FLYING LESSONS for December 2, 2010

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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The third annual FLYING LESSONS Safety Day at Denton, Texas, is this Saturday, December 4th, hosted by Aviation Precision Maintenance. Read the details here.

See www.mastery-flight-training.com/mftdto_syllabus_2010.pdf

This week's lessons:

You likely made your very first takeoff yourself—with significant instructor oversight, of course. Add power, steer with your feet and hold the elevator control *just so*…and you were off.

By contrast, landing took much practice, several trips "following" the instructor's control inputs by gingerly holding the stick or yoke, and a lot of bounces, skips and mis-steps before your touchdowns were consistently smooth.

And yet we should really approach "first" takeoffs with more caution than even we do landings. Face it, the risks are there. Propeller torque is greatest at a time when airflow is low so controls are least effective. Nosewheel steering may not be terribly effective, and modern free-castoring nosewheels are nearly as skittish as tailwheel airplanes.

We don't have a complete "feel" for the controls on the first takeoff of the day, certainly not the practiced interaction we feel later in the flight. We can predict, but we can't tell for certain, how the wind, field elevation and temperature are going to affect airplane control and performance.

Don't assume the takeoff is just an exercise necessary to accomplish the rest of the flight. Taking off is an operation of its own, requiring the same type of mental preparation and go/no-go evaluation as landings and instrument approaches. Think, then fly…in all phases of flight.

As one reader quoted to me this week, landings are mandatory, takeoffs are optional. Be certain your airplane has the capability, and you have the skills, to maintain directional control on takeoff, and the will and the discipline to abort the takeoff early in the ground roll if power or control are not as expected.

What would you have done? The pilots in this video of a power-interruption, off-airport landing chose to put it onto a (thankfully) empty and suspended-line free stretch of city street. They even coasted into an empty parking lot at the end of this amazing video.

See http://ifrpilot.blogspot.com/2009/04/off-airport-landing-captured-on-video.html

Forget that the failure was probably fuel exhaustion (engine stop-start-stop-start-stop is indicative of this). Flying above populated areas, especially large urban areas, may be as risky as flight over mountains as far as engine failures are concerned.

Approach over-urban flight the same way you'd plan for a trip over rugged terrain or extensive forests. Be looking for landing spots at all times, even those that may be too tight for a completely obstacle-free rollout, but at least permit a touchdown under control and deceleration with aggressive braking before impacting a fence or a building.

Consider that overhead wires and light poles are the norm in built-up areas, and are just as deadly as a tall tree or a rock outcropping if you're coming down without power. Avoid overflying towns and populated areas if at all possible, and try to minimize the time you're over built-up areas just as you'd plan a route around steep terrain or extensive forests. You can't always count on an open stretch of boulevard without traffic, wires and poles like the lucky pilots in the video.

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

Debrief: Readers write about recent *FLYING LESSONS:*

Reader John Hodgson writes:

> Just wanted to let you know that I found the [podcast] tutorial on turbos very interesting and helpful. I hope you don't mind but I took the liberty of sending it to a list of maybe 30 Cessna Crusader owners. There are not enough T303's to have a strong owner group so many are CPA [Cessna Pilots Association] members. Most of them are in the UK so you might get some odd e-mail sign ups.
>
> Podcast: http://bonanza.org/documents/Turbo%20Troubles.mp3
>
> Slides: http://bonanza.org/documents/Turbocharger Simplified.ppt

Thanks, John, I'm glad to help. My wife and I have friends who own a T303 near Brisbane, Queensland Australia. I got a little right-seat time in it last year. Great airplane!

