



National Transportation Safety Board Aviation Accident Final Report

Location:	PALM SPRINGS, CA	Accident Number:	LAX99FA001
Date & Time:	10/01/1998, 1005 PDT	Registration:	N5YZ
Aircraft:	Aero Commander 680 FPL	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

While departing on a local area aircraft checkout flight the aircraft stayed low and the pilot advised the tower that he had a fuel problem. The aircraft had been fueled with aviation grade 100LL twice the day before in preparation for a trip. The pilot attempted to return to the airport, but collided with power lines 1.5 miles north. Examination of the engines revealed severe detonation had occurred. A fuel sample was obtained from the aircraft and tested negative for jet fuel contamination. The aircraft had been modified by installation of higher horsepower engines and turbochargers with manual wastegates. During postaccident examination of the aircraft systems the manual wastegates were found partially closed; a position that can provide additional manifold pressure. The engines are restricted to a maximum of 29.5 inHg.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to properly use the manual turbocharger wastegates and to monitor the manifold pressure during takeoff.

Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - NONMECHANICAL
Phase of Operation: CLIMB

Findings

1. (C) ENGINE ASSEMBLY,CYLINDER - OVERTEMPERATURE
2. (C) POWERPLANT CONTROLS - IMPROPER USE OF - PILOT IN COMMAND

Occurrence #2: FORCED LANDING
Phase of Operation: CLIMB

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

Findings

3. OBJECT - WIRE,TRANSMISSION

Occurrence #4: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On October 1, 1998, at 1005 hours Pacific daylight time, an Aero Commander 680 FPL, N5YZ, was destroyed during a forced landing at Palm Springs, California. The pilot was fatally injured. Visual meteorological conditions prevailed for the personal flight and no flight plan was filed. The flight, operated by Desert Aircraft Sales, originated at Palm Springs as a local area flight under the provisions of 14 CFR Part 91. After a northbound departure from runway 31L, the pilot stayed low and reported a fuel problem. The aircraft collided with power lines and terrain about 1.5 miles north of the airport.

PILOT INFORMATION

The pilot's logbook was not recovered. According to Federal Aviation Administration (FAA) records, the pilot held a private pilot's certificate for airplane single and multiengine land airplanes. He also held an instrument airplane rating. The pilot reported a total of 3,200 flight hours at his third-class flight physical on October 23, 1996.

AIRCRAFT INFORMATION

No aircraft records were recovered. The aircraft had been modified by installation of higher horsepower engines and turbochargers with manual wastegates. An aircraft sales specification sheet was obtained and represented the aircraft as having a Mr. RPM Turbo 800 Conversion. The conversion replaces the Lycoming IGSO-540-B1A 380 horsepower supercharged engines with Lycoming IO-720-B1B 400 horsepower engines. Turbochargers are installed with manual exhaust bypass valves. There are no manifold pressure overboost protection systems.

The aircraft had been fueled twice the day before the accident with aviation grade 100LL fuel in preparation for a trip.

The specification sheet stated that the total aircraft time was 5,420 hours, and that both engines had 1,390 total hours since new. The left engine had zero hours since major overhaul, and the right engine had 70 hours since top overhaul.

Aircraft information was obtained from a prospective buyer who had declined the purchase because, according to him, 10 years of aircraft records were missing.

METEOROLOGICAL CONDITIONS

At 0953, Palm Springs weather was reporting: clear, 10 miles visibility; wind calm; temperature 79 degrees Fahrenheit; dew point 52 degrees Fahrenheit; altimeter 29.89 inHg.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located 1.5 miles north of the Palm Springs Regional Airport in an area of sand dunes. The heading of the aircraft was measured about 230 degrees magnetic. Witnesses reported seeing the aircraft rotate about 360 degrees during collision with the power lines and ground. A section of right outer wing leading edge was found under the wire location with wire imprints. A postcrash fire nearly consumed the aircraft structure.

