

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR23LA016

AIRFRAME AND ENGINE EXAMINATION

January 31, 2023

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A. ACCIDENT

Location: Laramie, Wyoming
Date: October 14, 2022
Time: 1443
2043Z
Airplane: Quickie II, Canadian Registration: C-GDHK

B. AIRFRAME AND ENGINE EXAMINATION

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C. SUMMARY

On January 30, 2023, the IIC and an NTSB engine specialist travelled to Laramie, Wyoming to prepare for the examinations. On January 31, 2023, the engine examination revealed the number 1-cylinder exhaust valve was found lodged open and would not reseat, despite the use of moderate force.

D. DETAILS OF THE EXAMINATION

1.0 Accident Site.

The IIC did not travel to the accident site. The airplane was recovered to Cowboy Aviation, located at the Laramie Regional Airport (LAR) Laramie, Wyoming.

2.0 Airframe Examination

2.1 Fuselage.

The fuselage was intact except for the right-front canard, the empennage, and the two main landing gear wheels. There were numerous cracks in the composite fuselage.

2.2 Empennage.

The empennage separated from the fuselage. The rudder and the small elevators remained installed and maintained their movements from stop to stop.

2.3 Wings.

The right-front canard separated from the fuselage. The right main landing gear was installed at the outboard end of the right-front canard. The wheel brakes remained installed onto the wheel assembly. The left-front canard remained installed onto the fuselage; however, the left main landing gear wheel separated from the left-front canard. The left and right ailerons remained installed and articulated fully.

2.4 Landing Gear.

The tail wheel separated from the fuselage and remained installed onto the empennage. The two main landing gear wheels separated from the fuselage, as stated above.

2.5 Cockpit.

The cockpit remained intact with only minor damage found. The canopy remained installed and exhibited minor damage. Flight control continuity was established for all flight control surfaces. The rudder and elevator control cables were cut during the recovery process.

2.6 Survivability.

The cockpit did not crush, which allowed for acceptable living space. There was not post-accident fire, and the G-forces were within acceptable limits.

2.7 Fuel/Fuel System.

The fuel injected system remained installed onto the underside of the engine. The throttle, mixture and carb heat remained installed and articulated to the full limits.

3.0 Engine Examination.

The engine, a Revmaster, R-2100D, remained installed to the fuselage. The top spark plugs were removed and examined. The four top plugs exhibited a dark tan color. The electrode gaps varied from .021 inch to .016 inch. The number four, top spark plug exhibited a bend of the plug to about 10° and a cracked insulator. The leads all exhibited black "electricians' tape" around the lead near the spark plug.

4.0 Valve Train.

The valve train was normal but exhibited one anomaly. The number one-cylinder exhaust valve was lodged open and would not return to its seat despite the use of moderate force. When removed, with the assistance of a mallet, the number one-cylinder exhaust valve exhibited discoloration on the stem and a slight bend. The discoloration had the appearance of a black substance buildup, consistent with carbon buildup. All other valve train components exhibited normal characteristics. The cam lobes appeared to move normally and evenly. The rocker arms all moved about the same distance, except for the number 1-cylinder exhaust valve, rocker arm. The valve train system rotated smoothly.

5.0 Propeller Examination.

The wooden fixed-pitch propeller remained installed onto the propeller flange and exhibited fracture separation of the tips.

Submitted by:

Fabian Salazar
Air Safety Investigator

PHOTO ARRAY



Figure 1. C-GDHK at the accident site. Photo pilot.



Figure 2. C-GDHK at the recovery site, prior to the engine and airframe examination.



Figure 3. Left-side view of engine showing valve cover for the number 1- and 2-cylinders valve cover.

