

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR23FA225

AIRFRAME AND ENGINE EXAMINATION

June 19, 2023

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A. ACCIDENT

Location: McCall, Idaho
Date: June 12, 2023
Time: 10:29 mountain daylight time
Airplane: N3138C, Cessna R182

B. AIRFRAME AND ENGINE EXAMINATION

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C. SUMMARY

On June 12, 2023, about 1029 mountain daylight time, a Cessna R182, N3138C, was substantially damaged when it was involved in an accident near McCall, Idaho. The pilot was fatally injured, and the passenger was seriously injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

D. DETAILS OF THE EXAMINATION

1.0 Airframe Examination

N3138C - Cessna R182
SR# R18200239
Hobbs: 2050.8
Tach: 9626.6
100 hour / Annual inspection conducted: March 20, 2023

Examination of the recovered airframe revealed that both wings and empennage were separated from the airframe. The fuselage was mostly intact. The engine cowlings, engine and propeller remained attached. Crushing and bending was observed throughout the cowlings, consistent with impact damage. The forward left

section of the fuselage was impact damaged and displaced to the left. The landing gear remained attached via the fuselage mounts and was extended. The left main landing gear was fracture separated near the tire.

The forward section of the cockpit was impact damaged. The instrument panel was impact damaged with multiple instruments displaced.



Figure 1: View of accident airplane during examination

The left and right wings exhibited impact damage. The airplane was equipped with bladder fuel tanks. The left wing fragmented into numerous sections, left flap remained attached via its mounts and partially extended. The outboard section of the left wing was bent in a semi-circular shape. The aileron remained attached via its mounts. Crushing and bending was observed throughout the outboard wing section. The fuel cap was separated and not observed with the wreckage.



Figure 2: view of left wing

The right wing separated from fuselage at the wing root, crushing and bending was observed throughout the wing span. The right flap and aileron remained attached via their mounts. The flap was observed partially extended. The right main fuel tank fuel cap was observed in place and secure. Visual inspection of the right fuel cap revealed that the rubber seal appeared normal and unremarkable. Both wing fuel filler ports were normal and unremarkable.



Figure 3: view of right wing

The empennage was separated from the fuselage, near the leading edge of the horizontal stabilizer. The vertical stabilizer, rudder, horizontal stabilizers, elevator, and elevator trim tabs remained attached and secure to their respective mounts. Both elevator and rudder flight control cables remained attached to their respective mounts. Crushing and bending was observed throughout the empennage.



Figure 4: view of empennage

Throttle and mixture control continuity was established from the cockpit controls to the carburetor. The throttle control cable was bent and exhibited binding when actuated by hand, consistent with impact damage. The mixture control cable moved freely from stop to stop when actuated by hand.

Propeller control continuity was established from the cockpit controls to the propeller governor. The propeller governor cable housing was bent and the cable exhibited binding when actuated by hand, consistent with impact damage.

A visual inspection was conducted of the fuel system. Continuity was established from the fuel tanks throughout the fuel system to the carburetor. Air pressure was applied to both the left and right wing pick-up fuel lines and heard coming from the airframe fuel strainer. The airframe fuel strainer screen was clear and unremarkable.

A visual inspection was conducted of the induction system. The induction system remained attached to the cowling. The air induction filter element and housing were impact damaged and contained dirt and grass consistent with impacting the field.

2.0 Engine Examination

Engine Manufacturer: Lycoming
Engine Model Number: O-540-J3C5D
Engine Serial Number: L-21713-40A

Examination of the recovered engine revealed that engine remained attached to the engine mount. All six cylinders and all engine accessories remained attached. All fuel and oil lines that were removed were tight. The number 1 and 2 cylinder rocker box covers exhibited impact damage. No evidence of any mechanical damage was observed to the engine crankcase.



