Aviation Investigation Final Report

Location:	Parker, Colorado	**Accident Number:**	ERA19LA027
Date & Time:	October 26, 2018, 07:30 Local	**Registration:**	N5575U
Aircraft:	Piper PA28	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

After completing the preflight inspection, the pilot reported a normal engine runup and recalled checking the carburetor heat and magnetos twice before takeoff. He started the takeoff roll and noticed that the roll was a "little longer than normal" and that the airplane's climb performance was poor. He applied carburetor heat, noted a loss of rpm, then turned the carburetor heat off. Shortly thereafter, the airplane started to descend, and the pilot performed a forced landing to a field.

Examination of the engine revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation. The atmospheric conditions at the time of the accident were conducive to the formation of serious carburetor icing at cruise power settings. Since postaccident examination of the engine revealed no anomalies, it is likely that the loss of power was a result of carburetor ice accumulation. It is possible that carburetor ice formed before departure, when the engine was operating at a low power setting, which resulted in a partial loss of engine power during the initial climb.

Probable Cause and Findings

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

A partial loss of engine power during initial climb due to carburetor icing, and the pilot's failure to effectively use carburetor heat in conditions conducive to the formation of carburetor ice.

Findings

Environmental issues	Conducive to carburetor icing - Effect on equipment
Aircraft	Intake anti-ice, deice - Incorrect use/operation
Personnel issues	Identification/recognition - Pilot

Factual Information

History of Flight

Initial climb	Loss of engine power (partial) (Defining event)
Emergency descent	Off-field or emergency landing
Landing	Collision with terr/obj (non-CFIT)

On October 26, 2018, about 0730 mountain daylight time, a Piper PA-28, N5575U, was substantially damaged when it was involved in an accident near Denver, Colorado. The commercial pilot and pilot-rated passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot stated that he completed the preflight inspection, started the engine on the left fuel tank, then switched to the right fuel tank during taxi to the runup area. He reported a normal engine runup and recalled checking the carburetor heat and magnetos twice. He received a weather briefing, opened his flight plan, and was cleared to take off from runway 17L. He started the takeoff roll and noticed that the roll was a "little longer than normal," but attributed it to the weight of the airplane's full fuel tanks and the passenger.

During the initial climb, the airplane was climbing at 400 to 500 ft per minute. He then noticed that the climb rate was deteriorating and that the stall warning light was flashing intermittently. He pitched down, verified that the throttle was in the full power position and that the fuel/air mixture was full rich, then applied carburetor heat and retracted the flaps. He noticed a decrease in rpm after applying carburetor heat, concluded that carburetor ice was not a factor based on "no engine roughness" before turning on carburetor heat and the atmospheric conditions, and subsequently turned the carburetor heat off. The airplane's climb performance continued to degrade; shortly thereafter, the airplane began to descend, and the pilot performed a forced landing to a field. During the landing, the engine "seemed to lose power," then briefly surged just before touchdown.

A Federal Aviation Administration (FAA) inspector who responded to the accident site reported the airplane came to rest upright 2 miles and 195° from the departure end of runway 17L. The airplane remained intact; however, the nose and main landing gear were separated from the fuselage, the right-wing leading edge was damaged, and the empennage skin was wrinkled. One propeller blade exhibited aft bending and chordwise scratching. The inspector noted the presence of fuel in both wing tanks.

The engine crankshaft was rotated by hand, and internal and valvetrain continuity was established. Fuel was present throughout the fuel lines and was absent of any water and debris. The fuel gascolator was dry and the gascolator screen was free of debris and contamination. Power was applied to the electric fuel pump and it functioned normally. The engine-driven fuel pump was actuated by turning the propeller and it functioned normally. Both magnetos produced spark at all towers. There was no

evidence of any preimpact mechanical malfunctions or failures that would have precluded normal engine operation.

The 0653 weather reported at APA included a temperature of 3°C and a dew point of -3°C. The calculated relative humidity was about 66.8%.

According to an FAA Carburetor Icing Probability Chart, the atmospheric conditions at the time of the accident were conducive to serious icing at cruise power settings.

FAA 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	**Age:**	40,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	November 23, 2016
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	April 10, 2018
Flight Time:	881 hours (Total, all aircraft), 316 hours (Total, this make and model), 797 hours (Pilot In Command, all aircraft), 92 hours (Last 90 days, all aircraft), 24 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N5575U
Model/Series:	PA28 140	**Aircraft Category:**	Airplane
Year of Manufacture:	1969	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	28-26304
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	May 12, 2018 Annual	**Certified Max Gross Wt.:**	2150 lbs
Time Since Last Inspection:	3494 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	C91 installed, activated, aided in locating accident	**Engine Model/Series:**	O-320-E2A
Registered Owner:		**Rated Power:**	150 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:	KAPA,5883 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	06:53 Local	**Direction from Accident Site:**	16°
Lowest Cloud Condition:	Few / 20000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	120°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.11 inches Hg	**Temperature/Dew Point:**	3°C / -3°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Denver, CO (APA)	**Type of Flight Plan Filed:**	VFR
Destination:	Ogden, UT (OGD)	**Type of Clearance:**	VFR
Departure Time:	07:27 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	CENTENNIAL APA	**Runway Surface Type:**	Asphalt
Airport Elevation:	5885 ft msl	**Runway Surface Condition:**	Vegetation
Runway Used:	17L	**IFR Approach:**	None
Runway Length/Width:	10001 ft / 100 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	39.535556,-104.861663

Administrative Information

Investigator In Charge (IIC):	Hill, Millicent		
Additional Participating Persons:	LeRoy H Sutton; FAA/FSDO; Denver, CO		
Original Publish Date:	January 20, 2022	**Investigation Class:**	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=98549		