

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR22LA262

MAGNETO AND IGNITION EXAMINATION

11/7/2022

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A. ACCIDENT INFORMATION

Location: Three Forks, Montana
Date: July 20, 2022
Time: 0820 MDT
Airplane: N6224M Maule M-5-235C

B. MAGNETO AND IGNITION EXAMINATION

Investigator	Eleazar Nepomuceno National Transportation Safety Specialist Federal Way, Washington
Pilot	David Shapiro Airplane Builder Three Forks, Montana
Airport Manager	Nick Bilton Gallatin County Three Forks Airport Three Forks, Montana

C. ACCIDENT SUMMARY

On July 20, 2022, about 0815 mountain daylight time, a Maule M-5-235C, N6224M, sustained substantial damage when it was involved in an accident in Three Forks, Montana. The commercial pilot was not injured. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

According to the pilot who holds a Federal Aviation Administration Airframe & Powerplant Mechanic certificate, the accident flight was the first flight following an engine overhaul and new avionics. He recalled that he had completed several engine ground run iterations and multiple full power, high speed test run iterations. Stemming from the test run engine data obtained by the onboard engine data monitoring system, he adjusted the idle and mixture controls. Eight engine test runs were accomplished, and the engine monitoring data identified normal operational engine parameters.

Confident in the engine performance, the pilot took off and continued with engine break-in procedures. He recalled that several flight maneuvers were accomplished with consistent normal engine parameters confirmed by the flight instruments. He decided to land, established the airplane on the right downwind leg of the airport traffic pattern, and noticed that the engine rpm was winding down

slowly. Troubleshooting the anomaly to no avail, he pitched for best glide, no flaps applied, and made a right 180° turn for runway 03. However, the airplane's sink rate was too high to land on the runway. The airplane touched down about 1,000 ft short of the runway threshold, on an unplowed pasture surface and collided with a barbed wire fence.

D. DETAILS OF THE EXAMINATION

1.0 Magneto System Examination

The installed magneto was a Bendix D6LN-3000, serial no. B000484 (Figure 1). This dual magneto system consists of a dual magneto and a harness assembly. The magneto was installed securely onto the mounting pad of a Lycoming O-540-J1A5D, serial no. L-19410-40A, by magneto clamps, lock washers, and nuts. The magneto cover and ignition harness were securely attached and found unremarkable.



Figure 1. View of installed D3000 magneto

All ignition harness leads were removed from its corresponding spark plug and was found unremarkable. All fine-wire top spark plugs were removed and found

unremarkable. While manually spinning the propeller in the direction of rotation, the crankshaft and camshaft freely rotated, and both impulse couplings were heard engaging.

The magneto housing was removed and both keepers were retrieved. Both keepers were found unremarkable. The end of the leads within the magneto cover were unremarkable. The block and bearing assembly was intact and secured (figure 2). When manually rotated, each of the 12 magneto terminals produced a spark. Both left and right capacitor were secured with a corresponding lock ring and its wire was attached to its connector found on the contact assemblies. Upon further examination, the right magneto capacitor wire was improperly secured and separated from its crimp on the connector with minimal movement of the capacitor wire. The 4-lobed breaker cam was secured and found unremarkable.

