



National Transportation Safety Board Aviation Accident Factual Report

Location:	TUCSON, AZ	Accident Number:	LAX03FA057
Date & Time:	01/01/2003, 1212 MST	Registration:	N8212D
Aircraft:	Beech 95	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	1 Fatal, 3 Serious
Flight Conducted Under:	Part 91: General Aviation - Personal		

HISTORY OF FLIGHT

On January 1, 2003, at 1212 mountain standard time, a Beech 95, N8212D, collided with terrain during departure from runway 6R at Ryan Airfield, Tucson, Arizona. The private pilot/owner was operating the airplane under the provisions of 14 CFR Part 91. The pilot and two passengers sustained serious injuries and one passenger sustained fatal injuries. The airplane was destroyed. Visual meteorological conditions prevailed, and no flight plan had been filed. The primary wreckage was at 32 degrees 08.48 minutes north latitude and 111 degrees 10.16 minutes west longitude.

The flight was the first of two local sightseeing flights for relatives of the pilot. Family members who observed the accident provided statements to the Pima County Sheriff's Department. The pilot had completed an uneventful 2-hour flight the previous day. As they watched the airplane takeoff, one family member heard a pop, which sounded like a backfire. The right wing dipped; then the airplane's nose went down and into the ground.

The local controller (LC) and ground controller (GC) in the air traffic control tower (ATCT), which was down approximately 1/4 the length of the runway, observed the takeoff. Other witnesses were also in the tower.

The LC said that the pilot of N8212D called in ready for departure. He cleared the pilot for departure on runway 6 right with a right turn on departure. Everything looked good until the airplane began to turn. He thought that it didn't look right. The airplane was low and at midfield. It was a normal turn except that it was way low. The airplane was past the windsock and about 60 to 80 feet above ground level (agl). The airplane kept turning and had a continuous pitch up. The right wing dipped and then looked like it went straight down. He was now looking at the top of the cabin. He then saw a big dust cloud. He immediately started making notifications. The airplane still looked fairly normal at the taxiway.

The GC reported that the LC asked what the pilot was doing as the airplane was between taxiways 3 and 4. The airplane was veering off the runway and wasn't very high. The airplane

was rolling to the right. It stayed in a rolled position and climbed a little more. After crossing the taxiway, it appeared to go straight up, and then the nose went down. It hit and the back end came back down. It went from very nose high to very nose low.

Other witnesses in the ATCT stated that the airplane appeared to be going slow as it lifted off. It banked right, but continued straight. It then turned hard right, pitched up, and then the nose pitched down. After the airplane hit the ground, it bounced back and pivoted.

First responders reported that the pilot had opened his window and secured the master switch.

PERSONNEL INFORMATION

A review of Federal Aviation Administration (FAA) airman records revealed that the pilot held a private pilot certificate with airplane single and multiengine land ratings. The pilot held a third-class medical certificate issued on November 15, 2002. It had the limitations that the pilot shall wear corrective lenses.

The pilot obtained his multiengine certificate on December 7, 2002. The FAA indicated that the pilot had a total time of 630 hours. He had 20 hours in multiengine airplanes, which were all dual instruction in make and model.

AIRCRAFT INFORMATION

The airplane was a Beech 95, serial number TD-8. A repair station at Marana Air Park provided records, which indicated that they completed an annual inspection on May 24, 2002. On the airworthiness directive compliance record, they noted a total airframe time of 3,726.9 hours, and a Hobbs hour meter reading of 501.7. The Hobbs meter read 532.5 at the accident scene.

The airplane had a Textron Lycoming O-360-A1A engine, serial number L-120-36, installed on the left side. Total time on the engine at the last annual inspection was 2,804.9 hours with 64 hours since major overhaul.

The airplane had a Textron Lycoming O-360-A1A engine, serial number L-117-36, installed on the right side. Total time on the engine at the last annual inspection was 2,634.1 hours with 22.8 hours since major overhaul.

Fueling records at Tucson Airport Authority established that the airplane was last fueled on December 30, 2002, with the addition of 46 gallons of 100 LL octane aviation fuel. The fuel tanks contained a placard, which indicated that the main tanks held 19 gallons each, and the auxiliary tanks held 31 gallons each.

The fuel selector valves were in the left and right main positions. Recovery personnel drained 19 gallons of fuel from the right main tank, and 5 ounces of fuel from the right auxiliary tank.

