

Ned's Nuggets

1. Distance between Landing gear actuator clevis and bolt should be 1/32 inch with pressure on the system and the bolt removed. Should not be able to remove the bolt with pressure on the system. Many Widgeons have a bushing instead of a stepped bolt.
2. Accumulator pressure should be 1/3 of the working pressure of the system. ($950 \times 1/3 = 350$ psi). Do not let pressure go below 350 psi. Pressure of 200 psi given in Bulletin-24 is a miss-print. This pressure will maximize the number of gear/flap cycles possible after loss of the hydraulic pump.
3. Jam nut on ldg. Gear shock strut can show no more than four threads (preferable three threads) when fully tightened.
4. Do not loosen jam nut further without deflating nitrogen pressure from shock strut. Can use 15-50 psi of air pressure to loosen and remove the piston and chevron seals from the cylinder.
5. Landing gear lock linkage-Adjust the length of the rod-end so that there is good spring tension on the down lock; should not be able to move with your fingers but easily move with a screwdriver.
6. Landing gear accuator seals- may be obtained from Devane Hydraulic. Need to give them the I.D and the O.D. Ask for commercial homogenous rubber (don't get AN parts as the commercial is better).
7. Flap and gear selector valves- use standard AN-6227 O-rings and are simple to overhaul.
8. Relief valves have no O-rings and are basically poppit valves with spring- loaded ball bearings. They are easily re-built. Any leak in the relief valve will result in a hissing noise overhead and the pressure fluctuating between relief valve pressure (1050 psi) and the unloader valve pressure (950 psi).
9. System pressure will drop after engine shut down due to minor leaks into the low- pressure side of the system. If system will hold 50% pressure after 30 minutes this is acceptable. Loss of pressure can be due to leaks overboard or into the reservoir as by way of the unloader valve or any of the gear actuators.
10. Brake master cylinder- Best system is the D-18 Twin Beech master cylinder. Available from Southwest Aero Exchange, Tulsa OK. 1-918-272-9815(\$125 each or \$30 to overhaul). Has smaller diameter piston but a longer stroke and is a stronger brake. Original compensator pre-loaded the brake with the old expander tube system and is not needed on modern brake systems. Devane Hydraulic can overhaul the Hayes brakes with 5606 hyd. fluid resistant cups. Must cut a hole in the cup.
11. Main landing gear shock strut overhaul- Use V.P.-22502875VH chevrons (use 4-5). Can use as few as three if it does not leak, but four is standard. Can be ordered from Devane Hydraulic. Fill cavity with same height of chevrons and spacers. Should have 3 and no more than 4 threads showing below the gland nut. Should have 1/16" of top steel billet showing above the top of the cylinder. There should be 1/16-1/8 inch free space in the cavity. Do not screw the gland nut down enough to actually compress the seals. Jam nut should be screwed down hand tight then backed off 1/4 turn. The steel bearing at the top of the stack should not have a hole for the setscrew. Setscrew should be a straight -slot screw and the safety wire should lie in the screw slot. Can expect 4-5 years between overhauls.
12. Causes for main landing gear not locking in the up position:
 - a. Shock strut too short because the gland nut is too tight.
 - b. Snubber block protrudes too far in to the wheel well.
 - c. Up latch bar is in the wrong position. Correct by moving outboard.
 - d. Spacer on the inboard portion of the axle is too then; correct by installing a thicker spacer.
 - e. Actuator clevis is not adjusted properly; correct so that clevis rod is approximately 1/32" too long. The bolt should be too tight too remove by hand with pressure on the system but removable by hand with pressure off the system.
13. Main Gear – It will take 1100 psi to fill the main strut half way (three inches of chrome showing) with the weight on the wheels. It will take 800 psi to fully extend the main strut with no weight on the wheel. Can make replacement main gear bushings from #316 stainless steel. Bushing should have a groove with a 1/8" hole in the groove to allow grease to get to the bolt. Drag link bolts can be replaced with 125,000 psi bolts (AN Bolts) which have been drilled and have grease fittings threaded in the end.
- 14 Tail- Wheel Gear- It will take 550 psi in the TW shock strut with the weight off the gear to give the proper extension when the weight is on the gear.

