



National Transportation Safety Board Aviation Accident Final Report

Location:	Benson, AZ	Accident Number:	LAX08FA092
Date & Time:	04/02/2008, 1929 MST	Registration:	N20480
Aircraft:	BEECH 95-B55	Aircraft Damage:	Substantial
Defining Event:	Loss of control in flight	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Business		

Analysis

A witness at the airport reported that the airplane's first approach for landing in dark night conditions appeared high and fast. Prior to touchdown, the pilot announced over the common traffic frequency that he was going around. During the second approach, which the witness reported as not as high and fast as the first approach, the airplane was about 10 feet above ground level when it passed the midfield point on the 4,000-foot runway. The witness lost sight of the airplane behind a hangar, but heard what sounded like a hard landing, followed by the sound of increasing engine sounds. The witness looked over the hangars and saw a green light (right wing tip) arc to the left as if the airplane were rolling inverted. The airplane collided with the ground in a near-inverted, slightly nose-down attitude and came to rest between the runway and the taxiway. Postcrash examination of the airframe and flight control systems found no anomalies. The left engine was examined and subsequently placed in a test cell. The engine started easily and ran smoothly at various rated power settings. The right engine was subject to a teardown inspection. The disassembly of the engine did not reveal any preexisting anomalies that would have precluded normal operation of the engine. Both propellers had impact marks on the spinner from contact with a counterweight while the blade/counterweight was at a low pitch position. There were no impact marks or other indications to suggest that either propeller was feathered. Both propellers were turning and were driven toward a lower blade angle at impact as evidenced by the damage to the low pitch stop. A review of the private pilot's flight logbook indicated the pilot had accumulated approximately 274 hours total flight time in all aircraft, with only 29 hours in the aircraft type and 5 hours of night flying experience logged.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's misjudged speed and altitude during approach that led to a long landing and his subsequent failure to maintain control during an attempted go-around. Contributing to the accident were the dark night, the pilot's low total night flight experience, and low total time in the make and model airplane.

Findings

Aircraft	Lateral/bank control - Not attained/maintained (Cause) Descent/approach/glide path - Not attained/maintained (Cause)
Personnel issues	Aircraft control - Pilot (Cause) Total experience w/ equipment - Pilot (Factor)
Environmental issues	Dark - Not specified (Factor)

Factual Information

HISTORY OF FLIGHT

On April 2, 2008, about 1929 mountain standard time, a Beech 95-B55, N20480, collided with terrain during landing at Benson, Arizona. The pilot/owner was operating the airplane under the provisions of 14 Code of Federal Regulations (CFR) Part 91. The private pilot and one passenger were killed; the airplane sustained substantial damage to the fuselage, right wing, and rudder. The cross-country business flight departed Safford, Arizona, about 1848, with a planned destination of Benson. Visual meteorological conditions prevailed, and no flight plan had been filed.

The airport manager at Benson reported that he talked to the pilot on the common traffic advisory frequency. The airport manager advised him that winds were from the west at 10 to 12 knots, and favored landing on runway 28. He observed the airplane, and thought that it was high and fast. He could see the airplane's lights, and estimated that the airplane was approaching midfield about 50 feet above ground level (agl). At this time, the pilot broadcast an intention to go-around. The airport manager heard an increase in engine sounds, and saw the airplane climb out.

The pilot broadcast the downwind position, and then turning final. The airport manager observed the airplane's lights, and noted that it was not as high or fast as on the first approach. But he thought that it was higher and faster than the approach should be. Due to hangars, he lost sight of the lights as the airplane passed the midfield point on the 4,000-foot runway; it was about 10 feet agl. Then he heard what he described as a hard touchdown followed by increasing engine sounds. He looked over the hangar, and saw a green light arc to the left. He then heard a thud and the engine sounds stop.

The airplane manager notified emergency services, and went to the accident site. The airplane was between the runway and the taxiway. He stated that the airplane's lights were still illuminated. He determined that the occupants were fatally injured, and that there was a fuel leak. He contacted a mechanic, who instructed first responders on how to cut electrical lines from the battery and shut off power to the airplane's systems.

PERSONNEL INFORMATION

A review of Federal Aviation Administration (FAA) airman records revealed that the 53-year-old pilot held a private pilot certificate with ratings for airplane single engine land and multiengine land.

The pilot held a third-class medical certificate issued on June 17, 2006. It had the limitation that the pilot shall wear corrective lenses.

An examination of the pilot's logbook indicated an estimated total flight time of 244 hours as of the last entry on February 9, 2008. He logged 7 hours in the last 90 days, all in the accident airplane. He had an estimated 29 hours in this make and model. He received his multiengine rating on June 17, 2007.

