Aviation Investigation Final Report

Location:	Tucson, Arizona	**Accident Number:**	WPR14LA027
Date & Time:	October 23, 2013, 10:40 Local	**Registration:**	N3162P
Aircraft:	Piper PA-23-150	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot, who did not have a multiengine rating, reported that, during takeoff, the airplane's nose starting turning left; he did not realize that it was due to the left engine losing power. As a result, he did not perform the engine failure emergency procedure. A witness reported hearing one of the engines "misfiring" and subsequently seeing the airplane drift left, roll into a steep left bank, and then impact the ground.

Postaccident examination revealed no fuel in the left engine's fuel strainer and carburetor; the right engine's fuel strainer and carburetor both contained fuel. Fuel was present in both the left and right wing fuel tanks, and no evidence of fuel contamination was found. The left engine-driven fuel pump's diaphragm was found to be brittle and cracked in several locations, which resulted in its inability to provide sufficient fuel pressure to maintain engine power during takeoff. No other anomalies were found with the left engine's fuel system. The electric fuel boost pump switches were both found in the "off" position, indicating that the pilot had not turned them on before takeoff as called for in both the owner's handbook before takeoff checklist and the before takeoff checklist located on a placard on the instrument panel. If the pilot had turned on the electric fuel boost pumps, the left engine would not have lost power because the electric pump would have compensated for the malfunction of the engine-driven pump.

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 airplane control during takeoff following the loss of left engine power due to the failure of the left engine-driven fuel pump's diaphragm. Contributing to the accident was the

pilot's failure to use the electric fuel boost pumps for takeoff in accordance with checklist procedures and to conduct the engine failure emergency procedure.

Findings

Personnel issues	Aircraft control - Pilot
Personnel issues	Use of policy/procedure - Pilot
Aircraft	(general) - Failure

Factual Information

History of Flight

Takeoff	Loss of control in flight (Defining event)
Takeoff	Loss of engine power (partial)

On October 23, 2013, about 1040 mountain standard time, a Piper PA-23-150 Apache D, N3162P, was substantially damaged when it impacted terrain following a loss of aircraft control on takeoff at Tucson International Airport, Tucson, Arizona. The private pilot, the sole occupant on board, was seriously injured. The airplane was being operated by the owner under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed for the personal local flight, which was originating at the time of the accident. A flight plan had not been filed.

The pilot purchased the airplane, after a mechanic performed an annual inspection, on February 22, 2013, in New Smyrna Beach, Florida. Because he did not have a multi-engine rating, he had a flight instructor fly with him on the trip from New Smyrna Beach to Tucson. He did not fly the airplane again until the day of the accident.

The pilot told a Federal Aviation Administration (FAA) inspector that shortly after liftoff from runway 11R, crosswinds were blowing the airplane to the left. He said the airplane lost altitude and rolled left impacting terrain with the wings near 90 degrees of bank. The airplane completely cartwheeled before coming to rest upright. The airplane's nose, both wings, and the empennage were bent and wrinkled.

In a written statement to the National Transportation Safety Board (NTSB) investigator-in-charge, the pilot reported that after takeoff, the nose of the airplane started turning left, and he "misinterpreted this as being an effect of the wind." He further reported that he realized after the accident that the uncontrollable turn to the left was due to the left engine losing power.

A witness, who was an airport operations officer with the Tucson Airport Authority, reported that he observed the airplane's takeoff, and he heard one of the airplane's engines "misfiring." The airplane "drifted" to the left, rolled into a steep left bank, and impacted the ground.

Postaccident examination of the airplane by the FAA inspector revealed that both propeller controls were full forward, the mixture controls were full rich, and the throttles were full aft. Both fuel selectors were in the off position. Later it was determined that Tucson Airport firefighters had moved the throttles from full forward to full aft and placed both fuel selectors in the off position. The landing gear was down, and the flaps were up. Both electric fuel pump switches were in the off position. The FAA inspector found no fuel in the left fuel strainer and carburetor; the right fuel strainer and carburetor both contained fuel. He visually examined fuel taken from both the left and right wing fuel tanks and found the fuel to be "clear and bright" with no evidence of contamination.

On November 27, 2013, an NTSB investigator examined the left engine's fuel system at the facilities of Air Transport in Phoenix, Arizona. All fuel lines throughout the left wing were found intact and tight at

their fittings. All lines were disconnected at their fittings, examined, and found to be free of obstructions. The left fuel selector and left fuel selector valve were examined, and no anomalies were noted. The fuel strainer screen, the carburetor finger screen, and the left main and left auxiliary fuel tank finger screens were found to be free of obstruction. Power was applied to the left electric fuel pump, and it produced a repetitive clicking sound, consistent with normal operation. On December 11, 2013, an NTSB investigator disassembled the left engine-driven fuel pump and found the pump's rubber diaphragm to be brittle and cracked in several locations.

The Apache Owner's Handbook listed "electric fuel pumps on" as a step in the before takeoff checklist. Additionally, a placard attached to the right side of the airplane's instrument panel provided a takeoff checklist that included "elec. fuel pumps on" as one of the items to be completed.

The Apache Owner's Handbook described the emergency procedure for an engine failure, indicating that yaw in the direction of the dead engine should be corrected with the rudder; the propeller on the dead engine should be feathered; and the dead engine wing should be held up about 3 degrees higher than level to help counteract the airplane's tendency to turn in that direction.

Pilot Information

Certificate:	Private	**Age:**	75
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	None
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	October 29, 2012
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	400 hours (Total, all aircraft), 14 hours (Total, this make and model), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N3162P
Model/Series:	PA-23-150 Apache D	**Aircraft Category:**	Airplane
Year of Manufacture:	1957	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	23-1094
Landing Gear Type:	Retractable - Tricycle	**Seats:**	
Date/Type of Last Inspection:	February 1, 2013 Annual	**Certified Max Gross Wt.:**	3501 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	4169 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	Installed	**Engine Model/Series:**	O-320 SERIES
Registered Owner:	On file	**Rated Power:**	150 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	DMA,2640 ft msl	**Distance from Accident Site:**	4 Nautical Miles
Observation Time:	10:58 Local	**Direction from Accident Site:**	40°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	13 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	120°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	29.96 inches Hg	**Temperature/Dew Point:**	29°C / -2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Tucson, AZ (TUS)	**Type of Flight Plan Filed:**	None
Destination:	Tucson, AZ (TUS)	**Type of Clearance:**	None
Departure Time:	10:30 Local	**Type of Airspace:**	Class C

Airport Information

Airport:	Tucson Intern Arpt TUS	**Runway Surface Type:**	Asphalt
Airport Elevation:	2643 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	11R	**IFR Approach:**	None
Runway Length/Width:	8408 ft / 75 ft	**VFR Approach/Landing:**	None

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:**	32.11222,-110.933334(est)

Administrative Information

Investigator In Charge (IIC):	Struhsaker, James
Additional Participating Persons:	Raymond D Adams; FAA; Scottsdale, AZ
Original Publish Date:	September 29, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=88289