

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR23LA196

ENGINE AND AIRFRAME EXAM NOTES

June 9, 2023

A. ACCIDENT

Location: Seattle, Washington
Date: May 18, 2023
Time: 1817 Pacific standard time
Airplane: 1967 Cessna 172H N2550L

B. ENGINE AND AIRFRAME EXAM NOTES

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C. SUMMARY

On May 18, 2023, about 1817 Pacific daylight time, a Cessna 172H, N2550L, was substantially damaged when it was involved in an accident near Seattle, Washington. The pilot was uninjured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported 1000 ft from the shoreline of Elliott Bay, he experienced a partial engine power loss. The engine RPM dropped to 1400 RPM and was no longer able to maintain altitude to reach the destination. He elected to conduct a water ditching. The pilot was rescued by local authorities and the airplane was recovered. (See figure 1& 2).



Figure 1. Airplane Recovery. Photo courtesy of AvTech Services



Figure 2: Recovered airframe.

D. DETAILS OF THE INVESTIGATION

1.0 Fuel/Fuel System Examination

Examination of the airframe fuel system revealed that when compressed air was applied to each wing root fuel line with the fuel selector valve in the left and right position, liquid and air expelled from the carburetor fuel inlet line. No restrictions throughout the airframe fuel system were observed.

2.0 Engine Examination

The Continental Motors O-300D engine, serial number 35264-D-6-D, remained attached to the fuselage via the engine mount.

All engine accessories remained attached to their respective mounts. All fuel and oil lines were found secure to their respective attach fittings. Throttle, mixture, and carburetor heat control continuity was established from the cockpit controls to the engine. The mixture control arm on the carburetor was observed about 1/16th to 1/8th of an inch from the stop when the mixture was in the full rich position. Engine

accessories remained attached to their respective mounts. The induction and exhaust systems were intact and exhibited varying degrees of corrosion.

The rocker box covers were removed from all 6 cylinders along with all 6 upper spark plugs. The propeller was rotated by hand and water expelled from all 6-cylinder upper spark plug holes. Rotational continuity was established throughout the engine and drive chain. Equal movement of all intake and exhaust rocker arms was observed on all 6 cylinders except for cylinder no. 4 exhaust valve rocker arm. Movement of the cylinder no. 4 pushrod was observed. The cylinder no. 4 exhaust valve was observed in a partially open position. Thumb compression was obtained on cylinders 1, 2, 3, 5, and 6.

The upper spark plugs were removed from all 6 cylinders. They exhibited normal operational signatures and varying degrees of corrosion and debris (See figure 3). The left magneto was removed and was unable to be disassembled due to corrosion.



Figure 3. Upper spark plugs

Cylinder no. 4 was removed for further examination (See figure 4). The intake valve was removed with little effort; however, the exhaust valve was found stuck in the partially open position (See figure 5). The exhaust valve was removed utilizing a punch and hammer along with significant force. The no. 4 exhaust valve guide exhibited evidence of oil coking along with an area of polishing on one side of the guide. A slight amount of discoloration consistent with corrosion was observed adjacent to the polished area (See figure 6). The exhaust valve stem was intact with some coking near the valve fillet. All intake and exhaust valve springs were found intact and undamaged (See figure 7). Cylinder No. 2 and 4 cooling fins showed thermal damage (See figure 8).



