

# **FLYING LESSONS** for August 11, 2011

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.

If you wish to receive the free, expanded *FLYING LESSONS* report each week, email "subscribe" to [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net).

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## ***This week's lessons:***

*Many FLYING LESSONS readers fly retractable-gear airplanes. Many others have aspirations to fly them. Here are some important considerations for us all:*

**Gear up landings** continue unabated as the single most common mishap cause in retractable-gear airplanes...from light singles to turboprops and jets. Most never make it into accident studies because they are almost never NTSB-reportable. So they are vastly under-reported and almost completely absent from articles and studies that use NTSB data as their only information source.

**But having personally studied the problem** for well over a decade, I suspect gear-up landings are the most frequent reason otherwise perfectly good airframes are "totaled" and removed from the ever-shrinking general aviation fleet. In addition to the damage and injury potential of landing gear up, there is another scenario that crops up now and then—attempting to go around after the airplane makes initial ground contact after the pilot has forgotten to extend the landing gear.

**The significant danger** of a propeller or engine failure resulting from a propeller strike makes it preferable from a life-saving risk management standpoint to give in to the failure once any part of the airplane makes ground contact in a gear-up landing.

**It's far preferable**, obviously, to properly monitor gear extension and verify the extension is complete as part of your Standard Operating Procedure [SOP] well before nearing the runway...even if it means sacrificing the airplane in order to protect its occupants.

**It takes the most disciplined pilot** to make the decision to let the airplane settle onto the runway with the wheels up after first ground contact. That's why we must work so hard to avoid the scenario completely, by properly and completely evaluating the landing gear's functioning while it is in transit, in addition to checking the final outcome by looking for the cockpit indications.

**Confirming landing gear extension** is much more than moving a gear switch and looking for lights or a mechanical pointer. A successful extension will provide obvious clues in many ways. Your job is to monitor the extension process, and *only then* check the indications. Actively evaluating the entire gear extension process will make it much more likely you'll catch any problem that crops up during gear movement. It will help you detect abnormalities and gear extension trends so you can have them addressed before they result in an unrecoverable gear failure in the wheel wells or while the gear is in transit.

**When your SOP tells you** it's time to put the wheels down, move the gear switch and check *all* these indications:

- **Sound.** Does the landing gear motor or hydraulic pump sound right? Do you hear it run for the correct amount of time?
- **Feel.** Does the airplane "feel right" as the gear moves downward? Does it have what you've come to expect as the correct pitch change as the gear moves out? Does the airplane yaw like you'd feel in types where the gear extends asymmetrically? Do the

rudder pedals of a hydraulic extension system “kick” as you’ve come to expect at the end of the gear cycle?

- **Performance effect.** Once the gear is down, does the airplane behave properly? Do the vertical speed, airspeed and power setting all agree with the gear-down norm?
- **Gear indicators.** Only *after* you've confirmed the gear **sounds right, feels right and performs correctly**, look at the gear indicator lights and/or mechanical position indicator to confirm the gear is fully down. If you have a gear mirror take a look to see what you can of the gear position. If you're able to see one or more gear legs directly from the cabin, take a visual look as a final confirmation. Ask a right-seat passenger if he/she “sees a wheel” out that side of the airplane.

**A good technique** to ensure you remember the last, cockpit/visual indications check, consider holding onto the landing gear switch until you complete the landing gear verification.

**Use every indication** to confirm the gear is fully and completely down before landing. Make it a firm habit to double-check gear position on short final, while there's still plenty of time to go around if you've gotten the landing gear or there is any mechanical anomaly.

**If you've completely messed up** and fail to detect a gear-up condition before the airplane makes ground contact, pull the power and land “WUS”--wings level, under control at the slowest safe speed.

Verify extension:
➤ Sound
➤ Feel
➤ Performance effect
➤ Indicators

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## **Debrief:** Readers write about recent *FLYING LESSONS*:

Reader David Heberling hurls a little (perhaps justified) outrage my way, over a photo I used in last week's discussion on hydroplaning:

How could you!?? That image of the wheeled airplane skimming the surface of the water sends the wrong message. I had this same argument with *AOPA Pilot* magazine. That is a horribly unsafe and misguided maneuver for any pilot to perform. I do not care how good they are. Most of the time, it can be done successfully. Bad things happen when something goes wrong because there is absolutely no recovery. I know a pilot that used to do that in his Stearman. One day he took a passenger along with him and decided to show them this really cool maneuver. He nearly killed her when the airplane flipped upside down. He still has back problems to this day. The airplane was a total loss. Why do prestigious magazines and well known pilots (particularly those who push safety) insist on using an image that depicts a stunt that can kill pilots that try to mimic it? Do you consider it safe? Do you condone it? I think it dents your credibility when you talk all about managing risk, then show a stunt that is risky as hell that cannot be managed at all. Call me incredulous.

