



National Transportation Safety Board Aviation Accident Final Report

Location:	Eden Prairie, MN	Accident Number:	CEN09FA518
Date & Time:	08/12/2009, 1138 CDT	Registration:	N3038C
Aircraft:	BEECH E18S	Aircraft Damage:	Substantial
Defining Event:	Loss of control in flight	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Ferry		

Analysis

The pilot purchased the airplane approximately one year prior to the accident with the intention of restoring it for flight. The airplane had not been flown for approximately five years and had been used for spare parts. The pilot was flying the airplane to another airport to pick up passengers prior to returning. The pilot was cleared for takeoff and to circle the airport at 2,500 feet prior to departing the area. Witnesses reported that after taking off the airplane seemed to “wobble” at a slow airspeed in a nose-high attitude and that it never got higher than 500 feet. Some witnesses reported the engine(s) sputtering, and another stated that the airplane was loud and "didn't sound good," although other witnesses reported that the engines sounded normal. One witness reported seeing white smoke coming from the left engine and hearing the engine "popping" as the airplane took off. The airplane made three left turns and it appeared as if the pilot was attempting to return to land. Witnesses described the left wing rising prior to the airplane banking hard to the left and the nose dropping straight down. The airplane impacted the ground just northeast of the airport property and a postimpact fire ensued. Flight control continuity was established. The right side of the elevator/tailcone structure exhibited black rub marks and scrapes. Grass and nesting material was found inside the left wing. The left fuel valve was found in the OFF position and the right fuel valve was positioned to the rear auxiliary tank. Neither the fuel crossfeed valve nor the fuel boost pump switch was located. The left engine sustained substantial fire and impact damage. The right engine sustained heavy impact damage. The airplane was last fueled one month prior to the accident with 120 gallons of fuel. About 20 engine test runs in addition to high-speed taxi tests had been conducted since then. A Special Flight Permit had been obtained but had not been signed by the mechanic, who did not know that the pilot was going to fly the airplane on the day of the accident. The pilot reportedly did not have any Beech 18 flight experience.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's lack of experience flying the accident make and model of airplane, which led to a loss of control while maneuvering to return to the airport. Contributing to the accident was a partial loss of engine power for undetermined reasons.

Findings

Aircraft	Aircraft power plant - Failure (Factor)
Personnel issues	Total experience w/ equipment - Pilot (Cause)
	Aircraft control - Pilot (Cause)

Factual Information

HISTORY OF FLIGHT

On August 12, 2009, at 1138 central daylight time, a Beech E18S, N3038C, collided with the terrain following a loss of control while circling the Flying Cloud Airport (FCM), Eden Prairie, Minnesota. Both the commercial rated pilot and the student pilot passenger were fatally injured. The airplane was substantially damaged by impact forces and a post impact fire. The flight was operating under Title 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan was filed. The flight departed FCM at 1133. The intended destination of the flight was the LO Simenstad Municipal Airport (OEO), Osceola, Wisconsin.

According to a work associate, the pilot was intending to fly the airplane to OEO where he was going to pick up passengers and return to FCM. The pilot contacted FCM ground control and requested flight following for the flight to OEO. He also stated that he wanted to circle FCM a couple of times prior to heading to OEO to "make sure she wants to fly." The pilot was cleared to takeoff on Runway 28R and to make left turns over the airport at 2,500 feet above mean sea level (msl) prior to heading to OEO.

Numerous people witnessed the accident. Several of the witnesses reported seeing the airplane take off on Runway 28R. They recalled the airplane made left turns staying at an altitude that was estimated to be less than 500 feet above ground level (agl). Some of the witnesses described the airplane as being loud. Some witnesses reported the engine(s) sputtering, and another stated that the airplane was loud and "didn't sound good." Additional witnesses reported the engines sounded normal. One witness reported seeing white smoke coming from the left engine and hearing the engine "popping" as the airplane took off. Several witnesses reported it looked as if the airplane was trying to land back at the airport, but that the pilot overshot the runway. Witnesses reported seeing the airplane "wobbling" back and forth just prior to the left wing dropping followed by the nose of the airplane. The landing gear was reported to have been extended throughout the entire flight.

