Aviation Investigation Final Report

Location:	Bloomingdale, Georgia	**Accident Number:**	NYC07LA245
Date & Time:	September 15, 2007, 10:50 Local	**Registration:**	N515KJ
Aircraft:	Beech C-90	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Positioning		

Analysis

The pilot said that he started the accident flight with 500 pounds of fuel, which he thought was sufficient for the flight. Approximately 12 miles from the destination airport both engines lost power. The pilot was vectored to a turf strip 2,700 feet long. He spotted the airport through breaks in the cloud layer and landed on the wet grass. The airplane overran the runway and impacted trees. The pilot stated that he determined the fuel quantity by referring to the fuel quantity gauges, and that the right fuel quantity indicator "consistently reads two hundred pounds less than the left" fuel quantity indicator. Postcrash examination of the airplane showed that it contained no usable fuel and there was no evidence of in-flight or postaccident fuel leakage from the airplane. No evidence of precrash failure of the aircraft fuel system or engines was found.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power due to fuel exhaustion as a result of the pilot's improper preflight planning and preparation. Contributing to the accident was the pilot's reliance on inaccurate fuel gauges.

Findings

Factual Information

History of Flight

HISTORY OF FLIGHT

On September 15, 2007, about 1050 eastern daylight time, a Beech C-90, N515KJ, was substantially damaged during a forced landing at Cypress Lake Airport (GA35), Bloomingdale, Georgia. The certificated airline transport pilot was not injured. The positioning flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Instrument meteorological conditions prevailed at the accident site, and the flight operated on an instrument flight rules flight plan.

According to the pilot, he began a series of flights with an initial fuel load of 2,611 pounds, and did not refuel between those flights. The accident flight was the fourth flight in the series. According to a Federal Aviation Administration (FAA) inspector, the pilot stated that he started the accident flight with 500 pounds of fuel, which the pilot "felt" was sufficient for the flight. The pilot determined the onboard fuel quantity by referring to the fuel quantity gauges. The pilot also stated that the right fuel quantity indicator "consistently reads two hundred pounds less than the left" fuel quantity indicator, and that it "flutters in flight sweeping from 0-1200 pounds before settling on the fuel remaining."

The pilot stated that the flight departed Blairsville Airport (46A), Blairsville, Georgia about 0955. While climbing out after takeoff, the "no fuel transfer" light illuminated, indicating to him that all of the fuel in the wing tanks had been consumed, leaving only the fuel in the nacelle tanks. Approximately 60 miles from the destination, the pilot notified air traffic control that he had fuel concerns, and requested priority handling. He "knew" he had approximately 400 pounds of fuel left at this point. While descending through 3,200 feet, the pilot noticed that the fuel indicators displayed a total fuel quantity of 100 pounds, so he declared a "fuel emergency." Approximately 12 miles from the airport, the indicated fuel quantity was 50 pounds. A short time later the left engine, and then the right engine, lost power.

The pilot received radar vectors to GA35, which was a turf strip 2,700 feet long. He was able to see the airport through breaks in the cloud layer. The pilot maintained a descent rate of approximately 2,500 feet per minute, and approximately 150 feet above ground level, he reduced the descent rate and "adopted a normal landing attitude." On touchdown, the pilot applied full braking. Due to the wet grass conditions, the airplane slid the remaining length of the runway, traveled down an embankment, and impacted trees. The airplane sustained substantial damage to the left wing leading edge and spar, and to the left engine nacelle.

The pilot stated that he was not aware of any mechanical irregularities with the airplane, other than the fuel quantity indication discrepancy. In his written statement, the pilot stated that he suspected that "a check valve in the #2 engine driven fuel pump has failed and allowed as much fuel to drain overboard as it provided to the right engine." According to the FAA inspector who examined the airplane on scene, no mechanical deficiencies were detected. The airplane was then moved to a maintenance facility for repair. The mechanic who inspected the airplane after recovery stated that there was no usable fuel in the airplane's fuel system and there was no evidence of inflight fuel leakage. His tests of the fuel system showed it operated normally.

