FLYING LESSONS for December 17, 2009

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.

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This week's lessons:

It's amazing how many fuel-related engine failures occur within sight of the planned destination airport. Whether fuel starvation (fuel is available on board but an empty tank is selected) or fuel exhaustion (running completely out of fuel), it seems doubly tragic when the pilot *almost* made it to the airport.

Fuel tank selection sometimes leads to engine stoppage close to the ground. If the pilot doesn't switch tanks correctly or in a timely manner in cruise flight, it's almost always possible to get the engine restarted in plenty of time to avoid tragedy. But if the same tank-switch-gone-wrong happens close to the ground, especially in the airport traffic pattern, there simply may not be enough time to correct the error before the airplane descends into an obstacle or ends up on the proverbial "under the downwind leg" road.

The classic GUMP check taught to pilots transitioning into retractable-gear airplanes starts with "G" for Gas. Many are taught to switch to the fullest main fuel tank in response to the "G". Trouble is, if the GUMP check takes place on the downwind leg (where most instructors teach it to be performed), it prompts the pilot to switch tanks at this historically unrecoverable time. The Gas check on GUMP should be a *verification* of the fuel selection, but not the action of switching tanks at that time. Frankly, if the fuel selector is on a tank that cannot support landing and go-around if needed at that point the pilot has terribly mis-managed his or her arrival.

Final tank selection, then, should occur well before the traffic pattern. I suggest "Fuel selector—position for landing" should take place at "top of descent" (TOD), or just before beginning let-down from cruising altitude. At this point you should choose the main fuel tank that has sufficient gas for descent, approach/pattern, and missed approach/go-around and initial climb if needed. Yes, it takes some fuel planning to arrive at TOD with enough fuel in a single tank to meet this requirement, but that's part of your job as pilot-in-command.

If it's impossible in the airplane you're flying to select a single tank with the necessary fuel from TOD to missed approach climbout, then I submit you're trying to get more range out of your airplane than is possible under the conditions you've chosen. Reduce power in cruise, alter your mixture leaning technique, fly at a more efficient altitude and/or airspeed, and/or re-plan your trip to fly shorter distances between fuelings.

Fly the airplane within the capabilities of its design, and the options its systems provide. Don't try to force the airplane to perform like the airplane you *wish* it to be.

Landing gear collapse is one of the most common mishaps, accounting for as much as a third of all reported accidents in retractable-gear airplanes. Techniques for avoiding gear collapse include:

- Delaying all airplane reconfiguration (retracting flaps, adjusting cowl flaps, re-setting trim, etc.) until the landing roll is complete, and preferably until the airplane is brought to a momentary stop after exiting the runway.
- Avoiding touch-and-go landings. Many pilot-induced gear retractions, either on takeoff or on landing, happen during the harried "hands-flying" phase of reconfiguring the airplane during the brief on-runway portion of a touch-and-go. Full stops with a taxi-back not only provide more time for airplane reconfiguration, in instruction they also facilitate a thorough debrief of the previous landing and pre-brief for the coming takeoff, enhancing the value of time spent in dual instruction.
- Strictly following manufacturer and owners-group advice for maintaining landing gear. Aircraft fatigue is a function of cycles and exposures. Every flight introduces more cycles that add to overall fatigue. Left unchecked everything will break eventually; take advantage of the collective wisdom of manufacturers, overhaulers and owners to address landing gear problems early, before a minor rig check or adjustment turns into an airplane slammed into pavement when a gear system fails.

Not flying an RG airplane? Consider adopting the same techniques. They will help you keep your head outside during takeoff and landing, to better maintain directional control and detect others to avoid runway incursion mishaps. They will promote a less-hurried, more complete aircraft reconfiguration to ensure the next takeoff is safer. And they'll better prepare you for the day you might transition into a retractable-gear airplane, making you much less susceptible to the "gotchas" that lurk in the first hours of time-in-type regardless of the landing gear configuration.

