



Aviation Investigation Final Report

Location:	Delta Junction, Alaska	Accident Number:	ANC18LA080
Date & Time:	September 30, 2018, 13:30 Local	Registration:	N5907Y
Aircraft:	Piper PA18	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, while maneuvering the airplane in mountainous terrain, he reduced engine power and initiated a descent; the engine then began to cough and run roughly. He applied full throttle, and the engine subsequently lost total power. In an attempt to restore power, he applied carburetor heat and switched fuel tanks while initiating an emergency descent. The engine restarted; however, it continued to run roughly and would not develop full power. He continued the emergency descent and landed the airplane on a mountain ridge. Upon touchdown, the left main landing gear separated from the fuselage and the left wing struck the ground, which resulted in substantial damage to the left wing.

A postaccident examination of the engine, which included an engine test run, revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation.

According to a carburetor icing probability chart, an airplane operating in the ambient conditions at the accident site could expect carburetor icing while at cruise power and at glide power. It is likely that, when the pilot reduced engine power for the descent, carburetor ice formed and resulted in the loss of engine power.

Probable Cause and Findings

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

The total loss of engine power due to carburetor icing, which resulted from the pilot's failure to use carburetor heat while operating at low power settings in conditions conducive to the formation of carburetor ice.

Findings

Environmental issues	Conducive to carburetor icing - Effect on equipment
Aircraft	Intake anti-ice, deice - Not used/operated
Personnel issues	Delayed action - Pilot
Personnel issues	Identification/recognition - Pilot

Factual Information

History of Flight

Maneuvering-low-alt flying	Loss of engine power (partial) (Defining event)
Maneuvering-low-alt flying	Loss of engine power (total)

On September 30, 2018, about 1330 Alaska daylight time, a tundra tire and tailwheel-equipped Piper PA-18 Super Cub airplane, N5907Y, sustained substantial damage during a forced landing following a partial loss of engine power while maneuvering near Delta Junction, Alaska. The private pilot was not injured. The airplane was registered to and operated by the pilot as a 14 *Code of Federal Regulations* Part 91 visual flight rules (VFR) flight. Visual meteorological conditions prevailed, and no flight plan had been filed. The local area flight departed Delta Junction Airport (D66), Delta Junction, Alaska about 1130 for the upper Salcha River area with a planned return to D66.

According to the pilot, while maneuvering in mountainous terrain, he reduced engine power and initiated a descent when the engine began to cough and run rough. He applied full throttle and the engine subsequently lost all power. In an attempt to restore power, he applied carburetor heat and switched fuel tanks while initiating an emergency descent to a mountain ridge. The pilot stated that the engine appeared to restart; however, it continued to run rough and would not develop full power. He elected to continue with the emergency descent and landing on the mountain ridge. Upon touchdown, the left main landing gear separated from the fuselage and the left wing struck ground resulting in substantial damage to the left wing.

On October 12, the engine, while still mounted on the accident airplane's airframe, was operated under the direction of the NTSB IIC. The engine accelerated normally and a series of power adjustments from idle to full power were conducted without any hesitation, stumbling or interruption in power. During the engine test the magnetos were checked and a drop of about 25 rpm was noted for the left and right magnetos.

According to the carburetor icing probability chart, an airplane operating in the ambient conditions at the accident site could expect carburetor icing while at cruise power and at glide power.

A Lycoming Service Instruction states in part: "Landing Approach – In making a landing approach, the carburetor heat is generally in the 'Full Cold' position. However, if icing conditions are suspected apply 'Full Heat.' In the case that full power needs to be applied under these conditions, as for an aborted landing, return the carburetor heat to 'Full Cold' after full power application."

Pilot Information

Certificate:	Private	Age:	46,Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	4-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:	August 13, 2018
Occupational Pilot:	No	Last Flight Review or Equivalent:	August 24, 2018
Flight Time:	475 hours (Total, all aircraft), 475 hours (Total, this make and model), 440 hours (Pilot In Command, all aircraft), 20 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N5907Y
Model/Series:	PA18 150	Aircraft Category:	Airplane
Year of Manufacture:	1966	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	18-8414
Landing Gear Type:	Tailwheel	Seats:	
Date/Type of Last Inspection:	June 8, 2018 Annual	Certified Max Gross Wt.:	1750 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	4782.8 Hrs as of last inspection	Engine Manufacturer:	Lycoming
ELT:	C91A installed, not activated	Engine Model/Series:	O-360
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:	Day
Observation Facility, Elevation:	D66	Distance from Accident Site:	
Observation Time:	21:53 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Few / 13000 ft AGL	Visibility	10 miles
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	10 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	110°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.15 inches Hg	Temperature/Dew Point:	11°C / -3°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Delta Junction, AK	Type of Flight Plan Filed:	None
Destination:	Delta Junction, AK	Type of Clearance:	None
Departure Time:		Type of Airspace:	Class G

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:	64.610557,-144.616943

Preventing Similar Accidents

Preventing Carburetor Icing

Accident involving carburetor ice stem for pilots not recognizing when weather conditions are favorable to carburetor icing and inaccurately believing that carburetor icing is only a cold- or wet-weather problem. Pilots also may not use the carburetor heat according the aircraft's approved procedures to prevent carburetor ice formation. Carburetor icing accident can occur when pilots do not recognize and promptly act upon the signs of carburetor icing.

Be sure to check the temperature and dew point to determine whether the conditions are favorable for carburetor icing. Remember, serious carburetor icing can occur in ambient temperatures as high as 90° F or in relative humidity conditions as low as 35 percent at glide power. Consider installing a carburetor temperature gauge, if available.

Refer to the approved aircraft flight manual or operating handbook to ensure that carburetor heat is used according to the approved procedures and properly perform the following actions: 1) Check the functionality of the carburetor heat before flight. 2) Use carburetor heat to prevent the formation of carburetor ice when operating in conditions and at power settings in which carburetor icing is probable. Remember, ground idling or taxiing time can allow carburetor ice to accumulate before takeoff. 3) Immediately apply carburetor heat at the first sign of carburetor icing, which typically includes a drop in rpm or manifold pressure (depending upon how your airplane is equipped). Engine roughness may follow.

Engines that run on automobile gas may be more susceptible to carburetor icing than engines that run on Avgas.

See http://www.nts.gov/safety/safety-alerts/documents/SA_029.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):	Banning, David
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Additional Participating Persons:	
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Original Publish Date:	June 29, 2020
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Note:	The NTSB did not travel to the scene of this accident.
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Investigation Docket:	https://data.nts.gov/Docket?ProjectID=98426
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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](#).