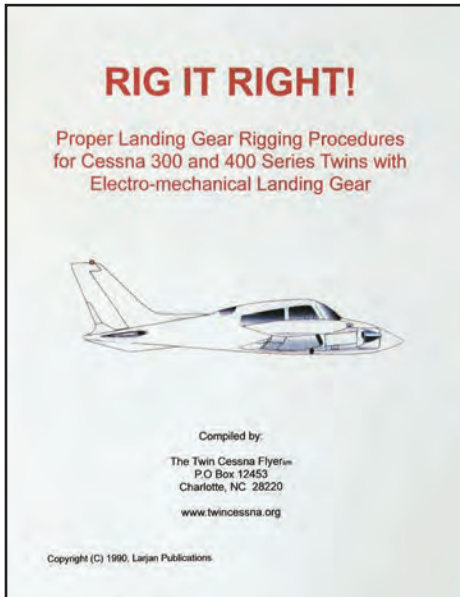


310 GEAR RIGGING

by Greg Ortega & Captain Mike Ward, TTCF Members



The Rig It Right video and booklet (above) can be found on our website at: www.twincessna.org.

KA-BANG! The airplane lurches hard to the left and the left tip tank slams into the unyielding pavement. The grinding noise continues for several moments as the left propeller makes every attempt to create a large hole in the taxiway.

Eventually the machinery comes to a complete stop and an embarrassing silence envelops the remains of what had been my Twin Cessna.

It's a glorious spring day in the Pacific Northwest. Fabulous VFR weather over the North Cascade Mountains in Washington State, perfect for a cross-country adventure. I am flying my 1958 Cessna 310B and we are heading for a sports event in South Dakota.

However, midway into the flight we encounter an area of significant



My 1958 310B after its landing gear failure a few years back.

convective activity. As we are not equipped with weather radar, we make the difficult decision to abandon the journey and reverse course to return to our home base of Frontier Airpark near Everett, Washington. We detour for a \$100 Hamburger at Port Townsend.

On preparing for landing we experience the curse of far too many Cessna 310 pilots.

Even with the landing gear cycled multiple times, we are unable to get a green safe light on the landing gear. With that in mind we make a cautious touchdown but I feel the landing gear start to give way.

We immediately make a go-around and head out to the west for additional troubleshooting. Normal and alternate procedures do not work and even pulling the cover off the floor to look at the landing gear box from inside the cabin yields no additional solution.

So off for an emergency landing at the Arlington (KAWO) Airport. This is not only a longer runway than at the Airpark but also has emergency equipment and maintenance assistance available.

On final approach with landing assured, I shut down the left engine and feather the prop. I then bump the starter so that the left prop is parallel with the wing to minimize any ground contact damage.

We touch down gently and as we slow the airplane lays over onto the left tip tank. We slowly go off the runway and slide to a stop and the adventure is done for the day.

We jack the airplane up and manage to get the left main gear fully extended. Damage is minimal



My current 310H, an H model.

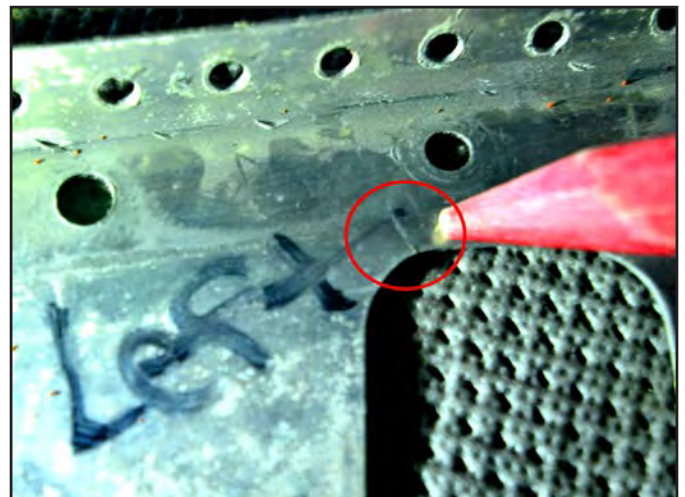
and repairs are easily accomplished. Another notable entry in my log book.

Forty-eight landings and nine months later I am again landing the 310 at Frontier Airpark.

All landing gear indications are normal and the subsequent touchdown is uneventful. However, while on the taxiway and approaching my hangar we experience the event described at the beginning of this article.

With no warning or abnormal indication the left main gear has folded, wrecking not only the left wing, spar, and wing tank but also the left engine and propeller.

Inspection reveals damage to the left landing gear overlock mechanism from the previous incident that had not been detected during the original repair.



Cracks like this are not uncommon for Twin Cessna landing gear. They must be repaired.

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The doubler plated used for the crack repair.

