



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Eden Prairie, MN	<b>Accident Number:</b>	CEN10LA188
<b>Date &amp; Time:</b>	04/01/2010, 1440 CDT	<b>Registration:</b>	N20FP
<b>Aircraft:</b>	BEECH 95	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Powerplant sys/comp malf/fail	<b>Injuries:</b>	2 Serious
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

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## Analysis

The pilot stated that he had no recollection of the events leading up to the accident. The passenger reported that the airplanes' engines seemed to come up to full power during takeoff. The airplane lifted off about halfway down the runway; however, it didn't climb very well. The stall warning sounded just as the airplane was off the end of the runway, and the pilot's efforts to continue flight were unsuccessful. The right wing dropped, and the airplane descended and impacted the ground. A witness reported that the airplane's nose was pitched up 10 to 15 degrees and the wings appeared to be level, as it was flying in ground effect about 10 feet agl. He noted that the engines seemed to be running without any obvious problems. A postaccident examination revealed a lack of compression on the right engine No. 4 cylinder. Further investigation determined that the intake valve spring on the cylinder had fractured. Metallurgical examination noted that the fracture surfaces exhibited features indicative of fatigue progression initiated by corrosion pitting. Corrosion pits and red rust deposits were observed on many areas of the spring. The fatigue initiation also coincided with longitudinal tooling marks consistent with the original forming of the spring. Maintenance records indicated the right engine had been overhauled nearly 2 years prior to the accident. The cylinders were replaced with new non-original equipment manufacturer (OEM) assemblies at that time. The replacement cylinder assemblies were furnished with the valves and valve springs installed. According to the pilot, the right engine had accumulated 18 hours since overhaul.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The fatigue failure of an intake valve spring on the right engine, which resulted in a partial loss of engine power on takeoff.

## Findings

Aircraft	Recip eng cyl section - Failure (Cause) Altitude - Attain/maintain not possible
Personnel issues	Aircraft control - Pilot

## Factual Information

On April 1, 2010, about 1440 central daylight time, a Beech model 95, N20FP, impacted a flooded ravine about 2 miles south of Flying Cloud Airport (FCM), near Eden Prairie, Minnesota. The flight had departed from Runway 18 (2,691 feet by 75 feet, asphalt) at FCM. The pilot and passenger both sustained serious injuries. The airplane was registered to Fisher Air LLC, and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91, as a repositioning flight after avionics maintenance. Visual meteorological conditions prevailed for the flight, which was not operating on a flight plan. The flight was originating at the time of the accident.

The pilot reported that the purpose of the flight was to reposition the airplane from FCM to New Richmond Regional Airport (RNH), New Richmond, Wisconsin, after avionics work has been completed. He stated that he had no recollection of the events leading up to the accident.

The passenger stated that the engines seemed to come up to full power during takeoff. The airplane lifted off about halfway down the runway; however, it didn't climb very well. The stall warning sounded just off the end of the runway about 50 feet above ground level (agl). The pilot appeared to check the gear position and auxiliary fuel pump in an attempt to troubleshoot the problem. The pilot reduced the pitch attitude in an attempt to increase airspeed, but the airplane was unable to maintain altitude. The right wing dropped, and the airplane descended from an altitude of about 300 feet agl. It came to rest in a flooded area at the bottom of the hill off the end of the runway.

A witness reported that the accident airplane's nose was pitched up about 10 to 15 degrees. The wings appeared to be level and it was flying in ground effect about 10 feet agl. He noted that the engines seemed to be running, and he did not recall hearing any sputtering or seeing any smoke. A hill dropped off past the end of the runway. The airplane came to rest upright about 30 yards out into a flooded area. The wings were facing north and the fuselage was canted about 30 degrees relative to the wings. The nose section was separated from the remainder of the fuselage and the windshield was broken out. There did appear to be fuel present at the accident site.

