

# FLYING LESSONS for May 12, 2022

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.**

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## ***This week's LESSONS:***

**“The aircraft experienced engine issues...”** The frequency of this statement has increased alarmingly of late. In just the past two weeks [the FAA's preliminary mishap reporting website](#) has included these accounts:

- [PA-30 Twin Comanche] experienced engine issues and landed on a road. No injuries, no reported damage
- [Cirrus SR20] made an emergency landing on a highway due to engine issues. No injuries, unknown damage
- [PA32R Saratoga SP] experienced engine issues and made an emergency landing on a road. No injuries, unknown damage
- [PA28 Cherokee 180] experienced engine issues and landed in a field. No injuries, unknown damage
- [North American AT-6D] lost power midfield and settled back down gear up. No injuries, unknown damage
- [Cessna 150] experienced fuel exhaustion and landed short of the runway. No injuries, known damage
- \*[Cessna 140] made an emergency landing on a highway. No injuries, unknown damage
- [Mooney M20F] Aircraft made a forced landing on a road due to engine issues. No injuries, no damage
- \*\*[Murphy Renegade Spirit] landed in a field. No injuries, unknown damage
- \*[Cessna 172] made a forced landing in a field. No injuries, unknown damage
- [Cessna 210] experienced engine issues and landed short of the runway. No injuries, unknown damage
- [F33A Bonanza] declared an emergency due to engine issues and landed on a highway. No injuries, unknown damage
- \*[Diamond DA42] declared an emergency and landed in a field. Unknown injuries, unknown damage
- [Mooney M20J] experienced engine issues and landed in a field. No injuries, unknown damage
- [Cessna 172] experienced engine issues and crashed short of the runway in a field. No injuries, unknown damage
- [PA28 Cherokee 160] experienced engine issues and landed five miles short of the airport. No injuries, no damage
- [PA24 Comanche] experienced engine issues and crashed into wooded area ¼ mile short of the runway and caught on fire. One fatality, aircraft destroyed
- [PA34 Seneca] experienced engine issues and crashed in a field. One serious injury, substantial damage
- [Game Composites GB1 Gamebird] experienced engine issues and landed in a field. No injuries, no damage
- \*[PA18 Super Cub] made a precautionary landing in a field. No injuries, no damage

*\*Not necessarily an engine failure, but engine issues are the most likely scenario*

*\*\*Perhaps a back-country landing gone bad, but reported as having occurred “enroute” for engine failure is the most likely scenario*

**That's 20 reports** in the past 10 working days, if you're counting. Three of the reports involved multiengine airplanes, two making off-airport landings and one crashing. There was also a large UAV in the reports that I did not include for purposes of this discussion.

See <https://www.asias.faa.gov>

### A few observations:

- I'm amazed at the number of engine failures this last two weeks.
- I'm even more amazed, and gratified, to see how many of these engine failures resulted in no injuries. Engine failures are the third most common cause of general aviation fatalities, [according to AOPA](#). Faced with one of flying's most-feared experiences, most pilots have done a great job of getting the airplane on the ground without injuries.
- The "land on a road vs. land in a field" debate will continue to rage as data suggests either works...if conditions, skill and likely some luck prevail.
- Twin-engine airplanes are no immune to engine failure crashes...which long-term *FLYING LESSONS* readers already know.

See [https://blog.aopa.org/aopa/2016/09/02/data-driven-the-engine-failure-debacle-and-a-modest-proposal/?\\_ga=2.132184903.893445254.1652406846-151105133.1652406846](https://blog.aopa.org/aopa/2016/09/02/data-driven-the-engine-failure-debacle-and-a-modest-proposal/?_ga=2.132184903.893445254.1652406846-151105133.1652406846)

**As much as we could probably learn**, we probably won't get much more information about most of these. Success comes at the expense of learning...even in an off-airport landing, if no one is seriously hurt and there is not substantial or greater airplane damage there is no [requirement to notify the National Transportation Safety Board](#). There will be no official investigation and no publicly released investigative results. The event will not be included in most accident trend data reports and articles, which draw their data from the NTSB. Unless you were in the accident yourself or are close to one of the persons involved, you'll probably never hear more than what's in the FAA preliminary report quoted above.

See <https://www.ecfr.gov/current/title-49/subtitle-B/chapter-VIII/part-830>

**In the spirit** of *FLYING LESSONS*, however, this confluence of events reminds us to consider several things about engine failures. First, a large percentage of engine failures that make it into an NTSB report are the result of fuel mismanagement—the engine itself was fine, it just wasn't needing the gas it needed. Take care of the fuel and engine failures are historically quite rare.

**Second**, along those same lines we should frequently practice the engine restart procedure for the airplane being flown. That's not as challenging as it may sound—it's simply a matter of remembering Fuel, Ignition, Air. These are the things an engine needs in order to run; if one or more is interrupted it's by manipulating the appropriate controls for these systems that will get it running again.

Priority	Carbureted	Fuel Injected
1	Carb heat ON	Mixture FULL RICH**
2	Mixture FULL RICH**	Switch Tanks
3	Switch Tanks	Auxiliary pump ON
4	Auxiliary pump ON	Magnetos CHECK
5	Magnetos CHECK	Alternate Air ON

\*Turbine engines have different characteristics. See the approved flight manual.  
\*\*Or leaned significantly, in turbocharged aircraft with a loss of manifold pressure

**If you check** the sources of fuel, ignition and air and the engine does not relight, then there's nothing you can do from the pilot's seat to get it restarted. Learn more about customizing this Fuel, Ignition, Air checklist to the airplane you fly by reviewing this from way back in the [October 8, 2009 FLYING LESSONS](#).

