



Subject: Findings from magnetos removed from N1831AZ.

10/08/19

Met Eric Alleyne at Champion Aerospace's Liberty, SC facility. Retrieved (1) 4347 15030621 & 4370 11040207 from Zach Lincolnhol. The mags were installed on a Schweizer 269 helicopter with an HIO-360-G1A which was involved in an accident with serious injuries to the pilot and minor injuries to the passenger on 8/11/19.

The 4370 mag was found to be badly damaged and not suitable for whole mag testing. Performed a visual inspection of the mag with the following findings: The frame had extensive damage with large pieces broken out of both sides to the extent that the frame was nearly broken in half, the flange was broken and missing from both clamp points. All 4 housing to frame bolts had sheared on impact. The distributor block assembly was badly broken with several parts missing. Point insulator was broken in pieces. Rotor shaft had one side broken at the cam slot and the broken end was missing. Coil tab was severely bent where it projects from its molded body. Severe corrosion was found on the frame, laminate stack, rotor and points. Several parts were missing including the distributor gear, rotor gear, bearing bar and the broken pieces of the frame. The torque seal was missing indicating that someone had opened this mag at some point since new. The harness cap remained installed on the mag with the ignition leads cut at varied lengths.

Removed the harness cap from this mag and found minor corrosion and indications of miss firing on the distributor block and number 2 insulator. Point faces were in good condition with no signs of burning. Coil was in good condition with the exception of the bent tab and had .8 Ohms on the primary windings and 14.7K Ohms on the secondary windings which are both within allowable limits. Condenser was undamaged and functioned satisfactorily. No further testing was possible on this mag.

The 4347 15030621 passed visual inspection with minor crash damage to the housing near the retard breaker connection and the harness cap assembly. All ignition wires were cut off about one inch outside the cap, the cap was removed from the mag. The rotor turned freely and the mag was run on the ATP tester, the mag failed all sections of the testing and only intermittently produced a weak spark at all setting.

The mag was opened and components inspected with the following findings. Coil was in good condition and had .9 Ohms on the primary windings and 15.0K Ohms on the secondary windings which are both within allowable limits. Condenser was undamaged and functioned satisfactorily. Points were worn but in good condition, maximum point opening was found to be 2.5 thou (allowable limit is 8-10 thou). Attempted to reset E-gap with the old cam installed but it was too worn to allow proper function. The distributor block was serviceable and showed minor wear, SB1-15A had not been completed on this mag.

We removed the original M3611 cam and installed and lubricated a new cam and reset E-gap and the mag was again ran on the ATP tester and passed all testing with 100% scores. Following testing, NTSB requested the reinstallation of the old cam and resetting of the E-gap back to the condition it was in at the time of the accident.

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Based on the above findings we were unable to determine the functionality of the 4370 mag at the time of the accident, this mag was installed as used-serviceable unit on 7/25/18 Hobbs 2386.8 with no previous history or TIS information provided and had accumulated 195.6 hours on this engine. Based on the corrosion and indications of misfiring in the distributor block assembly it could not have performed in optimal condition.

Based on the above findings the 4347 mag should not have been able to provide adequate spark for normal operation at any RPM. This mag was installed new with the overhauled engine and had accumulated 578.8 hours TIS on this engine. There was no indication or logbook entry on a 500 hour inspection having been done on this mag.

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