



# Aviation Investigation Final Report

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<b>Location:</b>	TORRANCE, California	<b>Accident Number:</b>	LAX97FA328
<b>Date &amp; Time:</b>	September 21, 1997, 10:34 Local	<b>Registration:</b>	N543JL
<b>Aircraft:</b>	Beech C23	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	4 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

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## Analysis

Witnesses reported that after takeoff, the airplane never climbed beyond 150 to 200 feet above ground level. One witness reported the airplane's rotation and initial climb were normal until it achieved 100 feet, then it began to pitch nose up until the witness could clearly see the tops of the wings. The airplane then rolled to the right and descended vertically. The airplane collided with a three-story commercial office building about 2,000 feet from the departure end of the runway and was partially consumed by a postimpact fire. An audiocassette re-recording from the airport noise-monitoring site was examined to document any engine or propeller sounds that could be heard during the takeoff. A video recording that was recovered from the accident aircraft was also examined to document the takeoff distance and airborne pitch attitude/flight path of the airplane. The video recording began just as the aircraft was taking the runway for departure and appeared to continue uninterrupted until the airplane crashed. The audio track of the video was examined to document any engine or propeller sounds heard during the takeoff. Engine rpm was derived from both the audio track of the video recording and the noise-monitoring recording. The engine speeds derived from the video recording were between 2,250 and 2,430 rpm. Engine speeds derived from the noise monitoring station started at 2,750 and decreased to 2,510 rpm. Directly above the monitoring station there was no alteration in the measured frequency due to the Doppler shift. No dramatic changes were observed in the frequencies associated with the aircraft's engine. Examination of the engine did not disclose evidence of mechanical malfunction.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the pilot to attain and maintain adequate airspeed during the initial takeoff climb, which resulted in a stall/spin and subsequent collision with a building.

## Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: TAKEOFF - INITIAL CLIMB

### Findings

1. (C) AIRSPEED(VS) - NOT MAINTAINED - PILOT IN COMMAND
2. (C) STALL/SPIN - INADVERTENT - PILOT IN COMMAND

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Occurrence #2: IN FLIGHT COLLISION WITH OBJECT

Phase of Operation: DESCENT - UNCONTROLLED

### Findings

3. OBJECT - BUILDING(NONRESIDENTIAL)

## Factual Information

### HISTORY OF FLIGHT

On September 21, 1997, at 1034 hours Pacific daylight time, a Beech C23, N543JL, collided with a commercial office building after takeoff from Zamperini Field, Torrance, California. The airplane was destroyed. The certificated private pilot and three passengers received fatal injuries. The airplane was operated as a personal flight by the pilot under the provisions of 14 CFR Part 91. The flight was originating from runway 29R and was destined for the Catalina Airport, Avalon, California. Visual meteorological conditions prevailed and no flight plan was filed.

Several witnesses were interviewed. One pilot/witness reported that he saw the airplane as he was driving to the airport. He observed the airplane depart at "an extremely low altitude, approximately 150 to 200 feet agl." He continued to watch the airplane and noted that he would be crossing under its flight path. The witness stated that "the elevator appeared to be in an extremely high position given the slow speed and altitude of the aircraft. The engine was not missing or making any irregular noises . . . . I immediately assumed he was grossly overweight. At this point I knew the pilot was in trouble." He looked over his shoulder to see where the airplane was headed and noticed a cloud of black smoke. He drove over and found that the airplane had collided with the office building.

Another witness reported that he first noticed the accident airplane flying westbound just after takeoff. He stated, "the tail of the plane was low in relation to the front of the plane. It was at that time I did not think the plane was going to stay in the air much longer." The airplane disappeared from his view due to surrounding buildings. He then saw smoke rising from an office complex. The witness reported that he later realized why the airplane had first captured his attention. He stated, "I watched about a dozen other planes take off and they were all at a higher altitude at the same point where I first observed the plane that crashed."

One other pilot/witness had been on a helipad waiting for a takeoff clearance at the time of the accident. He stated that the takeoff roll and initial rotation appeared normal, but when the airplane reached approximately 100 feet agl, it began to pitch up. He reported that the "pitch attitude was so high that I could clearly see the top of his wings." The airplane never seemed to gain altitude, but then banked to the right about a 20- to 30-degree bank angle. A few seconds later the witness observed a black cloud of smoke from the building area.

