

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



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AIRFRAME AND ENGINE EXAMINATION REPORT

August 17, 2023

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A. ACCIDENT

Location: Ravensdale, Washington
Date: July 30, 2023
Time: 1301 Pacific daylight time
Airplane: Cessna 195

B. AIRFRAME AND ENGINE EXAMINATION REPORT

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SUMMARY

On July 30, 2023, about 13:01 Pacific daylight time, a Cessna 195 airplane, N195JL, was substantially damaged when it was involved in an accident near Ravensdale, Washington. The pilot and passenger were not injured. The airplane was operated as a Title 14, *Code of Federal Regulations* Part 91 personal flight.

Members of the NTSB and FAA convened at AvTech Aircraft Recovery, Auburn, WA, to conduct an examination of the airframe and engine. Postaccident examination revealed staining from the fuel port of the left wing, wear marks on the left-wing tank filler port locking section, and staining at the bottom of the engine cowling below the carburetor. No other mechanical malfunctions or anomalies were observed that would have precluded normal operations. A test run of the engine was conducted and identified no anomalies that would have precluded normal operations.

C. DETAILS OF THE EXAMINATION

1.0 Accident Site

The airplane came to rest in a commercial water treatment plant. The area was confined with obstacles and buildings. The owner photographed the inside of the

engine cowling, directly under the carburetor and captured an image of blue fuel staining, as shown in figure 1 and 2.



Figure 1. Image of blue staining underneath the carburetor. Image courtesy of the owner.



Figure 2. Additional blue staining on cowl. Photo courtesy of the pilot.

2.0 Airframe Examination

2.1 Fuselage

The fuselage was substantially damaged. The mid-section exhibited deep wrinkles and bent sheet metal. The entire aft section of the fuselage was bent to the right about 5° to 10°. The left-side fuselage above the left main landing gear exhibited breaches and wrinkles in the sheet metal.



Figure 3. Airplane right-side view.



Figure 4. Airplane left-side view.

2.2 Empennage

The empennage remained secured to the end of the fuselage. The left elevator was crumpled to the root. The vertical stabilizer exhibited wrinkles and bends to the sheet metal. The rudder exhibited dents and wrinkles. The right-side horizontal stabilizer and elevator exhibited minor damage.



Figure 5. Left-side view of empennage.



Figure 6. Right-side view of empennage.

2.3 Wings

The right-side wing was removed from the airframe during the recovery. About 3 to 5 gallons of fuel had been reported to have been removed from the right-side wing tank. The fuel cap was found to be secured and the rubber seal was soft and pliable. The right-side wing tip and about 36 inches inboard was bent upwards. The wing root exhibited dents and bends.



Figure 7. Right wing, topside

The left-side wing was removed from the fuselage during the recovery. About 3 gallons of fuel was reported to have been removed during the recovery. Postaccident examination revealed a significant amount of fuel staining on the top surface of the wing, that ran aft of the fuel fill port to the trailing edge of the wing. There was enough fuel/dirt staining that the area exhibited a flat hue when compared to the shiny, clean remainder of the wing and the right wing. The fuel cap was found to be secured and the rubber seal was soft and pliable. Disassembly of the filler port revealed wearing in the area of the cap locking section of the port. The left-wing tip, inboard to about 24 inches exhibited upward bending. The left aileron exhibited damage.



Figure 8. Left-side wing, top view showing the staining that ran aft from the fuel fill port to the end of the wing.

