



Airframe and Engine Examination Report

NTSB ACCIDENT NUMBER: **ERA20FA118**

AIRCRAFT REGISTRATION: N43368

AIRCRAFT TYPE: Piper PA-46

ACCIDENT LOCATION: Bishop, Georgia

Investigative Team:

NTSB Investigator-in-Charge (IIC): Millicent Hill, Aviation Accident Investigator

FAA Inspector: Russell Layton

CMI: Mike Council (Air Safety Investigator)

Piper: Damien Lewis (Air Safety Investigator)

HISTORY OF FLIGHT

On March 3, 2020, about 1634, a Piper PA-46-310P, N43368, was destroyed when it was involved in an accident near Bishop, Georgia. The private pilot and two passengers were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* 91 personal flight.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted a wooded area behind a residential property at an elevation of 760 ft and the main wreckage was oriented on a magnetic heading of 090°. All major components were accounted for at the scene. The main wreckage consisted of the fuselage and engine. The wings, empennage, and airframe components were located along the 1/2 mile long debris path. The right side of the fuselage was destroyed by a postimpact fire. The primary flight control cables were traced from the cockpit area to their respective flight control surfaces through impact and overload separation areas.

A borescope was utilized to examine the engine cylinders; all intake and exhaust valves were intact. Crankshaft and valve continuity were confirmed from the front to the rear of the engine. Both magnetos were rotated through the impulse coupling and exhibited a spark on all lead outputs. The two-bladed propeller remained attached to the engine, both blades were free of leading edge gouges or chord-wise scratches.

The postaccident examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

ENGINE EXAM

The engine remained with the main wreckage and was destroyed by a post impact fire, it remained attached to the fuselage was lying inverted.

- Crankshaft and valve train continuity was confirmed from the front to the rear of the engine. An electronic borescope inspection was performed.
- The engine was manually rotated, and thumb compression was achieved in all cylinders except Nos. 2 and 4. Rocker covers were removed from all cylinders and all rocker arms moved normally when the engine was manually rotated.
- The top sparkplugs were removed and examined. When compared to a Champion Check-A-Plug chart, the condition of the sparkplugs was normal.
- The left magneto was separated, both magnetos were removed from the engine and manually rotated using an electric drill. Spark was produced at all ignition leads.
- The engine-driven fuel pump was removed. The drive coupling was intact, and the fuel pump rotated smoothly. The fuel pump was disassembled, and all impeller blades were intact. The fuel manifold was removed and disassembled. The diaphragm and spring were intact, and the fuel screen was clean.
- The left and right turbochargers were rotated manually. The right turbo rotated smoothly but the left turbo rotated with minor binding consistent with impact damage.
- The two-blade Hartzell constant speed propeller remained attached. One propeller blade was completely buried in the soft ground. The second propeller blade was pointing upward and did not exhibit any leading edge damage or cordwise marks. The propeller spinner exhibited only minor impact damage to the pointed end.

AIRFRAME EXAM

Fuselage

- The primary flight control cables were traced from the cockpit area to their respective flight control surfaces through impact and overload separation areas. All observed cable separations exhibited a splayed, broomstrawed appearance consistent with tension overload separation.
- The right side of the fuselage was destroyed by post-impact fire.
- The instrument panel was thermally destroyed. The pilots Artificial Horizon (AH) was thermally damaged, and upon disassembly there were no visible rotational scoring noted to its internal gyro rotor or housing. The airspeed indicator was static at 40 knots.
- The fuel selector was observed selected to the RIGHT fuel tank position.
- The flap actuator and control lever were thermally damaged. The actuator's piston was retracted and the flap control lever was in the "up" position which is indicative of the flaps set to the UP/0° position.
- The engine cowlings were impact damaged. The gascolator and its filter were thermally damaged. The right boost pump and header tank was destroyed and the left was impact damaged.

