

National Transportation Safety Board

Office of Aviation Safety

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AIRFRAME AND ENGINE EXAMINATION

November 12, 2024

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A. ACCIDENT

Location: Ritzville, Washington
Date: July 15, 2024
Time: 11:45 Pacific daylight time
Airplane: Cessna 150M, N714PW

B. AIRFRAME AND ENGINE EXAMINATION

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C. SUMMARY

On July 15, 2024, about 1145 Pacific daylight time, a Cessna 150M, N714PW, was substantially damaged when it was involved in an accident near Ritzville, Washington. 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, while enroute from Spokane, Washington to Yakima, Washington the airplane's engine started running rough. While troubleshooting the rough running engine, he diverted to the Pru Field Airport (33S), Ritzville, Washington and observed a complete loss of engine oil pressure. The airplane then had a total loss of engine power, and the pilot initiated an off-airport landing to an open field. During the landing roll, the nose landing gear collapsed, and the airplane impacted terrain coming to rest upright.

D. DETAILS OF THE EXAMINATION

1.0 Airframe Examination

Examination of the recovered wreckage revealed that both wings, vertical stabilizer, horizontal stabilizer, both elevators, rudder, engine and engine mount remained attached to the airplane. The nose landing gear was impact damaged and collapsed under the fuselage. The flight control cables remained attached from the flight controls to their respective flight control surfaces. Flight control continuity was established from the cockpit flight controls to the respective flight control surfaces.

The observed hobbs meter time was 279.8 hours, and the observed tach time was 3881.2.



Figure 1: Front view of airplane during examination.

The left wing remained attached to the fuselage at the wing root. Impact damage was observed on the leading edge near the wing tip. The left wing aileron and flaps remained attached to its respective attachment points. The wing tank was visually examined, no obstructions or debris was observed. Visual inspection of the left fuel cap revealed, rust and the rubber seal appeared worn. The left main filler port had rust and appeared worn.

The right wing remained attached to the fuselage at the wing root. Impact damage was observed on the leading edge near the wing tip. The right wing aileron and flaps remained attached to its respective attachment points. The wing tank was visually examined, no obstructions or debris was observed. Visual inspection of the right fuel cap revealed, rust and the rubber seal appeared worn. The right main filler port had rust and appeared worn.

The vertical stabilizer, horizontal stabilizer, both elevators and rudder remained attached to the fuselage. Impact damage to the inboard left horizontal stabilizer was observed. No other damage was observed.

Throttle and mixture control continuity was established from the cockpit controls to the carburetor. When actuated by hand, both the throttle and mixture control moved freely from stop to stop. The fuel line connected to the carburetor was disconnected and the fuel selector lever was rotated to the on position and a clear in color liquid consistent with MOGAS fuel was observed coming from the fuel line. The fuel was collected in a clear glass container and tested for water using SAR-GEL water finding paste, with negative results.

2.0 Engine Examination

Engine Manufacturer: Continental Motors

Engine Model Number: O-200-A

Engine Serial Number: 69526-8-A

Examination of the recovered engine revealed that the engine remained attached to the airframe via the engine mounts. All four cylinders and all engine accessories remained attached. All fuel and oil lines that were removed were tight. No evidence of any mechanical damage was observed to the engine crankcase.



Figure 2: View of airplane engine during examination.

The rocker box covers were removed. The No. 2 cylinder exhaust valve was not in secure in the valve spring and the valve spring was fully extended. The intake and exhaust rocker arms on the No. 1, 3 and 4 cylinders were intact, and oil coated. The No. 1, 3 and 4 cylinders intake and exhaust valve springs were in place and visually appeared to be undamaged. The upper spark plugs were removed, and all four 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 on the No. 1, 3 and 4 cylinders; the intake and exhaust valves were unremarkable. The No. 2 cylinder exhaust valve was missing, and damage was observed to the combustion dome and piston. 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 the No. 1, 3 and 4 cylinders.

