



# **Aviation Investigation Final Report**

Location:	Bridgeton, New Jersey	Accident Number:	ERA22FA426
Date & Time:	September 19, 2022, 13:48 Local	Registration:	N2716E
Aircraft:	Champion AERONCA 7AC	Aircraft Damage:	Substantial
Defining Event:	Aerodynamic stall/spin	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

## Analysis

The pilot and pilot-rated passenger were departing on a local personal flight. Witnesses stated that the as the airplane departed the engine did not sound like it was creating full power. During the initial climb, the airplane briefly climbed at a steep angle then turned left, descended, and impacted the ground about 500 ft from the departure end of the runway. Postaccident examination of the wreckage revealed no evidence of preimpact mechanical anomalies that would have prevented normal engine operation. Given the witness statements, and the findings of the postaccident engine examination, it could not be determined whether there was a partial loss of engine power during the takeoff.

Nevertheless, the conditions about the time of the accident, given the temperature and dew point, were favorable for serious carburetor icing at a glide power setting. Given this information, it is possible that during the ground operation, when the engine would typically be operating at low power, carburetor ice formed. This could have resulted in at least a partial loss of engine power during the initial climb. The available evidence for this investigation did not indicate whether or not the pilot applied carburetor heat before or during the flight.

The witness reports of the airplane briefly climbing at a steep angle, the video showing the airplane in a steep descending left turn, as well as the signatures observed on the wreckage (aft crushing of the forward portion of the fuselage, the relatively uniform aft crush damage on the leading edges of both wings, and damage consistent with a relatively low energy state at the time of impact) were all consistent with the airplane encountering an aerodynamic stall before it impacted the ground. Given that there were no anomalies observed with the airplane's flight controls during the postaccident wreckage examination, it is likely that the pilot exceeded the airplane's critical angle of attack at an altitude too low to recover, which resulted in the subsequent 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 shortly after takeoff, which resulted in an aerodynamic stall, loss of control, and impact with terrain.

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

## **Factual Information**

History of Flight		
Initial climb	Aerodynamic stall/spin (Defining event)	
Initial climb	Loss of control in flight	
Uncontrolled descent	Collision with terr/obj (non-CFIT)	

On September 19, 2022, about 1348 eastern daylight time, an Aeronca 7AC Champion, N2716E, was substantially damaged when it was involved in an accident near Bridgetown, New Jersey. The pilot and pilot-rated passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to airport security video, the pilot started the airplane's engine at 1341 and taxied to the end of the 1,900-ft-long turf runway. About 4 minutes later, another security video showed the airplane in a steep left-turning descent and then the airplane's impact with the ground.

A witness located near the departure end of runway 18 at Bucks Airport (00N), Bridgeton, New Jersey, heard an airplane departing the runway and described that it sounded "unusual." He observed the airplane 3 to 4 ft above the runway surface and stated that the airplane then "aggressively pulled up" in a steep climb near the end of runway. The airplane cleared power lines, but the engine sounded as if it were not accelerating or generating full power. The airplane subsequently did not appear to climb and entered a descending left turn. The witness lost sight of the airplane when it descended behind trees before hearing an impact.

Another witness, the owner of the airport, observed the airplane depart the runway with about 50 ft remaining. He stated that the airplane entered a steep angle of attack and slowly leveled out again. The witness lost sight of the airplane after its slow left turn.

The airplane impacted the front yard of a residential house that was about 50 ft from a road and about 500 ft from the departure end of the runway.

The airframe came to rest upright oriented on a magnetic heading of about 20°. The cabin, instrument panel, seats, and engine compartment were fractured into several pieces. The forward section of the fuselage was crushed aft and upward. The Leading edges of both wings displayed relatively uniform aft crushing damage. The tail section of the airplane was not damaged. Flight control continuity was established from the controls in the cockpit to the respective flight controls. The position of the throttle, mixture, and carburetor heat controls could not be determined due to impact damage. Fuel samples were taken from the fuel tanks, fuel lines, and gascolator. The fuel was blue in color and tested negative for the presence of ethanol.

