

National Transportation Safety Board

Office of Aviation Safety

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AIRFRAME AND ENGINE EXAMINATION

October 19, 2022

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A. ACCIDENT

Location: Yellow Pine, Idaho
Date: August 15, 2022
Airplane: Aviat, A-1A, N26HV

B. AIRFRAME AND ENGINE EXAMINATION

1.0 Participants

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Air Safety Investigator	Kristyn Blocher National Transportation Safety Board Federal Way, Washington
Group Member	Troy R. Helgeson Lycoming Engines Williamsport, Pennsylvania

C. SUMMARY

On August 15, 2022, about 0630 mountain daylight time, an Aviat Aircraft Inc., A-1A, N26HV, was substantially damaged when it was involved in an accident near Yellow Pine, Idaho. The pilot and passenger were fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

D. DETAILS OF THE EXAMINATION

2.0 Airframe Examination

Examination of the recovered airframe revealed that the recovery company had removed both wings and empennage for transport. The forward section of the cockpit was impact damaged and crushed aft. The instrument panel was impact damaged with multiple instruments displaced. Crushing and bending was observed throughout the fuselage.

Additionally, recovery personnel had drained about 17 gal of fuel from the left tank and about 10 gal of fuel from the right tank.



Figure 1: View of airplane during examination

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

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 line and heard coming from each fuel filler port. The airframe fuel strainer screen was impact damaged.

The right wing separated from the fuselage at the wing root; the aileron separated from the wing, but remained tethered to the wing via the flight control cables, and the flap remained attached to the wing via its mounts. The wing and aileron exhibited bending and crush damage. A turnbuckle barrel from the flight control stick to the right aileron was separated about mid span. Visual inspection of the right fuel cap revealed that the rubber seal appeared normal and unremarkable. The fuel filler port was also normal and unremarkable. A breach in the right wing fuel tank, consistent with impact damage was observed near the top, aft tank. The right landing gear remained attached to the fuselage and was bent aft.



Figure 2: View of right-wing during examination

The left wing separated from the fuselage at the wing root; the aileron separated from the wing, but remained tethered to the wing via the flight control cables, and the flap remained attached to the wing via its mounts. The wing and aileron exhibited bending and crush damage. Visual inspection of the left fuel cap revealed that the rubber seal appeared normal and unremarkable. The fuel filler port was also normal and unremarkable. The left landing gear separated from the fuselage and was impact damaged.



Figure 3: View of left-wing during examination

The empennage structure aft of the cabin area was removed from the fuselage by recovery personnel. The vertical stabilizer, rudder, horizontal stabilizers, elevator, and elevator trim tabs remained attached and secure to their respective mounts.



Figure 4: View of empennage during examination

3.0 Engine Examination

Engine Manufacturer: Lycoming
Engine Model Number: O-360-A1P
Engine Serial Number: L-35980-36A

Examination of the recovered engine revealed that engine remained attached to the engine mount. All four cylinders remained attached. All fuel and oil lines that were removed were tight. The forward left/right side of the engine at the number 1 and 2 cylinders exhibited impact damage. 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, the number 1 cylinder exhaust valve assembly exhibited impact damage, the remaining intake and exhaust valve springs 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. The crankshaft was rotated by hand using the propeller hub. Rotational continuity was established throughout the engine and valve train. Thumb compression was not obtained at the number 1 cylinder due to damage of the exhaust valve assembly.