My mention of the no-slip-with-full-flap statement in certain Cessna Pilot's Operating Handbooks (POHs), a parenthetical aside to a discussion of fires in flight and emergency descents, led to yet more reader comment this week. Michael Szczepanski writes:

> Ok, I promised myself I'd let it go, but I think it is worth the time to work at chipping away aviation "old wives' tales." One of those is that there might be control issues with full flaps in a slip in a Cessna. I dug out the book and scanned the page that addresses this and attached it to this message. It is important to observe the difference between "limitations" and advisories. Limitations generally carry the force of law - you can't operate an aircraft contrary to its limitations. The book just advises that you might notice an oscillation.
>
> The bottom line, from the manufacturer: "If flap settings greater than 20° are used in sideslips with full rudder deflection, some elevator oscillation may be felt at normal approach speeds. However, this does not affect control of the airplane."
>
> I teach students to be aware of the possibility of the oscillation, but to slip away when needed.

Thanks, Michael. Another reader, a test pilot/CFI/pilot examiner who must remain anonymous because his comments have not been cleared by his employer, provides the definitive answer:

> In response to the "limitation" for full flap slips: The problem showed up on airplanes with 40 degree flaps and the problem manifested itself as pitch pulsing. This is not a significant safety problem but does not meet the certification criteria. The 150/152, 172, and 182 all have the problem. The problem is worst with older airplanes that the smaller horizontal stabilizers.
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> Some airplanes do have a strict Limitation [against slips with flaps extended], but most just have a

> recommendation. Consult your POH, Owner's manual, or placard to see which it is [for the airplane you fly]. If the word "prohibited" is in the handbook/placard then it is a Limitation. If you see the words "avoid slips" or "not recommended", these are not limitations, but recommendations.
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> When pitch pulsing occurs it means you have an airflow separation on the tail. I highly recommend that you don't ignore such events and reduce the slip, reduce the flaps, or both. In all cases, if the reason for the slip was because of a mismanagement of altitude or airspeed (and it happens to all of us), then I highly recommend a go-around instead.

Thank you, reader!

What happened to the basics?

What you learn early in training, and what those of you who are instructors are charged with teaching and covering in ratings, proficiency training and flight reviews, is vital no matter what or how long you fly. This recent event adds to the growing list of air carrier accidents that point to a possible failure to convey and understand the basics of aviating as a critical component of airmanship. The Boeing 737 Flight Officer was "not trained" to recover from a straight-ahead dive?

Remember this and other big-airplane incidents, and remember that no matter how bright and shiny your new panel or how high-performing the aircraft, all pilots need to acquire and maintain instinctive, and *correct*, responses to conditions like unusual attitudes, high angles of attack, strong runway-environment winds and airfoils contaminated with ice.

See http://news.blogs.cnn.com/2010/11/30/report-co-pilot-moved-seat-sent-jetliner-plumetting/?hpt=C2

More free training

Pilot Workshops LLC is offering a free, 20-minute audio program entitled "In-Flight Emergencies" Engine Failures." I just learned of it as I was finalizing this week's *FLYING LESSONS*, but I'll be reviewing this and some other Pilot Workshops online training in the near future, and reviewing them here at Pilot Workshop's request. Have you listened? Let us hear what you think at mastery.flight.training@cox.net.

See http://pilotworkshop.com/audio

Guest Editorial

Reader Dave Dewhirst's Sabris Aviation provides aircraft purchase consultation and initial pilot services, mainly in high-performance singles and light- to medium-twins. Although *FLYING LESSONS* doesn't usually attempt to describe the causes of a specific accident, Dave feels strongly about a recent, high-profile crash, and sent his opinion:

> Tom:
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> I was in Vero Beach two weeks ago when this accident happened. It really shook up the people in the area. Three students and one instructor from the flight school had flown to the Bahamas for the day. This was the return trip. The details of the accident make me mad enough to pound the desk. I have added the preliminary report at the bottom. Here are the relevant parts.
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> > On November 11, 2010, at 1805 (local) time, a Piper PA-44-180 [Seminole light twin] collided nose down…shortly after takeoff from runway 10R at the Palm Beach International Airport (PBI), West Palm Beach, Florida. The training flight was operated under Part 141, with a visual flight rules (VFR) flight plan filed. The certificated flight instructor (CFI), a certificated commercial pilot and 2 passengers were killed, and the airplane was destroyed. There was a post crash fire. The airplane was departing at the time of the accident, enroute to Melbourne, Florida (MLB).
> >
> > According to…Air Traffic Control…, a female voice, later determined to be the CFI, transmitted during initial climb that they had an engine failure and "needed to turn-around and land." The controller cleared the flight to land "any runway" and there was no further communications with the flight.

