



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	NORWICH, OH	<b>Accident Number:</b>	NYC94FA028
<b>Date &amp; Time:</b>	12/02/1993, 1341 EST	<b>Registration:</b>	N515WB
<b>Aircraft:</b>	PIPER PA-31T	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	2 Fatal

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

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## Analysis

EN ROUTE AT FL 240, THE PLANE ENTERED A LEFT SPIRALING DESCENT & SUBSEQUENTLY EXPERIENCED AN INFLIGHT BREAK-UP AT 7000' WITH SEPARATION OF OUTBOARD WINGS, TAIL SECTIONS & INTERNAL VINYL FROM THE NOSE BAGGAGE DOOR. THERE WAS NO DISTRESS CALL. WITNESSES HEARD THE ENGINES & AN EXPLOSIVE SOUND, THEN THEY SAW THE PLANE IN A SPIN, TRAILED BY FALLING DEBRIS. DEBRIS WAS STREWN OVER A DISTANCE OF ABOUT 3.5 MI. LIGHT WEIGHT PIECES INCLUDING VINYL FROM THE BAGGAGE DOOR, WING SKIN, & TAIL SKIN PIECES WERE AMONG THE 1ST DEBRIS ON THE WRECKAGE PATH. TAIL SECTIONS WERE FOUND ABOUT 2.5 MI FROM THE MAIN WRECKAGE WITH EVIDENCE OF OVERLOAD FAILURE; PIECES OF THE WINGS WERE FOUND WITH EVIDENCE OF DOWNWARD/OVERLOAD SEP- ARATION. NO PREEXISTING AIRFRAME FAILURE WAS FOUND THAT WOULD HAVE LED TO LOSS OF CONTROL, INFLIGHT BREAKUP, LOSS OF PRESSURIZATION OR HYPOXIA. THE PLANE WAS INACTIVE FOR ABOUT 2 YRS BEFORE BEING PURCHASED 2 MONTHS BEFORE ACCIDENT. LAST ANNUAL INSPECTION WAS ON 6/8/92. ICING WAS FORECAST FROM 9000' TO 17,000'MSL; TURBULENCE WAS FORECAST BELOW 8000' MSL.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: THE PILOT'S LOSS OF AIRCRAFT CONTROL FOR AN UNKNOWN REASON, AND SUBSEQUENT FLIGHT THAT EXCEEDED THE DESIGN STRESS LIMITS OF THE AIRPLANE, WHICH RESULTED IN AN IN-FLIGHT AIRFRAME BREAKUP.

## Findings

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Occurrence #1: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: CRUISE - NORMAL

### Findings

1. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
2. MAINTENANCE, ANNUAL INSPECTION - EXCEEDED
3. WEATHER CONDITION - TURBULENCE

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Occurrence #2: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION

Phase of Operation: DESCENT - UNCONTROLLED

### Findings

4. (C) DESIGN STRESS LIMITS OF AIRCRAFT - EXCEEDED
5. STABILIZER - OVERLOAD
6. STABILIZER - SEPARATION
7. WING - OVERLOAD
8. WING - SEPARATION
9. DOOR, CARGO/BAGGAGE - SEPARATION

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Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

## Factual Information

On December 2, 1993, at about 1341 eastern standard time, a Piper PA-31T, N515WB, piloted by Mr. Michael Stevenson, and registered to Brent's International Inc., separated in flight, and collided with the terrain near Norwich, Ohio. The two pilots were fatally injured, and the airplane was destroyed. Visual meteorological conditions prevailed at the time, and an IFR flight plan had been filed. The flight was being conducted under 14 CFR 91.

The pilot had requested and received an IFR clearance from the Baltimore Terminal Radar Control (TRACON) at 1139, from Easton, Maryland, to Des Moines, Iowa.

At 1332, the pilot radioed Indianapolis Air Route Traffic Control Center (ARTCC), frequency 125.07, "level FL 240" [flight level 24,000 feet MSL].

At 1338:37, the recorded radar data from the FAA Indianapolis Air Route Traffic Control Center (ARTCC) showed N515WB, at FL 240, ground speed 205 knots, and heading 300 degrees. At 1338:43, the data showed that N515WB had climbed 100 feet to FL 241, same speed, and heading 299 degrees.

At 1339:01, the airplane had descended to FL 237, and was in a left turn. The airplane continued in a left descending turn, through the following times and altitudes: at 1339:13, FL 217; at 1339:31, 14,400 feet; at 1339:43, 11,600; at 1340:01, 3,900 feet, and the last altitude depicted was 2,100 feet at 1340:19.

The airplane had descended from FL 241 to 2,100 feet, the last altitude depicted on radar, in an elapsed time of 84 seconds. The average vertical speed was approximately 15,714 feet per minute.

Witnesses in the area of the crash site said they heard the airplane's engines revving, followed by explosive sounds. The airplane was seen descending under the clouds in a flat spin, followed by many pieces of debris. The airplane impacted the ground inverted and the wreckage was scattered over an area of approximately 3.5 miles.

The accident occurred during the hours of daylight approximately 39 degrees, 59 minutes north, and 83 degrees, 12 minutes west.

