

# **FLYING LESSONS** for July 16, 2009

suggested by this week's aircraft mishap reports

*FLYING LESSONS* uses the past week's mishap reports as the jumping-off point 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.

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

**Abnormal conditions can be cumulative** in airplanes. Situations that alone are easily handled by the pilot may not be when combined with other equally benign conditions.

**Take for example** a radical fuel imbalance (one wing far heavier in fuel than the other) and a strong or gusty crosswind. Either one alone might be well within the capability of the pilot, and the airplane. Combine them, adding the thrust of takeoff or go-around power, and the combination may be lethal.

**If circumstances cause you** to accept one challenging condition, don't put the successful outcome in doubt by choosing to combine it with other adverse factors. Delay or divert if you need to, to manage the risk.

**For most aircraft insurance policies** to be in effect when an airplane is test-flown by a maintenance facility, one of three conditions must usually be satisfied:

- The shop's pilot must meet the Open Pilot Warranty (OPW) provisions of the insurance policy (including any special training requirements)
- The shop's pilot has been named to the policy as an Approved Pilot, and the premium adjusted as necessary (this option applies if the pilot does not meet the OPW)
- The shop doing the work holds an FAA Certificated Repair Station certificate and the pilot is an employee of that shop.

**There's a "grey area"** if a Repair Station contracts pilot services instead of using an employee to conduct test flights, and there may be an issue with persons not meeting the above requirements in a "high-speed taxi test" on a runway in lieu of flight.

**It's best you discuss this** with any maintenance provider that may test-fly your airplane beforehand to ensure your coverage remains in effect. Check your aircraft insurance policy, or ask your agent or broker to find what applies specifically to you.

**There is a strong correlation** between electrical failure in flight and retractable landing gear collapse on the subsequent touchdown. Anything less than full alternator/generator power may be insufficient to fully extend the gear. Follow any extension of landing gear on battery alone or with less than full system voltage by completing the alternate or emergency Landing Gear Extension procedure. The extra effort and few minutes it takes often prove to be the difference between a minor inconvenience (fixing an alternator) and a catastrophe that in many cases results in an airplane being scrapped.

Questions? Comments? Email me at [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net)

# DEBRIEF

Award-winning author, retired air traffic controller and aviation safety expert Norm Scroggins writes about a recent *FLYING LESSONS* about high density altitudes:

Very timely...and most helpful. Discussed recently how the presence of warm humid air above a forest can affect lift during initial climb.

You really deserve "pay" for this program which not only informs, but raises the level of "experience" for all whom draw from the experiences of others. My dipping into the well of others' success and failures ranges over fifty years. *FLYING LESSONS* is most effective in filling this need.

Thank you very much, Norm. Sharing experience is what it's all about. I wouldn't turn down donations to help compensate for the 10-12 hours a week I put into *FLYING LESSONS*, and may in the future offer enhanced services by subscription, but *FLYING LESSONS* is my effort to try to positively affect the frankly horrendous way we seem to repeat the same mistakes over and over and over again.

On the same topic of density altitude, airline training and safety director Alan Davis writes:

Another item related to density altitude that many do not consider is the effect of humidity - which is not accounted for in any of the performance charts. I wrote an article several years back (the source site is no longer available to the public, having been taken down by the military - too bad!). The "summary" calculation suggestion for use in applying humidity to the DA calculation - and it is pretty impressive! I will eventually put both into the SAFE [[Society of Aviation and Flight Educators](#)] library when it becomes fully functional.

It would be pretty disappointing to have done all the normal calculations to "do things right" and then find that you were off anywhere from 11% to 32% in actuality. That could ruin your whole day!

