



National Transportation Safety Board Aviation Accident Final Report

Location:	BINGHAMPTON, NY	Accident Number:	NYC00FA023
Date & Time:	11/01/1999, 0616 EST	Registration:	N511AR
Aircraft:	Cessna T303	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 Serious, 2 Minor
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

While in cruise flight, at 6,000 feet, the left engine lost power. The pilot attempted a restart of the engine, but only about one-half rotation of the left engine propeller was observed, and the engine was secured. The pilot stated that he was unable to maintain altitude and initiated a decent. He requested and was cleared for an instrument approach at an airport where the weather conditions were, 1/4 statute mile of visibility, fog, and a vertical visibility of 100 feet. On the approach, at the minimum decent altitude, the pilot executed a missed approach. As the airplane climbed, the pilot reported to the controller that the 'best altitude [he] could get was 2,200 feet.' A second approach was initiated to the reciprocal runway. While on the second approach, the pilot 'was going to fly the aircraft right to the runway, and told the controller so.' He put the gear down, reduced power, and decided there was 'no hope for a go-around.' He then 'flew down past the decision height,' and about 70-80 feet above the ground, 'added a little power to smooth the landing.' The pilot also stated, 'The last thing I remember was the aircraft nose contacting the runway.' A passenger stated that once the pilot could not see the runway, [the pilot] 'applied power, pitched the nose up,' and attempted a 'go-around' similar to the one that was executed on the first approach. Disassembly of the left engine revealed that the crankshaft was fatigue fractured between connecting rod journal number 2 and main journal number 2. Review of the pilot's operating handbook revealed that the single engine service ceiling, at a weight of 4,800 pounds, was 11,700 feet. The average single engine rate of climb, at a pressure altitude of 6,000 feet, was 295 feet per minute. The average single engine rate of climb, at a pressure altitude of 1,625 feet, was 314 feet per minute. Review of the ILS approach plate for Runway 34 revealed that the decision height was 200 feet above the ground.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper in-flight decision to descend below the decision height without the runway environment in sight, and his failure to execute a missed approach. A factor in the accident was the failed crankshaft.

Findings

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

Findings

1. 1 ENGINE
2. (F) ENGINE ASSEMBLY,CRANKSHAFT - FRACTURED

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: APPROACH

Findings

3. TERRAIN CONDITION - RUNWAY
4. (C) IN-FLIGHT PLANNING/DECISION - IMPROPER - PILOT IN COMMAND
5. (C) MISSED APPROACH - NOT PERFORMED - PILOT IN COMMAND
6. DECISION HEIGHT - DISREGARDED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On November 1, 1999, about 0616 Eastern Standard Time, a Cessna T303, N511AR, registered to Twin Cities Air Service Incorporated, was substantially damaged while landing at the Binghamton Regional/Edwin A. Link Airport, Binghamton (BGM), New York. The certificated commercial pilot received serious injuries and two passengers received minor injuries. Instrument meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan was filed for the on-demand air taxi service, conducted under 14 CFR Part 135.

According to the pilot, he conducted a preflight inspection of the airplane and added a quart of oil to each of the airplane's two engines prior to departing from the Auburn/Lewiston Airport, Auburn, Maine, at 0320. The pilot then flew the airplane to the Portland International Airport (PWM), Portland, Maine. The flight took about 12 minutes and was uneventful. At PWM, two passengers boarded the airplane, and the flight departed, destined for the Youngstown-Warren Regional Airport, Youngstown, Ohio. About 2 hours into the flight, at 6,000 feet, the left engine "suddenly stopped." The left engine oil pressure gauge fluctuated and then went to zero. The pilot observed the propeller to be "windmilling, but turning at a rate."

After the left engine failed, the pilot placed the throttles, mixture, and prop controls for both engines in the full forward position to attempt a restart of the left engine, but since "we were in cruise mode, I did not immediately try to feather the engine, but tried the obvious restart procedures." During the attempted restart, the pilot observed only about one-half rotation of the left engine propeller. He also changed the position of the fuel selector to the left engine, but could not remember what position he finally selected. The boost pump switch was placed in the low position, and then into the high position. Both magnetos were shut off for the left engine, and the pilot attempted to feather the propeller. The attempt to feather the propeller failed. The pilot believed "the prop was turning slower than normal, [and] the locks may have come out, making it impossible to feather." The pilot did recall that the propeller eventually feathered later in the flight.

The pilot added that during the processes of attempting to restart the engine, and then securing it, he noticed that the airplane's speed was "slowly bleeding down, to a point when it got to blue line." The pilot pitched the airplane down to maintain the blue line speed. Unable to maintain the airplane's altitude, the pilot initiated a descent. The airplane descended to 3,200 feet, described by the pilot as a "slow, gradual, sink."

