



Aviation Investigation Final Report

Location:	Elkin, North Carolina	Incident Number:	ERA09IA331
Date & Time:	June 8, 2009, 20:15 Local	Registration:	N34TG
Aircraft:	CIRRUS DESIGN CORP SR22	Aircraft Damage:	Minor
Defining Event:	Powerplant sys/comp malf/fail	Injuries:	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot stated that he was at a cruise altitude of 6,000 feet mean sea level when he heard a loud bang. Oil began to flow over the windshield and the pilot decided to activate the Cirrus Airframe Parachute System. The airplane descended under the parachute into a cornfield. Examination of the engine revealed the No. 2 piston had failed. Metallurgical examination of the No. 2 piston showed it had failed due to a fatigue crack that originated adjacent to the piston pin in the pin boss area. The exact location of the fatigue crack and the cause of fatigue crack initiation could not be determined due to extensive damage in the area of origin. Damage to the other components submitted for examination likely occurred as a result of the failure of the piston once the fatigue crack reached a critical size. While the pin boss is an area under high stress and it is possible that operational factors, such as improper timing, could initiate a fatigue crack, the investigation could not determine the cause of the fatigue crack.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: A total loss of engine power due to the failure of the No. 2 piston as a result of a fatigue crack of undetermined origin.

Findings

Aircraft	Recip eng cyl section - Malfunction
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Factual Information

History of Flight

Enroute-cruise	Powerplant sys/comp malf/fail (Defining event)
Enroute-cruise	Loss of engine power (total)
Emergency descent	Collision with terr/obj (non-CFIT)

On June 8, 2009, about 2015 eastern daylight time, a Cirrus SR22, N34TG, experienced an engine failure near Elkin, North Carolina. The certificated commercial pilot was not injured, and the airplane sustained minor damage. The personal flight was operated under the provisions of 14 Code of Federal Regulations (CFR) Part 91, and an instrument flight rules flight plan was filed. Visual meteorological conditions prevailed at the time of the event.

The pilot stated that he was in cruise flight at an altitude of 6,000 feet mean sea level (msl), when he heard a loud bang followed by a violent vibration of the airplane. He said that prior to this event, all engine instruments were in the normal operating range. He contacted air traffic control and requested to be vectored to the nearest airport, Elkin Municipal Airport. The airplane continued to vibrate violently, oil began to flow over the windshield, and forward vision was lost. The pilot decided to activate the Cirrus Airframe Parachute System (CAPS) at an altitude of 6,000 feet msl, and the airplane descended under the parachute into a cornfield.

The pilot, age 63, holds a commercial pilot certificate with ratings for airplane single-engine land and instrument airplane. His certificate was updated on March 30, 2007. The pilot's most recent Federal Aviation Administration (FAA) third-class medical certificate was issued on January 16, 2009, with limitations for lenses for near vision. The pilot reported 2,531 total flight hours, with 900 flight hours in the SR22.

The four seat, low-wing, fixed gear airplane, serial number (S/N) 0386, was manufactured in 2002. It was powered by a Continental IO-550-N7, 310 horsepower engine and equipped with a Hartzell three-bladed propeller. Review of the aircraft logbook revealed that the most recent annual inspection was conducted on October 30, 2008, at an airplane total time of 876.4 hours. The current Hobbs time indicated 928.9 hours.

Examination of the airplane by an FAA inspector revealed that the airplane descended through trees into a cornfield. The airframe and flight control system components revealed no evidence of preimpact mechanical malfunction. The examination of the engine revealed it had a 6-inch diameter hole at the top rear of the engine case, below the right magneto. The right magneto was broken away from its mount. Fragments of the No. 2 piston were located externally on the engine case. Examination of the oil quantity revealed that the engine still had 4 quarts of engine oil remaining in the sump.

The engine was removed by Precision Air Incorporated and sent to Teledyne Continental Motors to be examined under NTSB oversight. During the examination of the engine; fragments of the No. 2 piston, rings, and pin boss were found throughout the engine case and oiling system. All of these fragments were collected, and the remainder of the piston assembly was removed for further examination. The fragments, along with the No. 2 piston assembly were sent to the NTSB Materials Laboratory for examination.

The metallurgical examination revealed that the No. 2 piston failed due to a fatigue crack that originated adjacent to the pin in the pin boss area. The exact location of the fatigue crack and the cause of fatigue crack initiation could not be determined due to extensive damage in the area of origin. During the examination of the engine, no other valve train abnormalities were noted within the engine.

Pilot Information

Certificate:	Commercial	Age:	63, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	January 16, 2009
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	2531 hours (Total, all aircraft), 900 hours (Total, this make and model), 2500 hours (Pilot In Command, all aircraft), 50 hours (Last 90 days, all aircraft), 10 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	CIRRUS DESIGN CORP	Registration:	N34TG
Model/Series:	SR22	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	0386
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	October 30, 2008 Annual	Certified Max Gross Wt.:	3400 lbs
Time Since Last Inspection:	52 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	928 Hrs at time of accident	Engine Manufacturer:	CONT MOTOR
ELT:	C91 installed, not activated	Engine Model/Series:	IO-550 SERIES
Registered Owner:	OBI-1 AT PENSACOLA INC	Rated Power:	300 Horsepower
Operator:	OBI-1 AT PENSACOLA INC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Dusk
Observation Facility, Elevation:	UKF,1301 ft msl	Distance from Accident Site:	15 Nautical Miles
Observation Time:	20:21 Local	Direction from Accident Site:	360°
Lowest Cloud Condition:	Unknown	Visibility	7 miles
Lowest Ceiling:	Unknown	Visibility (RVR):	
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	10°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	23°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Manville, NJ (47N)	Type of Flight Plan Filed:	IFR
Destination:	Spartanburg, SC (SPA)	Type of Clearance:	IFR
Departure Time:	17:15 Local	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Minor
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	36.279998,-80.786109(est)

Administrative Information

Investigator In Charge (IIC):	Alleyne, Eric
Additional Participating Persons:	Wayne M Vohs; FAA/FSDO; Greensboro, NC Rodney Martinez; Teledyne Continental Motors; Mobile, AL Brad Miller; Cirrus Aircraft; Duluth, MN
Original Publish Date:	May 6, 2010
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=73988

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](#).