### PERSONNEL INFORMATION

Mr. Michael Stevenson held Airline Transport Pilot Certificate, No. 1730904, with airplane multiengine and airplane single engine land and sea, instrument airplane ratings.

Mr. Stevenson was issued a Second Class Airman Medical Certificate on October 6, 1993, with limitations, must wear corrective lenses.

Mr. Stevenson's records showing his total flight hours were not located. It was estimated from information provided by the FAA that he had a total of 5,200 flight hours. A friend of Mr. Stevenson told the Safety Board that he had approximately 3 hours of flight time in Piper PA-31T aircraft.

Mr. James E. Templeton held a Commercial Pilot Certificate, No. 1500875, with a single and multiengine engine land and sea, instrument airplane ratings. Mr. Templeton was issued a Second Class Airman Medical Certificate on November 14, 1991, with limitations, must wear lenses for distant vision, and posses glasses for near vision.

Mr. Templeton's records showing his total flight hours were not located. It was estimated from information provided by the FAA that he had a total of 1,300 flight hours.

#### AIRCRAFT INFORMATION

Documents found at the crash site indicated that the airplane was purchased in Canada, June, 1992, then flown to the United States. The airplane was flown to Florida where an annual inspection was completed on June 8, 1992, at a total time of 6643.45 hours. The next annual was due June 30, 1992. No records were found to indicate that N515WB had a current annual at the time of the accident.

The NTSB learned from the Airport Manager, at the Easton Airport, Maryland, that N515WB had been flown into the Easton Airport two weeks prior to the accident, and parked at the airport until it departed on the day of the accident. The Airport Manager revealed that he thought some maintenance might have been completed by a Mr. Les Brendal.

Mr. Brendal was contacted by phone, and he told the NTSB that he performed a hot end inspection, at the request of Mr. Stevenson.

Mr. Brendal indicated that he did not know the history of the airplane, but that he believed the airplane sat in Florida for two years, and that it was purchased two months prior to being flown to Maryland.

Documents found at the crash site indicated that Brent's International purchased N515WB from Mr. Stevenson, and that Mr. Stevenson agreed to fly the airplane to California, then to New Zealand. In the letters Mr. Stevenson, indicated that N515WB, had a total time of 6,688 hours. Based on the information obtained from this letter it was determined that at the time of the accident N515WB had 44.55 hours since the last annual inspection, on June 8, 1992.

#### METEOROLOGICAL INFORMATION

The NTSB Meteorological Factual Report, revealed that N515WB, was in Instrument Meteorological Conditions at the time of the altitude excursion that was noted by ATC. At FL 240 there was a probability of light to moderate turbulence, a temperature of minus 33 degrees C, with winds southwesterly at 50 to 60 knots. Ice crystals were predominant in the clouds.

#### WRECKAGE AND IMPACT INFORMATION

The wreckage was examined at the accident site on December 3-5, 1993. The wreckage was scattered over a 3.5 mile area on a heading of 240 degrees. Among the first pieces of debris located on the wreckage path were small light weight pieces of internal vinyl (identified to have been part of the left forward baggage door lining), a section of wing skin, and tail skin. A 5 foot section of the left elevator was located on the wreckage path approximately 2.5 miles from the main wreckage. About 150 feet southwest from the left elevator section, a 12 foot long piece of the leading edge of the right horizontal stabilizer with the deicing boot was found.

Approximately 200 feet southwest of the right horizontal stabilizer, was a 3 foot long piece of the right elevator with the trim tab still attached. All the debris found on the wreckage path was in a straight line. There was no evidence of any fire or soot accumulation to any structural pieces found on the wreckage path. The airplane came to rest inverted and was completely destroyed.

The forward pressure bulkhead was found crushed. The aft pressure bulk head was intact. No

blowout holes or cracks were found on the aft bulkhead.

Control continuity was established to all flight controls by tracing the cables and control rods, with the exception of the elevator control rod. The elevator control rod was removed from the wreckage for further examination at the NTSB Materials Laboratory.

An examination of both engines was completed after the engines were removed from the accident site, and taken to a hanger at a near by airport. No discrepancies were observed.

The propellers were removed from the accident site, and shipped to Hartzell Propeller for examination.

The left forward baggage door had separated from the fuselage and was found forward of the left engine at the main wreckage site. The door was not crushed, but the door frame where the door had been attached to the fuselage was crushed. The door was removed from the crash site for further examination.

#### MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on both pilots, Mr. Michael W. Stevenson and Mr. James E. Templeton, on December 3, 1993, at the Franklin County Medical Examiner's Office, Columbus, Ohio, by Dr. Patrick M. Fardal.

The toxicological tests on both men were conducted at the Armed Forces Institute of Pathology, Washington, DC, and revealed, "... no drugs or alcohol where found."

#### TEST AND RESEARCH

A Trajectory Study, done by the NTSB, Vehicle Performance Division, revealed that the airplane breakup occurred at 7000 feet MSL, and the flight path angle was 45 degrees down. The breakup occurred approximately 0.75 statute miles southwest of the main wreckage sight.