Point taken, David. I had specifically included that image because of the ludicrousness of an airplane seemingly supported on a film of water...without explaining myself in a caption to that effect. I share your concern about anyone attempting the maneuver (including the formation team of South African T-6 pilots). I appreciate you serving as not only my conscience, but also that of all *FLYING LESSONS* readers on this issue. Thanks!

Not wanting to lose the message in a side discussion of its presentation, here's a comment from reader Woodie Diamond, also about last week's *LESSONS* on hydroplaning, and my observation that this may have been a factor in three runway excursions on a single wet day at Oshkosh (an F-16, a FJ-4 Fury and a Beech Bonanza). Woodie writes:

Like everyone else, [I] have listened to speculation about each individual incident at Oshkosh. No one combined the incidents and common culprit [except *FLYING LESSONS*]. I would never have thought about hydroplaning. That's why you make the big bucks [lol—ed.]. Thanks for keeping the rest of us honest and ultimately better pilots!

You're welcome, Woodie. It's only a theory...one event is a fluke, two is a coincidence, but three is a trend. Whether hydroplaning was a factor in any or all of these incidents at all, they nevertheless serve as a reminder to consider the hazard of hydroplaning any time you're landing on a wet runway. Thanks!

David Heberling has more good points about recent editions of *FLYING LESSONS*:

Stalls on takeoff or initial climb: I took my airplane out and tried this drill. At 3000 feet AGL, I slowed the airplane down with the gear up and no flaps. When I reached take off speed, I added full power and raised the nose to the standard 10 degrees nose up. The airplane climbed nicely at 10 degrees nose up. I then raised it more. The nose got so high, I had to look out to the side to see the horizon. I swear the nose was at least 20 degrees nose up before the airplane started to stall. To me it felt more like 30 degrees. After the break, I only had to reduce the angle of attack to get flying again as I already had wide open throttle. I had to work to make that airplane stall. Granted, I am in the forward part of the weight and balance envelope flying by myself. If the C.G. is near or at the aft limit, the nose becomes much lighter and takes much less pull to get to a high angle of attack. I think this is what surprises people, the change in flying characteristics for the same airplane at different weights and C.G locations.

I think you're right too, David. The way we teach and practice power-on stalls does little to prepare us for the situations that "get" pilots (and their passengers). David continues:

Engine failure after take off. On the same flight I established a full power climb at 85 KTS. I then pulled the power to idle. At the same time I shoved the nose below the horizon. Oops! Too much pitch down and the speed is increasing. Again, with a forward C.G. it is easy to over control the push to emergency landing speed. So, I tried it again, this time aiming the nose to a point closer to the horizon. It worked out much better that time with the speed hardly budging from 85 KTS. So it does help to practice this maneuver (like so many others).

Yes, if the engine quits during initial climb (including takeoff, go-around/balked landing and missed approach) you need to pitch down *aggressively*, but you need to aim for a specific pitch target...which will vary by airplane type and, as you said, requires practice to make perfect.

Back to reader Woodie Diamond, who discusses a recurring theme in recent *FLYING LESSONS* reports. Woodie, who flies a Beech Travel Air twin, offers some excellent criteria for self-evaluation when considering whether to attempt a maneuver. He writes:

Perhaps I am the exception, but I get the same 6-year-old little boy thrill out of flying my airplane straight-and-level at 5000 feet as I do at 500 feet. Having said that, after a recent ride with a friend who is in the process of getting back into flying and using my Travel Air to do it, I offer the following:

1. **Are my passengers comfortable with the maneuver?** You may well routinely fly a close pattern to the runway, followed by a sharp steep diving bank to short final. But are the others in your aircraft going to find this enjoyable? No one is ever impressed with their pilots' flying skills while lying in a hospital bed!
2. **I've done this a thousand times.** This is the same as saying you always find your car keys "...the last place I look." If you found them the first place you look, why would you keep looking? It is not the thousand times you've performed a maneuver in the past that is important, it's the next time you intend to do it. Generally, no two maneuvers are ever the same; different aircraft, different load, different wind, different temperature, different airport, etc. Change one or more of those, and what you have done "a thousand times" now becomes very dangerous if not deadly maneuver. Because you have done something routinely, you will be more apt to not be able to recognize and react when the maneuver does not develop as it always has.

