

FLYING LESSONS for January 7, 2010

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.

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

FLYING LESSONS is an independent product of MASTERY FLIGHT TRAINING, INC. www.mastery-flight.training.com

This week's lessons:

Fuel tanks require a vent source to provide positive pressure to permit fuel flow, and to prevent vacuum build-up that can cause a tank to collapse. It's easy to brush past preflight inspection of fuel vent, especially so for multiple vents or when the vent is part of an aftermarket modification "way out there on the wing."



Pilots may have the erroneous perception that fuel vents aren't that critical, or that the worst that'll happen with an auxiliary tank is that the fuel in that tank won't flow if the vent line clogs.

Bugs can block vent lines in a very short period, and obstructed fuel vents are an unappreciated but very real hazard of flying non ice-certified airplanes into icing conditions—"known ice" certification includes heated fuel vents. See my article "Top Three Icing Myths Busted" in the January 2010 [Aviation Safety](#).

See www.aviationsafetymagazine.com.

An instrument approach glidepath is designed to take the airplane to a touchdown zone 1000 feet or one-third of the total runway length from the landing threshold, whichever is less. Visual approach guidance is usually also set to take the arriving aircraft to this touchdown zone.

One of the real tricks to "going visual" at the end of an instrument approach is to remain on glidepath. Human factors research shows a great tendency in pilots to "dive for the runway" once they break out, and the fact the airplane is pointed not at the numbers but a touchdown zone some distance down the runway may make a pilot think he/she needs to steepen the descent to avoid overflying the runway, if landing at near-minimums visibility or ceiling.

When the weather's good (or bad), practice staying on glidepath all the way to touchdown, not just to the missed approach point.

Landing on an ice-covered runway may turn the best approach and smoothest touchdown into an uncontrolled departure from the runway. Usually the runway excursion occurs late in the landing roll (or slide), when flight controls lose effectiveness in low forward speed. Attempting to turn onto a taxiway at too great a speed is another frequent contributor to icy runway excursions, recently in everything from light sport aircraft to intercontinental business jets.

Braking action reports may help...but in their absence you need to consider the possibility of an ice-contaminated runway any time you land with temperatures are or below freezing.

- Expect a much longer ground roll that permits you to come to a stop with virtually no braking.
- Touch down at the slowest possible speed, in the touchdown zone or even a little closer to the threshold, assuming safe obstacle clearance on final approach.
- Touch down on centerline with the longitudinal axis of the aircraft precisely aligned with the runway.
- Don't try to turn off the runway until the airplane is taxiing very slowly.
- Be ready to power up and go around if you fail to meet your airspeed, glidepath and alignment goals on short final.
- Once you're on the runway, if you begin to lose directional control your best bet is to cut power to decelerate, and avoid braking—"the same response you should have when driving your car," according to Meredith Saini in this recent article in [FAA Aviation News](#). Use flight controls to steer as best as possible. More actions for operating on wintry or slick runways is in [FAA Advisory Circular 150/2250-30C](#).
- Icy runways and crosswinds don't mix. If there's a crosswind and the runway braking action is reported or reasonably expected to be poor or nil.

Terms used to describe braking action are in the *Aeronautical Information Manual*. [Chapter 4, sections 3-8 and -9](#) define Braking Action Reports, using terms "goo", "fair", "poor" and "nil", and Runway Friction Reports and Advisories, using instrumented Mu values.

See

www.faa.gov/news/aviation_news/2009/media/NovDec2009IceRink.pdf
www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/74199
www.faa.gov/air_traffic/publications/ATpubs/AIM/Chap4/aim0403.html

(Apologies to my many Southern Hemisphere readers suffering through mid-summer heat. Heavy and tropical rains may create braking action similar to ice, however, so with a little translation the *FLYING LESSON* applies to you as well.)

Questions? Comments? Email me at mastery.flight.training@cox.net

DEBRIEF: Readers comment on past *FLYING LESSONS*

Flight instructor, prolific aviation author and *FLYING LESSONS* reader LeRoy Cook writes about the on-going problem with gear-up landings:

To avoid a gear-up arrival, I always run a prelanding check on short final, in every kind of airplane. When the numbers are growing larger in the windshield, I say "gear down, props up, am I cleared to land?" You don't always make a downwind leg, but you always fly a final.

Thanks, LeRoy. That matches precisely one of the 10 tips for avoiding landing gear-related mishaps found on the Mastery Flight Training DVD [Those Who Won't: Avoiding Gear Up and Gear Collapse Mishaps](#).

See <https://secure5.webfirst.com/ABS/Store/#ThoseWhoWont>.

And aerobatics instructor Tony Johnstone writes:

Hi Tom. I would like to reinforce what I think is an excellent habit, the GUMPS check. I teach my students to do this on EVERY downwind, even in a C150 or Decathlon. It may seem redundant in a fixed-gear airplane but the habit will translate to anything they may fly later. The other mnemonic I use is the old WWII

Royal Air Force TMPFFGG I learned from my dad: Trim, Mixture, Pitch, Fuel, Flaps, Gills [cowl flaps], and Gyros before every takeoff. It works for pretty much any piston airplane and is handy if you happen to be flying something unfamiliar (it doesn't replace any other checklists, but it is good from a practical standpoint).

Major Amnon Shmueli commands the Israeli Air Force's Beech Bonanza Training Center, which uses late-model A36 Bonanzas for instruction, light transport and liaison roles. Amnon writes about recent *FLYING LESSONS* concerning fuel management:

Fuel check during flight is important, but we teach to change [the] fuel tank only when it is needed. From the way we see it: After start as POH dictates, in short flights (up to 40 minutes) there is no need [to change tanks], in long flights (about 3 hours) change after every half tank is used. Most our flights are short, and the airplane will be refueled always at destination. In addition, we use the Garmin scheduler to announce "Fuel" every 30 minutes – a very good way to remember to switch tanks.

