Aviation Investigation Final Report

Location:	HICKORY, Pennsylvania	**Accident Number:**	IAD97FA060
Date & Time:	April 1, 1997, 14:52 Local	**Registration:**	N2685S
Aircraft:	Cessna 337D	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal, 1 Minor
Flight Conducted Under:	Part 91: General aviation		

Analysis

The pilot of the unpressurized airplane was cleared to climb to 25,000 feet by air traffic control (ATC) and he was observed going through the assigned altitude and leveling at 27,700 feet. Then the aircraft was observed at 26,000 feet, and subsequent contact was lost. The pilot did not respond when ATC queried him about exceeding his assigned altitude. The aircraft sustained an inflight breakup during an uncontrolled descent, and came to rest in a tree. According to the surviving passenger, the airplane was refueled and a portable oxygen bottle was filled prior to takeoff. She stated that they were going to take aerial photographs at four separate locations during this flight. She said that they shot three of the locations and landed at Williamsburg, Pennsylvania where the pilot filed a flight plan and setup the portable oxygen system for their use during the next flight. They departed and climbed to 10,000 feet, and the pilot told her to put her oxygen mask on, and he did the same. The last altitude she remembered the pilot calling out was 20,000 feet, and he asked her how she was doing and if she felt okay and she said yes. When asked, 'who turned on the oxygen?' she stated that she did, started to but wasn't sure how, so, the pilot reached back and turned it on. She said she knew it was on because she could feel the cool air and that there was a little valve in both lines and they went from red to green indicating the oxygen was flowing. She said that she remembered him saying that they had just crossed 20,000 feet and she began feeling dizzy, she said that her eyes would not focus, and that she felt like she was cross eyed. She said she told the pilot that she was dizzy but she thought that he was talking to the tower because he did not respond. She recalled that she felt better when she closed her eyes, when she did, that was the last thing she clearly remembered until after the crash. Analytical testing of the contents of each cylinder used to fill the pilot's oxygen bottle found that they contained compressed breathing air at about 21 percent oxygen instead of aviation oxygen. Postmortem examination revealed the pilot's death was a result of hypoxic hypoxia due to insufficient oxygen reaching the blood.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Servicing of the pilots portable oxygen system with compressed air, which resulted in pilot incapacitation due to Hypoxia.

Findings

Occurrence #1: ALTITUDE DEVIATION,UNCONTROLLED
Phase of Operation: CLIMB - TO CRUISE

Findings
1. (C) OXYGEN SYSTEM - IMPROPER - OTHER MAINTENANCE PERSONNEL
2. (C) INCAPACITATION(ANOXIA/HYPOXIA) - PILOT IN COMMAND

Occurrence #2: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: DESCENT - UNCONTROLLED

Findings
3. FUSELAGE - OVERLOAD
4. AIRCRAFT CONTROL - NOT PERFORMED - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: DESCENT - UNCONTROLLED

Findings
5. (F) OBJECT - TREE(S)

Factual Information

HISTORY OF FLIGHT

On April 1, 1997, at about 1452 eastern standard time, a Cessna 337D Skymaster, N2685S, collided with the ground shortly after being cleared by Air Traffic Control to climb to 25,000 feet. Air Traffic Controllers observed the airplane going through its assigned altitude and leveling at 27,700 feet. Then the aircraft was observed at 26,000 feet, and subsequent contact was lost. The aircraft broke up during its uncontrolled descent and the cabin section came to rest in a tree at the Ft. Cherry Hill Gulf Resort in Hickory, Pennsylvania. The airplane was operated by the private pilot under the provisions of Title 14 CFR Part 91. Visual meteorological conditions prevailed and an IFR flight plan was filed. The pilot sustained fatal injuries and the passenger sustained minor injuries. The flight had originated at Williamsburg, Pennsylvania about 1345 for the purpose of aerial photography.

According to the passenger/employee, the airplane was fueled and a portable oxygen bottle was filled prior to takeoff at the Youngstown Elser Airport, North Lima, Ohio by Gemco Aviation Services, Inc. She stated that they were going to take aerial photographs at four separate locations during this flight. She said that they shot three of the locations and landed at Williamsburg, Pennsylvania where the pilot filed a flight plan and setup the portable oxygen system for their use during the next flight. They took-off about 1345 and climbed to 10,000 feet and the pilot told her to put her oxygen mask on, and he did the same. The last altitude she remembered the pilot calling out was 20,000 feet, and he asked her how she was doing and if she felt okay and she said yes.

When asked, "who turned on the oxygen?" She stated that she did, started to but wasn't sure how, so, the pilot reached back and turned it on. She said she knew it was on because she could feel the cool air and that there was a little valve in both lines and they went from red to green indicating the oxygen was flowing. She said that she remembered him saying that they had just crossed 20,000 feet and she began feeling dizzy, she said that her eyes would not focus, and that she felt like she was cross eyed. She said she told the pilot that she was dizzy but she thought that he was talking to the tower because he did not respond. She recalled that she felt better when she closed her eyes, when she did, that was the last thing she clearly remembered until after the crash.

PERSONNEL INFORMATION

The pilot held a private certificate for airplane single and multiengine land. The pilot reported 3100 civilian flight hours in all aircraft on the application for the most recent second class medical certificate, which was dated September 15, 1995.

AIRCRAFT INFORMATION

The Cessna 337D, was a four seat, twin engine airplane, however, modification to the airplane configured it with a center aft cabin floor mounted camera, for use in aerial photography. An annual inspection was performed on October 23, 1996.

METEOROLOGICAL INFORMATION

Visual meteorological conditions prevailed at the time of the accident. Additional meteorological information may be obtained in this report on page 4 under section titled Weather Information.

