



Aviation Investigation Final Report

Location:	Louisville, Kentucky	Accident Number:	ERA19LA109
Date & Time:	February 26, 2019, 18:35 Local	Registration:	N2184X
Aircraft:	Piper PA28	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (partial)	Injuries:	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

According to the pilot, the airplane accelerated normally during the takeoff roll, became airborne, and the engine started to run "rough." He elected to land straight ahead on the remaining runway. The airplane subsequently overran the runway and collided with the perimeter fence. Examination of the airplane revealed it sustained substantial damage to the airframe.

During an examination of the left magneto, two ignition wires in the distributor cap revealed evidence of arcing, and one ignition lead was found detached from the insulator and spring. The right magneto was removed, rotated, and produced spark at each spark lead. The metal copper electrode on the right magneto distributor gear was found loose.

To address a potential decreased service life of Slick 4-cylinder magneto distributor gear assemblies, Slick/Champion Aerospace Service Bulletin SB1-15A calls for replacing distributor gear assemblies that have a copper electrode with assemblies that have a Monel electrode. A rough running engine was a symptom of the condition that the SB was intended to address. A review of the accident airplane's maintenance logbooks revealed no entries for the repair of the magnetos or compliance with the applicable SB and that the airplane received three annual inspections since the release and the revision of the SB.

Probable Cause and Findings

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

The failure of the magnetos due to a known deficiency, which resulted in a partial loss of engine

power. Contributing to the accident was maintenance personnel's failure to comply with the applicable service bulletin.

Findings

Aircraft	Magneto/distributor - Failure
Personnel issues	Replacement - Maintenance personnel

Factual Information

History of Flight

Takeoff-rejected takeoff	Loss of engine power (partial) (Defining event)
Takeoff-rejected takeoff	Collision with terr/obj (non-CFIT)

On February 26, 2019, about 1835 eastern standard time, a Piper PA-28-181, N2184X, was substantially damaged when it was involved in an accident near Louisville, Kentucky. The private pilot and passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 flight.

According to the pilot, after performing a preflight inspection, he taxied to the active runway for departure. He conducted an engine run-up; pretakeoff checklist and no anomalies were noted. Once he was cleared for takeoff, he advanced the throttle and began the takeoff roll. As the airplane accelerated through 60 knots and became airborne, the engine started to run "rough." He elected to land straight ahead on the remaining runway. The airplane over-ran the runway and collided with the perimeter fence.

An examination of the airplane by a Federal Aviation Administration inspector revealed that the left wing was broken away from the fuselage. The outboard section of the right wing, which included the aileron, was broken away from the wing assembly. The vertical stabilizer was also separated from the empennage.

While examining the engine, the propeller was rotated through 360° of motion and spark was noted at each of the spark leads. The left magneto was removed and two ignition wires in the distributor cap revealed evidence of arcing. One ignition lead was found detached from the insulator and the spring. The right magneto was removed and rotated and produced spark at each lead. The metal copper electrode on the right magneto distributor gear was found loose.

Slick/Champion Aerospace Service Bulletin (SB)1-15A (issued July 2, 2015, and revised November 12, 2018) indicated a potential decreased service life of Slick 4-cylinder magneto distributor gear assemblies and was based on a limited number of field reports and product returns. Typical symptoms are unusual rpm drops during magneto check, difficulty starting the engine, or rough running engines. The anomaly was observed in magnetos with a varying number of service hours. The SB called for replacing affected distributor gear assemblies that have a copper electrode with assemblies that incorporate a Monel distributor gear electrode.

The accident airplane's engine was equipped with serial numbers 4370 and 4371 magnetos, which are in the range of affected magnetos indicated in the SB. A review of the maintenance logbooks revealed an entry dated February 29, 2016, for an "excessive rpm drop of the right magneto" during run-up. No logbook entries were noted for the repair of the magnetos or compliance with SB1-15A. The airplane received three annual inspections since the release and the revision of the SB.

Pilot Information

Certificate:	Private	Age:	35, 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 With waivers/limitations	Last FAA Medical Exam:	April 27, 2015
Occupational Pilot:	No	Last Flight Review or Equivalent:	October 18, 2018
Flight Time:	(Estimated) 252 hours (Total, all aircraft), 35 hours (Total, this make and model), 215 hours (Pilot In Command, all aircraft), 8 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft)		

Passenger Information

Certificate:		Age:	Male
Airplane Rating(s):		Seat Occupied:	Right
Other Aircraft Rating(s):		Restraint Used:	3-point
Instrument Rating(s):		Second Pilot Present:	No
Instructor Rating(s):		Toxicology Performed:	No
Medical Certification:		Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N2184X
Model/Series:	PA28 181	Aircraft Category:	Airplane
Year of Manufacture:	1979	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	28-7990365
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	August 10, 2018 Annual	Certified Max Gross Wt.:	2600 lbs
Time Since Last Inspection:	506 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	9638 Hrs at time of accident	Engine Manufacturer:	Lycoming
ELT:	C126 installed, not activated	Engine Model/Series:	O&VO-360 SER
Registered Owner:		Rated Power:	180 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Night
Observation Facility, Elevation:	LOU, 545 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	18:53 Local	Direction from Accident Site:	0°
Lowest Cloud Condition:	Clear	Visibility:	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	120°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.25 inches Hg	Temperature/Dew Point:	12°C / 6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Louisville, KY (LOU)	Type of Flight Plan Filed:	VFR
Destination:	Lexington, KY (LEX)	Type of Clearance:	VFR flight following
Departure Time:	18:35 Local	Type of Airspace:	Class D

Airport Information

Airport:	Bowman Field Airport LOU	Runway Surface Type:	Asphalt
Airport Elevation:	545 ft msl	Runway Surface Condition:	Dry
Runway Used:	24	IFR Approach:	None
Runway Length/Width:	4358 ft / 75 ft	VFR Approach/Landing:	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	38.228054,-85.663612(est)

Preventing Similar Accidents

Signs of Potential Mechanical Problems

Some pilots do not pay adequate attention to indications of aircraft mechanical problems, which can lead to in-flight emergencies and accidents. Powerplant systems and component failure is the third-most common defining event for general aviation fatal accidents; nonpowerplant system or component failures also rank high on the list.

Safety should take precedence over all other considerations. Listen to what your aircraft is telling you; it is better to address a problem on the ground rather than risk having to deal with an emergency in the air. Maintenance diagnostic flights are not the time for bringing passengers onboard; they are conducted to identify problems, which the pilot should be prepared to handle. Maintenance troubleshooting sometimes takes time, and the aircraft must perform correctly after maintenance. If any indication of a potential problem persists, additional maintenance or a second opinion may be needed.

The most critical aspect of safe flying is to always be prepared. Should an in-flight emergency occur, the pilot must quickly and successfully execute the aircraft's emergency procedures. All pilots should ensure that flight and ground training are current and that your skills are not rusty; an emergency is not the time to practice.

See http://www.nts.gov/safety/safety-alerts/documents/SA_021.pdf for additional resources

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Alleyne, Eric		
Additional Participating Persons:	Charles B Holsclaw; FAA; Louisville, KY		
Original Publish Date:	March 16, 2022	Investigation Class:	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=99028		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).