



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

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AIRFRAME AND ENGINE EXAMINATION

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This document contains 13 embedded photos.

(13 Pages)

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2.0 SUMMARY

Examination of N8428J was conducted on June 3, 2021, at Anglin Aircraft Recovery, Clayton, Delaware. Examination of the airframe revealed corrosion on the right tank filler neck. Examination of the engine revealed no anomalies. The engine was started, and the engine run-up demonstrated no deficiencies.

White sediment was recovered from the fuel samples taken from the left and right fuel tanks at the accident site. Additionally, water was recovered from the fuel sample taken from the left wing fuel tank at the accident site. About 2 ounces of fuel were drained from the fuel strainer assembly. The fuel sample contained a small bubble of water. The fuel strainer assembly bowl exhibited white chalky corrosion and minor debris was present. The fuel strainer standpipe and sump spring tube were covered in white deposits.

The fuel strainer screen exterior appeared mostly clean; however, it was obscured by white, chalky deposits on the inside of the screen. The material was removed for follow-up lab analysis.

The carburetor fuel inlet screen was removed. The threads in the carburetor body exhibited white, chalky corrosion.

Review of the logbooks revealed that the airplane was flown 16 hours between March 1, 2016, and May 9, 2020, and 19 hours before the accident flight on February 17, 2021. The last annual inspection was completed on May 9, 2020, at tachometer time of 1240.8 hours and aircraft total hours of 6,366.14. Tachometer time on the date of the accident was 1259.51 hours, and total aircraft hours were 6,384.84. The Hobbs meter appeared to have been inoperative since 2017 based on logbook entries which showed the Hobbs meter unchanged.

3.0 HISTORY OF FLIGHT

On February 17, 2021, about 945 eastern standard time, a Cessna 150G, N8428J, was substantially damaged when it was involved in an accident near Maryland Airport (2W5), Indian

Head, Maryland. The flight instructor and pilot-rated student were uninjured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

According to the pilot-rated student, he kept his airplane tied down on the ramp at the Potomac Airfield (VKX), Friendly, Maryland. On the day of the accident, he was flying with his flight instructor to prepare for his initial flight instructor checkride. He added 10 gallons of fuel to the fuel tanks, conducted a preflight inspection, and rocked the wings to free any water that might have been trapped in the fuel tank before draining the fuel tank sumps. He noted no water from the wing sump fuel samples; however, there was water in the fuel drained from the fuel strainer drain. He also noted that the right wing sump did not "flow as freely" as the left wing sump.

About 90 minutes into the lesson while performing a left chandelle maneuver, the engine "hiccuped" momentarily. The instructor and pilot-rated student climbed to 4,000 ft msl and proceeded about 10 miles to 2W5 for a precautionary landing. The pilot-rated student reported that upon arrival over 2W5, he descended in a circle over the airport. Upon arriving abeam the runway numbers on a right downwind leg to runway 20, the airplane was still several hundred feet above pattern altitude. He stated that the instructor took control of the airplane and initiated a side slip to lose altitude, keeping the throttle set to 1,400 rpm to ensure that the engine did not lose power. The instructor stated that flaps were not extended during the side slip because the airplane's airspeed was "above the white arc." When the airplane reached the midpoint of the 3,740-ft runway at an indicated airspeed of 100 knots, the instructor executed a go-around maneuver. During the maneuver, after the airplane climbed about 300-400 feet, the engine stopped producing power and the propeller windmilled momentarily before stopping. With inadequate time to perform remedial actions, the instructor executed a forced landing into the trees.

4.0 DETAILS OF THE EXAMINATION

4.1 Airframe Examination

The airplane wings and tail were removed for recovery and transport. The tail cone was cut about 18 inches forward of the dorsal fin. All portions of the airplane were accounted for during the examination. The fuselage was intact and did not sustain any significant impact damage. The lower engine cowling had a small dent, and the right side of the tail was dented. The cabin capacity was not reduced.

The aircraft was observed separated into multiple sections which consisted of the left wing, right wing inboard section with flap attached, right wing outboard section with aileron attached, and the tail. The aircraft pieces were placed in their corresponding positions to resemble a properly oriented aircraft.

The left wing was cut from the aircraft at the wing root and remained principally intact. The leading edge of the left wing sustained significant tree impact damage near the flap/aileron intersection and the leading edge skin was separated outboard of the landing light. The left wing leading edge skin had been replaced and was not painted. The outboard left wing exhibited tapering compression damage near the wingtip. The majority of the left aileron remained attached to the left wing. An approximately 15" section of the outboard left aileron was

separated. The left aileron and flap cables remained attached to their respective bellcranks; they had been cut by recovery personnel at the wing root. The left wing tip was separated.

