National Transportation Safety Board
Office of Aviation Safety
Washington, DC 20594

ERA23FA209

WRECKAGE EXAMINATION

April 28, 2023

Table of Contents

A. ACCIDENT

Location: Watkinsville, Georgia
Date: April 26, 2023
Time: 1425 EDT
1825 UTC
Airplane: N123DS, Cessna 177B

B. WRECKAGE EXAMINATION

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C. SUMMARY

D. On April 26, 2023, about 1425 eastern daylight time, a Cessna 177B, N123DS, was destroyed when it was involved in an accident near Watkinsville, Georgia. The private pilot and a pilot-rated passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

E. DETAILS OF THE EXAMINATION

1.0 Accident Site

The right wing separated in flight, at approximately the mid-section of the right flap, and came to rest in a wooded area about 988' west-northwest of the aircraft's initial ground impact. The right-wing flap separated inflight and came to rest in a yellow pine tree approximately 90 ft above the ground. The right-wing flap came to rest in the tree about 428 ft to the west of the separated right-wing section.

The area between the separated right wing and the initial ground impact contained windshield fragments and personal light weight effects, including a ball cap, clothing, and papers found scattered on the ground.

The initial ground impact exhibited a left-wing leading edge imprint, a crater with both propeller blades, three ground scars consistent with the left, right, and nose landing gear wheels, and the inboard section of the right-wing leading edge imprint. After the initial ground impact, ground scars indicated the aircraft fragmented on a magnetic heading of approximately 137°. Along the debris path, the engine and the bottom section of the cockpit came to rest about 36 ft southeast of the initial ground impact point. The empennage came to rest approximately 22 ft south of the engine. The left wing and the top section of the cockpit came to rest approximately 60 ft southeast of the empennage. The right main landing gear wheel separated and was found approximately 135 ft southeast of the left wing. One of the cabin doors was found approximately 104 ft to the southeast of the left wing. The engine cowling was found approximately 62 ft northeast of the left wing.

2.0 Airframe Examination

The wreckage was examined and documented at the accident site on April 27, 2023. The wreckage was transported to Atlanta Air Recovery, Griffin, Georgia and a layout examination of the airframe and engine occurred on April 28, 2023.

All primary (elevators, ailerons, and rudder) flight control surfaces with their appropriate trim tabs and flaps were accounted for at the wreckage examination.

2.1 Fuselage

The fuselage, including the cockpit, was extensively crushed and fragmented from the collision with terrain.

2.2 Empennage

Continuity of the elevator/stabilator and rudder primary flight control cables were confirmed from the cockpit to their respective flight control surfaces.

The elevator/stabilator trim actuator extension was measured and found to be approximately 1.5 inches, which corresponded to approximately 10° trim tab trailing edge down.

Continuity of the elevator/stabilator trim control cables was confirmed from the cockpit to the flight control trim surface. Continuity was confirmed by either visual and/or pulling the cable at one end to see the other same cable end and/or control surface move.

2.3 Wings and Carry Through Spar

The aileron primary flight control cables were confirmed from the cockpit to their respective flight control surface with cable separations at the right-wing separation and at the cockpit with all cable separations exhibiting signatures consistent with tensile overload.

A section of the right wing separated from the aircraft. The bottom section of the right-wing main spar separated approximately 51.5 inches outboard from the wing attachment (~W.S. 75). The top section of the right-wing main spar separated approximately 78.5 inches outboard from the wing attachment (~W.S. 102). Both separations exhibited signatures consistent with tension overload. With the separated right wing positioned upright on a concrete surface at the recovery facility, the wing was bowed upward in the mid-section.

With the carry through spar positioned upright, the spar was bowed aft. One of the carry through spar lightening holes was cracked, the first lightening hole left of center line, up to and along the top of the spar. In the same location of the cracked lightening hole, a section of the spar top forward flange was partially separated and bowed/buckled upward. The lightening hole crack and the spar flange separation both exhibited signatures consistent with tension overload.

A section of the right wing inboard leading edge, approximately 30 inches, separated from the wing. The leading edge exhibited skin tearing, crushing, and buckling. The leading edge wing attachment link to the fuselage remained intact. The attachment link remained attached to a section of the forward cockpit structure. That leading edge attachment and the cockpit section were canted aft and up. The cockpit structure separation exhibited signatures consistent with tension overload.

The flap actuator extension was measured and found to be approximately 4 inches, which corresponds to approximately 0°. Flaps full retracted/UP position.

