

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ERA23FA380

AIRFRAME AND ENGINE EXAMINATION

N3079M, Piper PA-28-161

A. ACCIDENT DETAILS

Location: Whitesville, Kentucky
Date: September 27, 2023
Time: 2249 CDT
0349 GMT (September 28)
Airplane: N3079M, Piper PA-28-161

Investigator In Charge Lynn Spencer
NTSB/AS-ERA
Washington, DC

FAA Party Coordinator Stephen Travis
Federal Aviation Administration/FSDO
Louisville, KY

EXAMINATION PARTICIPANTS

Investigator (on scene) Dan Boggs
NTSB/AS-ERA
Washington, DC

Group Member Jon Hirsch
Piper Aircraft
Vero Beach, FL

Group Member David Harsanyi
Lycoming Engines
Williamsport, PA

B. SUMMARY

On September 27, 2023, about 2249 central daylight time, a Piper PA28, N3079M, was destroyed when it was involved in an accident near Whitesville, Kentucky. The flight instructor and student pilot were fatally injured. The airplane was operated by Eagle Flight Academy as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

The airplane encountered weather while on a night, cross-country flight. The airplane's last ADS-B position was at an altitude of 2,200 ft msl about 1,000 feet northwest of a debris field that spanned 25 acres in a hilly, densely wooded area.

Examination of the airframe and engine revealed no preaccident mechanical malfunctions or failures that would have precluded normal operation of the airplane.

Debris Field Description

All major components of the airplane except for the left portion of the stabilator were recovered from the debris field. The fuselage was separated aft of the rear seat, and the forward fuselage including the cockpit, engine, and right wing were located together in the most westerly portion of the debris field. The left front seat and the rear bench seat were separated from the airframe and located in the debris field. The left wing with aileron attached was located about 800 feet east of the forward fuselage. The flap was separated from the wing and located in the debris field. The right wing remained attached to the forward fuselage and was upside down with aileron and flap attached. The empennage with vertical stabilizer intact was located over a ridge about 200 feet north of the forward fuselage. The right side of the stabilator was located about 1,500 feet away from the forward fuselage in the most eastern edge of the debris field.

C. AIRFRAME EXAMINATION

The airplane was a low-wing, fixed tricycle landing gear equipped airplane. Its fuselage was an all-metal construction, seating four people with two front seats with dual flight controls and an aft bench seat. After the recovery effort from the large debris field, an airframe layout and examination took place on September 30, 2023, at AMF Aviation in Springfield, Tennessee.

Fuselage

The fuselage was separated aft of the rear seat. The forward fuselage included the cockpit, engine, and right wing. The left seat and the rear bench seat were separated from their mounts. The main cabin door remained attached to the forward fuselage by its hinges. The baggage door was not located.

Left Wing

The left wing was cut for recovery. The aileron remained attached to the wing by its hinges and the flap was separated from the wing. The interior wing ribs exhibited signatures consistent with the aileron bellcrank having been pulled from its mount and drawn through the wing to the inboard end. The aileron bellcrank was broken with the balance cable arm remaining attached to the balance cable. The balance cable was continuous to the right wing. The remainder of the bellcrank was not located. The pitot mast and lift detector remained attached to their respective mounts.

Right Wing

The right wing was cut for recovery. The aileron and flap remained attached to the wing by their hinges. The aileron cables were continuous to the wing root. The aileron cables remained attached to the bellcrank and the bellcrank remained attached to the wing.

Empennage

The vertical stabilizer remained attached to the tailcone. The rudder was impact damaged and torn diagonally from top to bottom with the lower portion of remaining attached to the vertical stabilizer and the upper portion separated.

The stabilator was torn chordwise just outboard of the hinges. The left side of the stabilator was not located.

Flight Control Continuity

Flight control cable continuity was confirmed from the cockpit to each of the respective control surfaces except for separations consistent with accident forces and recovery cuts. A portion of the left aileron drive cable between the fuselage and the bellcrank was not located.

