



# Aviation Investigation Final Report

<b>Location:</b>	Mount Vernon, Indiana	<b>Accident Number:</b>	CEN21LA008
<b>Date &amp; Time:</b>	October 6, 2020, 08:20 Local	<b>Registration:</b>	N2942A
<b>Aircraft:</b>	STEPHENS WILLIAM E Quicksilver MXL-2 Sport	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of control in flight	<b>Injuries:</b>	2 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The sport pilot and pilot-rated passenger were conducting a local flight in the light sport airplane, which was not approved for aerobatic flight. A witness near the accident site saw the airplane exit a loop then spiral toward the ground. The airplane impacted the ground on a southwesterly heading and came to rest about 100 ft from the initial impact point. The flight controls were intact and there were no mechanical malfunctions or anomalies with the airplane that would have precluded normal operation.

Toxicological testing detected memantine in specimens from the pilot, which is used to treat dementia. The pilot’s presumed underlying dementia could have influenced some of his decision-making but without more information about the status of his disease, its effect on the safety of his flying could not be determined. Specimens from the pilot-rated passenger detected diphenhydramine, THC, and its metabolites; however, the low levels of each substance were unlikely to have caused impairing effects. Overall, it is unlikely the pilot’s presumed dementia, or the pilot-rated passenger’s use of multiple substances contributed to the circumstances of this accident.

The circumstances of the accident are consistent with the pilot’s decision to perform aerobatic maneuvers in an airplane not approved for aerobatic flight, during which he exceeded the airplane’s critical angle of attack, resulting in an aerodynamic stall/spin and loss of control.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's exceedance of the airplane's critical angle of attack during an aerobatic maneuver, which resulted in an aerodynamic stall and spin and loss of control. Contributing to the accident was the pilot's decision to perform aerobatic maneuvers in an airplane that was not approved to do so.

## Findings

<b>Personnel issues</b>	Aircraft control - Pilot
<b>Aircraft</b>	Angle of attack - Not attained/maintained
<b>Personnel issues</b>	Decision making/judgment - Pilot
<b>Aircraft</b>	(general) - Incorrect use/operation

## Factual Information

### History of Flight

<b>Maneuvering-aerobatics</b>	Loss of control in flight (Defining event)
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On October 6, 2020, about 0820 central daylight time, a Quicksilver MXL-2 Sport light sport airplane, N2942A, was substantially damaged when it was involved in an accident near Mount Vernon, Indiana. The sport pilot and pilot-rated passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* (CFR) Part 91 personal flight.

A witness stated that she saw the accident airplane flying in the area. She watched the airplane come out of a loop then spiral toward the ground. She did not see the airplane impact the ground, but when the airplane was out of view, she heard the sound of an impact. She observed the airplane from her residence, which was 0.33 nautical mile (nm) east of the accident site and about 1 nm northeast of the airport.

### Pilot Information

<b>Certificate:</b>	Sport Pilot; Student	<b>Age:</b>	75, Male
<b>Airplane Rating(s):</b>	None	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Unknown
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	None None	<b>Last FAA Medical Exam:</b>	
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	(Estimated)		

## Pilot-rated passenger Information

<b>Certificate:</b>	Private	<b>Age:</b>	57, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>		<b>Restraint Used:</b>	Unknown
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>		<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 3 With waivers/limitations	<b>Last FAA Medical Exam:</b>	October 12, 2016
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	(Estimated) 2020 hours (Total, all aircraft)		

The pilot, who was the owner of the airplane, was seated in the right seat. The pilot-rated passenger was seated in the left seat. Both occupants were eligible to fly the light sport airplane with a valid driver's license.

An individual who had flown with the pilot about 1 year before the accident recounted that the pilot performed several "dangerous maneuvers" that made him very uncomfortable. He added that the pilot had "good technical skills, but his decision making was very poor."

Another individual had just flown with the pilot in the days before the accident. She reported that the pilot made low passes and dives. She captured numerous photos and videos of these flights from the ground and while flying in the airplane and provided them for the investigation. A review of the videos revealed that the pilot performed several steep climbs and steep descents at low altitude over the runway. Other videos showed the pilot maneuvering the airplane through a small opening in a tree line while on base to final approach for landing.

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	STEPHENS WILLIAM E	<b>Registration:</b>	N2942A
<b>Model/Series:</b>	Quicksilver MXL-2 Sport	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1993	<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Unknown	<b>Serial Number:</b>	001
<b>Landing Gear Type:</b>	Tricycle	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	Unknown	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>		<b>Engine Manufacturer:</b>	Rotax
<b>ELT:</b>	Not installed	<b>Engine Model/Series:</b>	582
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	64
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

The airplane was not approved for aerobatic flight per the experimental operating limitations.

