

FLYING LESSONS for February 10, 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.

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:

Jet engine exhaust can have speeds over 100 mph—the equivalent of a Category II hurricane. It can cause damage to other aircraft at distances of up to a quarter mile.

Exhaust velocities produced behind a wide-body jet at takeoff power is:

- 100 mph at up to 350 ft. behind the generating aircraft.
- 70 mph at up to 650 ft. behind the generating aircraft.
- 50 mph at up to 1050 ft. behind the generating aircraft.
- 35 mph at up to 1350 ft. behind the generating aircraft.

Lighter aircraft are more susceptible to damage from a large jet's exhaust than heavier aircraft. Lighter aircraft also have a greater propensity to tip over.

The items above come from the [Gleim](http://www.gleim.com) online Flight Instructor Refresher Course, which I'm currently completing for my biennial CFI renewal. I'll review the Gleim program in *FLYING LESSONS* once I'm complete. See www.gleim.com.

But the definition of "light" is relative. [Watch this video](#) of an F-16 Fighting Falcon that comes afoul of the jet blast of a B-1B Lancer bomber (does anybody really use those nicknames?) during Red Flag exercises in 2007. In addition to taxiing to avoid the jet (and prop) blast of other airplanes, there may be a *LESSON* about crosswind taxi controls in there as well!

See <http://gizmodo.com/#15752983/this-is-what-happens-when-a-fighter-jet-gets-too-close-to-a-bomber>

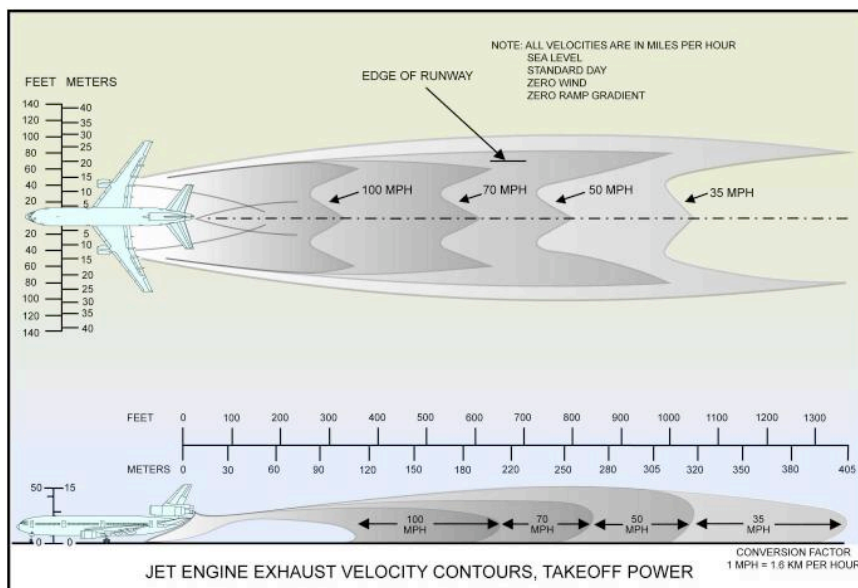


Diagram from the [Gleim](http://www.gleim.com) Flight Instructor Refresher course.

As you're taxiing, then, be watchful for other aircraft, and the effect their thrust may have on yours if they power up when you're behind them (or with helicopters, within about four rotor diameters). Maneuver your craft to stay clear just as you'd avoid wake turbulence if you were on the runway or in the air.

Even in light aircraft, consider the effect of your engine or propeller blast on other aircraft, including those parked on the ramp; ground vehicles; and people on the ramp when you power up to taxi. It's safety as well as courtesy.

Be especially careful to avoid prop- or jet blasting into an open hangar. Accelerated air can damage anything inside a closed space, and has been known to knock an airplane off jacks during a gear retraction test. Plan your taxi route to keep your blast away from hangars; if you can't avoid such a direction, shut down and push or tow the airplane so you do not blast into a closed space. Or get the owner's permission to shut the hangar door first.

Propeller strikes are frequently precursors to catastrophic engine failures later in the engine's life. A hard impact against a spinning propeller blade, or a rapid change in the engine's rotational speed, may not cause immediate damage. But it can begin a series of microscopic stress fractures that, over time, will accelerate fatigue and can give out without warning under otherwise completely benign conditions.

Most propeller and engine manufacturers strongly recommend an engine tear-down inspection following any prop strike. A detailed, internal inspection of all engine components is the only way to tell whether a prop strike has caused potentially catastrophic damage. If there is any doubt about the airworthiness and integrity of an engine part during the tear-down inspection, the only safe recourse is to replace the damaged parts. Otherwise the engine is a ticking time bomb...and single-engine or twin, when engines break altogether, our record of successfully flying through the emergency is not all that good.

