

FLYING LESSONS for July 8, 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.

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This week's lessons:

Engine out, preparing to land... Tighten your seatbelts, ensure shoulder harnesses are secure, and remove sharp objects (pencils, etc.) from your pockets.

Unless the Pilot's Operating Handbook recommends otherwise, unlatch a cabin door or a large window emergency exit to aid your escape should impact forces jam the doors shut.

Before you even start the engine prepare for the unlikely event it will quit. Secure all baggage and tools in the airplane, anything that is heavy enough or sharp enough to become a deadly missile in a rapid deceleration. John and Martha King of [King Schools](http://www.kingschools.com) present a chilling story of their crash, many years ago, in a Cessna 210. A tool box in the far aft baggage compartment flew forward through the windscreen on impact, missing their heads by mere inches.

See www.kingschools.com.

If you must ditch in water, plan a similar approach. But since it is difficult to judge height above the water and stalling too high can be as disastrous in water as it is over land, most experts recommend maintaining the minimum sink rate and flying the airplane into the water.

It's imperative to keep the wings level so they hit the water at the same time. One wing hitting before the other will cause the airplane to lurch dangerously or cartwheel.

Don't try to slip it to "land"ing or apply crosswind correction. If the body of water is large enough aim into the wind to reduce your impact groundspeed to a minimum. If you can't point into the wind, touch down in a wings-level crab.

For more guidance on ditching see [this web page](#).

See www.pilotfriend.com/safe/safety/ditching.htm.

If an engine quits and it's capable of restart, you'll do so by manipulating three systems: fuel, air and ignition. In carbureted piston engines the most common cause of reversible engine failure is carb ice. After you've established a glide pull the carb heat—but realize that if you have carburetor ice the engine will sound *even worse* when you first apply carb heat, because hotter, lower-density air will reduce induction air even more. Only after a few seconds to minutes after applying carb heat will it melt out enough ice to make the engine develop smooth power again.

In fuel injected and turbine airplanes the most common cause of flight-repairable power loss is fuel starvation. Start your restart attempt by switching fuel tanks, activating boost pumps and manipulating the fuel mixture or condition lever.

Follow your POH in all cases, but remember that once control is established and you're headed toward a landing spot, your restart involves only three things: fuel, air and ignition controls.

For more on dealing with engine failures, watch for my upcoming article "From Denial to Final: Engine Failures in Cruise" beginning in the August 2010 issue of [Aviation Safety](#).

See www.aviationsafetymagazine.com.

Comments? Questions? Tell us what you think at mastery.flight.training@cox.net.

Debrief: Readers write about recent *FLYING LESSONS*

Concerning overdue airplanes and VFR flight plans, reader Jim Herd writes:

I always enjoy your newsletter and learn something. Thanks. However, I must raise an issue with you. Your story about a VFR local flight that went missing with tragic results is indeed horrifying. Your lobby for filing VFR Flight Plans to combat such tragedies is well-meaning but misguided, in my humble opinion. When taking-off for a short local sight-seeing flight it is excessively burdensome and not even practical to file a Flight Plan – because you probably don't know where you are going. We simply should not be making aviation more complex and burdensome, because this is a primary factor in scaring away new (and old) pilots!

No, there is a far simpler and more trustworthy solution with the name of SPOT. You are certainly correct by saying that ELTs "are not a reliable trigger for first responders", so we absolutely need a better solution and we also need to kill the false comfort that is generated by ELTs. I believe that SPOT (or similar products) along with simply advising someone when you will return, is the solution you should be advocating.

If I am missing the reason why you did not recommend this solution, as well as or instead of filing a Flight Plan, then please write more on this in your next newsletter. Personally, I have been using SPOT for 2 years and it has really never failed me. And all for a few hundred dollars! I am currently at a sailplane gathering with about 40 gliders and pilots. Daily flights around 300 to 600 miles are common – with turnpoint decisions being made in the air, based on weather conditions. Almost every single pilot is carrying a SPOT!

One more point. May I also urge you to lobby against any move to mandate 406 ELTs in the USA – simply because they produce virtually no increase in safety, based on studies I have read. Further, please lobby to remove the mandate for 406 ELTs in all adjacent counties to which many of us fly from time to time.

I appreciate the stimulation and knowledge that comes from your newsletter.

Thanks very much, Jim. You're absolutely correct that a personal locator (like the [SPOT personal locator](#)) is really the current ultimate in emergency location, backed up with letting someone know your plans, and how to begin a search if you turn up overdue. Although *FLYING LESSONS* stresses safe operation with available equipment and technology and is not a political lobbying forum, many at the very highest level of FAA and NTSB, as well as lobbying firms AOPA and EAA, are *FLYING LESSONS* readers and will see your appeal. Readers, please let your opinions be known by your political lobbying representatives at [AOPA](#) and [EAA](#).

