

National Transportation Safety Board

Office of Aviation Safety

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WPR24FA298

AIRFRAME AND ENGINE EXAM SUMMARY REPORT

April 1, 2025

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A. ACCIDENT

Location: Yacolt, Washington
Date: September 6, 2024
Time: 12:59 Pacific daylight time
Airplane: N53466, Boeing A75L3

B. AIRFRAME AND ENGINE EXAM SUMMARY REPORT

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C. SUMMARY

Examination of the recovered wreckage was conducted on April 1, 2025, at the facilities of Inter-State Aviation in Pullman, Washington. No evidence of preaccident mechanical malfunction or failure was noted.

D. DETAILS OF THE INVESTIGATION

1.0 Airframe

N53466, Boeing A75L3
Serial #: 75-2175

Rear cabin controls:

Throttle: $\frac{3}{4}$ forward
Mixture: mid-range
Fuel Selector: ON
Elevator Trim: 4° pitch down
Ignition/Magnetos: BOTH
Master Switch: OFF

The fuselage, aft of the rear cabin was observed intact, with bending and tears in the fabric.

The upper wings were removed by recovery personnel. The upper right wing was crushed along its entire leading edge, and the outboard half was twisted and displaced aft. The upper left wing was crushed and buckled along the entire span. The lower right wing was removed by recovery personnel and displayed aft crushing and bending throughout. The lower left wing's wingtip was partially torn away; the leading edge remained mostly intact, with aft bending near the torn away area.

The left aileron was separated from the wing, with crushing and buckling, consistent with impact damage. The right aileron remained attached to the lower right wing at its attachment points and displayed bending in multiple places along the aileron.

The left side of the horizontal stabilizer was crushed aft and buckled mid span; it remained partially attached to the empennage. The right side of the horizontal stabilizer remained attached and mostly undamaged. The vertical stabilizer remained attached and appeared mostly undamaged. The left side of the elevator remained partially attached to the horizontal stabilizer, was buckled, and displaced aft. The right side remained attached to the horizontal stabilizer and was mostly undamaged. The rudder remained attached to the vertical stabilizer and was mostly undamaged. (Figure 1.)



Figure 1. View of empennage.

Multiple control cables, control tubes, and cabin structure were cut by search and rescue, and recovery personnel.

Control cable continuity was established from the rudder to the aft cabin area, and from the elevator to the aft cockpit control stick control tube. Aileron control tube continuity was established for both ailerons.

The forward cockpit displayed extensive crush damage and was separated from the fuselage. The rear cockpit remained partially intact and remained attached to the fuselage. (Figure 2.)



Figure 2. View of rear cockpit.

The main landing gear assembly was separated from the fuselage and remained intact. Both struts remained attached to the cross tube, and both wheel assemblies remained attached to the axles. The rear extending arms remained attached to the cross tube. The strut fairings remained attached to the struts. Both main wheel tires displayed scuffing and contained mud consistent with the accident location. The leading edge of the left strut fairing was dented lengthwise, and displayed brown colored transfer, consistent with tree bark. The right extension arm was bent inboard, near the base of the arm. (Figures 3 and 4.) The tailwheel remained attached at the empennage and was undamaged.



Figure 3. View of main landing gear assembly.



Figure 4. View of main landing gear assembly.

2.0 Engine

Engine Manufacturer: Lycoming
Engine Model Number: R680 B4D
Engine Serial Number: 3733
Hobbs: 655.3

The engine was removed from the fuselage by recovery personnel.

The cylinders, spark plugs, and ignition leads remained attached. The forward spark plugs were removed. (Figure 5.)

