



Aviation Investigation Final Report

Location:	Alabaster, Alabama	Accident Number:	ATL06FA129
Date & Time:	September 23, 2006, 13:00 Local	Registration:	N8148R
Aircraft:	Beech F-33A	Aircraft Damage:	Substantial
Defining Event:		Injuries:	3 Fatal
Flight Conducted Under:	Part 91: General aviation - Other work use		

Analysis

Witnesses heard the airplane engine sputter and lose power on initial take off climb. The nose of the airplane was observed to level out and the engine started and lost power again. The airplane was observed to enter a steep bank to the left estimated between 45 to 100 degrees. The nose of the airplane pitched down and two witnesses observed the airplane level out before it collided with the ground. The Pilot's Operating Handbook states that the airplane would stall with flaps up at 75 knots with a 45-degree angle of bank, and at 85 knots with 60-degree angle of bank. A friend of the pilot who flew in the airplane the day before the accident stated that he thought the left main fuel gauge indicated empty and the right main fuel gauge indicated half full. There was no record indicating that the airplane had been refueled before the pilot started conducting sightseeing flights lasting 10 to 15 minutes each on the day of the accident. One passenger who flew on the first sightseeing flight stated that she could not see both fuel gauges, however one fuel gauge was in the yellow range. A passenger on the second flight stated that the left fuel gauge indicated empty and the right fuel gauge was less than a quarter tank. The Pilot Operating Handbook states in Section II, Limitations, do not take off if fuel quantity gauges indicate in the yellow band or with less than 13 gallons in each main tank. The pilot flew a total of three flights before the accident flight without shutting the airplane down. The airplane holds a total of 40 gallons of fuel in the left and right main fuel tanks. Three gallons of fuel are unusable in each fuel tank. The left and right main fuel tanks were ruptured and there was no evidence of fuel or browning of vegetation at the crash site. Examination of the airplane revealed no evidence of a precrash mechanical failure or malfunction of the airframe, flight controls, or engine assembly and accessories.

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 while maneuvering toward an emergency landing area following the total loss of engine power shortly after takeoff resulting in an inadvertent stall, uncontrolled descent, and collision with the ground, and a fence. A factor in the accident was the pilot's improper fuel management resulting in a total loss of engine power due to fuel exhaustion.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL

Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings

1. (F) FUEL MANAGEMENT - IMPROPER - PILOT IN COMMAND
2. FLUID,FUEL - EXHAUSTION

Occurrence #2: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: MANEUVERING - TURN TO LANDING AREA (EMERGENCY)

Findings

3. (C) AIRSPEED(VS) - NOT MAINTAINED - PILOT IN COMMAND
4. STALL - INADVERTENT - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Findings

5. TERRAIN CONDITION - GROUND
6. OBJECT - FENCE

Factual Information

HISTORY OF FLIGHT

On September 23, 2006, at 1300 central daylight time, a Beech F-33A, N8148R, registered to CJ Aviation LLC, operating as a 14 CFR Part 91 sightseeing flight, at the Wings and Wheels 2006 Air Show, collided with the ground and an airport perimeter fence after departing Shelby County Airport, Alabaster, Alabama. Visual meteorological conditions prevailed and no flight plan was filed. The airplane received substantial damage. The private pilot and two passengers were fatally injured. The flight was originating at the time of the accident.

Witnesses stated they observed the airplane on take off from runway 15, and on initial takeoff climb. The airplane climbed between 100 to 200 feet on runway heading before they heard the engine sputter, stop, and start again. The nose of the airplane pitched down to a level attitude, and the engine started and stopped. The airplane was observed to start a steep left turn estimated between 45-degrees to a 100-degree angle of bank. The nose of the airplane pitched down and disappeared from view. Two witnesses stated the airplane leveled out and collided with the ground.

PERSONNEL INFORMATION

Review of information on file with the FAA Airman's Certification Division, Oklahoma City, Oklahoma, revealed the private pilot was issued a private pilot certificate on September 14, 2005, with ratings for airplane single engine land, airplane single engine sea, and instrument airplane.

