FLYING LESSONS for June 9, 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:

It reads like five to seven other FAA preliminary accident reports each week. The aircraft landed gear up. The solo pilot was unhurt and aircraft damage was minor. Weather: good VMC.

What's different in this case, however, is that the airplane wasn't a retractable piston single or light twin. It was an almost new, twin-engine turboprop.

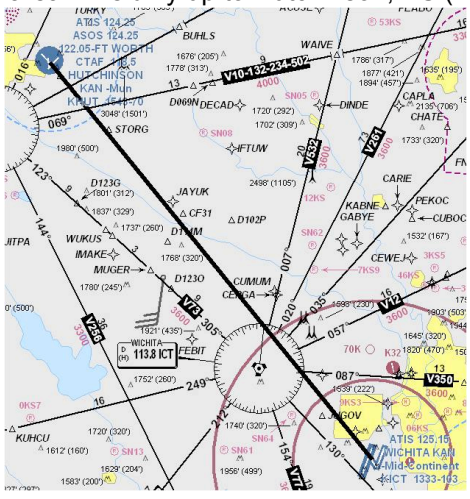
And the pilot defied the stereotype, too. Not a low-timer at all, he has over 35,000 hours in his logbook, including over 150 trans-ocean delivery flights.

So what happened? According to the *FLYING LESSONS* reader who reported this event, the airplane was being prepared for delivery to South America. The ferry pilot made a short hop of about 10 miles to get to an airport with a lower price for its fuel—a hop that ended in skidding the airplane on its belly.

It's not just the low-time pilots or pilots new to a particular type of airplane who land gear up, or mis-manage fuel tank selection, or read an altimeter or an instrument approach chart wrong, or make any of dozens of other possible procedural errors that can lead to mishaps. It happens to high-time professionals too, which serves to remind us that *it really can happen to anyone*. Expect that you'll sometimes miss a checklist step, so always double-check your actions…and triple-check the actions with the greatest adverse outcome if missed.

The shortest hops, too, can sometimes be the riskiest. Especially if we fly higher-performance, cross-country airplanes, we're used to a flurry of activity at takeoff and climbout, with a long period to prepare ourselves for approach and landing on the other end. If the en route phase is very short we can find ourselves behind the airplane, more likely to forget something that might be vital.

I used to demonstrate this to students flying Beech Bonanzas and Barons in the Wichita area. We'd fly up to Hutchinson, KS (KHUT), ending the session with an ILS 13 or LOC-BC 31 depending on winds. After a full stop landing we'd then depart and go directly to Wichita…a 13-minute flight in one of these airplanes. During the flight the pilot would need to make three comm frequency changes, set up for and brief the ILS 1R or LOC-BC 19L into KICT, comply with ATC requirements and fly the airplane…making for a *very* busy, short flight. Compounding the issue was the fact that the localizer frequency at KHUT (which would have been dialed on departure) is 110.1, while the localizer at KICT is 110.*3*. Especially in the days before approach selection from a GPS database, it was very common that the pilot would scan and think he/she had the correct localizer frequency dialed in. Ah, something else to do on that 13-minute flight…tune **and identify** the localizer frequency.



The *FLYING LESSON* was to do as much as possible before ever taking off on a short hop, to reduce workload later on. Review the anticipated approach chart for destination. Call the destination airport ATIS on your phone so you know what runway and approach to expect, and any other information that will affect your arrival. Get all your charts out and available before you leave the ground, and tune any frequencies you can into the back-up or standby positions. Once aloft, use checklists to back up your actions, to make sure you've not forgotten anything. Use an autopilot if you have one, but watch for input errors you may make in the rush, and be ready to take over manually at any time. And always, focus on the critical items like approach set-up, basic aircraft control, and configurations management (including, as applicable, the position of landing gear) that ultimately determine a safe conclusion to the flight.

It's easy to mentally disregard planning for a short hop when it involves positioning the airplane for the "real flight." Who would spend a lot of time thinking about a 10-mile hop that is the first step of an intercontinental delivery flight? Well, we all should…because as this week's event shows, failing to put the appropriate thought into the positioning flight may mean the "real" mission doesn't get accomplished at all.

Put another way, from a planning and mental preparation standpoint, there is no such thing as a short flight. Every trip is a takeoff, a climb, an approach and landing, requiring mental focus. In most cases we have an en route "breathing period" in between, but not always. So plan for each phase of the flight, and be ready to move on to the next phase before allowing yourself to fly into that realm. It *can* happen to anyone…including me, and you.

