



Aviation Investigation Final Report

Location:	GREER, South Carolina	Accident Number:	ATL96FA114
Date & Time:	August 2, 1996, 19:15 Local	Registration:	N4813F
Aircraft:	Cessna TU206A	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The flight was at 8000 feet, in cruise flight, when the pilot reported a total loss of engine power and smoke in the cockpit. Air Traffic Control gave the pilot vectors to Sloan Airport, a small, private airstrip, north of Greer. The pilot was unable to locate the single east-west grass strip and attempted an emergency landing in a pasture approximately 0.7 nautical miles (nm) north of Sloan. The airplane struck a tree bordering the pasture and struck terrain beyond the tree, coming to rest inverted. The engine was examined and revealed that the number 3 piston had maximum mechanical damage and the least heat damage. The number 3 piston pin was found wedged in the left crankcase half, jammed against the number 2 main bearing support. The metallurgists report indicated that the number 3 piston had deteriorated in flight for undetermined reasons.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The disintegration of the number 3 piston, and the pilot's inadequate selection of terrain for the landing.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF
Phase of Operation: CRUISE - NORMAL

Findings

1. (C) ENGINE ASSEMBLY,PISTON - DISINTEGRATED

Occurrence #2: FORCED LANDING

Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

2. (C) EMERGENCY PROCEDURE - INADEQUATE - PILOT IN COMMAND

3. (C) UNSUITABLE TERRAIN OR TAKEOFF/LANDING/TAXI AREA - SELECTED - PILOT IN COMMAND

Occurrence #3: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

4. STALL - INADVERTENT - PILOT IN COMMAND

Occurrence #4: IN FLIGHT COLLISION WITH OBJECT

Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

5. OBJECT - TREE(S)

Factual Information

HISTORY OF FLIGHT

On August 2, 1996, at 1915 eastern daylight time, a Cessna TU206A, N4813F, was substantially damaged following a collision with trees and the terrain during a forced landing attempt near Greer, South Carolina. The private pilot was fatally injured in the accident. The personal flight was operated under the provisions of Title 14 CFR Part 91. Visual meteorological conditions existed at the time of the accident. The flight departed Charlotte, North Carolina about 1830, and was operating on an instrument flight rules flight plan to Dayton, Tennessee at the time of the accident.

Personnel at the Federal Aviation Administration Air Traffic Control Center in Greer, South Carolina reported that the pilot reported that the airplane engine had lost power, and he was getting smoke in the airplane. The air traffic controller attempted to give the pilot radar vectors to the nearest airport, which was a private grass airstrip approximately 5 miles from the pilots position. The radar controller stated that the last altitude readout from the airplane was about 800 feet above ground level, at a point about 1/2 mile west of the airfield.

Witnesses in the area of the accident reported that the aircraft engine sounded as if it were making surging sounds and saw smoke exiting the airplane. The aircraft wings appeared to rock back and forth from side to side just prior to the crash, and the aircraft nose appeared to drop to a near vertical attitude just prior to impact. The airplane came to rest inverted.

PERSONNEL INFORMATION

The pilot was certificated as an instrument rated private pilot. He had approximately 580 total flight hours, the most recent in the Cessna TU206A. The record of the pilot's flight time is incomplete due to the fact that the investigator was only given one log book and only total flight time was forwarded. The other log book was requested but not received from the estate. There are no reports of previous incidents or accidents involving the pilot.

The pilot applied and received a third class medical certificate on December 22, 1993. He reported, in the Medical History section, that he was medically discharged from the military and was admitted to the hospital, both which he previously reported. This application does not indicate the reasons for either condition. The pilot applied and received a third class medical on December 21, 1995. The Medical History section indicated the two previously reported conditions and a third condition, labeled, Other illness, disability or surgery, which he indicated was previously reported. Additionally, he reported hip surgery performed on April 24, 1995.

AIRCRAFT INFORMATION

The Cessna TU206B is a six seat, single engine airplane. According to the engine log of N4813F, on February 14, 1995, new standard pistons and rings were installed, from Superior Air Parts. A maintenance operations check was performed on the engine and the airplane was returned to service. An annual inspection was performed on December 7, 1995.