Figure 4. Cylinder no. 4 exhaust valve



Figure 5. No. 4 stuck exhaust valve

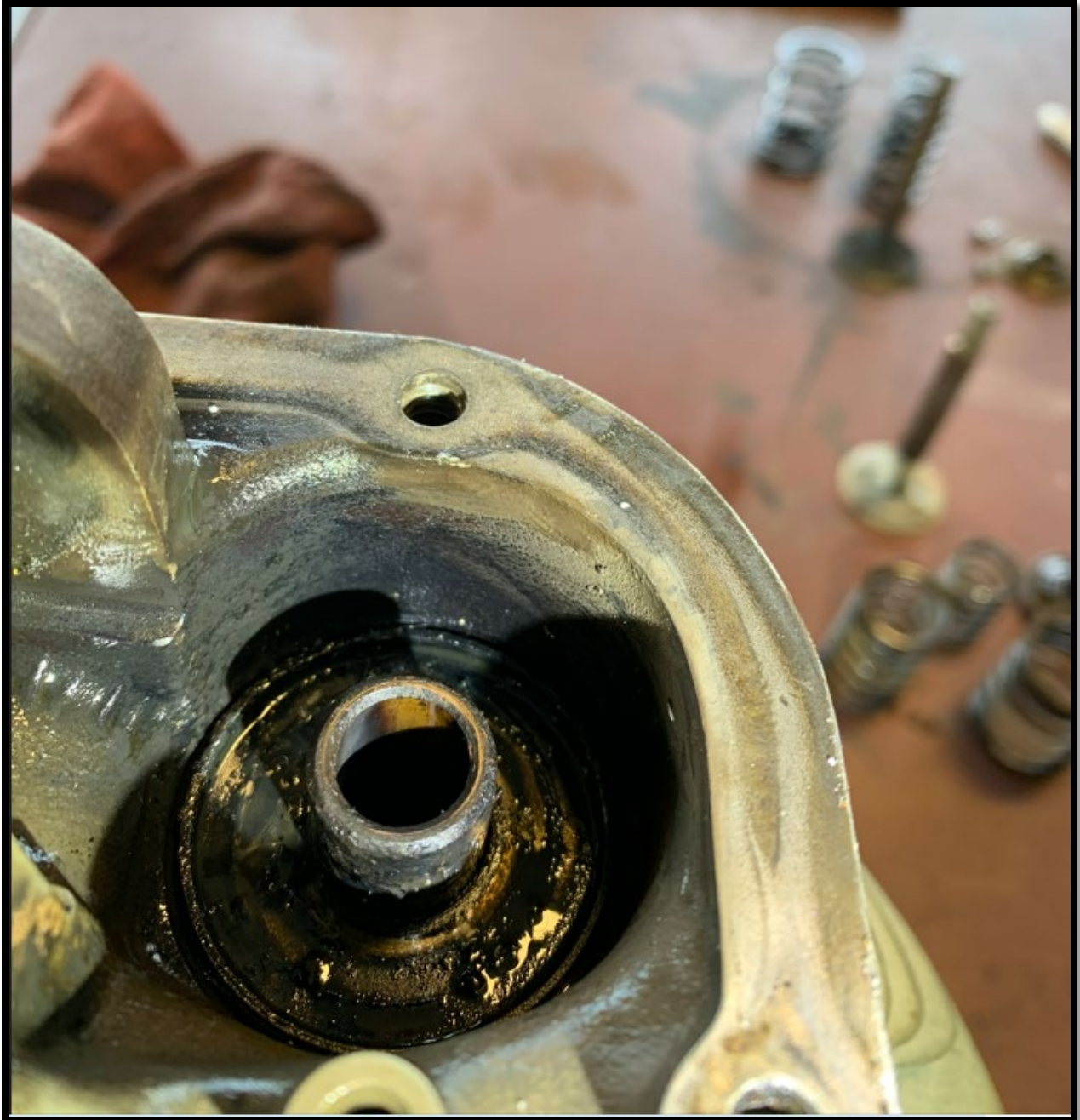


Figure 6. Cylinder No. 4 valve guide wear and corrosion.

