

My Losmandy G-11 has been unused for five years or so. During the last few days I hauled it out of storage, performed a modest overhaul, and tested it. All went well, but I thought some details might be useful.

The overhaul was basically a lube job plus an electrical and electronic functional test. The electronics still worked -- there might have been a problem with contact corrosion, so it was worth checking -- but the lube job turned up some interesting results.

The various bits and pieces had been stored in closed containers, so dust buildup and contamination of lubricant thereby was not a problem. Notwithstanding, partial disassembly revealed a substance with color and mechanical properties resembling stale peanut brittle in several locations where I was expecting grease, and indeed, all four sets of roller bearings (two on each axis) were frozen and would not turn freely. On the other hand, the small thrust bearings at the lower end of the polar axis and at the counterweight end of the declination axis were still well-lubed, and rotated freely.

The most interesting aspect of this observation is that I had cleaned and relubed the G-11 once before, more than five years ago; the fact that there was peanut brittle in some places and functional grease in others is a hint to some of the problems in taking care of a G-11.

Truth is in the details, so ...

When I first lubed the G-11, I found a much worse case of "peanut brittle"; all the bearings were pretty well jammed with something resembling old varnish. I had heard -- I forget where -- that Losmandy had for a time been in the habit of packing G-11 bearings with new grease without previously cleaning out the old: Mixing greases does not always result in grease -- physical and chemical interactions sometimes produce a very un-grease-like result -- so possibly that was the problem.

Anyhow, at that time I had cleaned all the bearings to the best of my ability. The two axes are mechanically similar: Each features a roller bearing at each end, press-fitted into the housing within which the axis turns. On the end where the clutch knob is, there is a thrust bearing assembly: The knob bears on a thick pressure plate, which bears on an annular leaf spring, which bears on a sandwich of two large thin washers with

a thin annulus between them, the latter carrying radially-oriented roller bearings. (All this stuff falls out when you start taking the assembly apart, so make drawings and be careful.) The other end of each axis features a clutch assembly comprising a thin disc of plastic -- might be Teflon -- between two large-diameter flat aluminum surfaces.

What I did last time was take apart everything that came apart easily; that included removing all the thrust bearing parts and sliding the big pieces apart so I could get at the clutch surfaces. I did not attempt to remove the press-fitted roller bearings, and I did not attempt any maintenance of the worm gears that drive the axes electrically -- I didn't even remove the worm gear housings.

I cleaned the thrust bearing parts by soaking them in solvent (drugstore brand isopropyl alcohol in concentrations varying from 70 percent to 99 percent), scrubbing goop off with warm tap water, dishwashing liquid, and an old toothbrush, followed by rinsing with more of the same solvents, the final rinse being with 99 percent isopropyl alcohol. (These alcohols dry residue-free, as confirmed by my experience using them to clean optics and examining the cleaned surfaces carefully during and after drying.)

I used the brush, rags, and solvents to clean the press-fitted roller bearings in place, and removed particles rubbed off the anodized clutch surfaces onto the plastic disc with a rag. When I was done, I did a final rinse and wipe with 99 percent isopropyl alcohol, and let everything dry. At that point, everything looked and felt squeaky-clean and grease free, and all bearing parts spun freely.

Then I reassembled everything, using no lubricant on the clutch mechanism (there hadn't been any there previously), but lubing all bearings and threads with white lithium grease. The G-11 went back together smoothly, and worked fine and with a much lighter touch required for slewing than had previously been required.

Skip forward half a decade now: When I disassembled this time, there was "peanut brittle" on the press-fitted bearings but none elsewhere; in particular, none on the thrust bearings that I had soaked in solvent before relubing. I think what this means is that even vigorous rubbing and use of a rag wet with solvent was insufficient to clean the old grease out of the press-fitted

roller bearings; when I finished the first lube job, there was probably enough grease hiding in the press-fitted bearings to produce a second helping of peanut brittle, as it slowly flowed and interacted with the new grease over time. I couldn't think of anything to do about it -- I had no non-destructive way to remove the press-fitted bearings, and it would have been messy and complicated to arrange a way to soak the bearings in place.

So, this time around, I cleaned and lubed everything as before, and reassembled. We shall see how well the bearings continue to work in service.

-- Jay Freeman
9 June, 2007