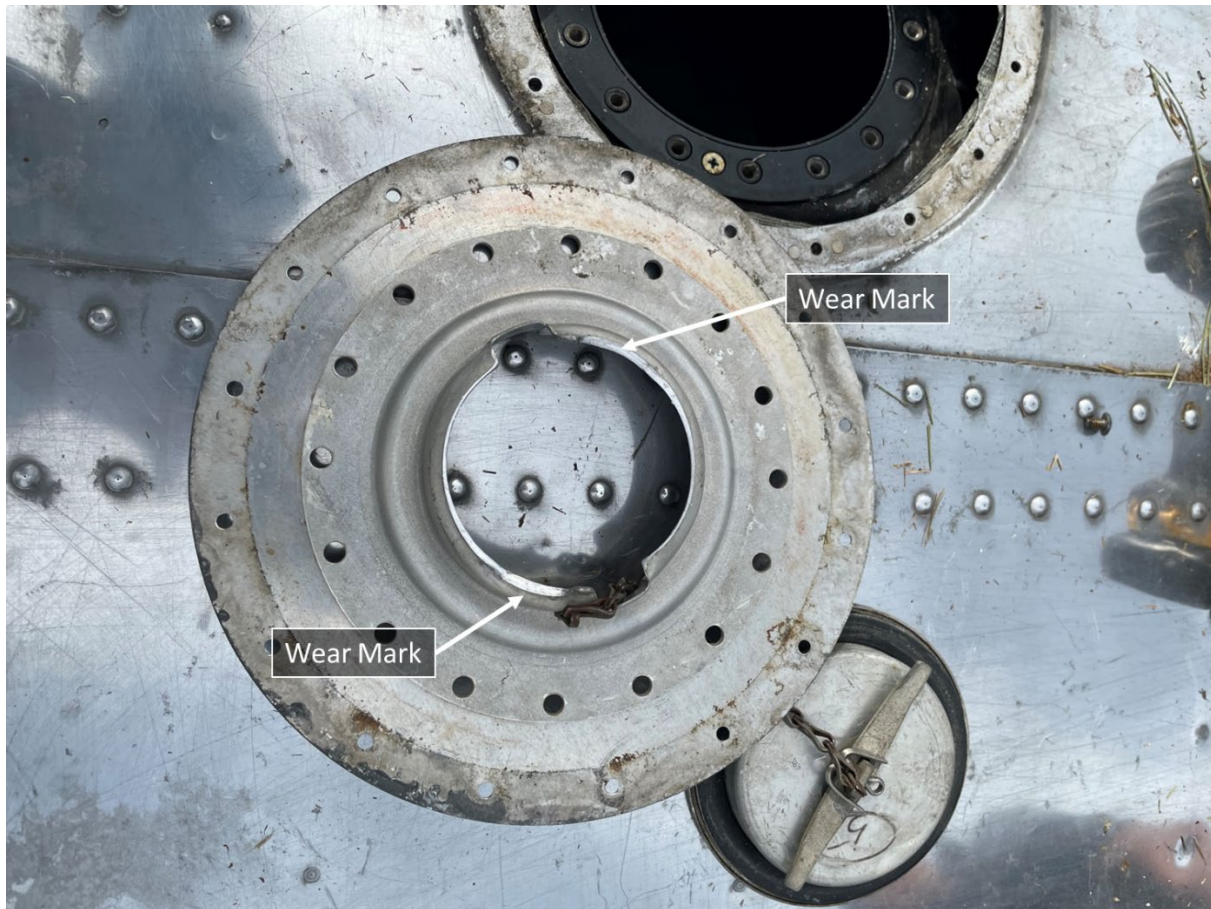


Figure 9. Left wing fuel filler port, showing wear marks near the cap locking section of the port.

2.4 Landing Gear

The main landing gear remained attached to the lower fuselage. The left main landing gear exhibited inward bending of the strut so that the outer surface of the wheel contacted the ground. The right-side main landing gear exhibited little to no bending of the strut. The brakes remained attached to the main landing gear wheels. The tail wheel remained attached to the aft fuselage and exhibited minor damage.



Figure 10. Main landing gear

2.5 Cockpit

The cockpit remained secure and exhibited no structural damage. The instrument panel remained secured. When power was applied, and the engine was operating, both fuel quantity gauges displayed $\frac{1}{4}$ tank full.



Figure 11. Instrument panel and control yoke

2.6 Flight Control Continuity

Flight control continuity was confirmed from the control yoke to the elevator. Flight control continuity was confirmed from the rudder peddles to the rudder. Flight control continuity was not confirmed from the control yoke to the ailerons due to the removal of the wings; however, the pilot did not report flight control irregularities.

2.7 Fuel/Fuel System

The two wing fuel screens were clean and free of obstruction. The fuel tubing for the right wing was secure and ran across the overhead cabin roof to the left side. The tubing ran to the fuel selector switch and was secure and exhibited no signs of fuel leaks. The fuel selector switch remained secured to the fuselage and exhibited no signs of fuel leakage. The fuel tube ran out of the switch and turned 90°. There was an indication of staining under the fuel selector switch. The fuel line ran to the fire wall and exited to the gascolator.



Figure 12. Fuel tank selector switch

The engine was pivoted away from the fire wall for examination of the rear of the engine. The fuel line from the gascolator to the engine driven fuel pump (EDFP) was secure. When the torque was released from the fuel line to the EDFP, fluid ran from the line. The fluid was clear in color and smelled of aviation gasoline.

2.8 Engine Examination

The radial engine was identified as a Jacobs, model R755-S, serial number: 35063, 7-cylinder radial engine. It remained attached to the engine mounts that remained attached to the firewall. The engine exhibited no external damage. There was no sign of fuel leaks or blue staining around the engine, nor the three-piece engine cowling (same area as shown in figure 1). Several small strips, aft of the engine cowling, were removed and exhibited no signs of fuel stains.



Figure 13. Engine data plate.



Figure 14. Engine right side.



Figure 15. Engine left side.

