



Engine Out!

By Gene Benson

As I read general aviation accident reports I realize that I have lived a charmed life, at least in respect to my flying. In my more than 50 years of flying consisting of more than 15,000 flight hours, I have never experienced either a complete or partial power loss. I once did a precautionary shut down of an engine in a Piper Navajo because of an oil pressure issue, but that is much different from an unexpected power loss.

The daily ASIAs listings of aircraft accidents and incidents is rarely without either a crash or an off airport landing due to a loss of engine power. Completed accident investigations reveal a variety of reasons for the loss of engine power. Many people use the term, “engine failure” but that does not always an accurate description of the cause. Sometimes there is found to be a mechanical failure within the engine or one of its subsystems. But fuel exhaustion, fuel management, misaligned fuel selector, fuel contamination, carburetor ice, or some other cause are more common.

Most of these power loss events are shown to have been preventable, usually easily preventable. We must take responsibility to prevent power loss by taking precautions such as insisting on good aircraft maintenance, understanding the systems on our airplanes, using our checklists, doing thorough preflight planning, performing good preflight inspections, and more. But systems fail and we humans will still make errors so there is no way to guarantee that we will not experience a power loss. Therefore, we can take some steps to prepare ourselves for the event that we hope will never happen.

I want to begin by saying that this subject could easily fill a textbook and that I have no illusion that I can adequately address it here. My intent is to raise awareness and hopefully encourage further study on the subject.

I want to focus mainly on the complete and sudden power loss, but the partial power loss can perhaps be more deadly. Pilots have become distracted while dealing with a partial power loss and have lost control of the airplane. We must remember that our primary job is to fly the airplane. Trying to restore full power is an important, but secondary job. Partial power loss is frequently a precursor to complete power loss, so if there is an airport nearby, it is advisable to get on the ground. If there is no airport nearby and the problem cannot be quickly remedied, my recommendation is to head toward the nearest suitable airport while evaluating possible landing sites along the way. Of course, every situation is different with many variables such as how much power is remaining, altitude, flight condition, terrain, and more. There is no single correct procedure that will suit all circumstances.

So, let's talk about the complete and sudden power loss. The first consideration is whether we have one or two engines. Two is better than one, right? Maybe. A multiengine airplane flown by a multiengine rated pilot who undergoes formal recurrent training that includes engine out procedures is perhaps less likely to have a serious accident following a complete loss of engine power on one engine. But the multiengine pilot who has not had recent training on engine out procedures, either in the airplane or in a simulator, is dangerous. A few seconds of delayed response or an incorrect response can be fatal. Reliance on recalling procedures learned during a multiengine training program three or more years ago is not going to lead to a happy ending. As an aside and as evidence in how lax regulations are, taking a flight

review in a Cessna 150 qualifies the pilot to act as pilot-in-command of all aircraft in which he or she is rated. There is absolutely no regulatory requirement, under Part 91, for a pilot to ever practice engine out procedures again in a multiengine airplane once the multiengine rating has been earned.

We will now limit our discussion of complete and sudden power loss to the single engine airplane. If we only have one engine and it ceases to produce power, what should we do? Of course, there will be exceptions to the following guidelines dictated by terrain, weather, or other circumstances. But our foremost responsibility is to maintain control of the airplane.

If power is lost shortly after takeoff, our viable options are extremely limited. Our initial reaction, the adult version of assuming the fetal position, is a strong desire to return to the airport. There may be scenarios in which this is possible, but such attempts very rarely have a good ending. The overwhelming best action is to land straight ahead, or at least as closely as possible to straight ahead. We should not fly into the large oak tree if a ten-degree turn will allow us to land in low brush. Attempts to return to the departure airport have been nicknamed “The Deadly Turn.” We should note that the danger in the “Deadly Turn” is the increased likelihood of an aerodynamic stall during the turn.

More altitude provides us with more options. A power loss a little later during the initial climb provides more options. Airports are preferred to other choices. If our direction of flight caused us to execute a turn after takeoff, perhaps our departure airport is a viable choice for our landing. If we have already executed a 180-degree turn, we might be in good position to land on a runway. If no airport is reasonably available, we will look for an open area and consider wind direction. Our groundspeed will determine how much energy the airplane has upon touchdown so landing into the wind is highly desirable. But making a turn at low altitude to align with the wind is not ideal. What if there are no open areas? Should we attempt a landing on a road? Are there wires across the road? How much traffic is on the road? There are many variables to consider and our brain may not be capable of sorting them all out and producing the best option before we reach the ground.

A little study and planning before our takeoff can pay huge dividends if we experience a power loss after takeoff. A look at the sectional chart and Google Earth can give us a good idea on what is in the vicinity of the airport. The Google Earth image might not be up to date, but generally we can see what is in the airport vicinity. We can treat it like a space launch. If we must abort here, we will land at X but if we make it to here and need to abort, we will land at Y.

A power loss at altitude provides us with many more options for a landing. The higher we are, the wider our target area and the more likely we will be in gliding range of an airport. However, a serious mistake is to overestimate our possible glide distance. Almost making it to an airport and then needing to find an off-airport site may greatly reduce our chance of finding a suitable location. A nice grassy field five miles from an airport is probably a better option than the industrial parking lot a half-mile from the airport.

Our goal in any power loss situation is to ensure the survival of and to minimize injuries to the airplane occupants. Once the engine stops producing power, we must mentally transfer ownership of the airplane to the insurance company. Saving the airplane is secondary to the well-being of ourselves and our passengers. Of course, we also want to avoid injury to anyone on the ground. Securing the airplane for the forced landing is probably addressed in a checklist and will be different for various makes and models. The one thing that may not be on that checklist is to ensure that everyone has their seatbelt and shoulder harness fastened and snug. Also, make sure that all occupied seats are fully upright.

Since this is an article and not a textbook, there are plenty of things related to power loss that we have not discussed. What if we are solid IFR? What if it is night? What about attempting a restart? My best advice is to study the procedures for the airplanes you fly and think through scenarios for engine failure during various phases of flight. A refresher with a flight instructor can also be valuable. Too many flight reviews just include the obligatory closing of the throttle, selecting a suitable field for a landing, and then having power restored with a commendation for a good choice of landing site. Demand more.