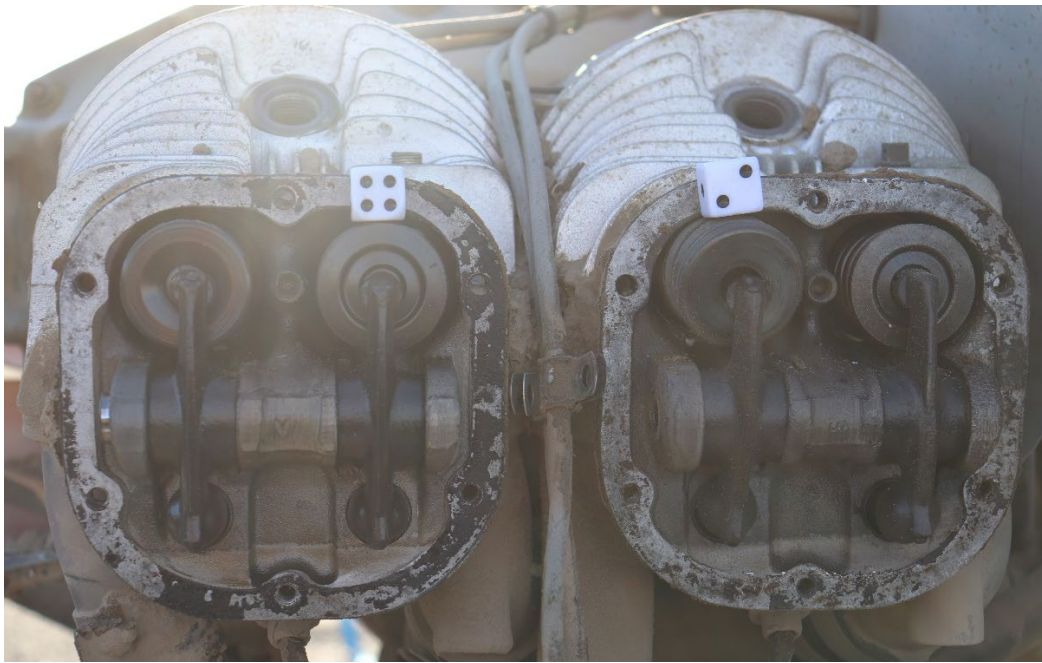


Figure 3: View of No. 2 and 4 cylinder rocker arms.



Figure 4: View of No. 1 and 3 cylinder rocker arms.

The No. 2 cylinder was removed. The exhaust valve was fracture separated from the valve stem and not observed within the cylinder or engine. The exhaust valve stem had exited the cylinder valve guide and was impaled into the cylinder head. Metallic debris was observed within the No. 2 cylinder. Remnants of the piston was observed with in the cylinder and oil sump.



Figure 5: View of No. 2 cylinder combustion dome



Figure 6: View of No. 2 cylinder piston.

The top engine spark plugs were removed from the engine, and they were the massive electrode type. The sparkplugs exhibited black deposits within the electrode area. The spark plugs exhibited signatures consistent with NORMAL when compared to the Champion Check-A-Plug comparison chart. The No. 2 cylinder spark plug electrode area was damaged.



Figure 7: View of top engine spark plugs.

The carburetor remained attached to the engine. No damage was observed to the carburetor. The air induction body remained attached to the carburetor and was impact damaged.

The left and right magnetos remained attached to the engine accessory case with no external damage noted. The magnetos were removed and rotated with a hand tool, spark was produced on all ignition leads.

A visual examination of the exhaust was conducted. The exhaust system remained secure to the cylinders. No evidence of any exhaust leaks around the cylinder attach points were observed. Crushing and bending was observed throughout.

3.0 Propeller Examination

Propeller Manufacturer: McCauley
Propeller Serial Number: K20834

The airplane was equipped with a 2 blade McCauley propeller. Propeller blade B was bent aft about mid span and exhibited various striations on the cambered side of the blade.



Figure 8: View of propeller.

4.0 Aircraft Information

According to the airplane maintenance records, the annual inspection was conducted on March 25, 2024. At the time of the inspection, the observed tach time was 206.75 hours.

The engine had been removed from another airplane and installed on the accident airplane on May 30, 1984. At the time of installation, the time SMOH was 912.0, and the tach time was 3825.0.