The local controller reported that the pilot had requested a straight-out departure from runway 29R. The controller suggested that the pilot perform a "right forty-five departure . . . for noise abatement reasons." He observed the airplane takeoff and cross the departure end of the runway. He then observed smoke about 1/4 mile west/northwest of the airport.

## PERSONNEL INFORMATION

According to the Federal Aviation Administration (FAA) Airman Certification database, the pilot held a private pilot certificate with an airplane single engine land rating, as well as an instrument airplane rating. The original date of issuance for the private pilot certificate was May 07, 1985. According to the FAA Aeromedical Certification Division, the pilot held a third-class medical, dated October 22, 1996, with the noted restriction that he must wear corrective lenses.

The FAA Airman Certification database revealed that none of the passengers had ever held FAA airman certificates.

## AIRCRAFT INFORMATION

A mechanic at the fixed-base operator (FBO) was interviewed. He reported that on Saturday, September 20, 1997, the accident pilot had planned to fly to Catalina Island with three passengers. The pilot left the FBO and returned some time later. He informed the mechanic that during the engine run-up at 2,000 rpm, with the parking brake set, the airplane "rotated" around the left brake, so he elected to return. The mechanic explained some of the possible causes of the problem and asked the pilot to bring the airplane back on Monday, September 22, 1997, since the shop was closed on the weekend.

According to the airplane's maintenance logbooks, the aircraft had last received an annual inspection on December 19, 1996. On the annual/100-hour inspection form, the engine static rpm was recorded as 2,200 rpm. The airplane's Pilot Operating Handbook (POH) lists the static rpm limits as 2,250 to 2,350 rpm. No corrective actions were noted on the inspection form. The mechanic who performed the inspection reported that he determined the aircraft to be in an airworthy condition.

Current weight and balance values were not obtained for the airplane. The delivery weight and balance values were used in calculating the airplane's accident gross weight and center of gravity (CG). The autopsy weights were used for the occupant weights. Three different weight and balance calculations were performed, since the occupant positions were not determined. A fuel loading of 50 gallons was used, based on a witness statement. According to the Beech representative, the weight and balance calculations showed that the airplane was near gross weight at takeoff, and the CG could have been as far forward as 114.09 inches, which is forward of the forward limit, or the CG could have been as far aft as 115.93 inches, which is a midrange CG value.

## WRECKAGE AND IMPACT

The accident site was in a medical business park located north of the runway 29R extended centerline, and about 2,000 feet from the departure end of the runway. The airplane penetrated

the third and second floors of the building, and came to rest inverted suspended in a hole in the first floor ceiling.

The empennage and the right wing were draped over a balcony railing, the left wing was inside the second floor office, and the fuselage was hanging from the first floor ceiling into the office directly below. Fire nearly consumed the fuselage, the left wing, and the first and second floor offices. The office sprinkler system flooded the remaining offices in the building.

The engine was observed lying inverted and lodged between the structure of the first and second floor of the office building. The two-bladed fixed pitch propeller remained attached at the crankshaft. The engine displayed thermal damage. Initial examination of the engine while still entangled with the attached wreckage did not reveal any evidence of catastrophic mechanical malfunction.

The left wing from the aileron outboard was consumed by fire. The flap remained attached to the wing. The wing fuel tank was consumed by fire. The aileron was not observed. The aileron flight control cables were continuous from the aileron bell crank attach fittings into the cabin.

The right wing was separated from the fuselage. The main spar was separated adjacent to the center wing spar splice and at the main landing gear strut. The inboard half of the flap remained attached to the wing, and the outboard half of the flap was consumed by fire. The wing fuel tank was consumed by fire. The outer 9 feet of the wing were separated from the airplane. The aileron remained attached to the outer wing panel. The aileron control cables remained attached to the aileron bell crank. The control cables were separated at the accident site by the recovery crew.

The fuselage sidewalls were consumed by fire. The lower cockpit and cabin floor area was partially consumed by fire. The cabin roof was separated from the fuselage and partially consumed by fire. The cockpit flight controls were intact from the cockpit aft to about FS 181, where they had been cut during the recovery process. The pitch trim mechanism was found melted and fused to the remains of the COMM Select Panel. The manual flap handle mechanism was examined. There was no evidence that the flap latch had been engaged in any of the three position notches. The flap extend cable was separated. The flap arm was separated on the right side.