AIRCRAFT INFORMATION

The airplane was a Beech 95-B55, serial number TC-1862. A review of the airplane's logbooks revealed that the airplane had an annual inspection dated July 4, 2007, and a total airframe

time of 3,905.2 hours. The Hobbs hour meter read 4,022.8 at the accident site.

The left engine was a Teledyne Continental Motors (TCM) IO-520E, serial number 215820-R. Total time recorded on the engine at the last annual inspection was 834.9 hours. The logbooks contained an entry dated April 12, 2005, at a Hobbs time of 3,693.7 that indicated an inspection of the engine and a lower end overhaul following an off-airport forced landing that damaged the airplane.

The right engine was a TCM IO-520E, serial number 215821-R. Total time recorded on the engine at the last annual inspection was 834.9 hours. The logbooks contained an entry dated April 12, 2005, at a Hobbs time of 3,693.7 that indicated an inspection of the engine and a lower end overhaul following an off-airport forced landing that damaged the airplane.

Personnel at Ponderosa Aviation in Safford established that they topped off both tanks of the airplane prior to the accident flight.

AIRPORT INFORMATION

The Airport/ Facility Directory, Southwest U. S., indicated that runway 28 was 4,000 feet long and 75 feet wide; the runway surface was asphalt. The field elevation was 3,829 feet. The common traffic advisory frequency was 122.8. It indicated that it had runway end identifier lights, and a precision approach path indicator (PAPI P2L) landing systems. It instructed pilots to activate the MIRL and PAPI on frequency 122.8.

WRECKAGE AND IMPACT INFORMATION

Investigators from the Safety Board, the FAA, Beech, and TCM examined the wreckage at the accident scene. The first identified point of contact (FIPC) was a ground scar. It contained remnants of the rotating beacon, which had been mounted to the top of the vertical stabilizer. The FIPC was 150 feet perpendicular to the runway edge at a point that was 3,100 feet from the approach end of the runway. The ground scar led about 56 feet to the inverted wreckage. The debris path was along a magnetic heading of 226 degrees.

The right engine crankshaft fractured and separated between the front of the crankcase and the propeller flange. The jagged fracture surface was on a 45-degree angle around half of the circumference, and had a shear lip. The right side propeller and flange were about 30 feet in front of the left engine.

The left propeller remained attached to the engine crankshaft. Two blades contacted the ground, and were bent aft around the cowling.

Flight control continuity was established for the ailerons, elevators, and rudder, as well as the elevator and rudder trim.

MEDICAL AND PATHOLOGICAL INFORMATION

The Cochise County Coroner completed an autopsy. The FAA Bioaeronautical Sciences Research Laboratory Forensic Toxicology Research Team, Oklahoma City, Oklahoma, performed toxicological testing of specimens of the pilot.

Analysis of the specimens contained no findings for carbon monoxide, cyanide, volatiles, and tested drugs.

TESTS AND RESEARCH

Investigators examined the wreckage at Air Transport, Phoenix, Arizona, on April 4 and 5, 2008.

Airframe

The fuel selector valves were in the ON position.

The landing gear handle separated from the switch, but the landing gear switch was in the down position. The landing gear was extended. The landing gear actuator was in a landing gear extended position.

The wings sustained mechanical damage. The flap handle was in the up position, and the flaps and flap actuators were retracted. Investigators connected an aircraft battery to the flap motor (jumper wires directly to the flap motor), and the flap motor moved the flaps to the extended position. The flap motor was reversed, but the flaps were binding and would not retract. Dirt and debris was observed to shake out of the flap tracks. Investigators detached the flexible drive cables from the flap drive motor. The flap motor successfully ran in a flap retract direction.

The cockpit elevator trim indicator was in the green takeoff trim range. The two pitch trim actuators were each extended about 1 1/16 inches, which corresponded to a 5-degree trim tab trailing edge down position.

The rudder trim indicator was at the zero position, but the rudder trim knob was broken. The rudder trim actuator was extended about 3 3/4 inches, which corresponded to a 5-degree tab trailing edge right position. The rudder trim operating range is plus and minus 25 degrees.

Each magneto switch was in the BOTH position, and the alternators and battery switches were in the ON position. The navigation/strobe light switch and the taxi light switch were in the ON position.

Both electric fuel boost pump switches were in the OFF position. Investigators put fuel in the left main tank, and activated the left electric fuel boost pump. Fuel was delivered through the left fuel selector valve to the left firewall engine driven fuel pump fuel line. Investigators put fuel in the right main tank, and activated the right electric fuel boost pump. The right electric fuel boost pump activated, but fuel was not delivered through the right fuel selector valve to the right firewall engine driven fuel pump fuel line. Further examination revealed that the fuel supply line from the right wing tank to the right selector valve separated at the wing/fuselage juncture. Investigators blew air into the separated line in each direction; they felt air pressure at the right firewall to the engine driven fuel pump fitting, and heard air flow in the right main tank.

