

# **FLYING LESSONS** for June 16, 2011

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. You are pilot in command, and are ultimately responsible for the decisions you make.

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

**Through your windscreen**, the runway rolls into view ... growing by the instant, with your extreme approach. Your airspeed indicator spirals upward and, in seconds, you race along a few feet above the pavement, a smile on your face and the look of amazement from your passengers. The end of the runway rushes to meet you as you haul back on the controls. Rolling into a steep bank, you complete what I call the "airshow pass"—a classic high-speed flyby and steep turning pull-up flown by dozens of pilots each day during the summer fly-in season, and legally validated (or at least tacitly accepted) by regulator-observers at major events every year.

**The crowds love** the airshow pass too. They can vicariously feel the rush of speed, sensed through the rumble of your engine, the whine of your propeller, and the flash of your passing. The pull-up and bank maneuver spotlights the capabilities of your airplane, and spectators wish they too could master your craft.

**Yes, the airshow pass is a staple of fly-ins everywhere** and it is perfectly safe—well, most of the time.

**Unfortunately, maneuvers like the airshow pass** lead to over 2% of *all* General Aviation accidents. Sure, two airshow pass accidents for every one hundred GA accidents is fairly small -- until you consider the miniscule amount of time spent flying this maneuver. According to the U.S. National Transportation Safety Board (NTSB), there are an average of **51 accidents** attributed to botched attempts at the airshow pass each year. That's practically one each week.

**Now consider** that very little of this type of flying occurs during the cold months (when attracting an audience is less likely) and you realize that it's actually a fairly common occurrence during the flying season. What goes awry so frequently? What can you do to reduce your chances of repeating accident history?

**Every one** of the high-speed airshow pass accidents resulted from a loss of airspeed, a stall, and, commonly, a spin. The NTSB lists three categories of accidents associated with this maneuver:

- Attempted low pass and pull-up, loss of control, stall/spin
- Inadequate airspeed, stall during low pass
- Steep turn at low altitude, stall, loss of control

The total number of accidents is almost equally divided among these three categories.

**Over 90% of the airshow pass accidents** involve single-engine, fixed gear airplanes. However, that doesn't mean retractable-gear and multiengine airplanes are immune to the stall/spin on pull-up, despite their typically greater power and cleaner aerodynamics. In fact, more twin-engine airplanes are involved in airshow pass mishaps than are single-engine retracts.

**Only about 14%** of the total airplanes involved in this type of mishap are normally considered to be aerobatic—such as Pitts, Stearmans, or P-51s. I imagine that 14% is actually representative of the aerobatic aircraft population at most air shows. No pilot, and no airplane type is immune.

**What can you do** to avoid falling victim to the airshow pass? The first answer is “don’t do it.” However, it’s a given that many pilots will, so to improve your chances of staying out of the news:

1. **Take an introductory aerobatics course** to learn what works, and what doesn’t.
2. **Practice recovery from stalls** in various airplane configurations. Do this at a safe altitude, preferably with an instructor who is well versed in your airplane’s stall characteristics.
3. **Try a few chandelles** to sample the transition from climb to minimum controllable airspeed in a turn.
4. **Simulate the airshow pass at a safe altitude** by diving at a designated altitude, roaring along level for a while, then pulling up into a climbing turn. Note the airspeeds, pitch, attitudes and angles of bank that look spectacular, yet keep you far from the edge of a stall. Pay special attention to the altimeter -- at altitude, missing your mark by 30 feet is relatively benign. The ground is not so forgiving.
5. **Change the parameters** (reduce airspeed, pull up more steeply, or bank more sharply) *one at a time* until each action *alone* causes the beginnings of a stall. Recover, then record the precise values that put you on the edge of a stall. Start varying two of the three parameters, to learn how control inputs interact and how your airplane reacts.
6. **Avoid “rolling Gs”** by pitching then banking, or banking then pitching. Military and aerobatic pilots know the dangers of rolling while changing g-forces. An airplane stressed for a particular g-load may not be able to withstand that stress if the load is applied during a roll. Remember, roll, then pull, or pull, then roll. Don’t “load up” the airplane at the same time you’re rolling into or out of a turn.
7. **Practice recoveries from incipient stalls.** Then, once you’ve mastered positive control of all parameters independently and in pairs, try going to the edge of the stall envelope by varying all three.

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**After completing steps one through seven**, you should be able to safely fly the maneuver by knowing exactly what values of airspeed, pitch attitude and/or bank angle keep you inside the airplane’s performance envelope.

**Diving at the runway**, flying along low at high speed, and climbing above the crowd provides a rush of adrenaline for you and those who watch. Done right, it’s a fine display of airmanship and an airplane’s grace and agility.

**Unfortunately**, the airshow pass destroys a number of airplanes and kills a lot of people each year. If you must try the maneuver, make sure you’ve logged the training and practice that will make you and those around you safe. Otherwise, leave the airshow pass to the professionals.

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



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

Frequent Debriefer David Heberling writes about last week's discussion of short hops and forgotten checklist items:

"It can happen to anyone...including me, and you." This is so true. It is too easy to get distracted from doing the checklist. Not only that, but are you actually looking at the gear indications when called for by the checklist? It is a habit I have developed over the years to actually touch the control called for in the checklist. Because I am by myself in my Bonanza (or at least the only pilot), I still run through a final GUMPS check on short final.

