

Thomas P. Turner's Mastery of Flight

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FLYING LESSONS for September 7, 2023

FLYING LESSONS uses recent mishap reports to consider what *might* have contributed to accidents, so you can make better decisions if you face similar circumstances. In most cases design characteristics of a specific airplane have little direct bearing on the possible causes of aircraft accidents—but knowing how your airplane's systems respond can make the difference in your success as the scenario unfolds. So apply these *FLYING LESSONS* to the specific 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.**

FLYING LESSONS is an independent product of MASTERY FLIGHT TRAINING, INC. www.mastery-flight-training.com

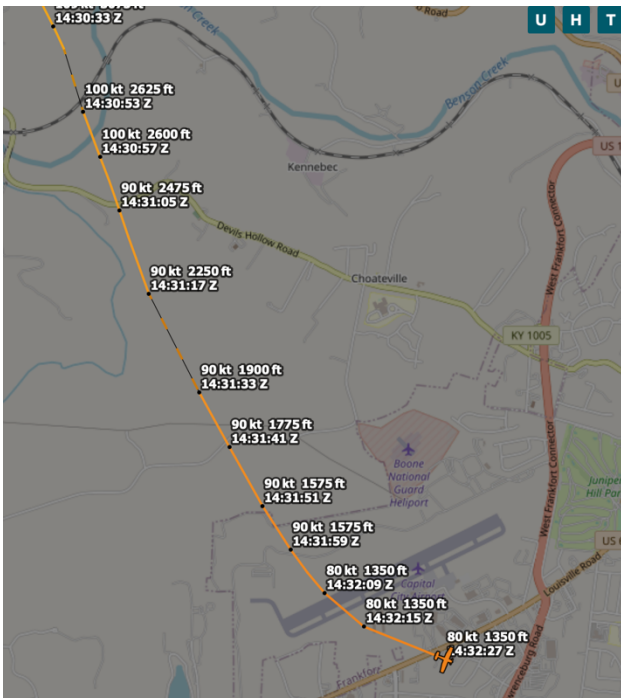
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This week's LESSONS:

From an FAA preliminary report:

A Beech A36 Bonanza “landed gear up and struck a taxiway light” at Frankfort, Kentucky. The three aboard have “unknown” injuries and the airplane “unknown” damage.

Another in a long line of gear-up landings, right? Or was it more than it seems? The Flight



Safety Foundation's [Aviation Safety Network](#) uses hard data to paint a completely different picture—literally. A depiction of the airplane's descent, from [ADS-B data](#), sure *looks* like an engine-out glide.

(left) ADS-B plot of the airplane's descent

Ground speed is consistent with an A36's Best Glide speed of 110 knots and slowing to the Landing Without Power speed of 83 knots as the airplane neared Frankfort Capital City Airport's 812 feet MSL field elevation. Time and altitude stamps on the depiction are consistent with an A36's 700-900 feet per minute rate of descent in the Best Glide configuration.

Further, a [news report](#) states “the pilot was able to land the plane on its belly in the grass at the airport.”

What at first looks like a report of a landing gone wrong—a pilot forgetting to

extend the landing gear and the airplane sliding out of control into taxiway lights after touchdown—now looks like an **engine failure handled masterfully** to a survivable landing at a location where rescue was quick at hand.

In fact, [flight radar records](#) show the Bonanza was enroute from Indiana to South Carolina when it diverted to Frankfort from cruise flight at 7000 feet about two minutes before the

beginning of the ADS-B plot at 2625 feet—supporting the engine failure thesis. Although local news reports one of the four aboard was transported to a hospital “with non-life threatening injuries,” the [ASN report](#) adds that “the pilot and passengers were not injured.” Either way, **well done, pilot!**

See:

<https://aviation-safety.net/wikibase/345233>

<https://globe.adsbexchange.com/?icao=a00203&lat=38.192&lon=-84.917&zoom=14.1&showTrace=2023-09-04&trackLabels>

<https://www.wlky.com/article/plane-emergency-belly-landing-frankfort-airport-kentucky/44992062#>

<https://www.flightradar24.com/data/aircraft/n1wn#31e1f6dd>

Two days earlier a similar event ended differently. Also from FAA preliminaries and the [ASN](#):

[A Beech V35 Bonanza] “experienced engine issues during...flight and landed in a field, flipping over. [The aircraft] sustained substantial damage....”

Happily the two aboard escaped injury.

See <https://aviation-safety.net/wikibase/345271>

We don't know yet, but if I had to guess the second airplane touched down with its landing gear extended. Assuming a pilot landing off-runway touches down **wings level, under control at the slowest safe speed**, it would be extremely hard to flip an airplane over if its landing gear was up.