An aircraft mechanic who witnessed the accident reported seeing the airplane on the south side of the airport heading east at an altitude of about 300 feet agl. He stated the airplane appeared to be at a slow airspeed with the nose at a high pitch attitude. He stated he thought the airplane was going to land, but that it overshot the runway. The witness stated that the way the airplane was being flown "appeared as if it had lost one engine." He stated the airplane continued to the west and was now at an altitude of about 250 feet agl and descending. The airplane turned toward the airport then back to the west. He stated the nose of the airplane dropped to a 90 degree nose down attitude and the airplane entered a steep bank. The wings then leveled and the nose of the airplane started to rise, but the airplane continued to descend. The airplane descended behind the trees and he lost sight of it.

Another mechanic stated the takeoff was normal, but once airborne the airplane appeared to be traveling very slowly. He stated it looked like the pilot was having a hard time controlling the airplane. The airplane turned to the south and started to lose altitude. It then turned to the east as if the pilot was making a "tight pattern" and the wings were going "back and forth." He stated the airplane turned to the north followed by a turn to the west. The airplane made a "hard bank" to the left. The mechanic stated the airplane then banked hard to the right followed by another hard left bank at which time the nose dropped. He stated the airplane

stalled and he was not sure if the engines were running or not.

A pilot/mechanic, who was very familiar with this airplane and had about 2,000 hours of flight time in Beech 18 airplanes, stated he went outside to watch the airplane when he heard the engines start. He stated the airplane took off to the west and it began a shallow climb. The nose of the airplane pitched up and the airplane was "wallowing" from side to side. He stated the airplane continued to "wallow" as it made left turns to the south and then to the east. The airplane was "extremely" low and slow, and he estimated the altitude to be less than 500 feet agl. He stated the left wing rose up and the airplane rolled to the right, followed by the nose pitching up. The left wing then stalled and the airplane rolled to the left descending with the nose low. This witness stated that the airplane appeared to have entered an uncoordinated stall and spin.

PERSONNEL INFORMATION

The pilot, age 53, held a commercial pilot certificate with a rating for single-engine land airplanes. The pilot also had private pilot privileges for airplane multi-engine land and instrument airplane. The pilot held a Federal Aviation Administration (FAA) second-class medical that was issued on January 19, 2008. The medical certificate contained the limitation, "Holder must wear correcting lenses while exercising the privileges of his Airman Certificate."

Burnt remnants of the pilot's logbook were found in the wreckage. The flight times and the dates could not be correlated or totaled due to the damage. On his application for his last medical certificate, the pilot listed a total flight time of 1,150 hours. Persons who knew the pilot stated that he did not have any flight experience in Beech 18 airplanes.

The passenger held a third-class medical and student pilot certificate that was issued on August 20, 2007. The certificate contained the limitation, "Holder shall wear corrective lenses."

AIRCRAFT INFORMATION

N3038C, serial number (S/N) BA-374, was manufactured in 1958. The last 100 hour/annual inspection was conducted on October 11, 2002, at a total aircraft time of 10,536.4 hours. The last logbook entry for the airplane was dated November 12, 2005. This entry showed an aircraft total time 10,626.0 hours. According to a mechanic who used to work for the previous owner of N3038C, the airplane had not been flown since about 2004. He stated that the airplane had been parked outside and that they had used it for spare parts to keep another Beech 18 airplane flying.

The airplane was powered by two Pratt & Whitney 450 horsepower, R-985 engines. The maintenance records for the right engine, S/N 201643, indicated the engine had received a 100 hour/annual inspection on October 11, 2002. The entry for this inspection showed the engine had a total time of 5,681.9 hours with a time since overhaul of 681.9 hours. The last logbook entry dated March 16, 2006, was an inspection for return to service. This entry listed the engine total time as being 5,771.5 hours with a time since overhaul of 771.5 hours.

