



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	LOCUST GROVE, GA	<b>Accident Number:</b>	ATL97FA095
<b>Date &amp; Time:</b>	07/02/1997, 0935 EDT	<b>Registration:</b>	N450GC
<b>Aircraft:</b>	Boeing Stearman B75N1	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	1 Fatal
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

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## Analysis

After takeoff, a witness observed a puff of black smoke coming from the engine. Shortly thereafter, the airplane nosed down and descended rapidly. During the on-site examination of the engine, it was observed that the #6 cylinder head was separated from the engine. Metallurgical testing on the cylinder head revealed that the fracture was indicative of high temperature separation or overstress.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The inadvertent stall encountered by the pilot after experiencing an in-flight cylinder head separation.

## Findings

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Occurrence #1: LOSS OF ENGINE POWER  
Phase of Operation: TAKEOFF - INITIAL CLIMB

### Findings

1. (C) ENGINE ASSEMBLY,CYLINDER - FAILURE,TOTAL
2. ENGINE ASSEMBLY,CYLINDER - SEPARATION

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Occurrence #2: FORCED LANDING  
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

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Occurrence #3: LOSS OF CONTROL - IN FLIGHT  
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

### Findings

3. (C) STALL - INADVERTENT - PILOT IN COMMAND

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Occurrence #4: IN FLIGHT COLLISION WITH TERRAIN/WATER  
Phase of Operation: DESCENT - UNCONTROLLED

## Factual Information

### HISTORY OF FLIGHT

On July 2, 1997, about 0935 eastern daylight time, a Boeing Stearman B-75-N1, N450GC, collided with the ground during uncontrolled flight, following a loss of engine power, at Locust Grove, Georgia. The airplane was operated by the owner/pilot under the provisions of Title 14 CFR Part 91, and visual flight rules. Visual meteorological conditions prevailed. A flight plan was not filed for the personal flight. The commercial pilot was fatally injured, and the airplane was destroyed by fire. The flight was originating at the time of the accident.

Conversations with witnesses at the accident site revealed that just after lift off from runway 25 at the private grass strip, a puff of black smoke was observed coming from the engine. A left turn was begun during which one witness reported hearing a surge of power, and another witness heard the engine quit. According to the witness who heard the engine quit, the airplane subsequently nosed down and descended rapidly. A column of black smoke was seen almost immediately after sound of the impact.

### PERSONNEL INFORMATION

The pilot held a commercial pilot certificate with airplane single engine land, airplane multiengine land, and instrument airplane ratings. His certificate was issued November 6, 1983. His last medical, a third class, was issued May 28, 1997, and contained the restriction that the pilot must have glasses available for near vision. The pilot was current at the time of the accident. A biennial flight review was completed July 22, 1995.

Additional information about the pilot is contained on page 3 under the title First Pilot Information.

### AIRCRAFT INFORMATION

An annual inspection of the airplane was completed April 21, 1997. The aircraft logbooks were reviewed by the FAA. According to the FAA inspector, Airworthiness Directive (AD) 50-06-02 was not documented as being performed. After he spoke with the mechanics, it was confirmed that no Airworthiness Directives were performed on the airframe. The AD required an annual inspection of the wing spars for cracks, checks, and warping.

The engine logbooks were reviewed, with no discrepancies noted. The engine was installed in the aircraft April 21, 1997. The airplane had flown approximately 10 hours, according to the pilot log, since the engine was installed. An annual inspection was also completed that day.

Additional information about the aircraft is contained on page 2 under the section titled Aircraft Information.

### METEOROLOGICAL INFORMATION

Additional information about the weather is contained on pages 3 and 4 under the section titled Weather Information.

### WRECKAGE AND IMPACT INFORMATION

Upon arriving at the scene, the right side pieces of the airplane were on the right side of the wreckage, and the left side pieces of the airplane were on the left side of the wreckage. The wreckage was distributed along a 320 degree azimuth line. The airplane was in an open area

on a gently sloping hill.

The nose of the airplane was partially buried in a 3 inch crater, with the majority of the propeller and engine outside the crater. Both propeller blades were bent rearward and twisted. The engine had significant fire damage. The #6 cylinder head was found separated from the engine. The cylinder head showed extreme heat distress. The piston was exposed with soot on top of the piston. The forward spark plug was broken out of the cylinder head and lying underneath the engine. The aft spark plug was still attached to the lead.