Figure 5: view of engine during examination

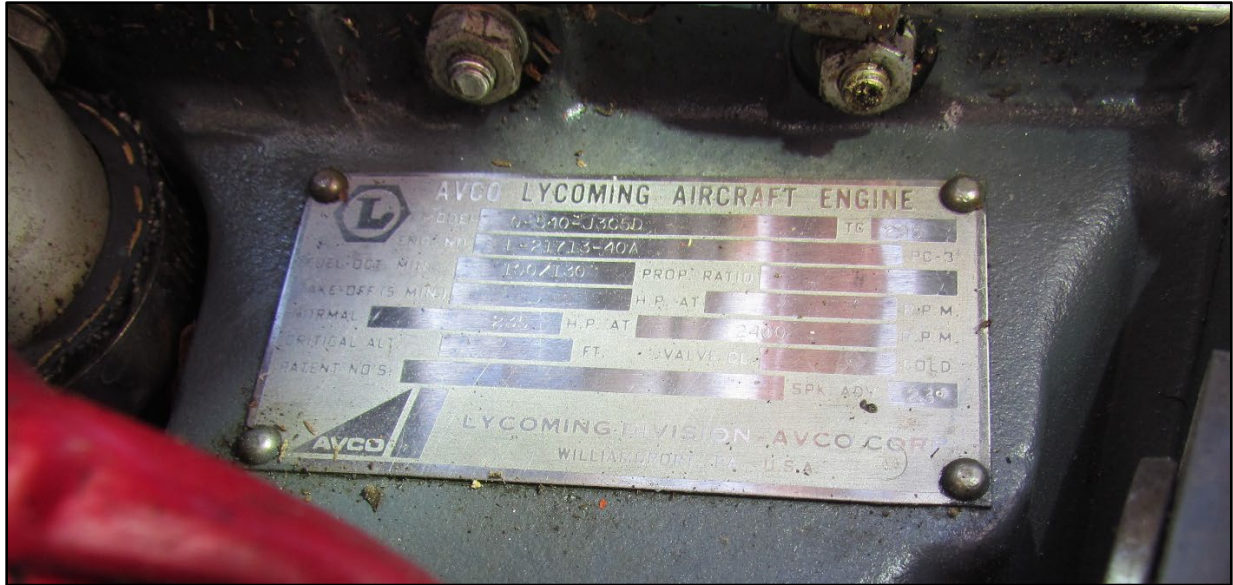


Figure 6: view of engine data plate

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 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 six cylinders.

