Aviation Investigation Final Report

Location:	Machias, Maine	**Accident Number:**	ERA17LA325
Date & Time:	September 14, 2017, 11:30 Local	**Registration:**	N2120W
Aircraft:	Beech C23	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 None
Flight Conducted Under:	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

Personnel issues	Delayed action - Pilot
Environmental issues	Conducive to carburetor icing - Effect on equipment

Factual Information

History of Flight

Approach-VFR pattern base	Fuel related
Approach-VFR pattern base	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing
Landing	Landing gear collapse
Landing	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

Certificate:	Private	**Age:**	21,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	January 30, 2014
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	August 1, 2017
Flight Time:	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

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

Meteorological Information and Flight Plan

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

Airport Information

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

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:**	44.703056,-67.478614(est)

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	John Keefe; FAA/FSDO; Portland, ME
Original Publish Date:	April 8, 2019
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=96015