The left forward baggage door was examined at NTSB Headquarters, Washington, DC. The examination revealed that the forward bayonet was bent about 45 degrees inboard, and the aft bayonet was bent about 15 degrees inboard. There was no impact damage on the inboard surface of the bayonets. The outboard surface of the bayonets, that part that makes contact with the fuselage portion of the door, displayed shiny gouge marks. The locking mechanism rod, connecting the door's forward and aft bayonet, was buckled and bent outboard. The door locking lever was found in the unlocked position. The condition of the door's bayonets and rods prior to the accident was not determined. There was no evidence of any paint transfer or metal transfer on the surface of the door.

Vinyl pieces from the inner surface of the door matched the texture of the vinyl pieces found 3.5 miles from the main wreckage. (Refer to NTSB Structures Group Chairman's Report, attached)

Examination of the autopilot pitch servo, by an NTSB Systems Engineer, revealed that the gear connecting to the pulley was free to rotate, indicating that the autopilot was disengaged. There was no evidence of fire or electric short circuit to the electric motor.

The spherical bearing end of the elevator push-pull rod, rudder control tube, elevator bellcrank control cable, and portions of the elevator stop bracket, were examined at the NTSB's Materials Laboratory, Washington, DC.

According to the Metallurgist's report, the elevator push pull- rod separated through the

threaded portion of the rod end near a spherical bearing. The fracture surface of the rod did not reveal any evidence of progressive crack propagation. The fracture surface of the push-pull rod revealed, "...a dimpled fracture mode, characteristic of overstress separation, throughout the entire fracture surface."

The examination of the elevator bellcrank control cable revealed, "...no evidence of extensive cable wear or corrosion of the wires."

The elevator stop bracket revealed that the pivot point was broken at several locations, and the fracture faces were subject to extensive post-fracture damage. Examination of the undamaged areas of the elevator stop showed no indications of progressive cracking. The extent of rubbing found on the head portion of the elevator stops, "...appeared to be consistent with normal operation of the stops."

The rudder control tube revealed no progressive cracking.

Both propellers were examined by Hartzell Propeller at the request of the NTSB, and under the supervision of the FAA. The propellers were examined at Hartzell Propeller's facilities, Piqua, Ohio, on August 9, 1994.

The examination of the left propeller revealed that at the time of impact the blades were at or close to feather. The blades showed no twisting, leading edge damage or chordwise scratching damage. The right propeller showed less impact damage than the left propeller. It was determined that at the time of impact the blades were in the feather position. The examination of both propellers revealed no discrepancies.

#### ADDITIONAL INFORMATION

The airframe was released to the owner's insurance adjuster Mr. R.H. Tenney on December 5, 1993. Additional instruments were released on July 7, 1994, to the owner's representative, Mr. Dale Munday, M&K Aviation Inc. Jeffersonville, Indiana. Both propellers were released to Mr. Munday on September 7, 1994. The left forward baggage door was released to Mr. Munday on September 30, 1993.

#### Pilot Information

<b>Certificate:</b>	Airline Transport	<b>Age:</b>	49, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Multi-engine Sea; Single-engine Land; Single-engine Sea	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 2 Valid Medical--w/ waivers/lim.	<b>Last FAA Medical Exam:</b>	10/05/1993
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	5200 hours (Total, all aircraft), 3 hours (Total, this make and model)		

## Aircraft and Owner/Operator Information

Aircraft Make:	PIPER	Registration:	N515WB
Model/Series:	PA-31T PA-31T	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	7720023
Landing Gear Type:	Retractable - Tricycle	Seats:	8
Date/Type of Last Inspection:	06/08/1992, Annual	Certified Max Gross Wt.:	6500 lbs
Time Since Last Inspection:	45 Hours	Engines:	2 Turbo Prop
Airframe Total Time:	6685 Hours	Engine Manufacturer:	P&W
ELT:	Installed, not activated	Engine Model/Series:	PT6A-28
Registered Owner:	BRENT'S INTERNATIONAL INC.	Rated Power:	620 hp
Operator:	BRENT'S INTERNATIONAL INC.	Operating Certificate(s) Held:	None
Operator Does Business As:	AIRWORK LTD.	Operator Designator Code:	

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	CMH, 816 ft msl	Distance from Accident Site:	20 Nautical Miles
Observation Time:	1350 EST	Direction from Accident Site:	240°
Lowest Cloud Condition:	Scattered / 3300 ft agl	Visibility	10 Miles
Lowest Ceiling:	Broken / 8500 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	13 knots / 18 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	220°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	12° C / 8° C
Precipitation and Obscuration:			
Departure Point:	EASTON, MD (ESN)	Type of Flight Plan Filed:	IFR
Destination:	DES MOINES, IA (DSM)	Type of Clearance:	IFR
Departure Time:	1130 EST	Type of Airspace:	Class E

## Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	

## Administrative Information

**Investigator In Charge (IIC):** ALAN J YURMAN **Report Date:** 12/02/1994

**Additional Participating Persons:** HAYDN G DECKER; COLUMBUS, OH  
LEE THIEL; COLUMBUS, OH  
THOMAS A BERTHE; LONGUEUIL, QC

**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](mailto: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](#).