

Foundations

By: Dave Miller

Dave Miller is the proud owner of the Navy U-3B that was on the May, 1999 cover of The Twin Cessna Flyer. One of the most important aspects of the complete restoration of the 310B was the removal, repair, rebuild and re-rigging of the complete landing gear.

Gear collapse is one of those experiences all of us can live without. The best way to learn about this tearful experience is to learn from the mistakes of others.

Cessna landing gear is inherently strong. There are two basic causes of gear collapse:

1. Incorrect gear operational procedures.
2. A lack of maintenance.

Both of these items are easily corrected.

Let's talk about pilot induced stress first. All of the Cessna twins are very clean airframes that do not slow down naturally during descent to pattern altitude. In fact, my 310B manual recommends starting the descent as much as an hour before ETA, keeping the engines warm at residual power for the arrival at your destination. The first notch of flaps comes out at 160 M.P.H. which will help you get down to the 140 M.P.H. gear extension speed. Although throwing out the landing gear will also bring your speed down, you should never use the landing gear as speed brakes or you'll be sorry. The drag forces of the almost five-foot-long nose gear are transferred to the retraction rods under the floor and the mounting structure that carries the transverse torque tubes. Damage in this area can cause the nose gear not to lock down properly. This condition will provide an excellent view of the runway while your airplane is grinding to a stop. The main gear is susceptible to very high side loads during high speed or sharp turns during taxiing. The structure in the wing that supports the main landing gear side brace support structure is subject to cracking on the early model twins as a direct result of the excessive side loads. A factory kit (SK414-8E) is available if cracks are detected.

The kit was factory installed in only the 340A and a few late 402Bs and 414s.

On the maintenance side, several often-

overlooked areas require regular attention to avoid gear collapse. The main gear torque tubes are subject to corrosion and may experience spiral cracks. The torque tube fork bolts are a life limited item and require changing under Service Bulletin in the 300 series and under Airworthiness Directive in the 400 series. A thorough check of the structure and all of the hardware should precede the required landing gear rigging. It isn't enough to just swing the gear. My landing gear required total rigging just 100 hours after overhaul.

I've seen the main landing gear with only the down lock tensions neglected and this will definitely catch up with you at a most inopportune time.

Other rigging areas that need attention are, main gear inboard door up tension, drop off, and up lock adjustment. If the inboard gear door looks out of rig, the gear is out of rig. Make certain your mechanic has the proper training before attempting any adjustments on your landing gear. Twin Cessnas are valuable airplanes. Don't let yours unintentionally become a parts airplane.

Proper rigging of the electro-mechanical landing gear found in the twin Cessna line is comprised of 37 separate steps. Not only are all 37 steps necessary, but the system must be done in a specific order starting with step 1 and finishing with step 37. You can not start in the middle as any changes or adjustments you make in the landing gear system must be followed with a check of other areas that the original adjustment could make out of tolerance limits.

Another important aspect of landing gear rigging is the tool necessary for measuring the proper tension on the main landing gear door actuator arm with the landing gear in both the up and down and locked positions.

The Twin Cessna Flyer has a 1-hour VHS video and booklet on proper gear rigging and the tool available. Look on the "shopper's" card inserted in this issue.