The pilot signed a Pilot's Participants Statement and provided it to the FAA before the air show at Shelby County Airport indicating his last flight review was on September 14, 2005. Review of a copy of the pilot's No.1 logbook provided by a family member revealed the pilot had recorded 251.30 total hours in the BE-36 of which 248.6 hours were as pilot-in-command. Review of the pilot's logbook No. 2 revealed his last recorded flight was on August 26, 2006. The pilot recorded in the logbook that he had 940 total flight hours of which .7 hours were in the Beech BE-33 in the last 30 days, and 3.1 hours were flown in the last 90 days. The pilot held a third-class medical certificate issued on September 2, 2005, with the restriction "must wear corrective lenses." The pilot was issued a Statement of Demonstrated Ability by the FAA on June 6, 1996, with physical defects for, "no useful vision right eye."

AIRCRAFT INFORMATION

Review of the airplane logbooks revealed the last annual/100 hour inspection was conducted on June 5, 2006. The tachometer was 2,488.64 hours and the Hobbs time was 632 hours. The

tachometer at the crash site was 2,512.37 hours and the Hobbs time was 661.0 hours. The airplane has flown 23.73 hours since the annual/100 hour inspection. Teledyne Continental Motors rebuilt the engine, on October 1, 1999, and the engine was zero timed. The engine has 361.2 total hours since it was rebuilt. The airframe has 9,839.96 hours at the time of the accident.

Review of refueling records revealed the airplane was refueled on August 22, 2006, at Shelby Air LLC, Alabaster, Alabama, with 20 gallons of 100 low lead fuel.

A friend of the pilot stated he flew to Sylacauga, Alabama, with the pilot on September 22, 2006, and the airplane was not refueled at Sylacauga. The friend thought the left fuel gauge was on empty, and the right fuel gauge indicated half full. No entry of the flight was recorded in the pilot's logbook.

The Pilot's Operating Handbook states in Section 7, System Description, on page 7-26, that the total fuel capacity is 80 gallons of which 74 gallons of fuel are useable.

The lead pilot for Birmingham Aero Club who was in charge of the air rides at the air show stated the deceased pilot was one of the pilot's assigned to conduct the sightseeing air rides. The pilot flew 3 flights prior to the accident. The flights lasted about 10 minutes with out shutting the airplane engine down in between each flight.

The Memorandum for Birmingham Aero Club dated September 13, 2006, "Air Rides Procedures for 2006-Applicable To Both Runways states, "This year, we will fly a different route. It will essentially be an extra large pattern that is designed to produce a 15 minute circuit from the ramp back to the ramp." The Memorandum states in the Air Ride Route, "All headings are actually desired track-make necessary wind corrections and this route will yield a flight of approximately 10 minutes. Maintain at least 90 seconds between departures of air ride aircraft for spacing. Fly the route at 130 KIAS at 2,000 MSL."

A participant who flew on a flight with her daughter and another male passenger stated she was looking at the instrument panel before they took off. A fuel gauge indicated the fuel tank was in the yellow range. When asked if she observed the other fuel tank she stated no. Three other occupants who flew with the pilot stated the boyfriend of one of the occupants observed the left main fuel gauge was empty, and the right fuel gauge indicated less than a quarter of a tank. The boyfriend stated he tapped the pilot on the shoulder before they departed, and asked the pilot if they had enough fuel for the flight. The pilot did not respond to the question. The boyfriend figured the pilot could not hear him due to wearing a head set. Another participant who was on the last flight before the accident stated his grandson asked the pilot if they had a full tank of gas before they departed. The pilot responded, "no but we have plenty of gas." During the flight the pilot informed them that he had one more flight to fly before the air show started. All of the participants who were interviewed stated neither the pilot nor ground personnel provided them with a briefing before departing on their flight.

Review of the Beechcraft Bonanza F33A Pilot Operating Handbook states in Section II, Limitations, on page 2-22, "Do not take off if fuel quantity gages indicate in the yellow band or with less than 13 gallons in each main tank."