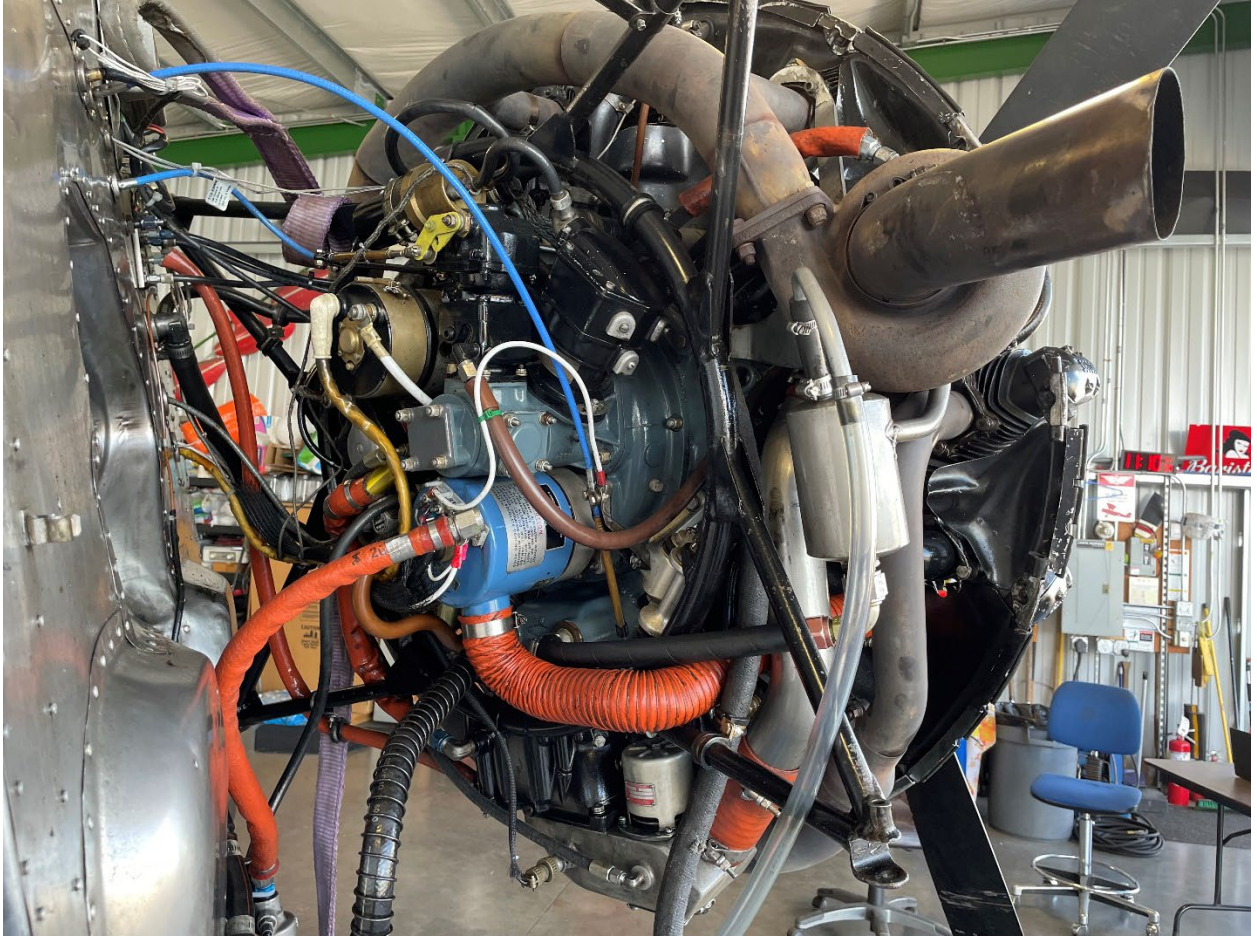


Figure 16. Engine rear view.

3.0 Engine Test Run

After the engine examination was completed, a test run of the engine was conducted. An external fuel tank was secured to a forklift, and the forklift secured the fuselage. The electrical system was charged via a jump start cables and power was supplied from an external source. The engine was cleared by rotating the propeller through several cycles. The engine started and ran at near full RPM (2,200 RPM and 22 inches of manifold pressure). The engine ran smoothly and exhibited no anomalies. There were no indications of fuel leaking from the carburetor before, during, and after the test run.



Figure 17. Airplane configured for a test run of the engine.

4.0 Propeller Examination

The three-bladed, propeller remained attached to the propeller flange and exhibited a slight bend on one of the propeller blades.



Figure 18. Image of the propeller.

5.0 Aircraft Information

The airplane was a Cessna, model 195, airplane. The fuselage was a semi monocoque design and was manufactured in 1952. According to the FAA Type Certificate Data Sheet (TCDS) the airplane has a total fuel capacity of 40.5 gallons per tank, of which, 38 gallons per tank are usable.

A maintenance records review revealed the engine was re-installed, in addition to an annual inspection on January 14, 2023, at a tachometer time of 1160.5 hours. The tachometer time recorded after the accident was 1187.54 hours, as shown in figure 11.

Submitted by:

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