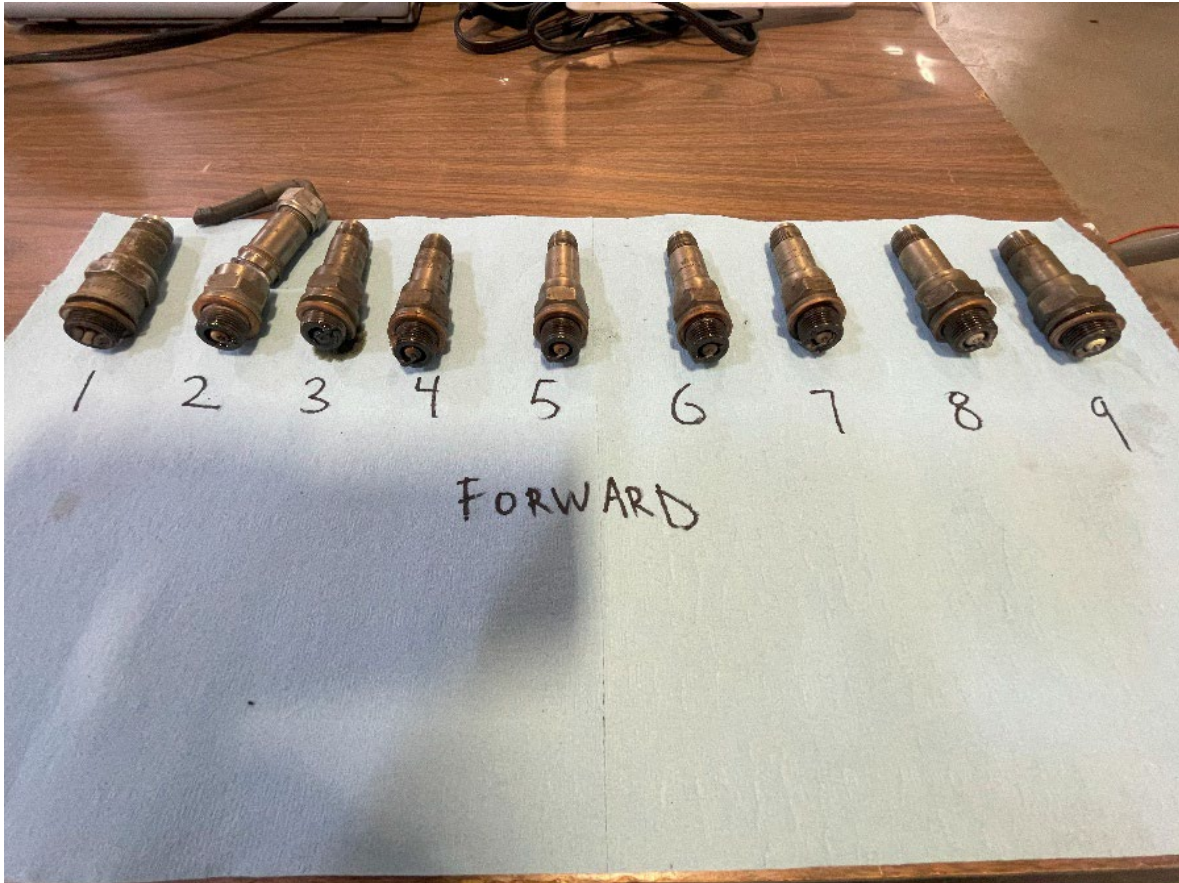


Figure 5. View of forward spark plugs.

The starter, alternator, and single drive dual magneto were removed. The starter was unremarkable. Prior to removal, the alternator was observed partially separated near the flange, and removal revealed a fractured/sheared gear drive, consistent with impact damage. (Figures 6 and 7.) Spark was observed from both leads on the single drive dual magneto.



Figure 6. View of alternator prior to removal from engine.



Figure 7. View of alternator gear.

Rotational continuity was confirmed by visually observing rotation at the alternator gear, when moving the propeller.

Examination of each cylinder's pushrod tubes revealed that:

Cylinder 1: both tubes were attached and undamaged.

Cylinder 2: both tubes were attached and undamaged.

Cylinder 3: the exhaust tube was undamaged; the intake tube was damaged and dented consistent with impact.

Cylinder 4: both tubes were damaged consistent with impact; the exhaust tube was fractured at the case fitting.

Cylinder 5: both tubes were damaged and dented consistent with impact.

Cylinder 6: both tubes were damaged consistent with impact; the exhaust tube was fractured at the case fitting.

Cylinder 7: the intake tube was undamaged; the exhaust tube was impact damaged at the rocker box case, and the box and valve cover was fractured.

Cylinder 8: both tubes were undamaged.

Cylinder 9: both tubes were undamaged.

(Figure 8.)



Figure 8. View of pushrod tubes.

A fracture in the nose case was observed, consistent with impact. The nose case was removed and a fractured roller bearing race was noted. (Figures 9 and 10.)

