



Magneto Examination Report

NTSB ACCIDENT NUMBER: **ERA21FA091**

AIRCRAFT REGISTRATION: N8311X

AIRCRAFT TYPE: Cessna 172

ACCIDENT LOCATION: Pleasant Valley, NY

Investigative Team:

NTSB Investigator-in-Charge (IIC): Millicent Hill, Aviation Accident Investigator

Champion Aerospace: Thomas Justice, Engineering Manager

HISTORY OF FLIGHT

On December 27, 2020, about 1500 eastern standard time, a Cessna 172C, N8311X, was substantially damaged when it was involved in an accident near Pleasant Valley, New York. The pilot was not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

AIRCRAFT INFORMATION

The wreckage recovery was delayed about 8 months. During this time the propeller, instruments from panel, and the left yoke were taken from the site and not recovered.

According to maintenance logbooks, on 08/10/20, about 4 months before the accident, the last entry in the engine logbook stated all lower spark plugs were replaced due to “rough mag drop on run up.” The airplane accumulated about 9 hours between the maintenance performed and the accident.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest inverted in swampy terrain amongst trees and sustained substantial damage to the wings and fuselage.

MAGNETO EXAM

Right magneto

- Manufactured in 2006
- The impulse couplings and ignition harness were in good condition.
- There was no cotter pin in the gear assembly. The gears were removed for bench testing.
- The gear retainer nut was not torqued, it was hand-tight, loosened, and removed by hand. The maintenance manual requires specific torquing of the nut.
- P-lead missing washer and nut to hold to connect to ignition switch.
- Bench test: no spark with impulse coupler, a little spark at high speed, no voltage.
- The impulse coupling was tight and in good condition.
- The terminal and housing assembly were in good condition.
- Moisture present, rust present on the lamination.
- Distributer gear had arcing present, there were markings on the distributor points
- Rotor gear and cam in good condition. The points assembly was worn where the cam hits, normal wear on the cam.
- Arcing was present throughout the distributor gear and points.
- Rotor bearing plate screws and cap had rust and corrosion present. Rotor had grease and rust present.
- Bearing leaking grease. Rust and grease present on the laminations in the rotor.
- Capacitor in good condition, there was extensive corrosion present on capacitor nut.
- The maintenance manual 500 hr inspection requires the rotor to be removed.
- Electrode post showed normal wear.
- Distributor point was in good condition.

Left magneto

- Manufactured in 1997
- Impulse couplings, and ignition harness were in good condition. The gears were removed for bench testing.
- A wire attached to the magneto showed several areas of fractured insulation.
- P-lead has washer and nut to connect to ignition switch.
- The gear retainer nut was not torqued, it was hand-tight, loosened, and removed by hand. The maintenance manual requires specific torquing of the nut.
- Bench test: no spark with impulse coupler, a little spark at high speed, no voltage.
- Capacitor nut in good condition.
- Impulse coupling in new condition, pawls in good condition.
- Rotor shaft had dimples consistent with normal wear.
- Rust, debris, and corrosion in the magneto housing and distributor gear housing.
- Finger on distributor gear had normal wear and some debris present.
- The magneto points were in good condition.
- Underneath the bearing plate caps rusted.
- Rotor had extensive rust and dimpling, coil and coil wires in good condition.
- Extensive rust corrosion around the coil laminations and coil housing.

Left and Right coil testing:

- Right coil- extensive corrosion present on laminations, passed the bench test, manufacture was unreadable.
- Left coil tested- extensive corrosion present on laminations, passed the bench test, the original coil was installed and manufactured in August 1997.



Figure 1: View of the left magneto and coil. (Photo courtesy of Champion)



Figure 2: View of the right magneto and coil. (Photo courtesy of Textron)