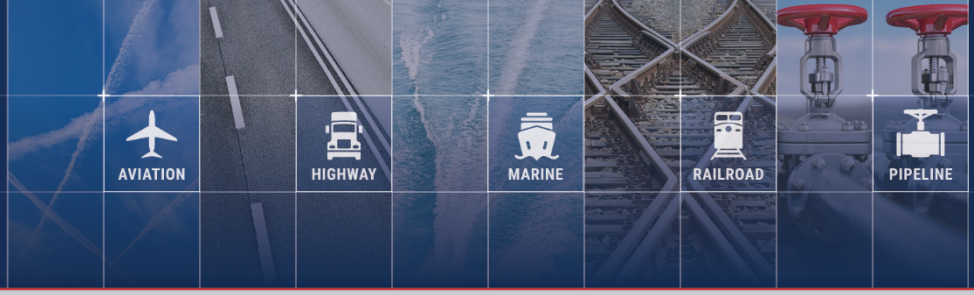

Aviation Investigation Final Report

Location:	Flint Township, Michigan	**Accident Number:**	CEN23LA161
Date & Time:	April 20, 2023, 10:05 Local	**Registration:**	N419W
Aircraft:	Piper PA-28-181	**Aircraft Damage:**	Substantial
Defining Event:	Fuel related	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot planned a short cross-country flight to two different airports with a return to his original airport. Due to concerns with weather conditions in the area, the pilot requested to air traffic control to execute the option and then return to his original departure airport. While on a 1-mile final approach, about 500 ft above ground level, the engine lost total power. An attempt to restart the engine was unsuccessful. Unable to make the runway, the pilot executed a forced landing on a railroad track. During the forced landing, the airplane sustained substantial damage to both wings and engine mount.

Postaccident examination of the airframe and engine revealed no preimpact mechanical malfunctions or failures that would have precluded normal operation. An undetermined amount of fuel remained in the fuel tanks at the accident site. Weather conditions reported at the time of the accident were conducive for serious icing at any power setting. The pilot stated that he did not apply carburetor heat during the approach. Therefore, it is likely that carburetor ice accumulated during the approach and descent, which resulted in a loss of engine power.

Probable Cause and Findings

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

The pilot’s failure to apply carburetor heat during the landing approach, which resulted in a loss of engine power from carburetor ice.

Findings

Environmental issues	Conducive to carburetor icing - Effect on operation
Personnel issues	Use of equip/system - Pilot

Factual Information

History of Flight

Approach-VFR pattern final	Fuel related (Defining event)
Emergency descent	Collision with terr/obj (non-CFIT)

On April 20, 2023, about 1005 eastern daylight time, a Piper PA-28-181 airplane, N419W, sustained substantial damage when it was involved in an accident near Flint Township, Michigan. The pilot was not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the pilot, before departure the airplane contained about 34 gallons of fuel. The airplane departed the Ann Arbor Municipal Airport (ARB), Ann Arbor, Michigan, and the pilot planned a short cross-country flight to two different airports with a return to ARB. Due to concerns with weather conditions in the area, the pilot contacted air traffic control and requested to execute the option at Bishop International Airport (FNT), Flint, Michigan, and then return to ARB. While on a 1-mile final approach to FNT, about 500 ft above ground level, the engine lost total power. An attempt to restart the engine was unsuccessful. Unable to make the runway, the pilot executed a forced landing on a railroad track. During the forced landing, the airplane sustained substantial damage to both wings and the engine mount. The pilot stated that he did not use carburetor heat during the approach.

Postaccident examination revealed that both magnetos produced spark on all spark plugs. Thumb compression and suction were noted on all cylinders when the propeller was manually rotated. The carburetor, venturi, and throttle valve were intact, and no anomalies were noted. The oil filter was clear of contaminants.

A review of the local area meteorological data showed that at the time of the accident the airplane was operating in conditions that were conducive to serious icing at any power setting. Federal Aviation Administration Special Airworthiness Information Bulletin (CE-09-35) – Carburetor Icing Prevention, stated that: "*…pilots should be aware that carburetor icing doesn't just occur in freezing conditions, it can occur at temperatures well above freezing temperatures when there is visible moisture or high humidity. Icing can occur in the carburetor at temperatures above freezing because vaporization of fuel, combined with the expansion of air as it flows through the carburetor, (Venturi Effect) causes sudden cooling, sometimes by a significant amount within a fraction of a second. Carburetor ice can be detected by a drop in rpm in fixed pitch propeller airplanes and a drop in manifold pressure in constant speed propeller airplanes. In both types, usually there will be a roughness in engine operation.*"

Pilot Information

Certificate:	Commercial; Flight instructor; Private	**Age:**	44,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	September 12, 2022
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	March 20, 2022
Flight Time:	653 hours (Total, all aircraft), 133 hours (Total, this make and model), 561 hours (Pilot In Command, all aircraft), 45 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N419W
Model/Series:	PA-28-181	**Aircraft Category:**	Airplane
Year of Manufacture:	1995	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	2843001
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	July 8, 2022 Annual	**Certified Max Gross Wt.:**	2550 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	6635.4 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-360-A4M
Registered Owner:	On file	**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:	KFNT,766 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	09:53 Local	**Direction from Accident Site:**	84°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	Broken / 11000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	120°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.06 inches Hg	**Temperature/Dew Point:**	9°C / 3°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Ann Arbor, MI (ARB)	**Type of Flight Plan Filed:**	
Destination:		**Type of Clearance:**	VFR
Departure Time:	09:45 Local	**Type of Airspace:**	Class C

Airport Information

Airport:	BISHOP INTL FNT	**Runway Surface Type:**	
Airport Elevation:	782 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	42.963555,-83.796115(est)

Preventing Similar Accidents

Preventing Carburetor Icing (SA-029)

The Problem

According to NTSB aircraft accident data, from 2000 to 2011, carburetor icing was a cause or factor in about 250 accidents. On average, carburetor icing causes or contributes to two fatal accidents per year. Accident evidence shows that some pilots do not recognize weather conditions favorable to carburetor icing and inaccurately believe that carburetor icing is only a cold- or wet-weather problem. Pilots may also have not used the carburetor heat according to the aircraft's approved procedures to prevent carburetor ice formation. In addition, some pilots may not recognize and promptly act upon the signs of carburetor icing.

What can you do?

- Check the temperature and dew point for your flight 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.
- Refer to your approved aircraft flight manual or operating handbook to ensure that you are using carburetor heat according to the approved procedures and properly perform the following actions:
    - Check the functionality of the carburetor heat before your flight.
    - 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.
    - 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.
- Consider installing a carburetor temperature gauge, if available.
- Remember that aircraft engines that run on automotive gas may be more susceptible to carburetor icing than engines that run on Avgas.

See https://www.ntsb.gov/Advocacy/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):	Sauer, Aaron
Additional Participating Persons:	Bruce Arthurs; FAA; Detroit, MI
Original Publish Date:	March 28, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=107095