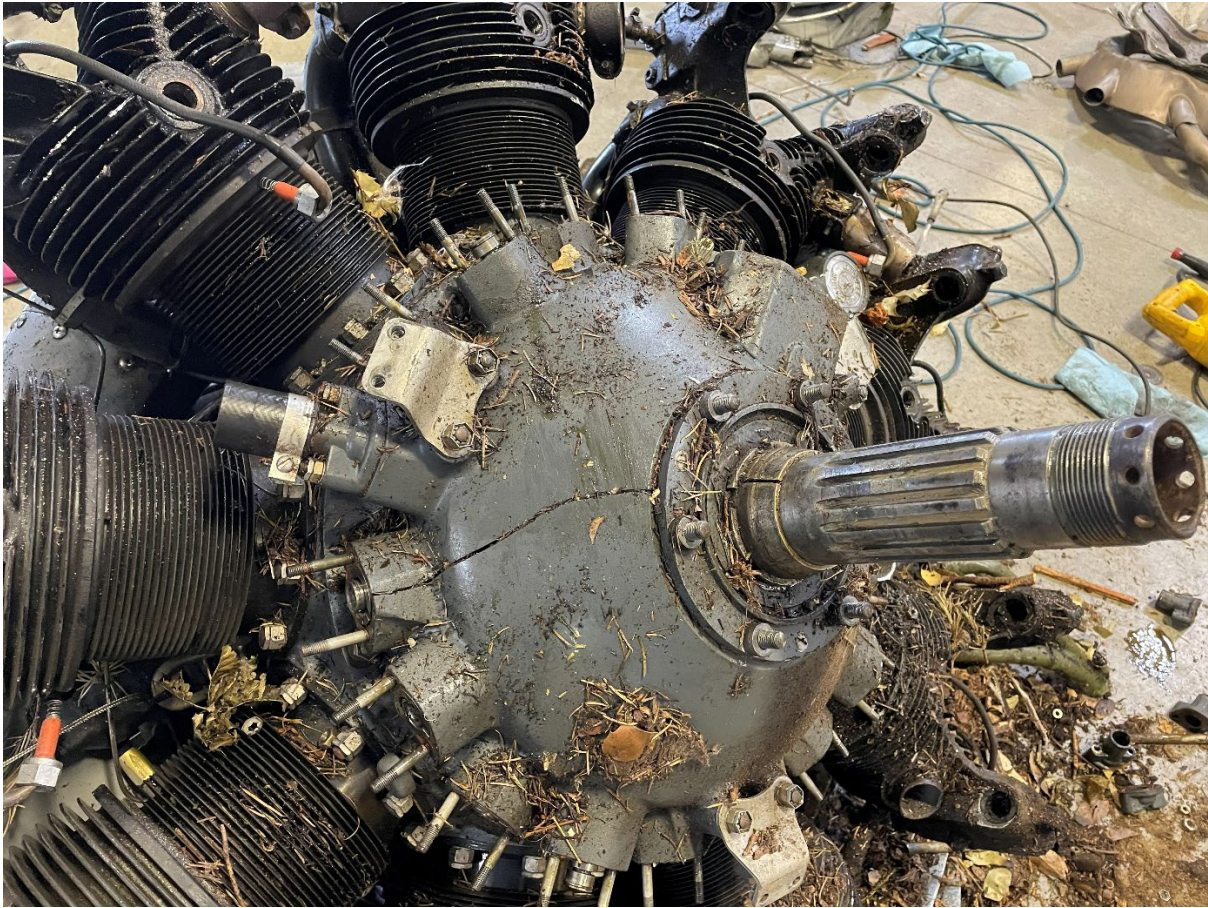


Figure 9. View of fracture in nose case.



Figure 10. View of roller bearing race.

The propeller was reinstalled and utilized to manually rotate the engine. Rotational continuity was reconfirmed and the driveshaft rotated freely. Thumb compression was confirmed on all cylinders.

The carburetor displayed fractures at the flange, consistent with impact; it was removed and disassembled. The float assembly was observed intact, the jets were present and clear, the screen was free of debris. (Figures 11 and 12.) The gascolator was removed and disassembled. No anomalies were noted.



Figure 11. View of carburetor.



Figure 12. Carburetor screen.

3.0 Propeller

Manufacturer: McCauley

Model: 41D5926

The propeller assembly remained attached to the driveshaft. Both blades remained attached at the hub. Both blades displayed chordwise striations across the full length of the blade. One blade was bent aft near the hub with scratching and gouging along the leading edge. (Figure 12) One blade displayed S-bending along the outboard half of the blade, with scratching and gouging along the leading edge. (Figures 13 - 15.)



Figure 13. View of propeller assembly.



Figure 14. View of propeller blade striations.



Figure 15. View of striations and S-bending.

Submitted by:

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