When is a prop strike a prop strike? One manufacturer calls for a tear-down inspection any time the rotational speed of a propeller has changed noticeably as a result of an impact, for instance, if the tachometer needle fluctuates when the blade or blade tip hits an object. The same manufacturer calls for the tear-down even if the propeller is not turning at the time of impact, for instance during a towing mishap, if the blade damage is great enough that the propeller must be removed from the airplane for repair (i.e., if it needs anything more than a simple filing and repaint or varnish job).

Insist on a tear-down inspection before the next flight if an airplane you fly has had a propeller strike. Most insurance companies will pay for the inspection if the policy is in force when the prop strike occurs...they know they're better off doing so than to risk having you fly around with an engine-failure-in-waiting.

Under very controlled conditions an extremely cautious pilot might move an airplane to a location where the engine can be removed for inspection can take place, if done so under a Special Flight Permit ("ferry permit"), or non-U.S. equivalent, and over benign and open terrain. If the airplane is a twin, the pilot needs to be spring-loaded to deal with engine failure, even more so than normal for a multiengine pilot.

If operating under a ferry permit, notify your insurance carrier beforehand. Most policies do not cover operations under a Special Flight Permit unless it has been approved in writing

beforehand. You may be able to get the ferry permit from the FAA the same day you apply, but budget a couple of days to ensure you have notification from your insurance company, in writing, that ferry permit operations are covered, and under what conditions.

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



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Maybe I asked too much...

In late December *FLYING LESSONS* began an ambitious project to look at the Top 10 causes of fatal general aviation accidents as determined by the U.S. National Transportation Safety Board and reported by the Federal Aviation Administration. We vowed to look at one cause category per month, and develop lesson plans to teach avoidance of the most common deadly threats.

In February we turn to the 9th most common cause of fatal GA events, Low Altitude Maneuvering/ Loss of Control. No one responded to my call for *FLYING LESSONS* ideas that that spring to mind as a result of reading the reports.

This week, then, I'll ask something simpler. Randomly select one or two of the scenarios below, read the brief description, and [send me your thoughts](#) on how the pilot may have better managed the situation, or what you think were the key factors that turned personal flight into tragedy. Format isn't important, or even a thorough critique of the scenario. Just send the scenario number(s) you read and your quick-reaction thoughts, and I'll piece them together into a whole.

Scenario 1: http://www.mastery-flight-training.com/ga_fatals_9_1.pdf

Scenario 2: http://www.mastery-flight-training.com/ga_fatals_9_2.pdf

Scenario 3: http://www.mastery-flight-training.com/ga_fatals_9_3.pdf

Scenario 4: http://www.mastery-flight-training.com/ga_fatals_9_4.pdf

Scenario 5: http://www.mastery-flight-training.com/ga_fatals_9_5.pdf

Scenario 6: http://www.mastery-flight-training.com/ga_fatals_9_6.pdf

Scenario 7: http://www.mastery-flight-training.com/ga_fatals_9_7.pdf

Help *FLYING LESSONS* help reduce the rate of fatal general aviation mishaps. www.mastery.flight.training.com.

Debrief: Readers write about recent *FLYING LESSONS*:

Alan Davis, Director of Safety, Education and Quality Control for the Society for Aviation and Flight Educators ([SAFE](#), of which I'm a member) writes about last week's *FLYING LESSONS* on emergency checklists:

Great checklist! We really do need to emphasize the "fly the plane" in all of our teaching - all the way to the "crash" (better known as the off airport landing) if that is the outcome. Many emergencies like this would be survivable except for the fact that many pilots stop "flying the airplane" (give up) shortly before the off airport arrival.

One other thing I teach students and instructors is that there are two items that occur just prior to the checklist and immediately after the failure - they are:

- 1) Disbelief - this CAN'T be happening to ME! **Get past it!**
- 2) Panic - No matter how hard or well we prepare, there will be a moment of panic - especially if the failure occurs near the ground and shortly after takeoff. We must realize that this is normal, minimize it, and **get past it!**

The other thing I find is that the pre-takeoff emergency brief is often cursory - as if we do it because we "have to" and not because we believe it is a real possibility. If we take this one very seriously, and believe it, while both of the above items will still happen, we can shorten them - and **get past them** more quickly and ... on to the checklist. This is especially true when flying out of familiar airports (such as our home airport), where we should already KNOW where we will go at various points.

So, the key is - believe it - and **get past it**, get on with the checklist, and, of course, **fly the airplane!**

Thanks, Alan. Several years back I wrote a piece once called "[The Psychology of Emergencies](#)" listing some of the "this is not happening" factors we all face when an abnormal or emergency situation first arises, including denial (as Alan writes, the dominant reaction), distraction, omission, expectation and fear.

