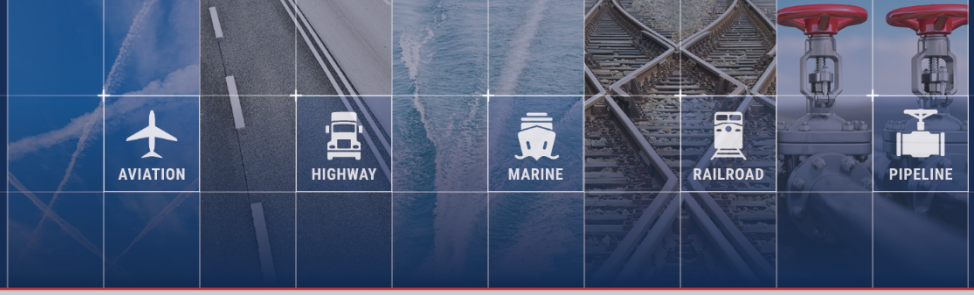

Aviation Investigation Final Report

Location:	Niceville, Florida	**Accident Number:**	NYC07FA200
Date & Time:	August 22, 2007, 16:00 Local	**Registration:**	N1802N
Aircraft:	Beech C24R	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 Serious, 2 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The Beech C24R was substantially damaged during the forced landing just after takeoff to the north from the 3,300-foot long, turf runway. The flight was the first flight of the day for the pilot and the airplane. The pilot filled the fuel tanks a few days prior to the accident, and had only flown the airplane once since then, for about 1 1/2 hours. The pilot estimated that that flight consumed approximately 18 of the 57 gallons of usable fuel. During the preflight inspection for the accident flight, the pilot did not look into the wing fuel tanks to check quantity as instructed by the pilot's operating handbook, since based on his recent fueling and flight history, he "knew the status of the fuel." The takeoff was normal until approximately 80 feet above ground level, when the pilot experienced what he variously described as a "loss of power" or a "loss of airspeed." The airplane descended along the runway, and impacted the clearway, in a roughly wings-level attitude. Fuel purchase records and pilot flight records substantiated the pilot's estimate of his takeoff fuel. However, only minimal amounts of fuel were detected at the accident site. Examination of the airplane did not reveal any indications of preexisting fuel leaks or other mechanical anomalies. Subsequent to the accident, the engine was successfully test-run.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadequate preflight inspection of the fuel quantity.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (C) AIRCRAFT PREFLIGHT - INADEQUATE - PILOT IN COMMAND
2. FLUID,FUEL - EXHAUSTION

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

Findings
3. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On August 22, 2007, about 1600 central daylight time, a Beech C24R, N1802N, was substantially damaged when it impacted airport terrain shortly after takeoff from runway 36 at Ruckel Airport (FL17), Niceville, Florida. The certificated commercial pilot and one passenger received serious injuries. Two other passengers received minor injuries. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed for the flight, and no flight plan was filed.

The accident flight was the first flight of the day for both the pilot and the airplane. The pilot stated that he filled the fuel tanks "a few days" prior to the accident flight. He also stated that he only flew the airplane once since that fueling, for "approximately 1.5 hours," and that that flight consumed approximately 18 gallons. In the period between that flight and the accident flight, no other persons operated the airplane.

On the day of the accident, the pilot and his three passengers arrived at the airport about 1530. One of the passengers reported that the pilot took about 15 minutes to conduct the preflight preparation and inspection, and the passenger noted that neither the pilot nor the passengers were in a rush to depart. The passenger stated that at some point during the preparation, the pilot said the fuel "tank was pretty full." In his written accident report, the pilot wrote that he "did not open the wing fuel caps since [he] knew the status of the fuel," based on his recent fueling and flight history.

The pilot characterized the preflight, engine startup, and before-takeoff checks as "normal." The airplane departed on runway 36, a 3,300-foot-long, 75-foot-wide, turf runway. The pilot said that he lifted off at 66 knots, began the climbout at 71 knots, and raised the landing gear. He stated that the takeoff was normal until there "seemed to be a loss of power" at approximately 80 feet above ground level (agl).

In response to interview questions by a National Transportation Safety Board investigator, the pilot stated that the loss of power was primarily a "loss of airspeed." The pilot said that he adjusted the airplane attitude accordingly to maintain airspeed. The pilot observed the airspeed indicator, and said that the airspeed had "quickly fallen to approximately 50 knots." He stated that he did not think that there was any problem with the engine, and that he did not observe any engine instruments during this event. The pilot subsequently re-explained the initiating event as a "loss of airspeed," and a passenger stated that the engine "did not stop."

The airplane descended along the runway and clearway, and impacted the ground in an approximately wings-level attitude, with the landing gear retracted.

