



# Aviation Investigation Final Report

|                                |                                           |                         |                    |
|--------------------------------|-------------------------------------------|-------------------------|--------------------|
| <b>Location:</b>               | Allentown, Pennsylvania                   | <b>Accident Number:</b> | CEN22FA436         |
| <b>Date &amp; Time:</b>        | September 28, 2022, 13:40 Local           | <b>Registration:</b>    | N7329F             |
| <b>Aircraft:</b>               | Piper PA-28-140                           | <b>Aircraft Damage:</b> | Destroyed          |
| <b>Defining Event:</b>         | Loss of engine power (partial)            | <b>Injuries:</b>        | 1 Fatal, 1 Serious |
| <b>Flight Conducted Under:</b> | Part 91: General aviation - Instructional |                         |                    |

## Analysis

The flight instructor reported that the airplane was not performing as expected during the takeoff and initial climb. He took control of the airplane from his student and was able to clear trees off the departure end of the runway, but the airplane would not continue climbing and the engine was “noticeably weak.” He maneuvered the airplane, maintaining the best angle of climb airspeed ( $V_X$ ), and was unable to find a suitable landing area. The airplane impacted trees and the ground and a postimpact fire ensued.

Postaccident examination of the airplane and its engine did not reveal any preimpact anomalies; however, the extensive fire damage precluded functional testing and examination of several airframe and engine components.

Recorded flight data indicated that the airplane was below the published  $V_X$  airspeed, but above stall speed. The airspeed derived from the data used surface winds reported at the departure airport and the actual winds encountered by the airplane could not be determined. This discrepancy could account for the difference in the derived speed and the speed the pilot reported. Operation of the airplane below  $V_X$  could have reduced the airplane’s climb rate but any deficit to climb performance could not be quantified.

The recorded temperature and dewpoint at the time of the accident was conducive to the development of serious icing at glide power and was between the range for icing at glide and cruise power and serious icing at cruise power.

## 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 for undetermined reasons.

## Findings

|                             |                                                     |
|-----------------------------|-----------------------------------------------------|
| <b>Not determined</b>       | (general) - Unknown/Not determined                  |
| <b>Environmental issues</b> | Conducive to carburetor icing - Effect on equipment |

## Factual Information

### History of Flight

|               |                                                 |
|---------------|-------------------------------------------------|
| Initial climb | Loss of engine power (partial) (Defining event) |
|---------------|-------------------------------------------------|

On September 28, 2022, about 1340 eastern daylight time, a Piper PA28-140, N7329F, was destroyed when it was involved in an accident near Allentown, Pennsylvania. The student pilot was fatally injured, and the flight instructor was seriously injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

The flight instructor reported that the purpose of the instructional flight was to fly to a nearby tower-controlled airport. After a preflight inspection, and pre-takeoff engine run-up, the instructor asked the student to perform a soft-field takeoff.

The instructor stated that, during the takeoff, the airplane had not become airborne by the time he felt it should, and he prompted the student to increase the airplane's pitch attitude and it became airborne. The student then reduced pitch to remain in ground effect but settled briefly back onto the runway before re-establishing flight in ground effect. The instructor stated that the airplane seemed to take longer to accelerate to its best angle of climb speed ( $V_x$ ), which he attributed to the student's initial slightly high pitch attitude. When the airplane reached  $V_x$ , the instructor assumed control of the airplane and maintained airspeed. He stated that the airplane was laboring in its climb, narrowly cleared the trees off the departure end of the runway, and was unable to climb thereafter. Although the engine was running, it was "noticeably weak." The instructor raised the flaps and continued to fly the airplane at  $V_x$  and was still not able to climb. He noted that the airplane was about 200 ft above the ground and approaching rising terrain. The instructor attempted to locate an area to land, but was unable to locate a suitable landing area, and the airplane descended into trees.

Recorded Automatic Dependent Surveillance-Broadcast (ADS-B) data showed that the airplane departed and continued for about 0.8 miles on runway heading, then made a slight left turn before the end of the data. The accident site was about 450 ft and 250° from the final recorded location. The reported wind at the departure airport was from 310° at 8 kts.

Examination of the data, taking into account the reported surface winds, showed that the airspeed during the final portion of the flight was below  $V_x$  but above the listed stall speed from the airplane owner's manual. The owner's manual listed a stall speed with 0° flap setting at maximum gross weight was 64 mph.



Figure 1. Overhead view of the accident flight path.

A witness to the accident, who was outside the residence where the accident occurred, reported that he did not hear the airplane until it impacted trees. The airplane then impacted the ground and a fire erupted. The witness was able to pull one of the occupants from the wreckage, but was unable to extricate the other occupant before fire engulfed the cabin section of the airplane.