I am reminded of an incident that occurred when flying with my daughter. When we were on short final, she asked me if the landing gear was down. At the time, I became irritated. We were flying at dusk and I had the NAV lights on. In my Bo' that dims the gear lights to invisibility. I knew she did not know that so I turned the NAV lights off, the gear down lights brightened and brusquely told her, "It is down, you see?" Once on the ground, I realized I had reacted in the wrong way. As we taxied in, I told her that I was sorry and that she should feel free to ask me a question like that at any time. I have since decided to make my right seat passenger my defacto First Officer. I have them read the checklist to me, change the radio frequencies for me, set transponder codes, and follow along on a sectional to keep track of where we are. It keeps me on my toes and keeps my passengers occupied. I really miss them when I am alone.

Great use of your available resources, David. It's a good *LESSON* about pilot acceptance of outside suggestions, as well. With proper briefing and good communications, a front-seat passenger can be a real asset to safety-of-flight.

Retired DFW air traffic controller and flying safety consultant Norm Scroggins responds to *FLYING LESSONS* on remaining Pilot-in-Command during abnormal or emergency situations. Norm writes:

OUTSTANDING INFO/INSTRUCTION! You might add that, except during emergency or potential emergency situations, that pilots avoid external influences that may push you beyond YOUR (not THEIR) optimum performance level. For example, should ATC be an influence, then one might request a slower pace. Or offer to break out of the crowd and re-enter. Should be "the boss" [a passenger], "maintain the "optimum" and save for discussion for later.

Thanks very much, Norm.

Reader Doug Cheney has a question I'll pass along:

I'm curious whether the accident statistics would show a positive correlation between pilots that actively involve themselves in safety and proficiency activities and lower accident rates for those pilots? I am thinking of FAA Wings participation, things like *FLYING LESSONS* and safety articles in aviation magazines, training in addition to the BFR, etc. Maybe the FAA has data for its Wings program comparing accident statistics for participant and non-participant groups.

Hi, Doug. No study has ever been done to scientifically support this, as best as I can learn. There's probably a Doctorial thesis in there somewhere...maybe I will someday! It's probably like other tenets of aviation (for example, running cylinders cooler makes them last longer) that sound logical and are probably right, but which can't be proven primarily because of inconsistent record-keeping and the fact aviation is such a small sample size that small numbers equal big percentages. Perhaps, however, some *FLYING LESSONS* readers are aware of pilot mishap studies they can cite for us. If you are in the know, please let us know too...at [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net).

Readers, what's *your* opinion? Tell us at [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net).

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## **Fisk Inbound**

Flying to Oshkosh for the EAA Convention next month? It's a phenomenal experience... but one that requires study, practice and attention as well. This week we'll begin our annual look at the first aspect of flying into AirVenture, designed to make this a safe and fun experience....Know the

NOTAM. And, consider the unusual situations that might occur while you're inbound. Read [Fisk Inbound #1: Know The NOTAM](#) (note: this links to a past year's article that is still posted online. The 2011 AirVenture NOTAM is at [www.airventure.org/flying/2011\\_notam.pdf](http://www.airventure.org/flying/2011_notam.pdf).

See: [www.aero-news.net/news/featurestories.cfm?ContentBlockID=E1FEE301-00FA-4BC9-9B2A-A114EDAA14D6&Dynamic=1](http://www.aero-news.net/news/featurestories.cfm?ContentBlockID=E1FEE301-00FA-4BC9-9B2A-A114EDAA14D6&Dynamic=1)  
[www.airventure.org/flying/2011\\_notam.pdf](http://www.airventure.org/flying/2011_notam.pdf)



No one wrote this week about the 6<sup>th</sup> most common cause of fatal general aviation accidents, stalls on initial climb. Take another look before we wrap up discussion and move to the fifth most frequent reason people die in noncommercial aviation. As you [review the scenarios](#) respond to these questions:

1. List the scenario number you're addressing.
2. What factors do you think might have contributed to the initial climb stall?
3. What conditions were different from the way pilots typically practice power-on (departure) stalls?
4. How could pilots better train and practice stalls to be able to recognize and avoid these real-world scenarios?

See [www.mastery-flight-training.com/top\\_10\\_number\\_6.pdf](http://www.mastery-flight-training.com/top_10_number_6.pdf)

Send your insights to [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net). Thanks!



Angle of attack, flight load and stall awareness has received a lot of press lately (much of it not good). AOPA's Air Safety Institute will host a free webinar, **Aerodynamics: The Alpha Factor** on Monday, June 20<sup>th</sup> at 3:00 pm EDT (2000Z) with a repeat at 8:00 EDT (0100Z 6/21/11).

Venture beyond Bernoulli and Newton when you join AOPA Foundation President Bruce Landsberg and panelists Rich Stowell (Master Aerobatic Instructor and 2006 National CFI of the Year) and Brian E. Smith (NASA Ames Research Center) in an energetic review of aerodynamic principles beyond the four forces of flight. As Landsberg leads a high-paced discussion with amazing video clips you'll discover the true meaning of power and pitch and what flying angle of attack is all about. Grab this chance to come away a precise aviator in all flight regimes.

Register for the [20Z](#) or the [01Z](#) show on the ASI website. [Let FLYING LESSONS know](#) what you think of the presentation afterward.

See: <http://webbeta01.crosstechpartners.com/Attendee/HtmlAttendee.aspx?Step=address&C=70000129&M=10000029&Mode=HTML>  
<http://webbeta01.crosstechpartners.com/Attendee/HtmlAttendee.aspx?Step=address&C=70000129&M=10000019&Mode=HTML>

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***Flying has risks. Choose wisely.***

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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