Once the left engine was secured, the pilot radioed to the Binghamton Approach controller that he "had an engine failure" and needed to land at the "closest VFR airport." According to the pilot, the controller replied that the closest VFR airport was 60 miles away. The pilot decided to land at BGM because it was nearby and he knew they had radar on the field.

An instrument landing system (ILS) approach was conducted to Runway 16 at BGM. On final approach, the landing gear was not selected to the down position until the last minute so that the pilot would have the option of executing a go-around. Once he descended to his minimum descent altitude, the only visual contact the pilot had with the runway environment were 3 unidentified lights, and a missed approach was initiated. As the airplane climbed, the pilot reported to the controller that the "best altitude [he] could get was 2,200 feet." Since the approach called for a higher altitude, the controller "started" him in on an ILS approach to

Runway 34 "inside the marker."

The pilot added that, while on the second approach, "I was going to fly the aircraft right to the runway, and told the controller so." The pilot put the gear down, reduced power, and decided there was "no hope for a go-around." He then "flew down past the decision height," and about 70-80 feet above the ground, he "added a little power to smooth the landing." The pilot also stated, "The last thing I remember was the aircraft nose contacting the runway, I may have instinctively pushed the throttle forward..."

A passenger stated that once the pilot could not see the runway, "he [the pilot] applied power, pitched the nose up," and attempted a "go-around" similar to the one that was executed on the first approach. The airplane's wing tip then hit the ground.

The accident occurred during the hours of dawn approximately 42 degrees, 12 minutes north latitude, and 75 degrees, 58 minutes west longitude.

PILOT INFORMATION

The pilot held a commercial pilot certificate with ratings for airplane single engine and multi-engine land, instrument airplane. He also held a flight instructor certificate for airplane single engine land, instrument airplane.

The pilot's most recent Federal Aviation Administration (FAA) first class medical certificate was issued on January 18, 1999.

The pilot reported approximately 2,430 hours of flight experience, 200 hours of which were in multi-engine airplanes, and 60 hours of which were in make and model airplane.

The pilot reported 180 hours of flight experience in the 90 days prior to the accident. His most recent biennial flight review was August 27, 1999, which was conducted in the Cessna T303.

AIRCRAFT INFORMATION

On April 30, 1994, the left engine was removed from the airplane and overhauled. During the overhaul, all steel parts were magnafluxed, and all aluminum parts were zygloed. The engine was then re-installed on the airplane. The engine's total time at overhaul was 3,596 hours and it had accumulated about 1,874 hours since.

The last maintenance performed on the engine was on October 20, 1999. It included an oil change and oil filter replacement.

METEOROLOGICAL INFORMATION

The weather reported by BGM at 0608 was; winds calm, 1/4 statute mile of visibility, fog, vertical visibility of 100 feet, temperature and dew point of 45 degrees Fahrenheit.

WRECKAGE INFORMATION

The wreckage was examined on November 1, 1999, at the accident site. The airplane came to rest on Runway 34; about 1,900 feet from the approach end, on a heading of about 290 degrees, and at an elevation of 1,636 feet mean sea level. All major components of the airplane were accounted for at the accident site.

The nose landing gear was collapsed, and exhibited scaring along the left side of the wheel forks. The forward nose cone section was crushed upward and to the right. It displayed scraping along the underside. The main landing gear were extended and locked.

The right outboard wing section, which was exposed to a post crash fire, exhibited rearward buckling, and damage along the wing tip. All control cables and fuel lines remained connected between the wing firewall and the right engine. Powerplant control cable continuity was confirmed from the cockpit to the engine. The right engine throttle lever, propeller control, and mixture control, were all found in the full forward position. Fuel was observed draining from the fuel lines as the engine was removed from the fuselage. The right wing fuel tank was not damaged and contained an undetermined amount of fuel.

The outboard section of the left wing exhibited damage from the impact and post crash fire. All control cables and fuel lines remained connected between the wing firewall and the left engine. Powerplant control cable continuity was confirmed from the cockpit to the engine. The left engine throttle lever, and propeller control were found in the full aft position. The mixture control was found in the mid-range position. A small amount of fuel was observed draining from the fuel lines as the engine was removed from the fuselage. The left wing fuel tank was compromised and did not contain any fuel.

Flight control continuity was confirmed from the cockpit area to the ailerons, rudder, and elevator. The flaps were found in the full extend position, which corresponded with the selector position located in the cockpit.

