

# **FLYING LESSONS** for August 5, 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).

*FLYING LESSONS* is an independent product of MASTERY FLIGHT TRAINING, INC. [www.mastery-flight.training.com](http://www.mastery-flight.training.com)

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

**Airspeed and glidepath control** are vital to a successful landing. If either is not managed to set the airplane down on the runway at a point where sufficient runway remains to stop, and at a speed where the airplane will not float excessively nor have excess energy that cannot be dissipated in time, then a go-around is not only advisable, it's mandatory.

**Runway alignment** is another crucial part of landing. All airplanes, from Light Sport to Light Jets, are susceptible to loss of directional control on landing. If you're not aligned with the centerline when you begin to flare you won't likely *get* in alignment before you touch down. If you crab into the wind on final approach you need to have the correct crab angle set before you flare, so you can judge when to "kick it out" (unless you're flying an Ercoupe, a B-52 or an airplane with a crosswind landing gear).

**Don't forget the risk of a stall** if you overshoot final and then try to reacquire alignment without good rudder coordination. In addition to the aerodynamic risks of uncoordinated flight at too low an airspeed, airspeed indicators often read inaccurately in a slip or a skid, and a nose- or wing-mounted angle of attack (AOA) indicator may not detect the asymmetric (and often higher) AOA of one wing compared to the other in uncoordinated flight. Stalls are not limited to low-time pilots in low-powered airplanes...again, Light Sport to Light Jets, exercise proper aircraft control.

**If the rudder's not centered**, treat airspeed indications and AOA displays skeptically. They may not provide warning of a rapid spin entry if one wing reaches its critical angle of attack before the other, but is not sensed by the stall warning or lift indicator.

**Configuration, airspeed, glidepath, alignment**...this should be your mantra on final approach. If all four aren't under control by the time you begin your flare, it's time to go around.

**Known airplane problems very rarely fix themselves.** In most cases what starts as a minor irritation or the need for preventive maintenance will, left unaddressed, become a much more dangerous (and costly) problem later on.

**Airplanes in general** do not lend themselves to deferred maintenance, not if you want them to be reliable transportation and to safely get you to destination any time the weather allows. Use great caution and consult with experts before deferring maintenance and repair, and do so only on the basis of good operating practice, not finances alone.

**Give each deferment one shot.** If you find yourself deferring the same item on successive annual or 100-hour inspections, you may be headed down the road toward

rationalizing an incrementally less and less ready-to-go airplane. Defer discretionary maintenance items to spread out the costs if you want, but not to eliminate the cost altogether.

Comments? Questions? Tell us what you think at [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net).

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

Reader Mike Dolan comments about loose fuel caps and ELTs:

I find your *FLYING LESSONS Weekly* giving good advice. Only on occasion do I see a comment I would question. The faulty fuel cap on a high wing airplane raised an eyebrow in this week's lesson. Fuel venting overboard due to a loose fuel cap was the cause of a fatal accident to some people in our Comanche Society. As for the high wing aircraft, perhaps while still on the ground a pilot could smell fuel or see it dripping off the back of a wing if they look for it. But in flight, I am doubtful that even if pilots did look at the back of a wing for liquid, any fuel would be visible. I fly a high wing airplane on occasion while giving dual instruction. Aside from checking fuel caps before takeoff, what can be done to recognize fuel loss during flight? You present a unique problem of fuel siphoning out, if a gas tank cap fails. It is especially a problem on airplanes with a fuel selector having a BOTH position.

Final comment; I dial through and occasionally listen to 121.5 MHz. It's interesting to hear how many statements are given. Mostly "This is the guard frequency." But sometimes ATC asking if an aircraft can hear them. If I hear an ELT, of course I report it.

Thanks, Mike. I've seen droplets of fuel form on the trailing edge of a high-wing airplane in flight when fuel was siphoning from the filler ports. I don't know if that would happen all the time or in all airplane types, but at least it's worth an occasional glance in case you're unlucky enough to have the problem but lucky enough to see the drops.