Cockpit Controls

Carburetor heat - OFF

Throttle - Half open

Mixture - Leaned aft of full rich

Tachometer - 2,505.0 hrs

RPM - Needle at 300 rpm

Airspeed - 0

Turn coordinator - level

Altimeter - 2,880 ft and set 29.92 inches of mercury

Vertical Speed indicator - 500 feet per minute UP

Attitude indicator - Tumbled to 90° right bank

Ignition/Magneto Switch - BOTH

Battery Switch - ON

Fuel Pump - OFF

Landing Light - ON

Pitot Heat - OFF

Hobbs Meter - 350.5 hours

Seats and Seatbelts

The left front seat and the rear bench seat were separated from the airframe. The front right seat remained in the cockpit and the seat bottom cushion was impaled on a portion of airframe structure. The left front seat belt was not buckled. The outboard portion of the lap belt remained attached to the airframe. The inboard portion of the lap belt remained attached to its mount; however, the mount was separated from the airframe. The right front seat belt was not buckled. The inboard portion of the lap belt remained attached to the airframe. The outboard portion of the lap belt was not observed. Both front seat shoulder harnesses remained attached to the airframe.

Airframe Fuel System

The cockpit sidewall on the left side of the fuselage was torn and damaged around the fuel selector valve. The fuel selector handle remained attached to the selector valve. The fuel selector cover bezel was separated and not observed. The fuel selector handle was in the left tank position. The selector handle was rotated to the right tank and off positions with each detent detectable. Low pressure air was able to pass through the valve in both the left and right positions.

The fuel strainer bowl was impact damaged and separated from its mount. The fuel strainer screen was separated from the mount and not located. The electric fuel boost pump cover was removed to facilitate examination of the filter screen. Liquid, consistent in odor and color with 100LL avgas drained from the boost pump when the filter cover was removed. The filter element and the inside of the pump contained a fine grain, black colored particles of unknown composition.

Other Systems

The emergency locator transmitter (ELT) remained attached to its mount in the tailcone. It was in the "off" position.

D. AIRFRAME EXAMINATION PHOTOS



Photo 1 - View of inboard right wing (cut for recovery) and main spar. (Photo courtesy of Piper Aircraft)



Photo 2 - View of outboard right wing (cut for recovery). (Photo courtesy of Piper Aircraft)



Photo 3 - View of left wing and cockpit door (cut for recovery). (Photo courtesy of Piper Aircraft)



Photo 4 - View of aft fuselage and empennage. (Photo courtesy of Piper Aircraft)



Photo 5 - View of fractured main wing spar. (Photo courtesy of Piper Aircraft)



Photo 6 - Close-up view of fractured wing spar. (Photo courtesy of Piper Aircraft)



Photo 7 - View of empennage and aft fuselage (cut for recovery). (Photo courtesy of Piper Aircraft)



Photo 8 - View of fractured stabilator on tail cone. (Photo courtesy of Piper Aircraft)



Photo 9 - View of right side of fractured stabilator. (Photo courtesy of Piper Aircraft)

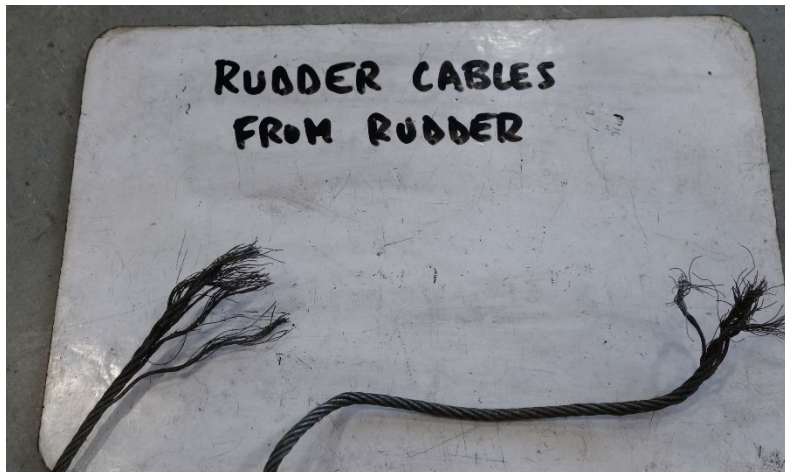


Photo 10 - View of broom-strawed rudder cables. (Photo courtesy of Piper Aircraft)

