
 National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: NYC03FA082		Aircraft Registration Number: N8985J	
		Occurrence Date: 04/12/2003		Most Critical Injury: Fatal	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place Conesus		State NY	Zip Code 14435	Local Time 1600	Time Zone EDT
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility:			
Aircraft Information Summary					
Aircraft Manufacturer Piper		Model/Series PA-28-180		Type of Aircraft Airplane	
Revenue Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:					
HISTORY OF FLIGHT					
<p>On April 12, 2003, about 1600 eastern daylight time, a Piper PA-28-180, N8985J, was destroyed when it impacted trees near Conesus, New York. The certificated flight instructor, private pilot receiving instruction, and passenger were fatally injured. Visual meteorological conditions prevailed for the instructional flight that departed the Dansville Municipal Airport (DSV), Dansville New York, about 1515. A flight plan was not filed, and the flight was conducted under 14 CFR Part 91.</p> <p>According to a witness, the airplane was operated by a local flying club, and the pilot was being evaluated by the instructor in order to be authorized to utilize the airplane. Two of the maneuvers planned for the flight were "power on" and "power off" stalls. In addition, the passenger had completed a similar evaluation earlier in the afternoon with a different instructor, and had gone on the accident flight for additional familiarization.</p> <p>According to a witness that was outside and within 1/2 mile of the accident site, the engine noise increased, and the airplane pitched up to the point that the witness thought the pilot was attempting a loop. The pitch up stopped, and the left wing dropped. The airplane rolled inverted and completed five "spirals," before impacting the ground. The witness added that he heard the engine "completely stop" about the third "spiral."</p> <p>A review of radar data revealed a target near the accident site about the time of the accident. The target was maintaining a constant altitude of 3,400 feet msl, a constant groundspeed of 100 knots, and heading 170 degrees magnetic before starting to slow and descend. The first target deviation was a return at 3,300 feet msl, and 80 knots, with no heading data. The second was at 2,600 feet msl, and the third was at 1,800 feet msl. The time between returns was approximately 5 seconds, and no ground speed or heading data was recorded for the last two returns.</p> <p>The accident occurred during the hours of daylight. The wreckage was located at 42 degrees, 40.871 minutes north latitude, 77 degrees, 36.945 minutes west longitude, and an elevation of approximately 1,875 feet msl.</p>					
PILOT INFORMATION					
Flight Instructor					
<p>The instructor held a Federal Aviation Administration (FAA) commercial pilot certificate with ratings for airplane single-engine-land, multi-engine-land, and instrument airplane. He also held flight instructor certificate with ratings for airplane single-engine-land, multi-engine-land, and instrument airplane. On his last FAA first-class medical certificate, dated July 18, 2002, he</p>					
FACTUAL REPORT - AVIATION					

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Narrative (Continued)

reported a total flight experience of 815 hours.

A review of the instructor's logbook revealed the last entry was on March 29, 2003, and listed a total flight experience of 1,097 hours. He had 45.8 hours in make and model. The pilot logged 30.7 hours in the previous 30 days from the last entry, and 89.1 hours in the previous 90 days. He conducted 1 hour of spin recovery training in a Cessna 152 on June 4, 2000, and 1 hour on September 13, 2000. His last flight review was completed on February 20, 2002, when he completed a multi-engine land instructor flight evaluation in a Piper PA-34.

Pilot Receiving Instruction

The pilot held a private pilot certificate with an airplane single-engine-land rating. On his last FAA second-class medical certificate, dated January 25, 2002, he reported a total flight experience of 100 hours. According to the pilot's logbook, he had a total flight experience of 146 hours as of February 15, 2003.

AIRCRAFT INFORMATION

The airplane was manufactured in 1966. It was equipped with a 180-horsepower Lycoming IO-360-A3A engine, and a fixed pitch propeller. According to maintenance records, since the last annual inspection, which was completed on March 28, 2003, the airplane flew 15.06 hours, and in the 8 years proceeding the accident, the airplane flew a total of 30.82 hours.