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

THOSE WHO WON'T ™:
Avoiding Landing Gear-Related Mishaps (LGRMs)

You know you've heard it: there are those who have, and those who *will* have a gear up landing. Become one of **Those Who Won't** with this DVD detailing 10 tips for avoiding landing gear-related mishaps. By Master CFI Thomas P. Turner, the 15-minute DVD is the result of over six years of studying why pilots make landing-gear mistakes. Great for airport, flying club and FAASTeam safety meetings. $25 plus shipping and handling online.

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

Thanks to everyone who attended the *FLYING LESSONS* presentation hosted by U.S. Aviation Group (the former Aircraft Precision Maintenance, Inc.) December 12th at Denton, Texas! We're already making plans to bring a new program to Denton next year. Fly safe, y'all.

Watch for additional *FLYING LESSONS* events in 2010. Contact mastery.flight.training@cox.net if you'd like to arrange a presentation at your conference, FBO, safety meeting or flying club.

DEBRIEF: Readers comment on past *FLYING LESSONS*

Writing about landing with an inoperative airspeed indicator, reader Tom Rosen writes:

> As usual, great stuff. Why didn't you mention the value of a GPS ground speed in an inop[erative] airspeed indicator situation?

Thanks for the reminder, Tom. Good idea, as long as the wind speed is not great enough to make a significant difference between airspeed and groundspeed. Since wind speed often doubles between the surface and about 1500 AGL, and it also varies 15 to 30 degrees in that same altitude band, GPS groundspeed does not provide a reliable trend instrument with changes in altitude. Best results come, as *FLYING LESSONS* described, from flying known airplane configurations, power setting and pitch attitudes, with GPS as a backup if possible.

QUESTION OF THE WEEK

December's Question of the Week #2

What's the worst weather you ever flew in? What did you learn from the experience?

Win your choice of a Mastery Flight Training hat or the instructional DVD *Those Who Won't: Avoiding Gear Up and Gear Collapse Mishaps.* **Answer this Question of the Week to be included in the random drawing for December. Copy and paste the question with your response to MFTsurvey@cox.net…then come back to read the rest of** *FLYING LESSONS.*

December's question of the week #1 was: *Do you have a favorite proficiency training maneuver? What is it, and why do you think it's valuable practice?* Here are some responses:

- I really like and use the precise 360°/720° [turn] Left & Right at altitude … 8,000 to 10,000 AGL. Precise means within 100 feet of initial altitude, within 10 knots of the initial airspeed and within 10 degrees of the specific roll out heading. This takes some procedural discipline and is really enhanced by an IFR scan ability.
- For the [Flight Review], I also like and use the turn about a point. If they do well, we can shift to 'Pylon 8's…a bit of a stretch for some but not many, especially with [a good instructor] in the right seat.
- A precise 60-degree bank 360° or 720° turn is no "GIMME"!
- The Chandelle is fun. It's also a useful blind canyon escape maneuver in mountain flying.
- An 'emergency descent' from 8,000 feet according to the POH.
- Vx climb-out. It is tending towards 'rare' in practice and actual use!
- A 180 [degree turn] back to the field is frowned upon … except by my charges. We do 6 to 8 of these, properly, in the usual Flight Review. [It's] just another pitch controlled, airspeed maneuver.
- The IPC gut issues are 1) Flight With Primary Flight Instruments and 2) an RNAV/GPS [LNAV] IAP with PFD and MFD INOP in an [Avidyne] Entegra (EFIS) SR-22 [Cirrus]. Very few pilots understand how we can still "autopilot our way to MDA."
- We need to be set up for the STAR and IAP at TOD [Top of Descent, or just before leaving cruise altitude]. My flight deck prides itself (a bit of a game) to accomplish this. Push the "Activate The Approach". Next push the autopilot disconnect!
- We need to really help ATC provide us what we want … not just [be] pawns in the game!
- The biggest word in the cockpit at times is "UNABLE!"
- ATC still struggles a little with us RNAV GPS folks. They are still VLOC guys!

Thanks, readers. What do you think? Let us know at mastery.flight.training@cox.net.

Fly safe, and have fun!

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