on top.



Red flag (note NAS number)



Completed pin with "flat". Note rounded end of pin.



One complete air rudder lock. You need two!



Air rudder lock installed



Note where pin locks between horn and airframe.



Make sure the pin is long enough to go through the rudder control horn AND protrude below the airframe bracket on both sides. See photo above.



Now, fold it up and ...



...put it in your Seabee!

If these air rudder locks are installed correctly, the air rudder should not move at all! Obviously these are not required if your Seabee is stored in a hangar. Use them at any outdoor event and REMEMBER to take them out before you fly! If the flags are long enough you won't miss them.