



Aviation Investigation Final Report

Location:	TUSAYAN, Arizona	Accident Number:	LAX99FA262
Date & Time:	August 3, 1999, 14:07 Local	Registration:	N19113
Aircraft:	Cessna 177B	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	2 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The cross-country flight departed Big Bear, California, with stops in Las Vegas, Nevada, Grand Canyon, Arizona, and returning to Big Bear. The accident departure from Grand Canyon National Park Airport was performed on runway 03; an 8,999-foot runway with a 0.8 percent up gradient (76-foot increase), and a density altitude of 8,800 feet msl. Witnesses reported that the airplane appeared to be slow, and barely cleared trees and buildings while climbing into mildly rising terrain. About 2 miles from the runway, the airplane was seen to roll to the left and descended into trees. The FAA Approved Flight Manual (AFM) for the accident airplane/performance data was not found at the accident site; however, a Cessna 337 Skymaster AFM was found. A California Airport Directory was also recovered. No Grand Canyon Airport information was found at the site other than the Las Vegas Sectional Chart airport information. Examination of the dual magneto revealed internal case corrosion on the left interior of the magneto. The right magneto was timed 22 degrees BTC instead of 25 degrees BTC. Test bench results indicated that the right magneto exhibited a weak spark. The massive electrode spark plugs exhibited a gap in excess of the recommended maximum gap for the plug. Cylinder plugs No. 1 and 2 were fuel sooted, No. 3 appeared lean, and No. 4 was slightly sooted.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: was the pilot's failure to have available and consult the FAA approved flight manual for performance data and, the high density altitude. Contributing to the accident were the dual magneto and spark plug system issues affecting optimum engine performance.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings

1. (F) TERRAIN CONDITION - HIGH TERRAIN
 2. (F) WEATHER CONDITION - HIGH DENSITY ALTITUDE
 3. (C) PERFORMANCE DATA - UNAVAILABLE - PILOT IN COMMAND
 4. (C) MAINTENANCE, SERVICE OF AIRCRAFT/EQUIPMENT - IMPROPER - OTHER MAINTENANCE PERSONNEL
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Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On August 3, 1999, at 1407 hours Pacific daylight time, a Cessna 177B, N19113, operated by Aero Haven, Inc., of Big Bear, California, was destroyed when it collided with trees and terrain at Tusayan, Arizona. The private pilot and one passenger received fatal injuries; another passenger received serious injuries. The airplane was rented by the pilot for the personal flight that was being conducted under the provisions of 14 CFR Part 91 when the accident occurred. The flight originated at Big Bear on August 1, 1999, and was to include stops at Las Vegas, Nevada, and Grand Canyon, Arizona, with a return to Big Bear on August 3, 1999.

The airplane arrived at the Las Vegas McCarran International Airport parking ramp about 1740 on August 1, 1999, where it remained for the night. On August 2, the airplane was topped off with fuel (15.4 gallons), and the fuel invoice showed an estimated departure time of 1400 for the Grand Canyon.

On August 3, 1999, about 1356, the pilot called the Federal Aviation Administration (FAA) Air Traffic Control Tower local controller and asked for the ground control frequency. He contacted ground control and requested to taxi to runway 03. The call-to-ground was partially stepped on by a helicopter transmission. The ground controller was also working a helicopter frequency. The ground controller did not confirm that the pilot had received the Airport Terminal Information Service (ATIS) "Foxtrot," which included the density altitude warning. The pilot was cleared for takeoff at 1405 from runway 03 at the Grand Canyon National Park Airport (GCN).

Several pilot witnesses stated that the airplane appeared slow and did not climb much above the trees. About 1 mile north of the airport it was seen to barely clear the buildings at Tusayan. At 1407:39, the local controller advised the pilot "if you need to turn up the highway for altitude you can do that" and the pilot acknowledged. After crossing highway 64, it was observed to roll to the left and descend into trees. At the time of the accident the airport density altitude was reported as 8,800 feet msl, and the wind was light and variable.

PERSONNEL INFORMATION

The pilot's logbook was recovered at the accident site. The logbook was initiated on October 29, 1990. The last documented log entry is dated June 26, 1998. The last six log entries were for a Cessna Skymaster 337. The log totaled about 422 total flight hours with about 76 hours in the accident airplane.

AIRCRAFT INFORMATION

According to maintenance logbooks, the last annual inspection occurred on June 21, 1999.

According to the time recording tachometer, there were 91.8 hours accumulated on the airplane since the annual/last inspection. The FAA Approved Flight Manual (AFM) for the accident airplane/performance data was not found at the accident site. A Cessna 337 Skymaster AFM was recovered at the accident site.

The gross weight for the airplane is 2,500 pounds. The estimated takeoff weight at the Grand Canyon is 2,432.6 pounds. According to the airplane manufacturer's operating data, under the accident conditions the optimum performance climb rate should be about 365 feet per minute. According to the engine manufacturer, under the accident conditions the optimum engine performance would be 70 to 75 percent power, or 125 to 135 horsepower.

A discrepancy form for the accident airplane dated July 99 was recovered. The form listed three open discrepancies; 1) Dated 7/19/99, is unclear; 2) Dated 7/28/99, exhaust gas temperature (EGT) inconsistent; and 3) Dated 7/28/99, gyro suction non-op.