One of the most common questions I get from pilots when the topic of engine failures comes up (realizing I teach in retractable gear airplanes) is: **“If making an off-airport landing, is it better to put the landing gear down or leave it up?”** Pilot's Operating Handbooks (POHs) for the models of airplane I fly say:

The use of landing gear is dependent on the terrain where landing must be made.

In other words, it's a judgment call...one you'd have to make quickly under extreme duress in the last moments before touchdown after experiencing engine failure in flight.

Bold Method recently posted [“How to Pick an Off-Airport Landing Site If Your Engine Fails.”](#) It includes this advice:

If you're touching down on something soft, like a plowed field, landing with your gear down means there's a reasonable chance your gear will dig into the dirt and flip your plane. So if you're faced with a soft field in a retractable gear plane, intentionally landing with your gear up might mean you'll have a slower deceleration. But if you're landing on a hard surface, putting your gear down helps cushion your touchdown, as well as decelerate your plane all the way to a complete stop.

It's still a last-minute decision based on evaluating the landing surface from pattern altitude or less when you've got a whole lot else going on. Can you accurately judge the condition of the ground from 1000 feet above ground level? Can you see rocks and ditches and gopher holes in a field of crops or tall grass?

See <https://www.boldmethod.com/learn-to-fly/navigation/if-your-engine-fails-how-to-pick-your-off-field-landing-on-a-spot/>

For many years I followed the pack, suggesting the gear should be down except in water or on very wet surfaces. At the very least, the old line goes, the gear will absorb some of the shock of landing, and if it tears off it will lessen the final force of impact. **But that doesn't account** for the likelihood that, if the extended gear hits a rock or log, or drops into a hole or ditch, that could stop the airplane suddenly and increase the stress on aircraft occupants. And it ignores that any of these scenarios makes it likely the airplane will flip over, **a much more dangerous situation** for those on board. I stopped making this suggestion long ago.

From there I moved to repeating a rather insightful suggestion I read somewhere: if the surface is something you think you can take off from again put the gear down, if not leave the gear up. **The problem with this idea** is that you still need to make an almost snap decision with

limited information under extreme duress at nearly the last moment. And there's still the hazard of flipping over.

My personal view now is that **the default engine-out landing configuration in retractable gear airplanes should be gear up**, unless you're landing on a prepared runway surface (paved or otherwise). You might consider this **sacrificing the airplane to protect those aboard**...and that's a valid consideration.

Supporting this is a personal experience from my very first flight in a Beech Bonanza. My instructor simulated an engine failure at altitude almost directly over a paved, rural airport. I did my best impression of the Commercial Pilot "steep spiral" maneuver, gliding down toward the runway. Turning onto a close-in final, knowing I had the runway made, I did what comes natural next: I extended the landing gear. The drag of the gear increases rate of descent by about 500 feet per minute at glide speed in a Bonanza; it was immediately obvious I would no longer make it to the runway.

We powered up and went around. But in an actual engine-out glide that's not an option. This may explain why so many airplanes come up a quarter of a mile short of their intended touchdown, hit obstacles they could otherwise have cleared, or stall just short of the field trying to "stretch" a glide. Landing gear doesn't explain all these cases, but it probably accounts for a lot of them.



I learned that, if you *do* have a runway within glide distance, ***don't extend the gear until you've cleared the last obstacle*** and pretty much have the landing surface under your wings. In some airplanes that doesn't give enough time for the gear to cycle down—another reason to make a belly landing the default goal of an engine-out glide unless everything is perfect.

I know other instructors and accident investigators—some *FLYING LESSONS* readers---have independently come to similar a conclusion, because I've spoken with a few about this. Some of them may have some accident data to back up their opinion. I invite any who do to add to our discussion in the Debrief if they are so inclined.

Of course, pilots of fixed gear airplanes, aircraft with ballistic parachutes, multiengine airplanes, and aircraft in categories other than "airplane" have other considerations and in some cases other options. But for the retractable gear crowd, ***what do you think?***

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

My friends and sponsors at Pilot Workshops extend this offer to all *FLYING LESSONS* readers in all aircraft types:

	<p>Free Access to 140+ Scenarios</p> <p>Guaranteed to challenge & improve your ADM and hone your IFR knowledge.</p> <p>Click here for ABS member details</p> 
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Debrief: Readers write about recent *FLYING LESSONS*:

Reader and instructor Brian Sagi writes about last week's *LESSONS* begun by relating a scenario based on the fatal crash of a long-out-of-annual Piper Pressurized Navajo with known, critical mechanical discrepancies:

Flying an aircraft post-maintenance is a serious matter. This is double true for flying an aircraft with expired maintenance on a ferry flight. Both require a thorough preflight and an attitude of "I

am not going to fly this airplane unless I find everything to airworthy and to my satisfaction.”