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

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Debrief: Readers write about recent *FLYING LESSONS:*

Last week's *LESSONS* centered on in-flight fire procedures. Electrical fires, of course, often pop circuit breakers before they become a full-blown fire. Conventional wisdom has been to let the breaker cool for a minute or two, then try one reset. If the condition that tripped the breaker was transient, the breaker should remain set and you can continue the flight as though the breaker never popped, according to the wisdom. Trouble is, this technique can feed a building fire wioth more amperage, which is the fuel of an electrical fire.

As a result a couple years ago the U.S. Federal Aviation Administration revised Special Airworthiness Information Bulletin (SAIB) CE-10-11 to incorporate comments FAA received in response to its initial publication. Since this SAIB apparently did not receive wide coverage, it's valid to repeat it here in the context of *FLYING LESSONS* about in-flight fires.

Prior guidance was to reset circuit breakers after allowing a cool-down period, and to reset a breaker only once. The revised FAA recommendation is to reset breakers *only if the affected electrical equipment is essential to complete the flight*, and then to attempt one reset only after a cool-down period *and* if no unusual heat or burning smell is evident. Any breaker found to be tripped before takeoff should not be reset until the cause is determined and addressed.

FAA issues SAIBs for situations it says affect safety but do not warrant issuance of an Airworthiness Directive. SAIB recommendations are therefore advisory but not mandatory.

See http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgSAIB.nsf/0/533F00940DE268AB862576AB0059B26A?OpenDocument&Highlight=ce-10-11

Reader Mark Briggs continues the discussion about in-flight fires:

> Your points made concerning in-flight fire training are, as usual, excellent. I believe *FLYING LESSONS* readers would benefit from adding another important point to the discussion. The importance of selecting the right *type* of extinguisher was recently driven home by an excellent write-up in the discussion forums frequented by builders of Vans homebuilt aircraft, *Vansairforce.com*. The article was authored by a builder/pilot who experienced an in-flight fire in his 4-place RV-10 aircraft. He kept his head screwed on during the emergency, did everything by the book and landed without injury to himself or others.
>
> One of the items on his memorized emergency checklist was to discharge the on-board fire extinguisher after the sources of fuel (gas and electricity) had been turned off. He did this and immediately found himself in IFR conditions... INSIDE THE COCKPIT! His extinguisher was of the dry powder chemical type, and its discharge in the cockpit resulted in an impenetrable zero-zero whiteout condition. Luckily he was able to jettison the entry door and quickly clear the air without losing control of the aircraft.
>
> The lesson to be learned from this bad news / good news story is that dry chemical extinguishers which are fitted to most aircraft are going to produce zero visibility conditions when discharged inside the aircraft. For a small incremental cost a Halon extinguisher introduces very substantial safety benefits. Just remember that Halon extinguishers should be maintained in accordance with their manufacturer's instructions. While they are often equipped with pressure indicator gauges, most manufacturers indicate their Halon extinguishers should be weighed at annual inspection time to ensure accurate determination of the extinguishers state of charge.
>
> Keep up the great focus on safety!

Reader and frequent Debriefer Jim Herd adds:

> I am moved to write on several issues in *FLYING LESSONS* this week, and unfortunately I must be controversial in all cases!
>
> In-flight Fires
> I read the referenced FAA material on combating airplane fires and I found it wanting. It seemed targeted at an entirely different segment of aviation and therefore largely not applicable. And of course it is written in typical government "long hand". I carry a small aviation-style fire extinguisher but I need model-specific guidance. In my Bonanza A36, if I had an undetermined avionics fire, where should I point the fire extinguisher for maximum effect behind the panel? Secondly, where are the few most likely locations for a fire to break out? And what specific instructions are appropriate for each location? I suspect the SOP would be quite different between a panel fire and say an engine fire. I realize this newsletter is not model specific, but perhaps there are general guidelines that are widely applicable to our segment of aviation. And I would urge Tom Turner to suggest each type club should directly address this issue for their members.

