



Aviation Investigation Final Report

Location:	North Myrtle Beach, South Carolina	Accident Number:	ERA22FA243
Date & Time:	May 28, 2022, 14:14 Local	Registration:	N4421M
Aircraft:	Piper PA-12	Aircraft Damage:	Substantial
Defining Event:	Aerodynamic stall/spin	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Banner tow		

Analysis

The pilot of the banner tow airplane made a low approach to pick up a banner. Witnesses reported that after the tow rope was picked up, the airplane pitched up and maintained a steep angle of attack until it entered an aerodynamic stall and made a near vertical descent to impact. The airplane came to rest in a nose-down, near-vertical position about 300 ft from the banner pick up zone. A postaccident examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. Toxicology testing detected a low level of ethanol in the pilot’s liver tissue. Some or all of the small amount of detected ethanol may have been from postmortem production. It is unlikely that ethanol effects contributed to the accident. It is likely that after the banner pickup and during initial climb, while the airplane had a high-power setting, high pitch angle, and low airspeed, the pilot exceeded the airplane’s critical angle of attack, and the airplane entered an aerodynamic stall from which recovery was not possible due to the airplane’s low altitude.

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, which resulted in a subsequent aerodynamic stall at an altitude that was too low for recovery.

Findings

Aircraft	Angle of attack - Attain/maintain not possible
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Maneuvering	Aerodynamic stall/spin (Defining event)
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On May 28, 2022, at 1414 eastern daylight time, a Piper PA-12, N4421M, sustained substantial damage when it was involved in an accident near North Myrtle Beach, South Carolina. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 banner tow flight.

Witnesses standing on the flight line at Grand Strand Airport (CRE), North Myrtle Beach, South Carolina, stated that the airplane approached to pick up a banner, picked up the tow rope, pitched up, and maintained a steep angle of attack until the airplane “stalled.” The left wing dropped, and the airplane made a near-vertical descent and impacted the ground about 300 ft from the banner pick up zone. One witness reported that the airplane entered a spin prior to impact.

The owner of the banner tow company stated that the pilot was a long-term employee and most of his 15,200 hours of flying were in the accident airplane or another Piper PA-12.

The accident site was located 126 ft to the right side of runway 23 and about midfield.

The fuselage came to rest in a nose down, near vertical position. Both wings exhibited accordion-style crushing. Both fuel tanks were breached. Flight control continuity was established from all flight control surfaces to the flight controls. The instrument panel was located under the engine, and all instruments were impact-damaged.

The engine was disassembled, and it was noted that there were no accessory drive splines installed in the engine accessory case, nor were they required to be; therefore, the engine crankshaft could not be rotated by hand. The right-side cylinders, Nos. 1 and 3, were removed to provide visual access to the internal engine components. Continuity of the crankshaft, camshaft, and valvetrain was confirmed by visual observation. The interiors of all four cylinders were examined with no anomalies noted. The magnetos were removed and sparked on all towers. Oil was present in the engine; the oil suction screen was examined, and no debris was noted.

The propeller separated at the crankshaft and was buried about 2 ft in the ground. One propeller blade exhibited chordwise paint abrasion, “S” bending, and longitudinal twisting toward the blade face. The other propeller blade exhibited chordwise paint abrasion.

Toxicological testing by the Federal Aviation Administration Forensic Sciences Laboratory identified ethanol at 0.016 g/dL in the pilot's liver tissue. Ethanol was not detected in the pilot's vitreous fluid or brain tissue.

Pilot Information

Certificate:	Commercial	Age:	56, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	Lap only
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	June 15, 2021
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	15200 hours (Total, all aircraft), 15200 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N4421M
Model/Series:	PA-12	Aircraft Category:	Airplane
Year of Manufacture:	1947	Amateur Built:	
Airworthiness Certificate:	Restricted (Special)	Serial Number:	12-3375
Landing Gear Type:	Tailwheel	Seats:	1
Date/Type of Last Inspection:	April 18, 2022 Annual	Certified Max Gross Wt.:	958 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	19928 Hrs as of last inspection	Engine Manufacturer:	Lycoming
ELT:	Not installed	Engine Model/Series:	O-320
Registered Owner:	BARNSTORMERS AERIAL ADVERTISING LLC	Rated Power:	150
Operator:	BARNSTORMERS AERIAL ADVERTISING LLC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	CRE,33 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	14:35 Local	Direction from Accident Site:	66°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	9 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	180°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	29.88 inches Hg	Temperature/Dew Point:	28°C / 21°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	North Myrtle Beach, SC	Type of Flight Plan Filed:	None
Destination:	North Myrtle Beach, SC	Type of Clearance:	VFR
Departure Time:		Type of Airspace:	Class D

Airport Information

Airport:	Grand Strand Airport CRE	Runway Surface Type:	Asphalt
Airport Elevation:	31 ft msl	Runway Surface Condition:	Dry
Runway Used:	23	IFR Approach:	None
Runway Length/Width:	5997 ft / 100 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	33.811535,-78.725278

Administrative Information

Investigator In Charge (IIC):	Boggs, Daniel
Additional Participating Persons:	Jason Author; FAA; SC Mike Childers; Lycoming ; Atlanta, GA
Original Publish Date:	January 30, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=105141

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](#).