

INFORMATION FROM S-TEC REGARDING S-TEC 55X PITCH PROBLEMS

Thank you for the information in regard to the [pitch problems](#) with this S-TEC Rate-Based Autopilot System.

The following are a few suggestions as to what we have seen in the past and what the dealer should look for:

- 1. Cable tensions (servo bridle and aircraft primaries).**
- 2. Start up voltage on the servos (less than 2V for 28V A/C and 1.5V for 14V A/C).**
- 3. Auto-Trim induced pitch porpoise (turn off trim to identify).**
- 4. Strapping/securing of the computer mounting rack (vibrations into the computer).**
- 5. Static system leaks (<100ft/min @ 18,000ft), moisture in the system.**
- 6. S-TEC altitude pressure transducer (see attached chart).**
- 7. Friction in the aircraft control system.**
- 8. Electrical interference (AC ripple from alternator).**
- 9. Seating of the computer into the rack/wiring harness.**
- 10. Wasted armature motion in Pitch Servo before making contact with Trim Sensors.**
- 11. Servo Clutch not set to specification.**

I realize some of those have probably already been checked. Please have the rack checked to make sure it is strapped properly. We've seen 55X systems with difficult to diagnose pitch problems. In many cases it turns out to be the strapping of the rack. Due to the nature of the computer and the accelerometer, vibrations can play a big role in causing pitch problems. Also, pay specific attention to friction in the system. The autopilot is programmed to provide a certain amount of force to the controls. If more force is required, (though it may go unnoticed by the pilot) the autopilot will lag behind (oscillate/porpoise). Often lubricating bearings/pulleys will eliminate friction that goes unnoticed by the operator. You can test the friction in the system by using a scale (fish scale) to physically pull up on the elevator or back on the yoke. Some aircraft manufactures have a spec or recommended force it should take to move the controls. Attach a scale (digital force gauge preferably) to the pilot's yoke and slowly pull the elevators from full down to full up, noting the gauge reading when the elevators go through neutral. Generally, it should be less than 18 pounds. Feeling the friction on the elevator when moving it up and down can be useful. Many times excessive friction can be felt this way.

If nothing can be found in these areas, the issue may be in the computer, and you will need to send it in to us for repair through an S-TEC dealer. After everything on the list has been gone through and the computer has been in for repair, we could (if the issue is still present) provide you with another computer to try through an S-TEC dealer.

Hopefully this information has been helpful. Let me know if I can be of further assistance.