



FLYING LESSONS for October 25, 2012

suggested by this week's aircraft mishap reports

FLYING LESSONS uses the past week's mishap reports to consider what *might* have contributed to accidents, so you can make better decisions if you face similar circumstances. In almost all cases design characteristics of a specific make and model airplane have little direct bearing on the possible causes of aircraft accidents, so apply these *FLYING LESSONS* to any airplane you fly. Verify all technical information before applying it to your aircraft or operation, with manufacturers' data and recommendations taking precedence. You are pilot in command, and are ultimately responsible for the decisions you make.

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This week's lessons:

I almost never seek out pilots involved in aircraft mishap reports. Very frequently, however, they come to me. So when the pilot of a retractable gear airplane who had two hours earlier had a gear-up landing sat next to me at an outdoor dinner, I was ready to listen.

The pilot cares deeply about airplanes and the people who fly them, and wanted to "unload" both as a catharsis and as a way to help other pilots understand the conditions that can make even very experienced pilots have a lapse in procedure that leads to a Landing Gear-Related Mishap (LGRM). He knew that by talking to me he was talking to the *FLYING LESSONS* audience—and that was his intention.

LGRMS—gear-up landings and gear collapses while the airplane is on the ground—are rarely covered because in almost all cases they are specifically exempt from NTSB 930 reporting requirements. They aren't in the U.S.' National Transportation Safety Board record, so they aren't in the magazine articles and annual safety reviews that are based on NTSB reports.

And yet the FAA preliminary accident reports are strewn with LGRM events...at times 10 or more each week. My contacts in the landing gear parts supply and salvage markets tell me even the FAA number under-reports the true total. Insurance sources reveal the average cost of repairing even a "minor damage" LGRM is USD\$60,000 - \$80,000 for a single-engine airplane, and \$80,000 - \$100,000 or more in piston-powered twins. The cost of engine teardown, inspection and repair, and propeller overhaul or replacement is the greatest expense incurred after a LGRM.

Given the current value of many retractable gear airplanes, especially light twins, a LGRM very typically results in the airplane being "totaled" by the insurance company, and parted out instead of being repaired to fly again. Although this keeps the salvage yards full of donor parts for the remainder of the shrinking general aviation fleet, I contend that the frequency of LGRMs and the high percentage of those airplanes that are totaled makes LGRMs by far the most common reason retractable gear airplanes are permanently grounded, and a major factor in the decline of the overall general aviation fleet.

Further, totaling so many airframes is a significant contributor to insurance rates for all airplane owners, regardless of whether their airplane's landing gear retracts. Insurance companies are for-profit businesses, so when they make frequent payouts to cover LGRM losses they must increase everybody's insurance premiums to cover those claims.

I conducted a [16-month study of LGRMs](#) several years ago and estimated the insurance industry was consistently paying over USD \$1 million each month. [My study](#) revealed that LGRMs are common to all types of retractable gear airplanes, without regard to differences in gear switch location or gear warning or safety devices. The issue more than anything else seems to be pilot distraction and lack of proactive landing gear system maintenance.

See www.thomaspturner.net/LGRM%20ongoing.htm

So the pilot sought me out that evening to provide *LESSONS* to help other pilots. He had

been flying as part of a recreational formation flight demonstration, and was the "missing man" of a missing-man formation flown over a large gathering of pilots. Having pulled up and away from the rest of his four-airplane formation in tribute, he was above and behind the remaining three-ship V as they returned to the airport for landing. As the formation was over the threshold the mishap pilot started a diving turn to final. He reached to the landing gear switch, ready to extend the wheels to aid in his descent.

As the three-ship touched down on Runway 18, according to the pilot, a helicopter pilot announced he was departing the ramp on the east side of the airport, leaving westbound "behind the three landing airplanes." The mishap pilot released the gear selector to adjust the throttle, anticipating a go-around from high above the airport. The helicopter cleared the runway to the west, however, and the pilot instead reduced power to land.

He later remembered thinking the airplane was high and fast, which he attributed to his diving turn from a high base leg. He has a personal technique of holding onto the landing gear switch on extension until he verifies the gear is down and locked, and says having released the switch because of an interrupted habit pattern must have subconsciously convinced him he had extended and verified the gear...otherwise, according to his habit, he would not have released the switch.

As the propeller made first contact with the runway the pilot instinctively turned off the battery and alternator switches, and the magnetos. The airplane slid to a stop on the runway.

The pilot does not remember hearing the gear warning horn--in fact, he distinctly recalls it was *not* sounding. When the airplane was later lifted and the pilot turned on the battery master to extend the landing gear, the gear warning home indeed blared.