Speaking of ELTs, our conversation on SPOT locators and 406 MHz ELTs continues. Reader John Townsley provides a challenge:

I think it's time *Flying Lessons Weekly* moves beyond the opinion and actually does some hard research on some of the assertions you publish as fact regarding the efficacy of SPOT, 121.5 ELTs, PLBs, 406 ELTs, etc. I don't believe a "dialogue" that includes assertions of fact based on "research I can provide" is what we need for pilots and aircraft owners to make sound decisions. How about it? You've got the bully pulpit (the mailing list and the e-gram). Do the research and publish something of substance on this very important issue. To merely parrot comments that a 406 ELT has no better success rate during SAR operations than does the old 121.5 ELT without some darn good references is very unhelpful, and perhaps worse.

Thank you, John. My biggest limitation in creating *FLYING LESSONS* each week is time—I have a very demanding professional position, and it's sometimes a real challenge to get the report out at all. That said, I agree with you—I need to start providing guidance to definitive resources on some issues addressed by my readers. I'll endeavor to do that as much as possible, including information about success rates as a result of ELT activation. I'll start by challenging my readers—many of whom have obvious passion for this topic based on the number of comments I've received—to point me toward any published research on the success rates of various types of emergency locator transmitters. From there I'll investigate as much as my after-hours workload will allow. Thank you, John, for wanting to make *FLYING LESSONS* a better pilots' resource.

Mark Briggs shows some perspective:

Hi Tom: Wow! What a great discussion the Spot/406ELT topic has prompted! While we each may hold entrenched opinions, the real value of this discussion is best seen if we take a few steps back and look at the bigger messages which are being conveyed. If I may, I'll try to summarize them here:

1) BE PREPARED - it doesn't matter whether that preparation means having a real-time data link system installed in your airplane, or something as simple as a signal mirror in the seat back pocket, or having filed a flight plan - do whatever you can do in advance to stack the odds of survival in your favor

2) THERE IS NO HOLY GRAIL - ELT's fail. SPOT fails. Even sophisticated and expensive real-time data links fail. History has clearly shown that no single system is THE answer. The best way to be prepared for an emergency is to have multiple SAR alerting and locating services working for you. Start by filing a flight plan (and following it or amending it as needed to cover deviations), then make sure you have the basics for survival including a signaling device such as a mirror. Once you've got these basics looked after it helps to ensure your ELT is serviceable, and you can back that up with a SPOT or PLB. Always remember, even if you're going on a local flight, tell somebody where you're going and when you expect to be back. There's nothing worse than an airplane that's not even noticed missing until a week after its owner left on a casual local flight.

3) THE REGULATIONS MANDATE THE MINIMUM - while we get painted into a small corner by regulations telling us what we must carry on board our aircraft, it's wise to understand this is a minimum requirement. This discussion has really highlighted the fact that there are other means available to us to aid in Search and Rescue. Doesn't matter whether it's SPOT, a PLB, an APRS transmitter... The legislation that mandates what we must carry aboard our airplanes for SAR alerting is always going to be several years behind the cutting edge of technology. It's up to us to put pressure on the legislators to ensure they continue to keep an eye on and give due consideration to fresh technologies as they emerge. As Dave Higdon so succinctly put it, each successive wave of technology is merely an advancement over the previous imperfect technology. Let's do all we can to keep the rate of advancement of SAR technologies rolling ahead. The best way to do so is to focus on what Jim Herd mentioned - perfecting the CONCEPTS that show the most promise.

Thanks for providing this excellent forum in which ideas can be shared. It's wonderful to see so many people so openly talking about vital safety issues!

You're very welcome, Mark. And thank you for summarizing.

Reader Woodie Diamond writes:

Another great *Flying Lessons*!!! Recurring theme "Fuel" which seems to be a problem that just won't go away. I ain't no engineer, but my daddy told me that an engine won't run without gas...seems like he knew what he was talking about. You mentioned "fuel gauges"....how about being "Myth Busters" and answering this one: I was always told that aircraft fuel gauges are worthless, certified to read accurately at only one level: Empty. True or False?

FAR 23.1337 governs modern certification rules for fuel quantity indication. It states:

**§ 23.1337 Powerplant instruments installation.**

(b) *Fuel quantity indication.* There must be a means to indicate to the flightcrew members the quantity of usable fuel in each tank during flight. An indicator calibrated in appropriate units and clearly marked to indicate those units must be used. In addition:

- (1) Each fuel quantity indicator must be calibrated to read "zero" during level flight when the quantity of fuel remaining in the tank is equal to the unusable fuel supply determined under §23.959(a);
- (2) Each exposed sight gauge used as a fuel quantity indicator must be protected against damage;
- (3) Each sight gauge that forms a trap in which water can collect and freeze must have means to allow drainage on the ground;
- (4) There must be a means to indicate the amount of usable fuel in each tank when the airplane is on the ground (such as by a stick gauge);
- (5) Tanks with interconnected outlets and airspaces may be considered as one tank and need not have separate indicators; and
- (6) No fuel quantity indicator is required for an auxiliary tank that is used only to transfer fuel to other tanks if the relative size of the tank, the rate of fuel transfer, and operating instructions are adequate to—
  - (i) Guard against overflow; and
  - (ii) Give the flight crewmembers prompt warning if transfer is not proceeding as planned.