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KEHR,387 ft msl	<b>Distance from Accident Site:</b>	8 Nautical Miles
<b>Observation Time:</b>	08:56 Local	<b>Direction from Accident Site:</b>	146°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	5 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	220°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.14 inches Hg	<b>Temperature/Dew Point:</b>	12°C / 8°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Mount Vernon, IN	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Mount Vernon, IN	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>		<b>Type of Airspace:</b>	Class G

## Airport Information

<b>Airport:</b>	Posey Patch Ultralight Flightpark 5911	<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>	374 ft msl	<b>Runway Surface Condition:</b>	Dry;Rough
<b>Runway Used:</b>		<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>		<b>VFR Approach/Landing:</b>	Unknown

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 Fatal	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Fatal	<b>Latitude, Longitude:</b>	37.920396,-87.7663(est)

The airplane impacted a harvested crop field oriented on a southwesterly heading and came to rest on its right side. The main wreckage was located about 100 ft from the initial ground impact marks. The engine remained attached to its mount and one propeller blade had separated from the propeller hub. The responding Federal Aviation Administration (FAA) inspector reported that the flight controls were connected and noted no anomalies. The airplane's metal tubular structure was bent in several places from the impact. The FAA inspector retained a section of fractured tubular structure for examination. There were no other anomalies noted with the airplane or engine.

The NTSB Materials Laboratory examined the fractured pieces of structure, which consisted mainly of anodized aluminum tubular supports that were bolted together with a steel alloy bolt. The bolt fracture surface exhibited rupture consistent with overstress fracture.

## Medical and Pathological Information

An autopsy of the sport pilot was performed by the Posey County Coroner's Office, Mt. Vernon, Indiana. The cause of death was multiple blunt force injuries. The FAA's Forensic Sciences Laboratory performed toxicology tests on specimens from the pilot; memantine was detected

in the blood and liver. Memantine is used to treat confusion (dementia) related to Alzheimer's disease.

An autopsy of the pilot-rated passenger was performed by the Posey County Coroner's Office, Mt. Vernon, Indiana. The cause of death was multiple blunt force injuries. The FAA's Forensic Sciences Laboratory performed toxicology tests on specimens from the passenger; glucose, diphenhydramine, carboxy-delta-9-THC, 11-hydroxy-delta-9-THC were detected in the urine, and diphenhydramine, delta-9-THC, and carboxy-delta-9-THC were detected in the blood.

## Preventing Similar Accidents

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Prevent Aerodynamic Stalls at Low Altitude (SA-019)

### The Problem

While maneuvering an airplane at low altitude in visual meteorological conditions, many pilots fail to avoid conditions that lead to an aerodynamic stall, recognize the warning signs of a stall onset, and apply appropriate recovery techniques. Many stall accidents result when a pilot is momentarily distracted from the primary task of flying, such as while maneuvering in the airport traffic pattern, during an emergency, or when fixating on ground objects.

### What can you do?

- Be honest with yourself about your knowledge of stalls and your preparedness to recognize and handle a stall situation in your airplane. Seek training to ensure that you fully understand the stall phenomenon, including angle-of attack (AOA) concepts and how elements such as weight, center of gravity, turbulence, maneuvering loads, and other factors affect an airplane's stall characteristics.
- Remember that an aerodynamic stall can occur at any airspeed, at any attitude, and with any engine power setting.
- Remember that the stall airspeeds marked on the airspeed indicator (for example, the bottom of the green arc and the bottom of the white arc) typically represent steady flight speeds at 1G at the airplane's maximum gross weight in the specified configuration. Maneuvering loads and other factors can increase the airspeed at which

the airplane will stall. For example, increasing bank angle can increase stall speed exponentially. Check your airplane's handbook for information.

- Reducing AOA by lowering the airplane's nose at the first indication of a stall is the most important immediate response for stall avoidance and stall recovery.
- Manage distractions when maneuvering at low altitude so that they do not interfere with the primary task of flying.
- Resist the temptation to perform maneuvers in an effort to impress people, including passengers, other pilots, persons on the ground, or others via an onboard camera. "Showing off" can be a deadly distraction because it diverts your attention away from the primary task of safe flying.
- Understand that the stall characteristics of an unfamiliar airplane may differ substantially from those of airplanes with which you have more flight experience.

See <https://www.nts.gov/Advocacy/safety-alerts/Documents/SA-019.pdf> for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).



## Administrative Information

<b>Investigator In Charge (IIC):</b>	Lindberg, Joshua
<b>Additional Participating Persons:</b>	Cory Irwin; Federal Aviation Administration; Indianapolis, IN
<b>Original Publish Date:</b>	July 7, 2022
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class 3</a>
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.ntsb.gov/Docket?ProjectID=102099">https://data.ntsb.gov/Docket?ProjectID=102099</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).