



# Aviation Investigation Final Report

<b>Location:</b>	Pahokee, Florida	<b>Accident Number:</b>	WPR19FA093
<b>Date &amp; Time:</b>	March 8, 2019, 15:26 Local	<b>Registration:</b>	N5894Y
<b>Aircraft:</b>	Piper PA23	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>	Loss of control in flight	<b>Injuries:</b>	5 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Unknown		

## Analysis

While descending from cruise altitude toward the destination airport, the pilot reported to air traffic control that he needed to divert to a closer airport because the left engine was "misfiring" and that he was going to "shut it down." Radar data indicated that the airplane flew toward the diversion airport and continued to maneuver south past the airport, where radar contact was lost around 700 ft mean sea level. The airplane subsequently impacted a lake about 1/2 mile west of the airport.

Data from the airplane's engine monitoring system revealed a drop in left engine exhaust gas temperature (EGT), cylinder head temperature (CHT), and fuel flow values near the end of the flight. These values then increased again for a few minutes before decreasing a second time. The left engine fuel flow value for the last 3 minutes of the data was 0, and the left propeller was found in the feathered position, consistent with the pilot having shut down and secured the engine in flight.

Review of the airframe maintenance logbook indicated that several airframe-related fuel system components were replaced during the 4 months before the accident. An entry in the left engine logbook about 4 days before the accident stated that the left engine No. 5 CHT was fluctuating and that a loss of 300 rpm was experienced when testing the right magneto in flight; however, this issue could not be duplicated on the ground, and the airplane was returned to service. Fuel residue was observed on and around the left engine's electric fuel pump. The pump was removed and functionally tested, during which two leaks were found during pressure tests; however, the effect of these leaks on engine operation could not be determined. No other anomalies of the airframe fuel system were observed; however, the system was heavily fragmented and had been submerged in water for several days before recovery.

Based on the available information, the reason for the reported loss of engine power and the extent to which the left engine may have been able to continue to produce power could not be determined. Additionally, the reason for the pilot's low-altitude maneuvering in the vicinity of the runway could not

be determined; however, it is likely that the pilot failed to maintain airspeed while maneuvering for landing with the left engine inoperative, which resulted in a loss of control and impact with water.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's failure to maintain control of the airplane while maneuvering for landing with one engine inoperative following a loss of engine power for reasons that could not be determined based on the available information.

### Findings

<b>Personnel issues</b>	Aircraft control - Pilot
<b>Aircraft</b>	(general) - Not attained/maintained
<b>Not determined</b>	(general) - Unknown/Not determined
<b>Aircraft</b>	(general) - Inoperative

# Factual Information

## History of Flight

Enroute-cruise	Loss of engine power (partial)
Maneuvering-low-alt flying	Loss of control in flight (Defining event)
Enroute-cruise	Off-field or emergency landing

On March 8, 2019, about 1526 eastern standard time, a Piper PA-23-250 airplane, N5894Y, was destroyed when it was involved in an accident near Pahokee, Florida. The pilot and four passengers were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 flight.

The airplane departed Tampa International Airport (TPA), Tampa, Florida, about 1420 and was destined for North Palm Beach County General Aviation Airport (F45), West Palm Beach, Florida. About 1514, while descending from cruise altitude through about 4,600 ft mean sea level (msl) toward F45, the pilot advised the controller that he might be having engine issues and may need to divert to Pahokee Airport (PHK), Pahokee, Florida. About 1518, the pilot informed the controller that he needed to divert to PHK, as the left engine was "misfiring" and he was "about to shut it down." The pilot subsequently advised that he had PHK in sight and was cleared for a visual approach. Just north of the airport, about 1,100 ft msl, the airplane turned away from the runway and continued to descend as it flew south past the airport. The last radar return showed the airplane descending through 700 ft msl about 1 mile south of the airport. The airplane subsequently impacted a lake about 2 miles northwest of the final data point, which was about 1/2 mile west of the airport.

