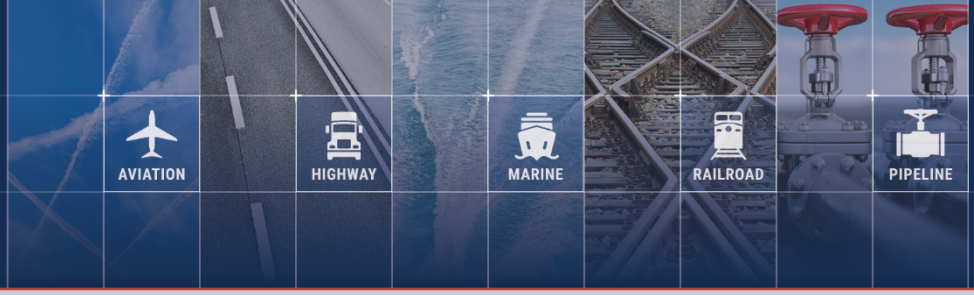

Aviation Investigation Final Report

Location:	Duluth, Minnesota	**Accident Number:**	CEN23FA248
Date & Time:	June 21, 2023, 07:19 Local	**Registration:**	N308ED
Aircraft:	Aeronca 7CCM	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The accident flight was the first flight after the pilot completed an annual inspection the previous day. The pilot and passenger were completing a local flight to the pilot's private grass strip. GPS data revealed that the airplane flew about 18 nm, then approached the grass strip and entered a left downwind for the runway. The airplane overflew the runway about 100 ft above ground level (agl) at a groundspeed of 58 mph. Near the departure end of the runway the airplane climbed and accelerated to 64 mph, then gradually slowed to 54 mph and reached a peak altitude of 240 ft agl. The airplane then made a descending left turn toward the accident site.

Postaccident examination of the airplane revealed that the outboard leading edge of the right wing exhibited aft accordion crush damage, the empennage was distorted to the right, and the engine and propeller were buried into the ground. Rotational scoring and leading edge damage was noted on both propeller blades and several tree limbs were cut by the rotating propeller blades. The examination revealed no preimpact mechanical malfunctions or failures that would have precluded normal operation.

The flight track showing a descending left turn, the position of the wreckage, the right wing crush damage, the empennage distorted to the right, and the lack of a horizontal debris field all suggest that the airplane entered an aerodynamic stall before it impacted the ground. It is likely that the pilot exceeded the airplane's critical angle of attack and failed to maintain proper airspeed at an altitude too low to recover, which resulted in a loss of control and impact with terrain.

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 and failure to maintain adequate airspeed, which resulted in an aerodynamic stall and loss of control.

Findings

Aircraft	Angle of attack - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Aircraft	Airspeed - Not attained/maintained

Factual Information

History of Flight

Approach-VFR pattern crosswind	Aerodynamic stall/spin (Defining event)
Approach-VFR pattern crosswind	Loss of control in flight

On June 21, 2023, at 0719 central daylight time, an Aeronca 7CCM airplane, N308ED, was substantially damaged when it was involved in an accident near Duluth, Minnesota. The pilot and passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot had just completed an annual inspection on the airplane the day before the accident. Family and coworkers of the pilot stated that the pilot was likely flying to his private airstrip to view the area.

Data from the pilot's handheld GPS revealed that after departure, the airplane proceeded northeast about 18 nm to the pilot's private grass airstrip. The airplane approached from the south and entered a left downwind for the east runway. The airplane overflew the runway about 100 ft agl and 58 mph groundspeed. Near the departure end of the runway the airplane climbed and accelerated to 64 mph, then gradually slowed to 54 mph and reached a peak of 240 ft agl. The airplane then made a descending left turn toward the accident site (Figure 1).