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

The wreckage was found 1/2 mile northwest of Sloan Airport. A crater was identified, about 3 feet by 1 foot, with the nose gear located near it, along with several tree branches. The airplane was found approximately 15 feet northeast of the crater, upside-down, with the nose pointing in a southerly direction. There was no evidence of a fire in the wreckage or around the site.

The spinner was found crumpled, at the tip and sides, with the three propeller blades still attached. One of the blades had scratch marks on the cambered side, parallel with the twist of the blade. Another blade was bent close to the hub and then again near the tip, creating an "S" curvature. The third blade was bent slightly aft. The engine was exposed when found at the accident site. Examination of the engine revealed a hole in the crankcase, between the number 2 and 4 cylinders, which measured about 1 inch in diameter. There was another hole between the number 1 and 3 cylinders, just above the engine data plate. A third hole was observed between the number 3 and 5 cylinders, smaller than the two previously mentioned. There was oil distributed throughout the engine cowling, and oil running down the left side of the aircraft fuselage. The number 2 cylinder through bolt, at the 10 o'clock position was pushed out from the cylinder base. The nut was missing from the number 3 cylinder at the 10 o'clock position.

The seats were found intact with their respective seat belts and harnesses. The instrument panel was damaged, with several instruments broken off the panel and obscured by the wreckage. See Supplement B for configurations.

The left wing leading edge was buckled rearward. The left flap extension was about 40 degrees as measured with a bubble protractor. The right wing leading edge was crushed aft from the tip to 1/3 from the wing strut. The right wing flap could not be measured because it had been moved to access the cabin door.

The fuselage appeared to have little damage. The tail was bent just forward of the vertical and horizontal stabilizers. The vertical stabilizer, forward of the rudder, was buckled on

both sides, at the top. The rudder was not damaged. The horizontal stabilizer was not damaged.

MEDICAL AND PATHOLOGICAL INFORMATION

On August 6, 1996, a toxicological examination of the pilot was conducted at the FAA Toxicological Research Laboratory. The toxicological examination revealed bupropion detected in the blood and urine, and 139.900 ug/ml, ug/g of Salicylate detected in the urine. Bupropion can be detected in the blood and urine for up to five weeks after use. The examination did not reveal ethanol. Bupropion and aspirin tablets were found in the pilot's pocket and bupropion, Tylenol Sinus, aspirin, and Marezine tablets were found in the wreckage.

Bupropion is a prescription medication used for the treatment of depression or attention deficit hyperactivity disorder (ADHD). According to the Physician's Desk Reference, some significant side effects include restlessness, agitation, insomnia, and a small risk of seizures, particularly at high doses. It also states that this drug may impair one's ability to perform tasks requiring judgment or motor skills, and therefore, individuals should refrain from driving an automobile or operating complex, hazardous machinery until reasonably certain that the medication does not adversely affect their performance. Conditions for which this medication is prescribed, depression or ADHD, are known to adversely affect performance, particularly in stressful environments.

The pilot was being treated for depression since late in 1992. In January of 1994, he was placed on bupropion. The pilot requested to be taken off of the medication in March of 1995. In October of 1995, his doctor stated that he had relapsed episodic depression, and put him back on bupropion. On the pilot's medical certificate application, December 22, 1993, he stated that he was not currently on any medication and did not report that he was diagnosed with depression. The same applies for his application for medical certificate on December 21, 1995.

TESTS AND RESEARCH

The engine was visually checked at the accident site, revealing 3 holes in the engine case. The engine was sent to Teledyne Continental Motors (TCM) for further examination. According to TCM, the oil sump was removed and various metallic debris was found, consisting of pieces of piston and rings, connecting rod and cap pieces, rod bolt and rod nut pieces, bearing from number 3 connecting rod, burned pieces of bearing, 2 pieces of the starter adapter spring and a piece of starter adapter drum. The color on the sump interior was darker than normal. The oil pump showed signs of heavy scratching and exhibited hard particle passage.

