Aviation Investigation Final Report

Location:	HAZARD, Kentucky	**Incident Number:**	NYC01IA046
Date & Time:	November 30, 2000, 11:00 Local	**Registration:**	N942TB
Aircraft:	Mooney M20C	**Aircraft Damage:**	None
Defining Event:		**Injuries:**	2 Minor, 2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

During cruise flight, the pilot became incapacitated. The pilot rated passenger was able to fly the airplane toward an airport and wake the pilot. The pilot landed uneventfully, but suffered from toxic levels of carbon monoxide. Examination of the airplane revealed a hole in the cabin air scat tubing. The hole was in the vicinity of the joint that connected the number one cylinder to the exhaust manifold, and there was a visible gap in the joint. Further examination revealed that the sometime during the airplane's history, the scat tubing had been misrouted.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The incorrect routing of the cabin air scat tubing by an unknown person, which resulted in a carbon monoxide leak into the cabin, and subsequent pilot incapacitation.

Findings

Occurrence #1: MISCELLANEOUS/OTHER
Phase of Operation: CRUISE

Findings
1. (C) AIR CONDITIONING/HEATING/PRESSURIZATION SYSTEM(S) - INCORRECT - UNKNOWN
2. INCAPACITATION(CARBON MONOXIDE) - PILOT IN COMMAND

Factual Information

On November 30, 2000, about 1100 Eastern Standard Time, a Mooney M20C, N942TB, was not damaged during a pilot incapacitation event near Hazard, Kentucky. The certificated private pilot and pilot rated passenger received minor injuries, and two passengers were not injured. Visual meteorological conditions prevailed for the flight that departed Lynchburg Regional Airport (LYH), Lynchburg, Virginia; destined for Kyle-Oakley Field (CEY), Murray, Kentucky. An instrument flight rules flight plan was filed for the personal flight conducted under 14 CFR Part 91.

The pilot stated that he was in cruise flight at 8,000 feet near Hazard, Kentucky. He began to feel ill, and requested a descent to 6,000 feet. The pilot then began to "go in and out of consciousness." The pilot rated passenger had not flown for over 25 years, but was able to fly the airplane to Big Sandy Regional Airport (K22), Prestonsburg, Kentucky. The pilot rated passenger successfully woke the pilot, and the pilot made an uneventful landing. The pilot stated that he remembered flying a left-hand traffic pattern at K22, but did not remember landing the airplane.

The pilot further stated that hospital tests revealed he and the pilot rated passenger had toxic levels of carbon monoxide in their blood. Carbon monoxide was present in the rear seat passengers, but the levels were not toxic.

Examination of the airplane revealed a hole in the cabin air scat tubing. The hole was next to the joint that connected the exhaust manifold to the exhaust from the number one cylinder. The joint was not secure, and a gap was visible.

Photographs of the engine were forwarded to the airplane manufacturer. The manufacturer stated that sometime during the airplane's history, the scat tubing was misrouted. The tube with the hole, connected the air inlet to the cabin. A second tube connected the air inlet to a heater exchange. The tube with the hole was suppose to be routed underneath the second tube, however, it was resting on top of it. The manufacturer added that the scat tubing was not clamped, but the clamps would only help if the tube was correctly routed.

The pilot stated that maintenance work was performed on his airplane prior to the day of the incident. Specifically, a fixed base operator replaced the alternator. However, a Federal Aviation Administration (FAA) inspector stated that the misrouting could have happened during any of several prior maintenance visits. The inspector could not confirm that the most recent maintenance work was the cause of the misrouting. Additionally, he could not confirm when the gap formed in the joint between the cylinder and exhaust manifold.

The airplane's last annual inspection was performed on October 28, 2000.

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--w/ waivers/lim	**Last FAA Medical Exam:**	September 23, 1999
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	751 hours (Total, all aircraft), 50 hours (Total, this make and model), 711 hours (Pilot In Command, all aircraft), 56 hours (Last 90 days, all aircraft), 18 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Mooney	**Registration:**	N942TB
Model/Series:	M20C M20C	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	2587
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	October 28, 2000 Annual	**Certified Max Gross Wt.:**	2575 lbs
Time Since Last Inspection:	49 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1404 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-360
Registered Owner:	THOMAS R. BAILEY	**Rated Power:**	180 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:	JKL ,1381 ft msl	**Distance from Accident Site:**	12 Nautical Miles
Observation Time:	11:56 Local	**Direction from Accident Site:**	350°
Lowest Cloud Condition:	Unknown	**Visibility**	10 miles
Lowest Ceiling:	Overcast / 1900 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	/ None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	1°C / -4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	LYNCHBURG (LYH)	**Type of Flight Plan Filed:**	IFR
Destination:	MURRAY (CEY)	**Type of Clearance:**	IFR
Departure Time:	09:00 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	BIG SANDY REGIONAL K22	**Runway Surface Type:**	Asphalt
Airport Elevation:	1221 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	21	**IFR Approach:**	None
Runway Length/Width:	5000 ft / 100 ft	**VFR Approach/Landing:**	Full stop;Precautionary landing

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	None
Passenger Injuries:	1 Minor, 2 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Minor, 2 None	**Latitude, Longitude:**	37.249748,-83.189178(est)

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	JEFF M JENNINGS; LOUISVILLE , KY
Original Publish Date:	July 10, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this incident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=50707

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties … and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available here.