METEOROLOGICAL INFORMATION


A weather observation was taken about 6 minutes before the accident at the Dansville Airport. The airport had a field elevation of 662 feet msl, and was located 10 miles to the south of the accident site. The observation recorded the wind as 330 degrees at 15 knots gusting to 20 knots, visibility 10 miles, sky clear, temperature 54 degrees Fahrenheit, dew point 34 degrees Fahrenheit, and an altimeter setting of 29.83 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The debris path was located in a wooded area. It was approximately 110 feet long, and orientated on a magnetic heading of 191 degrees. The start of the debris path was marked by freshly broken tree branches at the top of several trees that were approximately 55 feet in height. The down angle from the start of the debris path to the main wreckage was approximately 30 degrees. Within the debris path, all the major structural components for the airplane were identified, along with all the flight control surfaces. All the fracture surfaces for both wings and tail section were gray in color and consistent with overload. Also in the debris path was a section of wood that was approximately 6 inches in diameter, and displayed a cut mark along its vertical axis that was approximately 1-foot long, 4 inches wide, and 1 inch deep. About 3 inches from the top of the cut was red transfer paint consistent in color and width with a red stripe painted on the tip of both propeller blades.

The main wreckage was comprised of the engine, cockpit, cabin, and empennage. The engine and forward section of the cockpit came to rest upside down, and the cabin, along with the empennage, came to rest upright. The carry through spar, along with both wings had separated from the main wreckage and were fragmented. The horizontal stabilator and vertical stabilizer were separated from the empennage and fragmented.

Aileron and stabilator control continuity was confirmed from the control surfaces to the control column, but not to the individual pilot controls because of impact damage. The left aileron balance weight was separated from the aileron, the rivet holes were elongated, and the weight was not recovered. The right aileron balance weight was attached to the right aileron, and the

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Narrative (Continued)

stabilator balance weight was in place.

Rudder control continuity was confirmed from the rudder to the left and right rudder cable attachment arms. The left rudder cable attachment arm was separated from the rudder bar assembly at the attachment weld. The right rudder cable attachment arm was separated from the rudder bar assembly about 1/4 inch from the attachment weld. The fracture surface was gray in color, and had a 45-degree shear lip.

Rudder trim position was undetermined because of impact damage, and elevator trim was approximately full nose down. Continuity of both trim systems was confirmed to the cockpit area, but not to the associated trim wheels because of impact damage. The flap handle was up, but flap position could not be determined because of impact damage.

The left and right fuel tanks were compromised. The left wing fuel tank plumbing was intact, the fuel screen was connected, and absent of debris. The right wing fuel tank plumbing was also intact, the fuel screen was connected, and absent of debris. Continuity from both fuel tanks to the fuel selector could not be confirmed because of impact damage. Continuity from the fuel selector to the electric driven fuel pump, and the engine driven fuel pump was confirmed. Continuity was also confirmed from both pumps to the carburetor.

The fuel selector was in the right tank position. The left inflow line was removed, and no fuel was identified. The right inflow line was removed and approximately 1/2 ounce of fuel was observed. The engine feed line was then removed and another 1/2 ounce of fuel was observed. With both observations, the fuel was bluish in color, and no contaminants were identified. To test the fuel selector, air pressure was applied to the right inflow port. With the right tank selected, air was identified coming from the engine outflow port, but not from the left tank inflow port. Air pressure was then applied to the left inflow port, and the fuel selector valve was placed in the left tank position. Air was identified coming from the engine outflow port, but not from the right tank inflow port.


In the cockpit, the throttle was out about 1 inch, the mixture control was destroyed, the primer was in and locked, and the carburetor heat was full forward. Engine control continuity was confirmed from the cockpit to the carburetor and carburetor heat box.