The right wing was also cut from the aircraft at the wing root by recovery personnel. The outboard right wing sustained significant tree impact damage and was impact separated from the right wing at the aileron flap intersection. The majority of the right aileron remained attached to the crumpled section of the outboard right wing. An approximately 4' long section of the right aileron was torn away from the crumpled right wing. The right aileron control cables remained attached to the right aileron bellcrank. The aileron control cables were cut at mid span by recovery personnel. The flap cables remained attached to the bellcrank. The flap cables were cut by recovery personnel at the wing root. The flap actuator was extended approximately 0.15" which equates to 0 degrees of flaps. The right wing tip was separated from the wing.

The empennage was cut by recovery personnel approximately 18" forward of the dorsal. The left horizontal stabilizer and elevator remained attached to the tail. The leading edge sustained impact damage consistent with tree impact. The vertical stabilizer sustained leading edge impact damage. The rudder remained attached. The right horizontal stabilizer and elevator sustained tree impact damage and were separated from the tail. The leading edge sustained damage consistent with tree impact, and the elevator remained attached.

The right wing was impact crushed beyond the aileron flap intersection. The left wing sustained impact damage to the entire length of the leading edge with the outer third of the leading edge crushed aft and upward. The wing flaps were in the retracted position. The cabin doors were operational.

Control cable continuity was established for the elevator, rudder, and elevator trim from all flight control surfaces to the cockpit controls through disconnections at cuts made to facilitate recovery. The flap actuator was extended approximately 0.15 inches which equates to 0 degrees of flaps. The elevator trim actuator was extended 1.7 inches which equates to approximately 5° tab up.

Fuel System

Both left- and right-wing fuel tanks remained intact and were devoid of fuel (recovery personnel drained about 10 gallons of fuel at the accident site). White sediment was recovered from the fuel samples taken from the left and right fuel tanks at the accident site. Additionally, water was recovered from the fuel sample taken from the left wing fuel tank at the accident site. The fuel selector was positioned to the "ON" position.

The left fuel cap remained in place. It was opened and the chain was found connected. The vented cap appeared to have a new rubber gasket. The fuel filler neck appeared to be rusted and exhibited a significant amount of corrosion around the exterior. The left fuel tank was examined using an endoscope. Minor white, chalky corrosion was observed inside the fuel tank. The left fuel quantity transmitter was removed from the fuel tank. It was wired to the aircraft and tested using the ship's battery. It functioned normally for FULL but displayed approximately ¼ tank in the EMPTY position. The left fuel finger screen was removed, it appeared normal with no debris.

The left fuel tank sump was examined with the endoscope; no debris was observed. The left tank fuel sump was removed. It exhibited rust and corrosion around the pick-up holes which was indicative of water exposure. The left sump was depressed with a screwdriver. The spring compressed smoothly, and the pick-up holes were fully exposed which would have allowed fuel to drain easily into a sump cup.

The inboard aft corner of the right fuel tank sustained impact damage and was bent upward. The right fuel cap remained in place. It was opened and the chain was found to be disconnected from the clip. The vented cap appeared to have a new rubber gasket. The fuel filler neck appeared to be rusted and exhibited a significant amount of corrosion around the exterior. The right fuel tank was examined using an endoscope. No significant debris was noted inside. The right fuel quantity transmitter was removed from the fuel tank. It was wired to the aircraft and tested using the ship's battery. It functioned normally for EMPTY but displayed approximately $\frac{3}{4}$ tank in the FULL position. The finger screen and sump were removed; they appeared normal, and no debris was observed. The fuel sump exhibited rust and corrosion around the pick-up holes which was indicative of water exposure. The right sump was depressed with a screwdriver. The spring compressed about halfway. About half the capacity of the right sump fuel pick-up holes were exposed. This could have potentially caused the fuel to drain more slowly from the right wing sump during the preflight inspection as was reported by the owner.

The fuel sump located on the belly was removed. The port was corroded, and the sump plug was covered in a mixture of corrosion, debris, and rust-colored deposits.

Approximately 2 ounces of fuel were drained from the fuel strainer assembly. The fuel sample contained a small bubble of water. The fuel strainer assembly bowl was removed. The bowl exhibited white chalky corrosion and minor debris was present. The fuel strainer standpipe and sump spring tube were covered in white deposits.

The fuel strainer screen exterior appeared mostly clean; however, it was obscured by white, chalky deposits on the inside of the screen. The material was removed for follow-up lab analysis.

The carburetor fuel inlet screen was removed. The threads in the carburetor body exhibited white, chalky corrosion. The screen appeared relatively clean. The end of the screen material was found to be folded over with a brazed closure.