One of the propeller blade tips remained straight, and the opposite blade tip was bent with a slight aft curl.

The fuel selector valve, airframe fuel strainer (gascolator), and fuel boost pump were removed as an assembly. The gascolator was clear. The output fuel line check valve was installed in the proper direction. The fuel boost pump pumped fuel when energized.

The control column was found positioned forward, against the firewall. The instrument panel

was consumed by fire. The bottom fitting of the control column with the two pitch cables attached was found punched through the belly of the airplane. Neither control yoke assembly was found.

The empennage structure was partially consumed by fire. The empennage flight control surfaces could be manipulated by the control cables. The pitch trim actuator could be manipulated through the trim cables. An electric pitch trim servo was installed. During the examination, the pitch trim servo was energized and would operate in both directions.

The cabin area and occupant restraint systems were examined after the occupants were extracted and the airplane was recovered. Three engaged seat belt buckles were found. The four shoulder harness guides mounted along the cabin roof were found attached to the cabin roof structure.

## TESTS AND RESEARCH

A teardown inspection of the engine was performed at Aircraft Recovery Services, Compton, California, following recovery.

The propeller was removed to facilitate the examination. The top and bottom spark plugs were removed and examined. The rocker box covers and the rear mounted accessories were removed. The rocker assemblies, springs, and valve retainers were secure at each cylinder assembly. The four cylinder assemblies were removed and examined. The cylinder combustion chambers were undamaged and the valves were intact. There was no evidence of valve to piston face contact, detonation or foreign object ingestion. The pistons were intact and undamaged. The number 3 piston was found to have a broken number 2 compression ring; however, the piston skirt did not display any blow-by signatures and appeared consistent in coloration with the remaining piston skirts. The rings on the remaining pistons were intact with the end gaps resting at staggered locations.

The accessory case and oil sump were removed. The oil filter screens were uncontaminated. There was no evidence of metal contamination. The oil pump gears were undamaged and coated with a film of oil. The accessory gears and crankshaft gear dowel were intact and undamaged. The crankshaft was intact with the respective connecting rods securely attached. There was no evidence of heat distress observed at any of the bearing locations. The camshaft was intact and undamaged. Each of the camlobes and tappets was intact and displayed a consistent shape at each lobe. Mechanical continuity was established throughout the rotating group, valve train, and accessory gears.

Both magnetos were found securely clamped. The magneto to engine timing for the left magneto was observed at 25 degrees. The magneto to engine timing for the right magneto was observed at 24 degrees. Both magnetos produced sparks at all four spark plug leads during hand rotation.

The carburetor was found secure at the mounting flange. The throttle/mixture controls were found securely attached and continuity to the cockpit was established. The carburetor and induction system were examined and appeared to be free of obstruction. All engine compartment fuel lines were found to be secure. The fuel inlet screen was absent of contamination. Disassembly of the carburetor revealed approximately 1 ounce of fuel in the carburetor bowl. The float assembly was intact and undamaged. The accelerator pump was intact and undamaged.

The fuel pump was found attached to the engine. The outlet fuel fitting was broken off at the pump body. The pump was found intact and undamaged internally. There was no evidence of obstruction found.

The exhaust system was found secure about the engine and was absent of obstructions. The muffler was sectioned with a power saw to expose the internal baffling. The muffler was unobstructed and displayed a light gray gas path coloration.

An audiocassette re-recording from the City of Torrance Noise Monitoring Site #10 was sent to the Safety Board's audio laboratory. The recording was examined to document any engine or propeller sounds that could be heard during the takeoff. A video recording that was recovered from the accident aircraft was also examined to document the takeoff distance and airborne pitch attitude/flight path of the airplane. The audio track of the video was examined to document any engine or propeller sounds heard during the takeoff. A copy of the specialist's factual report is appended to this file.

The recordings were examined on an audio spectrum analyzer to identify any background sound signatures that could be associated with either the engine or the propeller.

The aircraft was equipped with a 4-cylinder piston driven engine. The engine is connected to a fixed-pitch 2-blade propeller. According to the POH, the aircraft's engine should be between 2,250 and 2,350 rpm during the start of the takeoff roll. At its maximum speed, the 2-bladed propeller would produce noise at the fundamental frequency of 90 Hz and at multiple harmonics of this frequency.

