



STEVE KROG

COMMENTARY / THE CLASSIC INSTRUCTOR

Losing Power on Takeoff

What to do if it happens to you

BY STEVE KROG

IT'S A BEAUTIFUL sunny Sunday morning. Wind and weather forecast are near perfect. What a great day for an early morning flight. While traveling to the airport your mind wanders. Where should I fly today? The lakeshore flight seems interesting, and it will only take about an hour and a half to complete. I can be home by 10 a.m.

Upon arriving at the airport, another flying buddy calls and mentions he has the same idea. He has already preflighted his airplane and is itching to get going. You agree to join up with him and quickly pull your airplane out of the hangar, do a quick once-over inspection, hop in, and start the engine. Your friend is already sitting at the end of the runway waiting for you.

Not wanting to further delay the flight, you do a cursory pre-takeoff check and everything seems to be in order. Your buddy has already taken off and has called back via radio asking what's taking so long. After confirming you have the noise-canceling headset on and adjusted, you respond that you are rolling and apply full power.

But something doesn't feel right. Your airplane staggers into the air. You keep asking yourself what is wrong. Wow! The airspeed is hovering right at stall speed, the airplane feels sluggish and won't climb, and finally, after scanning the tachometer, you realize the rpm is not what you need it to be. You're experiencing a partial power loss. Now what?

This scenario can and sometimes does happen, and it can usually be prevented.

During your primary flight training days, you and your instructor practiced a number of simulated engine failure situations. It became nothing more than another maneuver as you were prepped for the all-important checkride. You were always ready for it and knew exactly what to do at any given time.

But how many times have you practiced a simulated engine failure or partial failure since your checkride? If you answer the question honestly, probably never.

Learning to deal with engine failure is one of the requirements needed to earn a pilot certificate. However, were you ever taught how to deal with a partial power loss on takeoff, or in flight? Most likely not since it isn't required.

As an active flight instructor and an FAA Safety Team advocate, I closely monitor the monthly incident and accident reports. If one is to be a good instructor, one must always be learning and sharing that knowledge with students. Reading and trying to reconstruct what occurred in these reports brings to light mistakes that, had the pilot been better trained, could have been avoided.

Today's aircraft are very safe if maintained properly, but there is always a slim chance that something could occur. As pilots practicing safety, we should be aware and always prepare for the unexpected.

In preparing for takeoff, I try to practice the general 50/70 rule of thumb. If I haven't achieved at least 70 percent of my takeoff speed by the time I've used 50 percent of the runway length, it's time to pull the power and abort the takeoff.

Of late I've read of several accidents resulting from either partial loss or total loss of power on takeoff. In a total loss of power situation, studies have shown that when it occurs unexpectedly, it will take the average pilot a minimum of five seconds to recognize the situation and then begin a series of inputs or responses. In some incidents, it took the pilot a minute or more to take corrective action. Five seconds is a very long time if you're climbing at gross weight and best angle of climb speed. Suddenly the stall warning horn begins to wail, the aircraft shudders, you reach for the throttle and push on it, and then apply carb heat. Passengers on board become alarmed and create a distraction. Now what?

If you recall your primary training, you finally push the nose over, regaining some airspeed and quieting the stall horn. Then you think about turning back to the runway, but you hesitate. Should I do that or should I pick a field? You opt for the runway, but by now you've lost at least 300 feet. Options that were available 20 seconds ago are no longer options. Following a complete engine loss, a forced landing is inevitable, whereas in a partial power loss, pilots are faced with making some difficult decisions.

This is a tough situation to be in, and one that should be practiced from time to time to always remain vigilant when flying. Today's aircraft are very safe if maintained properly, but there is always a slim chance that something could occur. As pilots practicing safety, we should be aware and always prepare for the unexpected.

PARTIAL POWER LOSS

Experiencing a partial power loss on takeoff presents an entirely different scenario, and as mentioned earlier, it is rarely practiced, let alone taught. How does one go about preparing for a partial power loss situation? Partial power losses are three times more likely to occur than a complete engine failure.

Whenever you go for a pleasure flight, do you play the "what if" mind game? I try to instill this thought process in the mind of every student.

What if:

- You lose partial power on takeoff?
- The engine bogs down at 200 feet AGL after takeoff?
- The engine bogs down at 500 feet AGL?
- You lose partial power 5 miles from an airport?

Each of these potential scenarios should be given thought before each flight. Responses or actions to and for each may differ depending on the departure runway. Managing this occurrence may be significantly different between pilots of varying experience.

After completing your runup and taxiing into position for takeoff, do you pause for a few seconds and think through any of these possible situations? Probably not. After all, it has never happened before in your trusty aircraft. Why should it happen today? As an active flight instructor, I can tell you that these situations do occur. I've experienced each of them, some more than once.

In preparing for takeoff, I try to practice the general 50/70 rule of thumb. If I haven't achieved at least 70 percent of my takeoff speed by the time I've used 50 percent of the runway length, it's time to pull the power and abort the takeoff. As an example, assume your aircraft liftoff speed is 65 mph. You'll want to see at least 45-50 mph at the halfway point of your departure runway. But first, have you identified the halfway point? Again, probably not.



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What if your rpm drops to 1800 in your trusty Cub or Champ after passing over the end of the runway? You're at 150-200 feet AGL. What are your options? Have you ever thought through this "what if" scenario? Do you attempt to turn back? Continue straight ahead? Land in a field? Here in Wisconsin, we have a lot of open and relatively flat land from which to pick a landing spot. But in other parts of the country, airports may be surrounded by unforgiving terrain or urban or industrial development, which limits your options.

Do you know your aircraft well enough to know if you can stay in the air at 1800 rpm? If not, how far can you extend your glide at that power setting compared to a complete power-off glide? Have you ever practiced this scenario at a safe altitude?

I like to demonstrate this to students. At an altitude of approximately 1,500 feet AGL, align your aircraft with a straight stretch of road. Note a starting reference point and then reduce power to idle and see how far you can glide before losing 500 feet. Climb back to 1,500 feet and realign with the road and reference point. Reduce the power to 1800 rpm and then measure and compare the glide distance to that of the idle power glide. You may be amazed at the difference while developing a better understanding and knowledge of the capabilities of your aircraft.

Many of us take our trusty airplanes for granted and never practice any of the "what if" scenarios mentioned here. The next flight might be a good time to get to know your airplane better.

What if your rpm drops to 1800 as you reach 500 feet AGL? Many will say that at 500 feet one can make a 180-degree turn and return to the departure runway. When was the last time you practiced this maneuver?

There are two ways to practice this and prepare for this situation. The first time you attempt this maneuver, you'll be

ready for it and begin taking immediate action, lowering the nose, completing the turn, and safely returning to the runway with the engine running at 1800 rpm.

Now try again, but this time count off five seconds, or even 10 seconds, before lowering the nose and rolling into a turn back toward the runway. Can you still comfortably make it? Aircraft incident studies tell us time and again it takes a pilot at least five seconds after losing power before corrective action is taken. Five seconds after losing partial or all power while in a best angle of climb attitude can create a serious situation.

Knowing how your aircraft performs under a partial power loss may prevent you from having to make an off-airport landing. If you have an average 1,500 feet of altitude and your airplane loses 200 feet per minute at a 60 mph partial power glide speed, you'll still have 500 feet of altitude to work with after covering the 5-mile distance to the airport.

Many of us take our trusty airplanes for granted and never practice any of the "what if" scenarios mentioned here. The next flight might be a good time to get to know your airplane better.

Remember, a prepared pilot is a safe pilot! *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.