15. Pump cavitation can be caused by leakage of nitrogen into the system through the accumulator. This can be corrected by turning the engine off and selecting flaps down and pulling the flap down manually followed by selecting flaps up and letting the flaps return to the up position. This can be done several times to purge the system of air. The pump will pick up fluid from the reservoir even if the line from the reservoir is empty.
16. Aircraft used in cold climates/altitudes have thermal relief valves (2) in the system to relieve pressure build-up when the plane sits in the sun and heats up. Not needed in warmer climates
17. Vickers also makes an un-loader valve which can be used in place of the Electrol unit. It also has a mounting bracket but is slightly larger. It is more reliable than the Electrol. It uses a non-standard thread for which there is no AN equivalent. Use a banjo fitting and re-cut the threads.
18. The Electrol un-loader valve should be installed using #8 firewall fittings with an o-ring or with a union and an o-ring both using a B-nut with a chamfer recess. Be sure to align the chamfer with the area on the banjo fitting with the missing threads. Do not use a banjo fitting with an O-ring and a crush washer. Change the o-ring every time you remove the fitting.
19. It will take 1000-1100 psi pressure to fill the main gear shock struts and 750 psi to fill the tailwheel Shock strut with the aircraft on the ground; it will take only 1000 psi and 550 psi respectively with no weight on the gear. An 1100-1000 psi nitrogen bottle will service the struts easily with some lifting on the wingtips and the tail.
20. Unloader pressure settings are not critical. The pressure will drop to values of 200-300 psi when the main gear is lowered and even lower if the accumulator is not fully inflated. The accumulator should be charged to one third of the working pressure (350-psi).
21. The threads on the Schrader valve on the shock struts may tend to leak in which case apply a thin film of Permatex. An O-ring should be placed under the Schrader valve.
22. The hydraulic pump has two O-rings, which may deteriorate and cause leakage via the drain line. This will be a heavy drip and will empty the reservoir in short order if the engine is running. There are also several check valves in the pump, which may leak. This can occur either back into the reservoir or out the drain line and onto the floor. In either case there will be leakage through the drain line.
23. The reservoir should only be filled 2/3 filled to allow room for foaming of the fluid. The reservoir acts as an air-fluid separator and may blow fluid overboard if filled too far. The reservoir on the G-44 has too little capacity for the system.
24. Internal or external leaks will cause the system pressure to fluctuate between the un-loader valve settings of 950 and 750 psi. Possible causes of internal leaks are the relief valve (very unlikely) the un-loader valve or any of the actuators. The actuators can be capped off to isolate them from the system to verify which of them is causing the leak.
25. Relief valve must be set higher than the un-loader valve or the pump will have to work against a head of pressure resulting in excess wear on the pump. This is one of the reasons for the Bulletin-24 Modification. If the relief valve is set too low it will relieve first and the system pressure will fluctuate . Relief valve pressure should be 1050 psi (1100 psi would be better). The valve can be adjusted by first zeroing the system pressure and then loosening the lock nut followed by turning the adjustment nut clockwise (one turn = 175 psi.). It is O.K. to have the pressure set too high because it will relieve only in the event of excessive pressure. Jam nut is sealed by a square shouldered O-ring which should not leak. Re-safety the jam nut when done.
26. Engine mount repairs should be TIG welded by a certified shop (Rec. Kosola in Albany, Ga. 1-800-456-7652 / 1-229-435-4119). Should be mounted in a frame or jig to prevent warping. No need to heat treat

but weld should be normalized. Should either cad. plate or zinc plate or powder coat after welding. Must heat to 450 deg. to prevent hydrogen embrittlement with cad plating. Engine mount lug is original Grumman G-44 lug (used on all Widgeon conversions). This is very unlikely to break. This too should be TIG welded if necessary but must be removed from the aircraft and then re-riveted.

27. Cleveland disc breaks can be ground down, re-plated, and then re-machined at much less cost than new (\$350 vs. \$2000 for the Goose GoodYear brakes). Call UNAS Grinding (Paul Barron-Shop Manager) E. Hartford, Conn. 1-230-(? 860?)-289-1538. Plasma coating is acceptable as a way of building up wheel bearing seats. Can be done by any machine shop.