Aviation Investigation Final Report

Location:	Morrisville, New York	**Accident Number:**	ERA15FA362
Date & Time:	September 20, 2015, 12:51 Local	**Registration:**	N22721
Aircraft:	Cessna 150H	**Aircraft Damage:**	Destroyed
Defining Event:	Aerodynamic stall/spin	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot rented the airplane for a local pleasure flight and departed the airport with full fuel tanks. The airplane had been flying for about 30 minutes and then began a series of turns with its altitude fluctuating between 1,900 and 2,100 ft mean sea level (about 600 to 800 ft above ground level). About that time, one witness reported the engine began "spitting and sputtering" and experienced a total loss of power. Other witnesses reported that the engine stopped, restarted, and then lost power again. The airplane subsequently pitched nose down and entered a spin before ground impact, which is indicative of an aerodynamic stall. Postaccident examination of the airframe and engine did not reveal any evidence of preimpact malfunctions; however, damage to the engine and its associated components precluded a functional check of the engine. Additionally, there were no anomalies noted or reported with the fuel source that would have resulted in a loss of engine power. Although the environmental conditions were favorable for serious carburetor icing at glide power, it is likely the pilot was operating the airplane in cruise flight before the reported engine fluctuations.

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 airspeed and her exceedance of the airplane's critical angle-of-attack, which led to an aerodynamic stall, following a total loss of engine power for reasons that could not be determined because postaccident examination of the airframe and engine did not reveal any anomalies that would have precluded normal operation.

Findings

Aircraft	Airspeed - Not attained/maintained
Aircraft	Angle of attack - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Maneuvering	Loss of engine power (total)
Maneuvering	Aerodynamic stall/spin (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On September 20, 2015, about 1251 eastern daylight time, a Cessna 150H, N22721, registered to and operated by Bargabos Earthworks, Inc., dba Eagle View Flight, was destroyed when it collided with trees then terrain near Morrisville, New York. The private pilot and one passenger were fatally injured. Visual meteorological conditions prevailed at the time and no flight plan was filed for the 14 Code of Federal Regulations Part 91 personal, local flight that departed from Hamilton Municipal Airport (VGC), Hamilton, New York, about 1217.

The airplane owner indicated that the pilot rented the airplane for the purpose of a pleasure flight. About 20 minutes after departure, he heard her announce on the VGC common traffic advisory frequency that she was over Colgate University, which was the last communication from her. He further indicated there was no distress call made by the pilot.

Review of air route surveillance radar data revealed an uncorrelated visual flight rules target with a 1200 transponder code at 1217:53, at 1,300 feet mean sea level (msl) was located 347 degrees and 0.4 nautical mile from the departure end of runway 35 at VGC. The target, which was consistent with the accident airplane's departure, proceeded north and then east of VGC, where a 270 degree turn occurred, followed by proceeding in a southerly direction flying around Colgate University where another 270 degree turn occurred. The flight then proceeded in a north-northwesterly direction flying between 2,300 and 2,400 ft msl east and north of VGC until 1245, and then turned to the left and proceeded in a westerly direction until 1249. The flight turned right to a northwesterly direction until 1250, then performed a 180 degree turn to the left and proceeded in a south-southeasterly direction with an increase and decrease in altitude noted. The flight continued in the south-southeasterly direction until about 1251; the altitude was noted to increase from 1,900 to 2,000 ft between the last two radar returns, which were 12 seconds apart. The last uncorrelated radar target was at 1251:17, at 2,000 ft msl. The accident site was located about 141 degrees and 1,600 ft from the last radar target.

Witnesses who were located along or near the airplane's final flight path reported hearing an engine malfunction, that was described as "spitting and sputtering." Several witnesses also reported that the engine experienced a total loss of power while the airplane was climbing, then it restarted when the airplane was descending. The engine was heard to lose power again while climbing consistent with the altitude increase during the last two radar returns, but the engine did not restart during the subsequent descent. The airplane was then observed to pitch nose-down and then "spiraled towards the ground." One of the witnesses who was located northwest of the accident site and was on a tractor with the engine running reported he did not see any smoke trailing the airplane.

