Aviation Investigation Final Report

Location:	MORRISTOWN, New Jersey	**Accident Number:**	NYC00LA055
Date & Time:	December 19, 1999, 13:58 Local	**Registration:**	N7397Y
Aircraft:	Piper PA-30	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

While taking off, the pilot rotated the airplane at a speed below Vmc. As the airplane began to climb, the pilot and passenger, who was a certificated multi-engine flight instructor, observed the stall warning light illuminate, and the pilot lowered the nose to attain Vyse. The right engine then began to loose power. The pilot applied full power to the left engine, along with left rudder and the passenger retracted the landing gear. The airplane banked to the right and descended to the ground. The pilot additionally stated, 'The airplane just did not get enough speed up,' and suspected that the engine failure was from water in the fuel system. Prior to flight the pilot and passenger observed 'a little bit' of water on the asphalt, which came from the right side fuel drain when the airplane was pre-flight inspected. After the accident, a FAA inspector examined the area where the airplane was pre-flight inspected and did not observe any fuel stains on the asphalt. The airplane was last flown 30 days prior to the accident. A FAA Airworthiness Directive stated that to eliminate water contamination of the aircraft fuel supply, an inspection was required at each 50 hours of operation. Maintenance records dated after September 16, 1997 did not reveal any compliance of the AD, and the airplane had accumulated about 281 hours of operation. The airplane owner's manual stated, 'Accelerate to single engine minimum control speed (Vmc) before applying stronger back pressure for rotation.' The owner's manual also stated that, 'On take-off the aircraft should be kept either on, or near the runway, until reaching Vmc.' The FAA Airplane Flying Handbook (AFH), stated, 'If the airplane has just become airborne and the airspeed is at or below Vmc when the engine fails, the pilot could avoid a serious accident by retarding both throttles immediately. If this action is not taken immediately, the pilot will be unable to control the airplane.' It additionally stated, 'THE AIRPLANE SHOULD NEVER LEAVE THE GROUND BEFORE Vmc IS REACHED. Preferably, Vmc + 5 knots should be attained.' The AFH also stated, 'Sufficient fuel should be drained from the fuel strainer quick drain and from each fuel tank sump to check for fuel grade/color, water, dirt, and smell. If water is found in the first fuel sample, further samples should be taken until no water appears.'

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to obtain proper takeoff airspeed and his failure to follow published emergency procedures. Factors related to the accident were the pilot's inadequate preflight and water contamination of the fuel system.

Findings

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

Findings
1. 1 ENGINE
2. (F) AIRCRAFT PREFLIGHT - INADEQUATE - PILOT IN COMMAND
3. (F) FUEL SYSTEM - CONTAMINATION,WATER
4. MAINTENANCE,COMPLIANCE WITH AD - NOT COMPLIED WITH - PILOT IN COMMAND

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: TAKEOFF

Findings
5. (C) AIRSPEED(VMC) - NOT ATTAINED - PILOT IN COMMAND
6. (C) EMERGENCY PROCEDURE - NOT FOLLOWED - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
7. TERRAIN CONDITION - RUNWAY

Factual Information

On December 19, 1999, about 1358 Eastern Standard Time, a Piper PA-30, N7397Y, was substantially damage while taking off from the Morristown Municipal Airport, Morristown (MMU), New Jersey. The certificated commercial pilot and pilot rated passenger were not injured. Visual meteorological conditions prevailed, and no flight plan was filed for the personal flight conducted under 14 CFR Part 91.

According to a Federal Aviation Administration (FAA) inspector, the pilot was taking off from Runway 5, a 5,999-foot long asphalt runway. About 100-150 feet above the ground, the right engine lost power. The pilot added full power to the left engine, and applied left rudder. The airplane then started to roll to the right and the pilot decreased power to the left engine. The airplane began to descend, and the right wingtip struck the ground about 100 feet from the right side of the runway. The airplane then cartwheeled and came to rest inverted.