The propeller was separated from the engine and one propeller blade was bent aft. The propeller blades did not display chordwise scratching or S-bending. Engine powertrain continuity was established from the propeller flange to the accessory case. The top spark plugs were removed, and thumb compression was established on all cylinders. The magnetos were removed, and spark was produced on all leads. The carburetor was removed and disassembled, and no anomalies were noted. The oil screen was clean and clear of debris.

The 1354 recorded weather observation at Millville Municipal Airport (MIV), Millville, New Jersey, about 8 miles southeast of the accident location, included wind from 200° at 7 knots, 10 miles visibility, clear skies, temperature 28°C, dew point 18°C; and an altimeter setting of 29.94 inches of mercury.

The carburetor icing probability chart from FAA Special Airworthiness Information Bulletin (SAIB): CE-09-35 Carburetor Icing Prevention, showed a probability of serious icing at glide power at the temperature and dew point reported at the time of the accident

The engine operating instructions stated that, during the pre-takeoff ground test (engine run up), the carburetor heat control should be moved "to full 'HOT' position and observe decrease in engine speed if air heater and control are operating properly" and then "return control to full 'COLD' position." The instructions also noted, "under some conditions, ice may form in the carburetor during ground test. It must be eliminated before take-off."

Federal Aviation Administration Special Airworthiness Information Bulletin CE-09-35, Carburetor Icing Prevention, stated the following:

Pilots should be aware that carburetor icing doesn't just occur in freezing conditions, it can occur at temperatures well above freezing temperatures when there is visible moisture or high humidity. Icing can occur in the carburetor at temperatures above freezing because vaporization of fuel, combined with the expansion of air as it flows through the carburetor...causes sudden cooling, sometimes by a significant amount within a fraction of a second. Carburetor ice can be detected by a drop in rpm in fixed pitch propeller airplanes and a drop in manifold pressure in constant speed propeller airplanes. In both types, usually there will be a roughness in engine operation.

#### **Pilot Information**

Certificate:	Airline transport; Commercial; Flight instructor	Age:	24,Male
Airplane Rating(s):	Single-engine land; Single-engine sea	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	Toxicology Performed:	Yes
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	March 15, 2022
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	3700 hours (Total, all aircraft)		

## Pilot-rated passenger Information

Certificate:	Commercial	Age:	67,Male
Airplane Rating(s):		Seat Occupied:	Rear
Other Aircraft Rating(s):		Restraint Used:	3-point
Instrument Rating(s):		Second Pilot Present:	Yes
Instructor Rating(s):		Toxicology Performed:	Yes
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	June 3, 2020
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	2610 hours (Total, all aircraft)		

### Aircraft and Owner/Operator Information

Aircraft Make:	Champion	Registration:	N2716E
Model/Series:	AERONCA 7AC	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	7AC-6296
Landing Gear Type:	Tailwheel	Seats:	2
Date/Type of Last Inspection:	March 25, 2022 Annual	Certified Max Gross Wt.:	1220 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	1561.7 Hrs as of last inspection	Engine Manufacturer:	Continental
ELT:	C126 installed, activated, did not aid in locating accident	Engine Model/Series:	A65-8
Registered Owner:	TERRI AIR SERVICE LLC	Rated Power:	100
Operator:	On file	Operating Certificate(s) Held:	None

### Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
<b>Observation Facility, Elevation:</b>	MIV,58 ft msl	Distance from Accident Site:	8 Nautical Miles
Observation Time:	13:54 Local	Direction from Accident Site:	142°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	7 knots / None	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	200°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	29.94 inches Hg	Temperature/Dew Point:	28°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitat	tion	
Departure Point:	Bridgeton, NJ	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:		Type of Airspace:	Class G

### **Airport Information**

Airport:	BUCKS 00N	Runway Surface Type:	Grass/turf
Airport Elevation:	108 ft msl	Runway Surface Condition:	Dry
Runway Used:	18	IFR Approach:	None
Runway Length/Width:	1900 ft / 50 ft	VFR Approach/Landing:	None

## 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:	39.47075,-75.182577

#### **Administrative Information**

Investigator In Charge (IIC):	Boggs, Daniel
Additional Participating Persons:	Sven Ostrowski; FAA/FSDO; Philadelphia, PA
Original Publish Date:	January 30, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=105965

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 <u>here</u>.