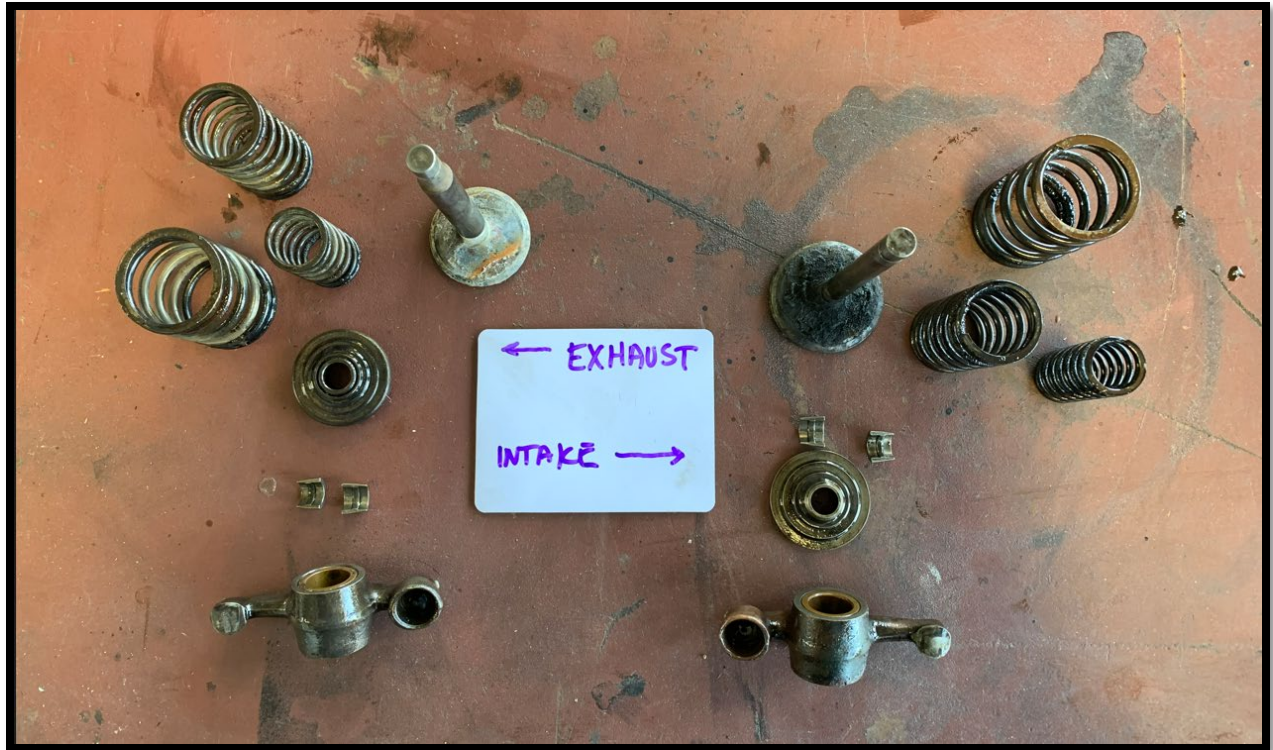


Figure 7. Exhaust and intake components

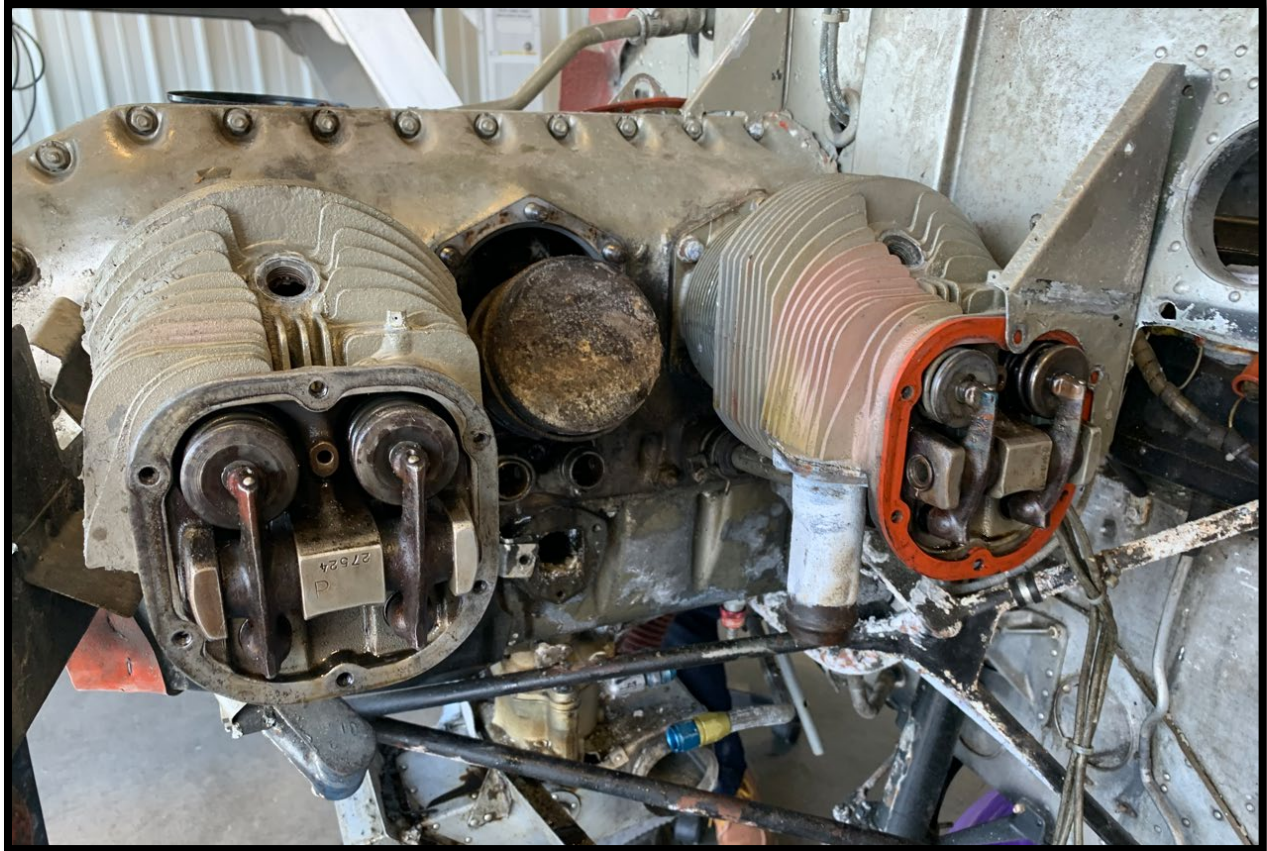


Figure 8. Thermal damage to cylinder cooling fins

The intake and exhaust pushrods were intact and not bent. The no. 4 piston exhibited evidence of corrosion and combustion deposits were observed on the piston face. All piston rings were intact and had various degrees of corrosion and contamination throughout. The internal area of the crankcase was visually examined, and the camshaft and crankshaft were found unremarkable.

The carburetor was removed from the engine. The throttle arm was actuated stop to stop by hand, with corresponding movement of the throttle plate. Liquid expelled from the accelerator pump nozzle when the throttle arm was actuated. The carburetor was subsequently disassembled. A mixture of fuel and water was observed in the carburetor float bowl. The plastic floats were intact. The fuel inlet screen contained a slight amount of debris consistent with water submersion. The needle valve was intact and undamaged.

3.0 Propeller Examination

The propeller remained attached to the crankshaft. One blade was straight, and the

opposite blade exhibited a slide aft bend about three quarters outboard of the blade root.

Submitted by:

Starr Blum
Air Safety Investigator