

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR23LA134

AIRFRAME AND ENGINE EXAMINATION

August 30, 2023

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A. ACCIDENT

Location: Brigham City, Utah
Date: March 11, 2023
Time: 1845 mountain daylight time
Airplane: Experimental amateur-built Zenith CH 801, N638BH

B. AIRFRAME AND ENGINE EXAMINATION

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SUMMARY:

On March 11, 2023, about 1845 mountain daylight time, an experimental amateur-built Zenith CH 801, N638BH, was substantially damaged when it was involved in an accident near Brigham City, Utah. The pilot was not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported that he departed from Brigham City Regional Airport, runway 35, and while ascending, about 200 to 300 ft agl, the airplane experienced a loss of thrust, but the engine remained running. Unable to maintain altitude, the pilot elected to land the airplane on the remaining runway. Subsequently, the airplane landed hard and the nose landing gear collapsed.

C. DETAILS OF THE EXAMINATION

1.0 Airframe Examination

Examination of the recovered wreckage revealed that the nose landing gear was fracture separated and both main landing gear were impact damaged. The fuselage near the main landing gear exhibited buckling. Both wings, horizontal stabilizer, vertical stabilizer/rudder, and elevator were removed by recovery personnel, no visible damage was observed. Additionally, the recovery personnel noted that the airplane was void of fuel during recovery.



Figure 1: View of accident airplane during exam.

Throttle and mixture control continuity was established from the cockpit controls to the carburetor and moved from stop to stop when actuated by hand.

Propeller control continuity was established from the cockpit control to the propeller governor and moved from stop to stop when actuated by hand.

A visual inspection of the left inboard and outboard fuel caps revealed that both fuel caps rubber seals appeared worn.

A visual inspection of the right inboard and outboard fuel caps revealed that both fuel caps rubber seals appeared worn.

A visual inspection was conducted of the fuel system. Continuity was established from the main fuel tanks throughout the system to the carburetor. The airframe fuel strainer was void of fuel and a visual inspection revealed minor debris consistent with normal operation. An external fuel tank was attached to the right-wing fuel line. The airframe fuel strainer was depressed and fuel expelled from the sump point.

2.0 Engine Examination

Engine Manufacturer: Franklin
Engine Model Number: PZLR-6A-350CIR
Engine Serial Number: 011111091

Examination of the recovered engine revealed that it remained attached to the engine mounts. All six cylinders and all engine accessories remained attached. All fuel and oil lines appeared attached to their respective fittings and were tight. No evidence of any mechanical damage was observed to the engine crankcase.



Figure 2: View of engine during exam.

The rocker box covers were removed. The intake and exhaust rocker arms were intact and oil coated on all cylinders. All intake and exhaust valve springs on all cylinders were in place and visually appeared to be undamaged. The upper spark plugs were removed, and all six cylinders were examined internally using a lighted borescope. A normal amount of combustion deposits was observed within the combustion dome of each cylinder and piston face. All of the intake and exhaust valves were unremarkable. The crankshaft was rotated by hand using the propeller. Rotational continuity was established throughout the engine and valve train. Thumb compression and suction was obtained on all four cylinders.

The top spark plugs were removed from the engine and they were the massive electrode type. Dark gray coloration within the electrode areas was observed. When compared to the Champion Check-A-Plug chart, the sparkplugs exhibited NORMAL use signatures.

The bottom spark plugs were removed from the engine and they were the massive electrode type. The No 1, 3, and 5 cylinder spark plugs were oil soaked. Dark gray coloration within the electrode areas was observed in the No. 2, 4 and 6 spark

plugs. When compared to the Champion Check-A-Plug chart, the sparkplugs exhibited WORN OUT-NORMAL use signatures.



Figure 3: View of engine spark plugs.

A visual examination of the induction system revealed the induction system was free of obstructions and undamaged.

The exhaust system remained secure to the cylinders. No evidence of any exhaust leaks around the cylinder attach points were observed.

The left and right magnetos remained attached to the engine accessory case with no external damage noted.

An external fuel tank was attached to the right wing fuel inlet line. The engine started during the initial attempt to start. The engine ran throughout various power settings uneventfully for about 5 minutes. A functional check was conducted of the magnetos while the engine was at about 1700 RPM. Both left and right magneto checks showed a decrease of about 150 RPM. Due to the damage to the propeller, the throttle was not advanced to the full forward position. However, the engine did produce a static RPM of 2600.

The propeller governor was retained for further examination.



Figure 4: View of propeller governor.

3.0 Propeller Examination

Propeller Manufacturer: MT propeller
Propeller Model: MTV-12D/192-30d
Propeller Serial Number: 01377

The airplane was equipped with a three blade MT propeller; for the purposes of this report the propeller blades were labeled A, B, and C. All blades remained attached to the propeller hub. All the propeller blades exhibited impact damage to the propeller tips. All the propeller blades splintered near the propeller tips.



Figure 5: View of airplane propeller blades.

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