The left wing was extensively burned. The strut between the ailerons was broken in three places, but both ends remained connected. The push pull tube connecting the aileron to the cockpit was burned away. The remaining ends of the push pull tube were melted. The aileron bell crank was connected inboard of the push pull rod.

The right wing was also extensively burned. The push pull tube connecting the aileron to the cockpit was burned away as was the strut between ailerons. The remaining ends of the push pull tube and strut were melted.

The empennage of the airplane was also consumed by fire. It was still attached to the fuselage structure. The elevator push pull tubes were fractured beneath the engine oil tank. The rudder cables were intact up to the rear cockpit where they were burned. The ends of the rudder cables were melted.

The cockpit was burned, leaving the frame of the airplane. The instrument panel was burned and only the altimeter was recognizable. It read 29.91 inches of Mercury, which corresponded with the altimeter setting at Hartsfield International Airport in Atlanta. The front and back throttle quadrants were identified. Both showed the throttle and mixture full forward, and the propeller control set full aft, for high pitch.

#### MEDICAL AND PATHOLOGICAL INFORMATION

A post mortem examination of the pilot was performed by the Henry County Coroner's Office on July 2, 1997. A toxicological examination was performed by the Federal Aviation Administration on October 14, 1997. The results were positive for Quinine in the urine. Quinine is found in tonic water. The side effects of quinine can include disturbances of vision, hearing, and balance.

#### ADDITIONAL INFORMATION

After a cursory examination of the engine at the scene, the engine was taken to Atlanta Air Salvage to be further examined. The engine case was breached in numerous places. After removing the carburetor, it was noted the throttle plate was full open. Also, the ignition leads were destroyed by fire and all spark plugs showed signs of sooting. When rotating the engine, there was no rocker movement and compression was not heard. The #6 cylinder exhaust push rod was melted inside the tube, making rotation difficult. After removing the push rod, there was movement of the cylinders. The fuel pump shear shaft was intact.

The cylinder and pieces of the cylinder head were sent to the National Transportation Safety Board's Materials Laboratory Division to be examined. According to a metallurgist there, the cylinder head was broken in "several pieces with at least two fractures intersecting one of the spark plug holes. The received pieces accounted for approximately 25 % of the cylinder head." The fractures were examined and shown to be indicative of either high temperature separation or overstress.

According to Pratt and Whitney's Airworthiness Directive 78-08-07, the cylinder heads must be inspected to prevent separation from the barrel. If they are ultrasonically inspected, they must be inspected every 150 hours. This engine was installed and ultrasonically inspected 10 hours, according to the pilot log, prior to the accident flight.

## Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	57, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Rear
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Seatbelt
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 3 Valid Medical--w/ waivers/lim.	<b>Last FAA Medical Exam:</b>	05/28/1997
<b>Occupational Pilot:</b>	<b>Last Flight Review or Equivalent:</b>		
<b>Flight Time:</b>	1270 hours (Total, all aircraft), 80 hours (Total, this make and model), 1140 hours (Pilot In Command, all aircraft), 10 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Boeing Stearman	<b>Registration:</b>	N450GC
<b>Model/Series:</b>	B75N1 B-75N1	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Restricted	<b>Serial Number:</b>	75-6781
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	04/21/1997, Annual	<b>Certified Max Gross Wt.:</b>	2950 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>		<b>Engine Manufacturer:</b>	P&W
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	R-985
<b>Registered Owner:</b>	JOHN K. REED	<b>Rated Power:</b>	450 hp
<b>Operator:</b>	JOHN K. REED	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	ATL, 1026 ft msl	Distance from Accident Site:	150 Nautical Miles
Observation Time:	0956 EDT	Direction from Accident Site:	20°
Lowest Cloud Condition:	Clear / 0 ft agl	Visibility	9 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	9 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	320°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	28° C / 23° C
Precipitation and Obscuration:			
Departure Point:	(GA04)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:	1030 EDT	Type of Airspace:	Class G

## Airport Information

Airport:	MALLARDS LANDING (GA04)	Runway Surface Type:	Grass/turf
Airport Elevation:	853 ft	Runway Surface Condition:	Dry
Runway Used:	25	IFR Approach:	None
Runway Length/Width:	2800 ft / 150 ft	VFR Approach/Landing:	Forced Landing; Traffic Pattern

## 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):	PRESTON E HICKS	Report Date:	04/24/1998
Additional Participating Persons:	GLENN WHITE REGAN H CAMPBELL KAREN WALSH		
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> .		

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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](#).