Aviation Investigation Final Report

Location:	Red Lodge, Montana	**Accident Number:**	WPR23LA307
Date & Time:	August 8, 2023, 09:00 Local	**Registration:**	N56907
Aircraft:	Boeing A75N1(PT17)	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was departing the airport with a passenger for a local flight when the accident occurred. After takeoff, and as the airplane was crossing a steep drop off in terrain, it began to descend. The pilot verified that the throttle and mixture were full forward, and ensured the ignition switch and fuel selector were both on. He did not detect a reduction in engine speed but did not check the engine tachometer. The airplane continued to descend until it impacted trees, nosed over, and came to rest in the trees, which substantially damaged the wings and the left horizontal stabilizer.

Postaccident examination revealed that one set of magneto points did not open and close when the magneto drive was rotated. Further examination revealed that there was an incorrect P-lead spring installed in the advance-side coil area. The screws that hold the advance-side coil in place were loose, but the yellow tamper indicator was still intact. When placed on a test bench the retard-side points did not begin firing until 400 to 500 rpm, when they should have begun firing at 280 rpm. The advance-side points did not fire at all, and the advance-side condenser did not function. The advance-side timing was so far off that it could not be properly measured, and the retard-side timing was about 3° off proper timing. Examination of the ignition harness revealed three of the nine leads from the left-hand harness did not pass a continuity test when the leads were attached to the distributor but passed when disconnected from the distributor.

The last 100-hour inspection occurred on November 2, 2022, at an airframe time of 559.47 hours, and included checking the timing of the magneto. No anomalies were noted in the maintenance records.

Given the improper maintenance to the magneto, it is likely that the engine ignition system did not provide adequate spark at the correct timing, which resulted in a partial loss of power and subsequent descent into terrain.

Probable Cause and Findings

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

A partial loss of engine power during the initial climb out due to improper maintenance of the magneto.

Findings

Aircraft	Magneto/distributor - Incorrect service/maintenance

Factual Information

History of Flight

Takeoff	Loss of engine power (partial) (Defining event)
Emergency descent	Controlled flight into terr/obj (CFIT)

On August 8, 2023, about 0900 mountain daylight time, a Boeing A75N1 airplane, N56907, was substantially damaged when it was involved in an accident near Red Lodge, Montana. The pilot and passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported that he and a passenger departed runway 16 at the Red Lodge Airport (RED), Red Lodge, Montana. As the airplane crossed over a cliff line, described as a "steep hill about 200 ft," it began to descend. The pilot did not detect an audible decrease in engine rpm and did not look at the engine tachometer. He checked that the throttle and mixture were full forward, the ignition switch was on both, and the fuel was on. The airplane continued to descend and subsequently impacted trees. A witness, located about 1 mile away, reported the airplane stopped climbing and descended, hit trees, then nosed over.

The airplane came to rest upright in trees, positioned in a nose-low attitude, which substantially damaged the upper and lower wings and the left horizontal stabilizer. Recovery efforts resulted in additional damage to the airplane.

The pilot reported that at the time of departure the temperature was about 60°F and the wind was from the south-southeast at about 4 knots.

Postaccident examination of the engine revealed no spark to any of the spark plug leads. The engine was equipped with a Bendix-Scintilla magneto with dual mechanical points. When the magneto drive was rotated, only one set of points opened. The magneto was shipped to a facility that catered to radial engine magnetos for further examination.

The components of the magneto were identified as belonging to the advance-side or retard-side of the magneto. Examination of the magneto revealed that the retard points had a coat of grease or oil burned onto them, but the points themselves were not burned. The screws that held the advance points in place were loose, which caused the advance-side points to back away from the cam and not open. The yellow tamper indicator was still intact but fell off when the screw was tightened before the bench test run. Figure 1o is a view of the magneto and the dual points configuration.

