

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN23LA297

AIRPLANE EXAMINATION SUMMARY

February 28, 2024

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A. ACCIDENT

Location: Boelus, Nebraska
Date: July 11, 2023
Time: 2103 central daylight time
Aircraft: Cirrus SR22, N151SR

B. EXAMINATION SUMMARY

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C. ACCIDENT SUMMARY

On July 11, 2023, about 2103 central daylight time, a Cirrus SR22 airplane, N151SR, was substantially damaged when it was involved in an accident near Boelus, Nebraska. The pilot was seriously injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

Post-recovery airframe and engine examinations were conducted on February 27th and 28th by the NTSB with the assistance of the Cirrus Aircraft and Continental Aerospace Technologies at Whisler Aircraft (Seward, Nebraska). The NTSB did not travel to the accident site.

D. EXAMINATION SUMMARY

1.0 Accident Site

Based on statements and photographs provided by recovery personnel, the airplane came to rest upright in a corn field. Those accident site photographs depicted the fuel selector on the left tank, the throttle and mixture controls near the forward positions, the flap selector in the up (retracted) position, both ignition switches in the off position, and all bolster panel switches in the off position.

2.0 Airframe Examination¹

Cirrus SR22 (s/n 2151)

The engine assembly was dislocated, and the left and right upper supports of the engine mount were separated near the firewall. The engine remained secured to the mount attachment points. The lower fuselage was compromised immediately forward of the wing assembly. The wing assembly remained attached to the fuselage but was dislocated from its normal position relative to the fuselage. The aft fuselage was separated immediately aft of the airframe parachute installation and was retained by the elevator and rudder control cables. The empennage was intact.

The left and right main fuel tanks were supplied with pressurized air. Pronounced air flow was obtained at the gascolator fuel line from each fuel tank. Air flow was interrupted when the cockpit fuel selector was turned off or switched to the opposite tank.

At the time of the examination, the Hobbs meter indicated 2002.6 hours, and the Flight meter indicated 1722.3 hours.²

3.0 Engine Examination

Continental IO-550-N (s/n 689924)

The engine remained attached to the engine mount. The mount was damaged, and the engine assembly was dislocated forward consistent with impact forces. The throttle, mixture, and propeller control cables remained attached to the throttle and control assembly and the propeller governor, respectively.

The induction ducting was secure and appeared undamaged. The air filter assembly was intact. The alternate air deflector door was unremarkable and appeared operational. The throttle and control assembly was secure and unobstructed. The butterfly valve was intact and free to rotate.

The exhaust ducting was deformed and crushed upward consistent with impact. The mufflers were displaced and dented but appeared otherwise intact. The flame cones were secure and intact. Both mufflers exhibited normal exhaust signatures.

The engine assembly appeared intact and undamaged. Each cylinder remained attached to the crankcase. Internal engine and accessory section continuity were confirmed via crankshaft rotation. Compression and suction

¹ Directions related to accident site placement and component damage/deformation are with respect to an intact airframe unless otherwise noted.

² The Hobbs meter is designed to be active when the avionics power is active. The Flight meter is active when the airspeed is 30 knots or greater.

were obtained at all cylinders. Borescope examination of each cylinder was unremarkable.

The fuel injection lines were secured to fuel flow divider and to each cylinder. The flow divider appeared undamaged. Disassembly of the unit was unremarkable. Each fuel injector nozzle was clear and unobstructed.

The engine driven fuel pump was secure and appeared undamaged. The drive coupling was intact. The input drive was free to rotate under hand pressure. The unit pumped fuel when tested with an electric drill.

The oil filter was secure, and the housing was undamaged. The housing was opened. Residual oil within housing was free of debris or sediment. The filter element was intact and clean.

The spark plugs were secure. Each spark plug was intact and exhibited normal combustion signatures. The spark plug electrode gaps were between 0.015" and 0.022".³ Several plug housings exhibited minor corrosion.⁴ The ignition harnesses remained attached at each spark plug.

The airplane was equipped with dual electronic ignition systems. The airplane ignition systems were designated as #1 (left side) and #2 (right side) for the purposes of the exam. The #1 ignition coil was dislocated from the firewall. Each harness lead remained attached to the coil. The housing appeared intact. The #2 ignition coil remained attached to the firewall. The housing was damaged, and three harness posts were separated from the housing. A fourth lead was separated; however, the coil housing post appeared intact. The power input cables remained attached to each ignition coil housing.

The electronic ignition timing modules remained secured to the engine magneto pads and each appeared undamaged. The internal gears were intact, appeared to be undamaged, and rotated corresponding to rotation of the engine crankshaft.

The ignition system was protected by in-line fuses installed behind the cockpit circuit breaker panel. They were not accessible without opening the breaker panel. One ignition unit was attached to the main electrical buss at the cockpit circuit breaker panel. The second ignition unit was attached to the essential electrical buss at the cockpit circuit breaker panel. The ignition coils were each protected by 10 amp in-line fuses. The ignition controller modules were each protected by 2 amp in-line fuses. Both 10-amp fuses were intact. The 2-amp

³ Information supplied by the ignition system manufacturer noted a spark plug electrode gap of 0.36".

⁴ The airplane was in storage from the time of the accident until the examination.

fuse corresponding to the #1 ignition controller unit was intact. The 2-amp fuse corresponding to the #2 ignition controller unit was open and not operational; no filament was observed. Electrical continuity of the ignition power wiring from the electrical buss to the ignition coil units and to the ignition timing units was confirmed.

The primary and secondary alternators were intact and secure. They were not removed or examined further.

4.0 Propeller Examination

MT Propellers MTV-14-D/195-30 (s/n 140642)

The propeller assembly had been removed from the engine prior to the exam.⁵ The hub appeared to be intact. The propeller attachment studs were secure and undamaged. The spinner mounting plates were deformed. They were not disassembled from the hub. Two composite faced-wood core blades were separated at the blade roots. The remaining two blades remained secured to the hub and appeared to be intact.

----- end of summary -----

⁵ Recovery personnel stated that the propeller was attached to the engine propeller flange at the accident site. It was removed to facilitate recovery and storage.