National Transportation Safety Board
Aviation Accident Final Report

Location:	Georgetown, Kentucky	**Accident Number:**	ERA15LA293
Date & Time:	August 1, 2015, 21:00 Local	**Registration:**	N257CQ
Aircraft:	Beech C90B	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	2 Serious, 2 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane was fueled with 140 gallons of fuel before the second of three flight segments. The pilot reported that, while en route on the third segment, a fuel crossfeed light illuminated. He reset the indicator and decided to land the airplane to troubleshoot. He requested to divert to the nearest airport, which was directly beneath the airplane. Subsequently, the right engine lost power, and the autofeather system feathered the right engine propeller. He reduced power on the left engine, lowered the nose, and extended the landing gear while entering the traffic pattern. The pilot indicated that, after the landing gear was extended, the electrical system "failed," and shortly after, the left engine would not respond to power lever inputs. As the flight was on a base leg approach, the airplane was below the intended flightpath to reach the runway. The pilot stated that he pulled "gently on the control wheel"; however, the airplane impacted an embankment and came to rest on airport property, which resulted in substantial damage to both wings and the fuselage.

Postaccident examination of the engines and airframe revealed no evidence of mechanical malfunctions or abnormalities that would have precluded normal operation. Signatures on the left propeller indicated that the engine was likely producing power at the time of impact; however, actual power settings could not be conclusively determined. Signatures on the right propeller indicated that little or no power was being produced. The quantity of fuel in the airplane's fuel system, as well as the configuration of the fuel system at the time of the accident, could not be determined based on the available evidence.

Although the position of the master switch (which includes the battery, generator 1, and generator 2) was found in the OFF position, the airplane had been operating for about 30 minutes when the electrical power was lost; thus, it is likely that the airplane had been operating on battery power throughout the flight. This could have been the result of the pilot's failure to activate, or his inadvertent deactivation of, the generator 1 and 2 switch. If the flight were operating on battery power, it would explain what the pilot described as an electrical system failure after the landing gear extension due to the exhaustion of the airplane's battery.

The postaccident examination of the left engine and propeller revealed that the engine was likely producing some power at the time of impact, and an explanation for why the engine reportedly did not respond to the pilot's throttle movements could not be determined. Additionally, given the available evidence, the reason for the loss of power to the right engine could not be determined.

Probable Cause and Findings

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

Undetermined based on the available evidence.

Findings

Not determined	(general) - Unknown/Not determined

Factual Information

HISTORY OF FLIGHT

On August 1, 2015, about 2100 eastern daylight time, a Beechcraft King Air C90B, N257CQ, experienced a loss of engine power during cruise flight and subsequently impacted terrain near Georgetown Scott County Airport – Marshall Field (27K), Georgetown, Kentucky. The commercial pilot and one passenger sustained serious injuries and the two other passengers sustained minor injuries. The airplane sustained substantial damage to both wings and the fuselage. Visual meteorological conditions prevailed, and an instrument rules flight plan was filed for the flight that departed the James M Cox Dayton International Airport (DAY), Dayton, Ohio, about 2030 with an intended destination of Lake Cumberland Regional Airport (SME), Somerset, Kentucky. The airplane was owned and operated by Absher Air LLC as a personal flight in accordance with the provisions of Title 14 *Code of Federal Regulations (CFR)* Part 91.

According to the pilot's statement the flight had stopped in DAY where two of the passengers disembarked. After the passengers disembarked, the pilot reported that he checked the fuel quantity indicator for the 45-minute flight, which indicated 1,200 lbs. of fuel. He determined that the flight needed between 360 and 410 lbs. of fuel and that they did not require any additional fuel. The flight departed DAY around 2030 and climbed to 12,000 ft above mean sea level. While enroute, the cross-feed light illuminated and the pilot recycled the "cross feed" switch, no other indicator lights illuminated. The cross-feed light illuminated again, and the pilot decided to land the airplane in order to troubleshoot the indicator. He requested to divert to the nearest airport, which was 27K, and it was directly beneath the flight. Subsequently, the right-engine shutdown and auto feathered. The pilot reduced power on the left engine, lowered the nose, and extended the landing gear in order to assist with descending and entering the traffic pattern for runway 21. He further reported that when the landing gear extended and locked into place the electrical system for the airplane "failed."