A witness reported that the airplane approached from the northwest and "appeared to be losing control." The airplane entered a nose-down attitude and descended rapidly to the water in a left bank. The airplane sank shortly thereafter and only the tail was visible.

The airplane was equipped with an engine monitoring system. The data revealed that, toward the end of the accident flight, the exhaust gas temperature (EGT), cylinder head temperature (CHT), and fuel flow values for the left engine decreased dramatically. Shortly thereafter, the EGT, CHT, and fuel flow for the left engine temporarily increased close to their previous values before they decreased again until the end of the recording. For the final approximate 3 minutes of data, the left engine fuel flow value was 0. About the time the data for the left engine decreased, the fuel flow value for the right engine slightly increased, and the EGT and CHT simultaneously decreased slightly and remained there until the end of the flight.

## Pilot Information

<b>Certificate:</b>	Commercial; Flight instructor	<b>Age:</b>	45, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	3-point
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Airplane single-engine	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 1 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	November 22, 2017
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	(Estimated) 2100 hours (Total, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Piper	<b>Registration:</b>	N5894Y
<b>Model/Series:</b>	PA23 250	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1965	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	27-3048
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	6
<b>Date/Type of Last Inspection:</b>	Annual	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	Reciprocating
<b>Airframe Total Time:</b>		<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	C91 installed, not activated	<b>Engine Model/Series:</b>	IO-540-C4B5
<b>Registered Owner:</b>		<b>Rated Power:</b>	
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

The airplane was purchased by the owner on June 18, 2018. According to the left engine maintenance logbook, the most recent overhaul occurred December 20, 2002. The engine manufacturer recommended engine overhaul every 2,000 hours or 12 years, whichever comes first.

The left engine logbook indicated that an annual inspection was completed on November 27, 2018. March 4, 2019, indicated, "left engine #5-cylinder CHT fluctuating. Right magneto drop over 300 RPM in flight. Run up performed NDN [no discrepancies noted], suspect momentary carbon fouling. Aircraft returned to service in airworthy condition with respect to work completed." Below the logbook entry was a handwritten note stating, "this entry created 3/8/2019 for expository purposes as not required by per 14 *CFR* 91.407 due to no maintenance performed as inability to duplicate discrepancy at run up. No WO [(work order)] opened."

According to the airframe logbook, the most recent annual inspection occurred on November 13, 2018. An entry dated February 7, 2019, stated, "RR [(replaced right)] fuel valve with new 492-052 due to cracked fitting. RR cross feed drain valve...due to broken valve arm. RR Left engine air filter with new BA15." In addition, it stated that the "RR Left starter...due to it being weak."

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	F45,22 ft msl	<b>Distance from Accident Site:</b>	25 Nautical Miles
<b>Observation Time:</b>	15:35 Local	<b>Direction from Accident Site:</b>	82°
<b>Lowest Cloud Condition:</b>	Few / 3400 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	Broken / 6500 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	11 knots /	<b>Turbulence Type Forecast/Actual:</b>	None / None
<b>Wind Direction:</b>	110°	<b>Turbulence Severity Forecast/Actual:</b>	N/A / N/A
<b>Altimeter Setting:</b>	30.13 inches Hg	<b>Temperature/Dew Point:</b>	25°C / 15°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Tampa, FL (TPA )	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	West Palm Beach, FL (F45 )	<b>Type of Clearance:</b>	IFR
<b>Departure Time:</b>	14:20 Local	<b>Type of Airspace:</b>	

## Airport Information

<b>Airport:</b>	Palm Beach County Glades PHK	<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>	16 ft msl	<b>Runway Surface Condition:</b>	Unknown
<b>Runway Used:</b>		<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>		<b>VFR Approach/Landing:</b>	Precautionary landing

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Destroyed
<b>Passenger Injuries:</b>	4 Fatal	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	5 Fatal	<b>Latitude, Longitude:</b>	26.788055,-80.713333

The airplane came to rest submerged in about 5 ft of water. The debris was mostly contained in the immediate area. The nose landing gear strut and propellers were embedded in the bottom of the lake. The airplane's wings remained attached via the wing spar but were otherwise separated from the airframe. The forward portion of the fuselage, which included the nose cone, right side fuselage, and right flap were heavily damaged and removed from the airframe before recovery. The cabin area was mostly separated aft of the instrument panel. The elevator and stabilator control cables were cut by recovery personnel to facilitate recovery.

