Aviation Investigation Final Report

Location:	Bingham, Maine	**Accident Number:**	ERA13LA370
Date & Time:	August 20, 2013, 14:54 Local	**Registration:**	N243RG
Aircraft:	Beech C23	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane had arrived at the departure airport earlier in the day. Witnesses, including the passenger, stated that it took multiple attempts for the pilot to land on the turf runway upon arrival; however, the pilot reported that "it was a non-event going in." The airplane subsequently took off from the 2,000-ft-long, turf-covered runway that had trees near its departure end. The pilot reported that, during takeoff, the airspeed indicator did not appear to be working, so he "tapped it" with his fingers. He estimated that the airplane was traveling about 60 to 70 mph at that time. He pulled back on the control wheel, and, when the airplane reached about 20 ft above ground level, the stall warning activated. He then pushed forward on the control wheel to gain airspeed and turned the airplane slightly upriver. The right wing then contacted trees, and the airplane subsequently impacted the river nose first. Examination of the wreckage did not reveal any evidence of preimpact failures or malfunctions of the airplane or engine that would have precluded normal operation.

At the time of the accident, the temperature was about 80 degrees F, and the calculated density altitude was about 3,218 ft, which would have decreased the airplane's climb rate by about 30 percent. Further, according to the airplane flight manual, about 2,300 ft of turf runway would have been needed to clear a 50-ft obstacle. Therefore, due to the extended required ground roll and the degraded climb performance, the airplane was likely not able to attain a sufficient climb rate to clear the trees at the end of the runway.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's inadequate preflight planning, which resulted in his attempt to take off from a short, turf runway in high-density altitude conditions under which the airplane was unable to attain a positive climb rate to clear trees.

Findings

Personnel issues	Performance calculations - Pilot
Aircraft	Climb rate - Attain/maintain not possible
Environmental issues	High density altitude - Effect on operation
Environmental issues	Tree(s) - Contributed to outcome

Factual Information

History of Flight

Prior to flight	Preflight or dispatch event
Initial climb	Stall warn/stick-shaker/pusher
Initial climb	Loss of lift
Initial climb	Collision with terr/obj (non-CFIT)
Initial climb	Aerodynamic stall/spin (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On August 20 2013, about 1454 eastern daylight time, a Beech C23, N243RG, was substantially damaged when it impacted the waters of the Kennebec River after takeoff from Gadabout Gaddis Airport (ME08), Bingham, Maine. The private pilot and his passenger were not injured. Visual meteorological conditions prevailed for the personal flight conducted under the provisions of Title 14 Code of Federal Regulations Part 91.

The airplane was owned by the pilot and based at Augusta State Airport AUG), Augusta, Maine. Review of fueling records indicated that the airplane departed AUG for ME08 with approximately 30 gallons of gasoline in each of the wing tanks. The purpose of the flight was to do an appraisal of a Chevrolet Corvette in Bingham, Maine for his automobile sales business.

The pilot stated that "it was a non-event going in" to ME08 and that he was familiar with the area having been to a fly-in there.

During his return flight to AUG he departed from runway 31 which was a 2,000 foot long turf runway. During the takeoff, he noticed that the airspeed indicator appeared to not be working. He then physically "tapped it" with his fingers. He estimated that he was traveling about "60-70" miles per hour. He pulled back on the control wheel and about 20 feet above ground level the stall warning activated. He then pushed forward on the control wheel to gain airspeed and turned slightly up river. The right wing then made contact with some trees, and the airplane impacted the waters of the Kennebec River nose first.

Pilot Information

Certificate:	Private	**Age:**	59
Airplane Rating(s):	Single-engine land; Single-engine sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	January 10, 2011
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	January 25, 2012
Flight Time:	1141 hours (Total, all aircraft), 950 hours (Total, this make and model), 4 hours (Last 90 days, all aircraft)		

According to Federal Aviation Administration (FAA) and pilot records, the pilot who was 59 years old at the time of the accident, held a private pilot certificate with a rating for airplane single-engine land, Airplane single-engine sea, and instrument airplane. His most recent FAA third-class medical certificate was issued on January 10, 2011, approximately 2 years and 7 months prior to the accident. He reported that he had accrued 1,141 total hours of flight experience, 950 of which were in make and model. His most recent flight review was completed on January 25, 2012.

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N243RG
Model/Series:	C23	**Aircraft Category:**	Airplane
Year of Manufacture:	1979	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	M-2150
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	May 22, 2013 Annual	**Certified Max Gross Wt.:**	2450 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	3676 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-360-A4K
Registered Owner:	On file	**Rated Power:**	180 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

According to FAA and maintenance records the airplane was manufactured in 1979. The

airplane's most recent annual inspection was completed on May 22, 2013. At the time of the accident, the airplane had accrued 3675.6 total hours of operation.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	GNR,1402 ft msl	**Distance from Accident Site:**	29 Nautical Miles
Observation Time:	14:56 Local	**Direction from Accident Site:**	45°
Lowest Cloud Condition:	Clear	**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:	30.01 inches Hg	**Temperature/Dew Point:**	26°C / 15°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Bingham, ME (ME08)	**Type of Flight Plan Filed:**	None
Destination:	Augusta, ME (AUG)	**Type of Clearance:**	None
Departure Time:	14:54 Local	**Type of Airspace:**	Class G

No weather broadcast or recording facilities were located at ME08.

