



# National Transportation Safety Board

## Aviation Accident Final Report

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<b>Location:</b>	GREAT BEND, ND	<b>Accident Number:</b>	CHI95FA124
<b>Date &amp; Time:</b>	04/12/1995, 0843 CDT	<b>Registration:</b>	N7057J
<b>Aircraft:</b>	BEECH 65-B80	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	1 Fatal
<b>Flight Conducted Under:</b>		Part 135: Air Taxi & Commuter - Non-scheduled	

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## Analysis

The airplane was cruising at 6,000 feet where it encountered icing conditions. When cleared to 3,600 feet, the pilot reported that one engine lost all power and the other one was running rough. The airplane continued the descent. After about ten minutes the airplane departed controlled flight, reversing heading and impacting near vertically in the terrain. A post accident examination of the left engine (which was feathered) found an induction duct which had deteriorated and begun to come apart. Foreign object material in the compressor assembly similar in appearance to material from the duct was found. The number five piston had a hole burned through it.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot/mechanic's inadequate maintenance (inspection) of aircraft and the pilot's failure to maintain airspeed (VMC). Factors were icing conditions, deteriorated induction air ducting, and failure of a piston assembly.

## **Findings**

Occurrence #1: LOSS OF ENGINE POWER

Phase of Operation: CRUISE

### **Findings**

1. (F) WEATHER CONDITION - ICING CONDITIONS
  2. (F) INDUCTION AIR DUCTING - DETERIORATED
  3. (C) MAINTENANCE, INSPECTION - INADEQUATE - OWNER/PILOT MECHANIC
  4. COMPRESSOR ASSEMBLY, IMPELLER - FOREIGN MATERIAL/SUBSTANCE
  5. (F) ENGINE ASSEMBLY, PISTON - FAILURE
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Occurrence #2: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: EMERGENCY DESCENT/LANDING

### **Findings**

6. (C) AIRSPEED(VMC) - NOT MAINTAINED - PILOT IN COMMAND
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Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

## Factual Information

### HISTORY OF FLIGHT

On April 12, 1995, at 0843 central daylight time a Beech 65-B80, N7057J, operated by Air Cargo Masters, Inc., of Brandon, South Dakota, and piloted by an airline transport rated pilot, departed controlled flight and impacted trees and terrain, approximately seven miles southwest of the Harry Stern Airport, Wahpeton, North Dakota. The airplane was destroyed and the pilot sustained fatal injuries. The 14 CFR Part 135 flight was operating on an IFR flight plan. Weather in the vicinity of the accident was reported as IMC. The flight departed Sioux Falls, South Dakota, about 0815, as an on-demand cargo flight with the intended destination of Fargo, North Dakota.

At 0626 the pilot of N7057J, called the Federal Aviation Administration (FAA), Huron Flight Service Station (FSS). During the conversation with the FAA briefer the pilot received current and forecast weather, pilot reports, winds aloft and filed an IFR flight plan from Sioux Falls, South Dakota, to Fargo, North Dakota. A transcription of the conversation between the pilot and the FSS briefer is attached to this report. Included in the weather briefing were current and forecast reports containing icing conditions.

En route to Fargo, North Dakota, cruising at 6,000 feet, the pilot of N7057J was in radio communication with the FAA Minneapolis Air Route Traffic Control Center (ARTCC). A transcribed copy of these radio communications are attached to this report. At 0810, the pilot of N7057J reported, "Yeaaa we're picking up some ice here. Any chance of four?" The flight was cleared to descend to 5,000 feet. Again at 0821, the pilot requested, "Any chance of getting four?" But was denied clearance, wherein, the ARTCC controller asked about icing. To this the pilot responded, "Yeah we've got ice for sure." One minute later the flight was cleared to descend to 4,000 feet. At 0831, the ARTCC controller inquired of the flight, "... are you out of the icing?" To which the pilot responded, "Nah, we're still in icing up here ..." Following this there was some discussion about the flight diverting to Wahpeton, North Dakota, and the airplane's ability to climb above the icing. At 0833, the flight was cleared to descend to 3,600 feet. Three seconds after this clearance, the pilot stated, "This is, ah we're, we just lost one of um... ." After this radio communication, continued uninterrupted radio communications between the ARTCC and N7057J, were not possible. The ARTCC controller began to relay messages through N150BC, and later through Mesaba Airlines Flight 3249. Information was relayed to the pilot and back to the controller as the flight continued to lose altitude. At 0838, a message was relayed to the ARTCC controller that, "... he's at two thousand and ah still in the clouds, but the ice is coming off good." The last radio communication between Mesaba Airlines Flight 3249 and the pilot of N7057J occurred at 0842. At 0843, another relay was attempted, but the pilot did not respond. At 0846, FAA and flights confirmed they were receiving Emergency Locator Transmitter (ELT)signals on frequency 121.5 mhz.

