

FLYING LESSONS for November 26, 2008

Suggested by this week's aircraft mishap reports

FLYING LESSONS uses the past week's mishap reports as the jumping-off point 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.

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This week's lessons:

Happy Thanksgiving! *FLYING LESSONS* comes a day early this week so I can travel with my family, and so readers like you can quickly review some concepts of safety before you make that flight to Grandmother's house (or wherever) for the holiday.

As you fly over the river and over the woods remember your most challenging go/no-go decision will likely be on the way **home**. It's relatively easy to make alternate plans or even cancel when weather, airworthiness or pilot issues arise before you leave home. It takes far greater discipline to start home a day early, or a day or two late, to divert, or to postpone the return flight indefinitely in favor of an airliner or rental car home, if the reason for delay affects the *return* trip.

There's a reason we all know the term "**get-home-itis**"—Don't forget an extra day away from work or school, or another way home altogether, is an available and frequently exercised option...especially when traveling in such a weather-challenging time of the year.

More FLYING LESSONS

For all their redundancies there are several single-point failures that can affect multiengine airplanes. Flight instruments could be affected by:

- Failure of the attitude gyro itself
- Failed [stuck open] check valves in the pneumatic manifold, where instrument air from both engine-driven pumps enters and combines in the cabin, combined with a previously undetected failure of a single instrument air pump (vacuum or pressure)
- Failure of a regulator many multiengine airplanes have between the pneumatic manifold and the panel instruments
- Significant leaks anywhere in the instrument air lines

Any of these situations can take a redundant twin's system and render it unusable with little warning.

There are documented cases where a professional pilot identified a failed attitude indicator but lost control despite a back-up attitude indicator installed on the "copilot" side of the airplane. It takes significant practice to include such a remotely-mounted indicator in your scan. If you have any say in the matter, install back-up instruments where they'll be in your primary field of vision in partial-panel flight.

It's common for corporate or contract pilots who fly turbine airplanes to also perform "pilot service" or fly their own "heavy singles" or piston twins, with the invalid assumption that recurrent training in, say, a King Air or a Citation provides all the relevant practice necessary to safely operate a "little" airplane like a Baron or 300-series Cessna. In fact many of my students who fly turbine aircraft in addition to the Baron in which I've provided training tell me single pilot operation of a piston twin is far more challenging. The airplane has complex systems with virtually no automation; available performance is almost nonexistent with many types of failure; and many redundancies taken for granted in larger airplanes are nonexistent or only available under certain circumstances in piston twins.

A tenet of training is "fly the plane you're flying", i.e., train and practice *type-specific* operation, because not everything applicable to flying one type of aircraft is appropriate in another. I train to the extent safety and realism allows, but I highly recommend my students seek out a good simulator-based program to cover items that cannot be done safely (or at all) in the airplane. These tasks include complex decision-making scenarios, engine failures in all phases of flight, and insidious development of partial panel conditions while under a high pilot workload. You simply cannot adequately prepare for such events even with thousands of hours in the airplane.

Landing gear-related mishaps (LGRMs) continue to account for as many as half of all reported accidents in general aviation airplanes. The record ranges across the board—light retractables to personal traveling airplanes to training twins to professionally flown corporate aircraft to military airplanes. Here's the record from just the last two weeks:

No.	Type	Gear Up	Gear Collapse	Known Mnx
1	Cozy		1	
2	PA28	1		
3	Be35	1		
4	FJ-4B Fury	1		
5	Be35		1	
6	PA44		1	
7	Saberliner		1	
8	DHC-8			1
9	M20	1		
10	C114A	1		
11	AC500		1	
12	Be60	1		
13	C172RG	1		
14	Be36	1		
15	C210	1		
16	Aerostar	1		
17	PA44		1	
18	C310			1
19	C210	1		
20	Glasair		1	
21	Be24	1		
22	Be36		1	
Totals		12	8	2

Reported LGRMs, November 12 – 25, 2008 (FAA preliminary reports)

A *gear up* landing is when the landing gear was not down on touchdown—the classic “oops, I forgot.” A *gear collapse* is when the gear was down but did not remain down for whatever reason, on landing, takeoff or taxi. A *known maintenance* report is one where it was obvious the crew knew about the situation before landing and had apparently exhausted efforts to correct the issue before committing to arrival.

For some time Mastery Flight Training tracked LGRMs in certificated, piston-powered airplanes to identify trends and (hopefully) reduce the number of LGRMs. Estimates of insured losses are consistently **above USD\$1 million every month** as a result of LGRMs. Review the [data](#) on LGRMs and some [observations](#) on how to address the threat.

See:

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

Since the November 6th FLYING LESSONS, which focused on midair collision avoidance, we’ve had two additional mid-air collisions involving light general aviation aircraft. It’s worth another look at “[See and Avoid: Techniques, Time and Technology](#)” from the Mastery Flight Training archives.