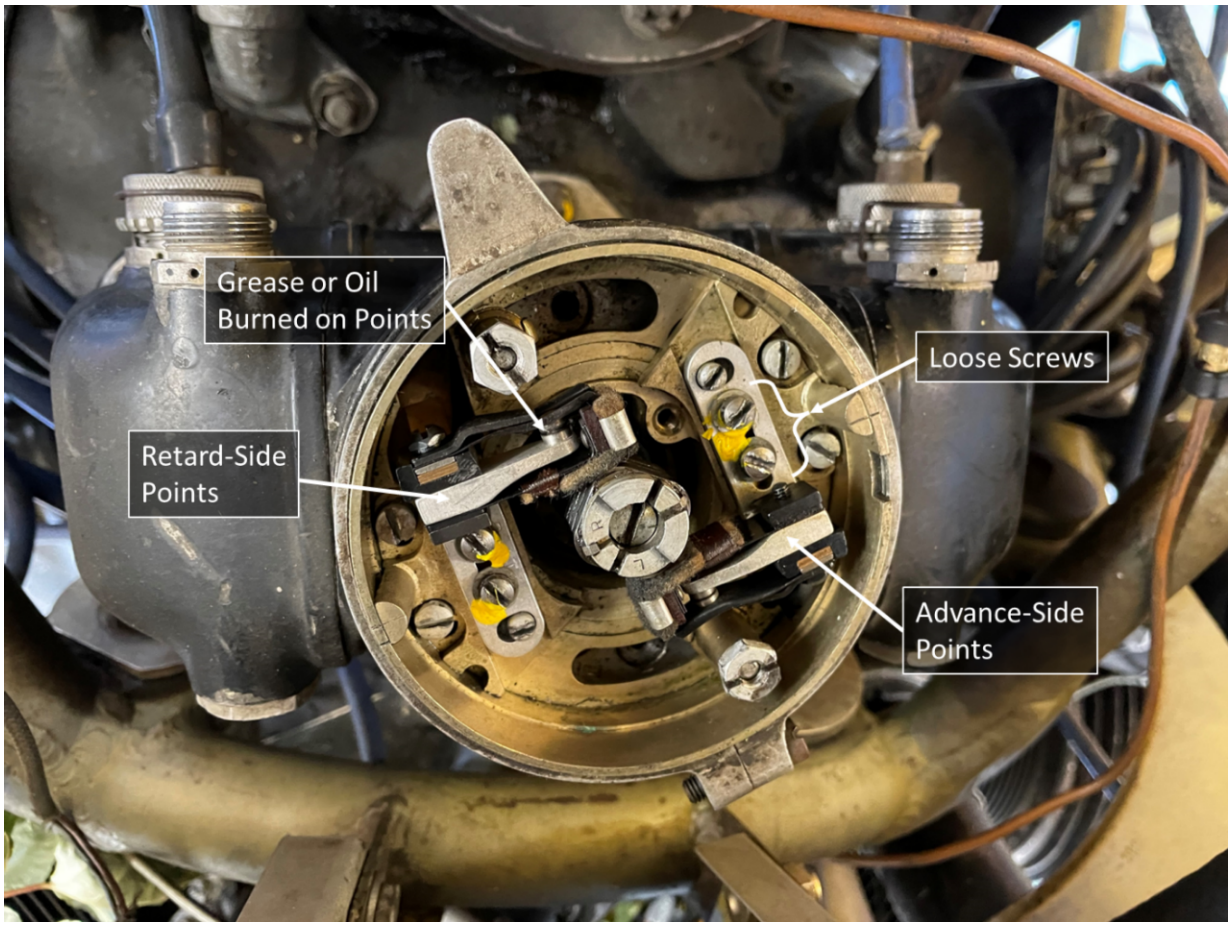

Figure 1. Bendix-Scintilla Magneto with dual points.

Upon removal of the advance-side coil cover, a P-lead spring fell out. Examination of this spring indicated that it was not the correct part and appeared to be modified to fit the magneto.

A test run of the magneto revealed that the retard-side points began firing at 400 to 500 rpm. According to the maintenance manual, the points should begin firing consistently at 280 rpm. The advance-side points did not fire at all but should have fired at 180 rpm.

Both coils were removed and checked to be operating within tolerance. The advance-side condenser was checked and was not functional. The retard-side condenser was checked and found to be functional.

The magneto drive was placed on a timing wheel to check for internal timing. Examination revealed the advance-side timing was so far off that it could not be properly measured. The retard-side timing was dependent on correct advance-side timing, so as a control, the advance-side was timed properly, and the retard-side timing was then checked. The retard-side timing was found to be 7.5° from the advance-side timing. The correct timing was 4.5° from the advance-side timing for this model of magneto.

Examination of the distributor and spark plug wires revealed no anomalies from the right-hand side. The left-hand side exhibited three spark plug wires with no continuity from the distributor to the end of the plug wire. The spark plug wires were then removed from the distributor and continuity was subsequently verified.

A review of the maintenance logbook revealed that the last 100-hour inspection occurred on November 2, 2022, at an airframe time of 559.47 hours, and included checking the timing of the magneto. No anomalies were noted in the maintenance records.

Pilot Information

Certificate:	Private	**Age:**	76,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Rear
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	August 26, 2021
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	June 30, 2022
Flight Time:	1820 hours (Total, all aircraft), 665 hours (Total, this make and model), 1740 hours (Pilot In Command, all aircraft), 8 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft)		

Passenger Information

Certificate:		**Age:**	Male
Airplane Rating(s):		**Seat Occupied:**	Front
Other Aircraft Rating(s):		**Restraint Used:**	4-point
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Boeing	**Registration:**	N56907
Model/Series:	A75N1(PT17)	**Aircraft Category:**	Airplane
Year of Manufacture:	1941	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	75-1676
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	November 2, 2022 100 hour	**Certified Max Gross Wt.:**	2950 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	599.47 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, not activated	**Engine Model/Series:**	R680-17
Registered Owner:	On file	**Rated Power:**	225 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:	KPOY,5092 ft msl	**Distance from Accident Site:**	27 Nautical Miles
Observation Time:	11:35 Local	**Direction from Accident Site:**	134°
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:	150°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.05 inches Hg	**Temperature/Dew Point:**	19°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Red Lodge , MT	**Type of Flight Plan Filed:**	None
Destination:	Red Lodge , MT	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Airport Information

Airport:	Red Lodge Municipal Airport RED	**Runway Surface Type:**	Asphalt
Airport Elevation:	5763 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	16	**IFR Approach:**	None
Runway Length/Width:	4000 ft / 75 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	45.1848,-109.2577(est)

Administrative Information

Investigator In Charge (IIC):	Salazar, Fabian
Additional Participating Persons:	Tracy Brendal; Federal Aviation Administration; Helena, MT
Original Publish Date:	February 20, 2025
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=192826