Examination of the engine revealed the airplane was equipped with a two bladed, fixed pitch propeller. The No. 1 propeller blade was bent aft, and the tip was curled back beyond the 90-degree mark. The No. 2 blade was bent aft approximately 5 degrees. No chordwise scratches, leading edge gouges, or "S" bends were identified on either of the propeller blades. The propeller and propeller flange had separated from the engine. The fracture surface was gray in color and consistent with torsional overload.

The fuel line to the carburetor was removed and a trace amount of fuel was identified. The carburetor displayed impact damage and was partially separated from its mount. The throttle was full open, the mixture was full rich, and the carburetor heat valve was in the cold position.

The top and bottom sparkplugs were removed and the electrodes examined. The No. 1 top was oiled soaked and absent of debris. The No. 2 top was dark gray and absent of debris. The No. 3 and No. 4 top were gray, and absent of debris. The No. 1 bottom was oil soaked and absent of debris. The No. 2 and No. 4 bottom were gray and absent of debris. The No. 3 bottom was oil soaked and absent of debris.

A rotational force was applied to the engine crankshaft via the vacuum pump drive gear. Compression was obtained on all four cylinders, the accessory drive gears rotated, the engine driven fuel pump piston actuated, and the left magneto ignition leads produced spark. The right magneto was partially separated from the accessory section and was removed for further examination.

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: NYC03FA082
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Narrative (Continued)

A rotational force was applied to the input drive of the right magneto, and spark was observed on all the ignition towers.

For testing purposes, the engine driven fuel pump intake port was submerged in water, the pump was manually activated, and water was expelled via the outflow port. The vacuum pump shear coupling was intact, and the pump produced suction when a rotational force was applied to the input drive.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the instructor and pilot at the Medical Examiner's Office in Rochester, New York, on April 13, 2003.

The FAA Toxicology and Accident Research Laboratory in Oklahoma City, Oklahoma, performed a toxicological test on the pilot on May 7, 2003, and on the instructor on June 9, 2003.

TESTS AND RESEARCH

The center portion of the rudder bar assembly was examined by the Safety Board's Materials Laboratory on October 20, 2003. According to the metallurgist's factual report, "the bar in the assembly was bent, and both rudder cable attachment arms were fractured. The attachment arms had a 'U'-shaped channel cross-section, with the base of the 'U' in the aft direction. The upper ends of the attachments arms were welded to the rudder bar, and the lower ends were attached to the rudder cable ends. The left cable attachment arm was fractured through the weld at the upper end, and the right cable arm was fractured just below the weld at the upper end.


The fracture surfaces for the right cable attachment arm were on slant angles and had a matte gray color, features consistent with overstress fracture.


On the left cable attachment arm, mating surfaces on the interior portion of the 'U' were flat, dark in color, and had a flattened globular appearance, features consistent with lack of fusion in the weld. The exterior portions of the surfaces were light gray with some areas appearing shiny in the optical microscope, features consistent with a relatively recent fracture. No evidence of fatigue was observed. The left cable attachment arm below the fracture had a general bend to the right. The legs of the 'U' on the upper end of the arm were collapsed together. No heavy markings or gouges were observed on the sides of the arm. These features were consistent with overstress fracture under side loading."

ADDITIONAL INFORMATION

According to the Airplane Flight Manual, the airplane was restricted from conducting aerobatic maneuvers, including spins.

The wreckage was released, minus a handheld GPS, and a section of the rudder bar assembly to the owner's representative on April 14, 2003. The GPS was released to the owner's representative on April 29, 2003, and the section of the rudder bar assembly was released on July 7, 2004.