3. **Is this really necessary?** On a return flight from a recent fly-in, I observed a Bonanza A36 flying along at a very low altitude. The aircraft was so low that we could see him pull up some when the terrain changed to trees, and then dive back down when it flattened out; pull up a little when a house got in the way, and then descend in its back yard. I could see from my position that there was movement in the rear windows of the aircraft, so I am assuming there were passengers in the airplane with the pilot. As I sat and watched the Bonanza fly along, the one word question that I had was “Why?”

Why indeed? Excellent question, Woodie, and a great set of decision-making aids. Thank you.

Comments? Questions? Tell us what you think at [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net).

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## Automation fixation

This month's issue of [Callback](#) looks at several NASA Aviation Safety Reporting System (ASRS) reports in which flight crews were so “autoflight complacent” that they were unaware of significant track or altitude deviations until alerted by Air Traffic Control.

See [http://asrs.arc.nasa.gov/publications/callback/cb\\_379.html](http://asrs.arc.nasa.gov/publications/callback/cb_379.html)

## Flying biathlon

Outspoken flight instructor Bob Miller and I share a similar outlook on risk evaluation for pilots, especially single-pilot operators who do not fly full-time as their primary employment. In fact, with my permission Bob has adopted *FLYING LESSONS'* tag line, “***Flying has risks. Choose Wisely,***” for his monthly Over the Airwaves e-newsletter as well.

In his [August 2011 issue](#) Bob likens the challenge to make meaningful improvement in the fatal general aviation mishap rate to great gains achieved in two other “personal freedom” sports: firearms (especially handguns) and downhill skiing. Two short excerpts:

“...airplanes are like firearms - if not handled properly, they kill. In other words, if we treated our airplanes like loaded weapons, our fatal accident rate would tumble.... Many of us were introduced to the 'romance' of aviation without ever being instilled with the responsibilities associated with it.”

“...frequent skiing injuries were standing in the way of the growth of the sport. Rather than telling people that skiing was safe when it wasn't, they addressed the injury problem straight on. Closely supervised ski schools were formed. Ski instructors were, and still are, subject to frequent training clinics and an ever-increasing series of proficiency ratings. The National Ski Patrol Association was created to train individuals to provide safety patrols on the ski slopes. Customers were informed of the hazards of skiing. Ski manufacturers got on board with better equipment. Skiers donned helmets. Guess what? The ski industry quickly soared....This, in turn, sensitized the skiing public to the need for quality initial and recurrent training.”

Taking Bob's skiing analogy further, skiers consciously created a complete culture change that not only made “safety” the norm, it also make it “okay” to chastise a fellow skier for “hot dogging” or violating the rules of the slope. That's precisely the sort of culture change we must create to significantly improve the general aviation fatal accident rate—a “flying biathlon” combining respect for the risks with active mitigation training, intervention on pilots who exhibit behaviors that put us all at risk, and marginalization of those who refuse to reform—strategies being championed by people like Bob Miller, coalitions like the [Pilot Training Reform](#) group led by the Society for Aviation and Flight Educators ([SAFE](#)) and of course Mastery Flight Training and *FLYING LESSONS Weekly*.

(Yes, I know the Olympic biathlon combines shooting *rifles* and *cross-country* skiing, not handguns and downhill skiing. But we're going for a memorable learning experience here, so please forgive the editorial license.)

It's well worth your time to [read Bob's complete August newsletter](#), and sign up for this valuable monthly resource. Bob, maybe you'll invite all your readers to [subscribe to FLYING LESSONS Weekly](#) as well!

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***Flying has risks. Choose wisely.***

Thomas P. Turner, M.S. Aviation Safety, MCFI  
2010 National FAA Safety Team Representative of the Year  
2008 FAA Central Region CFI of the Year

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