See <https://mastery-flight-training.com/wp-content/uploads/2022/05/2009.1008.FLYING-LESSONS.pdf>

**If your attempts at restart fail** you need to find a place to set it down. Selecting a proper field (or road) for an off-airport landing is an art that is not well taught in powered-airplane circles. Take a look at this (also vintage) *FLYING LESSONS*, in the Debrief in [the June 10, 2010 report](#):

I was frankly surprised to find that standard FAA pilot training texts (the *Aeronautical Information Manual* and the *Pilot's Handbook of Aeronautical Knowledge*) do not address the topic of emergency landing field selection.

In the absence of advisory guidance, I jotted down a list of qualities I'd try to consider in those heady moments after an engine quit. My list:

- Surface
- Wind
- Length
- Slope
- Presence of ditches, paths or other irregularities crossing the landing surface
- Approaches
- Wires, on the approaches or over the interior of the field
- Fences
- Animals present
- Nearby sources of rescue

That last one isn't a deal-breaker for a field selection, but it's also something that should be considered if you have more than one possible choice.

It took a little Google-sleuthing to find a really good reference on evaluating and choosing an off-airport landing zone. Leave it to the sailplane pilots to know what to look for. Kai Gersten's sailplane text [\*Off-Airport Landings\*](#) is an absolutely superb 24-page text not just for sailplane pilots, but for any of us who might have to pick out a field in a worst-case scenario. Sections include these gems about checking for wires around and over a landing zone:

There are likely to be wires:

- Between two poles.
- Between a pole and a group of trees, or a single tree. It is not uncommon to find a telephone pole hidden by one, or a cluster of trees.
- Between a road and a house.
- Above any road.
- Going to any kind of a building.

A narrow field with trees on one side and wires along a road on the other side, or a field with trees along both sides may have wires crossing anywhere along its length. Avoid such fields if at all possible. The advice of landing well into the field is not applicable in these situations. *The safest assumption is to pretend there are wires around the entire perimeter of every field.*

...and these observations about visual illusions related to unimproved fields, which would be even more important to remember under the stress of an unexpected arrival:

1. A narrow field will appear to be longer than it is.
2. A wide field will appear to be shorter than it is.
3. A long field will appear to be narrower than it is.
4. A short field will appear to be wider than it is.

5. If you have been [at] low [altitude] for a while, all fields will appear to be bigger than they are.

Gersten's short book is definitely worth a read to better prepare you for an off-airport landing. Consider reading it your *FLYING LESSONS* homework of the week.

See;

<https://mastery-flight-training.com/wp-content/uploads/2022/05/2010.0610.FLYING-LESSONS.FAA-format.pdf>  
[www.flsc.org/Xcountry/Kai\\_Off\\_Arpt\\_Ldg.pdf](http://www.flsc.org/Xcountry/Kai_Off_Arpt_Ldg.pdf)

**Lastly**, take another look at [last week's LESSONS](#) about making the transition from glide to flare to landing if descending out of an engine failure.

See <https://mastery-flight-training.com/wp-content/uploads/2022/05/2022.0505-FLYING-LESSONS.pdf>

**Why all the recent engine failures?** I have no idea. Because most of the pilots made a successful injury-free and likely damage-limited engine-out landing, we may never know. But all these recent failures remind us to think about engine restart procedures, off-airport landing zone selection and techniques needed to turn your engine-out glide into a successful, survivable touchdown.

**Why do you think** all these engine failures may have occurred? What additional *LESSONS* do you suggest as a result of reading these reports?

Comments? Suggestions? Questions? Let us know at [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net).



See <https://pilotworkshop.com>

**Debrief:** Readers write about recent *FLYING LESSONS*:

Reader, flight instructor and Air Safety Investigator Jeff Edwards telephoned me after reading [last week's LESSONS](#). Jeff suggested that, although as I wrote last week the Airman Certification Standards and other FAA training documents do not require training or evaluation of off-airport landing techniques. He noted, however, that

...it's right there in the glider certification standards.

This prompted me to take a look. Glider pilots are still evaluated under [FAA Practical Test Standards](#)...not yet superseded by an ACS. The Glider PTS include the task of Simulated Off-Airport Landing. But as the PTS states, "this TASK is knowledge only." It's evaluated orally but not in flight.

Of course every glider landing is a power-off landing, so I also looked at the normal landing TASKS. They include in-flight evaluation of slips to a landing, "with and without the use of drag devices," that is, speed brakes or spoilers. Pilots are checked on their ability to transition to and maintain minimum sink speed when appropriate. The PTS also includes testing of the "speed-to-fly," which varies based on position and conditions.

So yes, a glider rating will definitely help a pilot prepare for an engine-out emergency landing in a (usually) powered airplane. It's not exactly the same, given the relative glide ratios of most powered vs. nonpowered airplanes. But every bit of experience helps. Thank you, Jeff.

See:

<https://mastery-flight-training.com/wp-content/uploads/2022/05/2022.0505-FLYING-LESSONS.pdf>

[https://www.faa.gov/training\\_testing/testing/test\\_standards/media/FAA-S-8081-22.pdf](https://www.faa.gov/training_testing/testing/test_standards/media/FAA-S-8081-22.pdf)

More to say? Let us learn from you, at [mastery.flight.training@cox.net](mailto:mastery.flight.training@cox.net).



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