The reported weather at the closest weather reporting station located 29 nautical miles northeast of the accident site, at 1456, included: winds calm, 10 miles visibility, sky clear, temperature 27 degrees C, dew point 15 degrees C, and an altimeter setting of 30.02 inches of mercury.

Airport Information

Airport:	Gadabout Gaddis ME08	**Runway Surface Type:**	Grass/turf
Airport Elevation:	342 ft msl	**Runway Surface Condition:**	Vegetation
Runway Used:	31	**IFR Approach:**	None
Runway Length/Width:	2000 ft / 200 ft	**VFR Approach/Landing:**	None

Gadabout Gaddis Airport was privately owned. It was uncontrolled and had one runway oriented in a northwest/southeast (31/13) configuration. Runway 31 was turf, in good condition. The total length was 2,000 feet long and it was 200 feet wide. Obstacles existed in the form of trees which existed on the departure end of runway 31 where the turf runway ended, and also directly across from the departure end of the runway on an island, which was located 290 feet off the departure end of the runway on the opposite side of the Kennebunk River.

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	45.040279,-69.868888(est)

Examination of the wreckage by a Federal Aviation Administration (FAA) inspector revealed that the airplane had come to rest upright. The rear fuselage had separated from the cabin area aft of the baggage door. The flap handle was in the stowed (flaps up) position, and the propeller exhibited S-Bending.

Tests and Research

According to the passenger, on the day of the accident, they tried to land twice and then landed on the third attempt. It was hot, muggy, and very hazy, and that he could "see the heat." They took off about 1500. The passenger then also advised that the pilot was about halfway down the runway and started tapping a gauge that told him how fast they were going. He stated that everything happened so quickly, and that when they took off, the airplane stopped climbing, he heard the pilot say something, and then heard a buzzer at almost the same time. Then they hit a tree with the right wing and crashed.

According to a witness, she was trying to take a photograph of the airplane as it took off when the crash occurred. During the takeoff, the airplane was about halfway down the runway and it started to make her nervous. It then "took off" but it looked like the airplane was not "getting enough air." She then saw the airplane's right wing clip the trees at the end of the runway. The airplane then "spun" around and landed on the airplane's nose and then the tail.

According to the airport manager, it was hot and muggy and the pilot had made multiple attempts to land prior to touching down at the airport. During the takeoff attempt by the pilot there was a crosswind, the airplane "kinda" went up, stalled, and then the nose dropped and it clipped a tree.

Density Altitude

By utilizing the National Oceanic and Atmospheric Administration's density altitude calculator, investigators determined that density altitude at the time of the accident was approximately 3, 218 feet

According to FAA's Density Altitude Pamphlet (FAA–P–8740–2), density altitude has particular

implications for takeoff/climb performance and landing distance, pilots must be sure to determine the reported density altitude and check the appropriate aircraft performance charts carefully during preflight preparation.

A pilot's first reference for aircraft performance information should be the operational data section of the aircraft owner's manual or the Pilot's Operating Handbook developed by the aircraft manufacturer.

A pilot who is complacent or careless in using the charts may find that density altitude effects create an unexpected—and unwelcome—element of suspense during takeoff and climb or during landing.

If the airplane flight manual (AFM) is not available, Pilots should use the Koch Chart to calculate the approximate temperature and altitude adjustments for aircraft takeoff distance and rate of climb.

Review of AFM and Koch Chart

Review of the Beechcraft C23 FAA Approved AFM revealed that it contained performance information for takeoff distance on grass surfaces. The published information indicated that at gross weight at 27 degrees Celsius, with no wind, and full throttle, mixture leaned to maximum rpm then enrichened slightly, that takeoff ground roll would be approximately 1,374 feet, and that total distance to clear a 50 foot obstacle would have been approximately 2,300 feet.

Review of a Koch Chart also indicated that due to the higher than standard temperature of 27 degrees Celsius, that an approximate 40 percent increase in the airplane's normal takeoff distance would have occurred during takeoff, along with a 30 percent decrease in rate of climb.

Additional Information

Airspeed Indicator

Despite the pilot's and passenger's statements about the airspeed indicator to the NTSB, during an interview with a newspaper reporter the pilot stated that "I can't get my head around it. There was nothing weird." The passenger also stated to the reporter that he did not know anything was wrong until the airplane hit the trees at the end of the runway and he felt the tail break off. There was a loud bang, and they landed in the river.

After the accident, the airport manager looked at the pitot tube which captures ram air for use by the airspeed indicator but did not see any blockages.

Further examination of the airplane by the FAA also did not reveal any evidence of any preimpact failures or malfunctions of the airplane or engine, which would have precluded normal operation of the airplane.

Administrative Information

Investigator In Charge (IIC):	Gunther, Todd
Additional Participating Persons:	Joe Ingalls; FAA/FSDO; Portland, ME
Original Publish Date:	June 22, 2015
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=87832