They drained 5 gallons from the left main tank, and 6 ounces from the left auxiliary tank. Fuel leaked from the left wing lines during recovery.

METEOROLOGICAL CONDITIONS

The closest official weather observation station was Tucson (TUS), Arizona, which was 12 nautical miles east of the accident site. The elevation of the weather observation station was 2,643 feet mean sea level (msl). A routine aviation weather report (METAR) for TUS was issued at 1155. It stated: skies clear; visibility 10 miles; winds calm; temperature 54 degrees Fahrenheit; dew point 31 degrees Fahrenheit; altimeter 30.14 inches of mercury.

COMMUNICATIONS

The airplane was in contact with Ryan ATCT Center on frequency 125.8.

AIRPORT INFORMATION

The Airport/ Facility Directory, Southwest U. S., indicated Tucson Ryan runway 6R was 5,500 feet long and 75 feet wide; the runway surface was asphalt. The field elevation was 2,417.

WRECKAGE AND IMPACT INFORMATION

The National Transportation Safety Board investigator-in-charge (IIC) and investigators from the FAA and Beech examined the wreckage at the accident scene. An investigator from Textron Lycoming joined them for examination of the wreckage in the owner's hangar. An investigator from Hartzell Propellers examined the propellers at Air Transport, Phoenix, Arizona, on January 29, 2003, under the supervision of a Safety Board investigator.

The IIC estimated that the airplane came to rest about 200 feet beyond the 4,000-foot marker and southeast of Taxiway B. The terrain surface surrounding the runways and taxiways was hard dirt with patches of grass. The area between the runway and taxiway had a slight dip.

The first identified point of contact (FIPC) was a ground scar, which contained green lens fragments. The debris field from the FIPC to the main wreckage was along a magnetic bearing of approximately 140 degrees. The main wreckage pointed on a magnetic bearing of 050 degrees, and was about 77 feet from the FIPC.

About 15 feet from the FIPC along the debris path was a slash mark with blue paint along its smooth edge. About 5 feet further was the separated right propeller. About 10 feet further into the debris field was the separated left propeller, which was buried to the back of the flange. The propellers' tips had blue stripes that were approximately 2-inches wide with adjacent white and then red stripes of similar dimensions.

The nose of the airplane crushed up and aft.

The engines separated from the airframe except for some hoses and cables. The IIC supervised severance of the lines and placement of the inverted engines onto pallets.

MEDICAL AND PATHOLOGICAL INFORMATION

The Pima County Sheriff's Department reported that all of the victims had their seat belts fastened. The pilot sustained facial lacerations. The victim in the front right seat, who sustained fatal injuries, had the lap belt appropriately fastened; there was no shoulder harness. They observed severe head trauma during the autopsy that they attributed to contact with the instrument panel.

TESTS AND RESEARCH

The landing gear was in the down and locked position. The airframe representative determined that the flaps were in the up position. The rudder trim actuator measured approximately 3 3/8 inches, which he said was the neutral position. The left elevator trim actuator measured approximately 1.5 inches, and he said that this equated to approximately 8 degrees tab down.

Investigators noted that the primer for the left engine was stowed and locked. The right primer was out of the detent. Investigators manually operated the primer and were able to move it to the stowed and locked position.

Rudder Pedals

The left rudder pedal fractured and separated along an angular plane with a grainy fracture surface. A follow-up examination by a Safety Board investigator determined that the pedal's adjusting pin was out of its hole. Beech engineers reported that by placing the pin in one of two holes, pilots could adjust the rudder pedal arm for their comfort. They noted stops on each end of the pedal bracket that captured the rudder lever if the pin was not engaged. Thus, even with the pin dislodged from the adjusting hole, the pilot would have full rudder and braking authority. They opined that the fractured pedal arm allowed the adjusting pin to disengage from the adjusting hole.

LEFT PROPELLER

The engine crankshaft fractured circumferentially at the front of the case. The fracture surface was about 45° to the longitudinal axis of the engine. The spinner dome was crushed and several pieces separated. The spinner bulkhead was dented and deformed.

One blade bent forward about 20° with a large radius at mid-blade. There was rotational scoring on both sides of the leading edge along the entire length. The other blade bent aft

about 90° and twisted toward low pitch. There was rotational scoring on the leading edge along the entire length.