2.4 Landing Gear

The right main landing gear wheel assembly separated from the aircraft during the ground impact. The left main gear and nose gear were located with the main wreckage.

2.5 Cockpit and Cabin

The cockpit and cabin seats were impact damaged. The left and right cockpit seat shoulder harnesses were equipped with airbags manufactured by AmSafe that did not deploy. According to the last annual inspection logbook entry, it stated, "AMSAFE front seat belts, still rendered inoperative and placarded."

The environmental system controls and the pitot heat were fragmented/impact-damaged.

The navigation instruments, communications and navigation radios, and electrical and lighting switches were impact damaged.

2.6 Survivability

The accident was not survivable.

2.7 Fuel/Fuel System

The fuel strainer screen and fuel strainer bowl were not observed. The fuel selector valve handle/shaft was separated. Using a clear tube, an undetermined amount of air was blown through the fuel selector valve engine port and air could be felt by hand at the left and right fuel tank ports.

3.0 Engine Examination

As first viewed, the engine was found inverted on the grass about 36 ft from the initial impact crater. The following items were impact separated from the engine and found along the wreckage debris path: the oil sump, carburetor, induction air box, air filter, exhaust muffler and exhaust tubing parts, induction tubing parts, both magnetos, propeller governor, engine driven fuel pump, starter and alternator.

The Lycoming ASI examined the engine and confirmed valve train continuity. According to the NTSB, thumb compression was confirmed on three of the four cylinders. The fourth cylinder exhibited impact damage. The carburetor floats exhibited inward hydraulic deformation.

The engine was suspended from a lift and partially disassembled to facilitate the examination. The exhaust muffler was separated from the engine and crushed. The exhaust and induction tubing which remained attached to the engine was impact damaged. The no. 1, no. 2, and no. 4 cylinders exhibited impact damage. The crankshaft was rotated by means of a tool inserted in the vacuum pump drive pad. Continuity of the crankshaft to the rear gears and to the valve train was observed. Compression and suction were observed from cylinders nos. 1, 3 and 4. The interiors of the cylinders were examined using a lighted borescope and no damage to the pistons, cylinder walls or valves observed. Debris was observed in the no. 2 cylinder. The nos. 2 and 4 cylinders were removed to further examine the no. 2 cylinder. No damage other than impact damage was observed to the cylinders, pistons or piston rings. No damage to engine internal parts was observed through the no. 2 and no. 4 cylinder base pads.

The carburetor was impact separated from the engine and found along the debris path. The throttle and mixture control cabled were parted. The throttle cable rod end remained attached to the carburetor throttle control arm. The arm remained attached to the carburetor and was impact-damaged. A portion of the mixture control cable remained attached to the carburetor mixture control arm. The arm remained attached to the carburetor and was impact-damaged. The induction air box and foam air filter were crushed. The foam filter was unobstructed.

The carburetor was partially disassembled. The brass floats exhibited hydraulic crushing. No damage to other carburetor internal components was observed. No liquid was observed in the carburetor float bowl. The engine-driven fuel pump was fragmented and separated from the engine. The pumping section was partially disassembled and no damage to the internal check valves observed. The upper rubber diaphragm was intact. The lower rubber diaphragm was impact-damaged.

The spark plug electrodes exhibited gray coloration and normal wear condition. All four lower spark plugs were impact-damaged. The ignition harness was destroyed.

The alternator was impact-fragmented and separated from the engine.

The oil sump was impact-separated from the engine. Oil was observed in the engine. The oil filter was fragmented and crushed. No metallic debris was observed on the oil filter media that was visible. The oil suction screen was absent of debris.

4.0 Propeller Examination

The McCauley 2-bladed, constant speed propeller separated from the engine crankshaft. One propeller blade separated the hub. The other blade remained attached to the hub which was fragmented. Both propeller blades exhibited chordwise scratches.

The propeller hub was impact-fragmented. Portions of the hub and both propeller blades were found in the initial impact crater. A portion of the propeller hub remained attached to the engine crankshaft flange. One propeller blade was curved forward about 30 degrees and exhibited leading edge paint abrasion, chord-wise scratches and trailing edge impact damage. The other blade exhibited paint abrasion, chord-wise scratches and twisting along the longitudinal axis. The propeller governor was impact-fragmented with the base remaining attached to the engine. The governor oil screen was absent of metallic debris.

Submitted by:

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