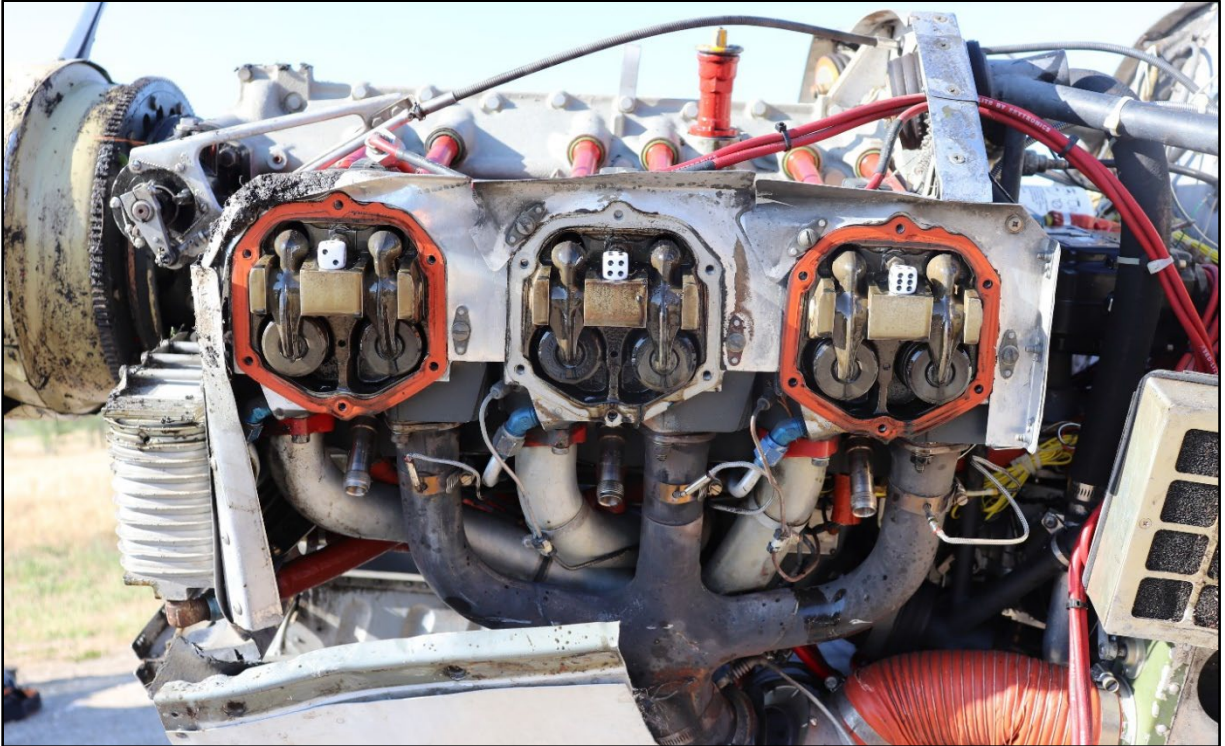


Figure 7: view of left side intake and exhaust rocker arms



Figure 8: view of right side intake and exhaust rocker arms

The top engine spark plugs were removed from the engine, and they were the fine-wire electrode type. The number 1 and 4 cylinder spark plugs were oil coated. The

number 2, 3 and 5 cylinder spark plugs exhibited gray deposits within the electrode area. The number 6 cylinder spark plug exhibited light gray deposits within the electrode area. The spark plugs exhibited signatures consistent with WORN NORMAL when compared to the Champion Check-A-Plug comparison chart.

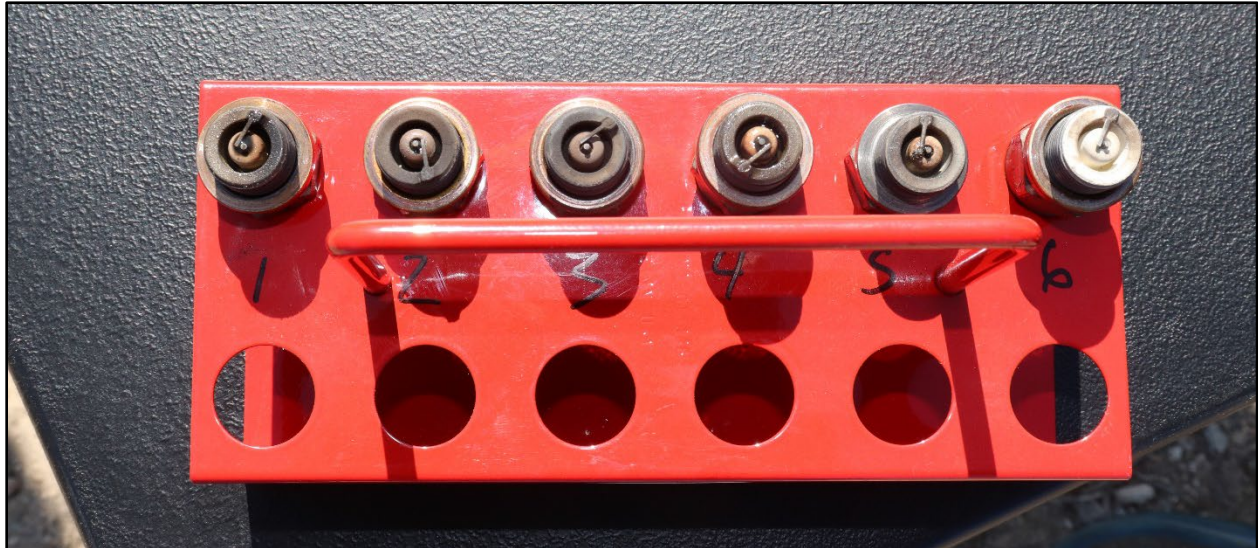


Figure 9: view of top spark plugs

The engine driven fuel pump remained attached to the engine accessory case with no external damage noted. The fuel line from the fuel pump to the carburetor was removed. When the propeller was rotated by hand, blue in color liquid, consistent with 100LL was observed from fuel pump.

The carburetor remained attached to the plenum and was unremarkable. The throttle and mixture levers were intact, undamaged, and moved freely from stop to stop.

The single drive, dual magneto remained attached to the engine accessory case but not secured to the mounting pad, which allowed for movement between the mounting pad and the magneto. The dual magneto rotated, left and right with minimal resistance. The upper magneto retaining hardware was loose and the lower retaining hardware was loose and backed off, about 1/8 in from the magneto. The dual magneto timing was found to be at about 18° before top dead center. When the engine crankshaft was rotated by hand using the propeller, spark was produced on all twelve ignition leads and the impulse coupling engagement was heard.