Left Wing

- The main wing spar exhibited upward deformation at the fracture locations. The fracture surfaces exhibited a dull, grainy appearance consistent with overload separation.
- About 8 ft of the inboard left wing remained attached to the fuselage at its attaching points. The inboard section was deformed upward and crushed under the fuselage.
- The separated outboard wing section about 11 ft exhibited full span downward deformation forward of the main spar. Skin separations were noted to the bottom outboard area of the wing. The wing's stall strip remained attached to the deice boot.
- The aileron was separated into three sections. The inboard about 52-inch section remained attached to the wing and the other two sections were separated. The full span of the aileron including the balance weight was accounted for. One aileron control cable was separated about 7 ft from the sector and the other about 16 inches. Their separated ends displayed a splayed, broomstrawed appearance consistent with tension overload separation.
- The flap was separated in two sections. The outboard about 6ft of flap was deformed and separated from the wing. The inboard about 5ft section remained attached to the wing in the UP position and was crushed.
- The fuel caps remained secured, the fuel cell was breached from the wing separation.
- The left main gear remained attached in the UP position and was impact damaged.

Right wing

- The main spar fractured exhibited upward deformation and their fracture surfaces displayed a dull, grainy appearance consistent with overload separation. An approximate 8 ft section of inboard upper wing skin was separated and exhibited pillowing. The inboard about 5 ft of wing which contained the main gear was located at the main wreckage area. This section was partially consumed by the post-impact fire that ensued. The fractured areas of the main spar were thermally damaged but exhibited upward deformation. The forward and aft wing to fuselage fittings remained attached but their supporting wing and fuselage structures were thermally destroyed.
- The right wing was separated about 5 ft from the fuselage. The separated approximate 14 ft section of separated wing exhibited a semi-circle impression to its leading edge about 5 ft from the wingtip. The stall strip was separated from its attach point of the deice boot and was not located within the recovered wreckage.
- White transfer-type marks were noted on the deice boot between 4 ft to approximately 9 ft from the wingtip. Red and black transfer-type marks were observed on top of the wing about 7ft from the wingtip.
- Both fuel caps were in place and no anomalies were noted to the fuel tank vent. The fuel cell was breached from the wing separation.
- The right main gear was observed in the DOWN position.
- The outboard about 6 ft of flap was separated from the wing and its outboard hinge was pulled from the flap. The inboard about 5 ft of flap was not observed; however, this area of the wing was partially consumed by the post-impact fire.
- The fuselage mounted flap actuator was retracted which is indicative of the flaps being in the UP position.
- The aileron was separated from the wing. The inboard about 5' of aileron remained attached to its hinge which was pulled from the wing. The outboard about 27 inches which contained the balance weight was not located within the recovered wreckage. The aileron control cables remained attached to the sector and were separated about 7 ft from their attach points. The separated control cable ends exhibited a splayed, broomstrawed appearance consistent with tension overload separation.

Empennage

- The horizontal stabilizers were separated from their attaching points. The left horizontal stabilizer was deformed upward and exhibited skin separations about 4 ft from its attach point. The right horizontal stabilizer was separated into two sections and deformed upward with skin separations noted.
- The elevator was separated from its attaching points and separated into five sections. The elevator's right balance weight remained attached, and its left balance weight was separated.
- The elevator control rod remained attached to its mounts; however, the elevator attach point was pulled from the assembly. The elevator control cables were separated from the control sector. Elevator control cable separations were consistent with tension overload separation.

- The elevator trim tab was partially separated from its attaching points. Its right control rod remained attached and was fractured at its trim barrel attach point. The left control rod was separated from the trim tab and was not located within the recovered wreckage. The elevator trim barrel exposed zero threads from the front of the assembly which is indicative of a near full NOSE DOWN trim setting. The elevator trim cables were separated in the tail cone area and their separated ends were consistent with tension overload separation.
- The rudder was separated from the vertical stabilizer and exhibited left deformation with black transfer marks noted about mid-span on its left side. Its balance weight remained attached and its bellcrank was fragmented. The rudder cables remained attached to the bellcrank but were separated in the tail cone area with their separated ends noted to be consistent with tension overload separations.
- The vertical stabilizer was partially separated from its attach points and was separated about 32 inches from its attach point. Black transfer marks were observed on its left side about 18 inches from top of the vertical stabilizer. A semi-circle impression was noted the left side of the leading edge about 2 ft from the top of part. Leading edge impact damage was observed to the lower section of the vertical stabilizer.



Figure 1: View of the engine during examination. (Photo courtesy of FAA)



Figure 2: View of the fuselage. (Photo courtesy of Piper)



Figure 3: View of the right side of the wreckage. (Photo courtesy of Textron)



Figure 4: View of the left side of wreckage. (Photo courtesy of Piper)