The Hartzell representative noted that the left propeller's pistons and blades were in the feather position. He noted that the piston exhibited severe frontal impact damage, which would drive the piston and pitch change mechanism toward feather. The piston fractured into multiple pieces, which would release the piston's oil pressure. This would allow the feathering spring to actuate the mechanism toward feather.

The Hartzell representative also noted that a blade counterweight in the feather position punctured the spinner dome, and the spinner material was crushed beneath the counterweight. He indicated that movement of this counterweight towards feather had to have occurred after the spinner dome crushed inward. This indicated that the blade could not have been feathered prior to impact.

The representative did not detect any discrepancies that would have precluded normal operation. He determined that the left propeller was spinning at the time of impact, and was not feathered. He could not determine the amount of power that the engine was developing.

RIGHT PROPELLER

The Hartzell representative examined the right propeller. The propeller mounting flange sustained mechanical damage, and the propeller separated. One blade was not bent or twisted; it had lengthwise scoring in the paint on the cambered side. The outer 3/4 of the second blade bent aft about 20°, and twisted slightly toward low pitch. It had rotational scoring in the leading edge with scratches and missing paint on the cambered side.

The blades did not rotate in their clamps, and their feather stops did not have any impact marks. The piston had a witness mark that was 1 18/32 inches from the aft end of the piston. The representative equated this to an approximate 21° blade angle. He reported that this blade angle would be consistent with operation at high power and low speed. Neither link arm was bent. However, both link arms had light score marks caused by contact with a blade counterweight. This occurred when the counterweights were at a low blade angle.

The representative did not detect any discrepancies that would have precluded normal operation. He determined that the right propeller was spinning at the time of impact, and was not feathered. He could not determine the amount of power that the engine was developing.

LEFT ENGINE

Investigators examined the left engine on a pallet. They removed the bottom spark plugs. The gaps were similar, and there was no mechanical damage on the electrodes. The electrodes were oval and gray, which corresponded to normal operation according to the Champion Aviation Check-A-Plug AV-27 Chart.

Investigators manually rotated the crankshaft with a tool in the propeller governor drive pad. All valves moved in sequence and approximately the same amount of lift. The accessory gears turned freely, and they obtained thumb compression on all cylinders in firing order.

A borescope inspection revealed no mechanical deformation on the valves, cylinder walls, or internal cylinder head.

Investigators manually rotated the magnetos, and both magnetos produced spark at all posts. The ignition harness sustained mechanical damage.

The left carburetor sustained mechanical damage. The mounting flange remained attached to the engine, but the bowl separated into pieces. There was no contamination in the inlet screen. The float assembly was secure in its mounting, and was not damaged. The float bowl was not contaminated.

The fuel pump remained attached to its mounting pad. Its operating arm moved, and it contained a blue fluid that smelled like aviation gasoline. The diaphragm did not exhibit mechanical damage.

The oil suction screen was clean. The oil filter separated and sustained mechanical damage.

RIGHT ENGINE

Investigators examined the right engine. The engine had a fuel primer system to assist with engine starting, which had primer lines connected to cylinders 1, 2, and 4. The cockpit mounted manual primer was in the unlocked position, and extended about 1/4 inch.

Investigators removed the bottom spark plugs. The electrode for cylinder number 3 was gray, which corresponded to normal operation according to the Champion Aviation Check-A-Plug AV-27 Chart. The electrodes for cylinders 1, 2, and 4 were sooty and black, which corresponded to rich operation according to the chart.

Investigators manually rotated the engine. All valves moved in sequence and approximately the same amount of lift. The accessory gears turned freely, and they obtained thumb compression on all cylinders in firing order.

A borescope inspection revealed no mechanical deformation on the valves, cylinder walls, or internal cylinder head.

Investigators manually rotated the magnetos, and both magnetos produced spark at all posts. The ignition harness sustained mechanical damage.

The carburetor remained attached to the engine. The throttle and mixture control rods

remained attached to their respective control arms. However, the mixture control arm fractured and separated along an angular plane with an irregular fracture surface. Blue fluid that smelled like aviation gasoline was in the carburetor, fuel pump, and their attached fuel lines. The carburetor discharged a steady stream of fluid at the accelerator discharge tube upon activation of the throttle lever.

The fuel pump did not exhibit any mechanical damage. It remained attached to the engine at its mounting pad.

The oil suction screen was clean. The oil filter remained attached.

PRECISION AIRMOTIVE

Precision Airmotive examined the carburetor under the supervision of a Safety Board investigator.