WRECKAGE AND IMPACT INFORMATION

Examination of the main wreckage revealed that both left and right tail booms, vertical stabilizers, horizontal stabilizer (with elevator and trim), left wing outboard and right door had separated from the airframe. During examination of the aft engine it was noted that both the left and right tail booms came in contact with the aft propeller. The fuselage/cabin separated from the rest of the airframe, came to rest in a hickory tree, approximately 30 feet above the ground. The rest of the debris was scattered over a 3 mile radius on a 195 degree bearing from the site.

The individual airframe components were located, identified and marked by GPS coordinates in reference to the main wreckage. (See attachment for wreckage diagram). The forward or Number 1, engine separated from the airframe upon impact with the tree and sustained moderate damage. The forward propeller showed one blade with minor damage and the other blade was found bent aft at approximately a 45 degree angle. The engine was rotated through normally about 90 degrees and the drive-train continuity established. The turbocharger was free to rotate. The turbocharger overboard exhaust duct had small splits on either side of a longitudinal weld, but there was no evidence of exhaust streaking of in-flight leakage. The rear engine sustained impact damage to the top of the number 5 cylinder head. The engine rotated freely by hand and drive-train continuity was established. The turbocharger was free to rotate.

The fuel system was breached during the accident. All cables from the Flight Controls and the Aerodynamic Surfaces were identified. Due to impact damage respective flight control movement was not possible.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy of the pilot was conducted by the Office of the Coroner in Washington County, Pennsylvania 100 West Beau Street, Room 405 Courthouse Square, Washington, Pennsylvania 15301, (412) 228-6785. The autopsy reported the cause of death as Hypoxic Hypoxia due to insufficient oxygen reaching the blood.

Post accident toxicological examination was performed by the Federal Aviation Administration (FAA) Civil Aeromedical Institute, in Oklahoma City Oklahoma. The toxicology report was negative for Carbon Monoxide, Cyanide, Ethanol, and no drugs were detected in the urine.

TESTS AND RESEARCH

On April 2, 1997 FSDO-19, in Pittsburgh, Pennsylvania was requested to provide an inspector to investigate the repair facility which serviced the oxygen bottle on N2685S. The FAA Inspector contacted Mr. Mike Stanco at Gemco Aviation. Mr. Stanco stated, "The pilot brought me a portable oxygen bottle to be serviced at 10:45 a.m. on Tuesday, April 1, 1997. The bottle was serviced to its full capacity, I believe it was 15 liters. The pilot walked to his aircraft carrying the serviced oxygen bottle and a handful of masks. The aircraft was serviced with 87 gallons of 100 low lead aviation fuel. I noticed numerous carbon monoxide detector dots throughout the aircraft. The pilot never complained to me about exhaust odor in the aircraft."

On April 3, 1997, the FAA Inspector met with Mr. Mike Stanko at Gemco Aviation, Elser Airport, North Lima, Ohio. Mr. Stanko indicated that Mr. Mankowski moved his aircraft form Columbiana County Airport in East Liverpool, Ohio to Elser Airport in the Spring of 1990.

The FAA Inspector, asked Mr. Stanko where he purchased his oxygen. He indicated that it was purchased from AGA Gas, 1055 North Meridian Road, Youngstown, Ohio, 44511. Mr. Stanko produced an invoice from AGA Gas, dated October 3, 1996. The invoice shows the purchase to be Breathing Air-Grade D(K), one cylinder purchased. The last aircraft serviced was a Mooney TLS N1065S. Mr. Stanko contacted the owner of the Mooney TLS to inquire if he was having any breathing problems with his oxygen. The owner indicated he had not. Mr. Stanko and the FAA Inspector walked to a storage building where the oxygen service cart was kept. Upon viewing the oxygen service cart, the Inspector noticed the four cylinders on the cart were painted Yellow. Further examination of the bottles found the following placard on each cylinder: AIR COMPRESSED UN1002 BREATHING AIR, Lot number 12 2000 (6000 D609) non-flammable gas 2.

Mr. Stanko stated he had been purchasing oxygen from AGA since 1989. His last purchase was October 3, 1996, the invoice verifies this statement. Mr. Stanko indicated that when he ordered oxygen from AGA he specifically stated that this oxygen was to be used for aircraft oxygen system servicing. He said to his knowledge, the cylinders in question have always been yellow.

On April 8, 1997 all four yellow cylinders were transported to AGA Gas, Inc., Corporate Headquarters in Cleveland, Ohio for analytical testing of the contents of each cylinder. The test results were the same for each cylinder and indicated that they contained compressed breathing air at about 21 percent oxygen, not aviator oxygen. (See attachment for test results).

Pilot Information

Certificate:	Private	**Age:**	52,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	September 15, 1995
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	3100 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N2685S
Model/Series:	337D 337D	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	337-0985
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	October 18, 1996 Annual	**Certified Max Gross Wt.:**	4500 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Continental
ELT:		**Engine Model/Series:**	IO-360
Registered Owner:	FLIGHT SERVICES, INC.	**Rated Power:**	210 Horsepower
Operator:	FLIGHT SERVICES, INC.	**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:	PIT ,1204 ft msl	**Distance from Accident Site:**	65 Nautical Miles
Observation Time:	14:51 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	13 knots / 23 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	350°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	WAYNESBURG , PA (WAY)	**Type of Flight Plan Filed:**	IFR
Destination:	NORTH LIMA , OH (4G4)	**Type of Clearance:**	IFR
Departure Time:	13:45 Local	**Type of Airspace:**	Class E

Airport Information

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

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Minor	**Latitude, Longitude:**	40.299144,-80.319297(est)

Administrative Information

Investigator In Charge (IIC):	Wilson, Butch
Additional Participating Persons:	RONALD HORAK; DANIELLE PINNERI;
Original Publish Date:	January 10, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=28130