The pilot rated passenger, who was a certificated multi-engine flight instructor and seated in the right front seat of the airplane, stated that the airplane accelerated normally until takeoff speed was reached. As the airplane started a positive rate of climb, the passenger looked over at the instrument panel and did not see anything abnormal, but did observe the stall warning light illuminate once. The airplane continued to climb and there was no concern that anything was wrong by the passenger until he realized that the pilot had not retracted the landing gear and the airplane was not accelerating as it normally does. The airplane started to drift over to the right side of the runway and the passenger noticed that the fuel flow gauges were not "matching up," with the right engine fuel flow gauge considerably lower than the left. The passenger made the pilot aware of the gauge indifference and offered to raise the landing gear. The pilot concurred and the passenger raised the landing gear. The airplane then started to descend and impacted the ground on the right side of the runway. After the airplane came to rest, the passenger switched off both fuel selectors and the master electrical switch. The passenger added that in the past, the pilot "liked to sump the fuel drain while he was taxiing."

A witness, who observed the airplane as it was about 2/3 down the runway, and about 15-20 feet above the ground, stated that the airplane was pitching "slightly" up, but the wings were level. The airplane then made a "more extreme" pitch up, rolled to right and descended out of sight behind trees.

A second witness, who was located in the air traffic control tower, observed the airplane takeoff, then dip to the right and impact the ground about 5,000 down the runway.

The pilot stated that he and a second pilot performed a walk around of the airplane and conducted a pre-flight inspection. The inspection included a check of the fuel and oil. Pulling a lever inside the airplane, the pilot drained the fuel, and it exited from the bottom of the

airplane, onto the ground. The pilot then climbed from the airplane and looked at the sample on the ground, observing "a little bit" of water from the right side drain. The pilot said that the drained fuel sample usually left a stain on the ground that was about 2 feet in diameter. The airplane was taxied to the runway and a run-up was performed. A takeoff was then initiated and the airplane was rotated at a speed below single engine minimum control speed (Vmc). As the airplane began to climb, the pilot lowered the nose to attain the single engine best rate of climb speed (Vyse). The stall warning light illuminated and the right engine lost power. The pilot applied full power to the left engine, and added left rudder. The airplane began to bank to the right and the pilot decreased power to the left engine. The airplane continued to bank to the right and descended to the ground. The pilot additionally stated the "The airplane just did not get enough speed up," and suspected that the engine failure was from water in the fuel system.

According to the pilot, he had last flown the airplane about one month prior to the accident to Orange County Airport, Montgomery, New York, where it was fueled. The airplane had not been flown since that time. He also recalled that the fuel tanks were about 7/8 full the day of the accident.

After the accident, a FAA inspector examined the area where the airplane was pre-flight inspected by the pilot, he did not observe any fuel stains on the asphalt.

The wreckage was examined on December 23, 1999, inside a heated fixed base operation hanger. The bottom spark plugs were removed from both engines and residual engine oil was observed on the electrodes. By rotating the propellers on both engines, valve train continuity and thumb compression was confirmed. Inspection of the left engine propeller revealed S-bending, chordwise scratching, and nicks to the leading edges of both blades. The right engine propeller exhibited rearward bending to one blade and forward bending to the upper 5 inches of the second blade. Impact marks were also noted on the upper leading edges of the propeller.

The left and right engine fuel dividers were examined, and each contained about one ounce of liquid similar to aviation fuel. The fuel was absent of contaminates. The right fuel selector drain cap was removed from the fuselage and contained about 1/2 ounce of liquid. The liquid was similar to aviation fuel, and was absent of contaminates.

According to FAA Airworthiness Directive 79-12-08, "To eliminate water contamination of the aircraft fuel supply, accomplish a check in accordance with...[Piper] Service Letter 851...Compliance required within 50 hours of operation after the effective date of this AD and at each 50 hours of operation thereafter."