There were no eyewitnesses to the accident. Shortly after the ELT signals were verified, a call was made to an operator at the Harry Stern Airport, Wahpeton, North Dakota. He was able to get airborne, and receive the signal; however later stated that he was unable to locate the accident airplane due to low clouds and encountering instrument meteorological conditions. After approximately one hour, he was able to return to the area of high signal strength of the ELT and locate the wreckage.

### OTHER DAMAGE

Trees and foliage were damaged during the descent of the airplane.

#### PERSONAL INFORMATION

The pilot, age 46, was the holder of an airline transport rating. He had accumulated 6,100 hours flight time with 250 hours in the make and model of the accident airplane. He held a second class medical certificate issued May 16, 1994. His most recent biennial flight review was five months prior to the accident.

#### AIRCRAFT INFORMATION

The airplane was a Beech 65-B80, serial number LD-291, N7057J. The airplane had a total time in service of 6,887 hours at the time of the accident. The most recent 100 hour inspection was on December 29, 1994. The airplane had accumulated 81 hours since the inspection.

#### METEOROLOGICAL INFORMATION

Residents and a pilot who was looking for the accident airplane said that instrument meteorological conditions existed in the vicinity of the accident site at the time of the accident. They stated that the weather was characterized by low ceilings, below 1,000 feet.

#### COMMUNICATIONS

A transcript of portions of radio communications between the pilot and FAA facilities is attached to this report. This transcript also includes telephone conversation prior to the accident flight between the pilot and FAA FSS.

En route the accident airplane descended below an altitude where the FAA facilities were able to maintain uninterrupted radio communication. During this period radio transmissions were relayed by two other airplanes, N150BC, and Mesaba Airlines Flight 3249.

#### WRECKAGE AND IMPACT INFORMATION

The airplane wreckage was located in an area of small timber growth. The direction of travel was on a heading of 280 degrees. There were broken branches from tree tops for 70 feet beginning at the initial impact with trees about 50 feet in height and leading up to the main wreckage. Trees within 20 feet of the wreckage were broken to the ground.

The airplane was found in a near vertical attitude, nose down with the final heading to the southeast. The landing gear and flaps were in the retracted position.

The left wing sustained tree impact damage that separated a portion of the wing and tip. The outboard section was located 45 feet from the main wreckage. The inboard section remained attached to the wing center section. The inboard wing exhibited tree impact damage of the leading edge that started at the separation point and continued inboard about four feet. The outboard edge of the outboard flap was bent upward and exhibited a tree impact mark. The wing bowed upward at the outboard edge.

The right wing sustained tree impact damage that separated the outboard wing in two sections. The outboard section was located 20 feet from the main wreckage. The inboard section remained attached to the center section. The inboard wing exhibited tree impact damage to the leading edge that started at the separation point and continued inboard about six feet. The wing was twisted with the leading edge curling upward and aft.

The fuselage sustained ground impact damage with the nose section crushed rearward and to

the left. The fuselage and center section were fractured at the aft spar. The sides of the fuselage were bent and wrinkled.

The empennage remained attached to the fuselage; however, the tail cone was bent to the right of the centerline of the airplane, aft of the rear cabin entry door. The left horizontal stabilizer, left elevator, vertical stabilizer, and rudder sustained minor damage during impact. One-third of the right horizontal stabilizer and right elevator separated during impact.

The outboard section of the right elevator separated into two sections. Both the right horizontal stabilizer and right elevator sections were located under the empennage section.

Control continuity was established in that all terminal ends of controls were intact and in their proper locations.

The right engine remained partially attached to its mount although it had moved aft into the firewall and nacelle. The gear box and propeller separated from the engine and were located six feet southeast of the engine, partially impacted in the ground. Upon removal from the ground, the right propeller exhibited polishing of the cambered side with leading edge impact marks. All three blades were bent aft and had spanwise twisting. The spinner was collapsed around the propeller hub exhibiting twist in the direction opposite rotation. Tree limbs were found the impact path to four inches in diameter indicating cut marks consistent with propeller strikes and exhibiting black paint transfers similar to that on the propeller face.

The left engine remained attached to the mounts and firewall in the nacelle area. The propeller remained attached to the engine and was feathered. The cowling was intact around the engine. Upon removing the top cowling, the right magneto was found separated from its mount, but remained attached by way of the ignition harness.