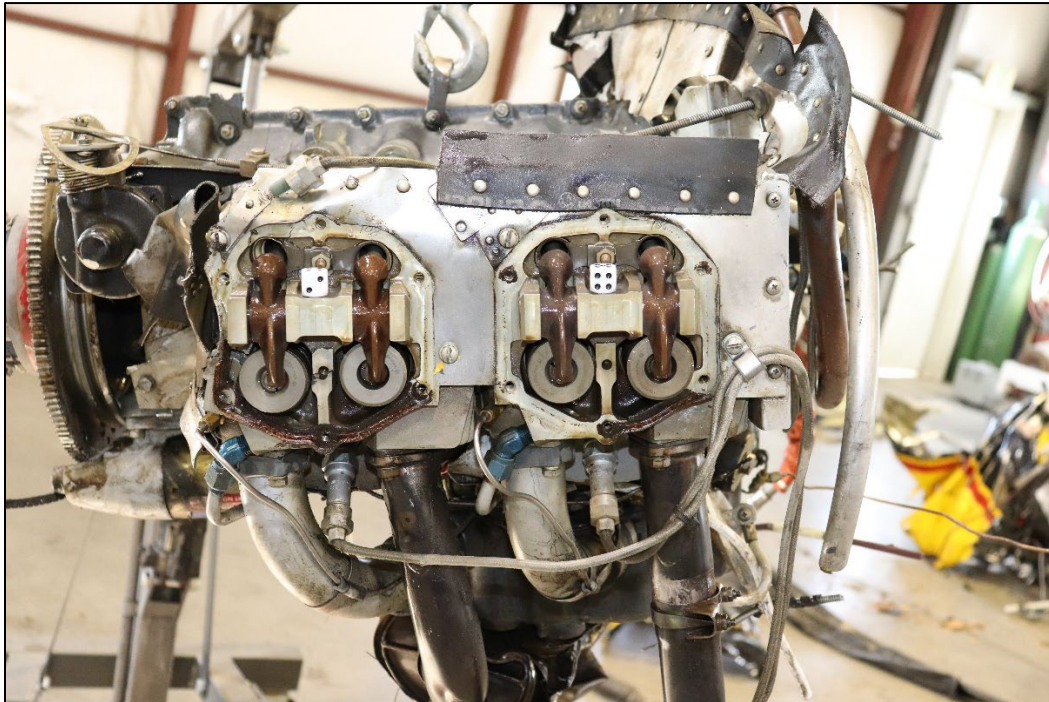


Figure 5: View of left side of the engine

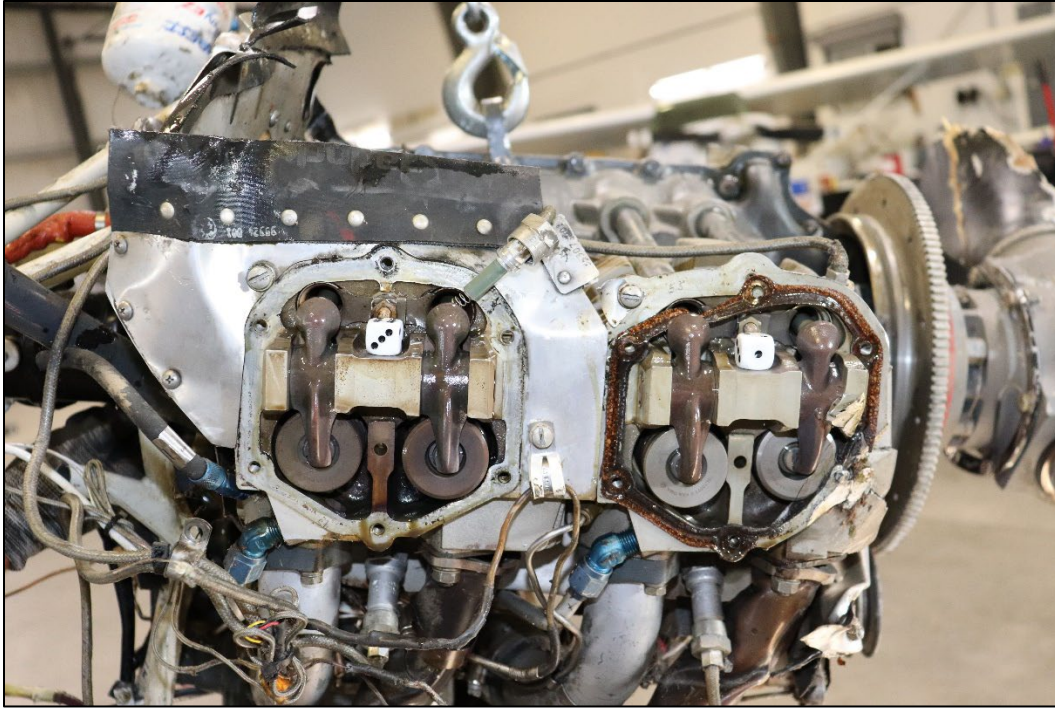


Figure 6: View of right side of the engine

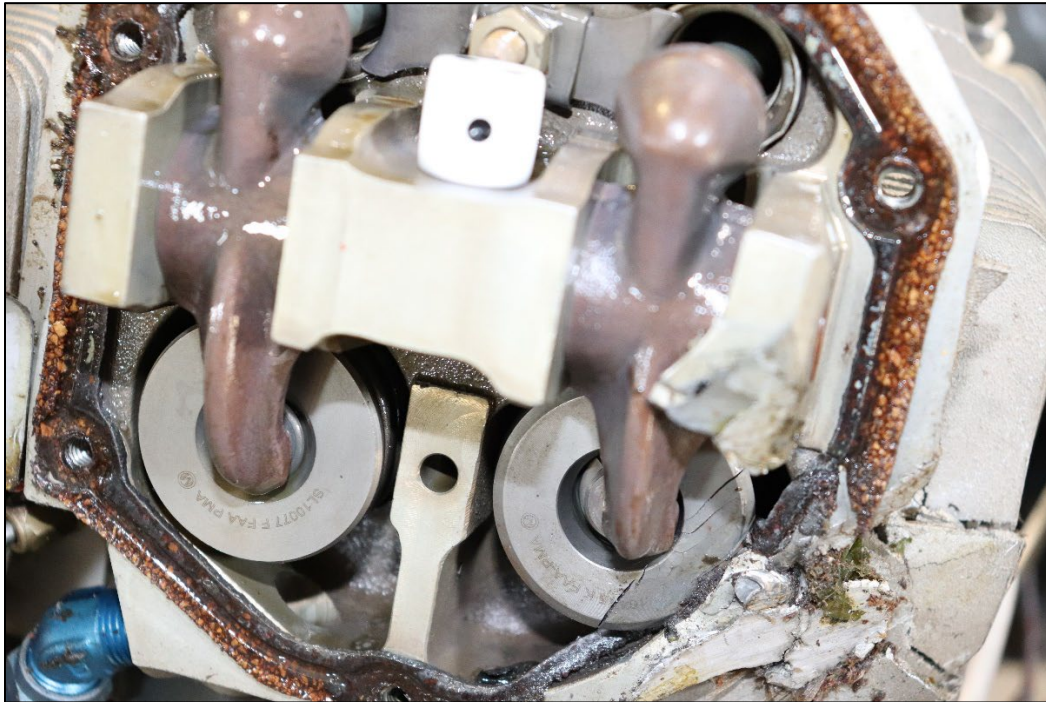


Figure 7: View of damage to the number 1 cylinder exhaust valve assembly

The spark plugs were removed from the engine, and they were the massive electrode type. All sparkplugs exhibited rust signatures within the electrode area or were oil soaked.



Figure 8: View of spark plugs

The carburetor separated from the engine, but remained tethered via the fuel line, throttle cable and fuel mixture cable. The throttle control lever was intact and moved freely from stop to stop. The mixture control cable remained attached to the carburetor, but the connecting linkage to the mixture cable was impact damaged. The mixture control lever arm moved the available length. The carburetor inlet fuel screen was removed and was free of debris.