PERSONNEL INFORMATION

The 77-year old pilot held a commercial pilot certificate with airplane single-engine land, airplane multiengine land, and instrument airplane ratings. His most recent third-class medical certificate was issued in April 2007. He had approximately 3,150 total hours of flight experience, and 22 hours in the accident airplane make and model. Prior to purchasing the accident airplane, the pilot logged approximately 15 hours flying another Beech C24R.

AIRCRAFT INFORMATION

The airplane was an all-metal low wing monoplane with retractable, tricycle-style landing gear. It was manufactured in 1981, and was equipped with a Lycoming IO-360 A1B6 engine, and a constant speed propeller. The airplane was equipped with four seats.

The pilot purchased the airplane in July 2007, and took physical possession following an annual inspection and other maintenance work in Clearwater, Florida. The maintenance included the replacement of the two fuel tank drain valves. The maintenance records indicated that, when this work was signed off on July 19, 2007, the tachometer registered 252.0 hours.

Once the work was completed, the pilot flew the airplane to FL17, where it remained based until the accident. The pilot stated that he flew the airplane "four or five times" since the purchase. At the time of the accident, the tachometer registered 257.6 hours. Examination of the aircraft logbooks indicated that at the time of the accident, the airframe total time was 4,684 hours, the engine total time in service was 3,037 hours, and the engine time since major overhaul was 860 hours. The engine was last overhauled in May 2002.

The airplane was equipped with two integral fuel tanks, each in the inboard section of the wing. Two fuel tank placards, one near each filler port, listed the maximum capacity of each tank as 29 gallons, and usable fuel as 28.6 gallons. The cockpit was equipped with two fuel quantity gauges, one for each tank. The instrument panel was placarded just below the fuel gauges with the statement "DO NOT TAKE OFF WHEN FUEL QUANTITY GAUGE INDICATES IN YELLOW ON EITHER GAUGE."

The pilot’s operating handbook (POH) listed the nominal capacity of each tank as 29.9 gallons, for a total fuel capacity as 59.8 gallons, and listed the total usable fuel capacity as 57.2 gallons. The POH "Limitations" section contained the following text under Fuel Management: "Do not take off when Fuel Quantity indicators indicate in the yellow band on either indicator." The POH "Systems Description" section contained the following text under Fuel Required For Flight: "Takeoff is prohibited if the fuel quantity indicators do not indicate above the yellow arc. The caps should be removed and fuel quantity checked to give the pilot an indication of fuel on board." The POH "Normal Procedures" section contained the following text under both the left and right Wing Leading Edge steps in the Preflight Inspection checklist: "Fuel Tank - Check Quantity." The POH "Normal Procedures" section contained the following text under Fuel

Selector Valve in the Before Starting checklist: "set on tank more nearly full." It then contained the following: "WARNING Do not take off if either fuel quantity gage indicates in the yellow arc."

METEOROLOGICAL INFORMATION

The 1557 weather observation at Eglin Air Force Base (VPS), Valparaiso, Florida, located approximately 6 miles southwest of the accident site, reported wind from 180 degrees at 10 knots, 10 miles visibility, few clouds at 2,500 and 5,000 feet, temperature 34 degrees Celsius (C), dew point 25 degrees C, and an altimeter setting of 30.03 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest upright, with its landing gear retracted, approximately 300 feet south of the north end of the clearway. The airplane remained approximately aligned with the departure runway heading. There was no fire. The windshield was fractured and partially dislodged. The fuselage sustained crush damage on the underside, and was buckled at the firewall, and aft of the aft cabin door. The occupied space in the cabin was very slightly compromised. All aerodynamic surfaces and control surfaces remained attached, and exhibited little or no damage. The engine remained attached to its mounts, and the constant speed propeller remained attached to the engine. One propeller blade was broken off approximately 2 feet from its root, and the other blade was curled aft and inboard, beginning approximately 2 feet from its root. The cockpit flap position indicator registered flaps "UP." The electrically controlled and actuated flaps were found in an intermediate extended position.

Subsequent to the accident, only minor quantities of fuel were observed in the airplane. No persons reported any indications of spilled fuel. The airport manager, who arrived on scene approximately one hour after the accident, said that law enforcement personnel told him that they did not see or smell any fuel. The airport manager said that he looked into each fuel tank, but did not see or smell any fuel. He also reported that he did not observe any indications of a fuel leak or spill in the grass where the airplane was normally tied down. A Federal Aviation Administration (FAA) inspector, who arrived on scene the morning after the accident, did not observe any fuel in either fuel tank. The FAA inspector stated that he did not observe any fuel in either the supply line to the manifold valve, or in the line from the manifold valve to the fuel flow gauge. The fuel selector valve was found set to the "R TANK" position.

