



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	SOUTHPORT, NC	<b>Accident Number:</b>	ATL98FA059
<b>Date &amp; Time:</b>	03/22/1998, 1050 EST	<b>Registration:</b>	N715PM
<b>Aircraft:</b>	Piper PA-31-310	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	3 Serious

**Flight Conducted Under:** Part 91: General Aviation - Personal

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## Analysis

The pilot stated he checked the fuel quantity in the inboard fuel tanks, but may have omitted the outboard tanks. He departed and climbed to 100 feet where the airplane yawed right. He believed it was a gust of wind which he attempted to correct. At 200 feet, the pilot stated the airplane rolled hard right and impacted trees in a 60 degree nose down attitude. There was no indication of a left engine discrepancy prior to impact. The right engine was examined with no fuel found in the fuel lines, and trace fuel was found in the fuel servo. According to the accident pilot, he regularly flew between Washington-Dulles and Southport, North Carolina using only the inboard tanks. Because of this, he did not check the location of the fuel selector, nor did he necessarily check the fuel quantity in the outboard fuel tanks. The cockpit fuel selector for the right engine was found in the outboard tank location. The right outboard tank on this airplane was not breached, and contained no fuel. The takeoff checklist states the fuel selector should be on the inboard fuel tank prior to takeoff.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to follow the preflight checklist, which resulted in a loss of engine power due to fuel starvation. Contributing to the significance of the accident was the pilot's failure to maintain control of the aircraft following the loss of engine power.

## Findings

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Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL  
Phase of Operation: TAKEOFF - INITIAL CLIMB

### Findings

1. (C) FLUID,FUEL - STARVATION
2. (C) FUEL SYSTEM,SELECTOR/VALVE - NOT SWITCHED
3. (C) CHECKLIST - NOT FOLLOWED - PILOT IN COMMAND

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Occurrence #2: LOSS OF CONTROL - IN FLIGHT  
Phase of Operation: TAKEOFF - INITIAL CLIMB

### Findings

4. (C) AIRCRAFT CONTROL - 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 March 22, 1998, at 1050 eastern standard time, a Piper PA-31-310, N715PM, impacted trees shortly after takeoff from runway 23 at the Brunswick County Airport in Southport, North Carolina. The airplane was operated by Arapahoe Aviation, Inc., under the provisions of Title 14 CFR Part 91, and visual flight rules. Visual meteorological conditions prevailed, and no flight plan was filed for this cross country flight. The pilot and two passengers sustained serious injuries, and the airplane was destroyed. The flight was originating at the time of the accident.

According to the pilot, he arrived at the airport and preflighted. He stated he checked the fuel quantity in the inboard fuel tanks, but may have omitted the outboard tanks because he did not intend to use them. He departed and climbed at blue line (best rate of climb speed) until 100 feet above the runway when the airplane yawed right. He believed it was a gust of wind, and attempted to control the airplane with rudder and left aileron. At about 200 feet above ground level (AGL), the airplane rolled hard right and impacted trees in a 60 degree nose down attitude. The pilot stated that he was unaware of any engine problems at the time of the accident.

### PERSONNEL INFORMATION

The pilot held a private pilot certificate with single engine land, multiengine land, and instrument airplane ratings. His certificate was issued February 5, 1990. His last medical certificate, a third class, was issued June 24, 1997, and contained the limitation that the pilot must wear corrective lenses in order to exercise the privileges of the airman's certificate. The pilot also had a Statement of Demonstrated Ability for his vision. The pilot had a flight review on November 25, 1997. Additional information about the pilot can be found on page 3 under the title First Pilot Information.

### AIRCRAFT INFORMATION

The airplane and engine records were inspected, with no discrepancies noted. All Airworthiness Directives were complied with, according to the airplane records. The last inspection of the aircraft, an annual, was completed August 1, 1997. The engines were also annually inspected on that day. Additional information about the aircraft is contained on page 2 under the section titled Aircraft Information and in the reports from Lycoming and Piper.

### METEOROLOGICAL INFORMATION

The conditions at the time of the accident were visual meteorological conditions. Additional information about the weather can be found on pages 3 and 4 under the section titled Weather Information.

### WRECKAGE AND IMPACT INFORMATION

The accident site was a flat, heavily wooded swamp area approximately 120 yards to the right of the departure end of runway 23 at Brunswick County Airport. The location was 33 degrees 56 minutes North latitude, and 78 degrees 4 minutes West longitude. The trees in the area were 40 to 60 feet high.

A 56-degree crush angle was measured from the nose of the airplane to just aft of the pilot

seats. Both engines and propellers were found imbedded into the ground about 2 feet from the propeller spinners aft, and both engines remained attached to the wings. Black soot and fire damage was evidenced on the outer cowling of the left engine. The left wing was bent upwards about 4 feet inboard of the wing tip, and the right wing was bent upwards and fractured about 7 feet inboard from the wing tip. Both elevators were damaged and partially separated from their attachment points. The leading edge of the vertical stabilizer was damaged and partially separated. The left and right flaps were found in the retracted position and confirmed by the position of the jack screws. The landing gear was in the down position. Fuel valves were found in the following positions; Crossfeed valve - off, Left fuel selector valve - inboard tank selected, Right selector valve - outboard tank selected.