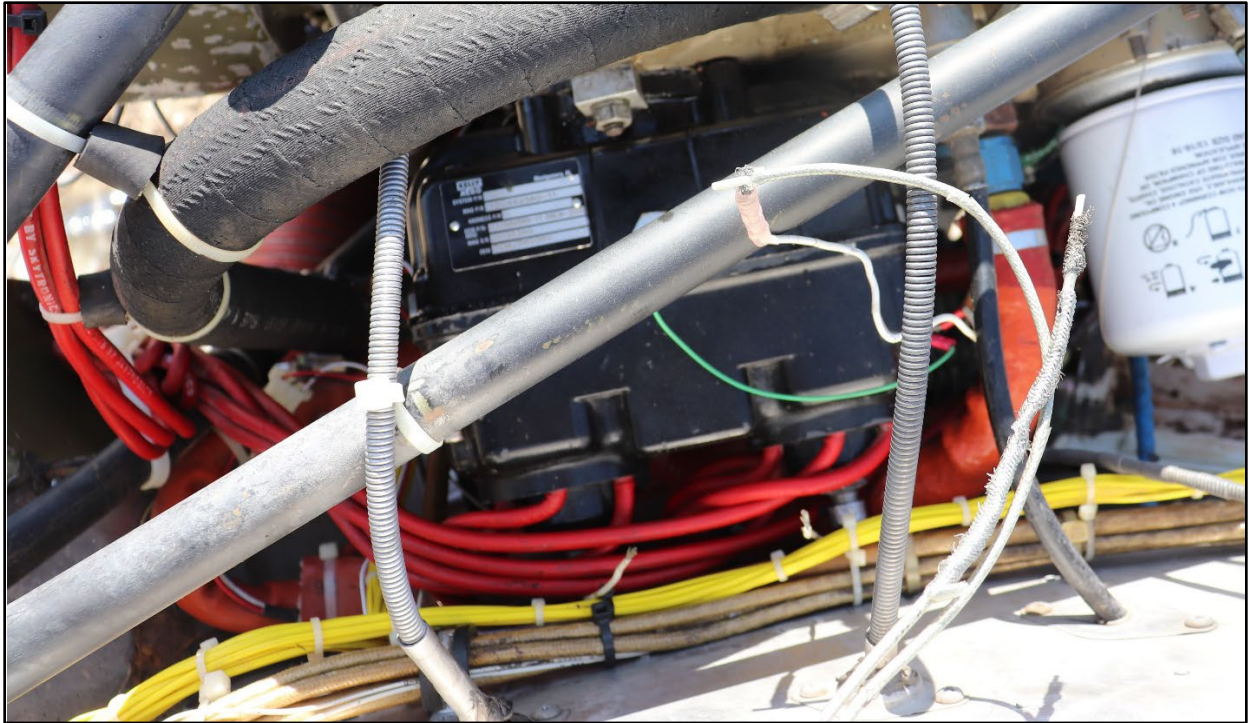


Figure 10: View of magneto from above

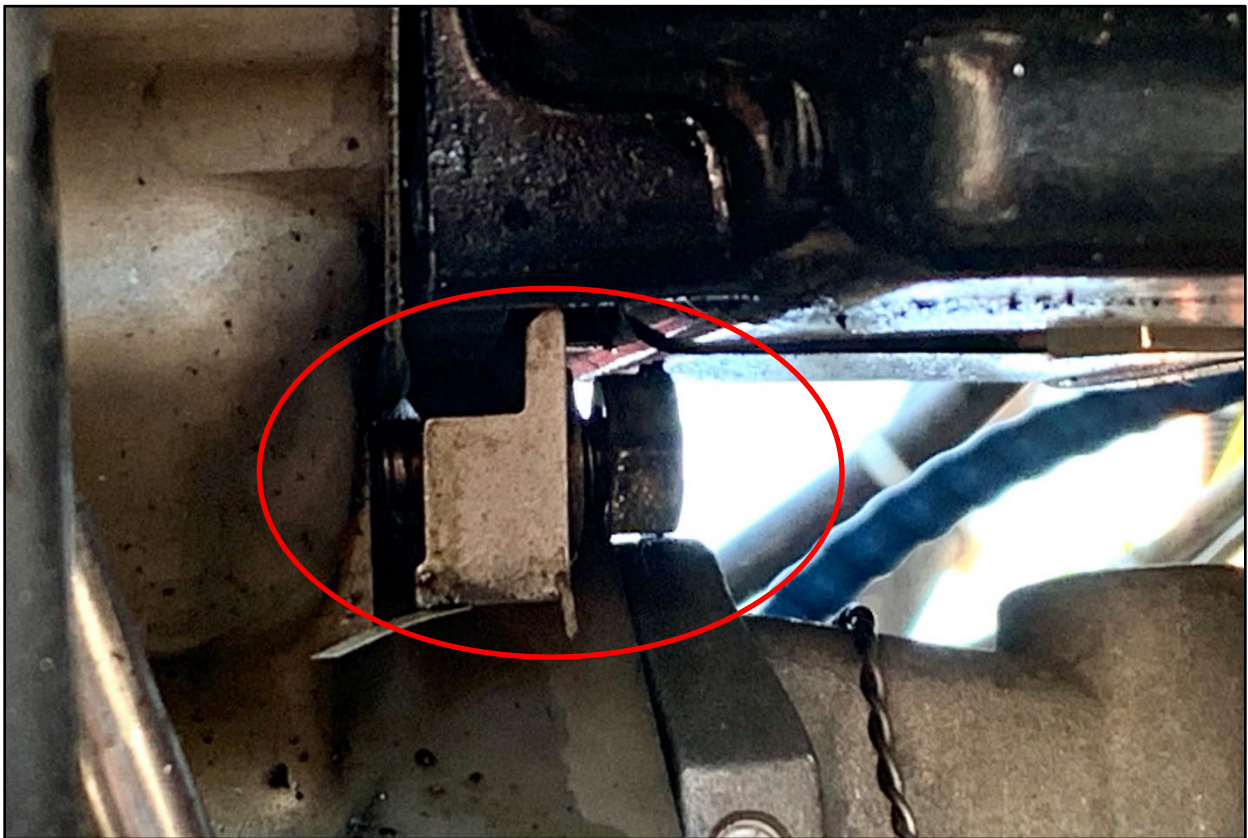


Figure 11: view of loose magneto retaining hardware



Figure 12: view of magneto retaining hardware

The exhaust system remained secure to the cylinders. No evidence of any exhaust leaks around the cylinder attach points were observed. The exhaust system was examined internally using a lighted borescope, no debris or obstruction was observed from exhaust outlet. Crushing was observed near the exhaust outlet port on the left side.

3.0 Propeller Examination