The maintenance records provided for the airplane indicated that the left engine had been installed on another Beech E18S, N16U, prior to the accident. The last maintenance records available for the left engine, S/N 14832, indicated the engine had received a 100 hour/annual inspection on October 21, 2003. The entry for this inspection showed the engine had a total time of 9,549.8 hours with a time since overhaul of 1,101.5 hours. The last entry which was

dated March 5, 2004, showed the engine had been removed from N16U.

The pilot purchased N3038C about 1 year prior to the accident. He was working with a mechanic to restore the airplane for operation. The mechanic stated that the right engine was installed when the pilot purchased the airplane, but they installed the left engine and propeller which had been removed by the previous owner. In addition, the mechanic stated that the boost pump had been removed and they replaced the ailerons. He stated that the airframe was in good condition.

According to records provided by a fixed base operator at FCM, the airplane was fueled with 120.1 gallons of 100LL on July 12, 2009. The mechanic who was working with the pilot stated that since the airplane was fueled, they had performed about 20 engine run-ups. He also stated that the pilot had performed high speed taxi tests since the airplane was fueled. The amount of fuel on board at the time of the accident could not be determined.

The mechanic applied for and received a Special Flight Permit so the pilot could move the airplane to a location closer to his home. He stated he was out of town and did not know that the pilot was planning to fly the airplane while he was gone. The mechanic stated that he had not signed the ferry permit nor had he made any logbook entries, because he did not think the airplane was going to be flown. The mechanic stated he wanted to "go over" the airplane again prior to it being flown. The mechanic stated that to his knowledge the pilot had never flown a Beech 18 prior to the accident flight.

The Special Flight Permit was for a flight from FCM to Osceola, Wisconsin. The permit stated "Occupants shall be limited to essential crew necessary to operate the aircraft and its' equipment." The permit also stated that the "Landing Gear to Remain Down." The expiration date of the permit was August 15, 2009.

METEOROLOGICAL INFORMATION

The weather conditions reported at FCM at 1153 were: Wind from 210 degrees at 9 knots gusting to 15 knots; visibility 10 statute miles; sky clear; temperature 28 degree Celsius; dew point minus 18 degrees Celsius; altimeter 30.05 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located on the Northwest corner of the intersection of Pioneer Trail and Flying Cloud Drive, just off the northeast corner of the airport property. It came to rest on property owned by the city of Eden Prairie which contained a historic farm house.

The wreckage path was located along a heading of about 270 degrees. The airplane contacted the top of a pine tree which was approximately 50 foot tall. About 60 feet later it contacted another pine trees which was about 50 feet tall. About 25 feet later was the beginning of a series of ground impact marks which led up to the main wreckage. The first ground scar contained pieces of green glass. This scar led up to a larger impact area which contained the right engine and propeller. Approximately 15 feet beyond the right engine was the main wreckage. The empennage was inverted and laying on top of the right wing. The fuselage/cockpit area was destroyed by fire. The left wing, left, engine, and left propeller were located in the area of the main wreckage.

The fuselage was destroyed by fire. A large toolbox which weighed an estimated 100 pounds

was located in the area of the burned fuselage. The empennage, beginning just forward of the horizontal stabilizer, was intact and the tailwheel was in place. The fire damaged left horizontal stabilizer and elevator remained attached to the empennage. The vertical stabilizer and rudder remained attached to the empennage. The inboard sections of the right horizontal stabilizer and elevator remained attached to the empennage. The vertical stabilizer and rudder remained partially attached to the stabilizer. The portion that was not attached was folded underneath the stabilizer. Both elevator trim tabs remained attached to the elevators. The elevator trim tabs were found in an approximate 5 degree tab down position.

The right wing was inverted and under the empennage. The outboard leading edge of the wing sustained impact damage. The inboard section of the wing and the lower wing skin on the outboard end of the wing were consumed by fire. The right main landing gear was located in the extended position.

The left wing came to rest inverted. The section of the left wing from the position of the engine and inboard was consumed by fire. The leading outboard section of the wing was crushed rearward. The aileron and flap structure remained attached although the skin was burned away. First responders reported fuel was dripping from the wing. Dried grass and nesting material was located inside the wing structure just inboard of the inboard aileron attach point. The left main gear was separated from the airframe structure and was located on the porch of the farm house.