Will do…Jim continues:

> Dry Fuel Tanks
> I run a tank dry on my Bonanza on a fairly regular basis – as is encouraged by the good folks at "Advanced Pilot Seminars", Ada, Oklahoma. It is entirely benign, as they said it would be, and it has a variety of benefits that I find very valuable. In my A36TN Bonanza I have a theoretical 80 gallons with 74 being officially "usable". However, in reality I have 80.3 usable in straight and level flight, and I know this because I have run each tank dry on separate flights and filled to the top after landing. But the benefits are far greater than the 6 gallons I have been hauling around for years and didn't know I could use. There is huge benefit in being able to calibrate the fuel gauges and have confidence where it matters most – empty. There is also huge benefit in having all my fuel in one tank for the final stages of a long flight. And of course I'm not leaving a few gallons in the other tank for fear of "running it dry".
>
> Here are my numbers: 80 gallons usable, so with a half hour reserve (8 gallons) and one empty tank, this is about 72 gallons for endurance. The math for not risking a dry tank is this: 74 gallons usable, with say 5 lost in a tank because we don't want to risk running it dry, and 5 gallons "untouchable" in the tank on which we plan to land. Then 8 gallons for the half hour reserve. So we then have just 56 gallons for endurance! Difference – 18 gallons usable, or one hour endurance! This is huge. In fact, it allowed me avoided a $15,000 expense for adding tip tanks along with my turbo-normalizer! After 18 months I am very happy with my decision.
>
> Bottom line – it's not about being a brinks-man with fuel! It is about precise knowledge of your fuel, then you can place whatever safety margin in place that makes you feel happy. And you can relax in cruise with full knowledge of when that first tank will run dry, and knowing you then have all fuel in one tank with no further need to juggle. Oh, and running dry is really an anti-climax –no big deal, as long as you have fuel in another tank. Of course, this won't work for aircraft with just one tank feeding each engine or two tanks that feed one engine simultaneously.

Well first, the record shows that the engine does not always re-light when you switch fuel tanks after draining one completely dry. Not having something happen to you (yet) does not mean it cannot or does not happen. Second, I did not say anything about published unusable fuel levels, what I wrote was to switch tanks before the tank in use goes completely dry. One argument used by many pilots who drain tanks completely is that they can tell within a minute or two when the engine will starve for fuel and quit. My response is that if you can plan that precisely, you can switch tanks a minute or two before the tank goes dry and get maximum range without a pilot-induced engine failure that will *probably* be a non-event. Of course, the choice is always yours.

See www.thomaspturner.net/Fuel.htm.

Jim concludes:

Aviation Safety
It was kinda depressing reading your contributor relate how the potential for improving safety in any significant way is all but a lost cause. I have a much different view. I think there is a huge potential to greatly improve aviation safety, and particularly with small singles and twins. The catch is this – the entire industry may not be willing to do what it will take. Here are some examples – will the industry do these things?

1. Separate and define the "critical few" from the "trivial many". It is the critical few that kill people, whereas the trivial many will just get you an instruction to "call the tower on a land line upon landing" or an FAA letter. Meanwhile, the FARs seem to operate on the principle that more is better, so instructors and the entire industry follows suit.
2. Instructors should train pilots on the "critical few" by creating "significant emotional events" – we all learn a lesson most unforgettably when we are scared half to death. I realize it would cause a portion of student pilots to quit, but perhaps those folks don't belong in a left seat anyway!
3. Trim down all our checklists – they were surely written by lawyers. For example, I used to use GUMPS (gas, undercarriage, mixture, prop, speed) on short final, but now I use FUS (flaps, undercarriage, speed). I see no value in distracting myself in the most critical of flight phases by checking fuel, mixture, and prop – they got me to where I can just about land no matter what is the state of any of them. If I need a go-around I have fully trained myself – Mixture, Propeller, Throttle! Some of my other checklists can easily be trimmed by up to half!

FLYING LESSONS is doing a great job of addressing another major step forward in aviation safety – that is to look at the top ten killers and determine what it will take to eradicate each from the list. Of course, *FLYING LESSONS* has no authority to implement anything industry-wide, but the industry could do it.

What is needed here is an attitude change! Instead of stressing over ruffled feathers or not being politically correct, we all need to view safety as if the lives of every one of our loved ones were directly in jeopardy from every single one of the top killers. Wouldn't we all then move mountains? It's not that different that President Kennedy deciding we would place a man on the moon.