One witness drove to the area and located the wreckage, then directed first responders to the accident

site.

Pilot Information

Certificate:	Private	**Age:**	18,Female
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	October 3, 2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	August 17, 2015
Flight Time:	130.6 hours (Total, all aircraft), 2.9 hours (Total, this make and model), 13.8 hours (Pilot In Command, all aircraft), 14.1 hours (Last 90 days, all aircraft), 3.4 hours (Last 30 days, all aircraft)		

The pilot, age 18, seated in the left seat, held a private pilot certificate with an airplane single-engine land rating issued August 17, 2015. She held a third class medical certificate with no limitations issued October 3, 2013.

A review of the pilot's logbook that contained entries from her first logged flight dated August 2, 2013, to her last logged flight dated September 2, 2015, revealed she logged a total time of 130.6 hours, of which 13.9 hours were as pilot-in-command (PIC). Of the 13.9 hours logged as PIC, 1.1 hours were in the accident airplane. In the last 90 and 30 days, she logged 14.1 hours and 3.4 hours, respectively, of which 2.9 hours were in the accident airplane.

According to the airplane owner, he flew with the accident pilot in the accident airplane on two separate flights as part of a checkout for insurance purposes. The checkout flights were performed on August 29 and 30, 2015; the flight duration of both was recorded to be 1.8 hours. The flights included practice departure stalls, approach to landing stalls, a power off stall from a left skidding turn, and several simulated engine failures; one of which culminated with a landing to a grass field. The airplane owner indicated that the accident pilot performed all the maneuvers "very well."

According to Federal Aviation Administration (FAA) records, the passenger did not hold any pilot certificate.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N22721
Model/Series:	150H	**Aircraft Category:**	Airplane
Year of Manufacture:	1968	**Amateur Built:**	
Airworthiness Certificate:	Utility	**Serial Number:**	15068474
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	April 8, 2015 Annual	**Certified Max Gross Wt.:**	1600 lbs
Time Since Last Inspection:	54 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4821.4 Hrs as of last inspection	**Engine Manufacturer:**	CONT MOTOR
ELT:	C91A installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-200-A
Registered Owner:	On file	**Rated Power:**	100 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The airplane was manufactured in 1968 by Cessna Aircraft Company. It was powered by a 100 horsepower Continental O-200-A engine, and equipped with a McCauley 1A101DCM 6948 fixed pitch propeller.

On September 16 and 17, 2015, the airplane was flown by a private pilot. The total flight duration of both flights was reported to be .9 hour. The private pilot reported that he did not experience any abnormal issues during the flights. He further recalled that the stall warning horn activated during one landing, just before touchdown.

Review of the engine logbook revealed the engine was overhauled last on June 26, 1980; the engine total time before overhaul was unknown. At the engine overhaul, new Slick magnetos were installed. The engine was installed at tachometer time 2,816, and had accrued about 2,059 hours since overhaul at the time of the accident.

According to maintenance records, the airplane's last annual inspection was signed off as being completed on April 8, 2015, at an airframe total time of 4,821.4 hours. The airplane had been operated about 55 hours since the inspection.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	RME,504 ft msl	**Distance from Accident Site:**	22 Nautical Miles
Observation Time:	12:53 Local	**Direction from Accident Site:**	209°
Lowest Cloud Condition:	Few / 3800 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	30.15 inches Hg	**Temperature/Dew Point:**	17°C / 7°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Hamilton, NY (VGC)	**Type of Flight Plan Filed:**	None
Destination:	Hamilton, NY (VGC)	**Type of Clearance:**	None
Departure Time:	12:17 Local	**Type of Airspace:**	

A weather observation taken at Griffiss International Airport (RME), Rome, New York, at 1253, reported the visibility was 10 statute miles, and few clouds at 3,800 ft. The temperature and dew point were 17 and 7 degrees Celsius respectively, and the altimeter setting was 30.16 inches of mercury. The accident site was located about 22 nautical miles south-southwest from RME.