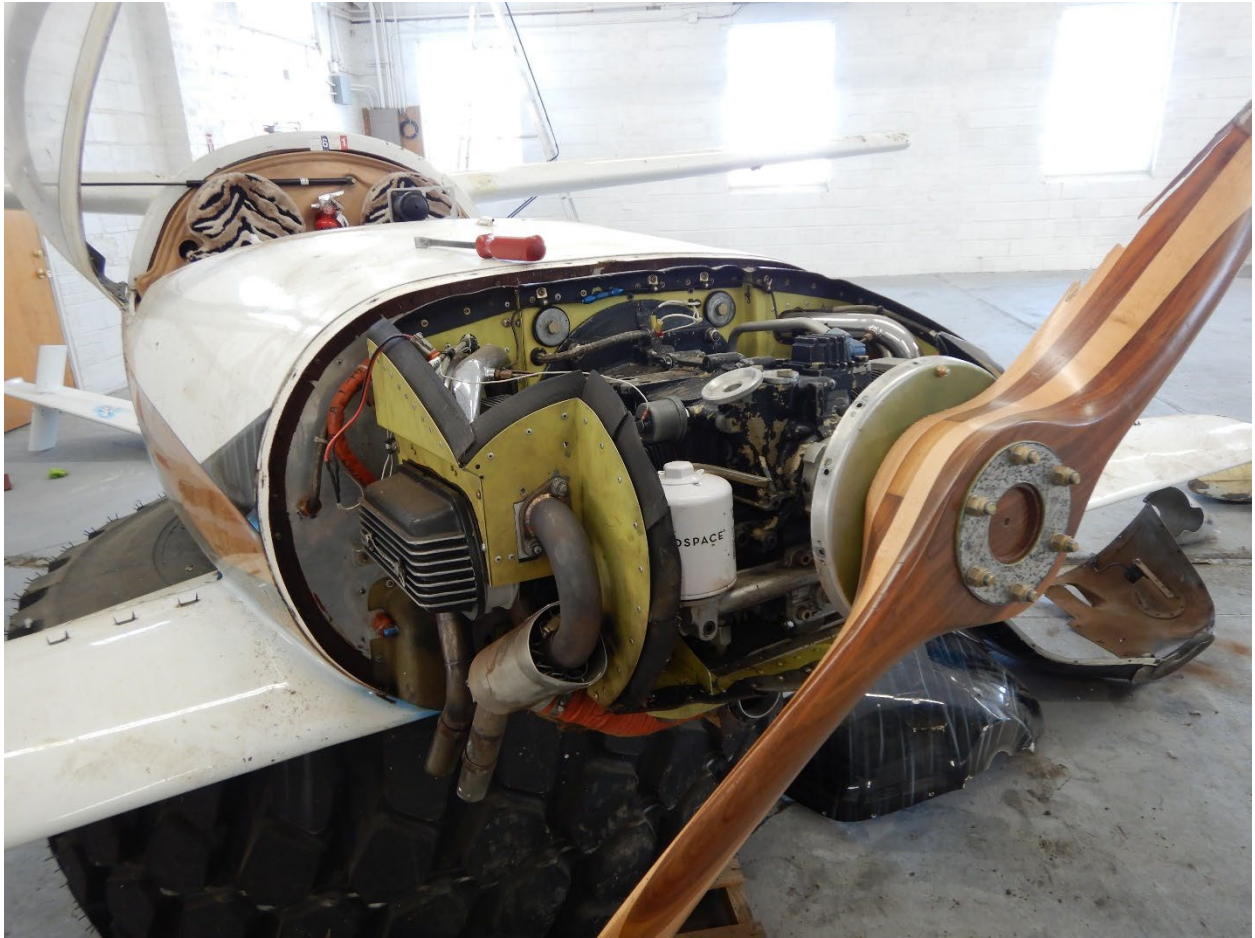


Figure 4. Right-side view of the engine, showing the number 3- and 4-cylinders valve cover.



