STEVE KROG
COMMENTARY / THE CLASSIC INSTRUCTOR

Emergency Landings

How were you taught?

BY STEVE KROG

IT'S A BEAUTIFUL CALM sunny autumn Saturday, and you feel the need to take advantage of the weather and exercise your airplane for an hour or so. After a thorough preflight, you taxi to the runway, conduct a runup, and off you go. The liftoff is perfect. Now airborne, you look off to the side and see the runway dropping away as you seek more altitude. Suddenly at 500 feet AGL, everything goes silent. What is your immediate reaction?

By the time you realize the engine has quit and you begin to react, three to five seconds, or more, have passed. Now the predicament has become a serious problem.

The obvious, correct answer is to immediately lower the nose for the best glide speed, prepare for a landing straight ahead or no more than 45 degrees left or right of the departure heading, and attempt to touch down as slowly as possible. In this situation the first priority is to prevent harm to yourself and anyone who may be in the airplane with you. Aluminum or tube and fabric can all be repaired or replaced!

In the November 2018 issue of *EAA Sport Aviation*, I discussed various situations involving partial power losses. You may want to refer to that article when time permits.

Studies have been conducted to determine how long it takes a pilot to recognize and react to a loss of an engine while in flight. If sudden and unexpected, it will take eight seconds or more. Even when it is anticipated — such as when you're with an instructor and practicing simulated forced landings — it will still take two to five seconds to respond.

If the engine is lost during a climb after takeoff, the aircraft is in a vulnerable attitude, nose above the horizon for a V_X or V_Y

climb, and at an airspeed not much greater than stall speed. In five seconds without power, you are approaching stall speed in a nose-high attitude. What began as a serious situation several seconds ago has now become critical.

During emergency situations as described above, a pilot will usually not rise to meet the challenge but rather sink to an instinctual lower level of proficiency. Without practice to maintain a high level of proficiency, the unsuspecting pilot will continue to hold the nose-high attitude for five to eight seconds, and then lower the nose slightly while attempting a steep turn back to the runway. The result is a stall/spin causing serious injury — or worse.

Emergency or forced landings have become a hot topic in our hangar talk sessions lately. A recent accident generated these discussions. As a flight instructor, I was curious about all the varied opinions and decided to do some research on the subject.

A safe pilot begins with good training, followed by regular practice, to achieve a level of proficiency that will help prevent making mistakes during an emergency such as an engine loss in flight.

My first search was the FAA website. Typing in the words "emergency landings" in the subject field, 198 items appeared. Hoping to find an article or articles on how to handle a forced landing, I scanned through the first 15-20 titles. I found nothing other than what one should do **after** an emergency landing.

Frustrated by the lack of information, I next tried "emergency landing training" in the subject field. Another 185 titles appeared but only one truly offered information on the subject — the FAA's *Airplane Flying Handbook*. Chapter 16 provides basic information on the types of forced landings. (This book is a wealth of basic information and can be downloaded for free if one chooses to do so.)

A Google search followed using the same terms. Several items turned up, but the FAA's *Airplane Flying Handbook* was at the top of the list again. Sadly, information on this serious subject is lacking.

Properly maintained aircraft have become so dependable, many of us never give the possibility of an engine loss, especially on takeoff, a serious thought. We expect it to turn up to the full throttle rpm and off we go — until it doesn't. Answer this question honestly: The last time you flew, did you give any thought to the possibility of losing your engine after takeoff prior to taking off?

Here at our flight school, we spend a good deal of time having students become familiar with the aircraft pilot's operating handbook, if one exists, before conducting simulated forced landing practice. As a pilot, do you know the best glide speed for your airplane? Do you know how far you can glide based on the altitude from where you started the descent? This might be good information to have on a visible placard in your aircraft.

The FAA Safety Team has a good document available to help you determine your aircraft's best glide speed as well as calculating glide distance. It can be found via the link at EAA.org/Extras.