**Flight instructor Information**

|                                  |                                                                                                                                                                                                                                            |                                          |                   |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------|
| <b>Certificate:</b>              | Commercial; Flight instructor                                                                                                                                                                                                              | <b>Age:</b>                              | 34, Male          |
| <b>Airplane Rating(s):</b>       | Single-engine land                                                                                                                                                                                                                         | <b>Seat Occupied:</b>                    | Right             |
| <b>Other Aircraft Rating(s):</b> | None                                                                                                                                                                                                                                       | <b>Restraint Used:</b>                   | Unknown           |
| <b>Instrument Rating(s):</b>     | Airplane                                                                                                                                                                                                                                   | <b>Second Pilot Present:</b>             | Yes               |
| <b>Instructor Rating(s):</b>     | Airplane single-engine; Instrument airplane                                                                                                                                                                                                | <b>Toxicology Performed:</b>             |                   |
| <b>Medical Certification:</b>    | Class 1 Without waivers/limitations                                                                                                                                                                                                        | <b>Last FAA Medical Exam:</b>            | December 19, 2017 |
| <b>Occupational Pilot:</b>       | Yes                                                                                                                                                                                                                                        | <b>Last Flight Review or Equivalent:</b> | March 1, 2021     |
| <b>Flight Time:</b>              | 1350 hours (Total, all aircraft), 700 hours (Total, this make and model), 1200 hours (Pilot In Command, all aircraft), 40 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft) |                                          |                   |

**Student pilot Information**

|                                  |                                                                                                                                                                                           |                                          |                   |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------|
| <b>Certificate:</b>              | Student                                                                                                                                                                                   | <b>Age:</b>                              | 49, Male          |
| <b>Airplane Rating(s):</b>       | None                                                                                                                                                                                      | <b>Seat Occupied:</b>                    | Left              |
| <b>Other Aircraft Rating(s):</b> | None                                                                                                                                                                                      | <b>Restraint Used:</b>                   | Unknown           |
| <b>Instrument Rating(s):</b>     | None                                                                                                                                                                                      | <b>Second Pilot Present:</b>             | Yes               |
| <b>Instructor Rating(s):</b>     | None                                                                                                                                                                                      | <b>Toxicology Performed:</b>             |                   |
| <b>Medical Certification:</b>    | Class 3                                                                                                                                                                                   | <b>Last FAA Medical Exam:</b>            | November 24, 2021 |
| <b>Occupational Pilot:</b>       | No                                                                                                                                                                                        | <b>Last Flight Review or Equivalent:</b> |                   |
| <b>Flight Time:</b>              | 51 hours (Total, all aircraft), 51 hours (Total, this make and model), 12 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft) |                                          |                   |

**Aircraft and Owner/Operator Information**

|                                      |                                  |                                       |                 |
|--------------------------------------|----------------------------------|---------------------------------------|-----------------|
| <b>Aircraft Make:</b>                | Piper                            | <b>Registration:</b>                  | N7329F          |
| <b>Model/Series:</b>                 | PA-28-140                        | <b>Aircraft Category:</b>             | Airplane        |
| <b>Year of Manufacture:</b>          | 1968                             | <b>Amateur Built:</b>                 |                 |
| <b>Airworthiness Certificate:</b>    | Normal; Utility                  | <b>Serial Number:</b>                 | 28-25237        |
| <b>Landing Gear Type:</b>            | Tricycle                         | <b>Seats:</b>                         | 4               |
| <b>Date/Type of Last Inspection:</b> | July 1, 2022 Annual              | <b>Certified Max Gross Wt.:</b>       | 2150 lbs        |
| <b>Time Since Last Inspection:</b>   |                                  | <b>Engines:</b>                       | 1 Reciprocating |
| <b>Airframe Total Time:</b>          | 6031.1 Hrs as of last inspection | <b>Engine Manufacturer:</b>           | LYCOMING        |
| <b>ELT:</b>                          | Installed                        | <b>Engine Model/Series:</b>           | O-320-D3G       |
| <b>Registered Owner:</b>             | PROFLITE AERO LLC                | <b>Rated Power:</b>                   | 180 Horsepower  |
| <b>Operator:</b>                     | PROFLITE AERO LLC                | <b>Operating Certificate(s) Held:</b> | None            |