Additionally, he reported that as he began to level out the descent, pushed the power levers for the left engine forward; however, the left engine did not respond. As the flight paralleled the intended runway he determined that there were trees between the airplane and the runway; however, when he was able to visually acquire the lights he maneuvered the airplane to fly perpendicular to those lights, later determining that the lights he observed were the parallel taxiway lights. As the flight approached the taxiway, he determined that the flight was lower than the required flight path to make the field. As they continued, he pulled "gently on the control wheel" and heard the passenger in the right seat telling the passengers to "brace for impact." The next thing he could recall was laying in the grass talking with a first responder.

Flight information indicated that the flight originated at Red Lake Airport (CYRL), Red Lake, Ontario, Canada, earlier in the afternoon, flew to Duluth International Airport (DLH), Duluth, Minnesota, where fuel records indicated the airplane was fueled with 140 gallons of Jet A fuel with prist. The flight departed DLH about 50 minutes later and then landed in DAY, prior to departing for SME. According to personnel at the three fixed base operations (FBO) facilities at DAY, the airplane was not fueled at DAY prior to departure. One FBO facility reported that security video captured the airplane taxiing onto the

FBO ramp and the engines being shut down. Several people exited the airplane and were let out through the security gate to the parking lot. Subsequently, four people returned to the aircraft and it taxied out.

PERSONNEL INFORMATION

According to FAA records, the pilot held a commercial pilot certificate with airplane single-engine land, multiengine land, and instrument rating. He held an FAA second-class medical certificate, issued August 14, 2014, which was issued with two (2) limitations of "Must wear corrective lenses" and "Not valid for any class after." At the time of his most recent medical examination, the pilot reported 3,022.0 total hours of flight experience. He also held a mechanic certificate with an inspection authorization, which was issued on March 27, 2007, and renewed in March of 2015.

AIRCRAFT INFORMATION

According to FAA records and recent phase inspection workorders, the airplane was issued an airworthiness certificate on November 19, 1975, and was originally registered to Absher Air, LLC on December 12, 2001. It was powered by two Pratt and Whitney of Canada PT6A-21 engines that drove McCauley four-bladed propellers. According to workorders, the most recent phase inspection, which was a Phase 1 and 2, was conducted on April 30, 2015, with a recorded hourmeter of 2312.0 hours. At that time it had accumulated 2312.0 total hours. The hourmeter was located within the instrument panel and indicated 2324.6 hours at the time of the accident.

METEOROLOGICAL INFORMATION

The 2054 recorded weather observation at Lexington Blue Grass Airport (LEX), Lexington, Kentucky, located approximately 14 miles to the southwest of the accident location, included wind from 340° and 6 knots, visibility 10 miles, clear skies, temperature 22°C, dew point 15°C; barometric altimeter 30.00 inches of mercury.

According to the United States Naval Observatory, Sun and Moon Data, official sunset was at 2048 and end of civil twilight was 2117 the moonrise occurred at 2136 and 98% of the moon disc would have been visible had the moon been above the horizon.

WRECKAGE AND IMPACT INFORMATION

According to a FAA inspector, the airplane impacted the ground in a right-wing low attitude. The airplane slid about 174 ft, impacted an embankment, became airborne, and then came to rest on airport property, about 238 ft from the initial impact location. According to FAA and local police photographs, the airplane came to rest upright, on the belly of the aircraft, parallel to an airport taxiway. The left engine propeller was found in the feathered position, separated from the engine flange, and was in the vicinity of the wreckage. All four propeller blades exhibited S-bending and chordwise scratching along the propeller face. The right engine propeller blade was in flat pitch; however, only one propeller blade was bent aft and no other damage was observed on the other three right engine propeller blades.