> A security video…showed the accident airplane taking off from runway 10R. The video was of poor quality due to the lights glaring into the camera from the main terminal. All that was viewable was the airplane's rotating beacon as it climbed and then start[ed] a slow turn to the left. The accident airplane continued to turn left until a large explosion was observed.
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> The left wing remained attached to the fuselage. Inboard of the engine nacelle received fire damage. Outboard of the engine nacelle had no major damage. The main gear was down and locked and had impact and fire damage. The fuel cap was in-place and fuel, blue in color, remained in the fuel tank. The left fuel system fuel lines were all free from blockage. No fuel was found from the fuel selector valve forward to the engine driven fuel pump. The electric fuel pump was removed. The screen was free from blockage and no fuel was observed. The pump was field tested by applying battery power and water in the inlet. The pump operated and the water place in the inlet was observed pumping out of the outlet. **The left fuel lever was found in the off position** [emphasis added by Mr. Dewhirst], one inch aft of the forward stop.
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> We teach instructors to consider that the student may be trying to kill [them] and to constantly monitor what is going on. We teach to check the five killer items - three fuel items, flaps, and trim - just before rolling past the hold-short lines for takeoff. There were three certificated pilots and one flight instructor in the airplane. No one noticed that someone apparently kicked the fuel selector while getting in or out of the airplane. That is likely [to be] what happened because the selector was not placed totally in the OFF position as if someone had positioned it there [intentionally]. It was on just enough to allow engine start and taxi. The only other explanation is that someone moved the selector to OFF for some reason just before the takeoff roll, and that is unlikely.
>
> We also teach that an engine failure with runway remaining allows for landing on the remaining runway. At the time of the engine failure the airplane had 4000 feet of runway directly ahead and [another runway] 8000 feet [long] ahead and 400 feet to the left. The gear was still down. The correct action would have been to close both throttles, lower the flaps and land on whatever is ahead.
>
> Sad. Four really nice kids died.

Thanks, Dave. Look at the Accelerate/Go and Climb—Single Engine charts for most piston twins, and you'll find that at or near maximum gross weight there is little or no climb ability in warm weather, even at or near sea level. As a former piston-twin simulator (actually, Flight Training Device, or FTD) instructor, I spent much of my time showing pilots what (and what not) a light twin is capable of with asymmetric engine power. With the gear down, the rate of deceleration is extremely rapid if the pilot attempts to continue to climb. Airspeed is life when an engine's out in a twin.

My multiengine students learn to quietly recite, but seriously consider, a brief refresher when lining up for each takeoff:

> "If the gear is down, we're going down; if the gear is up, three degrees up."

The first part reminds the pilot that any loss of engine power before gear retraction must be met with an immediate chop of *both* throttles and a push forward on the controls to remove the asymmetric power conditions and maintain enough speed to make a controlled landing on whatever is straight ahead. The second part reinforces the pitch attitude needed to maintain "blue line" airspeed in many light twins with the gear and flaps up and the failed engine's propeller still windmilling. Hit this attitude any you'll have enough airspeed for control, and the best possible climb performance (most likely, the least rate of descent) while you identify the failure and shut down the dead engine's propeller.

Ultimately it's checklists (written or memory), flow patterns and standard operating procedures that can save us from what *FLYING LESSONS* reader Rod Machado calls "the little things" that can add up to a catastrophe. Using After Start, Before Takeoff and a quick, practiced Takeoff—Final Items check like Dave suggests would probably have made this tragedy instead an unforgettably enjoyable experience for the four students of flight.

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
