



Aviation Investigation Final Report

Location:	Middle Township, New Jersey	Accident Number:	ERA22FA315
Date & Time:	July 16, 2022, 09:35 Local	Registration:	N3703M
Aircraft:	Piper PA12	Aircraft Damage:	Substantial
Defining Event:	Loss of control in flight	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Banner tow		

Analysis

The banner tow pilot had worked for the operator for about 2 months, and the accident flight was the first flight of the day. The pilot departed from the runway and flew a left traffic pattern to pick up the banner at the approach end of the opposite runway, which was normal procedure. Witnesses stated that the airplane descended between the poles, missed the banner, and the pilot initiated an aggressive, almost vertical climb. One witness stated that it appeared as though the accident pilot "kicked rudder" at the top of the climb to see if he had picked up the banner. The airplane entered an aerodynamic stall/spin and descended to ground contact. Examination of the wreckage did not reveal evidence of any preimpact mechanical malfunctions of the airplane that would have precluded normal operation.

Based on the available information, it is likely that the pilot exceeded the airplane's critical angle of attack during the banner pickup attempt, which resulted in an aerodynamic stall/spin and loss of control at an altitude too low to recover.

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 a missed banner pickup, which resulted in an aerodynamic stall/spin and loss of control at an altitude too low to recover.

Findings

Personnel issues

Aircraft control - Pilot

Aircraft

Angle of attack - Capability exceeded

Factual Information

History of Flight

Maneuvering-low-alt flying	Loss of control in flight (Defining event)
Maneuvering-low-alt flying	Aerodynamic stall/spin
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On July 16, 2022, about 0935 eastern daylight time, a Piper PA-12, N3703M, was substantially damaged when it was involved in an accident near Middle Township, New Jersey. The commercial pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 banner-tow flight.

According to the operator, who witnessed the accident, the pilot was hired about 2 months before the accident. The airplane was fueled to capacity before to the flight. On the accident flight, the pilot departed runway 32 and flew a left traffic pattern to pick up the banner at the approach end of runway 14, which was normal procedure. The airplane descended toward the banner, but missed the haul line during the pickup attempt. The airplane then climbed nose-high and stalled, spinning right and impacting the runway. Engine noise was consistent throughout the accident sequence.

Another witness stated that he was seated in an airplane, with the engine running, waiting to take off next and pick up a banner. He observed the accident airplane come down between the poles, miss the banner, and the accident pilot made a really "hard snap," climbing almost vertically. It looked to the witness as though the accident pilot "kicked rudder" at the top of his climb to see if he had picked up the banner. The witness added that he believed this caused the right wing to come out from the slipstream, resulting in an aerodynamic stall.

Pilot Information

Certificate:	Commercial	Age:	23, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 1 With waivers/limitations	Last FAA Medical Exam:	March 31, 2022
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	707 hours (Total, all aircraft), 203 hours (Total, this make and model), 259 hours (Last 90 days, all aircraft), 138 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N3703M
Model/Series:	PA12 No Series Exists	Aircraft Category:	Airplane
Year of Manufacture:	1947	Amateur Built:	
Airworthiness Certificate:	Restricted (Special)	Serial Number:	12-2648
Landing Gear Type:	Tailwheel	Seats:	3
Date/Type of Last Inspection:	May 29, 2022 Annual	Certified Max Gross Wt.:	
Time Since Last Inspection:	87 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	15117 Hrs as of last inspection	Engine Manufacturer:	Lycoming
ELT:	Not installed	Engine Model/Series:	O-320 A2B
Registered Owner:	Paramount Air Service Inc	Rated Power:	150 Horsepower
Operator:	Paramount Air Service Inc	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	WWD,23 ft msl	Distance from Accident Site:	3 Nautical Miles
Observation Time:	09:30 Local	Direction from Accident Site:	180°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	None / None
Wind Direction:		Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.13 inches Hg	Temperature/Dew Point:	26°C / 22°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Middle Township, NJ	Type of Flight Plan Filed:	None
Destination:	Middle Township, NJ	Type of Clearance:	None
Departure Time:		Type of Airspace:	Class G

Airport Information

Airport:	Paramount Air Airport JY04	Runway Surface Type:	Grass/turf
Airport Elevation:	8 ft msl	Runway Surface Condition:	Dry
Runway Used:	32	IFR Approach:	None
Runway Length/Width:	2000 ft / 100 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	39.064843,-74.90856

The wreckage came to rest nose-down, oriented about a 320° magnetic heading, and no debris path was observed. The wreckage remained intact. Both wings exhibited leading edge damage and buckling, with the left wing exhibiting more damage than the right. The ailerons remained attached to their respective wing. The empennage remained intact and was canted right. Flight control continuity was confirmed from all flight control surfaces to the cockpit. Measurement

of the horizontal stabilizer trim jackscrew corresponded to a nose-down trim position; 14 threads were observed, with 17 threads being full nose-down and 1 thread being full nose-up. The cockpit area was crushed, but the pilot's 4-point harness remained latched and was cut by rescue personnel.

The engine remained attached to the airframe and the propeller remained attached to the engine. One propeller blade remained undamaged, while the other exhibited s-bending and leading-edge gouging. The top spark plugs were removed from the engine. Their electrodes were intact and gray in color, except for the No. 4 spark plug, which was oil soaked. The rocker covers were removed and oil was observed throughout the engine. Both magnetos were removed from the engine and sparked at all leads when rotated by hand. When the propeller was rotated by hand, crankshaft, camshaft, and valvetrain continuity were confirmed to the rear accessory section of the engine and thumb compression was attained on all cylinders. The carburetor butterfly valve was in the open position. The carburetor floats and needle remained intact and the fuel screen was absent of debris.

Additional Information

FAA publication FS-I-8700-1 (Rev. 1), "Information For Banner Towing Operations" stated:

...Stalls during the banner pickup procedure constitute one of the more frequent causes of banner towing operational accidents. A stall occurs when an airfoil reaches a critical angle of attack (AOA) and is a function of wing loading, independent of airspeed. In fact, an excessively abrupt rotation of an airplane during a pickup, or a snap or steep turn after a missed pickup, may be sufficient to precipitate an accelerated stall...

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Dennis Petry; FAA/FSDO; Philadelphia, PA Ryan Enders; Lycoming Engines; Williamsport, PA
Original Publish Date:	November 15, 2023
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=105485

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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](#).