So the myth is busted. Fuel gauges must be able to indicate the amount of usable fuel available in flight, at least in main tanks under most circumstances. This applies to airplanes certificated under FAR 23...but not necessarily the CAR 3 airplanes the vast majority of us fly (I'm still looking for the old CAR3 reference—can any readers help?). Regardless, always confirm fuel level by

multiple means, and make alternate plans if any of your fuel cross-checks vary significantly from any others.

### **More on fuel, from NASA's Aviation Safety Reporting System**

Experience shows some pilots are unclear about the difference between declaring a "minimum fuel" state and an all-out "low fuel emergency." What ATC can—and will—do for you may vary based on which phrase you use if the go-juice is running out. Hopefully you'll plan well enough to never need to know the difference, but just in case read the [July 2010](#) issue of *Callback*.

See [http://asrs.arc.nasa.gov/docs/cb/cb\\_367.pdf](http://asrs.arc.nasa.gov/docs/cb/cb_367.pdf).

### **While you're sitting at your computer waiting for *FLYING LESSONS* next Wednesday...**

AOPA Foundation president (and *FLYING LESSONS* reader) Bruce Landsberg presents "Thunderstorms and ATC: What You Need to Know," on Wednesday, August 11<sup>th</sup>. Pre-register for the [4 pm](#) or [8 pm](#) webinar (both times U.S. Eastern)

See:

[https://www1.gotomeeting.com/register/831740696?hkey=1668732941&recid=874692&priority=F810TSWC1&imm\\_mid=060306&WT.mc\\_id=F810TSWC1](https://www1.gotomeeting.com/register/831740696?hkey=1668732941&recid=874692&priority=F810TSWC1&imm_mid=060306&WT.mc_id=F810TSWC1)  
[https://www1.gotomeeting.com/register/777001953?hkey=1668732941&recid=874692&priority=F810TSWC1&imm\\_mid=060306&WT.mc\\_id=F810TSWC1](https://www1.gotomeeting.com/register/777001953?hkey=1668732941&recid=874692&priority=F810TSWC1&imm_mid=060306&WT.mc_id=F810TSWC1)

Savvy Aviator Mike Busch (also a *FLYING LESSONS* reader) presents the third in his series of monthly maintenance seminars, "All About Annuals," on Wednesday, August 11<sup>th</sup> at 9 pm EDT/8pm CDT/7pm MDT/6 pm PDT. You must pre-register for this event at [www.savvymx.com/webinar](http://www.savvymx.com/webinar). Recordings of Mike's previous webinars are also linked there.

## **Question of the Week**

Readership is always lower during Oshkosh week, so although I've received a great many insightful answers I'm going to leave this four-part Question up for another week. If you've not done so already, please send your answers to and comments about each question by number (or copy-and-paste the questions with your answers) to [mftsurvey@cox.net](mailto:mftsurvey@cox.net):

1. **When we review accident records in print and discussion do we risk portraying our entire industry as excessively risky?**
2. **Do you believe flying is inherently dangerous, requiring constant study and practice to be an acceptable risk?**
3. **Does *FLYING LESSONS* go too far in presenting lessons to be learned from the mishap record?**
4. **Can we accomplish the same thing (avoiding repeats of common accident causes) differently, and if so, how?**

I'll begin featuring your answers to each of the four questions next week in *FLYING LESSONS*. Thanks, readers!

Thank you, everyone, who was able to attend the General Aviation Awards program at Oshkosh, and/or were at my presentation in the FAA Safety Center during AirVenture 2010. Thanks also to all who were unable to be there but sent your congratulations and best wishes...and to all who work to make general aviation safer.

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

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



*FLYING LESSONS* is ©2010 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](http://www.mastery-flight-training.com), or contact [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net) or your FAA Team representative.