METEOROLOGICAL INFORMATION

At 1354, GCN was reporting: winds variable at 5 knots; visibility 10 miles; scattered clouds at 7,000 feet; temperature 73 degrees Fahrenheit; dew point 52 degrees Fahrenheit; and the altimeter was 30.34 inHg.

The airport terminal information service (ATIS) was reporting a density altitude of 8,800 feet msl.

AIRPORT INFORMATION

According to Department of Commerce Airport/Facility Directory, runway 03 has a positive runway gradient of 0.8 percent (76-foot increase) over the 8,999-foot length. A California Airports Directory was recovered from the accident site, no Arizona; airport information was found other than the Las Vegas Sectional Chart.

WRECKAGE AND IMPACT INFORMATION

The Safety Board examined the wreckage on scene located at 35 degrees 59.07 minutes north latitude by 112 degrees 07.35 minutes west longitude. The site was about 2 miles north of the airport and 300 feet east of highway 64 in an area of pine trees.

A pine tree displayed damage about 40 above ground level with 16 feet of a narrowing tree top section lying at the tree base. About 25 feet from the damaged tree the airplane empennage was found severed from the fuselage. About 37 feet from the damaged tree the fuselage and wings were located standing vertical with the wing leading edges against the ground. At 63 feet the engine cowl was located, and the engine assembly was found at 117 feet. The wreckage path was oriented about 330 degrees magnetic.

The right horizontal stabilator exhibited leading edge damage at the root and tip. The root damage revealed bark and tree pitch transfer. The cabin structure from the firewall was collapsed aft to about the mid cabin door area. Both cabin doors were broken from the cabin structure. Both door-latching shafts were in the extended/latched positions. Both wing flaps were found in the full up position.

A tree limb measured to be 5.25 inches across the narrowest section was sliced in half with red paint transfer similar to the red paint found on the propeller blade tips. The propeller blades exhibited leading edge damage and chordwise striations and aft bending.

The fuel selector was found in the both position. The flap handle was in the up position. The mixture was full forward. The clock was stopped at 2:07. The altimeter barometric pressure was set at 30.31 inHg. The Hobbs recording hour meter was 4,314.8 and the recording tachometer was 9,431.8 hours.

MEDICAL AND PATHOLOGICAL INFORMATION

On August 4, 1999, the Coconino County Medical Examiner performed an autopsy on the pilot. During the procedure the FAA Civil Aeromedical Institute, Oklahoma City, Oklahoma, obtained samples for toxicological analysis. The results of the analysis were negative for carbon monoxide, cyanide, ethanol, and drugs.

TESTS AND RESEARCH INFORMATION

Postaccident examination of the Lycoming O-360-A1F6D engine revealed the Bendix D4LN-2021 magneto timing to be 25 degrees left and 22 degrees right. Lycoming recommended timing is 25 degrees before top dead center for both left and right magnetos. Some internal corrosion was evident. Test bench results for the left magneto revealed a strong blue spark. Right magneto test produced a weak reddish spark. Some points burning was noted.

Examination of the spark plugs revealed fuel sooting of the plugs located in cylinders No. 1 and 2. Cylinder No. 3 appeared lean looking, and cylinder plug No. 4 was slightly sooted. According to the Champion Spark Plug gap information, the massive electrode plug gaps were beyond the recommended maximum gap. The engine primer line was installed on cylinder No. 4. The primer was locked and seals were good.

ADDITIONAL INFORMATION

The wreckage was released to the insurance company representative on August 18, 1999.

Pilot Information

Certificate:	Private	Age:	39,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	September 24, 1997
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	422 hours (Total, all aircraft), 76 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N19113
Model/Series:	177B 177B	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	17702558
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	June 21, 1999 Annual	Certified Max Gross Wt.:	2500 lbs
Time Since Last Inspection:	92 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	9432 Hrs	Engine Manufacturer:	Lycoming
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	O-360-A1F6D
Registered Owner:		Rated Power:	180 Horsepower
Operator:		Operating Certificate(s) Held:	None
Operator Does Business As:		Operator Designator Code:	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	GCN ,6606 ft msl	Distance from Accident Site:	2 Nautical Miles
Observation Time:	13:54 Local	Direction from Accident Site:	210°
Lowest Cloud Condition:	Scattered / 7000 ft AGL	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	0°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	23°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	GRAND CANYON , AZ (GCN)	Type of Flight Plan Filed:	None
Destination:	BIG BEAR , CA (L35)	Type of Clearance:	VFR
Departure Time:	14:07 Local	Type of Airspace:	Class D

Airport Information

Airport:	GRAND CANYON NATL. PARK GCN	Runway Surface Type:	Asphalt
Airport Elevation:	6606 ft msl	Runway Surface Condition:	Dry
Runway Used:	3	IFR Approach:	None
Runway Length/Width:	8999 ft / 150 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Fatal, 1 Serious	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal, 1 Serious	Latitude, Longitude:	36.030887,-112.019294(est)

Administrative Information

Investigator In Charge (IIC): Petterson, George

Additional Participating Persons: NICK HARRINGTON; LAS VEGAS , NV
EMILE LOHMAN; WICHITA , KS

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Note:

Investigation Docket: <https://data.nts.gov/Docket?ProjectID=47018>

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

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](#).