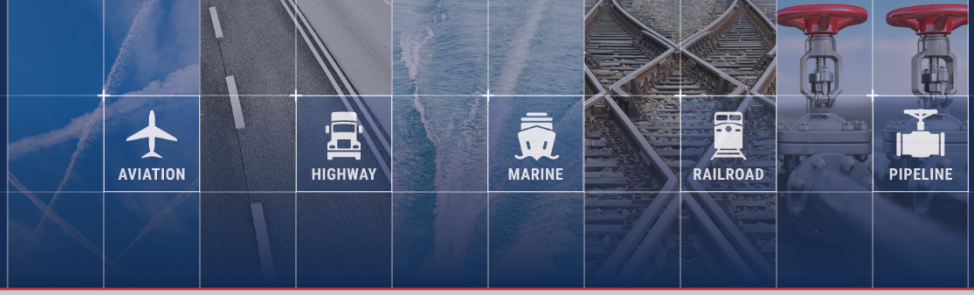

Aviation Investigation Factual Report

Location:	ALTON, New Hampshire	**Accident Number:**	IAD97FA043
Date & Time:	January 17, 1997, 13:35 Local	**Registration:**	N8263Y
Aircraft:	Piper PA-28-236	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Factual Information

HISTORY OF FLIGHT

On January 17, 1997, at 1335 eastern standard time, a Piper PA-28-236, N8263Y, was destroyed when it collided with trees near Alton, New Hampshire. The pilot and one passenger were fatally injured. Visual meteorological conditions prevailed and a flight plan was not filed. The personal flight was conducted under 14 CFR Part 91. The flight originated from Farmingdale (FRG), New York, at approximately 1115. The intended destination was Saranac Lake, New York.

According to Air Traffic Control (ATC) records, at 1117, the pilot radioed New York ATC, and advised the controller that he was 4 1/2 miles north of FRG at 3,000 feet, and requested flight following. The flight then proceeded uneventful for the next 25 minutes.

At 1139, the controller radioed the pilot and instructed him to contact the Boston Air Route Traffic Control Center (ARTCC), but there was no response. At 1141, the pilot rated passenger (PRP) transmitted that they were in trouble, and that the pilot was not responding. She told the controller that she was the co-pilot, and only had pilot experience in a Cessna 172.

At 1142, the controller advised the PRP that they were basically the same aircraft, and that they just land a little differently. He instructed her to do a shallow left turn southbound, and he would keep her VFR to help talk her down to an airport. He also advised her to descend if she could, and to stay clear of the clouds.

At 1143, the PRP advised the controller that she could see the ground while making the turn, and that the pilot was throwing up. The controller informed the PRP that she was over the Danbury Airport, Danbury, Connecticut. During the next 16 minutes, the controller and the pilot of another airplane (POAA) provided directions and instructions to the PRP.

At 1156, the PRP radioed that she was getting tired, and she was nauseated. At 1158, the POAA asked the PRP to lower the nose of the airplane and to start descending, and the PRP responded that she was trying to "activate" the pilot. At 1200, she repeated she was very tired. The POAA told the PRP where the control wheel was, and that she should trim the airplane. At 1204, the controller advised the POAA that the airplane had turned northbound, and that it was slowly climbing. The controller told the POAA that the PRP was responding with idents.

At 1207, the controller advised the POAA that the airplane was at 8,200 feet, and that there were no further idents from the PRP. At 1209, the controller advised the POAA that the airplane was holding it's heading and altitude of 8,800 feet. At 1210, the controller radioed the PRP and told her to open a vent on the airplane and get some fresh air as there might be

carbon monoxide in the cockpit.

At 1212, the controller radioed the PRP and told her to lower the nose because the airplane was probably trimmed to climb. The transmission was not acknowledged. At 1217, the controller radioed the PRP, and told her that maybe the autopilot was on, and that was probably why it was difficult to descend. Shortly thereafter, the controller advised the POAA that the PRP's airplane was descending rapidly.

At 1221, the controller advised the POAA that the airplane was at 7,800 feet, and that the bases of the clouds were around 5,000 feet. The POAA advised the controller that he was at 5,000 feet, and that it was VFR. The controller that had coordinated the two airplanes, contacted Bradley Approach Control, and coordinated the handover of the two airplanes to their airspace. The airplanes were then handed off to the Boston ARTCC at 1249.

At 1313, the POAA reported that he had the airplane in sight. At 1318, the POAA reported that he saw smoke coming out of the engine, and at 1320, the POAA reported that nobody was sitting up, and it appeared the entire cabin was full of smoke and that the engine was smoking.

