



Aviation Investigation Final Report

Location:	Atlanta, Georgia	Accident Number:	ERA23LA127
Date & Time:	February 16, 2023, 14:31 Local	Registration:	N103AV
Aircraft:	Piper PA-28-181	Aircraft Damage:	Substantial
Defining Event:	Fuel related	Injuries:	1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

Before takeoff, the student pilot and flight instructor performed a preflight inspection and an engine run-up that included checking the carburetor heat before taxiing the airplane into position; they noted no anomalies. After takeoff, about 200 ft above ground level, the engine lost total power. The flight instructor initiated a left turn and the airplane impacted the ground near a parallel runway, resulting in substantial damage to the wings and fuselage.

Postaccident examination of the engine revealed no evidence of preimpact mechanical malfunctions or failures 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 (idle) engine power settings. Furthermore, the engine data monitor indicated that the carburetor temperature decreased to 38°F just before the loss of engine power. Thus, it is likely that during the taxi and engine run-up, a period during which the engine would typically be operating at low power, carburetor ice formed and subsequently resulted in a total 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:

The flight instructor's failure to effectively utilize carburetor heat, which resulted in a total loss of engine power during initial climb due to carburetor ice that formed during the engine run-up and taxi.

Findings

Personnel issues	Lack of action - Instructor/check pilot
Environmental issues	Conducive to carburetor icing - Decision related to condition

Factual Information

History of Flight

Initial climb	Fuel related (Defining event)
Emergency descent	Controlled flight into terr/obj (CFIT)

On February 16, 2023, about 1431 eastern standard time, a Piper PA-28-181, N103AV, was substantially damaged when it was involved in an accident at Dekalb-Peachtree Airport (PDK), Atlanta, Georgia. The flight instructor sustained serious injuries and the student pilot sustained minor injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

According to the student pilot, he and the flight instructor conducted a preflight inspection, start up, taxi, and engine run-up, which included two checks of the carburetor heat system. Then, once they received their takeoff clearance, they began the takeoff roll on runway 21R and, after rotation while around 200 ft above ground level, the engine started to “sputter.” The flight instructor took over control of the airplane as the engine lost total power. The flight instructor stated that after the engine lost total power, he initiated a left turn to avoid colliding with structures.

The airplane impacted the ground on the right side of runway 3R, resulting in substantial damage to the fuselage and wings.

Postaccident examination of the engine revealed that internal and valvetrain continuity was established when the crankshaft was rotated by hand. Examination of the cylinders with a lighted borescope revealed no anomalies. The fuel inlet screen and fuel filter were examined and no debris was noted. The carburetor was disassembled, residual fuel was in the carburetor bowl, and no anomalies were noted with the system. The engine-driven fuel pump was actuated by hand and functioned normally. The engine oil, engine oil filter, and engine oil pickup screen were all absent of debris. Both magnetos produced spark at all towers.

Data downloaded from an Electronics International MVP-50P engine data monitor began at 1419 and ended at 1434. The data indicated that carburetor temperature decreased to 40°F and then increased twice before the takeoff. Then, during the takeoff, the rpm increased to 2,600 rpm and the carburetor temperature decreased to 38°F for about a minute. The fuel flow at the same time increased, surged three times, and then decreased to 0. Furthermore, the engine rpm remained around or below 1,500 rpm for the majority of the accident flight except two times, when the rpm increased to 2,000 rpm and 2,600 rpm respectively.

At 1444, the weather reported at PDK included a temperature of 23°C and a dew point 14°C. The calculated relative humidity at this temperature and dewpoint was 57%. Review of the icing probability chart contained within Federal Aviation Administration (FAA) Special Airworthiness Information Bulletin CE-09-35 revealed the atmospheric conditions at the time of the accident were "conducive to serious icing at glide [idle] power."

According to FAA Advisory Circular (AC) 20-113, "To prevent accidents due to induction system icing, the pilot should regularly use [carburetor] heat under conditions known to be conducive to atmospheric icing and be alert at all times for indications of icing in the fuel system." The AC recommended that when operating in conditions where the relative humidity is greater than 50%, "...apply carburetor heat briefly immediately before takeoff, particularly with float type carburetors, to remove any ice which may have been accumulated during taxi and runup." It also stated, "Remain alert for indications of induction system icing during takeoff and climbout, especially when the relative humidity is above 50%, or when visible moisture is present in the atmosphere."

Flight instructor Information

Certificate:	Commercial; Flight instructor	Age:	22, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Right
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 With waivers/limitations	Last FAA Medical Exam:	January 31, 2022
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	November 22, 2022
Flight Time:	557.7 hours (Total, all aircraft), 113 hours (Total, this make and model), 496.5 hours (Pilot In Command, all aircraft), 115.6 hours (Last 90 days, all aircraft), 42.4 hours (Last 30 days, all aircraft), 3.7 hours (Last 24 hours, all aircraft)		

Student pilot Information

Certificate:	None	Age:	14, Male
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	
Medical Certification:	None	Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N103AV
Model/Series:	PA-28-181	Aircraft Category:	Airplane
Year of Manufacture:	1983	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	28-8390084
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	March 31, 2022 Annual	Certified Max Gross Wt.:	2550 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	13761.8 Hrs at time of accident	Engine Manufacturer:	Lycoming
ELT:	C91A installed, activated, did not aid in locating accident	Engine Model/Series:	O-360-A4M
Registered Owner:	FLYING TO INFINITY AND BEYOND LLC	Rated Power:	180 Horsepower
Operator:	Centennial Aviation Academy INC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	PDK,979 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	14:44 Local	Direction from Accident Site:	26°
Lowest Cloud Condition:	Few	Visibility	10 miles
Lowest Ceiling:	Broken / 4500 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	8 knots / None	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	190°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	23°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Atlanta, GA	Type of Flight Plan Filed:	None
Destination:	Atlanta, GA	Type of Clearance:	None
Departure Time:		Type of Airspace:	Class D

Airport Information

Airport:	DEKALB-PEACHTREE PDK	Runway Surface Type:	Asphalt
Airport Elevation:	998 ft msl	Runway Surface Condition:	Dry
Runway Used:	3R	IFR Approach:	None
Runway Length/Width:	6001 ft / 100 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Serious, 1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious, 1 Minor	Latitude, Longitude:	33.870301,-84.30246(est)

Administrative Information

Investigator In Charge (IIC):	Kemner, Heidi
Additional Participating Persons:	Andre Cummings; FAA/FSDO; Atlanta, GA Mike Childers; Lycoming Engines; Williamsport, PA
Original Publish Date:	May 2, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=106743

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