After the cargo was removed from the wreckage it was weighed. The actual weight of the cargo was compared to the weight and balance on the manifest for the flight, and was 60 pounds greater than shown on the manifest.

#### MEDICAL AND PATHOLOGICAL INFORMATION

A post mortem examination of the pilot was conducted at St. Francis Medical Center, Breckenridge, Minnesota, on April 12, 1995. No pre-existent anomalies were noted during this examination which contributed to the accident or the pilot's death.

Specimens were collected for toxicology testing from the pilot. These tests were negative for those drugs screened.

#### TESTS AND RESEARCH

On May 23, 1995, both the left and right engines were further examined. During that examination, the left engine was disassembled for further inspection. The oil pump filter, and oil pressure relief valve were found to contain aluminum chips.

The connecting hose between the air filter and the intake air sump was deteriorated and pieces of the material were missing. When the diffuser cover to supercharger was removed the vanes on the compressor wheel exhibited a texture as though they had been sandblasted. Little bits of rubber and fiberglass from intake hoses were found on the diffuser vanes.

The engine rotated freely and there was continuity throughout.

A compression check indicated no compression on cylinder #5. On disassembly a hole was

found in the piston head which ran down through the ring groove area and through the piston skirt. The top piston ring was absent. The next ring was missing 3" of the ring. The oil control ring was separated where a hole was burned through it.

The #1 cylinder was found to have the top ring broken with the ring land worn to double its normal size.

The timing of the left magneto to the engine was established prior to removal. Both magnetos sparked when tested on a test bench.

The right engine was inspected for continuity, compression, and the oil pump filter for contamination. No abnormalities were noted. Both magnetos sparked.

#### ADDITIONAL DATA/INFORMATION

Parties to the investigation were the Federal Aviation Administration, Flight Standards District Office, Fargo, North Dakota; Lycoming, Williamsport, Pennsylvania; and Beech Aircraft, Wichita, Kansas.

The airplane wreckage was released to a representative of the owner on March 11, 1996.

#### Pilot Information

Certificate:	Airline Transport	Age:	46, Male
Airplane Rating(s):	Multi-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	05/16/1994
Occupational Pilot:	Last Flight Review or Equivalent:		
Flight Time:	6100 hours (Total, all aircraft), 250 hours (Total, this make and model), 5700 hours (Pilot In Command, all aircraft)		

## Aircraft and Owner/Operator Information

Aircraft Make:	BEECH	Registration:	N7057J
Model/Series:	65-B80 65-B80	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	LD-291
Landing Gear Type:	Retractable - Tricycle	Seats:	2
Date/Type of Last Inspection:	12/29/1994, 100 Hour	Certified Max Gross Wt.:	8800 lbs
Time Since Last Inspection:	81 Hours	Engines:	2 Reciprocating
Airframe Total Time:	6887 Hours	Engine Manufacturer:	LYCOMING
ELT:	Installed, activated, aided in locating accident	Engine Model/Series:	IGSO-540-A1D
Registered Owner:	HUNT, WESLEY	Rated Power:	380 hp
Operator:	AIR CARGO MASTERS, INC.	Operating Certificate(s) Held:	On-demand Air Taxi (135)
Operator Does Business As:	AIR CARGO MASTERS	Operator Designator Code:	A7MA

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Day
Observation Facility, Elevation:	BWP, 967 ft msl	Distance from Accident Site:	7 Nautical Miles
Observation Time:	0958 CDT	Direction from Accident Site:	20°
Lowest Cloud Condition:	Partial Obscuration / 800 ft agl	Visibility	0 Miles
Lowest Ceiling:	Unknown / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	17 knots / 20 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	330°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	0°C / 0°C
Precipitation and Obscuration:			
Departure Point:	SIOUX FALLS, SD (FSD)	Type of Flight Plan Filed:	IFR
Destination:	FARGO, ND (FAR)	Type of Clearance:	IFR
Departure Time:	0800 CDT	Type of Airspace:	Class G

## Wreckage and Impact Information

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

## Administrative Information

Investigator In Charge (IIC):	STEPHEN A WILSON	Report Date:	04/18/1996		
Additional Participating Persons:	JOE SOUSA; FARGO, ND JOHN G VOLD; FARGO, ND GREGORY ERIKSON; WILLIAMSPORT, PA JAMES E STERMER; WICHITA, KS				
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 <a href="mailto:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.ntsb.gov/pubdms/">http://dms.ntsb.gov/pubdms/</a> .				

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