See [www.safepilots.org](http://www.safepilots.org)

Thanks, Alan. We also had a number of comments on last week's *FLYING LESSONS* on stalls and spirals in the traffic pattern:

I knew this could (and does happen), but I didn't know exactly why. I too, just thought it was loss of lift. I always learn from you, my friend.—Randy Kenyon, aviation insurance manager and former combat Army Aviator

Great to reinforce some of your steep angle turns training. However, the question of the aircraft wanting to climb after leveling the wings in an incipient spiral is perhaps underestimated by most pilots. A recent accident in Australia involved a Cirrus SR22 which went into an incipient spiral after encountering a thunderstorm. The non instrument rated pilot came out of the bottom of the cloud in a steep spiral at an estimated 260 knots approx. Without thinking he leveled the wings. The result? He survived but the SR22 bent the wings up an estimated one meter or 3feet under the load. After recovering, he looked out to see all of the flaps and ailerons "V" shaped as the carbon-fibre wings straightened and the aluminum control surfaces stayed distorted from the bend up. Undeterred, he decided to fly the aircraft another 200 miles to his home strip! My question or contribution is to consider unloading the G forces on the wing by pushing forward on the control column just prior to rolling the wings level to alleviate the forces exerted on the aircraft. Jet fighter pilots have suggested this maneuver to me. —Rob Kerr, aviation safety advocate and past president, Australian Bonanza Society

Right, Rob—push to unload the wing, then pitch to recover. Excellent point. I'll try to incorporate it in my training.

While I totally agree with your mentioning that the stall speed does not depend on bank angle, I think an error has slipped into your discussion! If you are banked during a descending turn, the

stall speed will increase if the rate of descent remains the same. If back pressure is not changed when the bank is increased, the G load will not change and the stall speed will remain the same. However, the rate of descent will increase and that higher rate of descent must be dealt with before ground contact.—retired United Air Lines captain and aviation elder statesman “Old Bob” Siegfried

Absolutely right, Bob. At a recommended 1.3  $V_{SO}$  approach speed with wings near level you'd have to pull nearly 2 Gs to increasing stall speed by 30%, causing a stall. That's a pretty hefty pull—I don't have to tell you, but practice level, 60° banked turns to get the feel for 2Gs. A distracted and undisciplined pilot might do so under extreme stress. As Rob Kerr suggests, unload the wing, then recover.

Great and very timely reminders about banking to a stall. This situation has probably killed more good pilots trying to make the field than we all care to think about. I have watched a recent video of the experimental on floats that plowed into the water enough times to give me chills.

As a thought when offering readers an experiment you may consider suggesting something like "If you are new to flying or have been out of the left seat for some time you may want to perform these maneuvers while flying with and instructor" or something like that. I realize that these are no a brainer and all pilots should be able to recover from the flight condition you are suggesting in the experiment, but many don't. If they decide to try the experiment at the bank angle well beyond the 35 degrees or so. and they are a little slower than the maneuvering speed... and a little lower than they should be... all of these things that come together become the chain of an event. Anyway thanks for all you do.—FAA Safety Team manager Bobby Reed

Thanks, Bobby. I mentioned bringing a CFI along for the proposed “experiment,” but you're right—I should make that suggestion even more prominently in my writings.

**Thanks, everyone,** for the great comments and additions to *FLYING LESSONS*!

## QUESTION OF THE WEEK

### July Question of the Week #2

The Questions of the Week are a little different this time, but it's worth taking the time to answer because it make affect how you receive *FLYING LESSONS* in the future. To encourage greater response (I hope), I'll award **two** readers their choice of a Mastery Flight Training hat or my DVD [Those Who Won't: Avoiding Landing Gear-Related Mishaps](#) in July. Here goes:

1. **Do you read *FLYING LESSONS*:**
  - a. In an email sent directly to you?
  - b. On [www.thomaspturner.net](http://www.thomaspturner.net) as a result of a link sent to you?
  - c. On [www.faasafety.gov](http://www.faasafety.gov)?
2. **Would you prefer to receive *FLYING LESSONS*:**
  - a. In an email sent directly to you?
  - b. Online at [www.thomaspturner.net](http://www.thomaspturner.net), in a format with more meaningful charts and graphics not supported by email?
  - c. (*FLYING LESSONS* will continue to be posted on [www.faasafety.gov](http://www.faasafety.gov))

Copy and paste the questions with your responses to [MFTsurvey@cox.net](mailto:MFTsurvey@cox.net)...then come back to read the rest of *FLYING LESSONS*.