According to a carburetor icing probability chart found in FAA Special Airworthiness Information Bulletin CE-09-35, the temperature and dew point reported at RME about the time of the accident were favorable for "serious icing at glide power."

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	42.906387,-75.662223

The airplane crashed at the edge of a tree line adjacent to a field. The accident site was located about 310 degrees and 6 nautical miles from the geographic center of VGC. Further inspection of the immediate area revealed a gentle sloped clearing at a higher elevation about 700 feet and 160 degrees from the accident site location.

The airplane came to rest with the empennage elevated at a 60 degree angle from the ground. The empennage was lying over both wings, which was oriented on a magnetic heading of 308 degrees.

Inspection of the immediate area revealed damage to several tree limbs of an 80-foot tall tree about 30 feet above ground level; the tree limbs were damaged on the northwest side of the tree. The heading from the damaged tree limbs to the main wreckage was approximately 194 degrees. Also located in the immediate wreckage area were tree limbs of varying diameters, none of which exhibited evidence of smooth cuts oriented at a 45-degree angle. All primary and secondary flight controls and structure remained attached or were in close proximity to the main wreckage. No pre or postcrash fire was noted on any component of the wreckage.

Examination of the cockpit, which was destroyed by impact revealed the pilot's seat remained attached to the seat tracks at all seat feet positions; the seat lock pin was in the fourth hole from the front, and a safety stop was in place on the inboard seat track. The pilot's lapbelt and shoulder harness remained attached, but the lapbelt webbing was cut. The co-pilot's seat remained attached at the left forward and right aft seat feet positions. The co-pilot's lapbelt and shoulder harness were not buckled. The pilot's control yoke was fractured, while the right horn of the co-pilot's control yoke was fractured. The airspeed indicator, which was separated from the instrument panel indicated 68 mph. The vertical speed indicator was separated from the instrument panel and the needle was separated from faceplate, no needle slap mark was noted. The throttle control was extended 1.75 inches, and the mixture control was fractured at the instrument panel. The carburetor heat control knob was missing and the control was extended 0.50 inch. The tachometer was impact damaged and the needle was missing, no needle slap mark was noted. A needle slap mark on the oil pressure gauge faceplate was noted at the lower end red line radial. The ignition switch was in the both position and the key was inserted but broken. The switch was impact damaged. It was disassembled with no evidence of any preimpact anomalies and subsequently functioned properly in all positions when tested. Examination of the engine primer control revealed the outer nut that secured the primer to panel was separated from the barrel. The primer was impact damaged; however, the knob was in the locked position and was required to be rotated about 180 degrees before it could be unlocked from the outer knurled nut, which was separated. Two cellular phones were recovered and retained for further examination.

Examination of the both wings revealed extensive impact damage. Both lift struts remained connected at both ends. Vented fuel caps remained installed on both fuel tanks, which were breached; no stains were noted aft of either fuel tank opening. Residual blue colored fuel consistent with 100 low lead fuel was found in the left fuel tank, while no fuel was found in the right fuel tank. Both flaps and ailerons remained connected; however, impact damage was noted to the left aileron, right flap, and right aileron. One flap cable remained connected to the flap bellcrank near the left flap control surface, but the other cable was pulled from the bellcrank and exhibited tension overload. The right flap pushrod was bent and the rod was fractured at the right flap attach point. The flap motor support was fractured, and the flap jackscrew had no threads extended, which equated to the flaps retracted position. The flap cable exhibited tension overload about 2 ft outboard from the bellcrank. Operational testing of the stall warning horn revealed it did not operate. The internal portion of the wing leading edge was accessed, which revealed the plastic tube remained connected to a portion of the housing, but the housing was fractured. When suction was applied to the portion of housing that was still attached to the plastic tube, the stall warning horn was heard to operate.

Examination of the flight control system revealed aileron, elevator, and rudder flight control continuity from the cockpit to each cable where cut for recovery, and from that point to each control surface. The elevator push/pull rod remained connected to the forward bellcrank, but the push/pull rod exhibited "S"

type bending and was fractured near the control yoke attach point. Examination of the control yoke revealed the left and right control yoke chains were separated from the sprockets, and the chains were fractured into multiple pieces.