This time the damage is beyond economic restoration and eventually, after multiple heated discussions with the insurance company, payout is in hand - minus of course a significant deduction (\$10K) spelled out in the fine print should the airplane be totaled due to landing gear failure. Even the insurance company knew about the inherent risk with the Cessna 310 landing gear.

With funds now available and after an extensive search, I settle on a Cessna 310H with only 1,400 hours original time.



The stops on my landing gear motor were out of tolerance and the motor brake plate had glazed over. We sent it out for overhaul.

It is no great secret that the Cessna 310 series has experienced extensive landing gear problems over the years for reasons that almost always come back to inadequate or incorrect rigging and inspection.

Over the next few years of flying my 310H, the failures of the previous airplane were always on my mind.

I discussed this with my friend Mike V., who is a talented A&P and an AI. He has taken over the maintenance of my 310H and *The Twin Cessna Flyer* points me towards a video called "Rig It Right," available through the Twin Cessna Flyer owners group.

We eventually set up a Saturday morning in my hangar and with several local A&P mechanics participating. We begin by first reviewing the video, then starting the inspection.

The first item we find is obvious to the experienced Cessna technicians. The brake line is mounted on the wrong side of the left main landing gear. We mark this down for corrective action and proceed.

The next items uncovered were the main landing gear scissor linkages

which were worn beyond limits and needed re-bushing.

The Twin Cessna Flyer Cessna 310 forum also suggested checking a particular bolt in the nose gear assembly, however, after inspection, this part was still airworthy and no corrective action was required.

Dick Welsh, an active poster on the Cessna 310 forum, suggested that while not related to the landing gear, we also remove the exhaust mufflers. That was a good call as one of the



Landing gear parts and hardware. We removed, cleaned, and repainted all the parts.

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Someone suggested that while doing the landing gear work we also inspect my exhaust mufflers. We did and they needed replacing.

mufflers was cracked and both augments tubes needed replacing.

In order to inspect this area and make the subsequent repairs, it was necessary to drill out and remove a great number of rivets in the engine cowling assembly.

As a guess, we drilled out and eventually replaced over 350 rivets. During this process we identified multiple large rivets that were damaged during the original factory assembly. We sourced those rivets and replaced them as well. It must have been either "Get To The Bar Friday" or "Hangover Monday" in Wichita.



Here we have the muffler cowling removed, looking for corrosion to repair, and preparing to paint.

Once we had the cowling components disassembled, we then cleaned and repainted all of the parts before reassembly.

Back to the landing gear inspection, which was the original reason for the exercise.

We found that the stops on the landing gear motor were out of tolerance. This was a rebuilt motor with only 44 hours and

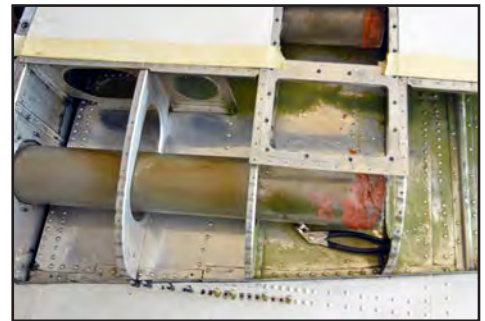
less than 40 cycles. So out comes the motor to go back for another rebuild.

Aircraft Accessories in Tulsa did the work and they were great to work with. Even though out of warranty, they made good on the repair. Inspection revealed that the brake plate in the motor had glazed over, which reduced motor braking beyond acceptable limits.

When we later reinstalled the landing gear motor, we elected to install doublers on the lower floor ribs to reduce flexing during landing gear operation.

Close inspection of the wheel well structure revealed the dreaded cracks as described in both the "Rig It Right" brochure and video. Even though our cracks were small and minor in nature, we made the decision to install the optional Cessna 310 Side Brace Kit. Note that when ordering this kit, the parts are aircraft serial number specific.

As we already had the majority of the cowling removed for the exhaust system repair, this aided in the installation of the side brace kit as access to this area is quite limited.



Good view of the augmentor tube inside the unpainted muffler cowling interior.

As I have never seen an armored car following a hearse to the cemetery, out came the smoking hot wallet and we began the search for the very long list of parts needed for the rebuild.

Eventually all of the parts were sourced using four different vendors. Once all of the items were on hand and organized, reassembly began. As we pulled parts off of the airplane that were reusable, we cleaned and repainted the components with two part epoxy as necessary.



The final painting after all the work was completed.

The airplane is now reassembled with the side brace kits installed. Following the advice in the "Rig It Right" video, we now have far more confidence in the continued satisfactory operation of the landing gear system.

Feel free to contact me at Skylanchpilot@yahoo.com if you have any more questions on this project.