Many people assume that because a mechanic just inspected the aircraft (surely true for an annual inspection, and also true for a ferry flight), they do not need to do much more than a precursory preflight. If you value your life and wish to conduct a safe flight, nothing can be further from the truth. **Mechanics are people, and [like pilots] they make mistakes.** And this does not even account for the (very small) unscrupulous members of the group who will basically sign anything. It is up to us pilots to do our best to find and correct these mistakes. **Painting ourselves into the corner of “must get the mission done” puts us in a bad position to be objective** in our assessment of the aircraft in front of us.

A couple of **suggestions for conducting a ferry flight, or a flight immediately after maintenance:**

- Assume that you will find something that will require rework before the aircraft is flyable. This way, you will not be disappointed, or want to discount, a preflight finding (e.g., leaking fuel tanks).
- Maintain an alternative way of getting back home. These days this is very easy. We can always order an Uber, buy an airline ticket to go back home, etc.
- Perform a very thorough post-maintenance or “airplane with which I am not familiar” preflight. How to conduct one is beyond the scope of this posting, although I touch on the topic in my *Twin & Turbine* article “[Respecting the Preflight](#)”. You also wrote extensively about this topic in prior *FLYING LESSONS*.
- Perform a very thorough runup.
- Brief the takeoff, including expected performance.
- Be prepared to abandon the takeoff if the aircraft is not performing as you expected.
- Weather must be perfect for the flight. It goes without saying that there will be no post-maintenance or ferry flights in IMC.
- If conducting a ferry flight in a pressurized aircraft, aim to stay at low altitudes where a loss of pressurization will not affect the outcome of the flight. Be sure to test emergency oxygen system prior to flight.

I have too many times observed pilots arrive at a shop to pick up an aircraft, step into it (sometimes accompanied by their loved ones) without as much as a walkaround and then blast off. ***After all, the mechanics just checked it, didn't they?***

A related item is that some players in aviation are unscrupulous (a small minority). I have run across a few of members of this group myself. I am wondering out loud if the owner of the PA-31P accident airplane was aware of the true state of the aircraft and was just “shopping” for a pilot eager enough to fly it.

I wonder that as well, given three pilots reportedly refused to fly the airplane before the fourth pilot took off and died. Regardless, good list, Brian. Thank you.

See www.twinandturbine.com/respecting-the-preflight-how-pilots-can-improve-aircraft-preflight-inspections/

Reader Ed Livemore sums it up succinctly:

Remember the phrase “compulsion to perform?” *Bingo.*

That about says it, Ed. Thank you.

Readers, what do you think? Let us learn from you, at mastery.flight.training@cox.net.



See www.nafinet.org.

Share safer skies. [Forward FLYING LESSONS to a friend](#)

Web woes

Several readers have emailed me saying they are unable to log onto the Mastery Flight Training website or that they get a warning about website security when they try. Yes, the Mastery Flight Training, Inc. website has been hacked in a hard-to-believe-but-true story of a web developer failing to deliver on contracted services and attempting to bill me for things not in our contract, apparently copywriting my intellectual property in its own name then threatening to sue me for half a million dollars but offering to make the case go away for \$4000, and then hacking into the website to take it offline after each time I work with the web host to get it working again. I'm working with Federal authorities but I know it's not worth what it would cost to try to recover the nearly \$10,000 I've spent with that company in the last year and a half. I'll spending about half that again out of pocket to start from scratch. I hinted at this a few weeks ago with the new logo seen above.

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I'm building a better website with a far more reputable company. These things take time and MFT is an after-hours pursuit for me; our goal is to be back up in October. Meanwhile **FLYING LESSONS Weekly will broadcast on schedule**, and I'll include pdfs of these "transition time" reports in the new website archives when the site debuts. I'll continue to compile the Beech Weekly Accident Update in the interim and will post an expanded report catching up when the new website is up.

I tremendously appreciate my monthly contributors and those of you who make one-time donations. Your gifts cover most of the usual costs of hosting and delivering the weekly reports, archives and other tools for flying safety. One reader, knowing my plight, has generously made a substantial contribution to help me begin this transition.

I don't expect every reader to help. But **if even half of you donate as little as \$1 I'll be able to break even** on what it takes to help us all be safer pilots. If you're so inclined [please donate through this secure PayPal link](#) that is independent of the old Mastery Flight Training website.

Thank you for your patience as once again I power through the time and expense of this after-hours passion to make us all safer and better pilots. Thank you.

See https://www.paypal.com/donate/?hosted_button_id=R5FFEHVEXGJ5C

Please help cover the costs of providing **FLYING LESSONS** through the secure PayPal [donations link](#).

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