



National Transportation Safety Board Aviation Accident Final Report

Location:	LITTLE FALLS, MN	Accident Number:	CHI98FA187
Date & Time:	06/01/1998, 1831 CDT	Registration:	N541N
Aircraft:	Cessna 421	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General Aviation -		

Analysis

A witness reported the airplane did not climb above 200 feet and reported seeing the airplane 'wobbling up and down' as it attempted to climb. He reported the airplane went into a sharp left bank and nose dived down. The airplane burned upon impact. The wreckage was located in a wooded area about 3/4 mile from the approach end of runway 30. Numerous open farm fields were located near the airplane's flight path. The winds were reported at 240 degrees at 22 knots gusting to 29 knots. The wreckage path was on a 040 heading and covered about 190 feet from initial tree impact to the location of the main wreckage. The engine inspection did not reveal any anomalies to either engine. The flight was the first maintenance check flight after the airplane had not been flown for 14 months. During maintenance the pilot had put about 100 gallons of water in the left main and left auxiliary fuel tanks to locate a fuel leak. A plug was installed in the left auxiliary fuel drain valve and the fuel tank could not be checked during preflight for fuel contamination without removing the plug.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's continued operation with a known deficiency in equipment.

Findings

Occurrence #1: LOSS OF ENGINE POWER

Phase of Operation: TAKEOFF

Findings

1. MAINTENANCE - IMPROPER - OWNER/PILOT MECHANIC
2. FUEL SYSTEM - CONTAMINATION, WATER
3. (C) OPERATION WITH KNOWN DEFICIENCIES IN EQUIPMENT - CONTINUED - OWNER/PILOT MECHANIC

Occurrence #2: FORCED LANDING

Phase of Operation: DESCENT - UNCONTROLLED

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Findings

4. TERRAIN CONDITION - GROUND

Factual Information

History of Flight

On June 1, 1998, at 1831 central daylight time, a Cessna 421, N541N, was destroyed after takeoff when it impacted the ground about 1/2 mile from the airport. The airplane had difficulty climbing to about 200 feet above ground level. It made a sharp left bank and nosed down into trees and impacted the ground. The airplane was engulfed in flames after impact. The commercial pilot was fatally injured. The 14 CFR Part 91 flight departed Little Falls-Morrison County Airport, Little Falls, Minnesota, on a local maintenance flight. Visual meteorological conditions prevailed and no flight plan had been filed.

No one witnessed the airplane departing runway 30, but a witness reported he was about 1/2 mile from the departure end of runway 30 when he saw an airplane flying above the tree line, about 100 feet above ground level (agl). He then saw the smoke from the airplane accident a "couple of minutes" later.

A witness reported he observed the airplane while he was doing field work about 1/2 mile east of the airport. He reported the airplane was flying to the east and that it never climbed more than 200 feet agl, "not a 100 feet above the trees." He reported the airplane tried to gain 20 feet in altitude, but then would lose it. He reported the airplane's flight path was "... wobbling up and down." He reported he could see the whole top of the airplane as it went into a sharp left bank and nose dived down. He reported seeing black smoke and flames immediately upon impact. He did not hear the engines or the explosion since he was riding on a tractor.

The airplane impacted the ground in a wooded area approximately 3/4 mile east of the approach end of runway 30. Rescue personnel found the pilot's body about 15 feet to the left of the main wreckage.

Personnel Information

The pilot was a commercially rated pilot with single and multi-engine land ratings. He held a second class medical certificate. He had a total of about 6,000 hours of flight time. 4,000 hours were in multi-engine airplanes with approximately 1,500 hours in the accident airplane. The pilot received a type rating in a North American Sabreliner, N-265, seven months prior to the accident. The pilot's logbook was not obtained.

Witnesses reported the pilot owned five airplanes and was an active pilot who flew frequently. A witness reported the pilot flew his twin engine Piper Aztec on Sunday afternoon, May 31, 1998.

The pilot held Airframe and Powerplant mechanic (A&P) licenses. He also held a maintenance Inspection Authorization license.

Witnesses reported the pilot had performed maintenance on the airplanes he owned to include engine overhauls, painting aircraft and control surfaces, and refurbishing aircraft interiors.

Aircraft Information

The airplane was a twin engine Cessna 421, serial number 4210161. The airplane seated seven and had a maximum gross weight of 6,840 pounds. The engines were 375 horsepower Continental GTSIO-520-D engines. The aircraft logbooks were not obtained and were reportedly kept in the airplane. The date of the last annual inspection was unknown.