According to Piper Service Letter 851, "The accumulation of water in the fuel tanks and related lines could cause rough engine operation or complete power interruption if the water freezes during cold weather operation."

Examination of airplane maintenance records forwarded to the Safety Board by the pilot's attorney did not reveal any compliance of AD 79-12-08 after September 16, 1997. The airframe total time on September 16, 1997 was 3,053.8 hours. The last maintenance performed on the airplane was on November 15, 1999, with an airframe total time of 3,332.5 hours.

At the time of the accident, the airplane's reported total time was 3,334.7 hours.

The FAA approved Airplane Flight Manual did not require draining the fuel strainers until the Before Starting Engines checklist. The Airplane Owners Handbook required the draining of the fuel strainer sump prior to the external preflight check.

FAA-H8083-3, Airplane Flying Handbook stated, "Sufficient fuel should be drained from the fuel strainer quick drain and from each fuel tank sump to check for fuel grade/color, water, dirt, and smell. If water is present, it will usually be in bead-like droplets, different in color (usually clear, sometimes muddy), in the bottom of the sample. In extreme cases, do not overlook the possibility that the entire sample, particularly a small sample, is water. If water is found in the first fuel sample, further samples should be taken until no water appears. Significant and/or consistent water or sediment contamination are grounds for further investigation by qualified maintenance personnel."

According to the Owner's handbook takeoff and climb procedures section, "During take-off roll apply light back pressure to the control wheel to avoid porpoising during the take-off run. Accelerate to single engine minimum control speed (Vmc) before applying stronger back pressure for rotation."

According to the Owner's handbook emergency procedures section, "If engine failure occurs during climb out after take-off, maintain directional control with rudder and ailerons, and establish the best single engine rate of climb airspeed... Speeds below or above the best rate of climb airspeed will result in lower than optimum rate of climb"

The owner's manual also stated that, "On take-off the aircraft should be kept either on, or near the runway, until reaching Vmc."

FAA-H8083-3, Airplane Flying Handbook, also stated, "If the airplane has just become airborne and the airspeed is at or below Vmc when the engine fails, the pilot could avoid a serious accident by retarding both throttles immediately. If this action is not taken immediately, the pilot will be unable to control the airplane." It additionally stated, "THE AIRPLANE SHOULD NEVER LEAVE THE GROUND BEFORE Vmc IS REACHED. Preferably, Vmc + 5 knots should be attained."

The reported MMU weather at 1350 was, winds from 080 degrees at 10 knots, temperature of 39 degrees Fahrenheit, dew point of 16 degrees Fahrenheit, and a barometric pressure of 30.41 inches of mercury.

Pilot Information

Certificate:	Commercial; Private	**Age:**	71,Male
Airplane Rating(s):	Single-engine land; Multi-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:**	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	June 1, 1998
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	2078 hours (Total, all aircraft), 702 hours (Total, this make and model), 1738 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N7397Y
Model/Series:	PA-30 PA-30	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	455
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	November 15, 1999 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:	2 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	3335 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-320-B1A
Registered Owner:	DONALD P. TOMPKINS	**Rated Power:**	160 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:	MMU ,187 ft msl	**Distance from Accident Site:**	
Observation Time:	13:50 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Scattered / 20000 ft AGL	**Visibility**	20 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	80°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	4°C / -9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(MMU)	**Type of Flight Plan Filed:**	None
Destination:	MONTGOMERY , NY (MGJ)	**Type of Clearance:**	None
Departure Time:	13:58 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	MORRISTOWN MUNICIPAL APT MMU	**Runway Surface Type:**	Asphalt
Airport Elevation:	187 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	5	**IFR Approach:**	None
Runway Length/Width:	5999 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	Demko, Stephen
Additional Participating Persons:	BOB BROMIRSKY; TETERBORO , NJ
Original Publish Date:	August 13, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=48399