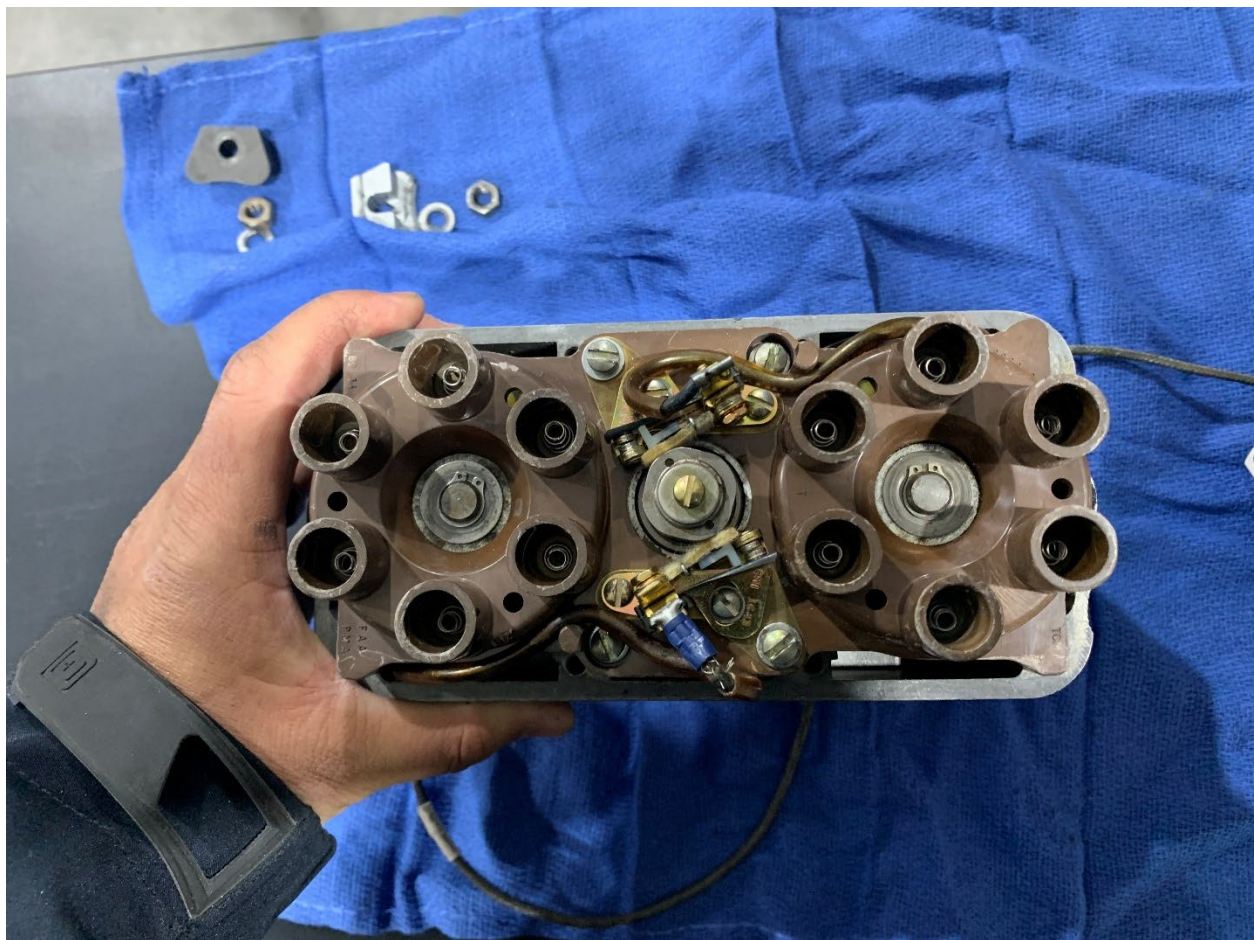


Figure 2. View of Magneto block and bearing assembly

2.0 Ignition System Examination

The P-lead terminal and wire was secured to each side of the magneto. Each wire and terminal at the ignition switch were found secured. Examination of the left P-

lead revealed a ground fault, as tested by a multimeter. Further examination revealed that the P-lead had exposed wires where the jumper line mated (figure 3), which in turn caused a ground faulted the dual magneto.

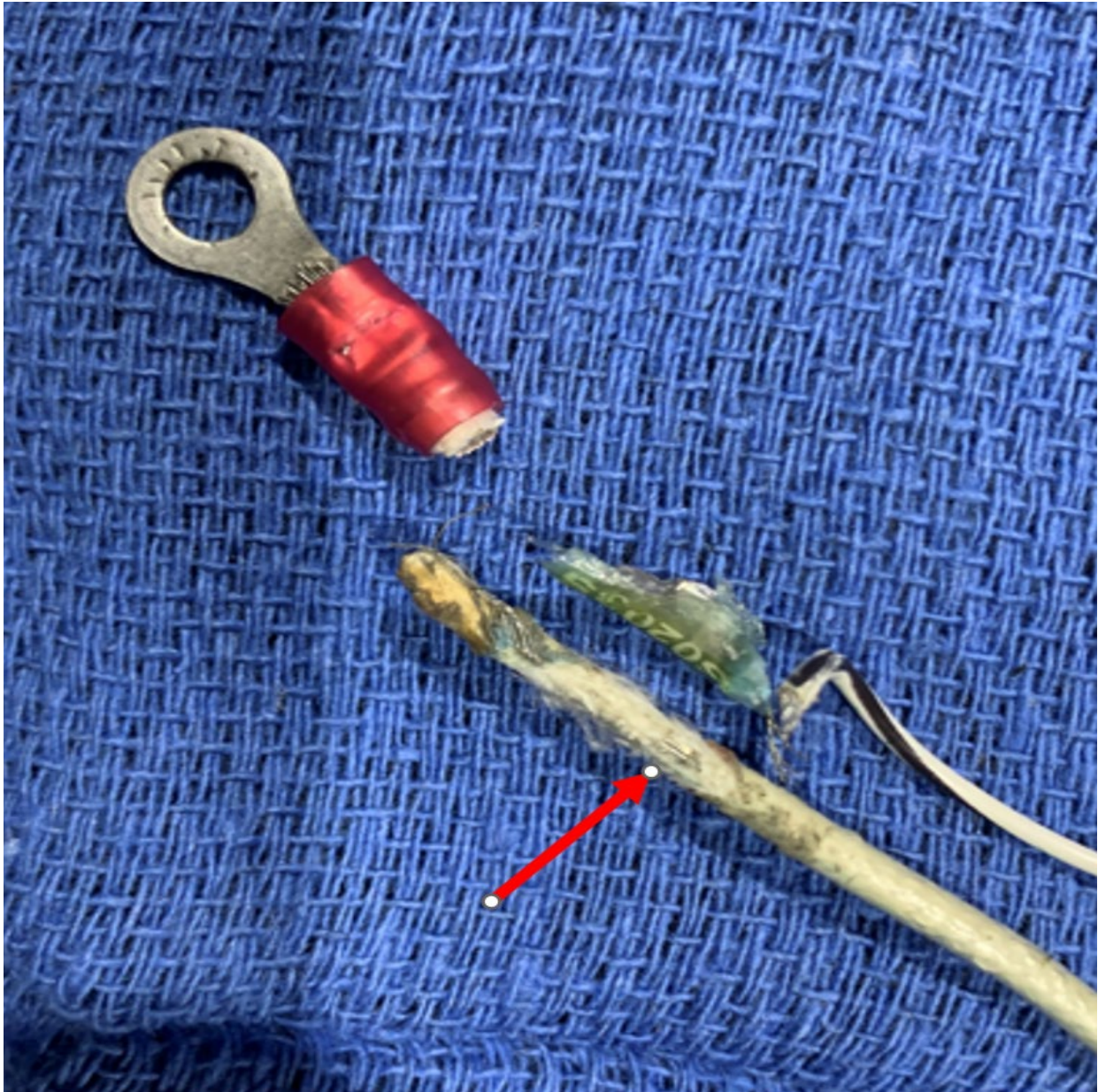


Figure 3. Closeup view of terminal end of P-lead with exposed wire from its mating surface with the jumper line, indicated by a red arrow.

Submitted by:

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