

# AS THE PROP TURNS

By  
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Hello everyone. I had an interesting year in 2007 with my airplane down for an extended period. As many of you know, I have a fairly interesting and unique CJ-6 Nanchang. It is one of only three that ever came from the factory brand new to be delivered into civilian hands in North America. [Working with Victoria Air Maintenance, we actually brought in two more in 2006 but they were destroyed in a trucking accident immediately after clearing Canadian customs so I guess the one out of three is still true.]

*Mongoose* has a 400 hp HS-6K engine that is the Chinese equivalent of the Russian M-14PF engine. It also has a Chinese designed JL-2, three-blade metal propeller. To say this combination is a “hoss” is an understatement. My typical cruise profile is 160 KTAS at 60% power burning 16 gph.



This is a very nice cross country machine but all that fun came to an end last summer. It seems that my prop, which uses oil to drive the blades to both coarse and fine pitch, was very slow to respond to control inputs. Not feeling safe about this turn of events, I decided to investigate further.

The mechanic I was using at the time sent the prop governor out to be flow tested. It came back with a good report. We next dismantled the prop and opened the hub for inspection. Initially, he did not find anything wrong and remounted the prop.

Unfortunately, and not known to me at the time, a rag was left in the dome and ended up blocking all oil flow from the governor to the dome. Needless to say, I am not using this mechanic's services any longer.

I flew a short hop to Gadsden, AL (KGAD) in the fall to my L-39 maintenance facility, International Jets. After a low approach, I pulled up to the downwind while bleeding off about 50 knots of airspeed. As I did so, the prop flopped over to the coarse pitch position. Even with the prop control full forward, about 1700 RPM was all I could achieve. To put this in perspective, I usually cruise at 2300 RPM and fly the pattern at 2200 RPM. Basically, I did not have enough thrust to stay in the air. So, I simply kept the airplane very close to the runway and flew it like a simulated flame out (SFO) in the jet.

Hawk Aviation Services operates out of Calhoun, GA (KCZL). They are owned and operated by three gentlemen, two of which are former airline mechanics and one is Air Force avionics trained. To say they are good is a tremendous understatement and I hope after reading this article that more of our community will make use of their skills.

I had Zac Hachem and John Konermann come to GAD to start the long process of troubleshooting this problem. Literally, every part of the prop system was eventually dismantled, disassembled and tested. We sent the governor and the hub out for testing and rebuild to South Coast Propeller Service in Bessemer, AL (KEKY). I particularly admire their courage in tackling items of experimental design.

The governor checked fine, again. The blade collars were set too tight though. The adjustment was made, all seals were replaced with a new set from China, and the blades were dressed and repainted under the supervision of my painter, Larry Baechler, at International Jets.



Everything was remounted and tested but the run-ups just before takeoff showed the same problem. So, we were down to the last possibility, which we had hoped to avoid. We now dismantled the nose dome, the prop shaft and reduction gearbox. The oil passages had seemed clogged but we weren't sure if it was because of check valves.

This airplane only has 500 hours since new and yet, thank goodness, we did what we did. What we found was quite amazing. There is a bearing sleeve mounted in the nose dome which has dual ports through which oil from the governor flows to journals in the prop shaft. From there, the oil flows to the hub and directs the prop to coarse or fine pitch. The sleeve had actually rotated in its mount just a fraction of an inch. However, it was enough to completely block the flow of oil to the hub.

Zac Hachem cleaned everything and remounted the sleeve securing it in place with a high temperature bearing retaining compound. Also, the nose dome is made of magnesium and we discovered surface corrosion under the paint. Larry Baechler stripped the dome completely, primed it, and repainted it the original Chinese baby blue color. So, you can see that while fixing one problem, it is a VERY good idea to check over everything that you wouldn't normally have access to otherwise.



The last and most problematic challenge was remounting the shaft and reduction gearbox into the dome. The shaft journals have metal sealing rings, which are very similar to automobile piston rings. The problem is their need to be compressed while being inserted into the sleeve. As you move the two together, the space available for your hands quickly disappears because the reduction gearbox is very wide and bolts to the backside of the

dome. Zac used thin (.003-5" stainless sheet metal) and some careful maneuvering to finally re-mate all the components.

The prop now operates flawlessly. It is powerful and instantly responsive to inputs. *Mongoose* is currently having its annual done with Hawk. The Chinese specify a 4 year or 600 hour IRAN and we are following the maintenance guidelines religiously. Again, it is amazing the things you find: gummed up check valves, corroded desiccant filter housings, leaking seals and gaskets. The airplane will come out of annual with a fresh TBO and all systems operating like new.

I know many of you enjoy Yaks and Nanchangs because they are cheaper to own and can be worked on by the owner. That said, I hope everyone has a competent, knowledgeable shop that can support you for the time that something unusual or involved malfunctions. I strongly recommend you add Hawk Aviation Maintenance Services ([www.hawkav.com](http://www.hawkav.com)) and South Coast Propeller Service (<http://southcoastpropellerservice.com>) to your short list of trustworthy shops. Fly safe and don't forget to "check six"...