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Landing Facility/Approach Information					
Airport Name	Airport ID:	Airport Elevation Ft. MSL	Runway Used NA	Runway Length	Runway Width
Runway Surface Type: Unknown					
Runway Surface Condition: Unknown					
Approach/Arrival Flown: Unknown					
VFR Approach/Landing: Unknown					
Aircraft Information					
Aircraft Manufacturer Piper		Model/Series PA-28-180		Serial Number 28-3008	
Airworthiness Certificate(s): Normal					
Landing Gear Type: Tricycle					
Amateur Built Acft? No	Number of Seats: 4	Certified Max Gross Wt. 2400 LBS		Number of Engines: 1	
Engine Type: Reciprocating		Engine Manufacturer: Lycoming		Model/Series: O-360-A3A	
				Rated Power: 180 HP	
- Aircraft Inspection Information					
Type of Last Inspection Annual		Date of Last Inspection 03/2003	Time Since Last Inspection 16 Hours		Airframe Total Time 2162 Hours
- Emergency Locator Transmitter (ELT) Information					
ELT Installed?/Type Yes /		ELT Operated? No	ELT Aided in Locating Accident Site? No		
Owner/Operator Information					
Registered Aircraft Owner Dansville Flying Club, Inc.		Street Address 44 Valley View Court			
		City Dansville		State NY	Zip Code 14437
Operator of Aircraft Dansville Flying Club, Inc.		Street Address 44 Valley View Court			
		City Dansville		State NY	Zip Code 14437
Operator Does Business As:			Operator Designator Code:		
- Type of U.S. Certificate(s) Held: None					
Air Carrier Operating Certificate(s):					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Part 91: General Aviation					
Type of Flight Operation Conducted: Instructional					

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First Pilot Information

Name On File	City On File	State On File	Date of Birth On File	Age 22
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Sex: M	Seat Occupied: Right	Occupational Pilot? Civilian Pilot	Certificate Number: On File
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Certificate(s): Flight Instructor; Commercial

Airplane Rating(s): Multi-engine Land; Single-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): Airplane Multi-engine; Airplane Single-engine

Current Biennial Flight Review? 02/2002

Medical Cert.: Class 1	Medical Cert. Status: Valid Medical--w/ waivers/lim.	Date of Last Medical Exam: 07/2002
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- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time	1097		966	105						
Pilot In Command(PIC)	1005									
Instructor	545									
Instruction Received										
Last 90 Days	90									
Last 30 Days	31									
Last 24 Hours										

Seatbelt Used? Yes	Shoulder Harness Used? No	Toxicology Performed? Yes	Second Pilot? Yes
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Flight Plan/Itinerary

Type of Flight Plan Filed: None

Departure Point Dansville	State NY	Airport Identifier DSV	Departure Time 1515	Time Zone EDT
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Destination Local Flight	State	Airport Identifier DSV	
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Type of Clearance: None

Type of Airspace: Class G

Weather Information

Source of Wx Information:

Unknown


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Weather Information					
WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
DSV	1554	EDT	662 Ft. MSL	8 NM	225 Deg. Mag.
Sky/Lowest Cloud Condition: Clear			Ft. AGL	Condition of Light: Day	
Lowest Ceiling: None		Ft. AGL	Visibility: 10	SM	Altimeter: 29.83 "Hg
Temperature: 13 °C	Dew Point: 1 °C	Weather Conditions at Accident Site: Visual Conditions			
Wind Direction: 330	Wind Speed: 15	Wind Gusts: 20			
Visibility (RVR): Ft.	Visibility (RVV) SM				
Precip and/or Obscuration:					

Accident Information		
Aircraft Damage: Destroyed	Aircraft Fire: None	Aircraft Explosion: None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot	1				1
Second Pilot					
Student Pilot					
Flight Instructor	1				1
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers	1				1
- TOTAL ABOARD -	3				3
Other Ground					
- GRAND TOTAL -	3				3

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Administrative Information

Investigator-In-Charge (IIC)
David S. Muzio

Additional Persons Participating in This Accident/Incident Investigation:

Fred Serlito
Rochester FSDO
Albany, NY

Gregory Erikson
Textron Lycoming
Wayne, IL

George Hollingsworth
New Piper Aircraft
Reston, VA