Controversial, perhaps, Jim, but spirited, and full of great ideas for making real progress toward reducing the fatal accident rate. I don't have nearly as much time as I'd like to focus on this crusade (if any *FLYING LESSONS* reader wants to contribute $1 million to Mastery Flight Training so I can address this full-time, just let me know <g>). Regardless, I'll try to incorporate some of your ideas, especially about checklists and focusing on the "critical few." Thanks!

Reader Charles Lloyd, a former aircraft factory sales pilot and fractional jet crewmember and captain, also responds to a reader's lament that we have reached a limit on our ability to improve the fatal accident rate, that any more programs or safety campaigns will have little additional success because we've reached a point of diminishing returns. Charles relates his idea:

From last week's writer – "Even when we compare GA to airline flying, or corporate flying, we are comparing apples to oranges. Professional crews are bludgeoned into conformity."

I respectfully disagree. Professional crews use Standard Operating Procedures [SOPs] and adhere to the words written in Operation Manuals to enhance safety. Airlines, charter and fractional operators sit down in a quiet conference rooms and offices and document what to do based on common sense and past fatal mistakes. Then they write it all up and put it in a big book called an Operations Manual ["Ops Manual"].

In GA we are a group of rugged individualist who have general guidelines and many times solve situations on the spot in the air when the results might not come out the way we want due to a "Chain of Events." Maybe we can learn a lesson from the professionals.

Randy Babbitt, FAA Administrator, told the CFIs at the recent at the CFI Summit held in Atlanta that he is not satisfied with the GA safety record. It is not trending down. To me that means we need to try new ideas. I created an Operations Manual for my GA flying based on experience with the safety culture and Ops Manual at a major fractional operator. It is smaller and simpler but achieves the same goal – safe decisions.

We *can* change the GA culture to become more structured by thinking through on the ground how to fly in a safer manner. CFIs can start the process with scenario-based questions with their students.

Here is a scenario number 1. You plan to start a flying vacation at 5 o'clock at the end of your workday. You have two hours to leave work pick up the family, get to the airport, and start on your four-hour flight to the seaside resort. This will be a 14-hour duty day from the start of work until you land at an unfamiliar airport after sunset. All the flying responsibilities are yours and there is no one to help with the flying or decisions. You need to be at your best for the landing when actually you will most probably be fatigued. Note: professional aviation studies show the correlation that the risk of accidents starts in increase after 10 hours duty and steadily increases until somewhere between 12 and 13 hours the risk increases dramatically.

Start thinking about what will be the maximum *duty day*. A major fractional operator has a max 14-hour duty day. Is the scenario above a reasonable way to start a vacation, or will you be better off starting early the next morning? Don't forget to include time spent at the office before flying. Maybe a 12-hour duty day is more prudent for you under this situation. Twelve hours is my GA maximum duty day.

Second, what is the shortest runway you will use for dry and wet conditions for specific type aircraft you fly? Summer time and departing a 1,800 grass field at max gross weight is a no brainer [in almost all airplanes]. Don't do it.

Third, aircraft do not have *range*, they have *endurance*. What is the time when you will be on the ground, even if you are 50 miles from your destination? Sometimes it may be better to split the trip in two equal parts to avoid this temptation.

Fourth, match your current experience with the aircraft and weather conditions for your flights.

Fifth, what equipment is an absolute for what conditions? For example, flying single-pilot IFR without an autopilot is a demanding task. Do you have a time limit on this type operation, and under what IMC conditions? For example, Cessna Citation single-pilot operations require a functioning autopilot, period. [So do most Part 135 commercial operations, even in single-engine piston airplanes].

Sixth, define time intervals for specific recurrent training.

Seventh, set up a personal tracking and dispatch system with someone you respect. This person does not necessarily need to be a pilot. This person will know you and what you plan to do. They can be invaluable in helping with dispatch decision-making. My wife plays an outstanding role as my dispatcher with whom I can discuss a planned trip.

Add any other thought you have, and be sure to write them down. It is *your* safety that is at risk without preplanned parameters. It is like aircraft limitations: don't push outside your own envelope.

Now sit down at your Personal Computer; write a paragraph defining each of these steps and place them in a three ring binder. Congratulations, you have just published your Personal Operations Manual (POM). Take these words seriously. They will help you make the right decisions with faced with these situations in the air. After writing your "Rules To Live By" it is harder to fudge and say, "aw just this one time I think I can make it."