Examination of the left fuel supply line revealed it was broken at the tank outlet, and the vent interconnect was separated from the tank. The left fuel vent check valve was installed correctly, and the line was free of obstructions from the inlet into the tank. Examination of the right fuel supply revealed the fuel tank outlet screen was clean. The fuel vent interconnect was separated, but the line was free of obstructions from the left to right side. Examination of the airframe fuel supply revealed the fuel strainer did not contain any fuel; the screen was clean but the bowl contained brown colored dust. Examination of the fuel shutoff valve revealed the control arm was fractured, but the valve remained attached to the structure. The valve was in the full open position; impact damage was noted to the inlet and outlet fuel lines.

Examination of the empennage revealed it was displaced to the right with the leading edge of the horizontal stabilizer contacting the right side of the empennage. The vertical stabilizer with attached rudder and right horizontal stabilizer remained attached, while the left horizontal stabilizer and elevator were separated but found in close proximity to the main wreckage. Examination of the left horizontal stabilizer revealed a semi-circular dent on the leading edge near the root; the left elevator was pulled from the torque tube. The elevator trim tab actuator was extended 1-11/16 inches as measured from the housing to the center of the rod end attach bolt, which equated to tab trailing edge 4 degrees up.

Examination of the engine revealed all cylinders and the oil sump remained attached, although the oil sump was breached and crushed. The carburetor and attached airbox were impact separated but remained attached by the control cables. The throttle was partially open and the mixture control was near the full rich position. An impact mark on the mixture stop boss adjacent to the "R" position was noted; the mixture control cable broke during removal. The inlet fitting of the carburetor was broken off and the carburetor bowl did not contain any fuel. Further inspection of the carburetor revealed a gap was noted between the throttle body and bowl near the accelerator pump. The carburetor was retained for further examination. Crankshaft, camshaft, and valve train continuity, and thumb suction and compression were confirmed to cylinder Nos. 1, 2, and 4. Continuity was also observed to the rear of the engine. The No. 3 cylinder intake pushrod was dented aft, which precluded movement of the intake valve. The No. 3 cylinder was removed for examination, which revealed the ring gaps were not aligned, and no discrepancies with the valve train components were noted. Examination of the piston dome revealed normal combustion deposits and color.

Further examination of the engine revealed the left magneto remained partially attached to the accessory case by the lower clamp; the upper clamp and securing hardware remained in place, but the stud was bent up. The right magneto was separated from the engine but the clamps and securing hardware remained in-place. Both magnetos were retained for further inspection. All ignition leads were impact damaged; therefore, operational testing of the ignition harness could not be performed. All spark plugs remained secured to each cylinder, but the top spark plugs for the Nos. 2 and 4 cylinders were broken. The No. 4 top spark plug was completely separated but recovered at the site, while the No. 2 top spark plug remained attached by the ignition lead. The No. 1 top spark plug was noted to be finger loose, but it was bent, and damage to the adjacent cylinder fins was noted. All spark plugs were marked, removed, and inspected in accordance with a Champion Aviation Check-A-Plug chart; all were dark in color. The

spark plugs were then tested in a spark plug tester at 80 psi; all tested good with the exception of the Nos. 2 and 3 top spark plugs. The No. 2 top spark plug was fractured and a shift of the center electrode was noted. Normal wear of the center and ground electrodes were noted. The No. 3 top spark plug was bent and the center electrode was displaced. Normal wear of the center and ground electrodes were noted.

Examination of the lubrication system components revealed the oil tank remained attached and the filler cap was in place, but the tank was breached and displaced. The oil pick-up screen was visible in the breached tank and was clean; no ferrous material was noted. The engine oil filter, which was safety wired, was removed and the filer media was cut out for inspection; no ferrous particles were present. The oil pump was also removed from the accessory case for inspection; no discrepancies with the gears or pump housing were noted.

Examination of the air induction system components revealed the airbox was heavily crushed, but the air induction filter was in-place; no obstruction of the air induction system components was noted. A screen was in place behind the filter. Inspection of the airbox revealed the carburetor heat cable remained attached, and the valve was found positioned in the "cold" position. No evidence of movement of the valve associated with impact was noted.

