



NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety

Wreckage Examination Group Field Notes

January 12, 2023

A. ACCIDENT WPR22FA354

Location: Sisters, Oregon
Date: September 22, 2022
Time: 1439 PDT
Operator: Private
Aircraft: Piper PA-28-140
Registration: N7063R

B. PARTICIPANTS or GROUP NAME:

Stephen Stein
National Transportation Safety Board
Federal Way, Washington

Mark Platt
Lycoming Engines
Williamsport, Pennsylvania

Kathryn Whitaker
Piper Aircraft Company
Vero Beach, Florida

C. SUMMARY

On September 22, 2022, about 1439 Pacific daylight time, a Piper PA-28-140, N7063R, was destroyed when it was involved in an accident near Sisters, Oregon. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot used an online flight planning tool for his enroute and destination performance planning. Data retrieved from the online tool showed that the pilot had planned to depart a private strip in Llano, California about 0700 and then fly a succession of waypoints and fuel stops while enroute to his final destination of Curtis, Washington (0WA2). The data did not include any flight tracking information such as global position system coordinates. His planned route of flight comprised the following waypoints (in the reported order): Rosamond, California (L00), Sanger, California (9CA7) followed by a stopover in Jackson, California (JAQ). Fuel records from the JAQ airport showed that the pilot purchased 25 gallons of 100 low lead aviation grade gasoline at 0953. The pilot's subsequent waypoints included Nevada County, California (GOO) followed by Sisters, Oregon (6K5) where the pilot purchased another 29 gallons of fuel at 1400. According to an airport surveillance video, the pilot departed 6K5 about 1410. He had planned to fly through Scappoose, Oregon prior to landing at his final destination.

A witness located about 0.50 nm north of the accident site heard the airplane during its final moments. The witness reported that between 1430 and 1445 she heard a small airplane that was flying close to her that caught her attention. She heard a "thud" sound approximately 30 seconds later at which point she began to look for the airplane. The witness stated that the engine sounded smooth and continuous prior to impact. Another witness, who was located about 1,000 ft from the accident site, stated that he heard the airplane impact the ground about 1439.

According to both witnesses, the ground visibility was low due to thick fog at the time of the accident.



Photograph 1: Accident site on slope of South Cinder Peak (2 days after the accident)

The airplane came to rest on a 60° slope on the northeast side of South Cinder Peak in the Jefferson Wilderness at a field elevation of about 6,500 ft mean sea level. All four corners of the airplane were accounted for at the accident site. The first point of impact (FPI) was about 500 ft from the top of the peak and was marked by a large ground scar about 6 feet wide. The main

wreckage was located down the hill about 20 ft northeast of the FPI and was comprised of both wings, the fuselage and empennage. The engine was collocated with the FPI.

D. DETAILS OF THE INVESTIGATION

The airplane was recovered about one month after the accident to a private hangar in Chehalis, Washington where an examination was completed on January 12, 2023.



Photograph 2: Accident airplane prior to examination

D.1 Airframe Examination

D.1.1 Characterization of Damage

Wings

The left wing had separated from the fuselage at the wing root and the leading edge exhibited accordion style damage along the length of the wing. The left wing spar was intact, but exhibited some minor bending. The wing flap and aileron remained attached. The flap remained attached at the inboard and middle flap hinges, but was separated at the outboard hinge.

The right wing remained attached to the main wing spar carry through at its wing attachment points. Most of the inboard left wing skin had been removed during the recovery process. The spar itself was intact and displayed some minor bending. Both the flap and aileron remained attached; the flap was attached at all three hinges and the aileron was attached at both its hinges. The leading edge exhibited accordion style damage along the length of the wing.

Fuselage and Empennage

The fuselage was highly fragmented and the instrument panel was shattered. The vertical stabilizer leading edge was crushed along its length of travel, but remained attached to the empennage along with the stabilator, which was attached the remaining empennage structure.

Instruments

The tachometer displayed 5090.9 flight hours and exhibited a slap mark at the approximate 1 o'clock position of the rpm gauge. The gauge read about 2,300 rpm when the needle was positioned over the slap mark.

D.1.2 Flight Control System

The stabilator, rudder, and aileron cables were crushed at the wing spar carry through area.

The right aileron balance cable was fractured at the rod end of the right wing bell crank; however, the cable was continuous from the bell crank to the wing root where it had separated consistent with overload separation. The right aileron control cable was continuous from the bell crank to the right wing root.

The left aileron balance and control cables were both attached at the bellcrank.

