



FLYING LESSONS for March 22, 2018

FLYING LESSONS uses recent 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 airplane have little direct bearing on the possible causes of aircraft accidents—but knowing how your airplane's systems respond can make the difference as a scenario unfolds. So apply these *FLYING LESSONS* to the specific 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.**

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This week's LESSONS:

Time to catch up on some reader mail. For my old-school coding fans, GOTO DEBRIEF.

Comments? Questions? Let us learn from you, at mastery.flight.training@cox.net



IFR Operations for Non-Towered Airports

Tips to easily manage your clearance and release
[Click here for video...](#)

See <https://www.pilotworkshop.com/nto-ifr?ad-tracking=turner-nto-ops>

You are doing all of us pilots a great service. I always find your analysis, recommendations and instruction spot on. Thanks! – Anthony Crescimanno

Thank you very much, Tony. You, and all our [generous supporters](#).

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PayPal donations button at www.mastery-flight-training.com.

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Debrief: Readers write about recent *FLYING LESSONS*:

Reader Paul Searles writes:

Here's one for your "Impossible/Improbable Turn" file. [N422PS, March 10, 2018 at KADS \(Addison/Dallas TX\)](#). Check it out on Google Earth; I can tell you there's really no good straight-ahead option north or south of this runway. It's surrounded by office towers and hotels. [Audio file between CFI \("Vapor Lock"\) and Tower](#).

See <http://www.fox4news.com/news/ntsb-investigating-saturday-plane-crash-at-addison-airport>

Hi, Paul. Many urban airports present some real challenges should a pilot have to make an off-airport landing shortly after takeoff. I've flown into Addison a few times, and each time I was concerned about a lack of options should the worst occur, at the worst time. Still, I chose to use the airport because it was near and, in two cases, exactly where I needed to go. Perhaps I should not have gone there even though it made the most sense.

You're absolutely correct on another point also, Paul. The ability to check Google Earth or similar mapping software before takeoff is a significant resource to help you make the "where will I go?" decision *before* you are faced with a loss of engine power and the extreme distraction and stress of engine failure so close to the ground.

Readers may recall that for several weeks I posted the announcement of a webinar by Rod Machado, David St. George and Russell Still they called "[The Improbable Turn](#)." I hope you took the time to view this program live or as recorded. You may still watch it at the link in this paragraph.

See <https://www.youtube.com/watch?v=4ackVNFct4I>

I viewed the recording the day after the live presentation. Because I'm like that, I took detailed notes for my own education and in case there was anything I wanted to clarify with the presenters. Afterward I sent a detailed note to all three (who also happen to be *FLYING LESSONS* readers). Two of them responded agreeing that I received their message loud and clear. The third speaker did not reply, but he did not refute any of my notes either.

If you promise to view their program also (assuming you have not done so already), I'll now share my notes about their webinar in the hope that readers will write me with their own comments and ideas on the topic of responding to power loss shortly after takeoff. Here's what I sent to the presenters, with my emphasis now added:

Outstanding presentation! I had to miss seeing it live, but I viewed it on YouTube tonight, and found and completed the quiz on Russ' website. This is an excellent discussion and hopefully will cause many pilots to view their takeoff planning more critically. That is probably the most important lesson of this presentation: ***we need to put a whole lot more thought into takeoff and initial climb planning.*** The possibility of engine failure is only one reason why, albeit a very important one.

