Aviation Investigation Final Report

Location:	Buford, Georgia	**Accident Number:**	ERA23LA117
Date & Time:	January 24, 2023, 16:42 Local	**Registration:**	N7470R
Aircraft:	Piper PA-28-140	**Aircraft Damage:**	Substantial
Defining Event:	Fuel contamination	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The student pilot and his flight instructor were on a local flight and were practicing maneuvers before returning to their home airport. Shortly after the student switched fuel tanks, the engine unexpectedly lost all power. The flight instructor confirmed that the throttle was full forward and the mixture was full rich. Unable to reach an airport due to their altitude, the flight instructor performed a forced landing to a local interstate highway. During the landing, the airplane's nose landing gear collapsed and the right wing was damaged. The pilots were not injured.

Examination of the engine, including a test run, revealed no evidence of any mechanical malfunctions or anomalies that would have precluded normal operation. During the examination of the carburetor, about 1 ounce of cloudy water was found in the carburetor bowl; no water was found in the gascolator. The flight instructor reported that no water was observed during the preflight inspection. Based on this information, it is likely that, as the student switched fuel tanks, previously undetected water from within the fuel system was introduced into the carburetor, resulting in the total loss of power.

Probable Cause and Findings

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

Water contamination in the fuel system that was not observed during the preflight inspection, resulting in a total loss of engine power and forced landing.

Findings

Aircraft	Fuel - Fluid condition

Factual Information

History of Flight

Maneuvering	Fuel contamination (Defining event)
Emergency descent	Off-field or emergency landing

On January 24, 2023, about 1642 eastern standard time, a Piper PA-28-140 airplane, N7470R, was substantially damaged when it was involved in an accident near Buford, Georgia. The flight instructor and a student pilot were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

The flight instructor reported that she and the student pilot practiced several maneuvers in the local area and were returning to their home airport. She asked the student to switch fuel tanks, since it was time to do so. Shortly thereafter, the engine lost all power. She confirmed that the throttle was full forward and the mixture was full rich. Unable to reach an airport due to their altitude, the flight instructor performed a forced landing to a local interstate highway. During the landing, the airplane's nose landing gear collapsed and the right wing was damaged.

An inspector with the Federal Aviation Administration responded to the accident site and examined the wreckage. He reported that the right wing was substantially damaged.

The wreckage was recovered to a salvage facility for further examination. The position of the cockpit fuel selector handle prior to the accident could not be determined. The engine was attached to the airframe and the engine mount was undamaged; therefore, a test run of the engine was attempted. A visual examination of the engine revealed no holes or breaches in the engine case, and internal continuity of the drivetrain was confirmed by rotating the engine crankshaft manually. The propeller remained attached to the engine; however, the blade tips were visibly bent. The spark plugs were removed and exhibited light brown color and normal wear when compared to a Champion Check-A-Plug chart.

The engine was started and ran without hesitation or stumbling from idle to about 2,100 rpm. The test run was concluded after 2 minutes.

An examination of the fuel system revealed the right-wing fuel tank was breached from impact forces and was empty of fuel. The fuel cap was secured and in place. The cap seal was supple. The left-wing fuel tank was intact and was empty of fuel. The fuel cap was secured and in place. The cap seal was supple. The gascolator contained about 2 ounces of clean, blue fuel. No water was observed. When the throttle arm was actuated, the accelerator pump expelled liquid, and water droplets were observed on the throttle plate. The carburetor was removed for examination. After partial disassembly, the composite floats and other internal components were observed to be undamaged. The carburetor bowl contained blue fuel and about 1 ounce of cloudy water.

The flight instructor reported the preflight inspection of the airplane prior to the accident flight was unremarkable and no water was observed in the fuel system.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	40,Female
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	May 3, 2022
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	July 14, 2022
Flight Time:	944 hours (Total, all aircraft), 44 hours (Total, this make and model), 778 hours (Pilot In Command, all aircraft), 141 hours (Last 90 days, all aircraft), 56 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Student pilot Information

Certificate:	None	**Age:**	53,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):		**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	34 hours (Total, all aircraft), 1 hours (Total, this make and model), 9 hours (Pilot In Command, all aircraft), 6 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N7470R
Model/Series:	PA-28-140	**Aircraft Category:**	Airplane
Year of Manufacture:	1966	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	28-22135
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	September 21, 2022 Annual	**Certified Max Gross Wt.:**	2150 lbs
Time Since Last Inspection:	68 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4640 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-320-E2A
Registered Owner:	On file	**Rated Power:**	150
Operator:	Advanced Aviation	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KLZU,1061 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	14:56 Local	**Direction from Accident Site:**	142°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	150°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.21 inches Hg	**Temperature/Dew Point:**	11°C / -4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Lawrenceville, GA (LZU)	**Type of Flight Plan Filed:**	None
Destination:	Lawrenceville, GA (LZU)	**Type of Clearance:**	VFR
Departure Time:	15:23 Local	**Type of Airspace:**	Class D

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	34.05,-84.03(est)

Administrative Information

Investigator In Charge (IIC):	Hicks, Ralph
Additional Participating Persons:	Jim Payne; FAA/FSDO; Atlanta, GA
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.ntsb.gov/Docket?ProjectID=106633