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CONTROL FAILURE! What would you do?

by Rich Stowell, MCFI-A, SAFE #0002

Have you ever had a control failure, or thought about what you would do if you ever did? The good news is that serious control failures seem to be relatively rare. Moreover, the majority of control failures are survivable. An online search of general aviation airplanes in the NTSB database, for example, yielded 42 accidents over a five-year period where the cause was attributed to a failure of airplane controls (“failure” meaning a control that had become disconnected, jammed, or otherwise inoperable).

Two distinct classes of accident emerged: the failure to remove gust locks, and everything else. Inexcusably, eleven accidents involved the pilot’s failure to remove control gust locks prior to takeoff. Ten of the twenty-three people involved were killed—a lethality rate of 43 percent. This type of senseless accident is completely preventable by following established preflight protocols.

By contrast, the other control failure accidents had a survivability rate of 92 percent. Eighty-two percent ended with minor or no injuries. Elevator-only control failures were the most common with twelve accidents. Recognizing the potential seriousness of a loss of elevator control, Part 23 Airworthiness Standards actually require that some inherent redundancy be designed into light, certificated airplanes:

By using normal flight and power controls...it must be possible...to establish a zero rate of descent at an attitude suitable for a controlled landing...without the use of the primary longitudinal control system.

The causes of elevator control failure accidents ranged from unknown, to a stick grip that jammed under the instrument panel, to a shotgun shell that lodged in the stick, to a banner tow line that wrapped around the horizontal stabilizer, to a detached seatbelt buckle that wedged in an elevator bell crank, to elevator controls that simply disconnected.

Throttle control problems ranked a surprising second on the list, attributed to nine accidents. Five of these involved a separation of the throttle cable as a result of improper maintenance. The time-in-service before the disconnects ranged from the first flight out of the shop up to 71 hours later.

The throttle cable failed with the engine producing partial power in three accidents. It appears the pilots in each case should have been able to land on the runway. In the heat of the emergency, however, the three pilots failed to plan ahead regarding shutting down the engine once landing was assured (i.e., pulling the mixture to idle cutoff or turning off the mags). Consequently, all three airplanes overshot and crashed, fortunately with just one serious injury.



What You Can Do

Prevention is the first line of defense against an accident. For control issues, prevention begins with your preflight. All preflights should be thorough, but pay special attention during preflights that follow maintenance. Prior to takeoff, you at least need to ensure that the engine is accessing uncontaminated fuel, the controls are “free and correct”, and the trim is properly set.

Don't panic if you do encounter limited use of the controls. Odds are that you won't get seriously injured provided you keep your head. Use whatever controls remain functional and fly the airplane. Set yourself up for the best possible outcome during landing: low, slow, landing attitude, wings as close to level as possible at touchdown. Keep in mind that a controlled, off-airport landing might be a better option than an uncontrolled, on-airport crash.

Practice is important as well. The ability to perform slips and slipping turns in both directions is especially useful should you ever encounter a jammed aileron or rudder, or split flaps, or even asymmetric thrust in twin-engine aircraft. In the author's EMT® Program, for instance, trainees spend one full lesson performing numerous slips followed by a lesson simulating various control failures. Two elevator scenarios are addressed as well: a jammed elevator during a V_x climb (simulated at altitude), and a floating elevator (simulated disconnected elevator) to an actual landing. Interestingly, the don't-touch-the-elevator landings are often no worse than landings where the pilot has full use of the elevator control! Only attempt this training exercise, however, with a qualified instructor.

Rich Stowell is a seven-time Master Instructor and the 2006 National Flight Instructor of the Year. He has been providing spin, emergency maneuver, and aerobatic training since 1987, and has given more than 8,200 hours of flight instruction and logged more than 23,000 landings and 31,900 spins.