

PREPARING FOR FAILURE

Why practice engine failures shortly after taking off? Because it's probably the worst-case scenario you can experience in a single-engine airplane. Think about it: You're barely aloft, still establishing a climb, maybe the gear's still down.

Whether the engine just stops, coughs, sputters or loses partial power, you've got a problem. As the accident record demonstrates, you have just a few seconds to get the nose down and establish a glide, converting the energy in what little altitude you have into the airspeed you need to avoid losing control. Here's the possible outcome, from a recent NTSB accident report:

The flight path observed by the witness and the damage to the airplane were consistent with the pilot maneuvering the airplane for an emergency landing and allowing the airspeed to decay, which resulted in an aerodynamic stall.

According to the witness, "the airplane began a descending left turn," which would be consistent with an attempt to return to the departure airport and/or runway. In our January 2006 issue, contributor Rich Stowell shared the results of a simulator-based study of 20 pilots who took a total of 147 "flights," all of which ended with an engine failure at 500 feet agl. The study defined "successful outcomes" to include a maximum descent rate of no more than 2500 fpm, a rate of descent at touchdown not in excess of 500 fpm, and the bank angle had to be within five degrees of wings-level below 100 feet agl. If attempting to turn back, the pilot had to complete at least 175 degrees of heading change without exceeding 55 degrees of bank.

The results? "One hundred percent of the attempts to



proceed straight ahead (35/35) resulted in successful outcomes—pilots maintained control of the airplane all the way down to the ground every time.... By contrast, only 62 percent of all of the attempted turnbacks were successful (69/112).... And the majority of failed turn-arounds culminated in stall/spin departures. The probability of survival from the failed turnbacks: low."

Another thing the study demonstrated is that experience in performing the maneuver is important: The pilots got better at turning back to the airport with practice. And, if there's a takeaway from this article, it's that even straight-ahead landings after an engine failure require practice.

As a final word to the wise, here's the FAA, from the *Airplane Flying Handbook*, FAA-H-8083-3A:

What characterizes all power loss or engine failure occurrences after lift-off is urgency. In most instances, the pilot has only a few seconds after an engine failure to decide what course of action to take and to execute it. Unless prepared in advance to make the proper decision, there is an excellent chance the pilot will make a poor decision, or make no decision at all and allow events to rule.

In the event of an engine failure on initial climb-out, the pilot's first responsibility is to maintain aircraft control. At a climb pitch attitude without power, the airplane will be at or near a stalling angle of attack. At the same time, the pilot may still be holding right rudder. It is essential the pilot immediately lower the pitch attitude to prevent a stall and possible spin. The pilot should establish a controlled glide toward a plausible landing area (preferably straight ahead on the remaining runway).