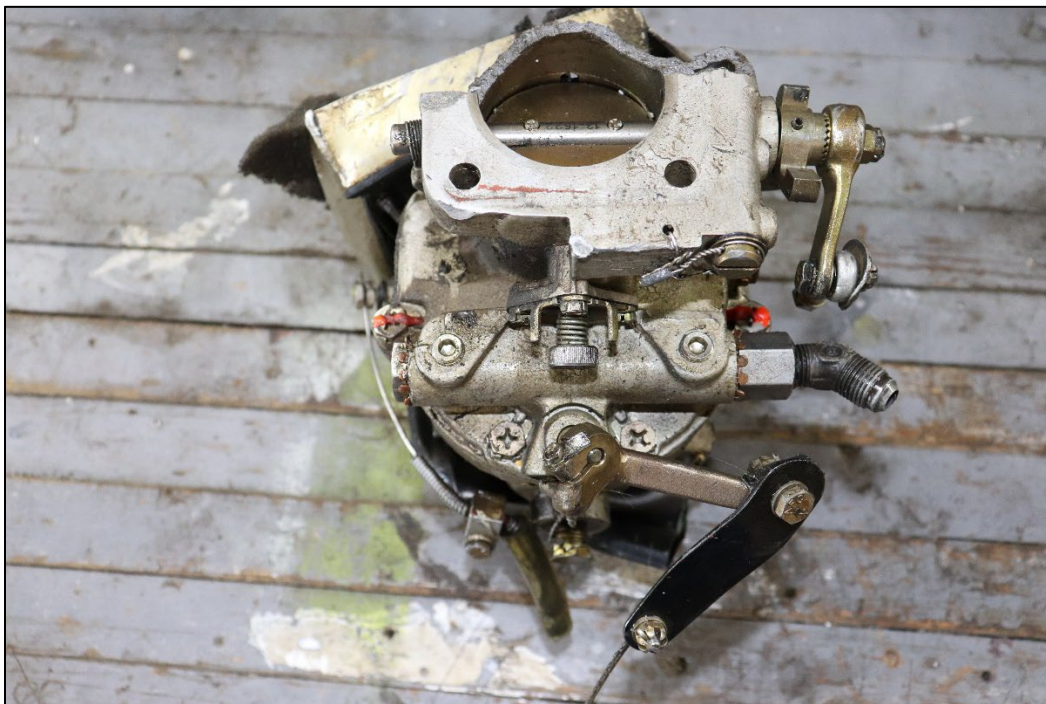


Figure 9: View of carburetor

The left and right magnetos remained attached to the engine accessory case with no external damage noted. Both left and right magnetos were removed from the engine's accessory case. The left magneto drive shaft was rotated by hand, and spark was produced at all four ignition posts and impulse coupling engagement was heard. The right magneto was not equipped with an impulse coupler; the drive shaft was rotated by hand; spark was produced at all four ignition posts.

The vacuum pump separated from the engine at the flange. The vacuum pump drive was rotated by hand and air was felt from the output port.

The propeller governor remained attached to the engine and impact damage noted to the control arm. The propeller governor screen and gaskets were intact and free of debris. The propeller governor arm remained attached to the cable but separated from the propeller governor.

The propeller governor control shaft moved from stop to stop when actuated by hand and the drive shaft rotated freely by hand.

4.0 Propeller Examination

Propeller Manufacturer: MT propeller

Propeller Model: MTV-15-B

Propeller Serial Number: M74DM-0-55

The airplane was equipped with a two blade, constant speed, MT propeller. The propeller hub remained attached to the engine. Propeller blade A splintered and separated near the propeller hub. Propeller blade B splintered and separated mostly flush near the propeller hub. Sections of the propeller blade root remained attached to the propeller hub, via lag bolts.



Figure 10: View of propeller hub during exam

The propeller spinner separated with crush damage consistent with impact damage.

