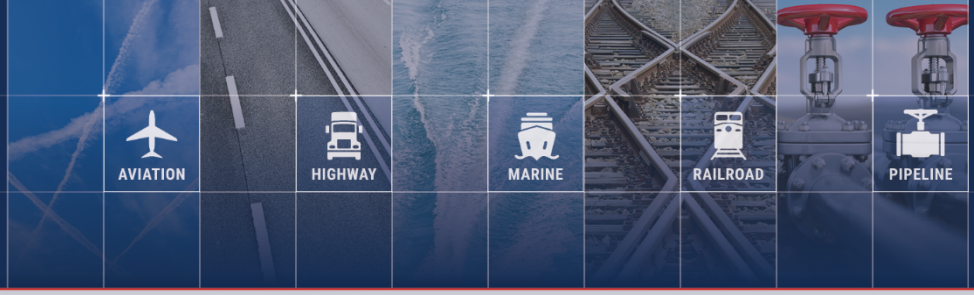

Aviation Investigation Final Report

Location:	Friendly, Maryland	**Accident Number:**	ERA17LA100
Date & Time:	February 6, 2017, 11:00 Local	**Registration:**	N21HD
Aircraft:	Piper PA32R	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

After completing a preflight inspection of the airplane, the private pilot filled the fuel tanks and sampled the fuel, which exhibited no anomalies. Shortly after takeoff, about 1,000 ft above ground level, the engine experienced a total loss of power and the airplane was substantially damaged during the subsequent forced landing. A postaccident examination of the engine and fuel system revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. Although the timing of both magnetos was found to be off, this discrepancy could have been a result of impact forces, since the engine ran smoothly before the loss of power.

Probable Cause and Findings

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

A total loss of engine power during initial climb for reasons that could not be determined because examination of the wreckage revealed no mechanical malfunctions or failures that would have precluded normal operation.

Findings

Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Initial climb	Loss of engine power (total) (Defining event)
Landing	Off-field or emergency landing
Landing	Collision with terr/obj (non-CFIT)

On February 6, 2017, about 1100 eastern standard time, a Piper PA-32R-301, N21HD, was substantially damaged during a forced landing during the initial climb after takeoff from Potomac Airfield (VKX), Friendly, Maryland. The private pilot was seriously injured. Visual meteorological conditions prevailed and an instrument flight rules flight plan had been filed. The personal flight, destined for Newport State Airport (UUU), Newport, Rhode Island, was conducted under the provisions of 14 *Code of Federal Regulations* Part 91.

After completing a preflight inspection of the airplane, the pilot taxied to the self-serve fuel pumps and topped-off the fuel tanks. A few minutes later, he sampled the fuel tanks and reported the fuel was blue and free of contaminates. Shortly after takeoff, about 1,000 ft above ground level, the pilot reported the engine suddenly lost power and "went quiet." He attempted to restart the engine to no avail and subsequently performed a forced landing.

On-scene examination of the wreckage by a Federal Aviation Administration inspector revealed the engine was partially separated from the airplane. The right wing was partially separated and the left wing was substantially damaged.

The six-seat, low-wing, retractable tricycle-gear airplane, serial number 3246091, was manufactured in 1997. It was powered by a Lycoming, IO-540, 300-horsepower engine. The airplane's most recent annual inspection was completed on January 11, 2017. At that time, the airplane had accumulated 1,155 total hours of operation. The engine had also accumulated 1,155 total hours of operation; of which, 480 hours were since its last major overhaul. The airplane had flown about 20 hours since the annual inspection.

Postaccident examination revealed the timing of the left magneto was 14.6° ahead of 20° top dead center and the right magneto was 17° ahead of 20° top dead center. Both magnetos produced spark at all leads when rotated by hand. Camshaft, crankshaft, and valve train continuity was confirmed to the rear accessory section of the engine. Thumb compression was attained on all cylinders with the exception of the No. 6 cylinder, which was impact damaged.

The engine-driven fuel pump was removed from the engine. Approximately 1 ounce of 100-low-lead aviation gasoline was recovered from the engine-driven fuel pump. The fuel was clear, blue, and absent of water when tested with water finding paste. When the engine driven fuel pump was actuated by hand, suction and compression were confirmed at the inlet and outlet port. The engine driven fuel pump was then disassembled and its diaphragm was intact with no obstructions noted. The fuel selector was in the right main fuel tank position and continuity was established from the right main fuel tank to the fuel

selector. The throttle, mixture, and propeller levers were difficult to move, consistent with impact forces. The airplane was equipped with a Bendix KMD 150 which was sent to the NTSB Recorder's Laboratory in Washington, DC for examination. The device recorded five data points during the flight, containing coordinates, ground speed, heading, and GPS altitude. A complete copy of the NTSB's Recorder's Laboratory factual report is included in the public docket of this report.
The recorded weather at an airport located about 7 miles northeast of the accident site, at 1058, included wind 220 at 5 knots, visibility 10 miles, sky clear, temperature 13° C, and dew point minus 1° C.

Pilot Information

Certificate:	Private	**Age:**	62,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	May 3, 2016
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 26, 2016
Flight Time:	862 hours (Total, all aircraft), 403 hours (Total, this make and model), 787 hours (Pilot In Command, all aircraft), 43 hours (Last 90 days, all aircraft), 13 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N21HD
Model/Series:	PA32R 301	**Aircraft Category:**	Airplane
Year of Manufacture:	1997	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	3246091
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	January 11, 2017 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	1155 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	IO-540 SER
Registered Owner:		**Rated Power:**	300 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:	KADW,282 ft msl	**Distance from Accident Site:**	7 Nautical Miles
Observation Time:	16:58 Local	**Direction from Accident Site:**	43°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	220°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.13 inches Hg	**Temperature/Dew Point:**	13°C / -1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Friendly, MD (VKX)	**Type of Flight Plan Filed:**	IFR
Destination:	NEWPORT, RI (UUU)	**Type of Clearance:**	IFR
Departure Time:	10:35 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	POTOMAC AIRFIELD VKX	**Runway Surface Type:**	Asphalt
Airport Elevation:	117 ft msl	**Runway Surface Condition:**	Vegetation
Runway Used:	24	**IFR Approach:**	None
Runway Length/Width:	2665 ft / 40 ft	**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:**	38.729999,-76.970001

Administrative Information

Investigator In Charge (IIC):	Hill, Millicent
Additional Participating Persons:	Mark France; FAA/FSDO; Dulles, VA Mike Childers; Lycoming Damian Galbraith; Piper William Tuccio; NTSB; Washington, DC Jason Fedok; NTSB; Washington, DC
Original Publish Date:	November 6, 2018
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=94688