The on-scene examination of the wreckage revealed engine oil trailing across both the right and left horizontal stabilizers and elevators. Preliminary examination of the engines revealed mild peening of the No. 6 cylinder top and bottom spark plugs from the left engine. The engine

manual wastegates were found partially closed.

MEDICAL AND PATHOLOGICAL INFORMATION

On October 2, 1998, the Riverside County Medical Examiner performed an autopsy on the pilot. During the course of the procedure samples were obtained for toxicological analysis by the FAA Civil Aeromedical Institute in Oklahoma City, Oklahoma.

The analyses were negative for cyanide and ethanol; carbon monoxide measured 18 percent; Diphenhydramine (Benedril) was detected in the liver, blood, and urine; and Acetaminophen (Tylenol) was detected in the urine. Details of the analysis are attached to this report.

TESTS AND RESEARCH INFORMATION

Postaccident engine examination revealed evidence of over-tempering (see note 1 regarding detonation under Additional Information) within the engine cylinders. Examination of the left engine cylinders revealed holes burnt through six pistons; the right engine had four pistons with holes burnt through. Valve and ring damage was also noted in the cylinders.

A fuel sample was obtained from the right wing fuel tank cell and was taken to a fuel-testing laboratory for analysis. The report confirmed that the fuel was uncontaminated 100LL-aviation fuel. The refueling FBO also tested their fuel to specification. The fuel sample tests are attached to this report.

Both RSA Fuel Injection Servos were sent to Precision Airmotive Corporation for examination and testing. One servo was functional tested and one was not due to damage. Both were disassembled and examined and there were no conditions or discrepancies found.

During postaccident examination of the aircraft systems the manual wastegates were found partially closed; a position that can provide additional manifold pressure. The engines are restricted to a maximum manifold pressure of 29.5 inHg.

Postaccident propeller examination revealed that both propellers were rotating at the time of impact and were not feathered. According to the Hartzell Propeller Company report, no preimpact discrepancies were noted on either propeller that would have precluded normal operation.

ADDITIONAL INFORMATION

1) Detonation (a reciprocating engine condition). An explosion or uncontrolled burning inside the cylinder or cylinders of a reciprocating engine. Detonation occurs when the pressure and temperature inside the cylinder becomes higher than the critical pressure and temperature of the fuel, and may be caused by using fuel that has a lower octane rating, or performance number, than is specified for the engine.

The pressure rise inside the cylinder caused by the fast-moving flame front can heat and compress the unburned fuel-air mixture enough for it to explode, or release its energy faster than the engine can accept it. This causes a rapid rise in cylinder pressure, excessive cylinder head temperature, and a decrease in engine power.

Pilot Information

Certificate:	Private	Age:	70, 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):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	10/23/1996
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	3200 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Aero Commander	Registration:	N5YZ
Model/Series:	680 FPL 680 FPL	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	151322
Landing Gear Type:	Retractable - Tricycle	Seats:	11
Date/Type of Last Inspection:	Unknown	Certified Max Gross Wt.:	8500 lbs
Time Since Last Inspection:		Engines:	2 Reciprocating
Airframe Total Time:		Engine Manufacturer:	Lycoming
ELT:		Engine Model/Series:	IO-720-B1BD
Registered Owner:	DESERT AIRCRAFT SALES	Rated Power:	400 hp
Operator:	DESERT AIRCRAFT SALES	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	PSP, 462 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	0953 PDT	Direction from Accident Site:	0°
Lowest Cloud Condition:	Clear / 0 ft agl	Visibility	10 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	26 °C / 11 °C
Precipitation and Obscuration:			
Departure Point:	, CA (PSP)	Type of Flight Plan Filed:	None
Destination:	(PSP)	Type of Clearance:	VFR
Departure Time:	1000 PDT	Type of Airspace:	Class D

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	GEORGE E PETERSON	Report Date:	04/20/2000
Additional Participating Persons:	GARY KAPPA; RIVERSIDE, CA MARK W PLATT; WILLIAMSPORT, PA ROGER J ADERMAN; ARLINGTON, WA		
Publish Date:			
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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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](#).