



NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety

NTSB Wreckage Examination Report

October 5, 2022

A. ACCIDENT WPR21FA211

Location: Eden, Utah
Date: May 29, 2021
Time: 1000 MDT
Operator: ATP Flight School
Aircraft: C172S
Registration: N1727T

B. PARTICIPANTS:

Stephen Stein
National Transportation Safety Board
Federal Way, Washington

Troy Helgeson
Lycoming Engines
Williamsport, Pennsylvania

Ricardo Asensio
Textron Aviation
Wichita, Kansas

John Strohl
ATP Flight School
Ponte Vedra Beach, Florida

C. SUMMARY

HISTORY OF FLIGHT

On May 29, 2021, about 1000 mountain daylight time, a Cessna 172S airplane, N1727T, was destroyed when it was involved in an accident near Eden, Utah. The flight instructor and student pilot were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

According to the airplane operator, ATP Flight School (ATP), this was an introductory training flight designed to assess the student's skill level. Federal Aviation Administration Automatic Dependent Surveillance-Broadcast (ADS-B) data showed that the instructor and student pilot departed the flight school's local base at Ogden-Hinckley Airport (OGD), Ogden, Utah about 0941, and immediately turned to an easterly heading. The ADS-B data ceased 5 nm east of the departure airport at 0946, when the airplane was entering Ogden Canyon at 6,600 ft mean sea level (msl), about 1,000 ft above ground level (agl), and was subsequently picked up by radar 9 nm east of OGD at 0949. The airplane flew south of Pineview Reservoir and then turned northwest while maintaining an altitude of about 2,000 ft agl. At 0955, the airplane turned to the northeast into a canyon where it began a climb over rising terrain. The final ADS-B targets showed that the airplane maintained about 1,000 ft agl (or about 7,550 ft msl), and was below ridgelines on either side of its flight path. The track data ceased at 0956:40.

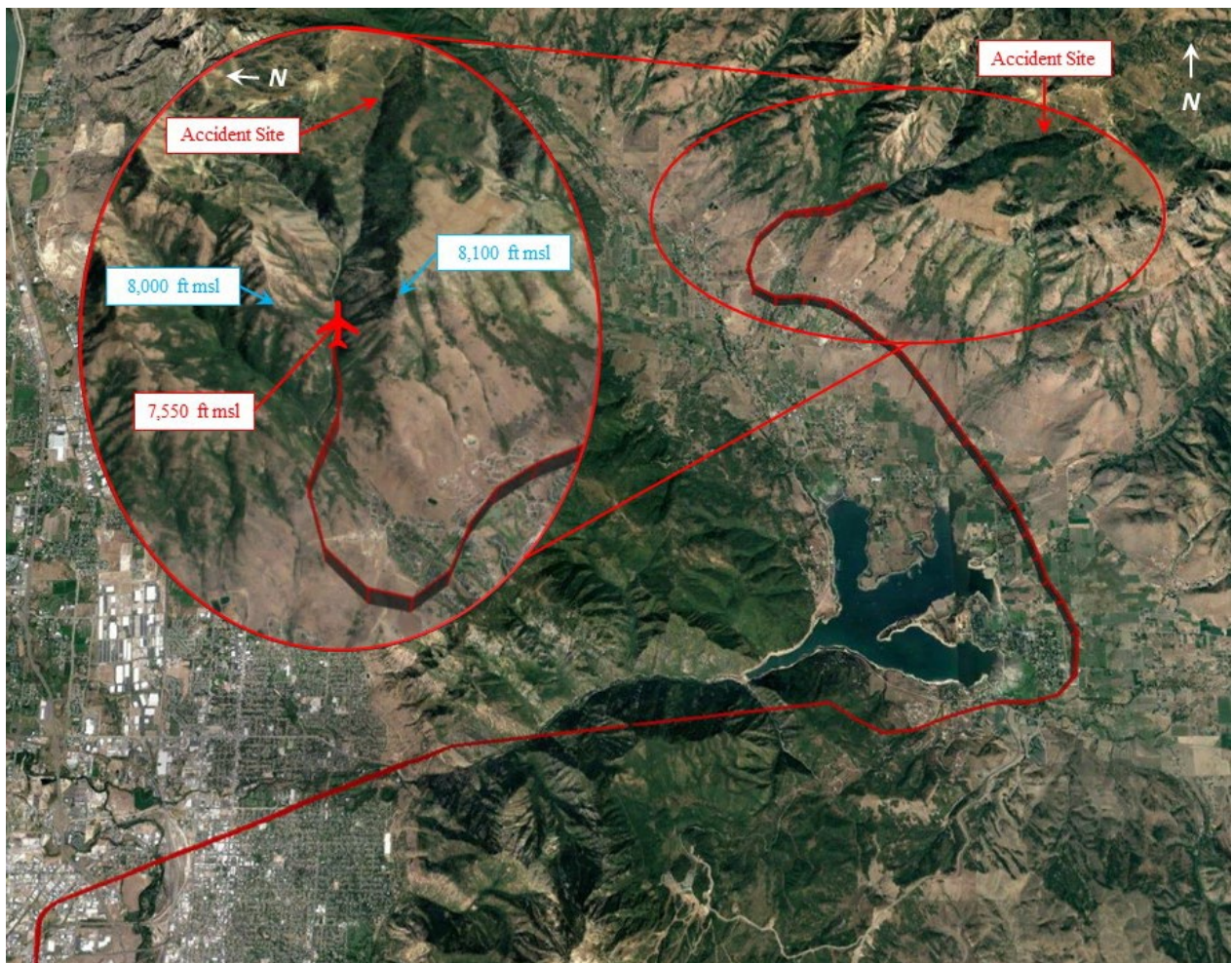


Figure 1: Flight Track of Accident Airplane

D. DETAILS OF THE INVESTIGATION

The airplane was recovered to Beegles Aircraft Service in Greeley, Colorado where an examination was completed on October 5, 2021.