Using this document as reference, a Cessna 172 has a best angle of climb speed (V_X) of 53 and a best rate of climb speed (V_Y) of 73. Ideally, the best glide speed is roughly halfway between each, or 63 mph. Again, using the Cessna 172 as an example, the gliding distance is approximately 1.5 miles for every 1,000 feet lost AGL. If I was flying at 5,500 feet MSL above my home base at Hartford, Wisconsin, (field elevation of 1,100 feet) and lost the engine, we would have 4,400 feet of altitude to work with. Figuring our glide distance at 1.5 miles for each 1,000, we would be able to glide approximately 6 miles before touching down. This distance does not take into consideration either upper or surface winds.

I'm not suggesting that all general aviation pilots be required to experience annual recurrent training. Rather, I would like to see each one of us assume responsibility for establishing and then maintaining a high level of proficiency.

A safe pilot begins with good training, followed by regular practice, to achieve a level of proficiency that will help prevent making mistakes during an emergency such as an engine loss in flight.

More than likely, the last time you performed a simulated forced landing was either the day of your sport, private, or commercial checkride five, 10, or more years ago. Or, perhaps more recently, while undergoing a flight review. In any event, many of us seldom, if ever, practice this maneuver.

Airline pilots undergo annual recurrent training. Much of the time spent deals with emergency situational recognition and then taking positive action to neutralize the problem. I'm not suggesting that all general aviation pilots be required to experience annual recurrent training. Rather, I would like to see each one of us assume responsibility for establishing and then maintaining a high level of proficiency.

The next time you take off from your home airport, level off at 500 feet AGL and look at the terrain in front of you and at 45-degree angles to either side of your heading. This is the landing area you will have to work with in the event of a forced landing. If your engine quit at that instant, what action would you take and where would you land? I'd venture to wager that many of us general aviation pilots haven't given that situation a thought in years! I have the advantage of flying nearly every day, so I have familiarity with our home airport. I have open areas for each runway in mind where I would land if I lost the engine after taking off.

Another good exercise to better know your airplane is to climb to a safe altitude of about 3,000 feet AGL. Clear the area, apply carb heat, and reduce power to idle. Begin tracking your time, and then establish and trim for the best glide speed. How long did it take you to lose 1,000 feet? For safety, don't forget to clear the engine every 20-30 seconds.

Some general aviation aircraft have great glide ratios while others sink like a brick when power is reduced. It is a good practice to know your airplane and its sink rate should you ever encounter an in-flight emergency.

From time to time I will challenge a student while in flight. I'll say something like, "See that field at 10 o'clock and 2 miles away? If the engine quit now, do you think you could reach and land in that field?" For the instant they are distracted and looking at that field, the old reliable Continental engine on the Cub seems to have stopped developing power. For the first few seconds, there is a lot of confusion, but then the student begins to focus and goes to work attempting to reach the selected field. Unless I've incorrectly calculated for the wind, or the student has taken a lot of time to recognize and react to the situation, we can usually reach the field. The challenge becomes quite an eye-opener and a true learning experience for the student. It teaches quick recognition and reaction, a steady hand on the controls, and patience.

If pattern traffic permits, I also like to practice simulated landings at various points in the traffic pattern. I've mentioned in previous articles that we have two intersecting runways, 9-27 and 18-36. Dividing the airport into four quadrants along the runway centerlines, the student can better envision what runway to aim for should they ever experience an engine failure at any point in the traffic pattern after reaching 1,000 feet AGL.

Most every general aviation pilot likes to believe they are also a safe pilot. But safety is compromised without proficiency, and proficiency comes from practice. Be a safe pilot. Practice the examples I've mentioned and become proficient. EAA

Steve Krog, EAA 173799, has been flying for more than four decades and giving tailwheel instruction for nearly as long. In 2006 he launched Cub Air Flight, a flight training school using tailwheel aircraft for all primary training.