Figure 5. Top spark plugs

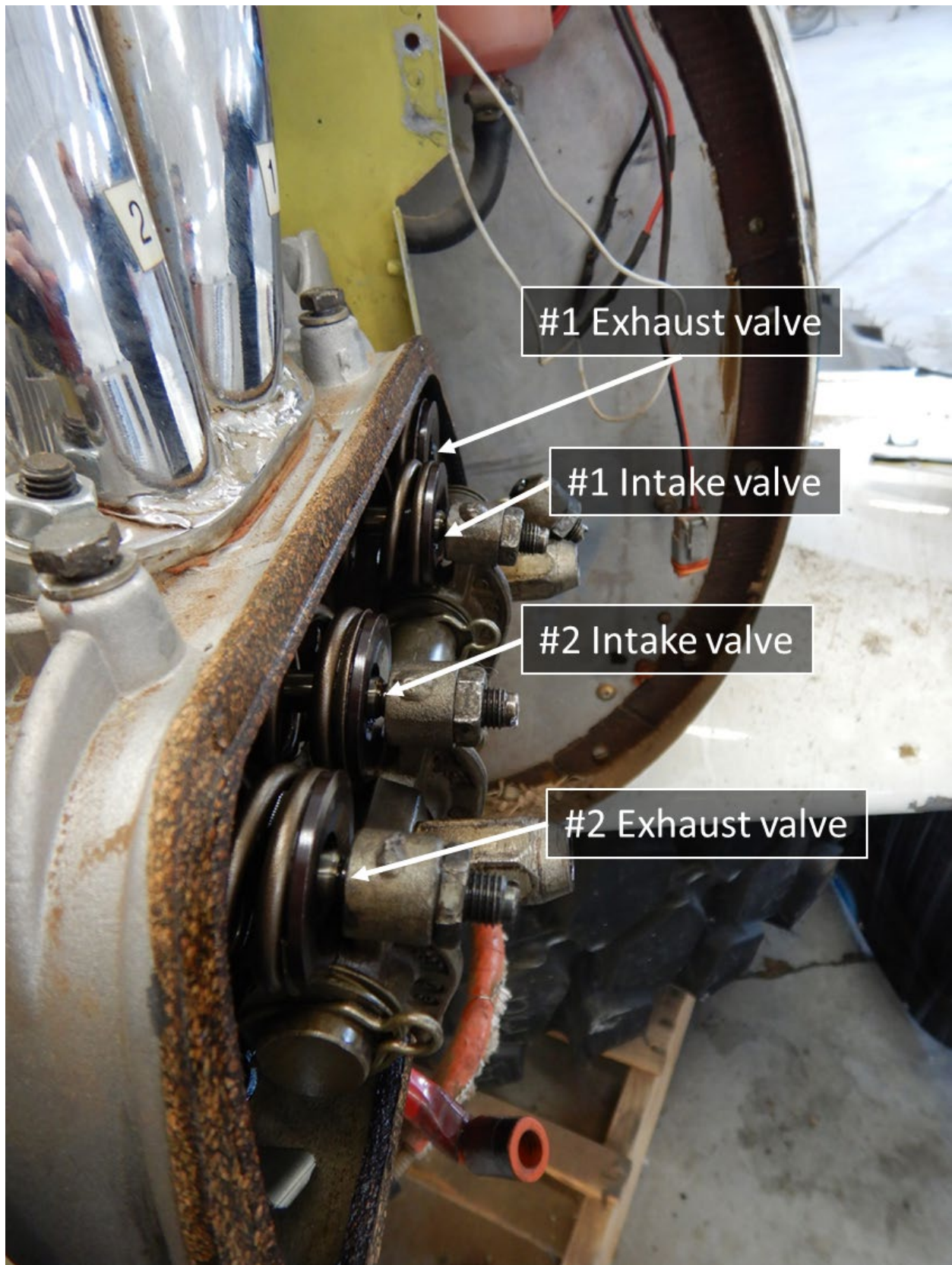


Figure 6. Number 1- and 2-cylinder valve train. The number 1 (back) exhaust valve is lodged in the open position.



Figure 7. Number 1-cylinder exhaust valve.