Cockpit

The aircraft was equipped with three-point, dual shoulder harnesses manufactured by Aero Fabricators. The data label on the lap belts indicated they were manufactured on 11-11-09. Per the NTSB 6120.1 accident forms that were completed by the occupants, they were wearing the lap and shoulder harnesses. The restraints remained attached to the aircraft structure and did not exhibit any torn stitches or stretching.

The instrument panel was examined and documented; there were no significant findings.

Suction Gage: 0

Magnetic Compass: 180°

Clock: 8:04
Airspeed: 0
Attitude (pitch): 6° up, level
Turn Coordinator: Level, ½ ball right
Altimeter: 380 ft, 30.39 inHg
Heading indicator: 252°
Vertical speed indicator: 0
Master battery: OFF
Master alternator: OFF
Ignition: BOTH
Transponder: ALT, code 4546

Airframe Exam Photos



Figure 1: Wreckage viewed from right



Figure 2: Wreckage viewed from left



Figure 3: Empennage viewed from right



Figure 4: Empennage viewed from left



Figure 5: Propeller



Figure 6: Left wing fuel sample with water contamination



Figure 7: Left- and right-wing fuel samples from accident site showed contamination



Figure 8: Right fuel filler neck exhibited corrosion



Figure 9: Right fuel sump exhibiting corrosion



Figure 10: Right fuel sump with screwdriver inserted

4.2 Engine Examination

The engine was equipped with a 2-bladed fixed pitched propeller, which remained attached. Neither blade exhibited s-bending or chordwise scratching. The spinner exhibited impact damage.

The engine did not exhibit any external anomalies. Fuel drained from the fuel strainer assembly was light blue in color and tested negative for water contamination with water paste. Fuel tested from the left fuel tank revealed about 1 ½ cups of water in the 1 ¾ cup sample upon testing. Fuel tested from the right fuel tank revealed no water upon testing, and about 1 teaspoon of white sediment in the bottom of the jar. Both fuel samples recovered from the accident site had lost their blue color; however, both samples exhibited an odor consistent with 100LL fuel. Two 5-gallon containers of fuel were recovered from the accident site and were light blue in color and exhibited an odor consistent with 100LL fuel.

The NTSB hired a mechanic to examine the engine and perform an operational test run. Prior to operating the engine, the top spark plugs were removed, and a compression check was performed. The cylinder compressions were 1 - 65, 2 - 80, 3 - 64, 4 - 70. A portable fuel tank was plumbed directly to the carburetor and the engine was operated normally for several minutes. The magneto and carburetor heat checks produced normal RPM drops.

4.3 Engine Exam Photos

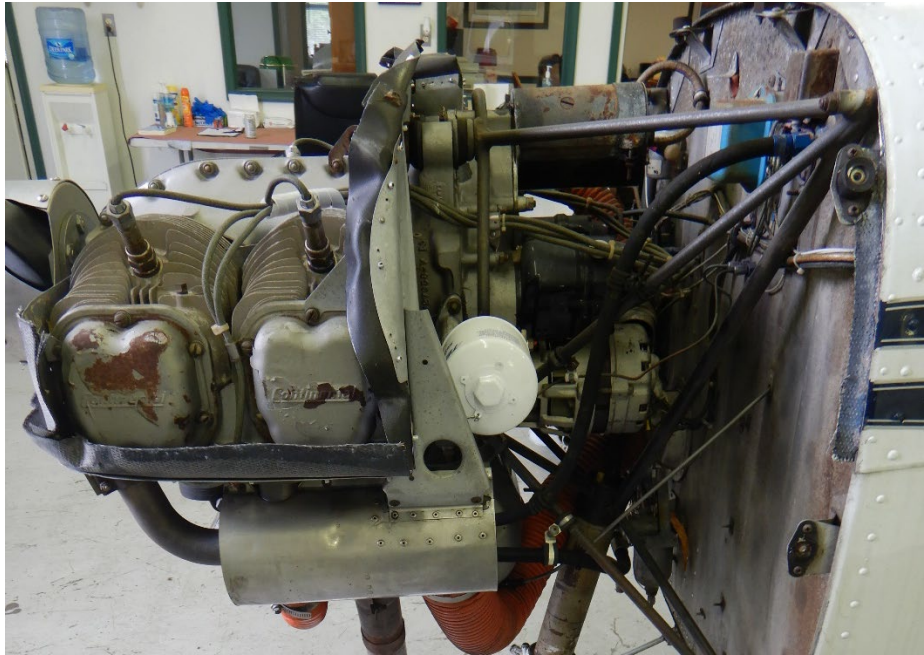


Figure 11: Engine viewed from left with cowling removed



Figure 12: Engine viewed from right with cowling removed



Figure 13: Engine start and run-up