

FLYING LESSONS for July 19, 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.

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:

According to local news reports, the pilot reported his aircraft was "leaking fuel" before the engine quit. Fuel was siphoning from the tank in use; the tank ran dry and the engine quit at about 3000 feet AGL, but the pilot said he "didn't have time" to attempt to restart the engine. The other wing's main tank was later found to be nearly full of fuel.

Despite the probability the engine would have immediately restarted had the pilot switched fuel tanks (the first step on the Engine Restart procedure), at least he did a masterful job of dead-sticking it onto an unopened segment of new highway. A mechanic replaced the fuel cap's O-ring and the cap no longer permitted fuel to vent overboard in flight.

This is a superb example of the need for regular, type-specific, *quality* training, to ensure you know what to do in the event of an abnormal or emergency situation. Was your last Flight Review comprehensive and designed to rebuild the muscle memory of emergency procedures?

Or was it like so many required reviews seem to be—an Instrument Proficiency Check in lieu of a basic Flight Review, or a brief review of some of the basics without clear identification of your lapsed expertise and sufficient practice to get you back up to standards?

I'm given the impression from the pilots I fly with, and the flight safety industry conferences I've presented to and participated in over the past few years (including FAA and NTSB at the highest levels), that a large part of the problem is that the training we *do* receive isn't the high-quality experience it needs to be to affect the accident rate.

When was the last time you practiced an engine failure in flight? If you have within the past few years, did your instructor emphasize aircraft control *and* actually running through the steps you can take to restart the engine *while* you still controlled the glide toward a landing zone? Or does your recurrent training emphasize the glide (if you practice engine failures at all) and gloss over or completely ignore the engine restart steps?

Given his successful performance at getting the airplane down on an unused section of interstate highway, perhaps the pilot in this week's incident that prompts this report had practiced the "aviate" portion of the Engine Failure in Flight procedure, but could have used more time on the Engine Restart checklist to develop the almost instinctive first restart step of switching the fuel selector to another main tanks. The pilot did a masterful job of the off-airport landing, for which he is commended...that's the main goal. But he almost certainly didn't need to land off-airport at all, if only he'd moved the fuel selector..

I had a somewhat similar incident occur in a Baron 58TC about a decade ago. I flew from near Chattanooga, Tennessee to Nashville, about a 45-minute flight, to pick up a passenger for a roughly 1.2 hours flight from there. It was a very cold morning, so instead of starting up, taxiing to the self-serve pump, and then doing a second still-very-cold engine start at my home airfield, I planned to have the airplane fueled for the remainder of my trip while waiting for my passenger.

I stopped in to the Nashville FBO often, and frequently fueled up there. The 58TC had long-range tanks but we almost never put fuel in the wet wingtip tanks. Per my usual prearranged signal, I flipped up the tops of the main tank fuel caps only, the sign to the line crew that I wanted fuel only in those tanks. I then went inside to watch the fueling from the nearby warmth of the FBO.

After a while the line desk person told me they were unable to start the fuel truck in the cold. I knew I had plenty of fuel for the next leg and could likely get fuel there or another nearby airport. I went out to the plane and closed up the left wing's tank, but then my passenger arrived, I stopped what I was doing to help him load his bags, and we climbed in. I cranked up, we taxied out, and soon we were climbing into the crisp blue skies of dawn. All was well--except I'd forgotten to re-secure the right wing's fuel cap.

To my extreme embarrassment my passenger, a low-time pilot, leaned up from the back cabin of the Baron and pointed out a small stream of fuel glistening on the right wing aft of the fuel cap. Meanwhile, the right fuel indicator showed that the main tank was completely full. As is common in Beech airplanes, suction through a venting fuel cap can pull the outboard fuel float up toward the top of the tank, resulting in an erroneous, higher-than-actual fuel indication.

I had to land--I had no idea how much fuel had vented, and no way to tell how long the fuel remaining would last at cruise-speed suction. I called Approach and asked for the visual approach to Smyrna, Tennessee, a sprawling, underused former military base just coming under the Baron's nose. I landed uneventfully, got out and visually confirmed plenty of fuel remaining in both tanks. I very carefully re-secured the tanks and completed the trip.

