

National Transportation Safety Board

Office of Aviation Safety

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AIRFRAME AND ENGINE EXAMINATION

June 3-5th 2023

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A. ACCIDENT

Location: Albertville, Alabama
Date: June 3, 2023
Time: 1320
1820 (UTC)
Airplane: Zenith 601XL; N601YP

B. AIRFRAME AND ENGINE EXAMINATION

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C. SUMMARY

During a test flight, shortly after completing the airplane, witnesses saw the airplane transition the area, before going out of control and descending into trees and terrain. Preliminary Automatic Dependent Surveillance - Broadcast (ADS-B) data revealed that the flight departed Albertville Regional Airport-Thomas J Brumlik Field (8A0), Albertville, Alabama at 1220. The airplane departed the airport traffic pattern to the southwest and flew for about 1 hour, performing several heading changes, and a climb to 4,000 ft mean sea level (msl) before descending to 2,000 ft msl, then leveling-off shortly before contact was lost. According to witnesses, the pilot had just completed the airplane build and was operating the airplane as a test flight.

D. DETAILS OF THE EXAMINATION

1.0 Accident Site and Overview

The accident site was 2 ½ miles west northwest from the departure airport Albertville Regional Airport-Thomas J Brumlik Field (8A0) Albertville, Alabama. Accident site was compact with impact indications in the treetops and on the terrain at the base of the trees.

Shattered tree branches, several of which exhibited features consistent with propeller slice marks were located around the impact site.

Both wings were displaced aft but remained partially attached to the wing spar that was torsional twisted; the two internal fuel tanks were severed from their internal mounts and were located in the debris field; the fuel tanks were compromised and there was the smell of

automotive gasoline in the area along with vegetative fuel blight on the grass and surrounding leaves and bushes.

Propeller pieces with erosion strips were found within 50 feet of the wreckage in multiple locations. There was sheet metal in the trees and surrounding area. The engine and portions of the landing gear were found about 50 ft further NE (057°) of the fuselage. Elevation was 1,000 feet. Lat/long 34.276043° / -86.300236°

2.0 Airframe Examination

2.1 Fuselage

Fuselage buckled, crumpled, and fractured throughout the entire airframe indicative of a high speed impact through the trees. All control surfaces and major parts of the airframe were discovered in the vicinity of the accident site. The engine compartment was significantly compromised by impact forces, severing the engine from the firewall and engine mounts. Note that the airplane is not painted and building specs are handwritten on the fuselage in blue permanent magic marker.

2.2 Empennage

All tail control surfaces were deformed by impact forces and the “flying” rudder separated at impact. The stab elevator remained attached moved manually with corresponding cable movement. A hole was cut into the fuselage to observe all cables and turnbuckles. No anomalies or other irregularities were discovered. The trim actuator (Ray Allen Electric) was in a full nose down position. T2-7A Servo. It will be removed with a portion of the trim and sent out for examination along with any wiring and cockpit indicators.

The “flying” Rudder separated during impact. Rudder continuity was established from the rudder-to-rudder pedals through breaks in the cables. All breaks were indicative of overload or mechanical cuts due to recovery and/or pilot extraction.

2.3 Flight Control

Both wings were severely damaged by impact forces and were partially separated from the wing spar. Ailerons remained attached, although severely deformed, in their respective positions. Aileron control cables were present and traced to their respective position in the cockpit to their control surfaces. All turnbuckles were intact. Flight control continuity was established on all surfaces. continuity was established from the rudder-to-rudder pedals through breaks in the cables. All breaks were indicative of overload or mechanical cuts due to recovery and/or pilot extraction.

2.4 Cockpit

The cockpit was destroyed by impact forces. The canopy frame was deformed by impact forces and only shards of plexiglass remained in place. The hydraulic lift assist was in the extended position. No secondary canopy latch was discovered in the wreckage. Unable to tell if the canopy opened in flight due to the severity of the damage but initial witness reports do not mention an open canopy; there are no indications of an open canopy on the accident site, however damage is severe.

2.5 Survivability

Main fuselage and cockpit were destroyed by impact forces. The accident was not survivable.

2.6 Fuel/Fuel System

No fuel was discovered in the tanks but there was a strong odor of fuel on site and there was fuel blight on surrounding vegetation. The fuel has the appearance (lacking blue staining) and smell of automobile gasoline.

2.7 Other Systems

A Dynon Skyview (SV) D1000 panel-mounted combination Electronic Flight Instrumentation System (EFIS) and Engine Monitoring System (EMS) was discovered in the wreckage and remained damaged but mostly intact and could contain non-volatile memory. Send to NTSB recorders lab for download.

3.0 Engine Examination

The powerplant is a 4-cylinder, liquid cooled, direct drive, inline, fuel injected naturally aspirated engine. Will attempt to confirm HP. There was no evidence of a post-crash fire.

The engine separated during impact and was discovered on a creek bed about 50 ft from the main wreckage.

All the spark plugs displayed normal coloration and normal electrodes as compared to the Champion Aerospace AV-27 Check-A-Plug chart.

The oil filter was removed, and no foreign debris or ferrous material was observed. The oil appeared light brown/gold in color and all lubricated components appeared to be well lubricated.

The engine crankshaft was manually rotated 720° degrees of rotation several times to check for crankshaft continuity and compression. Continuity was confirmed and all pistons, valves springs and pushrods operated as designed. There was compression on each of the cylinders. Continuity of the crankshaft to the camshaft was confirmed throughout the engine.

4.0 Propeller Examination

The propeller (Warp Drive) 3 bladed 68-inch composite propeller hub (T14344) partially detached from the flange and all 3 blades were damaged and splintered down progressively. Two propeller blades were fractured and severed about 3 inches outward from the hub and one blade was fractured about 9 inches outward from the hub; all of the blade fractures were bent in the opposite direction of rotation. Several pieces of delaminated propeller blades and their erosion strips were distributed throughout the accident site in multiple directions along the wreckage path.

Submitted by:

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