Last week's question was **Have you had a density altitude learning experience? What happened, and what did you learn?** Here's what some of you said:

- No. That's because in 25 years of flying out of high DA airports in the western US I have always made sure to be at least 300-400 pounds under gross weight. That plus an extra 5 knots above normal rotation speed has never let me down. Pucker factor has always been low with this technique. Oh, and it doesn't hurt to plan takeoff for as early in the morning as possible.
- Shortly after earning my PPSEL, I was taking my wife for a spin to grab a \$100 hamburger in her hometown about 60 miles from home base. The temperature was about 93F, clear skies, and a fairly humid atmosphere for North Texas. Two people and a full load of fuel in a 100hp C150 at that temp, and you aren't going to do much better than 4-500fpm climb out on a good day. About 300 feet AGL and a 300fpm climb, the tell tale signs of carburetor icing appeared (yes it *can* happen when it's that hot). Vertical speed dropped to near zero as the engine struggled to climb at lower power. I couldn't leave carb heat on and clear the ice, as the further reduced power caused altitude loss. I was able to alternate heat/no heat to make my way (slowly) to 500agl, called the tower and returned for a landing with partial power. Turned out the valve for the carb heat was only partially working, but gave no indication of this during run-up. Moral of the story is to know your expected climb rate in different conditions, react quickly when something doesn't go as expected, and never continue a flight if you are not comfortable with what the airplane is doing. Be especially wary of density altitude when you are flying a low powered airplane – I've had carb ice happen at 40F in the same plane and had no problems climbing and clearing the ice. If I had continued from the airport on course attempting to get broken carb heat to work with partial power, it could have been a very unpleasant afternoon flight.
- A couple of years ago, I began selling a line of taildraggers. Last summer I took delivery of a new Sport Cub from the factory in Yakima, WA and headed home on a GREAT cross country "adventure" to bring the airplane back to Atlanta. One thing struck me as I flew across the Rockies; the runways are L-O-N-G!!! Following a fuel stop in Rawlins, WY, on a hot (90°) still day, I began my departure from Runway 22 (7,000+ length, airport elevation 6,813 ft.). I was absolutely AMAZED at the time and distance required to get a 1300 lb. airplane airborne from this runway! I had not calculated density altitude (over 10,000 ft. +), nor had I even considered it - Hey, I was flying a CUB!!! It scares me to think about how much of that runway I might have used had I been in my Baron, at something close to gross weight!! YIKES!!! Now I don't question the runway lengths out in that part of the country ..... they NEED them!!! NEVER again will I depart a hot, high runway without checking D.A., regardless of airplane type!

Thanks, all, for letting us learn from your experience!

## OSHKOSH!

Flying to the Experimental Aircraft Association's [AirVenture](#) at Oshkosh? Here's a final Flying to Oshkosh-series [article](#) to help you prepare for your big arrival. I hope to see you there!

See:

[www.airventure.org/](http://www.airventure.org/)

[www.aero-news.net/news/featurestories.cfm?ContentBlockID=A435616D-9450-45AB-9234-70D5FFF01A1E&Dynamic=1](http://www.aero-news.net/news/featurestories.cfm?ContentBlockID=A435616D-9450-45AB-9234-70D5FFF01A1E&Dynamic=1)

### Mastery Flight Training seminars at Oshkosh

Please join me and your fellow *FLYING LESSONS* readers for:

- *Keep it on the Runway: Mastering Directional Control* Wed., 7/29 at 2:30 pm in EAA Forum Pavilion 4.
- *The First 60 Seconds: Performance in Transition* Sat., 8/1 at 1 pm in EAA Forum Pavilion 4

See you at Oshkosh!

Questions? Comments? Send your insights to [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net)

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

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



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