SURVIVAL ASPECTS

The pilot sustained a separated shoulder, cuts, and bruises. The left-rear seat passenger sustained a fractured L-2 vertebra, spinal cord compression. While still in the airplane after the accident, he told rescue personnel that he could not feel his legs. The two persons seated on the right side of the airplane received minor injuries. All occupants reported that they were wearing their seat belts and shoulder harnesses. The two left-seat persons were removed from the airplane on backboards by rescue personnel. One year after the accident, the passenger remained a paraplegic.

The front seats stood on legs approximately 8 inches high, with cushions and springs approximately 6 inches thick. The rear seat bottoms affixed directly to the floor, which was also directly aft and above the main wing spar. The rear seat bottom cushions and springs were approximately 6 inches thick.

TESTS AND RESEARCH

On February 20, 2008, the wreckage was examined at the recovery facility by investigators from Beechcraft, Lycoming, Kelly Aerospace, the FAA, and the Safety Board. Investigators did not find any fuel in the airplane systems or lines during the February 20, 2008 examination. The airplane external surfaces, including the wings and fuselage belly skin, were free of any visible fuel stains. Both fuel tank caps were functional, and were able to be locked securely in their ports.

The vent lines on each tank were clear of obstructions and determined to be functional. The sump drains on each tank were easily operable, and did not stick or jam. Both drains were free of fuel stains. The finger screen in each tank was observed to be installed, intact, and free from contamination or blockage.

The left tank lower surface exhibited a puncture approximately one inch long, located approximately eight inches aft of the wing leading edge, and twelve inches outboard of the root. The right tank exhibited a hole approximately one inch in diameter, located on the leading edge radius at the wing root. Both the left tank puncture and the right tank hole were observed in photographs taken shortly after the accident. These were the only penetrations of each fuel tank.

A cursory examination of the engine indicated that it appeared to be in a condition sufficient to allow a test run. The engine was then examined and successfully test run.

ADDITIONAL INFORMATION

The airport fuel records indicated that the pilot fueled the airplane on three separate occasions in the period between its arrival at the airport and the accident flight. The records listed purchases of 35.8 gallons on July 21, 15.5 gallons on August 8, and 12.0 gallons on August 11, 2007.

The pilot’s logbook indicated that the pilot flew the airplane on the delivery flight to the accident airport, and then three more times before the accident flight. The delivery flight was logged as 3.0 hours on July 20, and the subsequent three flights were logged as 1.3 hours on August 5, 1.3 hours on August 12, and 1.5 hours on August 18, 2007. One landing was listed for each of these flights.

Review of the POH climb and cruise performance charts indicated that a fuel burn rate of 11

gallons per hour was a conservative representative value for the airplane. Calculations that presumed the maximum usable fuel quantity of 57 gallons after the August 11 fueling, and a fuel consumption rate of 11 gallons per hour, resulted in a remaining fuel quantity of 40.5 gallons for the accident flight.

Pilot Information

Certificate:	Commercial	**Age:**	77,Male
Airplane Rating(s):	Single-engine land; Multi-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:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	April 1, 2007
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	April 1, 2007
Flight Time:	3188 hours (Total, all aircraft), 22 hours (Total, this make and model), 12 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N1802N
Model/Series:	C24R	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	MC758
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	July 19, 2007 Annual	**Certified Max Gross Wt.:**	2750 lbs
Time Since Last Inspection:	10 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4679 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	IO-360-A1B6
Registered Owner:	James Robert Wright	**Rated Power:**	200 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	VPS,87 ft msl	**Distance from Accident Site:**	6 Nautical Miles
Observation Time:	15:57 Local	**Direction from Accident Site:**	240°
Lowest Cloud Condition:	Few / 2500 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	180°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.03 inches Hg	**Temperature/Dew Point:**	34°C / 25°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Niceville, FL (FL17)	**Type of Flight Plan Filed:**	Unknown
Destination:	Niceville, FL (FL17)	**Type of Clearance:**	None
Departure Time:	16:00 Local	**Type of Airspace:**	

Airport Information

Airport:	Ruckel Airport FL17	**Runway Surface Type:**	Dirt;Grass/turf
Airport Elevation:	24 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	36	**IFR Approach:**	None
Runway Length/Width:	3300 ft / 75 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious, 2 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Serious, 2 Minor	**Latitude, Longitude:**	30.519721,-86.438331(est)

Administrative Information

Investigator In Charge (IIC):	Huhn, Michael
Additional Participating Persons:	Warren Green; FAA/FSDO; Birmingham, AL Paul Yoos; Beechcraft; Wichita, KS Al Beech; Kelly Aerospace; Mobile, AL John Butler; Lycoming; Ft Worth, TX
Original Publish Date:	November 25, 2008
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=66491