As best I could viewing your program while walking on the treadmill (thanks for the physical as well as mental workout), I took some notes and "walked away" with **these major points**. Now that I've sat down and can work my iPad thumbs more proficiently to record my thoughts, if you have time I greatly appreciate if you would correct me if I have misunderstood anything, or at least tell me I need to watch the video again to get it right. Here's what I came up with in **summary of what you said** in the webinar:

- Surviving a loss of power (partial or total) shortly after liftoff is **primarily a mental exercise**, not just a physical skill.
- It is vital to **plan and brief for engine failure before every takeoff**, and **expect the engine to fail** unless it proves otherwise.
- To be in a position to consider the possibility of successfully turning back after a loss of power **it takes at least 2-3 hours of dedicated instruction**, preferably with an aerobatics instructor at altitude or optimally in a simulator.
- If there is any significant headwind component on takeoff, 10 knots or greater, the impact ground speed and therefore **deceleration G forces of a tailwind landing call for landing straight ahead into the wind regardless** of the apparent ability to turn back.
- The turnback maneuver is to be exercised **only if there is no acceptable option** more or less straight ahead. *Attempting the turnback is a matter of necessity, not convenience.*
- **The objective is not to land normally**, it is to avoid hitting anything that will kill you.
- **Protecting the airplane is not a consideration** except where it minimizes impact forces for the purpose of occupant protection.
- It takes training *and* practice to consider making the turnback maneuver. **If you do not devote the time and effort needed to train, practice, plan and brief, then landing more or less straight ahead is the only option.**

Now, some of *my* thoughts about your content:

- With the exception of the brief comments about landing on Rwy 14 instead of returning to Rwy 18, **you present the turnback as an all-or-nothing decision. You might be at an altitude where you cannot return to the runway, but you can make up to a 90-degree turn** to align with a beach or clearing, or make it back to a parallel runway or taxiway, or at least make it to the mowed part of the runway where rescuers are more likely to find you (you did very briefly mention landing in an overrun).
- **Initial climb may be a series of incremental decisions.** For example, below some altitude (e.g. 400 feet) you must go essentially straight ahead; from 400-700 AGL you can turn up to 90 degrees, but once you reach 400AGL you must go essentially straight ahead from there; from 700 - 1200AGL you may be able to make 180 to the full 240 degrees of turnback, but once you get to 400AGL you must go essentially straight ahead from there, etc. As your “kidney diagram” suggests, **altitude represents a range of options**, and the higher you are the wider that range becomes. Altitude + wind create expanding and contracting possibilities; **it’s not straight ahead or back to the runway, but nothing in between.**
- With good reason you purposely avoid delving into airplane type-specificity. I caution, though, that saying **the turnback as evaluated at 200AGL for sailplane pilots does not have great validity in the airplane world.** A sailplane’s glide ratio, wing loading and (in many cases) slow-speed control response is very different from most powered aircraft. A very brief mention that airplane type will have a BIG impact on turnback altitude might have been made.
- As renowned instructors you understand the importance of recurrent training. What do you think is the half-life if turnback training? **How frequently must a pilot repeat the turnback training to retain the skill?**
- **Discussion topic:** How do you address this concept when making touch-and-goes? Do you review an abbreviated briefing while on each downwind leg, or make some callout as a reminder while on each final approach? **We need to be as prepared on the climb out of a touch-and-go as we are the first takeoff of the day**, so how do we address that?
- **How should we address this topic in the event of a go-around** that is followed by a loss of thrust close to the ground?
- You say only a “trained pilot” should attempt the turnback maneuver. **What is a trained pilot? In other words, what are the elements of turnback training, and the completion standards? Without dictating a specific lesson, can you provide a bullet-point list of the elements of how to determine turnback altitude, and what specifically should be done in that 2-3 hours it takes to gain proficiency in the maneuver?**

My final thoughts on the presentation:

- Extremely well done overall. The quality and content are superb.
- I’d like to have seen even more use of figures and animation—not to see you all less, but because as you know seeing is often a more effective learning experience than hearing.
- I’d like to have heard more from Russ. Not less from David and Rod, but more from Russ’ experience also. I don’t say that because Russ gave me an unnecessary shout-out at the end. That said, thank you, Russ.
- Once more, outstanding job, gentlemen!

Thanks for taking a controversial topic head-on and providing a superb webinar. I hope you are able to do more webinars together, and individually.