Control continuity was established to all controls forward to the pilot side lower pulley cluster below the floorboard. Impact damage precluded movement beyond that point.

The left engine was examined, and fire damaged was noted in the rear accessory area. The engine was a Lycoming TIO-540-A2B, SN RL-554-61. Compression was verified to all cylinders. The engine could be rotated. The magnetos produced a spark to all leads. Examination of the spark plugs found them in good condition with some carbon deposits. The air inlet hose and filter were found water soaked. Fuel pump and lines were fire damaged.

The left propeller was a Hartzell HC-E3YR-2ATF, three bladed aluminum construction. Blade H25401 was examined and found twisted in the direction of rotation at mid-span, with no leading edge damage noted. The tip end was twisted with wavy trailing edge damage, and the outboard tip was broken off about 3 - 4 inches and was not recovered. Blade H25394 was examined and found twisted in the direction of rotation at mid-span with minor leading edge abrasions and waves along the trailing edge. Blade H25396 was examined and found twisted in the direction of rotation at mid-span with waves along both leading and trailing edge near the tip.

The right engine was a Lycoming TIO-540-A2A, SN L-2875-61. Compression was verified to all cylinders. The engine could be rotated. The magnetos produced a spark to all leads and were properly timed with the engine. Examination of the spark plugs found them in good condition with some carbon deposits.

The right propeller was a Hartzell HC-E3YR-2ATF, three bladed aluminum construction. Blade H24061 was examined and found no leading edge damage and very slight or gentle forward bend at 2/3 span. Blade H42064 was examined and no leading edge damage was noted and a gentle aft bend 25-30 degree was noted near the mid-span. Blade H24065 was examined and no leading edge damage was noted and a very slight aft bend 2-3 degrees was observed near the tip.

Examination of the fuel system for the right engine found a teaspoon of fuel from the inlet fuel line to the servo from the engine driven fuel pump, and a trickle of fuel came from the inlet screen to the fuel servo, and the screen was clean. No fuel was found when the 6 fuel lines to the fuel manifold were examined. Additionally, no fuel was found when the fuel line to the engine driven fuel pump to the fuel totalizer was examined. The right outboard tank was examined and found to be undamaged, and void of fuel.

#### MEDICAL AND PATHOLOGICAL INFORMATION

The pilot and two passengers received serious injuries. No toxicological tests were conducted on them.

## ADDITIONAL INFORMATION

The airplane was reportedly flown by another pilot prior to the accident pilot departing for a trip on the 14th of March.

According to the pilot, he regularly flew between Washington-Dulles and Southport, North Carolina using only the inboard tanks to simplify refueling. Because of this, he did not check the location of the fuel selector, nor did he necessarily check the fuel quantity in the outboard fuel tanks. During this trip, which departed on the 14th, he flew from Dulles to Wilmington, North Carolina in order to have work done on the airplane. In Wilmington, the pilot requested that the inboard tanks only be topped off. The pilot believed the airplane would require about 65 gallons of fuel, however, the inboard tanks held 31 gallons and the pilot did not check the fuel receipt prior to departing Wilmington. The airplane was flown to Southport and stayed there until the day of the accident. No services were performed in Southport.

According to the airplanes' takeoff checklist, the fuel selector should be on the inboard tanks prior to takeoff.

### Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	51, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<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>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 3 Valid Medical--w/ waivers/lim.	<b>Last FAA Medical Exam:</b>	06/24/1997
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	955 hours (Total, all aircraft), 260 hours (Total, this make and model), 930 hours (Pilot In Command, all aircraft), 13 hours (Last 90 days, all aircraft), 6 hours (Last 30 days, all aircraft)		

## Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N715PM
Model/Series:	PA-31-310 PA-31-310	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	31-493
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	08/01/1997, Annual	Certified Max Gross Wt.:	6500 lbs
Time Since Last Inspection:	41 Hours	Engines:	2 Reciprocating
Airframe Total Time:	694 Hours	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	TIO-540-A2B
Registered Owner:	REX WILLIAM COWDRY	Rated Power:	310 hp
Operator:	ARAPAHOE AVIATION INC	Operating Certificate(s) Held:	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	ILM, 33 ft msl	Distance from Accident Site:	20 Nautical Miles
Observation Time:	1053 EST	Direction from Accident Site:	180°
Lowest Cloud Condition:	Clear / 0 ft agl	Visibility	10 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	11 °C / 1 °C
Precipitation and Obscuration:			
Departure Point:	(SUT)	Type of Flight Plan Filed:	None
Destination:	WASHINGTON, DC (IAD)	Type of Clearance:	None
Departure Time:	1050 EST	Type of Airspace:	Class G

## Airport Information

Airport:	BRUNSWICK COUNTY AIRPORT (SUT)	Runway Surface Type:	Asphalt
Airport Elevation:	25 ft	Runway Surface Condition:	Dry
Runway Used:	23	IFR Approach:	None
Runway Length/Width:	4000 ft / 75 ft	VFR Approach/Landing:	None

## Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Destroyed
Passenger Injuries:	2 Serious	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 Serious	Latitude, Longitude:	

## Administrative Information

Investigator In Charge (IIC):	BUTCH WILSON	Report Date:	05/19/1999
Additional Participating Persons:	GUIDO F HASSIG GREGORY ERICKSON MIKE MCCLURE REGAN H CAMPBELL		
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.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .		

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](#).