Photographic documentation provided by the FAA showed the "master switch," which included battery, generator 1, and generator 2 in the "OFF" position.

According to recovery personnel, 12 gallons of fuel was located in the left inboard tank, and about 10 gallons of fuel was located in the right inboard tank; however, the outboard fuel tanks in both wings were breached. The recovery personnel further reported observing blighting in the surrounding foliage of the where the aircraft came to rest.

On-scene examination of the cockpit by an FAA inspector revealed that the left engine power lever was in the full forward position and the right engine power lever was approximately mid-range. The left engine propeller lever was full forward and the right engine propeller lever was in the feather position. The condition lever for the left engine was near "low idle" and the right condition lever was in the forward position. Although the airplane was equipped with a cockpit voice recorder (CVR) the unit was deactivated and circuit breaker pulled and collared on April 5, 2007.

The left engine remained attached to the left wing at the accident location. The compressor turbine disc was intact with minimal scoring on the adjected center bore which coincided with minor rubbing on the power turbine baffle. Mechanical continuity was found from the accessory gear box to the compressor turbine.

The propeller was impact separated from the propeller hub and according to photographic evidence was co-located with the main wreckage. The left propeller was a McCauley model 4HFR34C768C, 4-bladed, controllable pitch propeller. According to the most recent Phase inspection the propeller's most recent overhaul was December 17, 2012. At the time of the Phase inspection the propeller had accrued 2,312.0 hours total time in service (TTIS) and 114.8 hours time since overhaul (TSO). Post recovery examination of the propeller revealed various degrees of S-bending and tip curling on all four (4) of the blades. The blade angles also appeared to be in or near the feathered position and exhibited signature marks consist with as being under power at the time of impact.

The right engine remained attached to the right wing at the accident location and the propeller remained attached to the engine. The propeller blades were in the latch position or near flat pitch. The chip detector was removed, examined, and was free of debris. The power turbine shaft section was unable to be rotated by hand and was subsequently disassembled. Examination of the shroud and power turbine disc revealed two score marks along the inner section of the power turbine. The compressor section rotated smoothly by hand and mechanical continuity for the compressor turbine to the starter generator. No other abnormalities were noted.

The fuel pump removed and a liquid, similar in smell as Jet A aviation fuel was present in the fuel bowl and no debris was noted. The fuel screen was removed and was free of debris.

The right propeller was a McCauley model 4HFR34C768C, 4-bladed, controllable pitch propeller. According to the most recent Phase inspection the propeller's most recent overhaul was December 17, 2012. At the time of the Phase inspection the propeller had accrued 2,312.0 hours TTIS and 114.8 hours TSO. The blade angles also appeared to be in the latch position, and devoid of any signature marks consist with developing power at the time of impact. Following the removal of the lower cowling the propeller blades moved to a feather or near feather position. The propeller blade angle is controlled by oil pressure and therefore it is likely that the absence of oil pressure allowed the blade angles to move to a feather position.

For detailed information about the wreckage and impact information, reference the report titled "Airplane and Engine Examination Report" in the docket associated with this accident investigation.

ADDITIONAL INFORMATION

According to the King Air C90B (model C90A) "Pilot's Operating Handbook and FAA Approved Airplane Flight Manual," section V "Performance – Maximum Cruise Power," the airplane's fuel consumption at 12,000 ft would be about 311 pounds per hour per engine.

According to the King Air C90B (Model C90A) "Pilot's Operating Handbook and FAA Approved Airplane Flight Manual," section IV "Normal Procedures – Engine Starting (Battery)" checklist stated in part the following:

5. Right Ignition and Engine Start Switch – OFF (at 51% N1 or above)

6. Right Condition Lever – HIGH IDLE

7. Right Generator – RESET, THEN ON [R DC GEN], (L GEN TIE OPEN], and [R GEN TIE OPEN] – Extinguished

8. Battery - CHARGE (until loadmeter reads approximately .50 or less)

NOTE

Airplanes Prior To LJ-1534:

The [BATTERY CHARGE] will illuminate approximately 6 seconds after generator is on the line. If the annunciator does not extinguish within 5 minutes, refer to the BATTERY CHARGE RATE procedure in Section 3A, ABNORMAL PROCEDURES.

