



National Transportation Safety Board Aviation Accident Final Report

Location:	Gainesville, GA	Accident Number:	ATL02FA072
Date & Time:	04/01/2002, 1500 EST	Registration:	N7471C
Aircraft:	North American T-6-AT6D	Aircraft Damage:	Substantial
Defining Event:		Injuries:	2 Fatal

Flight Conducted Under: Part 91: General Aviation - Instructional

Analysis

The pilot and CFI were conducting a series of touch and go landings when smoke was seen streaming from the right lower section of the engine cowling after take off. Witnesses also reported hearing a rough engine condition. At approximately the same time, the pilot initiated a left turn towards the airport. The airplane was last seen in a nose low attitude. The airplane disappeared below the tree line and collided with the ground. Examination of the engine revealed damage throughout the supercharger assembly. The supercharge impeller was not totally secure on the impeller shaft. The impeller shaft retainer nut was loose on its shaft. This nut as well as the impeller shaft gear-teeth showed signs of wear. These teeth were worn down and disfigured. Both the aluminum cover plate and the bottom of the impeller blades showed signs of circular scraping. Small pieces of metal were found throughout the engine. Disassembly of the oil filter revealed metal shavings throughout. No metal parts or gear teeth were found in the oil sump.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power following a supercharger bearing failure and subsequent collision with the ground while maneuvering for an emergency landing.

Findings

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

Findings

1. (C) ENG ASSEMBLY, BLOWER/IMPELLER/INTEGRAL SUPERCHARGER - FAILURE, TOTAL

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: EMERGENCY LANDING

Findings

2. OBJECT - TREE(S)
3. MANEUVER TO AVOID OBSTRUCTIONS - NOT SUCCESSFUL - PILOT IN COMMAND(CFI)

Factual Information

HISTORY OF FLIGHT

On April 1, 2002, at 1500 eastern standard time, a North American, T-6-AT6D, N7471C, registered to U.S. Aircraft Inc, collided with trees, and the ground while maneuvering for an emergency landing at the Gilmer County Airport in Gainesville, Georgia. The instructional flight was operated by the private pilot under the provision Title 14 CFR Part 91 with no flight plan filed. Visual weather conditions prevailed at the time of the accident. The airplane sustained substantial damage, and the certified flight instructor (CFI) and the private pilot received fatal injuries. The instructional flight initially departed from Gainesville, Georgia, at 1425, on April 1, 2002.

The pilot's wife reported they had recently purchased the T-6 and were not familiar with it. At the recommendation of the sales broker, the CFI was selected to train them. They had flown several hours with the CFI and on the morning of the accident she had flown about two hours. After her flight, the pilot and CFI took off and flew to Lawrenceville, Georgia, where the airplane was refueled.

According to the pilot's wife, she and friends were seated on a bench near runway 29 when the pilot and CFI returned from Lawrenceville. They recalled that the pilot and CFI made several touch and go landings to runway 29. On the fifth landing and takeoff, they observed a light color smoke streaming from the right lower section of the engine cowling. They also reported hearing a rough engine condition. At approximately the same time, the pilot and CFI initiated a left turn towards the airport. The airplane was last seen in a nose low attitude. The airplane disappeared below the tree line and collided with trees and the ground about 1/4 mile from the departure end of runway 29.

PERSONNEL INFORMATION

Review of information on file with the Federal Aviation Administration (FAA) Airman's Certification Division, Oklahoma City, Oklahoma, revealed that the pilot being instructed was issued a private certificate pilot with ratings for airplane single multiengine land, and instrument airplane. Review of records on file with the FAA Aero Medical Records Division revealed that the pilot held a third class medical certificate issued July 24, 2001 with no restrictions. The pilot reported on his application for the medical certificate that he had accumulated 750 total flight hours.

The CFI was issued an Airline Transport Pilot certificate (ATP) August 16, 2000. FAA airmen records showed that the CFI was rated for airplane multiengine ATP and single engine land commercial level as well as multiple type ratings. Medical records revealed that the instructor was issued a first class medical certificate on March 1, 2001. The CFI had accumulated a total of 6650 hours, however his total flight experience in the T-6 was not determined.

AIRCRAFT INFORMATION

On February 19, 2002 the airplane was purchased by U.S. Aircraft, Inc. LLC. The registration application paperwork was completed March 8, 2002 but was still being processed at the time

of the accident.

Review of maintenance records revealed that the last annual inspection was conducted on October 10, 2001 at a total airframe time of 5440.11 and a total engine time of 553.3 since overhaul. At the time of purchase the engine had approximately 500 hours. The review of the engine maintenance logs showed that the engine was last overhauled in 1976. The engine oil was changed about 25 hours prior to the accident, during the pre-buy inspection. The engine oil filter was examined during the oil change and no contamination was detected in the filter material.

METEOROLOGICAL INFORMATION

Weather data was recovered from the nearest observation facility at Dekalb-Peachtree Airport, Atlanta, Georgia. The surface weather observation at 1453 EST was: clear sky, visibility 10 statute miles, temperature 21 degrees Celsius, wind from 290 degrees at 4 knots and barometric pressure of 30.01 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The examination of the accident site disclosed that airplane wreckage debris was scattered over an area approximately 40 feet long and 40 feet wide. The wreckage was orientated on a 200-degree magnetic heading. The accident site examination also showed that the airframe was separated into three major pieces. The left and right outboard wing sections were lodged in trees 20 feet northeast of the main wreckage. Both wing assemblies sustained leading edge crush damage. The main wreckage consisted of the engine assembly, empennage section, and the center carry-through wing section. Fuel was found in the engine driven fuel pump and fuel lines.