Review of the Beech Pilot Operating Handbook, Section 5, Performance, page 5-20, Time, Fuel, And Distance To Climb Chart, states at 30-degrees centigrade, 1,000 feet pressure altitude, and with approximately 5 minutes to climb to the cruising altitude of 2,000 feet, the airplane will burn about 2 gallons of fuel per take off. The chart states at 30-degrees centigrade, 2,000 feet pressure altitude, the airplane will burn 19.2 gallons of fuel per hour.

METEOROLOGICAL INFORMATION

The Shelby County Airport, Alabaster, Alabama, 1253 surface weather observation was wind 180-degrees at 8 knots, gusting to 15 knots, visibility 10 miles, scattered clouds at 3,500 feet and overcast clouds at 14,000 feet, temperature 88-degrees Fahrenheit, dew point temperature 73-degrees Fahrenheit, and altimeter 30.01.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located in an open field located adjacent to Airport Marine Inc., 424 Highway 87, Alabaster, Alabama. The airplane collided with the ground on Shelby County Airport property on a heading of 091degrees magnetic, 370 feet from the departure end of runway 15. The airplane went through a perimeter chain link fence 410 feet from the departure end of runway 15, and came to rest on a heading of 180 degrees magnetic off airport property.

Examination of the airplane revealed the engine was separated from the engine firewall with the engine mounts attached and the engine was displaced to the left. The upper engine cowling was damaged and separated. The lower engine cowling remained in place and was damaged. The engine was removed from the airframe for further examination, and no fuel was present in the fuel lines.

The propeller assembly separated from the propeller crankshaft flange. The spinner remained attached to the propeller spinner bulkhead, was damaged, and there was no evidence of rotation. One propeller blade remained attached in the propeller hub. No "s" bending was present on the propeller blade, and chord wise scarring was present on the propeller tip. Another propeller blade was loose in the propeller hub. The propeller blade was bent inward towards the non-cambered side and no "s" bending was present. Nicks were present on the leading edge, and chord wise scarring was present on the propeller tip. The remaining propeller blade was loose in the propeller hub. The propeller blade was bent towards the non-cambered side 20 inches outboard of the propeller hub, and "s" bending was present. Chord wise scarring was present at midspan extending outboard to the propeller tip.

Examination of the cabin area revealed the cabin roof was compressed downward from the windshield extending aft to the baggage compartment. The windshield was broken and the left

pilot and right front passenger side windows were not damaged. The right forward cabin doorpost was compressed downward at the doorpost. The lower doorframe was deformed. The "A" pillar and aft doorframe was not deformed. The cabin door was open. The upper, aft, and lower cabin door latches were extended and deformed. The cabin floor was compressed upward at the firewall and extended aft to the rear passenger seats. Continuity of the flight controls was confirmed from both rudder pedals and both control wheels extending aft to all flight control surfaces. The nose landing gear was in the retracted position. No browning of vegetation was present on the ground.

The glare shield separated from the instrument panel. The top of the instrument panel was deflected forward to the engine firewall. The fuel selector valve was in the right main fuel tank position.

The pilot seat remained attached to the pilot seat track and the pilot lap belt was in use. The front seat passenger seat remained attached to the seat track and the lap belt was in use. The right rear passenger seat remained attached to the seat track and the lap belt was in use. The left rear seat remained attached to the seat track and the lap belt was not in use. No shoulder harnesses were installed in the airplane.

The right wing remained attached at the wing root. The inboard 18-inches of the wing root was damaged. The leading edge of the right wing was damaged 8 feet outboard of the wing root. Scratches were present along the leading edge of the right wing 3 feet inboard of the wing tip. The right navigation light lens was destroyed. A protrusion was present on the upper wing skin consistent with the position of the right main landing gear axle in the retracted position. The right aileron remained attached to its hinge points. The right flap remained attached to its hinge points and was in the retracted position. The underside of the right wing was compressed upward from the wing root extending outboard to the wing tip. The fuel cap had a tight seal and the fuel cap was locked. The right main fuel tank was ruptured and no browning of vegetation was present.