Once again, a nonstandard procedure and an interrupted landing operation conspired to lull a highly experienced pilot into a gear-up landing. The defense:

- *Always* make a short-final gear position check, and immediately go around if the gear is not down
- Cross-check the combination of power setting, pitch attitude and airspeed on final approach, and if all three are not the norm immediately suspect the landing gear position
- Recognize that anything that distracts or interrupts your normal patterns means that the risk of a gear-up landing is greatly enhanced. Use the presence of distraction itself as a trigger to check and re-check gear position.

The owner intends to have the airplane repaired. Thank you, pilot, for caring enough to let us learn from you.

Questions? Comments? Let us know, at mastery.flight.training@cox.net



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Debrief: Readers write about recent *FLYING LESSONS*:

The anonymous readers are out in force this week. One writes:

It was a beautiful VFR day. I was flying my daughter and sister in law from Dallas to Houston. My plane and I both [were] instrument current. Leaving Dallas I did not open my IFR flight plan since it was VFR and leaving the Dallas area on an IFR flight plan is such a hassle. About half way to Houston, clouds began to get thicker. It was forecast VFR all day. Me: "Center, please open my IFR flight plan to DWH in Houston"

Center: "You are now IFR and cleared to DWH, resume your own navigation." ATIS at DWH: "VFR" Then as we were getting close to DWH, DWH ATIS: "Field is IFR, expect LOCALIZER approach". My radios were already set for the approach. Center: "You are cleared for the LOCALIZER approach to DWH, switch to Tower". We descended thru the overcast, landed, and dropped off my passengers at the end of a completely uneventful flight.

The simple *LESSON*: Be prepared, and be ready *and* willing to execute Plan B (or C or D) without delay.

Another anonymous post, also on what the reader calls "the value of an instrument rating":

The Continental 727 popped up right in front of me. At that moment, it was confirmed. We were not where I thought we were. My two friends and I were flying to San Antonio for the car races. It was a beautiful clear day and the weather forecast was VFR all the way with a few clouds near San Antonio. When I went to pick up the plane, the FBO mentioned that the transponder was INOP. Since I was going VFR, it was good to know but I was not concerned.

We were flying south and I was following landmarks, everything was good. Then I noticed the clouds were getting thicker and it was getting harder to identify landmarks. I tried to triangulate on couple of VORs (GPS had not been invented yet) but was unable to get a to/from and then it happened. The Continental 727 came through the cloud layer below and then disappeared into the clouds above. I had to park my pride and admit to my non-pilot friends that I was not sure where we were and that I was going to contact San Antonio approach for help.

The clouds were getting thicker and transponder INOP. San Antonio had me make several turns and could not locate us. After some discussion, they had me contact Austin approach. As I was tuning the radio, I flew into a cloud and announced to Austin approach that I needed help and that I was making a 180 degree turn, the only thing I knew to do. Fortunately, Austin found us right away. They gave me instructions and I would reply back what I thought we could do to maintain VFR. Finally, I saw an opportunity to descend and Austin approach concurred. Austin gave me a heading and a few minutes later, instructions to call the tower. The tower gave us a clearance to land. Problem was that there were two really large airports in front of us. I had to ask, "Which one is it?" Tower, "It's the one on the left, you are cleared to land" Me, "Which runway?" Tower, "Anyone you want". As we taxied up, everyone in the FBO came out to greet us. Once inside the FBO, my friends both said, "You will never hear the end of this" and then they said, "We really appreciate you for doing the right thing". We rented a car and drove to San Antonio.

I have since earned an instrument rating and found flying on an instrument flight plan to be significantly simpler. It provides more choices and constant contact with controllers who are very helpful. The flight described above would have been routine and uneventful if I had been instrument rated.

Very unfortunately your story is not too uncommon...except that you survived. You knew how to get out of clouds with a level, 180-degree turn, you executed that plan immediately instead of hoping you'd fly out the other side of the cloud (hope is a bad risk management strategy), and you called ATC, confessed your situation and got the help you needed without hesitation or concern for that would happen after you got your passengers safely on the ground. Sometimes survival means owning up to the poor decisions you have made. Thanks for sharing.

A "friendly, un-named fan" writes about last week's *LESSON* on brake-related loss of directional control:

Good topic and one with many chances to end differently. One of those might have been being trained for a failed brake.

Maybe it was good fortune or learned foresight, but this scenario played a part in my instruction from my Private Pilot flight instructor. After solo but before turning me loose for my long cross-country flight my CFI occasionally set me up to attempt to land and stop using only one brake -- countering the asymmetric issue with hard opposite rudder...which I thought would work only down to a point -- the point at which rudder influence ended because of low airspeed. But it turned out, the asymmetric impact could still be countered, some, with opposite rudder because of the nosewheel trying to turn the airplane opposite the impact of the brake.

My CFI would sort of spring this on me just before touchdown, by touching my arm and telling me I'd have no brake on one side or the other and, on the first couple of times -- one left, one right -- coaching me through the exercise. It never felt natural; these exercises also made me worry some about the impact of stresses on

the nosewheel assembly of my 9,000-hour Cherokee 140. But the airplane held up -- and the practice proved very worthy training a about a year later.