The flight controls and surfaces were also examined at the accident site. This examination established flight control movement from the flight control surfaces to the cockpit. The airplane was equipped with two flight control sticks and two engine throttle quadrants.

The engine assembly was attached to the airframe but was displaced aft at the bottom attach points into the engine firewall. The carburetor throttle control rods were also deformed and displaced from their normally installed positions. The propeller assembly was still attached to the engine.

Examination of the engine revealed damage throughout the supercharger assembly. The supercharger impeller was not totally secure on the impeller shaft. The supercharger impeller shaft retainer nut was loose on its shaft. This nut as well as the impeller shaft gear-teeth showed signs of wear. These teeth were worn down and disfigured. The steel spacer that sits on top of the impeller shaft bearing retainer showed signs of rubbing against its aluminum cover plate. Both the aluminum cover plate and the bottom of the supercharger impeller blades showed signs of circular scraping. Beneath the steel spacer of the supercharger impeller the bearing retainers were found broken. Small pieces of metal were found throughout the engine. Disassembly of the oil filter revealed metal shavings throughout. Several teeth on the idler gear were found to be separated from the gear. The intermediate gear also had numerous separated teeth. The front spark plugs were saturated with oil. No metal parts or gear teeth were found in the oil sump.

Examination of the airframe revealed that the right wing assembly was torn from the airframe

outboard the over wing step area. The left wing was torn from the airframe at the wing root. The vertical fin and horizontal stabilizer assemblies were still attached to the airframe. The tubular structure of the airframe sustained deformation damage and was evident throughout the entire tubular network. Both cockpit areas maintained their shapes but also sustained deformation to the seat attach points. The airplane was equipped with seat belt and shoulder harness restraint systems for both pilot stations. The examination of the restraint systems revealed that they were functional. The forward cockpit instrument panel was in the normally installed position, however the rear cockpit instrument panel sustained deformation damage and was displaced forward.

MEDICAL AND PATHOLOGICAL INFORMATION

The Forensic Medicine Associates, Inc. conducted postmortem examination of both the instructor and the private pilot on April 4, 2002. The CFI's cause of death was determined to be multiple blunt force trauma. The private pilot's cause of death was determined to be multiple blunt force trauma. The Toxicology and Accident Research laboratory, Federal Aviation Administration, Oklahoma City, Oklahoma performed postmortem toxicology of specimens from the pilot and instructor. No carbon monoxide, cyanide, ethanol or drug was detected in the blood of the instructing pilot. No carbon monoxide or cyanide was detected in the blood and no ethanol was detected in the vitreous of the private pilot. Pseudoephedrine was detected in the blood of the private pilot.

ADDITIONAL INFORMATION

During previous instructional flights the pilot and CFI noticed oil on the cowling and windscreen, and concluded that there was a small oil leak. A line service manager stated that prior to the accident flight he had to wait to refuel the aircraft because the pilot and instructor were working near the engine with the cowling removed. At 0900, 41.7 gallons of aviation fuel was purchased on the day of the accident.

The airplane wreckage was released to the family of the pilot.

Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	Age:	51, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Rear
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	Toxicology Performed:	Yes
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	03/01/2001
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	6550 hours (Total, all aircraft)		

Other Flight Crew Information

Certificate:	Private	Age:	62, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
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:	07/24/2001
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	833 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	North American	Registration:	N7471C
Model/Series:	T-6-AT6D	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	42-85550
Landing Gear Type:	Retractable - Tailwheel	Seats:	2
Date/Type of Last Inspection:	10/10/2001, Annual	Certified Max Gross Wt.:	4225 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	5440.11 Hours as of last inspection	Engine Manufacturer:	Pratt & Whitney
ELT:	Installed, not activated	Engine Model/Series:	R-1340
Registered Owner:	Roger D Henderson	Rated Power:	600 hp
Operator:	U.S. Aircraft Inc., LLC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	PDK, 1002 ft msl	Distance from Accident Site:	34 Nautical Miles
Observation Time:	1453 EST	Direction from Accident Site:	229°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	4 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	290°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.01 inches Hg	Temperature/Dew Point:	21° C / 4° C
Precipitation and Obscuration:			
Departure Point:	Gainesville, GA (GVL)	Type of Flight Plan Filed:	None
Destination:	Gainesville, GA (GVL)	Type of Clearance:	Unknown
Departure Time:	EST	Type of Airspace:	Class G

Airport Information

Airport:	Lee Gilmer Memorial (GVL)	Runway Surface Type:	Asphalt
Airport Elevation:	1275 ft	Runway Surface Condition:	Unknown
Runway Used:	290	IFR Approach:	None
Runway Length/Width:	4001 ft / 100 ft	VFR Approach/Landing:	Touch and Go

Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	34.273056, -83.826944

Administrative Information

Investigator In Charge (IIC):	Phillip Powell	Report Date:	11/25/2003
Additional Participating Persons:	Beotis Wright; Federal Aviation Administration; College Park, GA Sam Thompson; Tulsa Aircraft Engines; Tulsa, OK		
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 pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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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](#).