Manufacturer: McCauley
Model Number: B2D34C14-B
Serial Number: 120337

The airplane was equipped with a two blade McCauley propeller. The propeller and propeller hub remained attached to the engine. Propeller blade A exhibited aft bending about mid span, with unidirectional striations on the cambered side of the blade and polishing along the leading edge. Propeller blade B exhibited polishing along the leading edge.

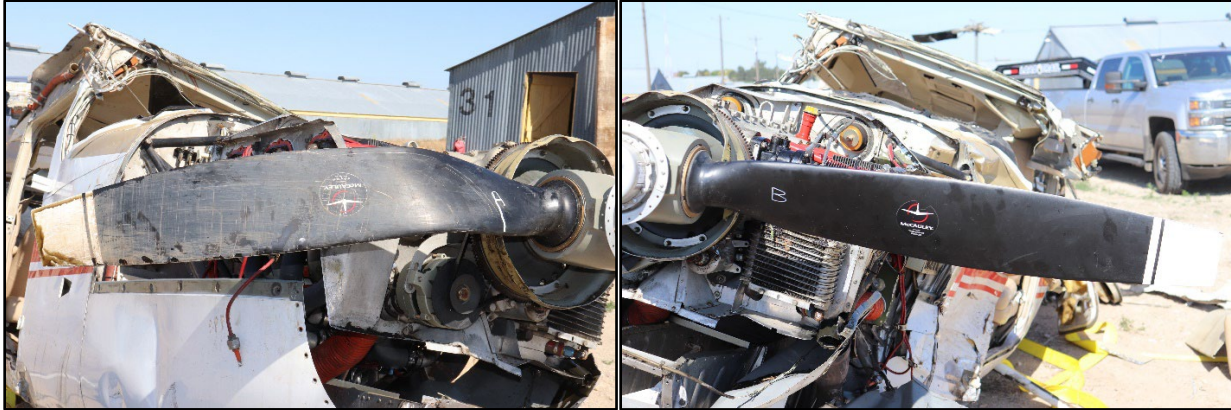


Figure 13: view of propeller

Submitted by:

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