**Meteorological Information and Flight Plan**

|                                         |                                  |                                             |                  |
|-----------------------------------------|----------------------------------|---------------------------------------------|------------------|
| <b>Conditions at Accident Site:</b>     | Visual (VMC)                     | <b>Condition of Light:</b>                  | Day              |
| <b>Observation Facility, Elevation:</b> | KXLL, 385 ft msl                 | <b>Distance from Accident Site:</b>         | 6 Nautical Miles |
| <b>Observation Time:</b>                | 13:51 Local                      | <b>Direction from Accident Site:</b>        | 28°              |
| <b>Lowest Cloud Condition:</b>          | Unknown                          | <b>Visibility:</b>                          | 10 miles         |
| <b>Lowest Ceiling:</b>                  | Broken / 4200 ft AGL             | <b>Visibility (RVR):</b>                    |                  |
| <b>Wind Speed/Gusts:</b>                | 8 knots /                        | <b>Turbulence Type Forecast/Actual:</b>     | /                |
| <b>Wind Direction:</b>                  | 310°                             | <b>Turbulence Severity Forecast/Actual:</b> | /                |
| <b>Altimeter Setting:</b>               | 30.15 inches Hg                  | <b>Temperature/Dew Point:</b>               | 18°C / 10°C      |
| <b>Precipitation and Obscuration:</b>   | No Obscuration; No Precipitation |                                             |                  |
| <b>Departure Point:</b>                 | Allentown, PA                    | <b>Type of Flight Plan Filed:</b>           | None             |
| <b>Destination:</b>                     | Allentown, PA                    | <b>Type of Clearance:</b>                   | None             |
| <b>Departure Time:</b>                  |                                  | <b>Type of Airspace:</b>                    | Class G          |

The weather conditions at the departure airport included a temperature of 18°C, and dewpoint of 10°C. According to Federal Aviation Administration Special Airworthiness Information Bulletin CE-09-35, the temperature and dewpoint were in a range of susceptibility for serious

icing at glide power and between the range for icing at glide and cruise power and serious icing at cruise power.

### Airport Information

|                             |                                  |                                  |                |
|-----------------------------|----------------------------------|----------------------------------|----------------|
| <b>Airport:</b>             | ALLENTOWN QUEEN CITY MUNI<br>XLL | <b>Runway Surface Type:</b>      | Asphalt        |
| <b>Airport Elevation:</b>   | 399 ft msl                       | <b>Runway Surface Condition:</b> | Dry            |
| <b>Runway Used:</b>         | 07/25                            | <b>IFR Approach:</b>             | None           |
| <b>Runway Length/Width:</b> | 3950 ft / 75 ft                  | <b>VFR Approach/Landing:</b>     | Forced landing |

### Wreckage and Impact Information

|                            |                    |                             |                      |
|----------------------------|--------------------|-----------------------------|----------------------|
| <b>Crew Injuries:</b>      | 1 Fatal, 1 Serious | <b>Aircraft Damage:</b>     | Destroyed            |
| <b>Passenger Injuries:</b> | N/A                | <b>Aircraft Fire:</b>       | On-ground            |
| <b>Ground Injuries:</b>    | N/A                | <b>Aircraft Explosion:</b>  | On-ground            |
| <b>Total Injuries:</b>     | 1 Fatal, 1 Serious | <b>Latitude, Longitude:</b> | 40.558901,-75.510649 |

The inboard portion of the left wing remained lodged in a tree about 15 ft above ground level. The remainder of the wreckage was located at the base of the tree. Examination at the accident scene confirmed the presence of all airframe and engine components. The cabin section of the airplane was consumed by fire. The right wing was located adjacent to the fuselage remnants and the empennage remained attached to the aft fuselage. The tip of the left wing was on the opposite side of the tree on the driveway of the residence.

The engine, with the propeller still attached, was located at the front of the burned cabin section. Postaccident examination of the airplane and engine at the accident scene did not reveal any preimpact anomalies that would have prevented normal operation; however, fire damage prevented functional testing of several components.

### Medical and Pathological Information

Toxicological testing of samples from the student revealed the presence of potentially impairing substances; however, according to the flight instructor's statement, the student had relinquished control of the airplane.

### Administrative Information

|                                          |                                                                                                                                   |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <b>Investigator In Charge (IIC):</b>     | Brannen, John                                                                                                                     |
| <b>Additional Participating Persons:</b> | Thomas Gilbert; FAA; Allentown, PA<br>Ryan Enders; Lycoming; Williamsport, PA<br>Damian Galbraith; Piper Aircraft; Vero Beach, FL |
| <b>Original Publish Date:</b>            | June 5, 2024                                                                                                                      |
| <b>Last Revision Date:</b>               |                                                                                                                                   |
| <b>Investigation Class:</b>              | <a href="#">Class 3</a>                                                                                                           |
| <b>Note:</b>                             |                                                                                                                                   |
| <b>Investigation Docket:</b>             | <a href="https://data.nts.gov/Docket?ProjectID=106014">https://data.nts.gov/Docket?ProjectID=106014</a>                           |

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The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).