D.1 Airframe Examination

Most of the airplane was consumed by postcrash fire. The cabin, right wing and tail were destroyed while the left wing sustained thermal damage and was cut about midspan by recovery personnel. An approximately 8 inch long depression was observed in the outboard leading edge of the left wing.

The left aileron was attached to the left wing at both hinges and a portion of the flap remained attached to the wing at the outboard hinge. The right wing was consumed by fire, but the flap actuator and motor remained intact, but were damaged by fire.



Photograph 1: Wreckage Layout

D.1.1 Flight Controls

The left aileron flight control cable was continuous from the left wing bell crank to a separation at the wing root that was made by recovery personnel. The right aileron control cable was connected to the right wing bell crank and was cut by recovery personnel near the wing root. Aileron control cable sections from the wing root to the cockpit were not identified. These sections also displayed cuts that were made by recovery personnel.

The right and left rudder cables were attached to the right and left rudder pedal assemblies, respectively. Continuity of the rudder cables to the rudder bell crank was confirmed through multiple separations in the cables that had been made by the recovery team.

The elevator control cables were continuous from the bell crank at the flight control column, which was intact, to the empennage bell crank through cuts made by recovery personnel near the aft elevator cable turnbuckles.

The flap actuator displayed 0.25 inches of exposed jackscrew consistent with a flaps retracted position. One flap cable was continuous from the actuator to the left wing, but was separated from the left wing bell crank. The cable displayed broomstrawing, consistent with overload separation. The other flap cable also displayed broomstrawing at its separation at the turnbuckle proximal to the wing root. The flap motor was thermally damaged.

The elevator trim actuator measured 1.37 inches, consistent with a 5° tab up deflection. The actuator chain was thermally damaged, but remained attached to the actuator sprocket. Both elevator trim cables were continuous to the trim wheel sprocket at the cockpit through several cuts that were made by recovery personnel.

The fuel selector and the gascolator were damaged by fire. The gascolator bowl was partially melted. The auxiliary fuel pump was also thermally damaged.



Photograph 2: Gascolator and Fuel Selector

The two row 1 seat frames and the row 2 seat frame were intact, but thermally damaged. No latched seat belt buckles were found. The airbags were not identified.

D.2 Engine

The engine was a Lycoming Engines IO-360-L2A, s/n RL-3186B-51E, an air-cooled, 180 hp reciprocating engine. The engine was thermally damaged by fire. The baffling was damaged, the cylinder 1 and 3 valve push rods shrouds were thermally damaged, and the cylinder 3 fins were bent. The accessory case was intact, but thermally damaged.



Photograph 3: Engine Before Exam

Mechanical continuity was established throughout the rotating group, valve train and accessory section as the crankshaft was manually rotated at the propeller. Thumb compression was achieved at cylinders 2 and 4 and the valves displayed normal lift when the crankshaft was

rotated. Cylinders 1 and 3 exhibited low compression and the valves displayed some lift during rotation; however, the push rod shrouds were damaged by fire. Examination of the cylinder's combustion chamber interior components using a lighted borescope revealed no indications of catastrophic engine failure.

The magnetos were damaged by fire and could not be rotated by hand. The left magneto was a Slick model no. 4371, s/n 9595609. The right magneto manufacturer and model could not be obtained as the case was melted. The top spark plugs were Champion, model REM38E massive electrode spark plugs when compared to the Champion Check-A-Plug chart. All four of the top spark plugs were gray in appearance, consistent with normal wear. The bottom 4 spark plugs were also normal in appearance when examined through lighted borescope.



Photograph 4: Left and Right Magnetos



Photograph 5: Top Spark Plugs

The fuel servo was partially fractured at the mount, but remained attached to the engine. The throttle valve moved normally from stop to stop, but the mixture control was seized. The servo screen exhibited a trace amount of debris. The fuel pump case was partially melted, but moved when the pump was actuated by hand. All four of the fuel injectors were free of debris. The fuel flow divider remained attached at the top of the engine case and each injector line remained connected to the fuel flow divider. The divider diaphragm was normal in appearance and no fuel residue was observed within the divider.



Photograph 6: Fuel Servo

The vacuum pump was damaged by fire and could not be rotated by hand as the pump drive was destroyed by fire.

The oil filter was damaged by fire, but was not disassembled.

The exhaust manifold and inner shroud were unremarkable.

Both propeller blades remained attached to the crankshaft at the propeller flange. One propeller blade was bent towards the blade face about midspan and was partially melted at the blade tip. The other propeller blade was bent aft at the blade root.