It is not that hard to add this level of safety to your personal flying or to teach it to others.

Thanks, Charles. Reader William Castaldo continues on the theme of risk management:

In evaluating GA safety, most studies consider risk in terms of events (e.g. fatalities) per 100,000 passenger-miles. While not without value, this measure is not particularly relevant to the comparison between different types of vehicles. Safety is certainly improved by using the appropriate type of vehicle for the mission at hand. But to restrict my comments to GA vs. commercial aviation, one would not reasonably use and airliner to go 200 miles, nor a lightplane to go 10,000. Time considerations aside, more than 85% of aircraft accidents that result in injury occur during departure or approach and landing. Therefore, it may be most reasonable to consider risk of injury per passenger-flight rather than passenger miles.

> I have made this calculation many times. For me it works out that a GA aircraft, flying IFR, has very nearly the same rate of fatalities per 100,000 passenger-*trips* as does commercial aviation. In the circumstance where the GA flight is non-stop and the commercial trip to the same destination has 2 or more legs, the GA trip appears to be safer.
>
> I would be honored to know your thoughts.

Thanks, William. I've not yet had time to get into the research needed behind this question. I will point, however, to a classic but then-groundbreaking interview of King Schools' John King that appeared in *FLYING* magazine in 2001. Entitled "The Big Lie," King's interview concludes that flying a light airplane is more dangerous compared to most forms of transport. "The big lie," by the way, is telling ourselves and our passengers that the most dangerous part of a general aviation flight is the drive to and from the airport. Having researched the relative hazard in depth, King concludes that "we are doing ourselves a grave disservice by looking at flight as a potentially safe activity. By denying the fact that general aviation flying is a risky activity-even if performed by intelligent, capable, achieving people- …we hamper our ability to manage or reduce the risks we face every time we take an airplane into the sky. What's needed in order to reduce that accident rate, according to King, is nothing short of a cultural attitude change that recognizes and acknowledges the risks inherent in all small airplane flying and encourages a more careful, conservative approach to managing that risk as best we can…. You're seven times more likely to have a fatality in a general aviation (GA) airplane than you are in a car, per mile. People say, well, per hour is what counts, so, okay, say 3 1/2 times as likely, because an airplane is twice as fast. The point is, you're more likely to have a fatality in a GA airplane than in a car, traveling the same distance. Airlines, on the other hand, are 49 times safer than GA per mile. So cars are seven times more dangerous than airlines. So where that old song came from are the airlines. The airlines have a phenomenal safety record. They have turbine equipment they're flying standardized routes, with more than one pilot, dispatchers to help them out, etc. That's why they're safe. General aviation planes don't meet that record. A [Beech] Bonanza does not have the same kind of guarantees that come with a transport category aircraft."

See www.kingschools.com/news/BigLie.htm

AVweb editor Paul Bertorelli (yes, a *FLYING LESSONS* reader) warns, however, that this culture shift is going to be difficult precisely because we have addressed most of the risks, and are left with the harder issues of pilot attitude that lead to crashes. As Paul puts it, there's no "low hangin fruit" to pick that will solve the issue. Hampering the effort, he writes, is the fact that much of the NTSB data we use to draw conclusions is very difficult to interpret. Read Paul's blog on Reducing Fatal Accidents.

See www.avweb.com/blogs/insider/AVwebInsider_FatalAccidentReview_204750-1.html

Readers, what's *your* opinion? Tell us at mastery.flight.training@cox.net.

We've begun a close look at the sixth most common cause of fatal general aviation accidents, according to the FAA: stalls on initial climb. Last week I asked readers to review these accident scenarios and address one or more in light of 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

Reader David Heberling, who has done significant work on the Top 10 project since we began in January, wrote about Cause #6 as well. Says David:

Scenario #1: It is impossible to know if any alcoholic beverages were consumed during the dinner as any evidence burned up during the post crash fire. It takes a lot of discipline to abstain from having a drink with dinner if your dinner mates are. The pilot obviously did a successful take off from his home airport. The load he was carrying was probably more than he was used to, but he handled it well enough on the first take off. If he did not add any fuel at the second airport, he was actually lighter for that second take off. So, what changed?

It is possible that the second runway was a different size than he was used to. It is easy to get conditioned to expect lift off at a certain point on the runway at your home airport. When using a smaller runway, it can cause you to rotate early. If the airplane was a new type for him, this could also be a factor.