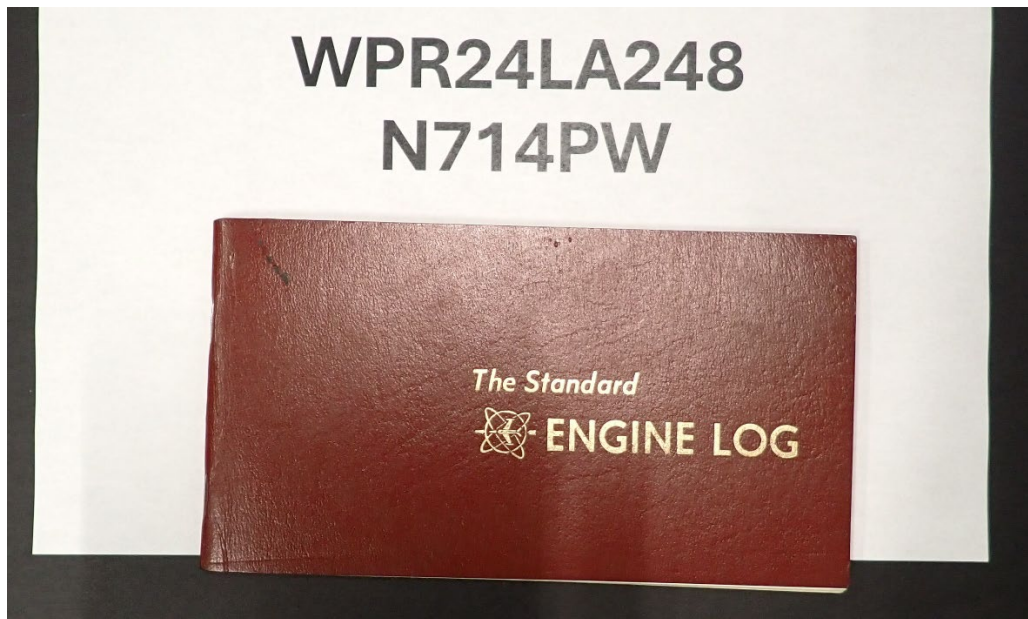


Figure 9: View of engine logbook cover page.

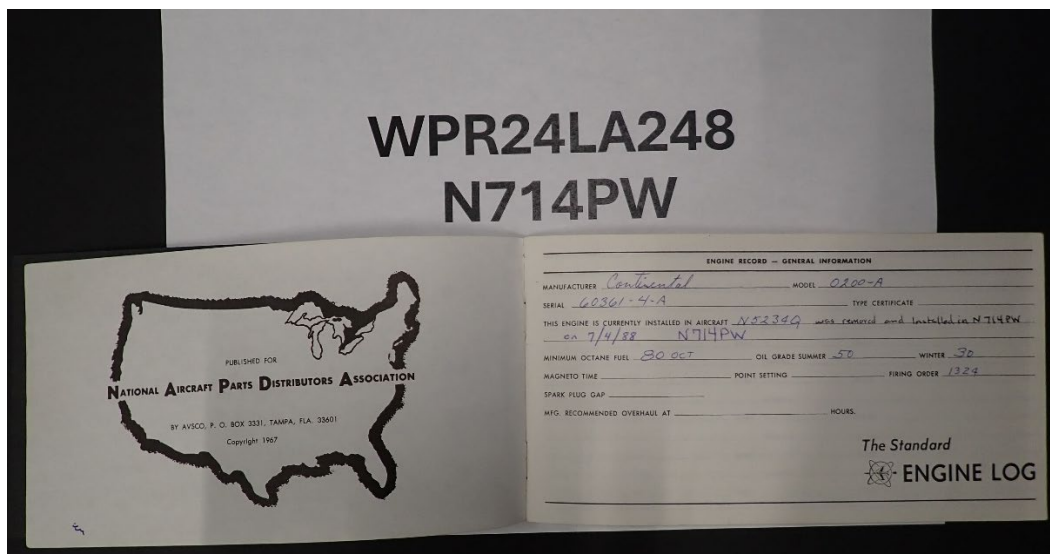


Figure 10: View of engine logbook title page.