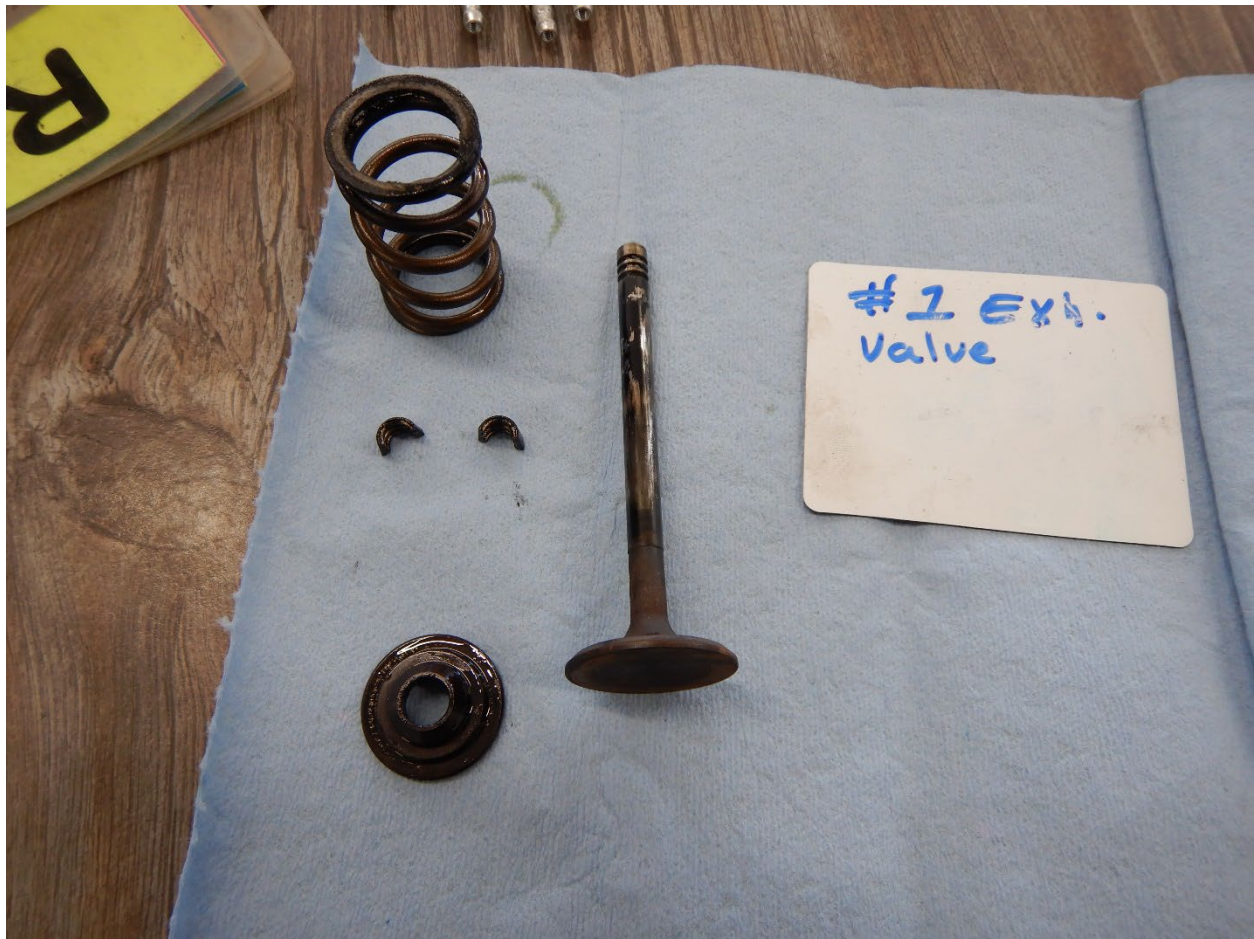


Figure 8. Number 1-cylinder exhaust valve removed from the valve guide.