



National Transportation Safety Board Aviation Accident Final Report

Location:	Boone, IA	Accident Number:	CEN10LA514
Date & Time:	09/02/2010, 0921 CDT	Registration:	N10128
Aircraft:	CESSNA 150L	Aircraft Damage:	Substantial
Defining Event:	Aerodynamic stall/spin	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Banner Tow		

Analysis

The pilot conducted a downwind takeoff on the local banner-tow flight. The airplane subsequently picked up the banner on a downwind low approach. A witness reported that the engine sounded normal. An eyewitness reported the airplane was not gaining much altitude and that the banner was very close to being dragged in crops on departure. A witness near the accident site said that the banner got caught in the corn while the airplane was maneuvering. Another witness saw the banner separate from the airplane before the airplane banked and went into a dive. The pilot was trained in and endorsed for banner towing operations and emergencies. However, his logbook did not contain an endorsement for a flight review. The local wind was 11 knots gusting to 20 knots. A wreckage examination revealed no preimpact anomalies. The propeller blades exhibited chordwise abrasion and leading edge nicks consistent with an engine producing power at the time of impact. A global positioning system unit showed that, after the airplane picked up the banner, it made a tight downwind turn to the left and headed northeast during its climbout. The data showed the airplane then turned to the south and subsequently descended.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain airplane control while performing low-level banner towing operations with a gusting wind.

Findings

Aircraft	Performance/control parameters - Not attained/maintained (Cause)
Personnel issues	Aircraft control - Pilot (Cause)
Environmental issues	Gusts - Contributed to outcome

Factual Information

HISTORY OF FLIGHT

On September 2, 2010, about 0921 central daylight time, a Cessna 150L, N10128, operated by Drake Aerial Enterprises, LLC, and piloted by a commercial pilot, sustained substantial damage when it collided with terrain near Boone, Iowa. The airplane was conducting banner tow operations under the provisions of 14 Code of Federal Regulations Part 91. The pilot sustained fatal injuries. The local banner tow flight departed the Boone Municipal Airport (BNW), near Boone, Iowa, about 0907. Visual meteorological conditions prevailed, and no flight plan was on file.

A witness at the fixed base operator (FBO), who saw the airplane depart from runway 15, stated that the airplane never gained much altitude and its banner looked like it was "very close" to dragging on the ground. The witness watched the airplane turn east and then back north with not much of an altitude change. The witness and two others went up in an airplane and spotted the wreckage. The banner was north of the aircraft and according to the witness, it appeared that "the aircraft went almost straight down because there was not much corn disturbed."

Another witness at the FBO stated that he observed the takeoff. He heard the initial takeoff and the approach to the banner. The engine "sounded normal."

A witness near the accident site reported that the banner was "dipping" in the wind and all of sudden, it "got caught in the corn." Within two to three seconds the "plane nose dived straight down into the field."

Another witness near the accident site stated that the airplane "seemed to be struggling to gain altitude as he headed north from the airport." The witness saw the airplane turn to the east and continued to appear to "struggle." The airplane turned back west and its altitude did not increase. After the airplane turned around the banner appeared to "fall off as if he cut it loose." Shortly after that the plane turned south. The witness said that the plane then banked hard to its left and its "nose went straight down."

Deputies from the Boone County Sheriff's Office found the wreckage in a cornfield north of 200th Street between S and R Avenues.

PERSONNEL INFORMATION

The 24-year-old pilot held a Federal Aviation Administration (FAA) commercial pilot certificate with airplane single-engine land, multiengine land, and instrument ratings. According to copies of his logbook, the most recent entry was dated August 23, 2010. Those copies showed that the pilot reported a total flight time of 559.6 hours. It further showed a banner towing endorsement, dated November 8, 2007. A current flight review was not located in the copies of the pilot's logbook. The operator estimated that the pilot had over 40 hours of total flight experience in the same make and model as the accident airplane.

The pilot's most recent FAA second-class medical certificate was issued on June 13, 2010, with no limitations.

According to the operator, the operator provided the following training to the banner tower pilot:

1. Familiarization of the aircraft to be used in this case it would be just Cessna 150s, as he did not have a tailwheel endorsement.
2. Tow hitches and their release handles
3. Flap settings for towing
4. Engine and fuel management
5. Pick up and drop procedures and speeds
6. Aborted pick up procedures
7. Aborted drop procedures
8. Pick ups that bring up FOD
9. Tangled and twisted banners
10. Landing with banner that will not come off
11. Set up and tear [down] of banner and launch equipment

AIRCRAFT INFORMATION

N10128 was a 1973 Cessna 150L, which was an all-metal, high-wing, semimonocoque design airplane with serial number 15074800. The airplane was equipped with externally braced wings, wing flaps, and a fixed tricycle landing gear. The airplane was configured to seat two occupants.

FAA airworthiness documents revealed that the airplane was powered by a Lycoming O-360-A4A, serial number L17153-36A, installed under supplemental type certificate (STC) SA4795SW, and had a short take off and land (STOL) kit installed under STC SA909CE. Both of those installations were documented on a major repair and alteration form, dated December 17, 1991. Long-range fuel tanks were installed under STC SA5733SW on November 25, 2003. A tow hook assembly was installed under STC SA1-349 on October 7, 2005. Vortex generators were installed under STC SA01065SE on January 29, 2009. The airplane had an EDM 700 cockpit displayed engine monitoring system, manufactured by J.P. Instruments (JPI), that recorded engine data. The monitoring system was installed under STC SA00432SE.