Technicians observed that the mixture lever was stuck beyond the idle cutoff stop, and the attachment end of the lever fractured and separated. One air box mounting hole and part of a flange had broken off and were missing. They used clay to seal the broken flange when they attached it to the flow bench. All readings were within established limits.

Owner's Manual

The owner's manual provided information on the airplane, its systems, and procedures.

One section described a normal takeoff. It indicated that the pilot should apply a gentle but steady back pressure when the airplane reached approximately 70 miles per hour (mph). At the approximate liftoff speed of 85 mph, it noted that normal back pressure should cause the airplane to fly off the ground. It pointed out that at 6,000 feet elevation, the ground speed would be higher, and the amount of runway required to attain liftoff airspeed would almost double.

The emergency procedures section discussed single engine operation. It noted that 84 mph was the minimum indicated airspeed (IAS) at which the pilot could maintain directional control in the takeoff configuration, with one engine inoperative, and full takeoff power on the operating engine. It pointed out that this was the minimum speed for control, and was below the speed at which the airplane would climb.

The emergency procedures section indicated that the best single engine rate of climb speed at sea level was 100 mph IAS (the blue line on the airspeed indicator). It also noted that the safe single engine speed, also 100 mph IAS, was probably the most important airspeed during emergencies. With this airspeed, the pilot could follow normal single engine procedures. Below this airspeed, it stated that the pilot must attain it through altitude loss or by making a landing.

The owner's manual contained a pictorial chart (attached in the public docket) with recommended airspeeds for average piloting techniques. The chart instructed the pilot to decelerate and stop with loss of power below 90 mph at 100 feet or below 100 mph at 50 feet. It then depicted the gear retracting and propeller feathering period with the airplane maintaining 50 feet and 95 mph followed by climb out.

The manual further discussed engine failure during takeoff. It noted that a major factor in a takeoff emergency was the airspeed at the time the pilot decided to abort the takeoff. It pointed out variable factors such as remaining runway, obstructions in the takeoff path, and the type of takeoff. It stated that if an engine lost power at an IAS less than safe single engine speed (100 mph) with the gear extended, the pilot should cut the power, get the wheels on the runway, and apply brakes. If the pilot could not stop the airplane within the field boundaries, and ground looping was not feasible, the pilot should prepare to stop straight ahead, turning no more than necessary to avoid obstacles. If the loss of power occurred after attaining safe single engine airspeed, the pilot should retract the gear immediately and follow normal single engine procedures. If it occurred after becoming airborne, but before attaining safe single engine speed, it said to reduce power and land straight ahead.

ADDITIONAL INFORMATION

The IIC released the wreckage to the owner's representative.

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
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	11/01/2002
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	630 hours (Total, all aircraft), 20 hours (Total, this make and model), 527 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	Registration:	N8212D
Model/Series:	95	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	TD-8
Landing Gear Type:	Retractable - Tricycle	Seats:	4
Date/Type of Last Inspection:	05/01/2002, Annual	Certified Max Gross Wt.:	4100 lbs
Time Since Last Inspection:	31 Hours	Engines:	2 Reciprocating
Airframe Total Time:	3726 Hours as of last inspection	Engine Manufacturer:	Lycoming
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	O-360-A1A
Registered Owner:	Leland E. Oliver	Rated Power:	180
Operator:	Leland E. Oliver	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	TUS, 2643 ft msl	Distance from Accident Site:	12 Nautical Miles
Observation Time:	1155 MST	Direction from Accident Site:	268°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	Calm /	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.14 inches Hg	Temperature/Dew Point:	12° C / -1° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	TUCSON, AZ (RYN)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	VFR
Departure Time:	1212 MST	Type of Airspace:	Class D

Airport Information

Airport:	RYAN (RYN)	Runway Surface Type:	Asphalt
Airport Elevation:		Runway Surface Condition:	Dry
Runway Used:	6R	IFR Approach:	None
Runway Length/Width:	5500 ft / 75 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Fatal, 2 Serious	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal, 3 Serious	Latitude, Longitude:	32.141389, -11.169444

Administrative Information

Investigator In Charge (IIC):	HOWARD D PLAGENS
Additional Participating Persons:	GARY G MARTIN; Federal Aviation Administration; Scottsdale, AZ Mark Platt; Textron Lycoming; Williamsport, PA Tim Rainey; Beech Aircraft; Wichita, KS Tom McCreary; Hartzell Propellers; Piqua, OH
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/ .