Aviation Investigation Final Report

Location:	NewPhiladelphia, Ohio	**Accident Number:**	IAD03FA058
Date & Time:	June 16, 2003, 15:42 Local	**Registration:**	N8162Y
Aircraft:	Piper PA-30	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

While on a long cross country flight, the left engine shut down in-flight and had to be restarted. The pilot then landed and refueled the airplane. While the airplane was being refueled, he asked the lineman if the left outboard tank was empty, and the fueler confirmed that it was. The pilot also stated that he thought that he had run the tank dry, and that the engine was burning more fuel than anticipated. He purchased 55 gallons of fuel and departed. About 2 hours later, while maneuvering near New Philadelphia, Ohio, a review of the last 4 minutes of recorded GPS data revealed the airplane had decelerated from 110 miles per hour (mph) to 84.9 mph, and descended from 1,699 feet to 923 feet, before the data ended. Witnesses heard the airplane having engine trouble, and observed the airplane make a left turn, then roll upside down, before it hit the ground. Examination of each of the four fuel-bladder tanks revealed that the left outboard tank was intact and empty, and the left inboard tank was empty, but breached at the engine nacelle. The right inboard tank was intact and about 1/4-full of fuel. The right outboard tank was intact, and a small amount of fuel was in the tank, but fuel was observed draining from the tank at the accident site. The fuel selector handles were set to the outboard tanks. According to the Piper Comanche Owner's Manual, "Vmc is the calibrated airspeed, determined by FAA test pilots, below which a twin engine aircraft cannot be controlled in flight with one engine operating at take-off power and the other engine wind milling." The Vmc, which the FAA had determined for this airplane, was 90 mph.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's mismanagement of the fuel, and his failure to maintain minimum controllable airspeed with one engine inoperative.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: MANEUVERING

Findings
1. (C) FLUID,FUEL - EXHAUSTION
2. (C) FUEL MANAGEMENT - IMPROPER - PILOT IN COMMAND
3. 1 ENGINE

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

Findings
4. (C) AIRSPEED(VMC) - NOT MAINTAINED - PILOT IN COMMAND

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

Findings
5. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On June 16, 2003, at 1542 eastern daylight time, a Piper PA-30, N8162Y, was substantially damaged when it collided with terrain near New Philadelphia, Ohio. The certificated private pilot, and the passenger were fatally injured. No flight plan was filed for the flight that originated at Crawfordsville Airport (CFJ), Crawfordsville, Indiana, about 1332, destined for Butler County/K.W. Scholter Field (BTP), Butler, Pennsylvania. Visual meteorological conditions prevailed for the personal flight conducted under 14 CFR Part 91.

The pilot departed Lee's Summit Municipal Airport (LXT), Lee's Summit, Missouri, at 1116, on a visual flight rules (VFR) flight plan, destined for New Castle-Henry County Municipal Airport (UWL), New Castle, Indiana. Instead, he landed at Crawfordsville Airport, at 1301, without closing his flight plan, and purchased 55.36 gallons of 100 LL fuel for the airplane.

According to a fueler at Crawfordsville Airport, he first filled the left outboard tank, and noticed that it looked dry. He then proceeded to fill the left inboard tank, when the pilot approached him, and asked if the left outboard tank had looked empty to him. The fueler replied that it had looked empty.

The pilot told the fueler that he thought he had run the left outboard tank dry while en route, because the left engine had shut down in flight and had to be restarted. The pilot also mentioned that he thought the left engine must have been burning more fuel than he had anticipated. The pilot paid for the fuel and departed.

Several witnesses observed and heard the airplane. A witness, a retired Trooper from the Ohio State Highway Patrol, was standing in an auto salvage yard, when she heard the sound of an airplane having engine trouble. She looked up and saw the airplane flying slow and low (about 1,500 above ground level), headed south-southeast toward Harry Clever Field (NPH), New Philadelphia, Ohio. She only heard the sound of one engine, and it was "sputtering" as if it were struggling for fuel. The witness saw no signs of debris or smoke trailing the airplane.

A second witness, who was in his shop at Harry Clever Field, said that the airplane passed just south of the airport in a west-northwest direction, at about 100 feet. The airplane was level with the landing gear up, and the engines were "sputtering." The airplane held its altitude until it crossed a tree line, then started a shallow left turn, and descended out of sight.

A third witness, who was refueling a loader at a sand and gravel quarry, heard an airplane that "didn't sound right." He looked up and saw the airplane coming from the east, then turn south. The witness said it looked like the airplane was trying to "turn and overturned and came

straight down inverted."