The airplane was maintained under an annual inspection program and airplane logbook entries showed that the airplane's most recent annual inspection was conducted on April 1, 2010. The entry showed that the airplane accumulated 6,796.9 hours of total time at the time of that inspection. The operator's accident report stated that the airplane had accumulated a total time of 7,107 hours.

METEOROLOGICAL INFORMATION

At 0915, the recorded weather at BNW was: Wind 310 degrees at 11 knots gusting to 20 knots, visibility 10 statute miles, sky condition clear, temperature 22 degrees C, dew point 17 degrees C, altimeter 29.81 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

FAA inspectors and an air safety investigator from Cessna examined the wreckage on-scene. Pictures of the wreckage showed that the leading edge of the airplane's wings came to rest on the ground. The engine came to rest below the ground and one propeller blade was visible above ground. Flight control continuity was established. The flap actuator was extended to about the 15 - 20 degree flap setting. The propeller blades exhibited chordwise abrasion and leading edge nicks.

The banner measured about 39 feet by 105 feet when it was laid out and examined. The banner's bridle lines were twisted and knotted. The top bridle line was detached from the banner. The third bridle line up from the bottom was torn away from the banner. Fraying was found on the bottom of the banner. The lead pole sleeve, near the bottom of the banner, was torn. The green parachute cord on the bottom lead pole sleeve was torn.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot at the Iowa Office of the State Medical Examiner on September 3, 2010. The autopsy reported multiple blunt force injuries as the cause of death.

The FAA Civil Aerospace Medical Institute prepared a Final Forensic Toxicology Accident Report. The report was negative for the tests performed.

TESTS AND RESEARCH

The JPI engine monitor and a recovered Garmin Global Positioning System (GPS) were shipped by a FAA inspector to the National Transportation Safety Board Vehicle Recorder Laboratory for downloading by NTSB National Resource Specialists. The JPI engine monitor sustained impact damage and no usable information about the accident flight was available from the monitor's data. The GPS unit also sustained impact damage. However, there was accident relevant data that was able to be downloaded from the GPS unit. A National Resource Specialist prepared a report on the flight's data.

From that report, the recovered GPS data showed that the airplane departed from BNW on runway 15 and made about a three-quarter mile left traffic pattern with its crosswind leg turn to downwind leg west of S Avenue. The data indicated that the airplane descended consistent with a low approach parallel to and east of runway 15 to pick up a banner. The data then showed that the airplane made about a one-quarter mile left traffic departure with its crosswind leg turn to the downwind leg east of R Avenue. According to the data, the airplane climbed and turned to the northeast and flew near the intersection of R Avenue and 200th Street. The plot of the data depicted a left turn towards the south near the intersection of S Avenue and 195th Street. The airplane, subsequent to the low approach, reached its highest recorded GPS altitude of 1,498 feet during the turn to the south. The airplane subsequently descended. The last recorded GPS altitude data point was 1,311 feet.

ADDITIONAL INFORMATION

According to preliminary information supplied to the NTSB, the same operator subsequently had a banner towing accident on September 12, 2011. That NTSB report, number CEN11LA182, in part, stated:

A Cessna 150L, N6622G, piloted by a commercial pilot, sustained substantial damaged when it collided with snow and terrain during a forced landing following an in-flight loss of engine power near Trenton, Michigan. The airplane was conducting banner tow operations under the provisions of 14 Code of Federal Regulations Part 91. The pilot reported no injuries. Visual meteorological conditions prevailed and no flight plan was on file. The banner towing flight departed from the Oakland/Troy Airport, near Troy, Michigan, and was destined for the Grosse Ile Municipal Airport, near Detroit, Michigan.

History of Flight

Maneuvering-low-alt flying	Aerodynamic stall/spin (Defining event)
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Pilot Information

Certificate:	Commercial	Age:	24, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 2 Without Waivers/Limitations	Last Medical Exam:	06/30/2010
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	(Estimated) 560 hours (Total, all aircraft), 40 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	CESSNA	Registration:	N10128
Model/Series:	150L	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	15074800
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	04/01/2010, Annual	Certified Max Gross Wt.:	1760 lbs
Time Since Last Inspection:	311 Hours	Engines:	1 Reciprocating
Airframe Total Time:	7107 Hours	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	O-360-A4A
Registered Owner:	DRAKE AERIAL ENTERPRISES LLC DBA	Rated Power:	180 hp
Operator:	DRAKE AERIAL ENTERPRISES LLC DBA	Air Carrier Operating Certificate:	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	BNW, 1161 ft msl	Observation Time:	0915 CDT
Distance from Accident Site:	2 Nautical Miles	Condition of Light:	Day
Direction from Accident Site:	230°	Conditions at Accident Site:	Visual Conditions
Lowest Cloud Condition:	Clear	Temperature/Dew Point:	22° C / 17° C
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:	11 knots/ 20 knots, 310°	Visibility (RVR):	
Altimeter Setting:	29.81 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Boone, IA (BNW)	Type of Flight Plan Filed:	Unknown
Destination:	Boone, IA (BNW)	Type of Clearance:	None
Departure Time:	0907 CDT	Type of Airspace:	

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		

Administrative Information

Investigator In Charge (IIC):	Edward F Malinowski	Adopted Date:	06/27/2011
Additional Participating Persons:	James Konig; Federal Aviation Administration; Ankeny, IA Peter Basile; Cessna Aircraft Company; Wichita, KS Troy R Helgeson; Lycoming; Milliken, CO		
Publish Date:	06/27/2011		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=77177		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report.