



National Transportation Safety Board Aviation Accident Final Report

Location:	Allentown, Pennsylvania	Accident Number:	ERA19LA245
Date & Time:	August 11, 2019, 14:48 Local	Registration:	N1831A
Aircraft:	Schweizer 269C	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (partial)	Injuries:	1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Other work use		

Analysis

Shortly after takeoff, the pilot of the helicopter transmitted a mayday call over the radio. The helicopter subsequently impacted a building, resulting in substantial damage to the airframe, serious injury to the pilot, and minor injury to the passenger. Neither the pilot nor the passenger provided statements regarding the events that transpired during the flight. Postaccident examination of the airframe and engine revealed no evidence of any preimpact mechanical malfunctions either, with the exception of the engine's magnetos. Examination of the right magneto revealed evidence of corrosion and indications of misfiring in the distributor block assembly; therefore, it is likely that the right magneto was not performing optimally during the flight. Additionally, examination of the left magneto revealed a worn cam gear, and functional testing indicated that the magneto could not produce adequate spark for engine operation at any power setting.

A review of the helicopter's maintenance logbooks revealed that the most recent 100-hour inspection was performed about 3 months and 35 flight hours before the accident. The right magneto was installed about 2 years before the accident as a used-serviceable unit, with no previous history or time in service information. The left magneto was installed as a new unit at the same time as the right magneto. There was no indication that the left magneto had been serviced in accordance with the manufacturer's 500-hour inspection. Given this information, it is likely that the helicopter's engine at least partially lost power shortly after takeoff, and that the loss of engine power was most likely the result of the failure of the left magneto and the sub-optimal output of the right magneto. Further, it is likely that a lack of adequate maintenance of both magnetos resulted in their degraded performance during the accident flight.

Probable Cause and Findings

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

Inadequate maintenance of the helicopter's magnetos, which resulted in a partial loss of engine power during the initial climb due to a failure of the left magneto and malfunction of the right magneto.

Findings

Aircraft	Magneto/distributor - Malfunction
Personnel issues	Scheduled/routine inspection - Maintenance personnel

Factual Information

On August 11, 2019, at 1448 eastern daylight time, a Schweizer 269C-1, N1831A, was substantially damaged when it was involved in an accident near Allentown, Pennsylvania. The commercial pilot sustained serious injuries and the passenger sustained minor injuries. The helicopter was operated by Ace Pilot Training Inc., as a Title 14 *Code of Federal Regulations* Part 91 sightseeing flight.

According to air traffic control, several minutes after being cleared for takeoff, the pilot transmitted via radio, "mayday, mayday, mayday, three one alpha going down." The helicopter subsequently collided with a building shortly thereafter. The pilot and passenger did not provide any statements regarding the circumstances or events that transpired during the flight.

Examination of the helicopter by a Federal Aviation Administration inspector revealed that the helicopter came to rest in a grassy area on the side of the building. The cockpit was impact-damaged. All three main rotor blades remained attached to the main rotor hub and were buckled. The tail boom was buckled and impact damaged. The tail rotor blades were buckled and remained attached to the tail rotor gearbox. Engine valve train continuity was established. The accessory section of the engine revealed some impact damage.

A review of the maintenance logbooks revealed that the engine was installed from another helicopter that was involved in an accident on May 17, 2017. At that time, the left magneto was newly installed. On July 25, 2018, the right magneto was replaced as a used-serviceable unit with no previous history or time in service information. The right magneto accumulated 195.6 hours on the engine since installation.

Following the accident, the right magneto could not be bench tested due to impact damage. The harness cap was removed and exhibited severe corrosion and indications of misfiring on the distributor block and the No. 2 insulator. The coil was in good condition with the exception of the bent tab; both primary windings and secondary windings were within allowable limits. The condenser was undamaged and functioned satisfactorily.

Examination of the left magneto revealed minor damage on the housing. The magneto was bench tested and failed all sections of the testing. The magneto produced intermittent and weak sparks at all test settings.

The left magneto was opened, and the components were inspected. The coil was in good condition and the primary and secondary windings were both within allowable limits. The condenser was undamaged and functioned satisfactorily. The points were worn but in good condition. An attempt was made to reset the E-gap with the old cam installed, but it was worn and did not allow proper function. The distributor block was serviceable and showed minor wear.

A new cam was installed, the E-gap reset, and the magneto was retested, during which it performed nominally. The magneto had accumulated 578.8 hours time in service on this engine. There was no indication or logbook entry of a 500-hour inspection being completed.

There were also no indications that the Slick/Champion Aerospace Service Bulletin SB1-15A, for replacement of the distributor block, had been completed.

History of Flight

Initial climb	Loss of engine power (partial) (Defining event)
Emergency descent	Collision with terr/obj (non-CFIT)

Flight instructor Information

Certificate:	Commercial; Flight instructor	Age:	23, Male
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	3-point
Instrument Rating(s):	Helicopter	Second Pilot Present:	No
Instructor Rating(s):	Helicopter; Instrument helicopter	Toxicology Performed:	No
Medical Certification:	Class 1 With waivers/limitations	Last FAA Medical Exam:	August 10, 2017
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	November 26, 2018
Flight Time:	180 hours (Total, all aircraft), 180 hours (Total, this make and model)		

Passenger Information

Certificate:		Age:	
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:	Schweizer	Registration:	N1831A
Model/Series:	269C 1	Aircraft Category:	Helicopter
Year of Manufacture:	2005	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	0228
Landing Gear Type:	Skid	Seats:	2
Date/Type of Last Inspection:	May 28, 2019 100 hour	Certified Max Gross Wt.:	1100 lbs
Time Since Last Inspection:	35 Hrs	Engines:	
Airframe Total Time:	2547 Hrs at time of accident	Engine Manufacturer:	
ELT:	Not installed	Engine Model/Series:	
Registered Owner:		Rated Power:	
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:	ABE, 393 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	14:51 Local	Direction from Accident Site:	0°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	9 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	250°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.03 inches Hg	Temperature/Dew Point:	27° C / 11° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Allentown, PA (ABE)	Type of Flight Plan Filed:	None
Destination:	Allentown, PA (ABE)	Type of Clearance:	VFR
Departure Time:	14:45 Local	Type of Airspace:	Class G

Airport Information

Airport:	Lehigh Valley Intl ABE	Runway Surface Type:	
Airport Elevation:	393 ft msl	Runway Surface Condition:	Unknown
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:	1 Minor	Aircraft Fire:	On-ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious, 1 Minor	Latitude, Longitude:	40.652221,-75.440551(est)

Administrative Information

Investigator In Charge (IIC):	Alleyne, Eric		
Additional Participating Persons:	Javier R Casanova; Sikorsky; Stratford, CT Mike Childers; Lycoming; Williamsport, PA David Horton; Schweizer RSG LLC.; Fort Worth, TX Joe Bauer; FAA/FSDO; Allentown, PA		
Original Publish Date:	June 1, 2022	Investigation Class:	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=100040		

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