At 1324, the POAA reported that the airplane was descending rapidly. At 1326, the POAA reported that the PRP had crashed into trees.

The airplane impacted trees in a heavily wooded area during the hours of daylight about 43 degrees 32 minutes North latitude, and 71 degrees, 12 minutes West longitude.

PERSONNEL INFORMATION

The pilot held a Private Pilot Certificate with ratings for airplane single engine land, and instrument airplane. The pilot had recorded a total flight experience of approximately 352 hours, upon the completion of his instrument flight test on January 13, 1991. From January 13, 1991, until the last log book entry dated January 4, 1996, the pilot only logged events such as adverse weather, actual instrument time, and the tach time at each refueling. On his application for a third class medical that was issued on August 1, 1995, he reported over 700 hours of total flight experience.

The pilot rated passenger held a private pilot certificate with a single engine land rating. According to her application for a third class medical certificate dated December 28, 1993, she reported 165 hours of total flight experience.

METEOROLOGICAL INFORMATION

At 1251, Concord Municipal Airport, Concord, New Hampshire, located about 26 miles south of the accident site, reported the following observation:

Sky condition, ceiling 7000 broken; visibility, 10 miles; temperature, 9 degrees Fahrenheit (F);

dew point, -14 degrees F; winds from 290 at 14 knots with wind gusts up to 33 knots; and altimeter, 29.74 inches Hg.

WRECKAGE AND IMPACT INFORMATION

The airplane wreckage was examined at the accident site on January 18 and 19, 1997. Examination of the accident site revealed impact scars at the tops of trees. The airplane wreckage was distributed over an area approximately 150 feet long by 25 feet wide, oriented on a magnetic heading of 060 degrees. All major components of the airplane were accounted for at the scene.

The main wreckage, which consisted of the empennage, top of the fuselage and remainder of the right wing were found about 130 feet beyond the initial impact point (IIP). The engine was separated from the fuselage and located about 150 feet beyond the IIP.

The lower forward section of the fuselage was destroyed. The cockpit section along with the right front seat, cabin door, and a section of the right side fuselage skin were located adjacent to the main wreckage against a tree. This area contained the rear fresh air vents, which were in the closed position. The front fresh air vents were separated, and found near the main wreckage. One vent was closed while the other vent was partially opened.

The overhead vent knob and the overhead vent were in the open position. The panel mounted fan switch was in the high position. The heater control box remained attached to the fuselage and was in the open position. The two forward floor heat vents were also in the open position.

The stabilizers and rudder remained attached to the main wreckage. The vertical stabilizer was crushed aft at the top. The rudder was crushed down and aft from the top to the top hinge. The rudder was compressed below the hinge from the leading edge to the trailing edge. The left side and right side horizontal stabilizer were damaged and were not functional. The elevator trim measured 3 threads. According to the Piper representative, this corresponded to 1.8 degrees tab up.

The propeller hub and propeller separated from the engine. One blade was bent aft while the other blade was straight. The blades displayed some chordwise scratches and gouges at the tips.

The engine was removed from the wooded area and examined in a hangar at the Lakes Region Airport, Wolfeboro, New Hampshire, on January 19, 1997, under the supervision of the National Transportation Safety Board (NTSB).

When the muffler shroud was removed, it revealed a large hole in the muffler that, was shared by the #5 and #6 cylinder exhaust stacks. The hole was near the left end (#6side), and measured approximately 4.5 inches long and 1 inch wide. The muffler was removed and sent to the NTSB laboratory for further examination.

TESTS AND RESEARCH

The muffler was examined at the NTSB laboratory. According to the Metallurgists factual report, the inlet end of the muffler case on the left side was crushed and contained a large crack that extended approximately two thirds of the muffler circumference. Most portions of the crack were darkly-discolored, as if they had been exposed to exhaust gases for a period of time. Other areas were shiny, as if they were recently created. The left inlet port of the muffler contained a welded in repair patch; however, the examination revealed that the crack was not associated with the repair welds.

In the area located about 5 inches from the inlet end of the muffler, a piece of the muffler case had separated creating an irregular hole. The fracture faces surrounding the hole had brittle appearance, and were covered with a layer of dark deposits. A section was cut from the muffler for Xray energy dispersive spectroscopy (EDS) and metallographic examination.

The EDS analysis of the fracture surface showed the presence of large quantities of lead and bromine, elements associated with the combustion of aviation fuel. The EDS analysis of the cut surface generated a spectrum typical of a stainless steel, with chromium and nickel as the primary alloying elements.