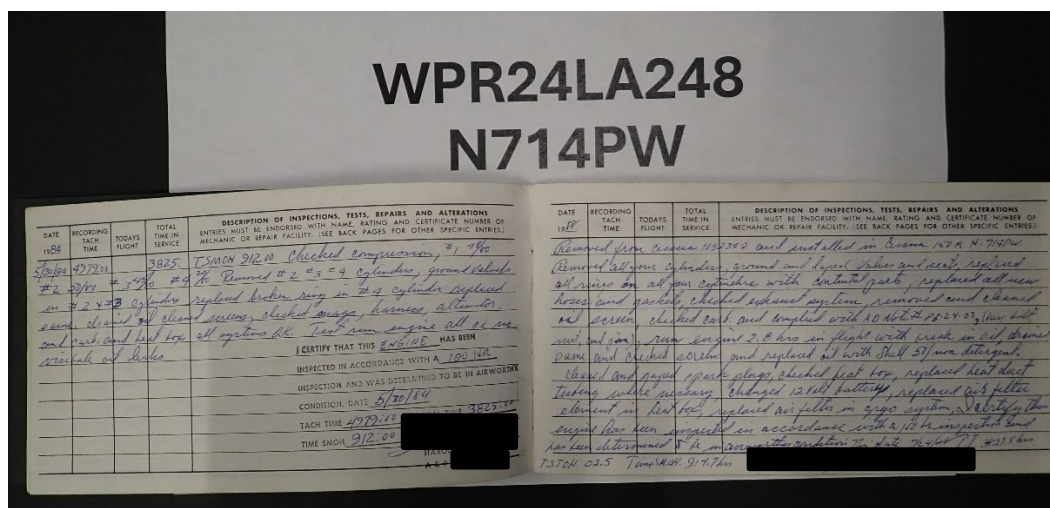


Figure 11: View of engine logbook engine swap.

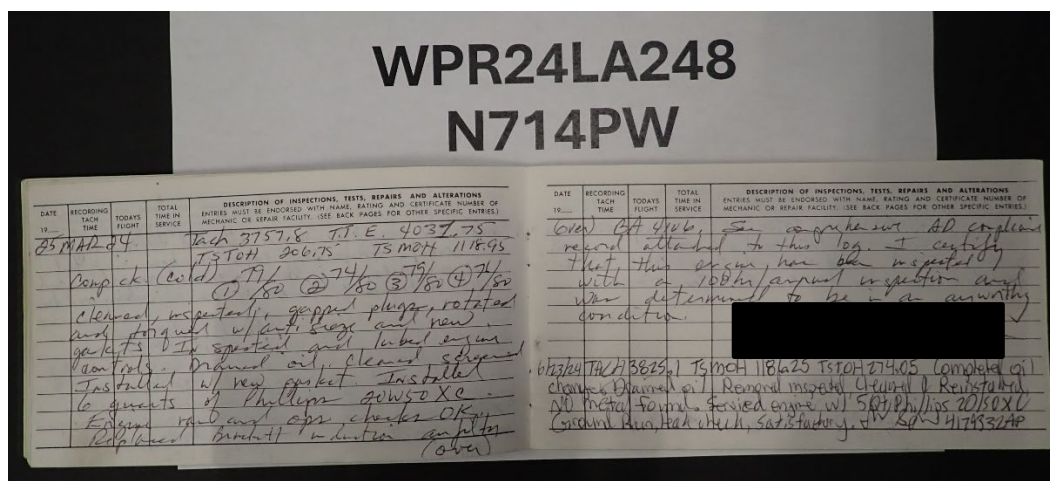


Figure 12: View of engine logbook annual inspection.

5.0 Items Retained

The No. 2 cylinder, rocker arms, exhaust valve spring, piston and metallic debris were retained for further examination.



Figure 13: View of the No. 2 cylinder.



Figure 14: View of No. 2 piston.



Figure 15: View of No. 2 rocker arms and valve spring.

Submitted by:

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