See:

www.safepilots.org

www.aero-news.net/news/featurestories.cfm?ContentBlockID=62C8EDC2-B400-40E6-91FE-28EF65EE93F1&Dynamic=1

Reader Karl Thomas comments on the ability of a small distraction to become a real human factors hazard, relating his experience in a Cessna Cardinal RG:

I lost my alternator last May on the way to [a] CFO ([Cardinal Flyers Online](#)) fly-in in Santa Maria, CA. Left out of Phoenix on Friday morning & ATC complained about hum in the radio, which I had noticed as well. Looking over the panel, everything seemed OK so I kept going. [An] hour or so later, near Blye, CA I noticed that EDM 700 [engine monitor] was flashing low voltage of 11.7 & [the] alternator [was] showing discharge. I had been contemplating what to do if/when the alternator quit & had determined I would go into Corona, CA, pick up [an] alternator at [Aircraft] Spruce [and Specialty] & hope I could find a mechanic to help with the change out. When I told ATC of my situation, they suggested I land first at Blye & then at each succeeding airport I passed, but having turned off everything but the [Garmin] 430 & the transponder, I wasn't seeing much of a voltage drop & decided to keep going instead of being stranded for the weekend.

Everything went well until I was just passing over Riverside, descending into Corona, when the big fan up front quit. I had set [the fuel] tank [selector] to [the] left - the Cardinal draws from [the] right tank until almost empty before pulling from [the] left - I usually put [it] on left after climb & change out after an hour, but in the "excitement" had forgotten to put back on both - that almost was the emergency!

Fortunately I was still at 3000 ft & she started right back up after 2-3 seconds as I started a turn back to Riverside. Anyway, [I] got the new alternator & was back up in the air 2 hours later. [The] alternator case was loose & I was real fortunate it didn't lock up & take out the belt! Got to go over LA (a bonus, I had planned on skirting to the east of the mountains & LA area) & got a birds-eye view of all that - what a deal!! Got into Santa Maria with winds howling 35-45 kts but down the runway to finish off the excitement for the day.

Wound up with the "hardship" & "longest trip" awards for the fly-in to boot !! Never did think of the alternator as an emergency given the clear weather, but my wife said if she had been with me we would have spent the weekend at Blye.

See www.cardinalflyers.com.

Good *LESSON* reinforcement, Karl. Thanks for sharing it with us.

Reader Kent “Eagle” Ewing, retired Naval Aviator, test pilot, and president of the Beechcraft Pilot Proficiency Program ([BPPP](#)) writes about last week’s *LESSON* thread based on recent mishaps and my article “[Twins and the Impossible Turn](#)”:

There is absolutely no way anyone except Bob Hoover is going to conduct a turnback maneuver in a light twin with one feathered. You are working stick and rudder to perfection to maintain any climb rate. If the pilot does not fly perfectly with zero sideslip (by the way we [at BPPP] use a yaw string!) he will not climb. Therefore the pilot needs to be thinking about where he is going to put it off airport.

Thank you, Eagle.

See:

www.bppp.org

www.ipilot.com/learn/article.aspx?ArticleID=665

Reader Woodie Diamond comments on last week’s report in general. ‘preciate it, Woodie!

Just finished reading this week’s *FLYING LESSONS*. Really good stuff here!!!! No BS, no fluff, just real life to-the-point!

What’s *your* opinion? Tell us at mastery.flight.training@cox.net.

How to Buy an Airplane and Stay Safe

There are signs that the airplane market is beginning to claw its way out of the hole made by the economy over the last couple of years. Award-winning instructor and author Max Trescott reminds buyers of airplanes that are new to them—regardless of the pilot’s previous experience—that they need to become fully familiar with the type, its handling and other characteristics, and its equipment. His first seminar, “How to Buy an Airplane and Stay Safe,” was held Feb. 15th in Palo Alto, California (if you’re a reader who attended the course send me a PIREP at mastery.flight.training@cox.net). Max has some good [observations on the topic](#) on his website, and might be enticed to bring the program to your area.

See: http://www.maxtrescott.com/max_trescott_on_general_a/2011/02/seminar-how-to-buy-an-airplane-for-business-or-pleasure-and-stay-safe.html.

Keep the Dirty Side Down

“Keep the Dirty Side Down” is a free webinar scheduled for February 28th 8:00 – 9:15 pm Eastern Standard Time (0100Z – 0315Z 01 Mar). Gene Benson’s program focuses on maneuvering flight issues—some of the very things we’re discussing in the Top 10 GA Fatal Accidents reports. You must [pre-register](#) to participate in Gene’s webinar.

See <https://www2.gotomeeting.com/register/744469482>

What’s your opinion? Tell us at mastery.flight.training@cox.net.

Share safer skies. Forward *FLYING LESSONS* to a friend.

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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