A fourth witness, who was talking to the witness refueling the loader, saw the airplane turn left, then upside down, and hit the ground. He said it didn't sound like the airplane was having engine trouble.

A hand-held Garmin 295 Global Positioning System (GPS) receiver was located near the main wreckage. Information downloaded from the receiver revealed that the entire flight was recorded, in addition to a stored route from Lee's Summit, Missouri, to Butler, Pennsylvania. When the airplane's flight track data was downloaded and compared to the stored route of flight, it paralleled a majority of the stored route of flight.

A review of the recorded data revealed that when the airplane was east of the Port Columbus Airport (CMH), Columbus, Ohio, it turned northeast, off of the stored route of flight. After flying northeast for several minutes, the airplane made a right turn and flew on a southeasterly heading for several more minutes, before it made a left, approximately 360-degree turn, and headed northwest towards Harry Clever Field.

Examination of the last 4 minutes of recorded data revealed that the airplane decelerated from 110 miles per hour (mph) to 84.9 mph, changed heading from 199 degrees to 215 degrees, and descended from 1,699 feet to 923 feet, before the data ended at 1542.

The last position recorded by the GPS was 40 degrees, 27 minutes north latitude, and 81 degrees, 26 minutes west longitude.

The accident occurred during the hours of daylight approximately 40 degrees, 28 minutes north latitude, and 81 degrees, 26 minutes west longitude.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with ratings for airplane single engine land, multiengine land, and instrument airplane. His most recent Federal Aviation Administration (FAA) third class medical was issued on July 16, 2002.

Examination of the pilot's logbook revealed that he had accrued a total of 956.7 flight hours, of which, 159.3 hours were in make and model.

On June 13, 2003, the pilot flew for one hour with a certified flight instructor, who was also a Federal Aviation Administration (FAA) Designated Pilot Examiner, and practiced left engine restart procedures, single-engine stalls, Vmc (velocity minimum control) demonstrations, aborted take-offs, go around procedures, and single-engine landings. According to the instructor, the pilot's flying skills were "excellent," but he was "vague" on fuel cross-feeding procedures.

METEORLOGICAL INFORMATION

Weather reported at the airport, at 1553, included winds from 120 degrees at 7 knots, temperature 75 degrees F, dew point 64 degrees F, and barometric pressure setting of 30.13 inches Hg. The visibility was 9 statute miles and clear.

WRECKAGE AND IMPACT INFORMATION

The airplane was examined at the site on June 17-18, 2003. All major components were accounted for at the scene. The airplane came to rest inverted on the shoreline of a lake located inside a sand and gravel quarry. It was on a heading of 168 degrees magnetic, at a ground elevation of approximately 900 feet, about 1 nautical southwest of Harry Clever Field.

The initial impact point was a large hill of piled dirt located directly behind where the airplane came to rest. Examination of the top of the dirt pile revealed a 4-foot-long ground scar consistent with the dimensions of the airplane's wing. To the right of the ground scar, was another impact mark, where a 12-inch-long section of a propeller blade was embedded.

Also located around these impact marks were pieces of Plexiglas and broken landing light.

The cockpit area exhibited impact damage. The empennage was buckled around the area of the "N" numbers, and there was no damage to any of the tail control surfaces. The tip of the vertical stabilizer came to rest in the dirt.

A section of the outboard right wing was separated, and came to rest about 15 feet to the right of the main wreckage, and exhibited impact damage. The wing tip was located behind the main wreckage settled in brush on the dirt hillside. The inboard section of the wing was intact and attached at the wing root.

The outboard section of the flap was pushed aft, and the aileron was attached to the inboard hinge and exhibited impact damage.

The left wing was intact and exhibited leading edge impact damage along the entire length of the wing. The wing tip, aileron, and were intact. The flap was in the retracted position.

The throttles, mixture, and propeller controls were found in the full forward position.

The main landing gear were retracted.

The fuel selector handles were found selected to the outboard tanks.

Flight control continuity was established for each flight control surface to the cockpit.

Examination of each of the four fuel-bladder tanks revealed that the left outboard tank was

intact and empty, and the left inboard tank was empty, but breached at the engine nacelle. The right inboard tank was intact and about 1/4-full of fuel. The right outboard tank was intact, and a small amount of fuel was in the tank. Fuel was observed draining from the tank at the accident site.

Both engines were pushed up and aft from the mounts.

Examination of the left propeller assembly revealed that both propeller blades were intact at the hub, and not loose. The spinner exhibited longitudinal scoring and impact damage. An examination of one blade revealed that it was straight, with leading and trailing edge damage near the tip, and chordwise scratching.

The second blade was twisted in the hub, curled, and bent aft. It exhibited leading edge and chordwise scratching.