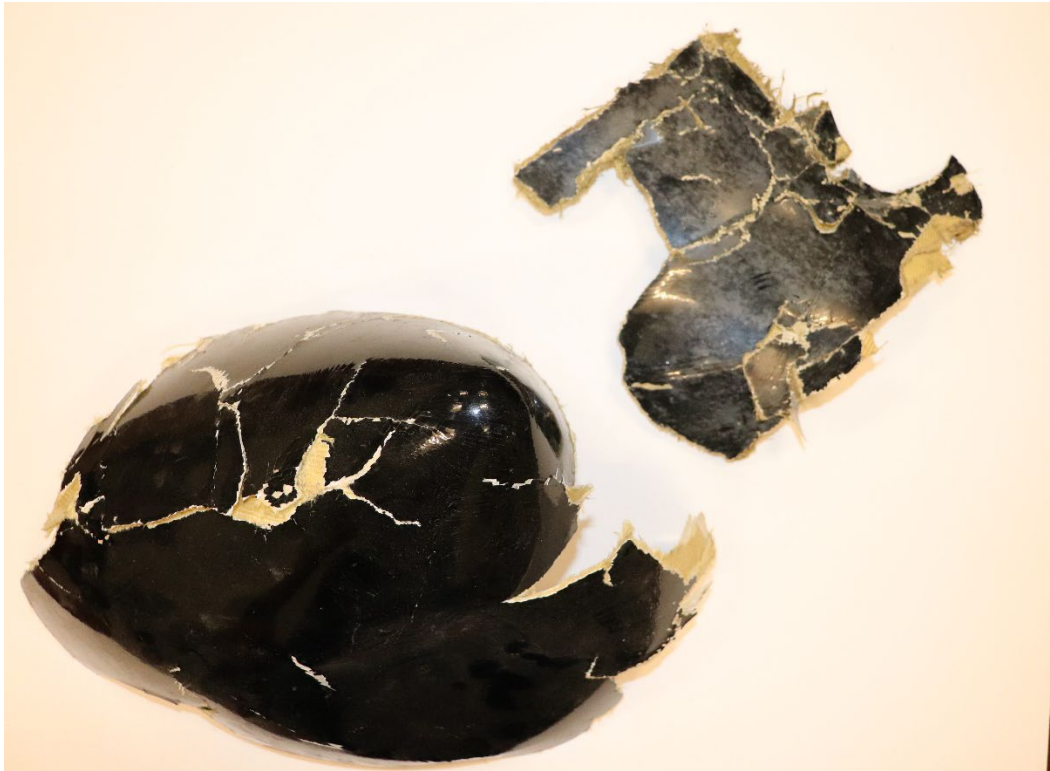


Figure 11: View of propeller spinner

A propeller blade leading edge separated. Crushing and bending consistent with impact damage was observed throughout.

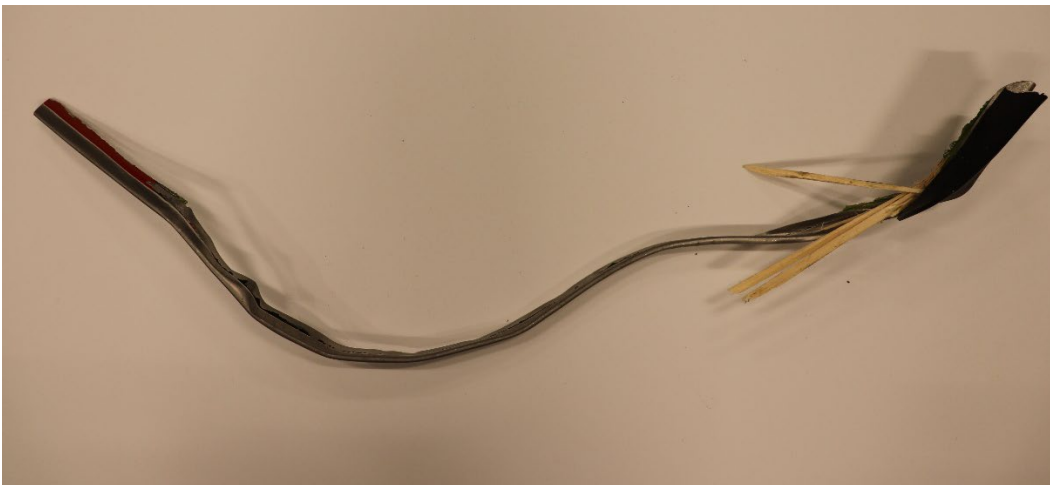


Figure 12: View of propeller blade leading edge

5.0 Additional Information

The total weight of the recovered personal effects was 66 lbs, however; the location of the personal effects could not be determined.



Figure 13: View of recovered personal effects

6.0 Retained Items

A turnbuckle barrel from the flight control stick to the right aileron was retained for further examination.



Figure 14: View of damaged turnbuckle barrel

Submitted by:

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