The left engine was inspected after being removed from the wreckage. It exhibited damage due to the post-crash fire. The engine was rotated by hand, using the propeller. Some resistance was noted during the rotation. The number 6 cylinder was damaged during the impact sequence and displayed exposed valves. Thumb compression was only confirmed to the number 3 and 5 cylinders. No compression could be determined for the remaining four cylinders. The top and bottom spark plugs were removed; their electrodes were intact and light gray in color. The left and right magnetos were removed from the engine and rotated by hand, producing spark on all towers. While the engine was rotated, the accessory drive section gears and the number 1 and 2 cylinder valves did not show any signs of movement. The propeller remained attached to the engine. Two of the three propeller blades were in the feather position. The remaining blade was in a high pitch position and bent 90 degrees about 9 inches from the hub. The counterweight for the bent propeller blade was found detached from the hub and was located along the debris path.

The fuel manifold valve on the left engine was inspected. The diaphragm was dry, but exhibited a smell of aviation fuel. The fuel screen was free of debris. The fuel selector control for the left tank was found in the crossfeed position, and the right tank selector was in-between the on and off positions.

TESTS AND RESEARCH

The airplane's left engine was examined at Hagerstown, Maryland, on December 8, 1999, under the supervision of a Safety Board Investigator.

Removal of the engine oil sump revealed large pieces of metal and metal shavings in the sump and trapped in the oil sump suction screen.

Disassembly of the engine revealed that the crankshaft was fractured between connecting rod journal number 2 and main journal number 2.

The crankshaft was forwarded to the Safety Board's materials lab on December 9, 1999. Fracture surfaces on the crankshaft were examined by optical microscopy. The fracture surface

on the aft section of the crankshaft was destroyed by post-fracture damage. The fracture surface on the forward section of the crankshaft displayed several areas of smooth features, curving boundaries, and ratchet marks, all typical of fatigue.

ADDITIONAL INFORMATION

Review of the Cessna T303 pilot's operating handbook revealed that the single engine service ceiling, at a weight of 4,800 pounds, with the landing gear and flap in the retracted position, was 11,700 feet.

The average single engine rate of climb, at a pressure altitude of 6,000 feet, a temperature of -5 degrees centigrade, and a weight of 4,800 pounds, was 295 feet per minute.

The average single engine rate of climb, at a pressure altitude of 1,625 feet, a temperature of 7.5 degrees centigrade, and a weight of 4,800 pounds, was 314 feet per minute.

Review of the ILS approach plate for Runway 34 revealed that the decision height was 200 feet above the ground.

The airplane wreckage was released on November 1, 1999, to a representative of the owner's insurance company.

Pilot Information

Certificate:	Flight Instructor; Commercial	Age:	27, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane Single-engine; Instrument Airplane	Toxicology Performed:	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	07/22/1999
Occupational Pilot:	Last Flight Review or Equivalent:		
Flight Time:	2430 hours (Total, all aircraft), 60 hours (Total, this make and model), 2280 hours (Pilot In Command, all aircraft), 180 hours (Last 90 days, all aircraft), 50 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N511AR
Model/Series:	T303 T303	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	T30300192
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	10/20/1999, AAIP	Certified Max Gross Wt.:	5150 lbs
Time Since Last Inspection:	9 Hours	Engines:	2 Reciprocating
Airframe Total Time:	5480 Hours	Engine Manufacturer:	Continental
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	TSIO-520-AE
Registered Owner:	TWIN CITIES AIR SERVICE INC	Rated Power:	250 hp
Operator:	TWIN CITIES AIR SERVICE INC	Operating Certificate(s) Held:	On-demand Air Taxi (135)
Operator Does Business As:		Operator Designator Code:	IWVA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Dawn
Observation Facility, Elevation:	BGM, 1636 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	0608 EST	Direction from Accident Site:	0°
Lowest Cloud Condition:	Unknown / 0 ft agl	Visibility	0.25 Miles
Lowest Ceiling:	Overcast / 100 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	Calm /	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	7° C / 7° C
Precipitation and Obscuration:			
Departure Point:	PORTLAND, ME (PWM)	Type of Flight Plan Filed:	IFR
Destination:	YOUNGSTOWN, OH (YNG)	Type of Clearance:	IFR
Departure Time:	0415 EST	Type of Airspace:	Class D

Airport Information

Airport:	BINGHAMTON REGIONAL APRT (BGM)	Runway Surface Type:	Asphalt
Airport Elevation:	1636 ft	Runway Surface Condition:	Dry
Runway Used:	34	IFR Approach:	ILS
Runway Length/Width:	7501 ft / 150 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:	2 Minor	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious, 2 Minor	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	STEPHEN M DEMKO	Report Date:	07/17/2001
Additional Participating Persons:	RICHARD P LANSILL; ROCHESTER, NY EMILE J LOHMAN; WITCHITA, KS GEORGE HOLLINGSWORTH; MOBILE, AL		
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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