Examination of the exhaust system components revealed heavy crushing, but there were no obstructions of the exhaust system components and the internal baffles of the mufflers were intact with no separation of baffle noted.

Examination of the propeller, which remained attached to the engine revealed one blade was bent aft about 10 degrees near the blade tip, and the leading edge was twisted towards low pitch. Slight chordwise scratches were noted on the cambered side of the blade, and nicks were noted on the leading edge. The second blade was bent aft about 45 degrees beginning about 13 inches from the hub. Slight chordwise scratches were noted on the cambered side of the blade, and nicks were noted on the leading edge.

Medical and Pathological Information

An external examination of the pilot, and an autopsy of the passenger were performed by Onondaga County Medical Examiner, Syracuse, New York. The cause of death for both was listed as blunt impact injuries.

Forensic toxicology of specimens of the pilot and passenger were performed by the Medical Examiner's Office, and also by the FAA Bioaeronautical Sciences Research Laboratory (FAA), located in Oklahoma City, Oklahoma. The Medical Examiner's toxicology report for the pilot indicated the results were negative for volatiles, carbon monoxide, and tested drugs, while the FAA toxicology report for the pilot indicated the results were negative for carbon monoxide, volatiles, and tested drugs; testing for cyanide was not performed.

The Medical Examiner's toxicology report for the passenger indicated the results were negative for

volatiles, carbon monoxide, and tested drugs, while the FAA toxicology report for the passenger indicated the results were negative for carbon monoxide and volatiles. Testing for cyanide was not performed and unquantified amount of Ibuprofen was detected in the submitted urine specimen.

Tests and Research

Postaccident examination of the carburetor was performed at an FAA Certified Repair Station (FAA CRS). Although the carburetor exhibited extensive impact damage, it was subjected to operational testing, and displayed excessive leakage from the parting surfaces of the throttle body and bowl assemblies, which precluded additional testing. Disassembly examination revealed the outboard sides of both pontoons were crushed in, consistent with hydraulic deformation, and the interior of the carburetor bowl was clean. The float was subjected to hot submergence test and no bubbles were noted.

Postaccident examination of the left and right magnetos was performed at an FAA CRS. Impact damage to both precluded operational testing. The primary and secondary resistance readings of both coils, and both capacitors were within specification. No evidence of carbon tracing was noted to the distributor block of the left magneto. The right distributor block was not attached or located. Additional testing of the left coil could not be performed due to the separation of the coil tab, though testing of the right coil at the manufacturer's facility did not reveal any preimpact failure, which would have resulted in total loss of engine power.

Both recovered cellular phones (iPhone 5 and iPhone 6) were sent to the NTSB Vehicle Recorder Laboratory for attempts to download any still or video files associated with the accident flight. Both phones exhibited extensive impact damage; therefore, no data could be recovered.

Additional Information

Fuel Information

The airplane was last fueled on September 19, 2015. According to fueler, both fuel tanks were filled with 100 low lead fuel to the top of each filler neck opening. The airplane had not been operated between the fueling and the departure of the accident flight.

Immediately after the accident, fuel operations at VGC were suspended. Subsequent checks of airport fuel samples for specific gravity and contaminates did not reveal any anomalies. Further, there were no reports of fuel related issues from other airplanes that were fueled from the same source as the accident airplane.

Weight and Balance Information

The latest weight and balance dated May 28, 2015, indicated that the airplane's empty weight was 1,086.29 pounds. Estimated weight calculations that were performed based on a full fuel load at takeoff, and the weights of the pilot and passenger (140 pounds each) reported during autopsy, revealed that the airplane was operating within its weight limitations at takeoff.

Administrative Information

Investigator In Charge (IIC):	Monville, Timothy
Additional Participating Persons:	Timothy B Shaver; FAA/FSDO; Latham, NY Cornelius Baker; FAA/FSDO; West Columbia, SC Joseph Logie; Champion Aerospace; Liberty, SC
Original Publish Date:	January 31, 2017
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=92000