The right baggage compartment door was separated. The right aft fuselage cabin window was broken. The right empennage cabin entry step was separated. All antennas were separated from the bottom of the fuselage. The right side of the empennage exhibited compression buckling extending aft to the right horizontal stabilizer.

The right horizontal stabilizer was not damaged. The right elevator was damaged 14 inches inboard of the outboard elevator tip. The elevator balance weight was intact. The right elevator trim tab remained attached to the right elevator and was not damaged. The elevator trim tab actuator extension was measured at 1 and 1/8 inch, which correlates to 6-degrees tab up.

The dorsal fin remained attached to the empennage and was not damaged. The top 16-inches of the vertical fin was damaged. The rudder remained attached and was not damaged.

The left horizontal stabilizer was damaged 18-inches outboard of the left horizontal stabilizer

root. The left elevator remained attached and was damaged 12-inches inboard of the left elevator tip. The elevator balance weight was intact. The left elevator trim tab was intact and not damaged. The left elevator trim tab actuator extension was measured at 1 and 1/8 inch, which correlates to 6-degrees tab up.

The tail cone remained attached to the empennage. The bottom of the tail cone was scratched its entire length. The tail cone navigation light was intact.

The left side of the empennage was compressed up 4-inches aft of the aft cabin bulkhead. The top 18-inches of the left side of the empennage was buckled. The left and right static ports were unobstructed.

The left wing remained attached at the wing root. The inboard 12-inches of the wing root was damaged. The leading edge of the left wing was damaged 8 feet outboard of the wing root. Scratches were present along the leading edge of the left wing 3 feet inboard of the wing tip. The pitot tube was damaged. The stall trigger was intact. The left navigation light lens was destroyed. A protrusion was present on the upper wing skin consistent with the position of the left main landing gear axle in the retracted position. The left aileron was damaged and remained attached to its hinge points. The left flap was damaged and remained attached to its hinge points and was in the retracted position. The underside of the left wing was compressed upward from the wing root extending outboard to the wing tip. The left main fuel cap had a tight seal and the fuel cap was locked. The left main fuel tank was ruptured. The left main fuel tank sump drain separated, and no browning of vegetation was present.

Examination of the engine revealed all four engine mounts were fractured. The left and right engine exhaust tubes and mufflers were damaged. The left and right induction tubes were not damaged. The balance tube exhibited impact damage. The intake air box was crushed. The throttle body fuel control unit was destroyed. The fuel pump remained attached to the engine, was not damaged, and rotated freely by hand. The left and right magnetos and ignition harness remained attached to the engine. The No.6 bottom ignition lead was separated from the ignition harness. The remaining ignition leads were not damaged. The starter separated from the starter adapter, and the starter adapter was damaged and attached to the engine. The alternator remained attached to the engine and was not damaged. The vacuum pump remained attached to the engine. The vacuum pump drive coupling rotated freely by hand. The vacuum pump was disassembled and the vanes were intact. The oil cooler remained attached to the engine and was not damaged. The oil filter remained attached to the engine and was not damaged. The engine oil sump received impact damage and was breeched on the bottom side. The propeller governor remained attached to the engine and no damage was noted. The propeller governor control arm was in the midrange position.

The engine was partially disassembled. The crankshaft and crankshaft flange were intact and not bent. The top spark plugs were removed and were light gray in color and "normal" when compared to the Champion Check A Plug Chart. Turning the drive gear on the vacuum pump mounting pad rotated the engine. Compression and suction was obtained on all cylinders.

