



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

April 21, 2021

AIRFRAME EXAMINATION SUMMARY

WPR21LA032

This document contains 9 embedded photos.

A. ACCIDENT

Location: Billings, Montana
Date: October 30, 2020
Aircraft: N124TW
NTSB IIC: Andrew Swick

Preliminary Report:

On October 30, 2020 about 1905 mountain daylight time, a Cessna 172M airplane, N124TW, was substantially damaged when it was involved in an accident near Billings, Montana. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 cross-country flight.

According to air traffic control, the pilot reported wind shear and turbulence and had difficulties in continuing its flight at night with strong headwinds. The pilot also reported that he was not able to climb to an altitude to safely navigate mountainous terrain and needed to divert to Billings Logan International Airport (BIL), Billings, Montana. The pilot turned right and continued his flight to BIL where he was instructed to land on runway 28R. As the pilot was approaching BIL he was asked by the tower controller if he would like runway 25, because it was more aligned with the winds, to which the pilot agreed. As the pilot was approaching the airport, he advised, "I'm having trouble making out the airport from the rest of the flashing lights." The controller gave the pilot a position report and the pilot reported that he thought he had the airport in sight. The controller advised the pilot to maneuver as necessary and to maintain an altitude of 4,500 ft mean sea level (msl) or higher. After some maneuvering the pilot reported that he did not have the runway in sight. The controller then requested that he pass over the top of the airport and the pilot replied he had the runway in sight. The pilot reported that he needed to maneuver to lineup with the runway to which the controller issued wind and cleared the pilot to land on runway 25 with additional instructions not to descend below 4,000 ft msl. As the pilot was lined up for runway 25, the controller advised the pilot the runway elevation was at 3,600 ft msl and that he could descend at any time. The controller also advised the pilot that the runway had Precision Approach Path Indicator (PAPI) lights, to which the pilot reported that he had them in sight. The controller lost sight of the airplane and lost all communication with the pilot.

B. EXAMINATION PARTICIPANTS:

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C. SUMMARY

Examination of the airframe and engine was conducted at a secured storage facility at the Oscar's Dreamland, in Billings, Montana on April 21, 2021. The examination of the airframe was conducted by an investigator from Textron Aviation and the examination of the engine was conducted by an investigator from Lycoming Engines. The examination revealed no evidence of preaccident mechanical malfunctions or anomalies that would have precluded normal operation.

D. AIRFRAME EXAMINATION

The propeller, engine, firewall, instrument panel, nose landing gear and forward fuselage remained attached and separated from the main wreckage during the accident sequence. The upper and lower engine cowling separated from the engine and remained partially attached to each other. The nose cowling separated and was found in several pieces. The propeller was removed from the engine and one blade was bent aft at its midsection and tip. The blade surfaces had scuff marks. The spinner was crushed.



Figure 1-Engine, firewall and instrument panel.



Figure 2-Propeller and spinner.

The wings separated from the main wreckage during the accident sequence. The left wing had leading edge damage and was buckled throughout. The wing tip fairing had impact damage and remained attached to the wing. A small section of the fuselage attachment remained attached to the spar attachment. The flap had impact damage, was partially attached and was found in the retracted position. The aileron remained attached to the wing and flight control cable continuity was established. The left wing fuel tank showed hydraulic deformation consistent with fuel in the tank during the accident sequence. A small bag with a cap seal was found in the main wreckage and was labeled “172 LH Tank.” The fuel tank cap was removed, and the Teflon and rubber seals were damaged and cracked.



Figure 3-Left wing.

The right wing had leading edge damage near the tip and inboard section. The wing tip fairing separated from the wing. The right wing spar was bent aft near the wing root and wood debris was found in this area. The flap remained attached to the wing and was found in the retracted position. The aileron remained attached to the wing and flight control cable continuity was established. The right wing fuel tank showed hydraulic deformation consistent with fuel in the tank during the accident sequence.



Figure 4-Right wing.



Figure 5-Right wing inboard spar.



Figure 6-Right wing.

The empennage remained intact, separated from the main wreckage and had impact damage. The leading edges of the vertical and horizontal stabilizers had impact damage. The rudder and elevators remained attached to the empennage. Flight control cable continuity was established from the flight control connections to tension overload separations near the aft cabin area. The elevator trim actuator was extended to about 1.35 inches, which equates to the elevator tab in about a 5 degrees tab up position.



Figure 7-Empennage.

The cabin floor and lower fuselage structure remained attached to the main landing gear struts. The cabin doors and cabin seats separated from the fuselage structure. The forward right side of the right cabin floor area had extensive impact damage and wood material was found in this area. The right main landing gear strut and step had impact damage. Wood was embedded into the step's attachment mechanism. The strut and adjacent fuselage structure had a circular impact consistent with the impact of a large diameter tree. Both wheel pants had impact damage and most had separated from the landing gear. The seat tracks remained attached to the floor. The right forward lap belt stitching unraveled near the inboard attachment, consistent with the seat belt being used during a high impact accident sequence. The shoulder harnesses for both forward seats were found attached to the roof section of the cabin area. The shoulder harnesses were undamaged.



Figure 8-Fuselage displayed in the examination area.

The engine was undamaged and removed from the engine mounts. The carburetor was removed and no anomalies were noted. The vacuum pump was removed and disassembled; no anomalies were noted. The upper spark plugs were removed, and the electrodes were undamaged and showed a normal amount of combustion deposits. The cylinders were boroscoped and no anomalies were noted. The crankshaft was rotated via the propeller assembly and gear continuity was attained to the accessory section. During the crankshaft rotation, the cylinders revealed compression and overhead valve movement. The magnetos were removed and spark was obtained from the ignition leads.



Figure 9-Engine and propeller assembly.

The attitude indicator was removed from the instrument panel area and had minimal impact damage to its housing. The rotor was removed from the gyro and no scoring was visible. Various medication and medication bottles were found with the wreckage. Numerous sectionals were found loose in the wreckage and dated from 2011 to 2012.

Submitted by: Andrew Swick