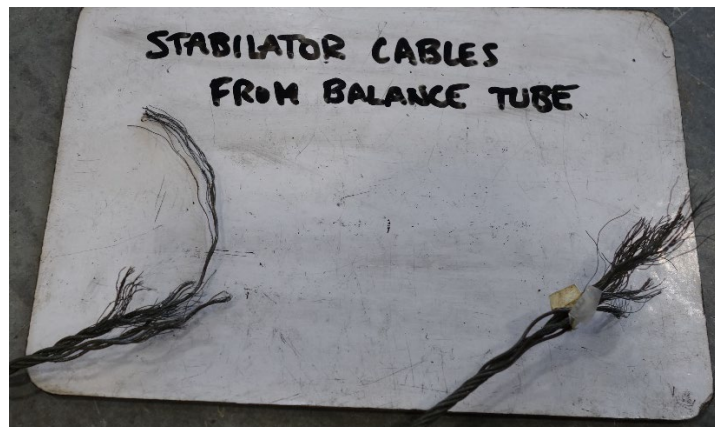


Photo 11- View of broom-strawed stabilator cables from balance tube. (Phot Courtesy of Piper Aircraft)



Photo 12 - View of hoisted engine section with forward cockpit and lower fuselage. (Photo courtesy of Lycoming Engines)



Photo 13 - View of hoisted engine and attached cockpit panel. (Photo courtesy of Lycoming Engines)

E. ENGINE EXAMINATION AND PHOTOS

The engine was impact bent to the right with corresponding bends to the engine mount. The engine was cut from the fuselage section and engine mount to conduct an engine examination.

The engine showed signs of impact damage to the starter ring gear which was found impact fractured into several pieces. The alternator sustained impact damage and was only attached by one of its bolts and attach brackets to the front of the engine. The carburetor was impact damage and separated at the bowl causing damage to both brass floats and the mixture control arm. The throttle arm remained attached to the unit and the throttle plate actuated freely throughout its travel range. The fuel inlet screen remained attached to the unit and was removed. The screen was found to be free and clear of debris. Blue fuel staining was found within the carburetor bowl and the side of the carburetor housing, but no fuel was present. All other engine components and accessories were found tightly installed.

The engine driven fuel pump was found secured and safety wired to the accessory section of the engine. The pump was removed and actuated by hand producing suction and compression at each port. No tears or debris were noted within the pump's diaphragms upon disassembly. The fuel pump actuation rod within the accessory section of the engine moved freely with engine crankshaft rotation.

No oil was observed leaking from the engine and no holes or fractures to the engine case were observed. All valve covers were present and tightly installed on each cylinder. All sparkplugs were present and undamaged on each cylinder. The plugs showed normal coloration and wear patters when compared to a Champion Check-A-Plug chart.

Oil was present within the engine and drained from the oil sump. The oil suction screen was found installed and safety wired to the oil sump. Upon removal, the screen was found free and clear of any obstruction or debris. The oil filter was found securely installed and safety wired to the accessory section of the engine. The oil filter was not cut open as part of the examination as no signs of metal or debris was present within suction screen or engine.

Both magnetos were found tightly installed and removed from the accessory section of the engine. When rotated using an electric dill, spark was produced at each ignition lead point with no anomalies noted. No further testing of either magneto was performed.

Suction and compression were observed on all cylinders as the engines propellor was rotated by hand. Valvetrain continuity was confirmed throughout the engine and all rocker arms moved as the crankshaft was rotated.

A lighted borescope inspection was unremarkable on all cylinders when performed.



Photo 14 - View of hoisted engine and propeller before examination. (Photo courtesy of Lycoming Engines)



Photo 15 - Engine as viewed from above. (Photo courtesy of Lycoming Engines)



Photo 16 - Spark plugs (Photo courtesy of Lycoming Engines)

F. PROPELLER EXAMINATION AND PHOTOS

The 2-blade fixed pitch Sensenich propeller remained attached to the crankshaft flange and the two blades remained attached to the hub. The propeller spinner was impact molded around the propeller hub, showing impact molding of the bolts and safety wire underneath through the aluminum. Blade A showed wear to the leading edge towards the tip of the blade; however, no other damage noted to either side of the blade. Blade B showed minor rearward bending of the entire blade consistent with ground impact.



Photo 17 - View of the propeller. (Photo courtesy of Lycoming Engines)

Submitted by:

Lynn Spencer
Air Safety Investigator, AS-ERA