There are several altitudes pilots should be aware of every time they take off. These altitudes might also be reminders of the options you have available in the event of a loss of thrust:

Altitude AGL	Significance	Possible Loss of Thrust Response
400 feet	Lowest altitude before turn when departing IFR.	0-400 AGL: Land nearly straight ahead. Wings level, Under control, at the Slowest safe Speed.
700 feet	Base of controlled airspace at most IFR nontowered airports	400-700 AGL: Turn options up to ~ 90 degrees left or right. After descending through 400 AGL, land nearly straight ahead. Wings level, Under control, at the Slowest safe Speed.
1000 Feet	Typical VFR pattern altitude	Turn options up to a return to the departure runway. After descending through 700 AGL, turn options up to ~ 90 degrees left or right. After descending through 400 AGL, land nearly straight ahead. Wings level, Under control, at the Slowest safe Speed.

As you train in the turnback maneuver at a safe altitude, and each time you take off, review these altitudes and options—or whatever options you are prepared for as a consequence of your training and the capability of the aircraft you’re flying. During climbout, call out each altitude as you climb through it, and your options available. For example:

“Above 400 feet AGL. Now up to 90 degrees left or right until back at 400 AGL.”

Returning to the reciprocal runway following engine failure takes serious practice and a heightened awareness on every flight. Turning back is not an all-of-nothing decision. There may be better options within 90 degrees left of right of your departure heading, that you can make if you have the altitude and the skills. **Heed the sage advice** of Rod Machado, David St. George and Russell Still. **Add to it training, briefing and thought** about less-than-total-return options that may be available to you.

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

Minding Weight, Maintaining Balance

Between 2008 and 2016, the probable causes of 136 general aviation (GA) accidents were related to pilots improperly conducting preflight performance calculations for weight and balance or not conducting them at all. One-third of these accidents resulted in pilot and/or passenger deaths.

- U.S. National Transportation Safety Board

The NTSB recently published **Safety Alert 072, *Minding Weight, Maintaining Balance***, warning of the hazards of improperly loading or overloading aircraft, and the specific performance impacts of flying an aircraft outside its approved flight envelope. SA072 illustrates the issue with examples, and provides a simple, one-page “what can pilots do?” synopsis.

Especially for Northern Hemisphere readers, for whom temperatures and the resulting density altitudes are rising—higher density altitudes being particularly unforgiving of weight and balances transgressions—this quick, four-page brochure is a good review.

With the proliferation of free and low-cost airplane loading software, **there’s really no excuse for a quick weight and balance and performance calculation before every flight**. Of course, once you become familiar with a specific loading pattern, for example, my friend and me with full

fuel in his Cessna 172, or me alone in the A36 Bonanza I usually fly, you can evaluate weight and balance by noting “I know from previous calculations that under these exact conditions the loading and distribution is correct.” **One note:** If you use weight and balance software, make a few calculations under various loading conditions using that program, then make the same calculations by hand. Then compare the results. Especially when airplanes have modifications that change the loading characteristics, I’ve come across some programs that do not accurately determine weight and balance when compared to hand calculations. As with any program, validate it against more traditional methods before you trust new-to-you software with your specific aircraft.

Yes, it should be easy—and routine—to evaluate weight and balance before every flight. Then again, when was the last time you saw a set of scales in an FBO or someone’s hangar to help a pilot know for certain? **Perhaps some aviation service organization might consider a campaign to put scales in FBOs around the country**, like those that have painted beautifully ornate but much less useful compass roses on ramps.

SA072, weight and balance, and validation and use of weight and balance software would be a great topic of discussion for your flying club, FBO, VMC Club or similar pilots’ gathering. [Read NTSB Safety Alert 072.](#)

See <http://www.mastery-flight-training.com/ntsbsa072wb.pdf>

Comments? Questions? Ideas? Let us learn from you. Email your input to mastery.flight.training@cox.net.

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