Many LESSONS from that flight stick with me to this day:

1. Don't loosen the fuel caps until the fueller or I is actually ready to insert the nozzle and begin fueling.
2. Double-check the security of all caps just before boarding the airplane.
3. Just prior to boarding the aircraft, bend down and check for any sign of fuel leaks or dripping from fuel vents, strainer valves or elsewhere on the underside of the airplane. I proactively added this step to my long-practiced "wheel chock check" just before boarding (bet you can figure how I learned *that LESSON!*)
4. As soon as possible after settling into climb, take a good look at each wing and check for any sign of fuel venting overboard. In low-wing airplanes you can usually see the fuel caps. Look for any "wet" appearance or diffuse spray behind the caps. In high-wing airplanes, look for "wetness" or droplets of fuel pooling on the trailing edge behind the fuel caps. In high-wing airplanes you can also see underwing fuel vents, so check them as well.
5. Although pilots tend to laugh off the supposed inaccuracy of cockpit fuel indicators, be highly suspect of any time a fuel gauge indicates more fuel than you think it should. Here's where a little type-specific training can help too: learning how your airplane's fuel system indicates in abnormal situations. In some scenarios, higher-than-expected fuel indication may actually indicate near-starvation fuel flows.

Fuel starvation (running out of gas in the selected tank, and not getting a restart on another tank before a forced landing) contributes to as much as a third of all engine failures (with fuel exhaustion, running completely out of gas, contributing that much or more to the record). Amend your Standard Operating Procedures to include checks for cap security and leaks before flight, and leaks or fuel venting regularly while airborne. Get a thorough, quality Flight Review and more

frequent training, to make engine restart procedures instinctive should your attempts as avoiding a fuel starvation engine stoppage prove unsuccessful.

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



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Debrief: Readers write about recent *FLYING LESSONS*:

The conversation continues to “mush” beneficially along. Reader Stephen Cote writes:

I am late to the party on the discussion of “mush”. You and I spoke at length about this at the Beech Aero Club dinner. I have experimented with mush in my Sundowner and gotten close to 1100 fpm descent. (I now know this is pretty stupid as the Musketeer line, in that configuration, is a leg spasm away from flipping onto its back in a spin!)

An instructor I see often maintains that mushing is perfectly safe and effective...”just like slips”. Having felt the uncertainty in the plane when halting a heavy mush, I don’t buy that a blanket statement.

I agree, Stephen. I don’t hear pilots talk about intentionally stalling on final approach to get into a tight strip, recovering just before touchdown, and I think it’s equally hazardous to routinely mush in with the hope you have the control authority to sharply reduce angle of attack and the power available to resist the descent. Slips are a completely different animal and much safer in the pattern, in my opinion.

Concerning loss of aircraft control in the vicinity of thunderstorms, reader William Wright chimes in:

Not sure I agree with statement that “the hazard of aircraft falling apart in flight results only if the aircraft exceeds VNE and ultimate flight loads.” I assumed these loads were one dimensional loads and did not take into account torsion/twisting forces which is what the thunderstorm would apply to the airframe, regardless of whether the aircraft was under control or no, i.e. updraft and roll at the same time.

Quite true, William. Several past *FLYING LESSONS* have reviewed the hazard of ‘rolling Gs,’ the vastly reduced load-carrying capability of most aircraft when G-loaded (i.e., “pulled”) and rapidly banked (“rolled,” but not necessarily a full, aerobatic roll) at the same time. A pilot trying to recover from a spiral descent improperly could easily overstress the airplane well below the Never Exceed Speed—one of the reasons the yellow-arc caution range exists on airspeed indicators of piston-powered airplanes. Thanks for the reminder.

Going to Oshkosh? Stop by the *air conditioned* FAA Safety Center for informative seminars all week. [Check out the full schedule](#)...including the Mastery Flight Training program “Strategies to Avoid Fatal General Aviation Accidents” at 2:30 pm on Saturday, July 28th. Not able to make it? The FAA Safety Center programs will be streamed live online through www.faasafety.gov so you may watch and learn anywhere. All programs are eligible for FAA WINGS credit. I hope to see you there!

See www.faasafety.gov/SPANS/event_details.aspx?eid=44968

NASA’s Aviation Safety Reporting System (ASRS) [Callback issue 390](#) again uses the popular “What Would You Have Done?” format in highlighting pilot decision making scenarios from real-world experience. Answer the question for yourself...in [ASRS Callback](#).

See:

http://asrs.arc.nasa.gov/docs/cb/cb_390.pdf

<http://asrs.arc.nasa.gov/publications/callback.html>

FLYING LESSONS is somewhat abbreviated this week as I pack to depart tomorrow for EAA AirVenture. Because of my duties at Oshkosh *FLYING LESSONS* will not be published next week unless something truly major requires our immediate attention (let's hope *that* doesn't happen.)

FLYING LESSONS will be back at full signal strength the first week of August.

Share safer skies. [Forward *FLYING LESSONS* to a friend.](#)

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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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