The engine speeds derived from the video recording were between 2,250 rpm and 2,430 rpm.

The engine speeds derived from the noise-monitoring recording started at 2,750 rpm and decreased to 2,510 rpm. The aircraft was flying toward the noise monitoring station during the first portion of the recording. According to the Safety Board's electronics engineer, this results in an increasing frequency due to the Doppler shift. When the aircraft was directly above the noise-monitoring microphone, there was no alteration in the measured frequency due to the Doppler shift. When the airplane was flying away from the station, there was a resulting decrease in the measured frequencies due to the Doppler shift.

There were no dramatic changes observed in the frequencies associated with the aircraft's

engine.

The Beech representative provided performance information regarding the Beech Sundowner. Using the POH, Section V, Performance, charts and the conditions present at the time of the accident, the following information was extracted from the two charts: for the takeoff distance from a hard surface, with calm winds and outside air temperature (OAT) of 77 degrees Fahrenheit, the airplane should become airborne after traveling 1,248 feet and would be 50 feet agl after traveling 2,155 feet from brake release at full throttle. Referencing the normal climb chart, at 2,400 pounds gross takeoff weight, OAT 77 degrees, 90 mph IAS, and full throttle, the rate of climb should be 769 feet per minute.

According to the Airport/Facility Directory, Torrance runway 29R is 5,000 feet long. The distance from the departure end of the runway to the medical building was measured to be about 2,000 feet. The Beech representative reported that a Model C23 Sundowner performing as shown in the above-noted performance charts would therefore have traveled 4,845 feet across the ground beyond the point at which it had climbed to 50 feet agl, and should have climbed to 520 feet agl. He further reported that if the airplane had started its takeoff roll at the displaced threshold, which is 500 feet down the runway, it would have passed over the medical building 472 feet above the ground.

#### MEDICAL PATHOLOGICAL

Postmortem examinations were conducted on the pilot and passengers by the Los Angeles County Coroner's Office, with specimens retained for toxicological examination by the FAA Toxicology and Accident Research Laboratory. The examinations were negative for all screened drug substances.

#### ADDITIONAL INFORMATION

The wreckage was released to the Aviation Insurance Group representative on February 25, 2000.



## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	35, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 3 Valid Medical-w/ waivers/lim	<b>Last FAA Medical Exam:</b>	October 22, 1996
<b>Occupational Pilot:</b>	UNK	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	300 hours (Total, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Beech	<b>Registration:</b>	N543JL
<b>Model/Series:</b>	C23 C23	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal; Utility	<b>Serial Number:</b>	M-1903
<b>Landing Gear Type:</b>	Tricycle	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	December 19, 1996 Annual	<b>Certified Max Gross Wt.:</b>	2450 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	3460 Hrs	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed	<b>Engine Model/Series:</b>	O-360-A4K
<b>Registered Owner:</b>	MARY M. MATSUMOTO	<b>Rated Power:</b>	180 Horsepower
<b>Operator:</b>	SHIMPEI MATSUMOTO	<b>Operating Certificate(s) Held:</b>	None
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	TOA ,101 ft msl	<b>Distance from Accident Site:</b>	1 Nautical Miles
<b>Observation Time:</b>	10:32 Local	<b>Direction from Accident Site:</b>	120°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	/	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	0°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29 inches Hg	<b>Temperature/Dew Point:</b>	26°C / 18°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	(TOA )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	AVALON , CA (AVX )	<b>Type of Clearance:</b>	VFR
<b>Departure Time:</b>	00:00 Local	<b>Type of Airspace:</b>	Class D

## Airport Information

<b>Airport:</b>	ZAMPERINI FIELD TOA	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	101 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	29R	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	5000 ft / 150 ft	<b>VFR Approach/Landing:</b>	None

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Destroyed
<b>Passenger Injuries:</b>	3 Fatal	<b>Aircraft Fire:</b>	On-ground
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	4 Fatal	<b>Latitude, Longitude:</b>	33.799617,-118.349205(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Wilcox, Thomas
<b>Additional Participating Persons:</b>	JAMES M WILKENSON; LONG BEACH , CA MARK PLATT; VAN NUYS , CA PAUL YOOS; WICHITA , KS
<b>Original Publish Date:</b>	August 18, 2000
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=29633">https://data.nts.gov/Docket?ProjectID=29633</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).