The right engine was completely separated from the rest of the airplane. The engine had sustained impact damage. One of the push rods was missing as was both magnetos. The right propeller remained attached to the engine. One propeller blade was bent rearward and the outboard half of the blade was slightly twisted. Chordwise polishing and scratches were visible on the outboard quarter length of one blade. The second blade was bent rearward and the outboard two-thirds of the blade were twisted. Chordwise scratches were visible near the tip of the blade.

The left engine was completely detached from the airframe and had been subjected to fire and heat. The data plate on the left engine could not be located. Portions of the engine case were melted. Several of the valve push rods and valve covers were either missing or melted. The right magneto was missing and the left magneto was melted. The engine case was melted. One propeller blade was twisted and the outboard trailing edge of the blade was melted. Chordwise scratches and gouges were present. The second blade was bent rearward and the outboard one-third of the blade was slightly twisted. Chordwise scratches were visible on the outboard one-half of the blade.

The flight control cables were intact with the exception of the right aileron control cable and the elevator trim cable which were separated near the cockpit. The separated cable ends of these exhibited broom-straw signatures. The right side of the elevator/tailcone structure exhibited black rub marks and scrapes from the overlying structure.

MEDICAL AND PATHOLOGICAL INFORMATION

The Hennepin County Medical Examiner's Office performed an autopsy on the pilot on August 13, 2009. The cause of death was reported as "Blunt-force injury due to plane crash."

The FAA Toxicology Accident Research Laboratory, located in Oklahoma City, Oklahoma, conducted toxicological testing on the pilot. The results for all tests conducted were negative.

TESTS AND RESEARCH

Both main fuel selector valves were located. The fuel selector handles were missing. The determination as to which was the left valve and which was the right was made based on their location in the wreckage. The selector valve covers were opened and it was determined that the left fuel valve was in the OFF position and the right fuel selector valve was positioned on the rear auxiliary tank. The fuel crossfeed valve was not located in the wreckage. The fuel boost pump switch was not located in the wreckage. The aircraft manual states that the fuel selectors should be positioned on the main fuel tanks and the fuel boost pump should be on for takeoff.

History of Flight

Takeoff	Loss of engine power (partial)
Maneuvering	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Commercial; Private	Age:	53, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
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:	01/02/2008
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	1150 hours (Total, all aircraft), 0 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	BEECH	Registration:	N3038C
Model/Series:	E185	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	BA-374
Landing Gear Type:	Retractable - Tailwheel	Seats:	2
Date/Type of Last Inspection:	10/11/2002, Annual	Certified Max Gross Wt.:	10100 lbs
Time Since Last Inspection:	90 Hours	Engines:	2 Reciprocating
Airframe Total Time:	10626 Hours	Engine Manufacturer:	Pratt & Whitney
ELT:	Installed, not activated	Engine Model/Series:	R-985 SERIES
Registered Owner:	SALE REPORTED	Rated Power:	450 hp
Operator:	Wayne R. Monson	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	FCM, 906 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	1153 CDT	Direction from Accident Site:	0°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	8 knots / 15 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	200°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.05 inches Hg	Temperature/Dew Point:	28° C / 18° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Eden Prairie, MN (FCM)	Type of Flight Plan Filed:	None
Destination:	Osceola, WI (OEO)	Type of Clearance:	VFR
Departure Time:	1133 CDT	Type of Airspace:	Class D

Airport Information

Airport:	Eden Prairie (FCM)	Runway Surface Type:	
Airport Elevation:	906 ft	Runway Surface Condition:	
Runway Used:	N/A	IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	1 Fatal	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	44.829722, -93.448611

Administrative Information

Investigator In Charge (IIC):	Pamela S Sullivan	Report Date:	01/07/2011
Additional Participating Persons:	Tommy Johnson; FAA-MSP-FSDO; Minneapolis, MN		
Publish Date:	01/07/2011		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=74510		

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