Aviation Investigation Final Report

Location:	LYNCHBURG, Virginia	**Accident Number:**	NYC99LA049
Date & Time:	January 15, 1999, 18:00 Local	**Registration:**	N72EZ
Aircraft:	Piper PA-60-602P	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

While en route, the pilot noticed oil streaming out of the airplane's left engine cowling and secured the left engine. Approximately 3 miles from his destination, the right engine lost total power and the pilot performed a forced landing to a highway. Examination of the airplane 50 minutes after the accident revealed that both wings were separated outboard of the engines. There was no fuel or odor of fuel present in or around the wing fuel tanks, and approximately 1.5 gallons of fuel was drained from the airplane's fuselage fuel tank, which was not compromised. Examinations of both engines revealed a hole burnt through the number 6 piston of the left engine, and damage to the piston was consistent with detonation. A test run of the airplane's right engine did not reveal any pre-impact discrepancies which would have precluded normal engine operation. The airplane's total usable fuel capacity was 165.5 gallons. The airplane had been flown about 2 1/2 hours since it's last refueling, and the estimated fuel used was about 122.5 gallons. The airplane was equipped with a fuel flow indicating system; which when powered after the accident indicated that 40.5 gallons of fuel remained, and 124.1 gallons had been used since the last re-fueling.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Fuel exhaustion for undetermined reasons.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: CRUISE - NORMAL

Findings
1. 1 ENGINE
2. MISC,ENGINE PRE-IGNITION AND/OR DETONATION

Occurrence #2: LOSS OF ENGINE POWER
Phase of Operation: APPROACH

Findings
3. 1 ENGINE
4. (C) FLUID,FUEL - EXHAUSTION
5. (C) FUEL SYSTEM - UNDETERMINED

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: EMERGENCY LANDING

Findings
6. OBJECT - TREE(S)

Factual Information

On January 15, 1999, about 1800 eastern standard time, a Piper PA-60-602P, N72EZ, was substantially damaged when it lost power and impacted terrain while on approach to the Lynchburg Regional/Preston Glenn Field Airport (LYH), Lynchburg, Virginia. The certificated private pilot was seriously injured. Visual meteorological conditions prevailed and no flight plan had been filed for the personal flight conducted under 14 CFR Part 91.

A review of the airplane's maintenance records revealed the airplane had received an annual inspection on January 11, 1999, at a maintenance facility located at the Lancaster Airport (LNS), Lancaster, Pennsylvania.

On the day of the accident, the airplane was flown from LNS to LYH by a pilot employed by the maintenance facility, and returned to the owner/accident pilot. According to the maintenance facility pilot, the fuel burn for the uneventful flight which lasted about 1 hour 24 minutes, was about 65 gallons.

Both pilots stated that the airplane's fuel tanks were "topped off" after landing at LYH. A ramp service agent stated he first filled the airplane's fuselage tank, followed by both wing tanks. He said the total fuel added was 75 gallons.

The owner/accident pilot flew the airplane back to LNS to drop off the maintenance facility pilot, and then departed for LYH.

According to the pilot/owner, the flight to LNS lasted approximately 55 minutes and was uneventful. He departed LNS about 1630, and flew direct to LYH at an altitude of about 12,500 feet msl. Approximately over Lovingston, Virginia, he noticed oil streaming out of the front of the left engine's cowling. When the left engine's oil pressure began dropping, he secured the left engine. The pilot said the airplane was approximately an equal distance between LYH and the Charlottesville Airport (CHO), and he elected to continue the flight (CHO and LYH are located about 70 statue miles apart). Approximately 3 miles from LYH, the pilot lowered the landing gear and the right engine quit "immediately." The pilot stated he did not have enough altitude to reach the runway, or to attempt a restart, and he performed a forced landing to a highway.

The airplane struck trees before it impacted the highway, slid through a drainage ditch, and collided with the highway divider. The airplane came to rest about 4 miles northeast of LYH.

A Federal Aviation Administration (FAA) Inspector arrived at the accident scene about 50 minutes after the accident. He stated that during the impact sequence, both wings had

separated outboard of the engines. There was no fuel or odor of fuel present in or around the wing fuel tanks, and approximately 1.5 gallons of fuel was drained from the airplane's fuselage fuel tank, which was not compromised.