Continuity was established from the crankshaft to the rear accessory gears. The rocker arms and valves moved when the crankshaft was rotated. The fuel pump was removed and the fuel drive coupling was intact. A water bottle was pressed up against the fuel inlet line of the fuel pump. The inlet fuel line and the fuel pump were primed. The engine driven pump was rotated with a hand drill and water exited the fuel outlet port. The fuel servo was separated and no fuel was present in the servo or the fuel line between the fuel servo and the fuel pump. The servo inlet screen was removed and free of contaminants. The fuel manifold valve was removed and disassembled. No damage was noted to the diaphragm and spring. No fuel was present in the fuel manifold valve cavity. The fuel injector nozzles were removed and were not obstructed. The left and right magneto timing was verified at 22-degrees top dead center. Spark was produced at all 12 magneto ignition leads when the left and right magnetos were turned with a power drill. The propeller governor was removed and the oil screen was free of contaminants.

MEDICAL AND PATHOLOGICAL INFORMATION

The Alabama Department of Forensic Science, Montgomery, Alabama, conducted a postmortem examination of the pilot, on September 24, 2006. The cause of death was "blunt force trauma." The Forensic Toxicology Research Section, Federal Aviation Administration, Oklahoma City, Oklahoma, performed postmortem toxicology of specimens from the pilot. The results were negative for carbon monoxide, cyanide, ethanol, basic, acidic, and neutral drugs.

The Shelby County Coroner's Office, Columbiana, Alabama, issued a certificate of death on the two passengers on October 2, 2006. The cause of death was "blunt force trauma."

ADDITIONAL INFORMATION

Review of the Beechcraft Pilot Operating Handbook, Section V, Stall Speeds-Power Idle Page 5-16, shows the airplane with an operating weight of 2,900 pounds, flaps up; with an angle of bank of 45-degrees the airplane will stall at 75 knots. With an angle of bank at 60-degrees, the airplane will stall at 85 knots.

The wreckage was released to Atlanta Air Recovery, Griffin, Georgia, on September 27, 2006. The airplane logbooks and the pilot's No. 2 logbook was released to the FAA Birmingham FSDO-09 on September 25, 2006.

Pilot Information

Certificate:	Private	Age:	62,Male
Airplane Rating(s):	Single-engine land; Single-engine sea	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 3 With waivers/limitations	Last FAA Medical Exam:	September 1, 2005
Occupational Pilot:	No	Last Flight Review or Equivalent:	September 1, 2005
Flight Time:	940 hours (Total, all aircraft), 268 hours (Total, this make and model), 3 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	Registration:	N8148R
Model/Series:	F-33A	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	CE-526
Landing Gear Type:	Retractable - Tricycle	Seats:	4
Date/Type of Last Inspection:	June 1, 2006 Annual	Certified Max Gross Wt.:	3400 lbs
Time Since Last Inspection:	24 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	9840 Hrs at time of accident	Engine Manufacturer:	Continental
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	IO-520-BA25
Registered Owner:	CJ Aviation LLC	Rated Power:	285 Horsepower
Operator:	Clayton V. Reuse	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KEET, 587 ft msl	Distance from Accident Site:	
Observation Time:	12:53 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Scattered / 3500 ft AGL	Visibility	10 miles
Lowest Ceiling:	Overcast / 14000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	8 knots / 15 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	180°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.01 inches Hg	Temperature/Dew Point:	31°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Alabaster, AL (KEET)	Type of Flight Plan Filed:	None
Destination:	(KEET)	Type of Clearance:	
Departure Time:	12:59 Local	Type of Airspace:	

Airport Information

Airport:	Shelby County Airport KEET	Runway Surface Type:	
Airport Elevation:	587 ft msl	Runway Surface Condition:	
Runway Used:	15	IFR Approach:	None
Runway Length/Width:	5000 ft / 75 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	2 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 Fatal	Latitude, Longitude:	33.173889,-86.780555

Administrative Information

Investigator In Charge (IIC):	Smith, Carol
Additional Participating Persons:	Jack Clark; Birmingham FSDO-09; Birmingham, AL Josh Cawthra; Teledyne Continental; Mobile, AL Russell Schrock; Raytheon Aircraft Company; Wichita, KS
Original Publish Date:	February 26, 2007
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=64582

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

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](#).