PERSONNEL INFORMATION

The pilot reported 3,226 hours of total flight experience, which included approximately 285 hours in the accident airplane make and model. He held an airline transport pilot certificate with airplane multiengine land rating, and a commercial pilot certificate with airplane single-engine land, rotorcraft-helicopter, and instrument helicopter ratings. The pilot's most recent second-class FAA medical certificate was issued in August 2007, and his most recent flight review was accomplished in January 2007.

METEOROLOGICAL INFORMATION

The 1053 weather observation, at an airport located approximately 9 miles east of the accident airport, reported winds from 300 degrees at 5 knots, broken cloud layer at 1,200 feet, overcast cloud layer at 1,700 feet, 10 miles visibility, temperature 26 degrees Celsius (C), dew point 24 degrees C, and an altimeter setting of 30.02 inches of mercury.

TESTS AND RESEARCH

A review of the flight planning and cruise control information in the C90 Pilot's Operating Manual (POM) indicated that the fuel consumption rate in cruise at altitudes and weights representative of the each of the four flights, would have been approximately 443 pounds per hour, with a true airspeed of 217 knots. The pilot reported that prior to the flight, for his planning purposes, he utilized an overall fuel consumption rate of 400 pounds per hour, with an airspeed of 230 knots. The pilot did not specify whether this was indicated or true airspeed.

Calculations based on the flight planning and cruise control information in the C90 POM, and which accounted for taxi-out, climb, cruise, descent and taxi-in, yielded total fuel consumption values of 546, 540, 638 and 554 pounds for each of the four flights, resulting in a total calculated fuel consumption of 2,278 pounds. Post-accident values provided by the pilot for these four legs were 402, 380, 402 and 380 pounds respectively, resulting in a total pilot-calculated fuel consumption of 1,564 pounds. The C90 POM specified a total usable fuel capacity of 384 gallons, or approximately 2,572 pounds.

ADDITIONAL INFORMATION

A teardown inspection report for the engine driven fuel pump from the right engine noted that the fuel pump "meets test requirements but will not be certified because of internal wear."

Pilot Information

Certificate:	Airline transport	**Age:**	43,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2	**Last FAA Medical Exam:**	August 1, 2007
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	January 4, 2007
Flight Time:	3226 hours (Total, all aircraft), 285 hours (Total, this make and model), 1509 hours (Pilot In Command, all aircraft), 45 hours (Last 90 days, all aircraft), 24 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N515KJ
Model/Series:	C-90	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	LJ 566
Landing Gear Type:	Retractable - Tricycle	**Seats:**	7
Date/Type of Last Inspection:	March 20, 2006 AAIP	**Certified Max Gross Wt.:**	9650 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo prop
Airframe Total Time:	9031.4 Hrs as of last inspection	**Engine Manufacturer:**	Pratt & Whitney
ELT:	Installed, not activated	**Engine Model/Series:**	PT6A-20
Registered Owner:	N515KJ Aviation, LLC	**Rated Power:**	550 Horsepower
Operator:	N515KJ Aviation LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KSAV,51 ft msl	**Distance from Accident Site:**	10 Nautical Miles
Observation Time:	10:53 Local	**Direction from Accident Site:**	280°
Lowest Cloud Condition:	1200 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 1200 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	300°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.02 inches Hg	**Temperature/Dew Point:**	26°C / 24°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Blairsville, GA (46A)	**Type of Flight Plan Filed:**	IFR
Destination:	Savannah, GA (SAV)	**Type of Clearance:**	IFR
Departure Time:	09:55 Local	**Type of Airspace:**	

Airport Information

Airport:	Cypress Lakes GA35	**Runway Surface Type:**	Grass/turf
Airport Elevation:	30 ft msl	**Runway Surface Condition:**	Wet
Runway Used:	13	**IFR Approach:**	Unknown
Runway Length/Width:	2700 ft / 100 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	32.157501,-81.391387(est)

Administrative Information

Investigator In Charge (IIC):	Huhn, Michael
Additional Participating Persons:	David Porter; FAA/FSDO; Atlanta, GA
Original Publish Date:	May 6, 2009
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=66785