The wings, engines, and instrument panel were recovered from the water. The engines were fracture-separated from their mounts. The left engine propeller blades were mostly undamaged and in the feathered position; the right propeller blades were both bent aft. The leading edge of the left wing was crushed aft about midspan, and the right wing was separated about midspan; both wings displayed 45° wrinkles along their skins. The cabin area and the empennage were recovered. The empennage was mostly intact and undamaged. The stabilator and rudder remained attached to the airframe.

Postaccident examination of both engines revealed no anomalies that would have precluded normal operation. All spark plugs and fuel nozzles were removed and exhibited normal operating signatures. The magnetos produced spark from all leads when rotated. The fuel servos were found fracture-separated from both engines; both the throttle and mixture arms moved freely when manipulated by hand. The engines were rotated at their respective propeller; thumb compression and drivetrain continuity were established throughout. Borescope examination of the cylinders revealed normal operating signatures.

Postaccident examination of the airframe revealed control continuity throughout. The fuel selector valves were manipulated, and air was blown through the valves with no blockages noted. The airframe fuel system was breached, consistent with impact damage. Air was blown through the airframe fuel lines with no blockages noted. The left engine nacelle cover was removed, and the electric fuel pump exhibited white discoloration with blue edges around the fuel inlet port. The area surrounding the electric fuel pump, as well as the nacelle panel below the pump, exhibited a dark discoloration.

The left engine electric fuel pump was removed from the airframe for further examination. The data tag on the pump indicated that it was overhauled in 2005 by an unknown facility. The pump assembly was installed onto a test bench and underwent a static pressure test at 5 psi with no anomalies; when the pressure was increased to 14 psi, fuel was observed exiting the overboard drain. The pump assembly was installed onto a different test bench and operated through the manufacturer's acceptance test protocol. When 5 psi inlet pressure was added for a dynamic seal test, fuel exited the overboard drain. The pump assembly was disassembled. The fuel inlet line was removed by hand with little difficulty and the O-ring was completely flat. The motor was removed from the pump and fuel was noted in the drive cavity between the pump and motor. The pump itself was installed onto a test bench and was pressure tested; fuel was observed seeping from around the drive shaft, consistent with a shaft seal leak.

Examination of the residue on the left electric fuel pump revealed the presence of possible surfactant/emulsifier and lead, consistent with degraded/old fuel.

## **Medical and Pathological Information**

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An autopsy was performed on the pilot by the Office of the District Medical Examiner, West Palm Beach, Florida. The cause of death was multiple blunt impact injuries.

The Federal Aviation Administration Forensic Sciences Laboratory performed toxicology testing on specimens from the pilot with negative results for carbon monoxide, cyanide, and ethanol. Ibuprofen was detected in the pilot's urine, and naproxen was detected in the pilot's blood and urine, neither of which are considered to be impairing.

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Link, Samantha		
<b>Additional Participating Persons:</b>	Anthony Saavedra; Federal Aviation Administration; Miramar, FL Jon Hirsch; Piper Aircraft; Vero Beach, FL Troy Helgeson; Lycoming Engines; Williamsport, PA		
<b>Original Publish Date:</b>	May 5, 2021	<b>Investigation Class:</b>	2
<b>Note:</b>	The NTSB traveled to the scene of this accident.		
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=99076">https://data.nts.gov/Docket?ProjectID=99076</a>		

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