Aviation Investigation Final Report

Location:	Salmon, Idaho	**Accident Number:**	WPR14LA335
Date & Time:	August 10, 2014, 07:23 Local	**Registration:**	N7784A
Aircraft:	Cessna 180A	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	4 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that, during the initial climb, everything appeared normal until he reduced the propeller rpm as part of his normal procedure. Shortly after, he noticed a difference in engine performance; he stated that it was as if the engine was not producing thrust. The pilot attempted to troubleshoot the loss of power; however, he was unsuccessful, so he initiated a forced landing to a nearby field. During the landing roll, the airplane struck a fence, and the left main landing gear separated, which resulted in the left wing striking the ground before the airplane came to rest upright.

Examination of the propeller revealed that both propeller blades exhibited indications of functioning in the normal operating range at the time of impact. No preimpact mechanical malfunctions or failures with the propeller were found that would have precluded normal operation. After a serviceable propeller was installed on the engine, the engine was test run at various power settings with no anomalies noted.

Probable Cause and Findings

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

A loss of engine power during initial climb for reasons that could not be determined because postaccident examination did not reveal any anomalies that would have precluded normal operation.

Findings

Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

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

On August 10, 2014, about 0723 mountain daylight time, a Cessna 180A, N7784A, sustained substantial damage during a forced landing following a loss of engine power during takeoff initial climb from the Lemhi County Airport (SMN), Salmon, Idaho. The airplane was registered to and operated by the pilot under the provisions of Title 14 Code of Federal Regulations Part 91. The private pilot and his three passengers were not injured. Visual meteorological conditions prevailed, and no flight plan was filed for the personal flight. The cross-country flight was originating at the time of the accident with an intended destination of Ogden, Utah.

In a written statement to the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), the pilot reported that prior to takeoff he conducted an engine run up, which included leaning the mixture for the high altitude airport, a magneto check, and cycling the propeller once. The pilot stated that during takeoff from runway 35, he applied full power, and observed 24.1 inches of manifold pressure and 2,690 revolution per minute (rpm), with no abnormalities noted. As the airplane ascended through about 300 feet above ground level, the pilot reduced the propeller setting to 2,400 rpm as part of his normal procedure. Shortly thereafter, he noticed a difference in aircraft and engine performance, as if the engine was not producing thrust. The pilot verified the fuel selector, throttle, mixture, and propeller settings, and initiated a forced landing to a nearby field. During the landing roll, the airplane struck a fence and the left main landing gear separated from the airplane. Subsequently, the left wing struck the ground and the airplane came to rest upright.

Postaccident examination of the airplane by the pilot revealed that the left wing and aileron were structurally damaged. The wreckage was recovered to a secure location for further examination.

Examination of the airplane by the NTSB IIC and a representative of Cessna Aircraft was conducted at the facilities of Aircraft Structural Repair, Stevensville, Montana, on April 13, 2014. The examination revealed that the wings, horizontal stabilizer, and elevators had been removed to facilitate transport of the wreckage. The cowling was removed and the engine was examined. The primer line from the "T" fitting to the number six cylinder was loose at the "T" fitting. The top number 2, 3, 4, 5, and 6 spark plug harness leads were finger tight on the spark plugs. All additional fuel lines and fittings were found secure. Throttle, mixture, propeller, and carburetor heat control continuity was established from the cockpit controls to the engine. The induction and exhaust system was intact. The propeller, a McCauley 2A34C66-CMNO/S-90AT-4 two-bladed constant speed propeller, remained attached to the propeller flange. Propeller blade two was found loose within the propeller hub.

In order to facilitate an engine run, the two-bladed propeller was removed and replaced with a serviceable three-bladed propeller. An alternate fuel source was attached to the left wing fuel inlet port. The engine was primed and subsequently started. The engine was run uneventfully for less than 10

minutes at various RPM settings. A magneto check was conducted at 1,700 rpm with normal rpm reductions noticed. In addition, the propeller was cycled twice with normal results. The engine was advanced to full power and the propeller RPM was reduced with no anomalies noted. The engine was shut down normally using the mixture control.

Examination of the propeller was conducted at the facilities of McCauley Propeller Systems, Wichita, Kansas, by representatives of McCauley Propeller Systems, Cessna Aircraft, and the NTSB IIC on November 20, 2014. The examination revealed that the propeller had damage consistent with impact and low rotational energy absorption. The propeller blades had leading edge impact damage, leading edge polishing and chordwise paint scratches.

The propeller exhibited no impact signature markings or component positions that would have indicated an angle disagreement between blades at impact. Both propeller blades exhibited indications of functioning in the normal operating range at impact. The exact blade angles at the time of impact were not determined.

Internal examination of the propeller hub revealed that pitch change system continuity was confirmed from the piston to both blade shanks. One actuating link was found fractured into two pieces. The failure of the actuating link was consistent with a tension overload type failure related to gross deflection of the blades and the pitch change mechanism during the impact sequence.

There was no evidence of any type of propeller failure or malfunction prior to the accident sequence.

The Woodward propeller governor, part number B210105, was retained and subsequently functionally tested using a test bench. During the bench test, no anomalies were noted that would have precluded normal operation.

Pilot Information

Certificate:	Private	**Age:**	38
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	December 18, 2012
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	July 22, 2013
Flight Time:	206 hours (Total, all aircraft), 57 hours (Total, this make and model), 206 hours (Pilot In Command, all aircraft), 16 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N7784A
Model/Series:	180A A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	32681
Landing Gear Type:	Tailwheel	**Seats:**	
Date/Type of Last Inspection:	September 19, 2014 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	3125.9 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	C91 installed	**Engine Model/Series:**	O-470
Registered Owner:	On file	**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:	KSMN,4043 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	13:35 Local	**Direction from Accident Site:**	183°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.28 inches Hg	**Temperature/Dew Point:**	11°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Salmon, ID (SMN)	**Type of Flight Plan Filed:**	
Destination:	Ogden, UT	**Type of Clearance:**	None
Departure Time:	07:23 Local	**Type of Airspace:**	

Airport Information

Airport:	LEMHI COUNTY SMN	**Runway Surface Type:**	Asphalt
Airport Elevation:	4043 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	35	**IFR Approach:**	None
Runway Length/Width:	5150 ft / 60 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	3 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 None	**Latitude, Longitude:**	45.131389,-113.881942(est)

Administrative Information

Investigator In Charge (IIC):	Cawthra, Joshua
Additional Participating Persons:	Morris Pittman; Federal Aviation Administration; Boise, ID Henry Soderlund; Cessna Aircraft; Wichita, KS
Original Publish Date:	June 1, 2015
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=89839

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