Left Engine

TCM personnel examined the left engine under the supervision of the IIC at the factory in Mobile, Alabama, on May 20 and 21, 2008.

All four engine mounts fractured and separated along an angular and jagged plane; the engine was displaced.

TCM personnel removed the spark plugs. All spark plugs were clean with no mechanical deformation. The spark plug center electrodes were oval and gray, which corresponded to normal operation according to the Champion Aviation Check-A-Plug AV-27 Chart.

TCM personnel performed a borescope inspection, which revealed no mechanical deformation on the valves, cylinder walls, or internal cylinder head. There was light rust on the barrels, and combustion deposits on the piston heads were unremarkable.

TCM personnel removed and replaced several damaged components.

TCM personnel installed the engine in a test cell. The engine started easily, and they ran it for about 5 minutes at 1,200 rpm until temperatures stabilized. They ran the engine at various rpm between 1,000 and 2,700. They performed quick accelerations and decelerations; the engine responded to all commands promptly without hesitation, sputtering, or stalling. A magneto check at 2,100 rpm produced an rpm drop of 140 on the left and 136 on the right.

Right Engine

TCM personnel examined the right engine under the supervision of the IIC at the factory in Mobile, Alabama, on May 22, 2008. They stated that disassembly of the engine did not reveal any pre-existing anomalies that would have precluded normal operation of the engine and production of rated horsepower.

Hartzell Propeller Examinations

A technician from Hartzell Propellers examined the propellers under supervision of an FAA inspector. A written report is part of the public docket, and pertinent excerpts follow.

Both propellers had impact marks on the spinner from contact with a counterweight while the blade/counterweight was at a low pitch position. There were no impact marks or other indications to suggest that either propeller was feathered. Both propellers were driven toward a lower blade angle at impact as evidenced by the damage to the low pitch stop.

Hartzell Examination of Left Propeller

There were no significant witness marks to the preload plates of the left propeller. The left propeller had relatively mild damage with light damage to the spinner and little blade damage. This suggested impact while at low speed and low power. The propeller had little or no rotational energy as evidenced by the absence of blade twisting, no harsh bending, no leading edge damage, and no clear indications of rotational scoring.

The technician concluded that, if rotating, blade damage to the left propeller suggested impact at low power or no power.

Hartzell Examination of Right Propeller

The damage to the blades of the right propeller (multiple bends, twisting, and leading edge damage) indicated significant rotational energy at impact. The right propeller had several preload plate impact marks. The R4 preload plate had multiple impact marks indicating that it had several strikes while changing blade angles. All of the preload plate marks on the right propeller were near the low pitch position. Since it was driven towards lower pitch during impact, the highest blade angle findings (16 degrees) would be closest to the preimpact blade angle.

The technician concluded that blade damage to all three blades of the right propeller and the blade angle findings were consistent with significant power production at the time of impact. There were no discrepancies noted that would have precluded normal operation. All damage was consistent with impact damage.

ADDITIONAL INFORMATION

Pilot's Operating Handbook (POH)

One section of the POH discusses normal procedures. It lists before landing procedures. Among the items listed were auxiliary fuel pumps OFF (or low as per ambient temperature), cowl flaps as required, mixture controls full rich, landing gear down, flaps down, normal landing approach speed, and the propellers at low pitch (high rpm (revolutions per minute)).

Another section discussed airspeeds for safe operation at maximum gross weight. It noted 90 knots for landing with flaps down, and 97 knots with flaps at 0 degrees. It noted a balked landing climb speed of 90 knots. The minimum control airspeed (V_{mca}) was 78 knots.

The POH discussed a balked landing. It directed the pilot to place the propellers into the low pitch (high rpm) position, and the power to maximum allowable. The pilot should maintain a climb speed of 90 knots (104 mph), and the gear and flaps should be up with cowl flaps as required.

The POH contains a section on systems, including the flaps. It notes that a three-position switch controls them; the positions are UP-OFF-DOWN. The pilot must pull the switch out of a detent before the flaps will operate. To stop the flaps at an intermediate position, the pilot must return the switch to the OFF position.

Section III of the POH discusses emergency procedures.

Engine Inoperative

During takeoff, the POH directs the pilot to close the throttles, and perform maximum braking. If insufficient runway remains for stopping, it directs the pilot to turn the fuel selectors OFF, and turn the battery, generator/alternator, and magneto switches OFF.

For an engine failure after liftoff, the POH directs the pilot to bring the landing gear and flaps up. It directs the pilot to close the throttle on the inoperative engine, feather the propeller, maintain power on the operating engine as required, and maintain the airspeed at engine failure (100 knots maximum until all obstacles cleared). After positive control is established, the pilot should secure the inoperative engine.