Scenario #3: What is it about flight instructors???!!! They are supposed to take over **BEFORE** things get too out of hand. I can understand not wanting to fly the airplane for the student, but self-preservation has to be the number one rule. The trouble is, you have to take over by *anticipating* what the airplane *will* be doing, not when it is doing it. Any bank over 30 degrees in the pattern is time for a sharp reprimand, followed by a take over if voice commands are not followed **immediately**. There is no excuse for such an event to happen with an instructor onboard. My advice to any instructor is to know how far you will let any maneuver go before you take over. Close to the ground, tolerances have to be tighter and the trigger pulled sooner.

I was flying with a student doing touch and goes. On a particular landing attempt, he was not in a position to land. I waited until it was obvious and when he did not abort the landing, I told him to do so. His response was to immediately dump the flaps (Cherokee 140, Johnson bar to the floor from the full flaps position), then add full power. We were on the express elevator down to the ground floor. I immediately took over, yanked the flaps [up] to second notch, shoved the nose down to gain speed and eventually climbed away from the grass beside the runway. Sometimes, you just cannot talk fast enough and have to take matters in hand.

Scenario #4: This looks like a stunt gone bad. Everyone who has done this (yes, I have, years ago) likes it because of the sense of speed you get. Plus the zoom climb is pretty cool. However, you have to anticipate the push over into level flight and lead the pitch over. If you wait until the last possible moment before the stall, it is too late. So, this is someone who ran out of airspeed and ideas at the same time. In the airline world, we are sometimes asked by ATC to "expedite" our climb. Even though an airliner is an aerial truck, you can still trade speed for altitude without the passengers noticing anything unusual. If our normal climb is 300 kts, we can usually take it all the way down to about 210 kts in trade for a phenomenal climb rate. The shorter the climb, the higher the climb rate. At any rate, you have to reign in the climb rate as you pass 250 kts and start the acceleration process. It obviously does not take a small airplane as long to accelerate back to a normal climb speed as an airliner does. But it does take planning.

In all of these scenarios, it seems that pilots have lost the mental picture of what normal climb pitch looks like. What I mean is where the nose of the airplane is in relation to the horizon. Forget about all that fancy glass stuff or even the airspeed indicator. Look out the window and see what the nose of the airplane is doing. If you do that often enough, you will never be phased by a loss of pitot static instruments. Barry Schiff has a great column in this month's *AOPA Pilot* magazine on this very subject (flying by what you see outside).

The zoom climb could be done at altitude, just to see what the student does to recover from the extreme pitch up. The only take off that comes close to simulating a too soon rotation is the soft field take off. It is also one of the most fun if done properly. Of course it can be a real nail biter for the person in the right seat, including flight instructors. To do a proper soft field take off, you have to feel what the airplane is doing. Nothing on the instrument panel will help you do the take off. All of your attention is outside. The seat of your pants is what tells you the aircraft is airborne. You are in the slow zone. You start by sucking the stick all the way back into your gut, then cobbing the power. Now you hang on for all you are worth. You will be amazed at how early the airplane will unstick from the runway. Do not let it climb! The trick is to ease off on the back pressure on the stick, only enough to keep the airplane suspended above the runway but accelerating. It is a major faux pas to contact the runway again. On a real soft field, this would suck you back down to the ground. Once you have the nose down to normal take off attitude, you can climb out at Vx for an obstacle, or Vy if no obstacle.

It is a thing of beauty when done properly. Heck, they even do this with every new model of airliner during certification. It is called minimum unstick speed or Vmu. They weld a steel plate to the tail to protect it during this extreme maneuver. Pretty cool.

I guess my solution to the stall/spin scenario is to get the student familiar with the slow side of the airspeed indicator or the yellow zone on the AOA. It also needs to be refreshed from time to time to keep familiar with it. Without that

familiarity, a pilot will not know what to do when confronted with a high pitch attitude. Once the airplane starts going downhill, ground rush will keep the pilot from having the presence of mind to push the stick forward to regain flying speed.

Thanks, David. Readers, let's keep the momentum going. Take another look at the eight scenarios and answer this one question: **What role, if any, might airplane weight and/or center of gravity location have played in one or more of the scenarios?**

Send your insights and suggestions to mastery.flight.training@cox.net. Thanks!

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

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