Witnesses reported the airplane had not flown for approximately 14 months. They reported that the pilot had inspected the right engine and had determined that an alternator gear tooth was chipped and needed repair. The witnesses reported the pilot repaired the engine himself. The witnesses reported that the pilot also repainted the aircraft and refurbished the interior of the airplane during the 14 months the airplane did not fly.

Witnesses reported the pilot had performed a ground engine run on both engines after the right engine had been repaired and reinstalled on the airplane. A fuel leak to the left auxiliary fuel tank, a bladder type fuel tank, was discovered. Witnesses reported the pilot used water as a means of determining where the bladder tank was leaking fuel. The witnesses estimated that between 50 to 100 gallons of water were put into the left main and left auxiliary fuel tanks.

A witness reported the fuel leak was fixed but he was uncertain how it was accomplished. He reported the pilot intended to install a new fuel drain valve in the left auxiliary fuel tank, but since he had the wrong one, he put a plug in it instead. The witness reported that there was no way to sump the left auxiliary tank for water.

A witness reported the pilot painted the exterior of the airplane. He reported that the control surfaces were not removed from the airplane when they were painted.

A witness reported the pilot accomplished about 90% of the work done on the interior when it was refurbished. He reported all the seats and seatbelts were installed. He reported that all of the interior work, except for installing a couple screws, was completed by noon on Sunday, May 31, 1998.

The witness reported the pilot attempted to start both engines on May 31, 1998, but neither would start. The witness reported the pilot charged the airplane's battery after the engines did not start.

The witness reported that he fueled the airplane with 100 to 104 gallons of fuel on Sunday night, May 31, 1998. He reported the tanks were "bone dry" and that he put in 25 gallons of fuel in each fuel tank.

The witness reported the pilot had called him at about 1730 on Monday, June 1, 1998, to ask him to go fly on the maintenance check flight. The witness was reported he was unable to fly because of a schedule conflict, but the pilot intended to fly the airplane on Monday evening.

Meteorological Conditions

At 1753, weather conditions reported at Brainerd, Minnesota, located about 30 miles north of Little Falls, Minnesota, were VFR. The sky was clear with ten miles visibility. The temperature was 70 degrees Fahrenheit. The winds were 240 degrees at 22 knots gusting to 29 knots.

Wreckage and Impact Information

The airplane impacted the trees on a 040 heading before coming to rest about 190 feet from the initial tree impact. The front of the airplane was heading approximately 220 degrees. An area approximately 100 feet long and 40 feet wide from 90 feet along the wreckage path to the main wreckage had been burned. The trees and other foliage had been burned or received fire damage.

Impact marks on trees indicated the airplane first hit trees at about 40 to 50 feet high. Numerous branches with propeller slashes and paint transfer were found about 45 feet after the initial tree impact. Two trees that were 12 feet apart and located about 90 feet from the

initial impact had impact marks. The right tree had an impact mark at about 34 feet high, and the left tree had an impact mark at about 22 feet high.

The left wing tip tank was found between the two trees about 90 feet along the wreckage path. The left propeller and spinner had separated from the engine and were found about 125 feet along the wreckage path. Three ground impact craters which measured 6 to 10 feet long and 3 to 7 feet wide were located in line from about 130 feet to 160 feet along the wreckage path. A five foot section of the left outboard wing was found between the first and second impact craters and offset to the right of the wreckage path centerline. Numerous plexiglass pieces were found in and to the left of the second impact crater. The right engine's oil dipstick was found in the third impact crater. A blade tip from the right propeller was found northeast of the third impact crater.

The main wreckage came to rest approximately 30 feet beyond the third impact crater. The wreckage was partially inverted and folded over. The right wing and right engine were located in front and to the left of the main wreckage along the wreckage path. The right wing section inboard of the engine was destroyed by fire. The left wing section inboard of the engine was destroyed by fire, but components from the left inboard wing section were found in the ash and debris just aft of the right engine and wing. The airplane's cockpit and cabin were destroyed by fire and were burned down to a height of less than three feet. The unburned portion of the empennage and tailcone was approximately seven feet long.

The horizontal stabilizer and elevator received fire damage and were found about 20 feet left and 10 feet aft of the main wreckage. A part of the pilot's instrument panel was found near the horizontal stabilizer. The right engine and the upper half of the rudder were found approximately 225 feet along the wreckage path.

Complete control cable continuity could not be determined due to impact and fire damage. Control cable continuity was established for the elevator, rudder, and their respective trim tabs to the cockpit. No continuity to the ailerons or flaps was established due to extensive fire damage.

Rudder cable continuity was established forward to the left torque tube. The right hand rudder turnbuckle located in the tailcone was found not safety-wired. The rudder trim tab actuating rod was extended 1.7 inches which equated to a 10 degree tab left position. The rudder stops were examined and no anomalies were observed.