Examination of the pistons revealed heavy scoring and transfer of piston material to the cylinder walls of the number 1 piston. Damage and breakage was observed of the number 3 and 4 pistons. The crowns of the number 3 and 4 pistons exhibited valve strikes. Crankcase

main bearings showed signs of lubrication distress on the number 1, 2, and 3 main bearings. The number 3 piston pin was found wedged in the left crankcase half, jammed against the number 2 main bearing support. The number 3 piston pin had collapsed and ruptured the oil galleries in the crankcase.

The connecting rods from the number 1, 2, 5, and 6 cylinders were removed and the bearings revealed signs of lubrication distress. The number 2, 4, and 5 bearings appeared "wiped" and suffered from oil starvation. The number 3 connecting rod was found in the oil sump.

The Metallurgist's Factual Report discussed the damaged components of the cylinders, in severity order, with the number 3 cylinder having the most extensive damage. The number 3 piston exhibited the maximum mechanical damage. The number 3 connecting rod and bearing exhibited the least amount of heat damage and heat discoloration. The P/N SA646303 piston normally has a cavity, or empty space, in the area around each of the piston caps. This cavity is enclosed by the cylinder barrel. Examination of the reconstructed pieces of the number 3 piston exhibited long-term rubbing, or polishing, damage around the perimeter of the piston pin cavity as well as the bottom skirt on the opposite side of the piston, creating a mirror-like surface. This polishing covered the entire width of the side wall between the scraper ring groove and the skirt bottom directly in line with the connecting rod cap. The fractures of the number 3 piston progressed through the piston pin boss, opening the cavities on both sides of the piston. Examination of the number 3 piston indicated very heavy peening damage to the cavity around the piston pin on one side of the piston wall. The cavity on the opposite side did not exhibit this peening damage. The area where the piston cap was placed did not exhibit this peening damage, demonstrating that, the cap was in place when the peening occurred. The oil scraper ring was broken apart and the oil control ring and the compression ring were found intact and in their respective grooves. The peened surface was examined with a scanning electron microscope (SEM). X-ray energy dispersive spectroscopy (EDS) of the peened surface revealed the presence of a small amount of iron, substantially above the amount expected for the overall alloy. A closer examination of the surface showed that the iron was concentrated in particles that appeared to have been smeared onto the surface as the peening damage was created. For additional information, refer to the Metallurgist's Factual Report.

ADDITIONAL INFORMATION

The aircraft wreckage was released to the owner's insurance adjuster: Harry
Brooks Carson-Brooks, Inc. PO Box 888525 Atlanta, GA 30356

Pilot Information

Certificate:	Private	Age:	48, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 Valid Medical-w/ waivers/lim	Last FAA Medical Exam:	December 21, 1995
Occupational Pilot:	UNK	Last Flight Review or Equivalent:	
Flight Time:	579 hours (Total, all aircraft), 75 hours (Last 90 days, all aircraft), 12 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N4813F
Model/Series:	TU206A TU206A	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	U206-0513
Landing Gear Type:	Tricycle	Seats:	6
Date/Type of Last Inspection:	December 7, 1995 Annual	Certified Max Gross Wt.:	3600 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	Continental
ELT:	Installed, not activated	Engine Model/Series:	GTSIO-520-C
Registered Owner:	CHARLES E. HOLMES	Rated Power:	340 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:	GSP ,964 ft msl	Distance from Accident Site:	8 Nautical Miles
Observation Time:	19:36 Local	Direction from Accident Site:	180°
Lowest Cloud Condition:	Unknown	Visibility	2 miles
Lowest Ceiling:	Overcast / 4300 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	260°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	23°C / 22°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	CHARLOTTE , NC (CLT)	Type of Flight Plan Filed:	IFR
Destination:	DAYTON , TN (2A0)	Type of Clearance:	IFR
Departure Time:	18:30 Local	Type of Airspace:	Class G

Airport Information

Airport:	SLOAN AIRPORT UNK	Runway Surface Type:	
Airport Elevation:		Runway Surface Condition:	
Runway Used:	0	IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	34.930759,-82.230445(est)

Administrative Information

Investigator In Charge (IIC):	Hicks, Preston
Additional Participating Persons:	WILLIAM NEELEY; COLUMBIA, SC KAREN C WALSH; ATLANTA, GA
Original Publish Date:	March 31, 1998
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=3656

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