Headed out on an afternoon of visiting airports round-robin style, and experienced normal braking performance taxiing to take-off...but....when landing at my first stop, a 2,500-foot strip near my home field, depressing the brakes resulted in one side giving me pressure feedback with no pressure noted in the other peddle. It had been less than 20 minutes since my last application of the brakes.

Fortunately, I was practicing slow-approach landings and had the entire runway, and wasn't trying for a max-performance braking.

The surprise problem was an abject *LESSON* in a couple of ways. First, it instilled in me a routine of testing the brakes a couple of times while on base and final -- checking for pressure; better to know *before* touchdown that there's no braking coming from one side...or, worst case, both.

A couple of years later, now owning and flying a heavier, faster airplane, I walked across the ramp at an airport in the Florida Panhandle and found a puddle of brake fluid collected near the left main. I topped the fluid, bled and tested the brakes, and on testing could perceptibly feel the pressure bleed off.

[I] walked back into the FBO, found the maintenance manager and stayed the night. I had a wonderful seafood dinner that night at a restaurant overlooking the Gulf of Mexico and flew home the next evening, an uneventful flight that ended uneventfully.

The temptation to make the flight knowing (a) I had an inop[erative] brake was egged on by knowing the technique learned in training and used once real-time was (b) cancelled out by the prospect of something happening to render the other brake inop -- and facing a landing with no way to stop.

It seems intuitively obvious that taking off with a problem is never a good idea; but **we often get it in our minds to do what we planned and ignore "small" issues.**

Had I been in the same spot as the student pilot, I'm pretty sure I'd have been tempted to fly home after encountering the problem -- you know, the urge to get back, particularly when we hadn't planned to overnight. But can't conceive most of us would knowingly *start* a flight with such a problem. And doubt my instructor would endorse that idea of flying back after the problem got worse. "An overnight is inconvenient and irritating -- and always cheaper than an accident," he frequently reminded his students.

Thanks, Anonymous. Part of last week's *LESSON* is that the go/no-decision to fly home must be made with the same criteria as starting the trip. That's a very hard call to make when you want to get home and the airplane to its regular mechanic.

(Identified) reader John Hodgson also writes about brake failure:

I have a Cessna T303 and there have been several incidents of brake failure in the fleet leading to taxi incidents, although nothing catastrophic yet. A ground loop with gear collapse and prop strike could easily happen. For the Crusader procedures include testing the brakes together and individually before take off. In addition as a preflight procedure put the parking brake on and in the walk around push each wing tip and any movement would suggest a brake failure. An additional comment would be never to leave the parking brake on for an extended period of time.

Another possible outcome is brake overheating and fires. This happens in many different types of airplanes...Cirrus airplanes seem to be especially prone to brake fires, probably because they have full-castoring nose wheels and are frequently steered by differential braking. If the pilot carries a lot of power on the ground (and Cirrus SR22s have very powerful engines) he/she may end up "dragging" a brake for extended periods, overheating the brake to the point of ignition. Thanks, John.

Reader Tom Allen writes about *LESSONS* the Beech Baron that ditched in the Gulf of Mexico earlier this month after a fire in the cabin:

What a story this week in *FLYING LESSONS*! Once as a result of severe thunderstorms, I was diverted south. I got a peak thru the clouds and realized that I was out over the ocean. I didn't have anything for a water emergency. What a story!!!

Reader Jerald Duncan also comments:

Tom, this was excellent article, both on [the] pilot's part and your part. I have recently started receiving your *FLYING LESSONS Weekly* and will look forward to each.

Thank you both, but I just published the pilot's first-hand account and provided some commentary. The "outstanding job" goes to the pilot for masterfully handling the emergency, then writing it up so we could all learn from his experience. Well done!

One last reader comment about the Gulf ditching, this about portable emergency beacons from reader John Townsley:

There's a big difference between a PLB, an EPIRB, and a SPOT. The SPOT is fine for keeping someone informed of where I am, but the EPIRB (preferred for overwater ops) and Personal Locator Beacon (PLB) are preferred for the clinch. They send out a relatively precise location, along with identification information. SPOT is a great tool, for the right purposes!

Comments? Questions? *LESSONS* of your own? Email mastery.flight.training@cox.net.

Updated Essentials about Thunderstorms

Professional Pilot Magazine has published a superb (and superbly illustrated) article on the flying risks presented by thunderstorms. [The October 24, 2012 article](#) by climatologist and commercial pilot Karsten Shein is definitely worth your read.

See http://propilotmag.com/archives/2012/September%2012/A4_thunderstorms_p1.html

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Thomas P. Turner, M.S. Aviation Safety, MCFI
2010 National FAA Safety Team Representative of the Year
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