The left engine was manually rotated by the propeller, and compression and valve train continuity were established for each cylinder. During the compression check, spark was produced to each ignition lead except the #1 bottom, because it was torn. However, spark was noted at the tear. Internal examination of each cylinder with a lighted borescope revealed that the top of each piston exhibited light tan colored deposits.

The spark plugs were removed and appeared white to light gray in color.

Examination of the fuel injector revealed that the mixture control arm was in the full 'rich' position, and the throttle arm was in the full forward position.

A small amount of fuel was found in the engine driven fuel pump. When the actuating arm was manipulated, fuel discharged from the outlet fitting.

Fuel was found in the fuel injector, and the finger screen was absent of debris.

The fuel manifold assembly was intact, and disassembled. The piston/diaphragm were intact, and when manipulated, fuel was drawn out of the manifold chamber.

Three of the four fuel injector nozzles were removed from their respective cylinders and examined. Each of the nozzles were absent of debris. The fourth nozzle could not be removed, so a flashlight was placed up the cylinder intake port. Light was observed through the nozzle opening.

Carbon deposits and two, 1-inch-long slivers of gasket material were found in the oil suction screen. The oil filter was absent of debris.

Examination of the right propeller assembly revealed that both blades were intact at the hub. However, approximately 12 inches of one blade was missing, but subsequently located on the

dirt hillside behind the airplane. The blade exhibited S-bending, leading edge damage, and scoring along the entire length of the blade.

The other blade was bent aft, exhibited leading edge nicks at the tip, and scoring on the front face of the blade. Longitudinal scoring was also observed around the entire circumference of the spinner.

Rotational score marks were found on the surface of the starter nose housing and the generator pulley.

The right engine was manually rotated by the vacuum pump drive. During rotation, compression and valve train continuity was established to each cylinder. During the compression check, spark was produced on each ignition lead.

Internal examination of each cylinder with a lighted borescope revealed the top of each piston exhibited light tan colored deposits. Each spark plug appeared light gray to white in color.

Examination of the fuel injector revealed that the mixture control arm was in the full 'rich' position, and the throttle arm was in the full forward position. Fuel was found in the inlet screen chamber, and the screen was absent of debris.

Fuel was found in the engine drive fuel pump chambers. When the actuating arm was manipulated, fuel exited the outlet fitting.

The fuel manifold assembly was intact, and disassembled. The piston/diaphragm were intact, and when manipulated fuel was drawn out of the manifold chamber.

All four fuel injector nozzles were removed, and were absent of debris.

A few carbon deposits were found on the engine oil suction screen. The oil filter was removed, and was absent of debris.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot and passenger by the Tuscarawas County, Ohio Coroner's office.

A toxological testing was conducted by the FAA Toxicology Accident Research Laboratory, Oklahoma City, Oklahoma.

ADDITIONAL INFORMATION

According to the Piper Comanche Owner's Manual, page 33, "Vmc is the calibrated airspeed, determined by FAA test pilots, below which a twin engine aircraft cannot be controlled in flight

with one engine operating at take-off power and the other engine wind milling." The Vmc, which the FAA had determined for this airplane, was 90 mph.

The airplane was released on June 25, 2003, to a representative of the owner's insurance company.

Pilot Information

Certificate:	Private	**Age:**	67,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:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	July 16, 2002
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	956 hours (Total, all aircraft), 159 hours (Total, this make and model), 12 hours (Last 90 days, all aircraft), 11 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N8162Y
Model/Series:	PA-30	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	30-1275
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	September 5, 2002 Annual	**Certified Max Gross Wt.:**	3200 lbs
Time Since Last Inspection:	36.8 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	3009 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-320-B1A
Registered Owner:	Kenneth Stremming & Woodrow Williams	**Rated Power:**	150 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	PHD,864 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	15:53 Local	**Direction from Accident Site:**	260°
Lowest Cloud Condition:	Clear	**Visibility**	9 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	120°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.12 inches Hg	**Temperature/Dew Point:**	24°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Crawfordsville, IN (CFJ)	**Type of Flight Plan Filed:**	None
Destination:	New Philadelphi, OH (PHD)	**Type of Clearance:**	None
Departure Time:	13:35 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	Harry Clever Field PHD	**Runway Surface Type:**	
Airport Elevation:	894 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	40.480823,-81.440368(est)

Administrative Information

Investigator In Charge (IIC):	Yeager, Leah
Additional Participating Persons:	Zoltan Vidacs; FAA/FSDO; Cleveland, OH Dave Moore; Textron Lycoming; Ardsley, PA Mike McClure; Prosper, TX
Original Publish Date:	September 1, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=57237