The wreckage was examined further at LYH, by an FAA Airworthiness Inspector, and a representative from the airplane's engine manufacturer. Examination of both engines revealed no fuel was present in the fuel lines from both engine firewalls, to the engine driven fuel pumps, and in the fuel lines from the engine driven pumps to the fuel injector servos of both engines. Fuel was found in the fuel lines from the fuel injector servos to the flow dividers of both engines. The left engine's propeller was found at or near the feathered position, and compression was noted on all cylinders, except the number-6 cylinder. The number-6 cylinder was removed and a hole was found burnt through the number-6 piston skirt. The number-6 piston was retained and forwarded to the Safety Board's Materials Laboratory, Washington, DC, for further examination. The right engine's propeller was not near a feathered position, and compression was noted on all cylinders. The right engine was retained for a test run-up.

Further examination of the airplane's maintenance records revealed that at the time of the annual inspection, maintenance was performed on the airplane which included replacing the number 1, 3, and 6 cylinders of the left engine, and the number-1 cylinder of the right engine, with factory new cylinders, pistons, piston rings, and piston pins. The airplane had been operated about 4.4 hours since the annual inspection had been completed. Additionally, at the time of the accident, the airplane's engines each had accumulated about 2,553 hours since new, and about 848 hours since being overhauled.

Examination of the number-6 piston by a Safety Board Metallurgist revealed that the piston's skirt was severely damaged in two areas located diametrically opposite to each other. One side contained melting, severe wear and a 3/4 inch diameter hole which had burnt through the piston skirt. The other side contained significant heat distress and scoring. The damaged observed on the piston was typical of detonation and pre-ignition.

The airplane's right engine was test run at Textron Lycoming, Williamsport, Pennsylvania, under the supervision of an NTSB Investigator. After the installation of some "slave" parts which included a left magneto, two magneto adapters, a throttle arm, and a new fuel line between the flow divider and the fuel injector servo, the engine was started. No pre-impact discrepancies were observed which would have precluded normal engine operation.

Additionally, the fuel injectors for both engines were removed and examined at Precision Air Motive, Everett, Washington, under the supervision of an FAA Inspector. Examination of the fuel injectors did not reveal any discrepancies, and all injectors "flow checked" satisfactorily.

According to the airplane's flight manual, the airplane's total usable fuel capacity was 165.5 gallons. Additionally, "..the [fuel] system is designed so that under normal operation conditions, the wing fuel should be depleted when approximately 12-16 gallons remain in the

fuselage tank...."

A "power setting and performance data" chart for the airplane revealed that the recommended fuel flow in gallons per hour (GPH) during cruise at 75 percent power, was 24.5 GPH, per engine. The airplane was estimated to be operated for about 2.5 hours, which equated to about 122.5 gallons of fuel used.

The airplane was equipped with a Shadin Fuel Flow Indicating System; which according to the maintenance facility pilot, was reset to 160.0 gallons, after the airplane was refueled at LYH. When power was applied to the unit after the accident, it indicated 40.5 gallons remaining, and 124.1 gallons used.

The pilot reported 3,896 hours of total flight experience, with 2,106 hours in the make and model of the accident airplane.

Pilot Information

Certificate:	Private	**Age:**	59,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:**	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	October 1, 1997
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	3896 hours (Total, all aircraft), 2106 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N72EZ
Model/Series:	PA-60-602P PA-60-602P	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	60-8265002
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	January 11, 1999 Annual	**Certified Max Gross Wt.:**	6029 lbs
Time Since Last Inspection:	4 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	2548 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	IO540-AA1A5
Registered Owner:	FLY L.L.C.	**Rated Power:**	350 Horsepower
Operator:	HERBERT FRAZIER II	**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:**	Dusk
Observation Facility, Elevation:	LYH ,938 ft msl	**Distance from Accident Site:**	4 Nautical Miles
Observation Time:	17:54 Local	**Direction from Accident Site:**	45°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	270°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	3°C / -9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	LANCASTER , PA (LNS)	**Type of Flight Plan Filed:**	None
Destination:	(LYH)	**Type of Clearance:**	None
Departure Time:	16:30 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**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 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	37.399314,-79.189155(est)

Administrative Information

Investigator In Charge (IIC):	Schiada, Luke
Additional Participating Persons:	DARREN BROWN; RICHMOND , VA GERALD R JAMES; DALLAS , TX
Original Publish Date:	December 4, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=45669