



# Aviation Investigation Final Report

<b>Location:</b>	Elkin, North Carolina	<b>Incident Number:</b>	ERA09IA331
<b>Date &amp; Time:</b>	June 8, 2009, 20:15 Local	<b>Registration:</b>	N34TG
<b>Aircraft:</b>	CIRRUS DESIGN CORP SR22	<b>Aircraft Damage:</b>	Minor
<b>Defining Event:</b>	Powerplant sys/comp malf/fail	<b>Injuries:</b>	1 None
<b>Flight Conducted Under:</b>	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

<b>Aircraft</b>	Recip eng cyl section - Malfunction
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## Factual Information

### History of Flight

<b>Enroute-cruise</b>	Powerplant sys/comp malf/fail (Defining event)
<b>Enroute-cruise</b>	Loss of engine power (total)
<b>Emergency descent</b>	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

<b>Certificate:</b>	Commercial	<b>Age:</b>	63, 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>	No
<b>Medical Certification:</b>	Class 3 With waivers/limitations	<b>Last FAA Medical Exam:</b>	January 16, 2009
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	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

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

## Meteorological Information and Flight Plan

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

## Wreckage and Impact Information

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

## Administrative Information

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

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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](#).