Thanks, Amnon. I always enjoy hearing how a military organization applies procedures to what are usually personal-aviation aircraft. The good major continues with a synopsis of recent *FLYING LESSONS*:

I decided to put up few points which I hope you will find useful, concerning the information from the weekly *FLYING LESSONS* since September 10:

1. I find the information and tips from your *FLYING LESSONS* very useful and I use it when training our pilots, either on the air or in ground school.
2. We also practice max takeoff weight with aft center of gravity at landing and takeoff. I think it is good idea to exercise stalls recoveries techniques [in this condition]. Remember: our A36s' max takeoff weight was raised to 3850 lb [from the original 3650 lbs under U.S. certification]
3. Fuel problems: we recommend that when you suspect a fuel gage, fly without the autopilot and see if there is an imbalance between the wings, since a leak is not always visible.
4. About cockpit technology surprises: I couldn't agree more!
5. From the October 8 *LESSONS*: We also teach and emphasize [for engine failure] in our single-engine airplanes: first fly the airplane while getting potential [energy, by way of increasing altitude], and just after that begin troubleshooting as workload permits. When an engine runs rough we also teach: mixture to full, switch tanks, wait few seconds (give the engine time to recover if that was the problem) and only then switch on the auxiliary fuel pump.
6. From the October 1 Question of the Week (what we learn from near accidents as result of GPS or other navigation system programming):
 - a. Fly with autopilot [if you have one], and use flight director modes correctly.
 - b. Don't hesitate - go around! (if needed)
 - c. "The long way is the short way" meaning that short cuts in procedures or pressing buttons in the wrong order might get you bad. (Typical mistake: pilots press the APP while in GPS mode before switching to VLOC...and can't find the Glideslope.)
 - d. Prepare your route, nav data and radio on the ground, and do as little programming as possible in the air.
 - e. We got the "right way to shoot an ILS" as part of the checklist in the cockpit.

Thanks again! I'm glad I've been able to positive affect your operation in a small way. Amnon finishes with a question I'll use as this week's Question of the Week, below.

Type-Specific Training Really Works

***FLYING Magazine* editor J. Mac McClellan's** editorial in the February 2010 issue shows that type-specific training indeed does work to dramatically reduce accidents. Mac cites the

experience of Mitsubishi MU-2 pilots, who after a series of deadly accidents were required under a Special Federal Air Regulation (S-FAR) to complete a “very thorough” training syllabus to act as pilot-in-command of the type. The S-FAR training specifies “exactly what a pilot must be taught, how much time [must] be spent on the training and what maneuvers must be successfully demonstrated on the check ride” and required recurrent training.

Implementation of this S-FAR made a dramatic difference in MU-2 mishaps, McClellan writes. In the 30 months prior to introduction of the new training standard there were 14 MU-2 crashes, 10 of which were fatal, cites McClellan. In three years since implementation there have been only two MU-2 crashes, and no one was killed.

Mac concludes “the accident rate in light airplanes could be cut if we [are] willing to demand a level of training and checking that goes far beyond normal [FAA] requirements.” The insurance industry, on the line for potentially millions of dollars when things go horribly wrong, has known it for years. McClellan understands we have to balance cost and benefit when discussing training requirements. “But if the accident rate becomes unacceptable, as it did with the MU-2,” he notes, “we have conclusive evidence that there is a solution.”

At the other end of the spectrum, Avemco Insurance had a similar experience with Special-Light Sport Aircraft (S-LSAs). In a roughly two year-old study Avemco president (and *FLYING LESSONS* reader) Jim Lauerman writes, “loss severity [the cost of an average claim] for S-LSAs was about 50% greater than for [the company’s] average risk.... A deeper analysis shows that the issues...are not that different from any new aircraft type....” Some of the hazard comes from design issues with individual aircraft types, Lauerman notes, but another significant factor is that pilots “continue to underestimate the quantity and quality of transition training necessary to go from current general aviation (GA) aircraft into the S-LSAs.” A year later, at Sun-n-Fun 2009, Avemco announced a significant improvement in S-LSA accident history credited in large part to the company’s requirement for a five-hour checkout in make and model of S-LSA regardless of the pilot’s experience prior to transition.

As I was once told by a senior FAA official on an unrelated topic, “FAA depends on general aviation to come up with ways of addressing problems. If you don’t, FAA will come up with something for you. And you probably won’t be happy with the result.” Consider requiring more of yourself as you map out a personal training strategy for 2010 and beyond.

See:

www.flyingmag.com

www.avemco.com/PDFs/ART0015.pdf

Quiz yourself for safety

AOPA’s online Safety Quiz series is a quick, informative way to keep your aviating brain sharp. The series has been around a while but recently received renewed visibility when AOPA Insurance Agency, Inc. added its name to the list of Safety Quiz sponsors that includes Sporty’s Pilot Shop and others who donate to AOPA ASF. Check out the [AOPA ASF Safety Quiz](#).

See www.aopa.org/asf/asfquiz/prevquizzes.cfm.

Fly safe, and have fun!

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



FLYING LESSONS is ©2009 Mastery Flight Training, Inc. Copyright holder provides permission for *FLYING LESSONS* to be posted on FAASafety.gov. For more information see www.mastery-flight-training.com, or contact mastery.flight.training@cox.net or your FAAsteam representative.