

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN23LA297

**ELECTRONIC IGNITION SYSTEM
EXAMINATION SUMMARY**

May 15, 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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National Transportation Safety Board
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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.

The ignition system components and airplane electrical harness were tested at Electroair in Waterford, Michigan, on May 15, 2024.

D. EXAMINATION SUMMARY

1.0 Ignition System Examination

Magneto Timing Unit

#1 / EA-10000 / s/n 22-224-003¹

The unit appeared intact. Electrical resistance measured at 999Ω. Resistance should be 900Ω to 1,100Ω. The unit was installed on a test bench. The sensor signal observed on the test bench oscilloscope was within requirements. Spark was observed on each test bench spark plug when operating with a test coil unit.

Magneto Timing Unit

#2 / EA-10000 / s/n 14-161-020²

The unit appeared intact. Electrical resistance measured at 663Ω. Resistance should be 600Ω to 800Ω. The unit was installed on a test bench. The sensor signal observed on the test bench oscilloscope was within requirements. Spark was observed on each test bench spark plug when operating with a test coil unit.

#1 MAP / Controller Unit / EA-21000 / s/n 22-192-008

The unit appeared intact and the internal circuit board undamaged. Ignition timing was set at 22°. The unit was installed on a test bench and spark was observed at each test bench spark plug. Unit was set for a Top Flow induction system. When the manifold pressure input, the timing advanced 4° as expected.

#2 MAP Sensor / EA-5000 / s/n 14-067-019

The housing appeared intact and the internal circuit board undamaged. At ambient pressure, the sensor began advancing at 22.5". It should have started advancing at 24" which was about 1" behind the standard curve.

¹ MTU was an initial design configuration requiring 900Ω - 1,100Ω.

² MTU was a secondary design configuration requiring 600Ω - 800Ω.

#2 Controller Unit / EA-7000 / s/n 14-075-007

The housing was damaged; however, the circuit board appeared undamaged. The ignition timing was set at 22.4°. When the manifold pressure input was removed, the timing advanced 15° as expected.

#1 Coil Unit / EA-8000 / s/n 22-227-002

The unit was separated from the mounting plate. The ignition towers³ appeared intact. The electrical connector (cannon plug) was shifted/angled consistent with accident / impact related damage. The unit was placed on a test bench. The towers corresponding to the A and B coils was not functioning. The electrical resistance of the A and B coils was within specification. The tower corresponding to the C coils provided current to the #5 and #6 spark plug leads and sparks were observed at the test bench spark plugs.

#2 Coil Unit / EA-8000 / s/n <unknown>

The unit was damaged and the left ignition towers were broken off consistent with accident related damage. The unit could not be tested.

Electrical Harness / EA-6000 / s/n 14-021 and EA-22000 / s/n 22-217
Switch Panel / 21-300

The electrical harness recovered from the airplane was installed on the test bench and connected to test/exemplar components. Harness continuity was confirmed and spark was observed on each test bench spark plug for both the left and right sides of the harness. Continuity of each cockpit ignition switch was confirmed.

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

³ The ignition towers provided connection for the airplane ignition harness leads.