The elevator remained attached to the horizontal stabilizer. The left elevator counterweight remained attached to the elevator, but the right elevator counterweight had torn away from the elevator and was not recovered. The elevator cable continuity was established from the bellcrank forward into the cockpit where the ends were found in melted metal. The elevator trim tab actuating rod had an extension of 1.8 inches which equated to an about 10 degrees tab up setting. The elevator stops were examined and no anomalies were observed.

Examination of the horizontal stabilizer and elevator showed the paint on the exterior surface of the aircraft had been applied over the prior existing paint surface. The paint surfaces along the hinge line between the horizontal stabilizer and elevator did not have the newer coat of paint on them.

Medical and Pathological Information

An autopsy was performed on the pilot at Ramsey County Medical Examiner's Office.

A Forensic Toxicology Fatal Accident Report was prepared by the FAA Civil Aeromedical Institute. The report concerning the pilot indicated the following results:

Carbon Monoxide: Not performed due to lack of a suitable specimen.

Cyanide: Not performed due to lack of a suitable specimen.

No ethanol detected in brain fluid.

13 (mg/dL, mg/hg) Ethanol detected in kidney fluid.

5 (mg/dL, mg/hg) acetaldehyde detected in kidney fluid.

The ethanol found in this case was from postmortem ethanol.

No drugs detected in liver fluid.

Tests and Research

The left and right Continental GTSIO-520-D engines were examined at Teledyne Continental Motors. The examination revealed that both engines exhibited normal operational characteristics and no anomalies were found. (See Teledyne Continental Motors Report)

The two Allied Signal Model TH0867 turbochargers from the right and left engines were examined by Allied Signal Aerospace. The left turbocharger did not exhibit rotational scoring on the compressor and turbine components, and the compressor and turbine wheel blades did not exhibit bending in the opposite direction of rotation. No pre-impact conditions were identified which would have interfered with normal operation of the left turbocharger or wastegate.

The right turbocharger exhibited rotational scoring of the turbine and compressor components, and a rotational deposit of an unknown material was found on the compressor impeller shroud. No pre-impact conditions were identified which would have interfered with normal operation of the right turbocharger or wastegate. (See Allied Signal Teardown Report)

The left and right propellers were examined at McCauley Propeller Systems. Neither propeller exhibited indications of fatigue failure. The feather stop mechanisms of each propeller were undamaged. Counterweight impact marks found on the hub sockets showed the propellers were operating near low pitch. The left propeller sustained blade bending, chordwise scratching, leading edge damage and blade tip curl. The right propeller exhibited chordwise scratching and leading edge damage. (See McCauley Propeller Teardown Report)

Additional Information

Parties to the investigation included the Federal Aviation Administration, Cessna Aircraft Company, Teledyne Continental Motors, Allied Signal, and McCauley Propellers.

The wreckage was released to the family of the pilot.

Pilot Information

Certificate:	Commercial	Age:	62, Male
Airplane Rating(s):	Multi-engine Land; 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:	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	06/19/1997
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	6000 hours (Total, all aircraft), 1500 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N541N
Model/Series:	421 421	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	4210161
Landing Gear Type:	Retractable - Tricycle	Seats:	7
Date/Type of Last Inspection:	Annual	Certified Max Gross Wt.:	6840 lbs
Time Since Last Inspection:		Engines:	2 Reciprocating
Airframe Total Time:		Engine Manufacturer:	Continental
ELT:	Installed, not activated	Engine Model/Series:	GTSIO-520-D
Registered Owner:	GEORGE FORTIER III	Rated Power:	375 hp
Operator:	GEORGE FORTIER III	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	BRD, 1226 ft msl	Distance from Accident Site:	30 Nautical Miles
Observation Time:	1753 CDT	Direction from Accident Site:	10°
Lowest Cloud Condition:	Clear / 0 ft agl	Visibility	10 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	22 knots / 29 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	240°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	21° C / 11° C
Precipitation and Obscuration:			
Departure Point:	(LXL)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:	1829 CDT	Type of Airspace:	Class E

Airport Information

Airport:	LITTLE FALLS-MORRISON (LXL)	Runway Surface Type:	
Airport Elevation:	1122 ft	Runway Surface Condition:	
Runway Used:	0	IFR Approach:	
Runway Length/Width:		VFR Approach/Landing:	

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):	JIM SILLIMAN	Report Date:	03/31/2000
Additional Participating Persons:	JEFF GORMAN; MINNEAPOLIS, MN ROBERT AUGUST; WICHITA, KS BILL PACKWOOD; MOBILE, AL DAVE LOOPER; PHOENIX, AZ		
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/ .		

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](#).