NTSB 2017–2018

MOST WANTED LIST OF TRANSPORTATION SAFETY IMPROVEMENTS

Prevent Loss of Control in Flight in General Aviation

AVIATION

MWL
MOST WANTED LIST

What is the issue?

Although commercial airline accidents have become relatively rare in the United States, accidents involving inflight loss of control (LOC) in general aviation (GA), while trending downward, still occur at an unacceptable rate. From 2008 to 2014, nearly 48 percent of fatal fixed-wing GA accidents in the United States resulted from pilots losing control of their aircraft in flight. During this time, LOC in flight accounted for 1,194 fatalities.

Although LOC happens in all phases of flight, approach to landing, maneuvering, and initial climb are, statistically, the deadliest phases of flight for LOC accidents.

According to the Federal Aviation Administration (FAA), an LOC accident involves an aircraft's unintended departure from controlled flight; this can be due to a variety of reasons, such as pilot distraction, loss of situational awareness, or weather. The most common type of LOC is a stall, including a post-stall spin, which can occur when the pilot allows the aircraft to enter a flight regime outside its normal flight envelope.

Stalls may happen because a pilot lacks understanding about how a stall actually relates to exceeding a wing's critical angle of attack (AOA), as opposed to the more common idea that it's just related to airspeed. When airplanes are close to the ground, such as in a landing pattern, there is limited time and altitude available to recover from a stall or spin, making these stalls particularly deadly.

Although LOC happens in all phases of flight, approach to landing, maneuvering, and initial climb are, statistically, the deadliest phases of flight for LOC accidents.

One notable accident we investigated occurred on November 10, 2015, in Akron, Ohio. Execuflight flight 1526, en route to Akron Fulton International Airport, was on a non-precision approach and descended below the minimum descent altitude, even though the pilots did not have the runway in sight. When the first officer attempted to arrest the descent, the airplane, a Hawker 700A, entered an aerodynamic stall and crashed into a four-unit apartment building, killing all nine persons on board.

In another crash that occurred on June 12, 2015, in Huggins, Missouri, the pilot and four passengers departed from a grass runway in a Beech A36. After a right turn during the initial climb, the pilot failed to maintain airspeed and exceeded the airplane's critical AOA, which resulted in an aerodynamic stall. The pilot and three of the passengers died in the accident.

GA pilot proficiency requirements are much less rigorous than those of airline pilots. GA pilots are more likely to have longer intervals between training sessions and between flights. They typically only need to complete a flight review, consisting of, at a minimum, 1 hour of ground training and 1 hour of flight training every 24 months. GA pilots almost exclusively maintain and improve their skills and

Continued on next page

Continued from previous page

update their knowledge of new technologies on their own. Their conduct of safe flight depends more on individual abilities and judgment than on robust training in emergency situations, potentially leaving them unprepared for situations that can lead to LOC.

What can be done?

In October 2015, we held a forum on "Humans and Hardware: Preventing General Aviation Inflight Loss of Control." The forum addressed some of the common causes of LOC events and suggested potential hardware solutions, such as the use of AOA indicators, and human solutions, such as increased pilot training to ensure a full understanding of stall phenomena. Future training should also include understanding AOA concepts and how elements such as weight, center of gravity (CG), turbulence, maneuvering loads, and other factors can affect an airplane's stall characteristics.

To prevent LOC accidents, pilots should:

- understand stall characteristics and warning signs, and be able to apply appropriate recovery techniques before stall onset.
- realize that stall characteristics can vary with aircraft loading and are usually worse at aft CG positions.
- be aware that stall can occur at a lower AOA in icing conditions.
- use effective aeronautical decision-making techniques and flight risk assessment tools during both preflight planning and inflight operations.
- manage distractions so that they do not interfere with situational awareness.
- obtain training in emergency response skills so it is more natural to apply those skills in an emergency situation.
- understand and maintain currency in the equipment and airplanes being operated.
- take advantage of available commercial trainer, type club, and transition training opportunities.
- consider installing new technology, such as an AOA indicator, which, when coupled with pilot understanding and training on how best to use it, can assist pilots during critical or high-workload phases of flight.

The FAA, aviation advocacy groups, type clubs, and manufacturers, including kit manufacturers, are creating and maintaining educational materials and initiatives that include general principles, best practices, and operational specifics related to LOC. For example, the FAA and various industry groups launched the "Fly Safe" national safety campaign to educate the GA community on how to prevent LOC accidents during the flying season. In November 2015, the FAA published an article focusing on Vmc (minimum airspeed at which a twin engine aircraft is controllable with only one engine operational) training and AOA indicators. These resources can be helpful in learning effective LOC countermeasures. The FAA is also spearheading an outreach effort to raise awareness of the inherent risks when flying in certain weather conditions.

Pilots play the most critical role in preventing LOC; they have both the ultimate responsibility and the ultimate opportunity to reduce these accidents through ongoing education, flight currency, self assessment, use of available technologies, and vigilant situational awareness in the cockpit. ■

The NTSB Most Wanted List highlights safety issues identified from the NTSB's accident investigations to increase awareness about the issues and promote recommended safety solutions.

The NTSB is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation – railroad, highway, marine and pipeline. The NTSB determines the probable cause of the accidents and issues safety recommendations aimed at preventing future accidents. In addition, the NTSB carries out special studies concerning transportation safety and coordinates the resources of the federal government and other organizations to provide assistance to victims and their family members impacted by major transportation disasters.

@NTSB

#NTSBMWL

Follow NTSB on

Related Accidents*

Date	Location	Accident ID
June 12, 2015	Huggins, MO	CEN15FA267
November 15, 2015	Akron, OH	AAR-16/03

*For detailed accident reports visit **www.ntsb.gov**

NTSB

MWL MOST WANTED LIST

Critical changes needed to reduce transportation accidents and save lives.