

# **FLYING LESSONS** for February 11, 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](mailto:mastery.flight.training@cox.net).**

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

**No matter what the aircraft**—Light Sport to light turbine—there are critical actions required just prior to taking off that, if not accomplished, can quickly spell disaster.

**Before Takeoff checklists** are the last defense against forgotten items. But sometimes there's a delay between completing the checklist and taking the runway. And it's the rare pilot that references a printed checklist between circuits when making multiple takeoffs with a brief stop on the runway or taxiing back to the takeoff position.

**To help in these cases** I use and teach a mnemonic FLATS as a "taking the runway" check before takeoff. Each letter of FLATS directs at least one and sometimes several actions. Customize this to the requirements of the airplane you're flying:

Fuel available and tank firmly selected (Note: Do not change tanks just before takeoff)

Elaps set

Cowl Elaps open

Lights as required

Door and window Latches secure

Avionics set (including transponder)

Trim set

Time recorded (for IFR and/or flight plan purposes)

Seat belts and shoulder harnesses secure

Switches as required (fuel pump, ice protection, external lights, etc.)

I use an abbreviated version of the same mnemonic when clear of the runway after landing, or during the ground pause on a stop-and-go:

Flaps up

Cowl Elaps open

Lights as required

Avionics to standby (including transponder)

Trim set (for the next takeoff)

Switches as required (fuel pump, ice protection, external lights, etc.)

**Fuel emergencies come in two types**—fuel exhaustion and fuel starvation. Fuel exhaustion means the airplane was flown beyond the range of the fuel on board—the airplane ran out of gas. Fuel starvation is more insidious; it's a condition where fuel is available somewhere on board the airplane, but for whatever reason it isn't getting to the engine.

**To avoid fuel starvation**, perform these checks before any flight when:

You intend to use multiple fuel tanks or (in twins) the crossfeed system.

You include auxiliary-tank fuel in your planning for alternates.

The airplane has been sitting outside in precipitation or freezing temperatures.

You make the first flight after aircraft maintenance, modification or inspections.

At least a month has passed since the last time you've done such checks at any other time you feel the checks are a good idea.

**Thoroughly check** all fuel tank vent lines for obstructions before flight. Be especially wary if outside temperatures have been at or below freezing (possible ice in the vent lines), or if insects are swarming near your airplane (possible obstruction by "mud dauber" nests or similar).

**Thoroughly "sump"** ALL fuel drains prior to flight. Remove ALL contamination. Inability to obtain a fuel sample from a drain is grounds for investigation -- it may indicate contaminated fuel tanks and/or the presence of ice crystals suspending in the fuel.

**Always visually inspect** fuel levels before assuming a tank is fueled.

**When switching fuel tanks** in flight, keep an eye on the fuel pressure, EGT or other reliable engine power gauges to ensure fuel flow and combustion continue. Don't let go of the fuel selector handle until the engine has run several, reliable seconds on the newly selected tank...and be spring-loaded to put it back where it was if switching tanks does cause a power interruption.

**Before approach or landing**, make your final fuel tank selection change when at least 1000 feet above terrain (higher over adverse terrain and/or in IMC). I personally like to make my final tank selection, if needed, just prior to descent from cruise. Use a tank that has sufficient fuel for the approach, missed approach/go-around, and climb to at least 1000 ft AGL (higher over adverse terrain and/or in IMC) without need for changing the tank selection. "GUMP" (for Gas, Undercarriage, Mixture, Prop) checks should NOT encourage switching fuel tanks at too low an altitude to recover if the engine stops.

**Use your checklists** for ALL phases of flight so you don't forget these checks, or attempt taking off with an improper tank selection.

**Know and follow** all handbook limitations for your fuel system, and practice the steps to restarting a failed engine in flight ... just in case.

What do you think? Let us know at [www.mastery-flight-training.com](http://www.mastery-flight-training.com).

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

Regarding last week's LESSONS on Light Sport and medical self-certification, a reader comments:

Tom -- as typical, an excellent newsletter this week. One point appreciated in particular was your attention to the LSA/Sport Pilot segment and dispelling some of the myths and misinformation floating around. As a guy who started in aviation flying hang gliders and ultralights before getting a license and an airplane, it still intrigues me how many pilots know so little about the lighter end -- unless it's a Champ or Cub or T-craft, etc.

One point that you might want to consider clarifying in your reader's question -- about the "large population of LSA pilots who 'grandfathered' into the world of pilot certificates" ...it's one of those myths that mystifies me. No pilots were "grandfathered" into a pilot certificate from ultralights or light-experimental. They either earned a certificate of some type, or they need to [earn a certificate] to fly LSAs.

As you noted, some pilots may opt to "grandfather" themselves into LSAs by opting out of renewing a medical certificate and flying under Sport Pilot privileges. But the FAA didn't grandfather any pilots who didn't earn either the Sport or Private [or higher] certificates.

I'm not really interested in being a named commenter; the clarification's all yours, if you care to use it at all. Thanks again for the great service you perform here, Tom.

Thanks, anonymous reader, for your input.

Reader Bob Reed found *FLYING LESSONS* for the first time with the February 4 edition, which includes discussion of "hand-propping" airplanes. Bob points us at this excellent video that details hand-propping safe operating practices. This video is one of many of a growing series at <http://aviationsafetyvideos.com>. Thanks, Bob!

Engine failure—aim for a road? Reader Justin Graff addresses this *FLYING LESSONS* topic:

Speaking from experience, I believe an open field is a better option in most cases. I had an engine failure due to loss of oil pressure five years ago. We have talked on the phone in years past about it. The bottom line is that how quickly you stop determines survivability, as you've discussed several times. After declaring an emergency and determining that the nearest airport was beyond my glide range, approach [controllers] recommended I find Highway 151. Knowing that this was a fairly busy two-lane highway, I advised them I would be landing on the cornfield below me. I was taught to first think of myself first and let the insurance company worry about the airplane.

With committing to a road landing, one has little options if a car happens to be at the wrong place at the wrong time. There are typically other obstacles like mailboxes, that one could strike leading to a loss of control.

I knew I would survive by landing in the corn field when the engine failed. I knew if I remained calm and stuck to procedure that we'd be fine. It is possible something could have gone very wrong with landing on a road and that's all it took to complete that split-second decision.

Thanks, Justin. "Training" is learning from the experience of others. Thanks for training us!

### **A little history**

From the "those who don't know about history are doomed to repeat it" file, "check" out this mishap report—and how very much it changed flying for us all, for the better.

<http://www.atchistory.org/History/checklst.htm> ]

***Fly safe, and have fun!***

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

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