Examination of the right engine revealed a lack of compression on the #4 cylinder. Further investigation determined that the #4 cylinder intake valve spring was fractured into 5 pieces. Metallurgical examination noted that some of the spring fracture surfaces had been damaged due to mechanical contact. However, the undamaged fracture surfaces exhibited features indicative of fatigue progression. Fatigue initiation was located at corrosion pits on the surface of the spring. Similar corrosion pits and red rust deposits were observed on many areas of the spring. The fatigue initiation also coincided with longitudinal tooling marks consistent with the original forming of the spring.

The accident airplane was a 1958 Beech model 95 (s/n TD-14). The airplane was powered by 2 Lycoming O-360-A1A engines, each capable of developing 180 horsepower. According to the maintenance logs, an annual inspection was completed on October 15, 2009, at 7,078.1 hours total airframe time. The left engine (s/n L515-36) was overhauled in July 1990. The right engine (s/n L2076-36) was overhauled in June 2008. The logs indicated that at the time of the annual inspection, the left and right engines had accumulated 1,837.0 hours and 2.1 hours since overhaul, respectively. On the NTSB accident report, the pilot noted that the left and right engines had accumulated 1,940 hours and 18 hours since overhaul, respectively.

A flight log, entitled "Fisher Air – N20FP," was provided to the NTSB with the aircraft documentation. The log included flight times dated January 7, 2010, through April 1, 2010; the date of the accident. The flight time noted in that log totaled 14.1 hours.

## History of Flight

<b>Initial climb</b>	Powerplant sys/comp malf/fail (Defining event) Loss of engine power (partial) Aerodynamic stall/spin Loss of control in flight
<b>Uncontrolled descent</b>	Collision with terr/obj (non-CFIT)

## Pilot Information

<b>Certificate:</b>	Airline Transport	<b>Age:</b>	56, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land; Single-engine Sea	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 Without Waivers/Limitations	<b>Last Medical Exam:</b>	01/25/2010
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	01/11/2010
<b>Flight Time:</b>	11320 hours (Total, all aircraft), 55 hours (Total, this make and model), 11220 hours (Pilot In Command, all aircraft), 60 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

Aircraft Manufacturer:	BEECH	Registration:	N20FP
Model/Series:	95	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	TD-14
Landing Gear Type:	Retractable - Tricycle	Seats:	5
Date/Type of Last Inspection:	10/05/2009, Annual	Certified Max Gross Wt.:	4000 lbs
Time Since Last Inspection:		Engines:	2 Reciprocating
Airframe Total Time:	7078 Hours	Engine Manufacturer:	LYCOMING
ELT:	Installed, not activated	Engine Model/Series:	O&VO-360 SER
Registered Owner:	Fischer Air LLC	Rated Power:	180 hp
Operator:	Fischer Air LLC	Air Carrier Operating Certificate:	None

## Meteorological Information and Flight Plan

Observation Facility, Elevation:	FCM, 906 ft msl	Observation Time:	1453 CDT
Distance from Accident Site:	2 Nautical Miles	Condition of Light:	Day
Direction from Accident Site:	360°	Conditions at Accident Site:	Visual Conditions
Lowest Cloud Condition:	Clear	Temperature/Dew Point:	26°C / 11°C
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:	11 knots, 150°	Visibility (RVR):	
Altimeter Setting:	29.45 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Minneapolis, MN (FCM)	Type of Flight Plan Filed:	None
Destination:	New Richmond, MN (RNH)	Type of Clearance:	None
Departure Time:	1438 CDT	Type of Airspace:	

## Airport Information

Airport:	Flying Cloud Airport (FCM)	Runway Surface Type:	Asphalt
Airport Elevation:	906 ft	Runway Surface Condition:	Dry
Runway Used:	18	IFR Approach:	None
Runway Length/Width:	2691 ft / 75 ft	VFR Approach/Landing:	None

## Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:	1 Serious	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Serious		

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Timothy Sorensen	<b>Adopted Date:</b>	06/20/2011
<b>Additional Participating Persons:</b>	Thomas A Hodnefield; FAA-Minneapolis FSDO; Minneapolis, MN		
<b>Publish Date:</b>	06/20/2011		
<b>Investigation Docket:</b>	<a href="http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=75643">http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=75643</a>		

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