See:
www.findmespot.com
www.aopa.org
www.eaa.org

Two readers sent notes about the conduct of multiengine training as a result of last week's *FLYING LESSONS* report. Reader and twin owner Woodie Diamond wrote:

Another great *Flying Lessons* this week! Thanks! Really sad about the multi driver, guess I never realized that stuff like that really happens. Every instructor I have flown with, including DPEs [Designated Pilot examiners], have made a point of telling me that anything happens during take-off is real, not them.

And retired 707 captain Syed Husain comments:

You've answered everything here, but flight handling of this scenario is equally important, at least at the experience level where this student is. There apparently was no briefing done or the instructor mistook the student abilities but preventing throttle use during recovery is rather odd.

Indeed it is very odd, Syed. I know when I provide MEL training one of my briefing items is that if during a simulation anything goes wrong, that I'll ensure the recovery includes full use of the available power.

Thanks to you both. It's been said that multiengine instruction is the most hazardous training you can receive—and give—in an aircraft. All depends on a clear understanding of what is and is not appropriate in the conduct of instruction, and the recovery methods to take if a training scenario begins to go bad. And, I'll repeat from last week, leaving the close-to-the-ground, starting-from-low-speed engine failures for approved flight training devices.

Over the last few issues we've been discussing changes in V_A and turbulent air penetration speeds with reductions in airplane weight. Reader Steve Weintraub asks:

How do V_{FE} , V_{LE} , and V_{LO} vary with weight?

Our discussion of airspeed variations with weight include all for which airplane load factor and angle of attack is the primary performance-determining factor. Maneuvering/turbulent air penetration speed, V_X , V_Y , and for multiengine airplanes, V_{MCA} , V_{XSE} and V_{YSE} ("blue line") are all really approximations of angle of attack, and therefore vary with airplane weight (sure, they are by definition determined at maximum gross weight, but the performance *effect* varies with weight). Other limitations airspeeds, however, including flap, landing gear and Never Exceed speed, are airframe drag limitations and do not vary with airplane weight.

Another reader, Doug Cheney comments on the same topic:

The comment about "negative V_a " was interesting and gave me pause. Not sure that I will change anything I do but I am sure I will spend some time to get comfortable with it.

While two readers provide a good bit of addition detail. From David Dewhirst:

The formula for determining the airspeed for a lower operating weight is: $V_{a1} = \text{Sq Rt } (W_g/W_1) \times V_a$
Where:

W_g = Gross Weight

W_1 = The current weight

V_a = Original maneuvering speed at gross weight

V_{a1} = Maneuvering speed at the reduced weight

This is simply the square root of the ratio of the weights times the original maneuvering speed. Remember that you are taking the square root of a decimal and the answer will be a larger number than the ratio. For example, the square root of 0.81 is 0.9. Notice that this is not a linear function. For an airplane with a large useful load, the maneuvering speed at a minimum weight will be very low, maybe close to blue line [in a twin].

When [Dave's instructors] do complex airplane transitions we always work out the speeds for the reduced weights and add the numbers to the pilot's checklist. We then have him compute the approximate takeoff weight along with a discussion about density altitude. That is followed by how to compute the change in the aircraft weight as the result of fuel burn. The pilot now has a quick way to determine the correct maneuvering speed and an appreciation for how low it can actually be. Gross weight increases as the result of airframe modifications do not result in a higher maneuvering speed.

Thanks, Dave. And reader Steven H. Weintraub, a professor of mathematics, adds:

There are many V-speeds that vary with the square root of the weight of the airplane. For example, if a V-speed is 150 knots at maximum gross, and actual weight is 90% of maximum gross, then that V-speed

becomes $\sqrt{.9} \times 150$. Of course, it takes some work to figure out square roots, but as a good approximation you can take 1/2 the difference between the actual weight percentage and 100%. In the above example, you would take 95% of 150. To check this approximation, $\sqrt{.9} \times 150 = 142.3$, while $.95 \times 150 = 142.5$. If you are at 80% of max gross, then the exact figure would be $\sqrt{.8} \times 150 = 134.2$ knots, while the approximation gives $.9 \times 150 = 135$ knots. At 70%, the exact figure is 125.5 knots and the approximation is 127.5 knots. So while this approximation gets worse the further away from 100% you are, it stays a pretty good approximation across a wide range.

Great information, readers. Thank you all.

From the Feds

The July/August issue of *FAA Safety Briefing* includes a focus on weather decision-making. "Part of being proficient and safe in IMC is knowing and adhering to your individual personal minimums," writes editor [and *FLYING LESSONS* reader] Susan Parson. "One way to approach this is to consider how comfortable you are in each of the different basic weather categories in aviation—VFR, marginal VFR, IFR, and low IFR." Read more in [FAA Safety Briefing](#). I also discussed this philosophy in my 2002 article "[Categorical Outlook Flying](#)," and provide a suggested [go/no-go decision-making matrix](#) on my website.