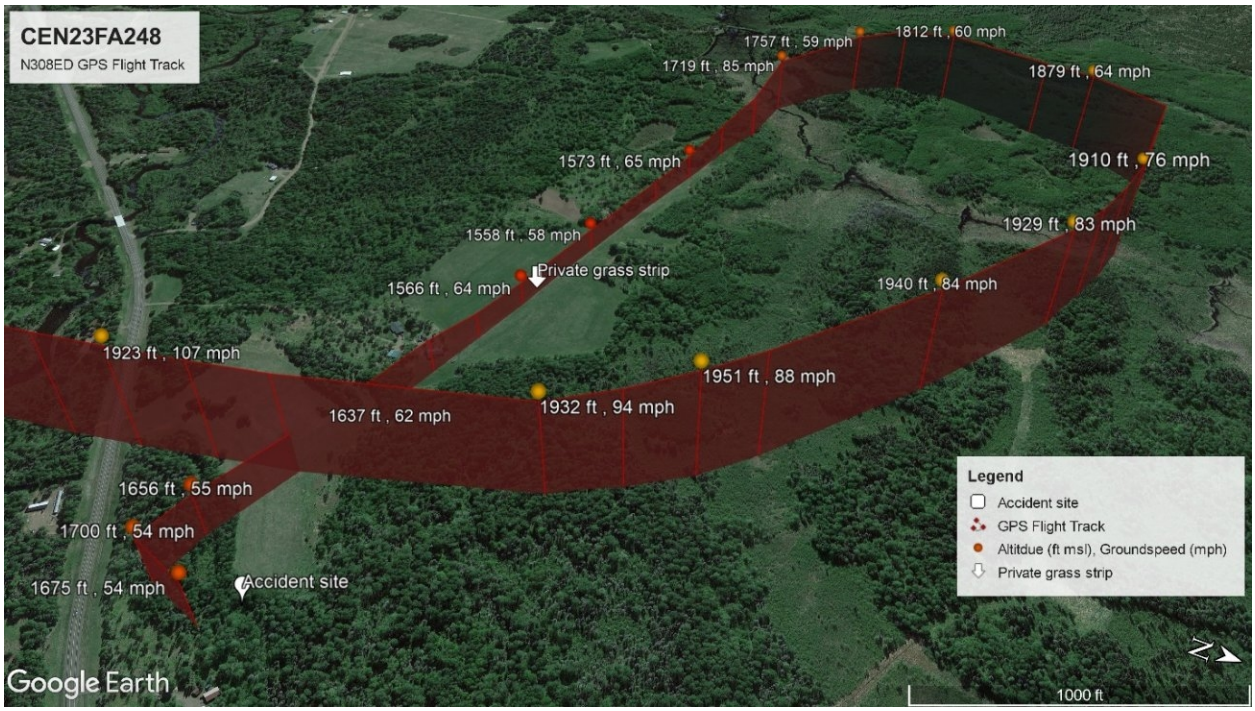

Figure 1. End of accident flight track overlaid on Google Earth.

Pilot Information

Certificate:	Private	**Age:**	60,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	September 8, 2022
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	October 20, 2022
Flight Time:	(Estimated) 639.49 hours (Total, all aircraft), 17.74 hours (Total, this make and model), 2.3 hours (Last 90 days, all aircraft), 0 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Passenger Information

Certificate:		**Age:**	64,Male
Airplane Rating(s):		**Seat Occupied:**	Rear
Other Aircraft Rating(s):		**Restraint Used:**	3-point
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Aeronca	**Registration:**	N308ED
Model/Series:	7CCM	**Aircraft Category:**	Airplane
Year of Manufacture:	1946	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	7AC2952
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	June 20, 2023 Annual	**Certified Max Gross Wt.:**	1300 lbs
Time Since Last Inspection:	0 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1971.4 Hrs at time of accident	**Engine Manufacturer:**	Continental Motors
ELT:	C91A installed, activated, aided in locating accident	**Engine Model/Series:**	C90-8F
Registered Owner:	STEVENS MIKE	**Rated Power:**	90 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The airplane's maintenance records showed that an annual inspection was signed off by the accident pilot the day before the accident. There were no outstanding discrepancies noted in the maintenance logbook entries.

There was no electrical system installed in the airplane.

The most recent airplane weight and balance from October 13, 2021, revealed that the empty weight was 910 lbs and the maximum gross weight was 1,300 lbs, which allowed a useful load of 390 lbs.

At the time of the accident, the airplane was about 136 lbs over maximum gross weight and the center of gravity was within an acceptable range. This weight is estimated based on 5 gallons of fuel in the auxiliary fuel tanks. The actual total amount of fuel onboard is unknown as both the main fuel tank and the left auxiliary fuel tank were breached.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KTWM,1080 ft msl	**Distance from Accident Site:**	11 Nautical Miles
Observation Time:	07:15 Local	**Direction from Accident Site:**	113°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	70°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.13 inches Hg	**Temperature/Dew Point:**	17°C / 13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Duluth, MN (DLH)	**Type of Flight Plan Filed:**	None
Destination:	Duluth, MN (DLH)	**Type of Clearance:**	VFR
Departure Time:	06:59 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Private strip pvt	**Runway Surface Type:**	Grass/turf
Airport Elevation:	1455 ft msl	**Runway Surface Condition:**	Dry;Vegetation
Runway Used:	110	**IFR Approach:**	None
Runway Length/Width:	1700 ft / 45 ft	**VFR Approach/Landing:**	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	47.118398,-91.98392

The wreckage was located in a densely wooded area about 1,500 ft east of the private grass strip. There was no noticeable damage to the surrounding trees or to the tree canopy (Figure 2). The airplane impacted in a right-wing-low and nose-down attitude. The right wing's leading edge exhibited accordion crush damage and the empennage was distorted to the right. The left wing was mostly straight with wrinkling and minimal leading edge damage.

Figure 2. Aerial view of accident site (Courtesy of Sheriff's Office).

Flight control continuity was established, through overload separations and first responder cuts, from the cockpit controls to the control surfaces. The front and back seats remained attached to their respective fuselage attach points. Both sets of 3-point harness assemblies remained latched but the left side of each lap belt was cut during the recovery. Both shoulder harness webbings were separated at the Y junctions. All harnesses remained attached to their respective fuselage attach points.

The main fuel tank and left auxiliary fuel tank were breached and did not contain fuel. There was blue aviation gasoline found pooled in the cockpit area underneath the main tank. The right auxiliary fuel tank contained about 2.5 gallons of aviation gasoline.

The engine and propeller were buried in the ground and remained attached to the airframe. One propeller blade was bent aft about mid-span and the other blade was relatively straight with no noticeable bending. Both blades exhibited leading edge gouges and chordwise abrasions. At the accident site, underneath the right wing and near the engine, there were several tree branches that exhibited 45° cuts and visible paint transfer from impact with the rotating propeller.

Postaccident examination of the engine and airframe did not reveal any preimpact mechanical malfunctions or anomalies that would have precluded normal operation.

Preventing Similar Accidents

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.ntsb.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

Investigator In Charge (IIC):	Lindberg, Joshua
Additional Participating Persons:	Gregory Thurston; Federal Aviation Administration; Minneapolis, MN
Original Publish Date:	September 5, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=192414