13. Left Ignition and Engine Start Switch (51% N1 or above) - OFF

14. Right Condition Lever - REDUCE TO LOW IDLE

15. Left and Right Prop RPM - 1100 MINIMUM

16. Voltmeter (L GEN) - 27.5 TO 29.0 VOLTS

17. Left Generator - RESET, then ON [L DC GEN] - EXTINGUISHED

18. Right Generator - RESET, THEN ON [L GEN TIE OPEN] and [R GEN TIE OPEN] remain extinguished with switch in the reset position)

The FAA provided regulatory guidance and the time the airplane's battery must be able to provide power to the airplane's systems in *CFR* 23.1353(h) "Storage Battery Design and Installation" which stated:

(h) In the event of a complete loss of the primary electrical power generating system, the battery must be capable of providing at least 30 minutes of electrical power to those loads that are essential to

continued safe flight and landing. The 30 minute time period includes the time needed for the pilots to recognize the loss of generated power and take appropriate load shedding action.

History of Flight

Enroute	Loss of engine power (partial) (Defining event)
Approach-VFR pattern base	Off-field or emergency landing
Approach-VFR pattern base	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Commercial	**Age:**	64,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**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 2 With waivers/limitations	**Last FAA Medical Exam:**	August 14, 2014
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	December 10, 2014
Flight Time:	3182 hours (Total, all aircraft), 1122 hours (Total, this make and model), 2935 hours (Pilot In Command, all aircraft), 90 hours (Last 90 days, all aircraft), 13 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N257CQ
Model/Series:	C90B	**Aircraft Category:**	Airplane
Year of Manufacture:	1995	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	LJ-1419
Landing Gear Type:	Retractable - Tricycle	**Seats:**	10
Date/Type of Last Inspection:	April 30, 2015 Continuous airworthiness	**Certified Max Gross Wt.:**	9705 lbs
Time Since Last Inspection:	13 Hrs	**Engines:**	2 Turbo prop
Airframe Total Time:	2324.6 Hrs at time of accident	**Engine Manufacturer:**	Pratt & Whitney - Canada
ELT:		**Engine Model/Series:**	PT6A-21
Registered Owner:		**Rated Power:**	550
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Dusk
Observation Facility, Elevation:	KLEX,989 ft msl	**Distance from Accident Site:**	14 Nautical Miles
Observation Time:	20:54 Local	**Direction from Accident Site:**	215°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	340°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	23°C / 15°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	DAYTON, OH (DAY)	**Type of Flight Plan Filed:**	IFR
Destination:	SOMERSET, KY (SME)	**Type of Clearance:**	IFR
Departure Time:	20:23 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	GEORGETOWN SCOTT COUNTY - MARS 27K	**Runway Surface Type:**	Asphalt
Airport Elevation:	947 ft msl	**Runway Surface Condition:**	
Runway Used:	03	**IFR Approach:**	None
Runway Length/Width:	5498 ft / 100 ft	**VFR Approach/Landing:**	Forced landing;Traffic pattern

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:**	38.228332,-84.436386(est)

Administrative Information

Investigator In Charge (IIC):	Etcher, Shawn
Additional Participating Persons:	Wayne M Cummings; FAA/FSDO; Louisville, KY Jan Smith; Textron Aviation; Wichita, KS Earl Chapman; Transportation Safety Board of Canada (Acc Rep); Gatineau Leslie Ederer; Pratt and Whitney (Tech Advisor to the Acc Rep); Longueuil
Original Publish Date:	June 8, 2020
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=91695

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available here.