See:

www.faa.gov/news/safety_briefing

www.ipilot.com/learn/article.aspx?ArticleID=707

www.thomaspturner.net/Categorical%20outlook%20matrix.htm

It's almost time...

...to finalize plans for your flight to Oshkosh. There's still time, however, to prepare to ensure your safe arrival. Continuing the annual *FLYING LESSONS* seven-part series on Arriving at AirVenture, this week let's look at Part 6: [Crosswinds and Tailwinds](#).

See www.aero-news.net/news/featurestories.cfm?ContentBlockID=439EFF1E-2A8F-4F12-A1FD-13EF01B27318&Dynamic=1

Recapping the earlier articles:

Part 1: [Know the NOTAM](#) (note: the correct link for this year's EAA NOTAM is [here](#).)

Part 2: [Have a Back-up; Fill 'er Up](#)

Part 3: [Airspeed Control](#)

Part 4: [Spot Landings](#)

Part 5: [Don't Go It Alone](#)

See also:

www.aero-news.net/news/featurestories.cfm?ContentBlockID=E1FEE301-00FA-4BC9-9B2A-A114EDAA14D6&Dynamic=1

www.airventure.org/flying/2010_NOTAM.pdf

www.aero-news.net/news/featurestories.cfm?ContentBlockID=11B5B140-1161-457B-BE89-3AA633B059B8&Dynamic=1

www.aero-news.net/news/genav.cfm?ContentBlockID=2AA8E421-F426-4450-A28A-E6A665891317&Dynamic=1

www.aero-news.net/news/featurestories.cfm?ContentBlockID=707D7B2B-8F23-477C-B509-82922D0727E9&Dynamic=1

www.aero-news.net/news/featurestories.cfm?ContentBlockID=232F926C-88EE-450D-B5B1-098AB96F0F74&Dynamic=1

www.aero-news.net/news/featurestories.cfm?ContentBlockID=439EFF1E-2A8F-4F12-A1FD-13EF01B27318&Dynamic=1

Arrive safely; I hope to see you there!

Question of the Week

I had a broken link for answering week's question of the week. A few readers answered by alternate means, which I've echoed below. However, it appears a great many of you tried the link, so I'll leave the same question up this week in the hopes you'll respond. I apologize for the inconvenience and thank you for your persistence:

Do you routinely file flight plans, even for VFR trips, or at least let someone on the ground know your plans and how to start a search if you're overdue? What value do you see in filing a VFR flight plan? Tell us at mftsurvey@cox.net.

Here's what some of you said:

I always file because I always fly IFR. VFR is just too difficult for me. I figure I pay for the system and I might as well use it. Last time I flew VFR beyond the traffic pattern was when I was giving a student an instrument proficiency check. No VFR flight plan but always talking to ATC with a discreet squawk.

I haven't filed a VFR flight plan in years. I do get flight following on almost every flight. I don't see much value in filing a VFR flight plan because I understand it can take quite a while after one is overdue before the search actually begins.

I generally fly in the Northeast corridor or the SF Bay area. I almost always (90%) file an IFR flight plan and in those instances when I do not (typically for very short trips), I get flight following from ATC. I never file VFR as I believe that the above two give me great service.

My answer is no to VFR flight plans. I don't see a value of a VFR flight plan when you are required to leave the active frequency in busy airspace (class C where I am) to open a VFR flight plan with FSS. Since I am already am in contact with ATC, I have a set of eyes on me for purpose of S&R [Search and Rescue] when it comes to flight following. Since I am instrument rated, I either talk and squawk (file IFR) or not talk at all (no ATC services). Only time I don't use ATC services is for touch and goes at [my home field], otherwise I am always using ATC services via flight following for practice area work or a IFR flight plan. My wife has approach [control's] direct line number programmed into her cell phone so if I don't contact her within a reasonable time of expected arrival (local practice area work), she can call them to see if I am still in contact with them. In my 10 years of flying this has not happened but I built this in as a safety net for my "practice area or practice approach" flights. I am a huge advocate of ATC services as you will see in my videos.

I often (almost always) use flight following and rarely file a flight plan. However, if traveling over sparsely populated territory with no roads I will file a flight plan as have had low ceilings drive me down to altitudes where radar not available and could not reach FSS via radio to file while enroute. Usually a trusted person on the ground knows where I am headed and when I expect to be back.

I seldom file VFR flight plans because although I've tried my best to make myself remember, I'm always distracted upon arrival and am embarrassed by the phone calls or announcements. I often use flight following.

And a reader addressed a previous question of the week on how he chose an instructor to check him out in his newly purchased airplane:

Before completing the purchase of my current plane (an A36 Bonanza) I contacted the type club (ABS) and got a list of its instructors, experts in the type, near where the plane was located, on the other side of the country from me. The one I chose was not only familiar with the type, unbeknownst to me he was familiar with that specific plane, having instructed the previous owner. After getting checked out in the plane with that instructor, my usual instructor from back home flew out commercial and accompanied me back home.

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



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