The stabilator cables were continuous from the stabilator tube assembly at the empennage to the wing spar carry through area where both cables had been cut by recovery personnel. The right and left rudder control cables were continuous from the rudder bell crank at the rudder to the cockpit area and both cables had been cut by recovery personnel.

The cockpit control yokes and tee bar were separated from their surrounding structures by impact forces. The rudder pedal bar was fragmented and the forward rudder cables and attachments were not observed.

The flap control was continuous from the flap lever assembly to the right and left wing roots where the connections had separated from both flaps at each rod assembly. The flap torque tube was in the flaps retracted position.

D.1.3 Fuel System

The fuel selector was in the right fuel tank position, but was not disassembled due to safety hazards as the selector was covered in biological remains. The fuel gascolator and auxiliary fuel pump were not identified within the parts recovered from the accident site.

Both fuel tanks had collapsed against the wing spars in their respective wings.

D.2 Engine

The engine was a Lycoming Engines O-320-E2A, s/n L-17790-27A, an air-cooled, normally aspirated, 150 hp reciprocating engine, which had been modified to produce 160 hp in

accordance with FAA supplemental type certificate SE367CH (according to logbook records). Additionally, the engine had separated from the airframe and engine firewall. The accessory case housing was breached, which exposed several spur gears and the engine case was cracked. Several of the exhaust and intake tubes were crushed or separated from their respective mounts. The oil sump was separated from the engine case. The exhaust shrouds had separated.



Photograph 3: Engine prior to examination

Mechanical continuity could not be established throughout the rotating group, valve train and accessory section due to the condition of the engine from the absorption of impact energy. The valve train within the rocker covers was unremarkable. Examination of the cylinders combustion chamber interior components using a lighted borescope revealed normal piston face and valve signatures, and no indications of catastrophic engine failure, detonation, or foreign object ingestion. The crankshaft was examined using an inspection mirror, which was accessed through the accessory section. Combustion signatures observed at the spark plugs, combustion chambers, and exhaust system components displayed coloration consistent with normal operation. The examination did not reveal any evidence of mechanical damage, fragmentation, lubrication deprivation or heat distress as the crankshaft and connecting rods appeared to be intact.

Both magnetos had separated from their respective mounting pads and had sustained varying degrees of damage. The left magneto manufacturer and model are unknown as the data plate was not found. The right magneto was a Slick Aircraft Products model no. 4370. Neither magneto displayed spark when they were rotated by hand at their respective drives.

The top spark plugs to cylinder 1 and 2 and the bottom plugs to cylinder 3 and 4 were destroyed. The cylinder 3 and 4 spark plugs and bottom 1 and 2 plugs were removed, all of which were manufactured by Champion, and were model REM40E massive electrode plugs. The bottom plugs to cylinders 1 and 2 were normal in color with dirt at the circumference and the center electrode, the top plug to cylinder 3 was normal in appearance, and the top spark plug to cylinder 4 was normal in appearance with some wear when compared to the Champion Aviation Check-A-Plug Chart, AV-27. The center and ground electrodes for each plug were all intact and free of mechanical damage. The static oil soaking exhibited by the cylinder 1 bottom plug and cylinder 3 top plug were attributed to the engine positioning at the mishap site and recovery. The ignition harness was destroyed.



Photograph 4: Top spark plugs



Photograph 5: Bottom spark plugs

The fuel supply lines at the engine and firewall were displaced from their respective fittings. The fuel pump had separated from the engine; however, the condition of its fragmented internal components precluded a thorough examination of the unit.

The upper half of the carburetor remained attached to the mounting pad at the plenum, which had separated from the engine case. The carburetor floats had separated from the carburetor bowl, which had separated from the upper half of the unit. The floats were not located within the wreckage that had been recovered from the accident site. All the fracture surfaces were consistent with overload separation. The throttle arm was securely attached at the control arm of the carburetor. The castellated nut and serrated interface at the throttle arm remained secure and properly engaged. The carburetor throat remained free of obstruction to airflow. Mixture control arm was moved beyond its normal operating range and the mixture cable had been pulled from the end of the arm.

The oil filter was crushed, which exposed the filter element. Some natural debris was observed within the filter element, but no metallic fragments were noted within the filter media.

The vacuum pump case was fractured in multiple sections and the rotary and vanes had separated from the unit.

The two bladed fixed pitch propeller and crankshaft flange separated from the engine. Both blades remained attached to the hub and the metal propeller spinner was crushed. One blade

exhibited chordwise scratches, nicks and “S” bending. The other blade was bent towards the camber side of the blade at the blade root and displayed chordwise scratches and gouges near the leading edge.



Photograph 6: Two bladed propeller from accident airplane