Metallographic examination revealed heavy pitting corrosion and high temperature oxidation on the interior surface of the muffler case.

MEDICAL AND PATHOLOGICAL INFORMATION

Autopsies and toxicological testing of the pilot and passenger were conducted by Dr. James A. Kaplan, Acting Chief Medical Examiner of the State of New Hampshire, on January 18, 1997.

The toxicological testing report from the FAA Toxicology Accident Research Laboratory, Oklahoma City, Oklahoma, showed the pilot's lung fluid had a Carboxyhemoglobin (Carbon Monoxide) saturation of 43%, while the passenger's blood had 69%.

ADDITIONAL DATA/INFORMTION

According to the Piper Maintenance Manual, it states in part:

"The entire exhaust system, including heat exchange shroud, muffler, muffler baffles, stacks, and all exhaust connections must be rigidly inspected at each annual or 100 hour inspection. The possibility of exhaust system failure increases with use. The system must also be checked carefully before winter operation when the cabin heater will be in use. Remove or loosen all exhaust shields, carburetor, and cabin heat muffs, shrouds, heat blankets, etc., as required to permit inspection of the system. Clean and inspect all external surfaces for dents, cracks, and missing parts.

Pay particular attention to welds, clamps, supports, and support attachment lugs, slip joints, stack flanges, and gaskets. Inspect internal baffle or diffusers. Any cracks, warpage, or severe oxidation are cause for replacement.

If any component is inaccessible for a visual inspection, conduct one of the following:

1. Conduct a submerged pressure check of muffler and exhaust stack at 2 psi air pressure. 2. Conduct a ground test using a carbon monoxide indicator. Head airplane into the wind. Warm engine on the ground. Advance throttle to full static RPM with cabin heat valves open, and take readings of heated airstream inside cabin at each outlet (including rear seat heat outlet, if installed) Appropriate sampling procedures applicable to the particular indicator must be followed. If carbon monoxide concentration exceeds 0.005 percent or if a dangerous reading is obtained on an indicator not calibrated in percentages, the muffler must be replaced."

According to the airplane's engine log book, the last annual inspection was completed on January 17, 1996, by Shakalis Aviation Services Inc., and the airplane had accumulated over 88 hours since the inspection. The inspection included replacing the #1 cylinder exhaust gasket. The pilot had contacted the above maintenance facility, and scheduled an annual inspection for January 27, 1997. There was no entry in the airplane or engine logs that the muffler had been checked or replaced.

According to the Army Aeromedical Training Handbook for Flight Personnel, it states in part:

"...The effects of carbon monoxide (CO) are subtle and deadly. CO is perhaps the most common gaseous poison in the aviation environment...It is a colorless, odorless gas slightly lighter than air...A relatively low concentration of CO in the air can, in time, produce high blood concentrations of CO. If an individual inhales a 0.5 percent concentration of CO for 30 minutes while at rest, a 45 percent concentration of CO will result. This is enough to produce total collapse... ."

The aircraft wreckage was released on January 23, 1997, to Allen A. Ryan, a representative of the owner's insurance company.

Pilot Information

Certificate:	Private	**Age:**	46,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	August 1, 1995
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	870 hours (Total, all aircraft), 686 hours (Total, this make and model), 758 hours (Pilot In Command, all aircraft), 30 hours (Last 90 days, all aircraft), 8 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N8263Y
Model/Series:	PA-28-236 PA-28-236	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	28-8111001
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	January 17, 1996 Annual	**Certified Max Gross Wt.:**	2900 lbs
Time Since Last Inspection:	88 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1626 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-540-J3A5D
Registered Owner:	DAVID A RIACH	**Rated Power:**	235 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	CON ,346 ft msl	**Distance from Accident Site:**	26 Nautical Miles
Observation Time:	12:51 Local	**Direction from Accident Site:**	230°
Lowest Cloud Condition:	Unknown	**Visibility**	10 miles
Lowest Ceiling:	Broken / 7000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	14 knots / 33 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	290°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	-13°C / -18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	FARMINGDALE (FRG)	**Type of Flight Plan Filed:**	None
Destination:	SARANAC LAKE (SLK)	**Type of Clearance:**	None
Departure Time:	11:15 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	Drake, Beverley
Additional Participating Persons:	GLENN GIBBONS; PORTLAND , ME DAN MC ANALLY; VERO BEACH , FL DANIEL B FLETCHER; WILLIAMSPORT , PA
Report Date:	April 27, 1998
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=28128