FLYING LESSONS for August 9, 2012

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:

From an NTSB preliminary report:

"The pilot had flown into the destination airport many times before and was familiar with the procedures associated with landing there. While completing the Before Landing checklist, the pilot became distracted by conversation from the passengers. The pilot never heard the gear warning horn and, before he realized that the gear was still up, he impacted on the runway.

"Earlier in the flight, the pilot briefed his passengers about having a sterile cockpit environment during the landing phase of flight. The pilot reported no mechanical anomalies associated with the accident."

The sterile cockpit rule was mandated for commercial flight operations after a fatal airline accident, when investigation revealed the crew was discussing irrelevant information when it should have been focusing on flight-critical tasks. The rule, in its simplest form, states that any time an airliner is within 10,000 feet of the ground the crew should refrain from any discussion not necessary for completing that phase of flight safely.

Aviation safety author and National Transportation Safety Board member Robert Sumwalt dubbed the airspace within 10,000 feet of the ground as an "Altitude Critical Area" in a 1990s article in *Professional Pilot* magazine. Among other actions, Sumwalt supports invoking the sterile cockpit rule when in an Altitude Critical Area.

See:
www.aopa.org/asf/asfarticles/sp0006.html
www.mwaugh.com/Aviation/Articles/ACA%20Article.htm
http://propilotmag.com/

In my (sadly) out-of-print book *Cockpit Resource Management: The Private Pilot's Guide,* I translate Sumwalt's airline/corporate jet concept into an Altitude Critical Area concept for general aviation airplanes. After all, most of us spend most of our time within 10,000 feet of the surface. In my definition an Altitude Critical Area (ACA) is any airspace within 1000 feet of the ground, any airspace inside the Initial Approach Fix or along the final approach course of an instrument approach procedure. ACAs also include the last 1000 feet of a climb or descent when changing altitudes. In an ACA? Limit conversation and actions to those necessary to safely fly the departure, level-off, approach or landing.

See:
www.amazon.com/Cockpit-Resource-Management-Private-Pilots/dp/0070656061
www.thomaspturner.net/Tools%20for%20Flying%20Safely%20ACA.htm
www.mwaugh.com/Aviation/Articles/ACA%20Article.htm

As the Baron pilot learned, It's not enough to know a good operating practice. You need to observe it *every time you fly*. When you make exceptions to your own rules, you're more likely to make mistakes.

From an FAA preliminary report:

"According to the flight instructor, the airplane had various landing gear issues during the week prior to the accident, and was released from maintenance for a faulty nose gear indicator light the day prior. While practicing [approaches], the nose gear indicator light did not indicate down and locked; however, the flight instructor observed that the nose gear was extended.

"[The instructor] cycled the landing gear without any changes to the nose gear indicator light, and subsequently attempted to land…. The airplane initially touched down on the main landing gear; however, as the nose landing gear touched down, it began to collapse. The airplane came to rest about 2,500 feet from the approach end of the runway, and sustained substantial damage to the fuselage around the nose gear.

"Initial examination of the airplane by a Federal Aviation Administration inspector, revealed that the nose landing gear eccentric bushing, which engages the downlock hook was out-of-adjustment. In addition, a check of the hydraulic system fluid reservoir dipstick revealed that the reservoir was empty."

Mechanical anomalies rarely get better on their own. The flight instructor appears to have done everything he could once the problem re-appeared in flight. The empty hydraulic system may have been a cause of the problem—something the pilot should have found and corrected during preflight—or the fluid may have leaked out as a result of the mechanical failure.

Be especially cautious any time you're taking an aircraft up on its first flight following maintenance. Be meticulous about your preflight inspection, and wary of anomalies at all times. Read my article "Your Post-Maintenance Test Flight" for more ideas about accepting an aircraft after repairs, maintenance, inspection or modification.

See www.mastery-flight-training.com/mftpost_mnx_test_flight.pdf

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

Debrief: Readers write about recent *FLYING LESSONS:*

Reader Alan Davis, an instructor and board member of the Society of Aviation and Flight Educators (SAFE), writes about recently *LESSONS* concerning density altitude:

> On the topic of DA [Density Altitude]…a piece I did [is posted in] the SAFE Members Resource Center - actually I did it some time ago - about adding in the effects of humidity, which can be sizeable. Might be interesting to provide the "top numbers" from the calculations as an addition to the DA information in your piece.

The article concludes:

> Humidity can further decrease performance from 11% at…higher altitudes to as much as 32% at lower altitudes – above and beyond the effects of temperature and altitude alone [and not noted in Pilot's Operating Handbook performance charts].

Thanks, Alan.

See:
www.safepilots.org
www.safepilots.org/members-only/error-members-only/?wlfrom=%2Fresource-center%2Flibrary%2Fmembers-only-enter-lib%2F

Writing about recent *LESSONS* about stalls and stall recovery, Dr. David Rogers notes that the FAA graph used to illustrate last week's report may be "misleading" about the relationship between stall angle of attack (AoA) and the AoA for best angle of climb—Vx. Dave notes that from his experience with a typical high-performance, single-engine airplane (a Beech E33A Bonanza) the stall AoA is at about 18 degrees, while Vx occurs at about 12 degrees AoA—a six degree difference, or as Dave puts it, one-third of the total available range of positive AoA between neutral and stall.

My observation that to move from a stall to a flying angle of attack requires relaxing pressure to reduce AoA by only a couple of degrees. To attain best angle of climb, however, will require a little more relaxation of elevator pressure, and a little more nose down movement. The movement necessary must be made swiftly and positively, but it still does not take shoving the nose below the horizon to recover with minimum altitude loss.

Dave also discusses achieving minimum drag during the takeoff roll to maximum takeoff performance:

> I'll add one more comment to your Safe Takeoff list. Mark the neutral elevator position on the column where it comes out of the panel. Hold neutral elevator position during the ground roll to reduce trim drag.

Finding the "neutral elevator position" probably takes two people: in at the tail, holding the elevator so that it is streamlined to the fixed stabilizer, and the second person in the cockpit to mark, with a grease pencil or a leaded pencil, a line where the control column exits the panel when the elevator is in the streamlined position (of course this doesn't work in airplanes with full-flying stabiliators and/or control sticks). Hold the elevator so the zero-angle line is aligned with the panel during the takeoff roll, and you'll minimize elevator drag while you accelerate—thus reducing your takeoff roll. Thanks, Dave.

Reader Tom Allen also comments about the density altitude *LESSONS*:

> Great *FLYING LESSONS* this week. Density altitude is 2300 at 8:00 a.m. at 82 degrees F [at a field elevation under 1000 feet]. Later it will be 105F. The thing that surprises me most is the number of accidents at higher elevations where the pilot flew in, filled up with fuel and then crashed on departure.

Yes, those events are tragic. Thanks, Tom.

Thanks to everyone who attended my presentations at AirVenture 2012, especially "Strategies for Avoiding Fatal General Aviation Accidents," delivered in the FAA Safety Center. I'll be posting video of the presentation and including a link in a future edition of *FLYING LESSONS Weekly*.

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

Personal Aviation: Freedom. Choices. Responsibility.

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2010 National FAA Safety Team Representative of the Year
2008 FAA Central Region CFI of the Year
