



# Aviation Investigation Final Report

<b>Location:</b>	Machias, Maine	<b>Accident Number:</b>	ERA17LA325
<b>Date &amp; Time:</b>	September 14, 2017, 11:30 Local	<b>Registration:</b>	N2120W
<b>Aircraft:</b>	Beech C23	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (total)	<b>Injuries:</b>	1 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Instructional		

## Analysis

The private pilot descended the airplane to the destination airport but did not apply carburetor heat. While in the traffic pattern, as the airplane was turning onto a left base leg for the runway, the engine began to run roughly. The pilot then applied carburetor heat, but the engine lost total power. After realizing that the airplane was not going to glide to the runway threshold, the pilot performed a forced landing in a grassy area just short of the runway. During the landing, the nose gear collapsed and the airplane spun 180° before it came to rest, which resulted in substantial damage to the right wing.

Examination of the wreckage did not reveal any evidence of preimpact mechanical malfunctions or failures of the ignition system, fuel system, or engine that would have precluded normal operation. The weather conditions at the time of the accident were conducive to the formation of serious carburetor icing at glide power. Although the Descent checklist in the pilot operating handbook for the airplane make and model instructed the pilot to use carburetor heat as required, the pilot did not apply carburetor heat before initiating the descent; rather, he waited until the engine began to run roughly. It is likely that the engine initially lost partial power after developing carburetor ice and that the pilot's delayed application of carburetor heat was ineffective at melting any accumulated ice.

## Probable Cause and Findings

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

The pilot's delay in applying carburetor heat, which resulted in a total loss of engine power due to carburetor icing.

## Findings

<b>Personnel issues</b>	Delayed action - Pilot
<b>Environmental issues</b>	Conducive to carburetor icing - Effect on equipment

## Factual Information

### History of Flight

<b>Approach-VFR pattern base</b>	Fuel related
<b>Approach-VFR pattern base</b>	Loss of engine power (total) (Defining event)
<b>Emergency descent</b>	Off-field or emergency landing
<b>Landing</b>	Landing gear collapse
<b>Landing</b>	Collision with terr/obj (non-CFIT)

On September 14, 2017, about 1130 eastern daylight time, a Beech C23, N2120W, operated by Maine Instrument Flight, was substantially damaged during a forced landing, following a total loss of engine power while on approach to Machias Valley Airport (MVM), Machias, Maine. The private pilot was not injured. The instructional flight was conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91. Visual meteorological conditions prevailed and a visual flight rules flight plan was filed for the flight that departed Augusta State Airport (AUG), Augusta, Maine, about 1015.

The pilot was accruing cross-country flight experience for his commercial license. The pilot reported that he and his flight instructor reviewed his flight planning for a three-leg cross-country flight and he departed with full fuel. During the first leg, about 10 miles from MVM, the pilot descended the airplane to the airport traffic pattern altitude. While in the traffic pattern, as the airplane was turning on to a left base leg for the runway, the engine began to run rough. The pilot verified that the mixture was full rich and the fuel boost pump was on. He also applied carburetor heat, but the engine lost all power about 15 to 20 seconds later.

The pilot then turned the airplane directly toward the runway, which resulted in a 45°-angle to the runway threshold. The pilot realized that the airplane was not going to glide all the way to the runway threshold and prepared to land in a grass area just prior to the runway. During the landing, the landing gear sank into soft ground and the nosewheel touched down hard, which collapsed the nose gear. The airplane spun 180° and came to rest upright in the grass area.

Examination of the airplane by a Federal Aviation Administration (FAA) inspector revealed damage to the right wing spar. The inspector noted that 20 gallons of fuel per wing were removed from the airplane. The magnetos, fuel boost pump and engine driven fuel pump tested satisfactorily. The carburetor was intact and its screens were absent of debris. The fuel bowl was also absent of debris. The inspector rotated the propeller by hand and noted camshaft, crankshaft, and valve train continuity to the rear accessory section of the engine. Due to damage to the engine mounts and exhaust system, an engine test-run was not attempted. The inspector added that the engine had accumulated about 359 hours since major overhaul.

Hancock County-Bar Harbor Airport (BHB), Bar Harbor, Maine was located about 40 miles west of the accident site. The recorded weather at BHB, at 1156, was: wind from 180° at 5 knots; visibility 10 miles; sky clear; temperature 24° C; dew point 17° C; altimeter 29.83 inches of mercury. Review of an

FAA Carburetor Icing Probability Chart for the given weather conditions revealed, "Serious icing (glide power)." Review of a descent checklist from a pilot operating handbook for the make and model airplane revealed, "2. Carburetor Heat - FULL ON or FULL OFF, AS REQUIRED."

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	21, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	4-point
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	January 30, 2014
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	August 1, 2017
<b>Flight Time:</b>	155 hours (Total, all aircraft), 91 hours (Total, this make and model), 87 hours (Pilot In Command, all aircraft), 8 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Beech	<b>Registration:</b>	N2120W
<b>Model/Series:</b>	C23 NO SERIES	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1973	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	M-1492
<b>Landing Gear Type:</b>	Retractable -	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	July 13, 2017 100 hour	<b>Certified Max Gross Wt.:</b>	2450 lbs
<b>Time Since Last Inspection:</b>	11 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	2550 Hrs at time of accident	<b>Engine Manufacturer:</b>	LYCOMING
<b>ELT:</b>	C91 installed, activated, did not aid in locating accident	<b>Engine Model/Series:</b>	O-360
<b>Registered Owner:</b>		<b>Rated Power:</b>	180 Horsepower
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	Pilot school (141)
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	BFYA

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	BHB,83 ft msl	<b>Distance from Accident Site:</b>	40 Nautical Miles
<b>Observation Time:</b>	11:56 Local	<b>Direction from Accident Site:</b>	270°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	5 knots /	<b>Turbulence Type Forecast/Actual:</b>	/ None
<b>Wind Direction:</b>	180°	<b>Turbulence Severity Forecast/Actual:</b>	/ N/A
<b>Altimeter Setting:</b>	29.82 inches Hg	<b>Temperature/Dew Point:</b>	24°C / 17°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Augusta, ME (AUG )	<b>Type of Flight Plan Filed:</b>	VFR
<b>Destination:</b>	Machias, ME (MVM )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	10:15 Local	<b>Type of Airspace:</b>	

## Airport Information

<b>Airport:</b>	Machias Valley Airport MVM	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	96 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	36	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	2909 ft / 60 ft	<b>VFR Approach/Landing:</b>	Forced landing

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 None	<b>Latitude, Longitude:</b>	44.703056,-67.478614(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Gretz, Robert
<b>Additional Participating Persons:</b>	John Keefe; FAA/FSDO; Portland, ME
<b>Original Publish Date:</b>	April 8, 2019
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=96015">https://data.nts.gov/Docket?ProjectID=96015</a>

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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](#).