A NOTE says that the most important aspect of engine failure is the necessity to maintain lateral and directional control. If the airspeed is below 78 knots, the pilot should reduce power on the operative engine as required to maintain control.

Emergency airspeed

The POH listed the following emergency airspeeds:

One engine inoperative best rate of climb 100 knots

One engine inoperative during landing

Maneuvering to final 100 knots

Final approach flaps down 90 knots

Final approach flaps up 97 knots

One engine operation

The POH indicated that two major factors govern one-engine operations: airspeed and

directional control. It stated that the airplane can be safely maneuvered or trimmed to normal hands-off operation and sustained by the inoperative engine as long as sufficient airspeed is maintained.

Global Positioning System (GPS)

Investigators found a handheld GPS in the wreckage, and downloaded the data. It contained data for a flight (track log 077) that began at an indicated time of 2148:37 on April 2, 2008. The data contained latitude, longitude, date, time, altitude, leg length, leg time, leg speed, and leg course.

Investigators overlaid the flight track coordinates over a topographical map. The initial latitude and longitude coordinates were for Safford Airport. The target track went to coordinates that coincided with Benson, and arrived in the area at an indicated time of 2222.

The target went in a southerly direction past the west end of the airport, and then went in an easterly direction along the south side of the airport. The target turned north and then west on a course that aligned with the runway. The recorded altitude began to decrease. At an indicated time of 2225, the altitude began to increase; the leg speed began to increase as the target proceeded westbound. The target turned left 180 degrees, and paralleled the runway on an easterly heading.

The target turned left 180 degrees, and the altitude decreased. From 2227:48 until 2228:50, the data indicated leg courses between 283 and 277 degrees, and leg speeds beginning at 120 miles per hour (mph) and decreasing to 106 mph.

The Airport/Facility Directory, Southwest US, indicates that the approximate geographic center of all usable runway surfaces at Benson was at 31 degrees 59.98 minutes north latitude 110 degrees 21.47 minutes west longitude.

The next to the last target was at 2229:04. This target was at 31 degrees 59.965 minutes north latitude by 110 degrees 21.468 minutes west longitude with a leg speed of 106 mph and 280-degree course.

The last target was at 2229:10. The target was at 31 degrees 59.991 minutes north latitude by 110 degrees 21.622 minutes west longitude with a leg speed of 92 mph.

The airplane came to rest at 31 degrees 59.974 minutes north latitude by 110 degrees 21.712 minutes west longitude.

History of Flight

Landing-flare/touchdown	Hard landing
Landing	Attempted remediation/recovery
Approach-VFR go-around	Loss of control in flight (Defining event) Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Private	Age:	53, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 With Waivers/Limitations	Last Medical Exam:	06/17/2008
Occupational Pilot:	No	Last Flight Review or Equivalent:	06/17/2007
Flight Time:	274 hours (Total, all aircraft), 29 hours (Total, this make and model), 7 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	BEECH	Registration:	N20480
Model/Series:	95-B55	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	TC-1862
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	07/04/2007, Annual	Certified Max Gross Wt.:	5100 lbs
Time Since Last Inspection:	117 Hours	Engines:	2 Reciprocating
Airframe Total Time:	3905 Hours	Engine Manufacturer:	Teledyne Continental Motors
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	IO-520-E
Registered Owner:	James Robertson	Rated Power:	260 hp
Operator:	James Robertson	Air Carrier Operating Certificate:	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	TUS, 2643 ft msl	Observation Time:	1953 MST
Distance from Accident Site:	29 Nautical Miles	Condition of Light:	Night
Direction from Accident Site:	209°	Conditions at Accident Site:	Visual Conditions
Lowest Cloud Condition:	Clear	Temperature/Dew Point:	22° C / -9° C
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:	9 knots, 270°	Visibility (RVR):	
Altimeter Setting:	29.97 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Safford, AZ (SAD)	Type of Flight Plan Filed:	None
Destination:	Benson, AZ (E95)	Type of Clearance:	None
Departure Time:	1848 MST	Type of Airspace:	

Airport Information

Airport:	Benson Municipal (E95)	Runway Surface Type:	Asphalt
Airport Elevation:		Runway Surface Condition:	Dry
Runway Used:	28	IFR Approach:	None
Runway Length/Width:	4000 ft / 75 ft	VFR Approach/Landing:	Full Stop

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	1 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal		

Administrative Information

Investigator In Charge (IIC):	Howard D Plagens	Adopted Date:	05/06/2009
Additional Participating Persons:	Leon K Kelley; Scottsdale FSDO; Scottsdale, AZ Paul Yoos; Hawker Beechcraft; Wichita, KS John Kent; Teledyne Continental Motors; Mobile, AL		
Publish Date:	05/06/2009		
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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