See www.thomaspturner.net/2008.1106%20FLYING%20LESSONS.pdf

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

Debrief: reader comments on past FLYING LESSONS reports

Dave Dewhirst is a highly experienced flight instructor whose [Sabris Aviation](#) provides aircraft buying assistance, checkout training and management services throughout the U.S. Writing about the ever-present threat of gear-up landings Dave notes:

It is pretty hard to put an airplane on a runway without reducing the power to a point below the gear horn activation point, unless the pilot just dives the airplane to a touchdown. The gear horn should work, but the pilot might not hear it until just before touchdown.

Airplanes that are difficult to slow down will usually cause the pilot to reduce the throttles below the gear horn activation point. I have been in one Baron and one Mooney where the owners of those airplanes had a mechanic reduce the gear horn activation set point to a very low position to avoid hearing the gear horn when the throttles were reduced for descent. In both those airplanes it was possible to demonstrate that the airplane could be slowed to a landing speed with the gear up and the horn silent.

During training I usually try to make the gear horn activate and then make the stall warning horn activate. The pilot needs to hear the difference in the sounds so he will not mistake one for the other. The [Garmin] G1000 systems are a step ahead with a voice saying /gear /or/stall.

Several readers commented in last week’s *FLYING LESSONS* about directional control on the runway. George Boney writes with this advice:

Great articles. On Directional Control, sometime it is helpful to take a glider ride with an experienced instructor. The control effects are exaggerated in a glider and things happen slowly, giving the pilot time to notice what is happening. This effect even applies when stalling, the ailerons stop working and you can pick up the left, then the right wing just with the rudder.

Tony Johnstone, a very active aerobatics and tailwheel instructor at Arkansas City, KS, adds:

Good points raised here. I believe most LOC [loss of control] accidents are preventable with better piloting skills, and maintaining proficiency. How many GA pilots actually go out and practice [cross]wind landings? Not many. I do a lot of tailwheel instruction, frequently in gusty Kansas winds of 15-20 knots. A couple of issues that I see commonly are failure to establish a slip into the wind on final, and not using the ailerons through the landing rollout.

It makes no sense to me to crab down final, then try to transition to a slip coming over the numbers when you are about as busy as at any time in the flight. You can compensate for almost any amount of crosswind in a crab BUT YOU CAN'T LAND!! If the slip is established well out on final, with the airplane aligned with the centerline of the runway, you will know if you can make the landing safely. If you can't maintain it down the middle of the runway, go somewhere else! Once the airplane is lined up and stable in the slip, all you have to do is worry about the flare and touchdown.

Once the airplane is on the ground, keeping the stick or wheel fully deflected into the wind all the way to a stop will make directional control much easier. It's rarely a good idea to jump all over the brakes, particularly in a taildragger. Keep the stick back and concentrate on maintaining directional control with your feet.

I do feel that tailwheel airplanes get a bad rap in terms of crosswind landing abilities. In a taildragger, you have an option not available to the tricycle pilot, the wheel landing. Flying the airplane onto the runway with a little power on, if done properly, gives much better control than surrendering to the elements in a full-stall touchdown on the mains in the nosewheel airplane. Trying to fly the tricycle onto the runway at higher-than-normal speed may result in a wheelbarrow and loss of control. Again, regular practice is key to proficiency. And, USE THE AILERONS!!

Thanks as always, readers, for your insightful contributions to the discussion.

More on Ice

Last week *FLYING LESSONS* noted the FAA's [General Aviation Safety Challenges](#) newsletter, focusing on the threat of airframe ice. Quick on its heels this week was AOPA Air Safety Foundation's release of [Weatherwise: Precipitation and Icing](#), an informative lesson on ice formation, its prediction, and aircraft performance effects. Using computer animation of an ice-related NTSB event, in-flight video of precipitation and ice accumulation, and the Air Safety Foundation's unique style of features-laden, interactive learning, *Weatherwise: Precipitation and Icing* is a valuable refresher as we face another icing season in the Northern Hemisphere. My favorite quote from the program: "Experience is no substitute for sound decision-making, especially when precipitation and ice are concerned."

See:

www.faasafety.gov/files/notices/2008/Nov/GAIcing.pdf
http://flash.aopa.org/asf/wxwise_precip/

Turbo Talk transcript

Thanks to all who participated in Mastery Flight Training's presentation, "Turbo Troubles," the inaugural Turbo Talk bimonthly turbo owners teleconference. If you missed it, or if you'd like to review:

- Download an [audio recording](#) of "Turbo Troubles".

- Download the [presentation PowerPoint diagrams](#) to follow along during the audio.

See:

http://bonanza.org/documents/Turbo_Troubles.mp3

http://bonanza.org/documents/Turbocharger_Simplified.ppt

www.bonanzapilots.com

Fly safe, and have fun!

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



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