

## Check Your Autopilot Servo Arm Screws!

It was a beautiful day here in the DFW area, so I decided to take my 8 up just to bore holes in the sky. After doing a few clearing turns, I started a loop. Up I went into the "delirious burning blue" and over the top just enjoying the wonderful view, then down the backside reducing the power as the speed increased and releasing a little back pressure.

The next feeling I had is really difficult to describe. As I released the back pressure, the G-load just increased. The first thought that went through my head was "Wow, that feels wierd." Then I pushed forward on the stick, and the G-load kept increasing. As the nose came through the horizon, I put both hands on the stick and pushed hard, and by now my thought was, "Oh \$^&#!" The nose kept moving up, so I pushed the power back in to maintain airspeed and rolled the lift vector off to the left to keep the nose down and the airspeed to reasonable levels.

For the next few minutes I was able to modulate the airspeed and attitude with the bank angle, while using throttle to maintain altitude. I distinctly remember thinking, "Why is my #%&\$ parachute in my apartment and not on my back!" The airplane just had its first condition inspection about 6 flight hours ago last week, and I was trying to figure out what could be causing the elevator jam. I reached behind me to the rear stick to feel if it was fouled on something, but it seemed completely clear. I felt all the linkages on the front stick I could reach, but nothing was out of place. I looked back at the elevators, and both appeared completely normal, it was just that I could not deflect them down even close to neutral (about the width of the elevator horn was showing below the stab on each side). I was able to deflect them more in the up direction, but it felt like they were hitting a stop when the stick was moved forward. I tried messing with the trim, but the tab is not large enough to even partially overpower the elevators.

I next tried leveling out a little to see if it was possible to fly in level flight, but the airspeed kept decaying too far, and I certainly did not want the airplane stalling with no down elevator available. Running out of options, I put both hands on the stick and shoved really hard. Nothing. Alright, it can't get a whole lot worse, both hands and push for all I'm worth. This time the stick popped forward to about -3 G's, and I was able to recover to level flight with normal elevator feel.

To get back on the ground, I just determined to keep the airplane fast enough to keep the elevators nearly neutral, figuring that as long as I didn't get too close to the same position they jammed in, they would continue work normally. I flew a wide, low pattern at 110 knots, and touched down at about 100, which actually worked out just fine. As I slowed to taxi speed, my habit of pulling the stick aft for ground ops jammed the elevators again.

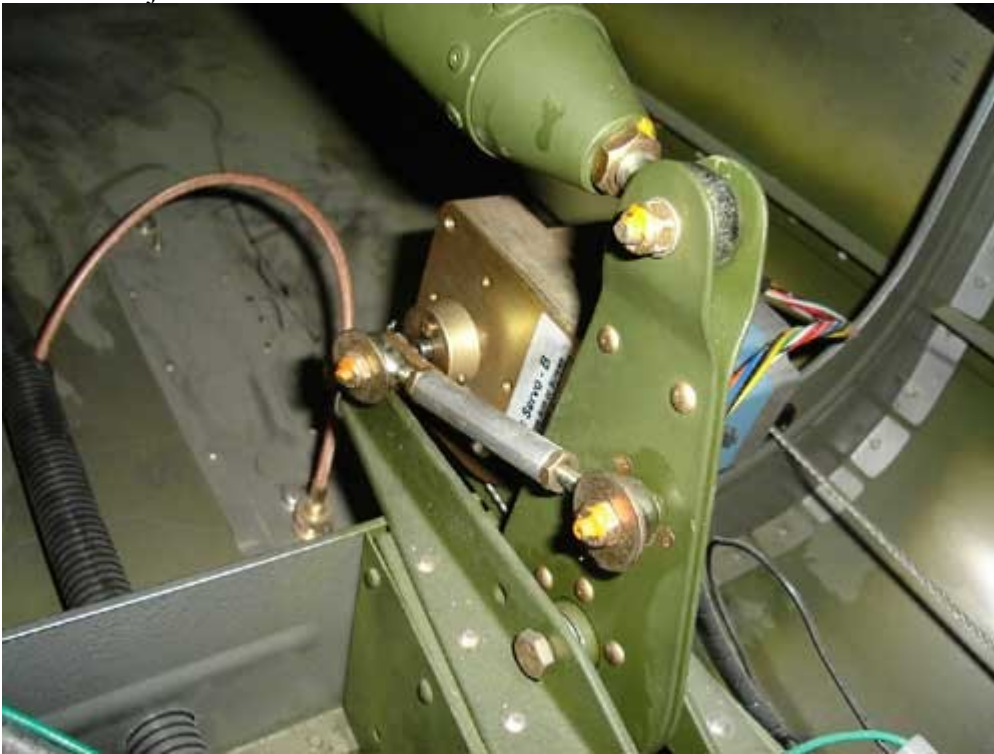
Back in the hangar, I found the problem. The arm of my autopilot elevator servo is held on by a screw, which was missing in action. The arm and attached linkage then dropped between the elevator bellcrank mounting bracket and the body of the servo and jammed there.

The screw which holds the arm on a TruTrak autopilot servo is a #8 panhead stainless 1/4 inch long, with a nylon washer between the screw head and the servo arm. This is the factory set-up, and I have never seen any indication of people using anything different. I am looking for a source for a screw with a drilled head so that I can safety the screw to the arm. I will not fly my airplane again until there is some positive safety lock on these screws (there is another identical servo for my ailerons).

Please note that there was no failure of any other aspect of the autopilot system, and I continue to have full confidence in my TruTrak autopilot. I just will require a positive safety lock on that servo arm attach screw.

Please check those screws!!! I am off to do laundry,

Here is the jammed arm fallen off.



Here is the fix.



The screw in the photo is secured with both locktite and safety wire.

I used a MS24677-14 which is a socket head cap screw with a drilled head in place of the original

screw. I had to use three washers because of the length of the screw. A MS35265-41 1/4 in filister head screw would be a better choice, but I couldn't find one locally.

I discussed the situation with TruTrak this morning, and Lucas said that they would be investigating the problem.

Pat