



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

March 31, 2015

IGNITION SYSTEM EXAMINATION

CEN15LA104

This document contains seven embedded photos.

A. ACCIDENT

Location: Woodlands, Texas
Date: January 16, 2015
Aircraft: BAKER BOBBY J SAFARI, Registration: N416JB
NTSB IIC: Courtney Liedler

B. EXAMINATION PARTICIPANTS:

Elliott Simpson	Klaus Xavier
Aviation Accident Investigator	Light Speed Engineering, LLC
National Transportation Safety Board	Santa Paula, CA
Western Pacific Regional Office	
505 South 336th Street. Suite 540	
Federal Way, WA 98003	

C. SUMMARY

Examination of the ignition components (Photo 1) was conducted on March 31, 2015 at the facilities of Light Speed Engineering in Santa Paula, California. No evidence of preimpact mechanical malfunction was noted during the examination.

D. DETAILS OF THE INVESTIGATION

1.0 Ignition System Examination

Model: LSE Plasma III CD Ignition Module (4 cylinder type)
Serial Number: 43546
Version B-9

The unit's case exhibited deformation to the mounting tabs, and compression damage to the top case, such that an imprint of internal components was observed. Both coil output BNC connector casings were damaged, with only the internal pins remaining. The case was removed and internal components examined. No damage was noted (Photo 2).

Both damaged BNC connectors were replaced with new items (Photo 3), and the unit was connected to a test bench and operated at engine speeds of between 190 and 3,000 rpm. The current draw at idle was 0.2 amps, and 1.5 amps at 3,000 rpm. According to the Light speed

representative, these were nominal current draw values. Sparks were observed on the test bench spark plugs throughout operation at all tested engine speeds (Photo 4). The manifold pressure input was adjusted, and the ignition timing advanced appropriately.

Hall Effect Module
Serial Number: 1440

The Hall Effect module sustained crush damage to its upper lid (Photo 5). Removal of the lid revealed that three of the sensors had separated from the sensor board (Photo 6). The rotor exhibited rotational scoring. The damage was determined to be consistent with crush damage exhibited on the case, forcing contact between the circuit board rotor while the rotor was rotating (Photo 7). The rotors magnet was intact.

Ignition Coils (two in total)
Part Number: 356120

Two coils were examined, and both had sustained damage resulting in the separation of one of their spark plug towers (Photo 1). Each unit was connected to an exemplar ignition system, and both produced spark between their output terminals as the exemplar Hall Effect module was triggered.

1.1 Ignition System Photos



Photo 1 - Examined Components

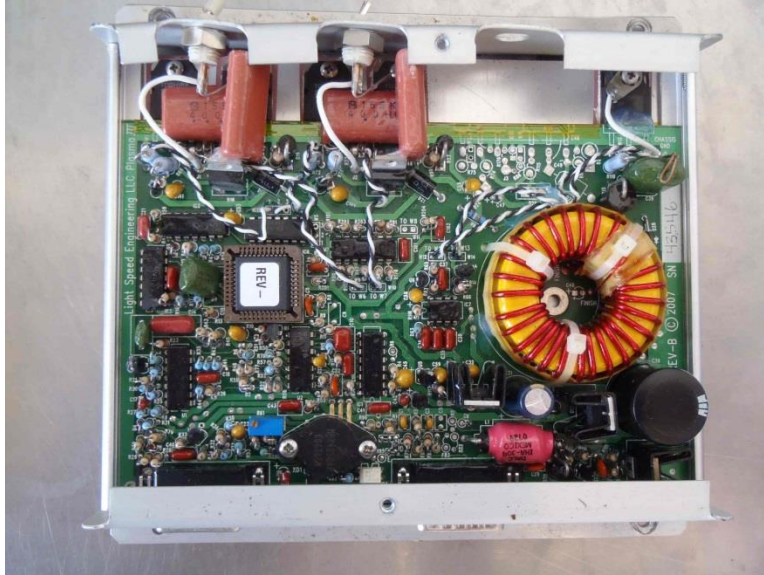


Photo 2 - Plasma III Unit With Lid Removed

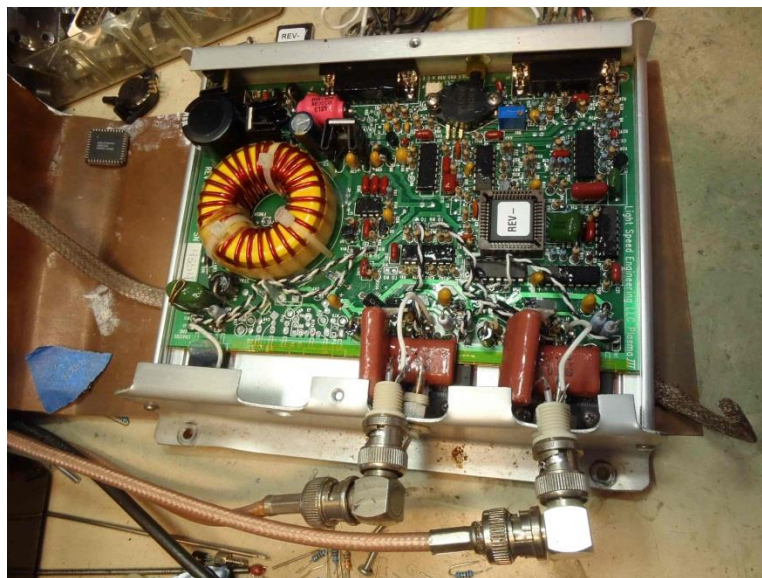


Photo 3 - Plasma III Unit on Test Bench with Replacement BNC Sockets

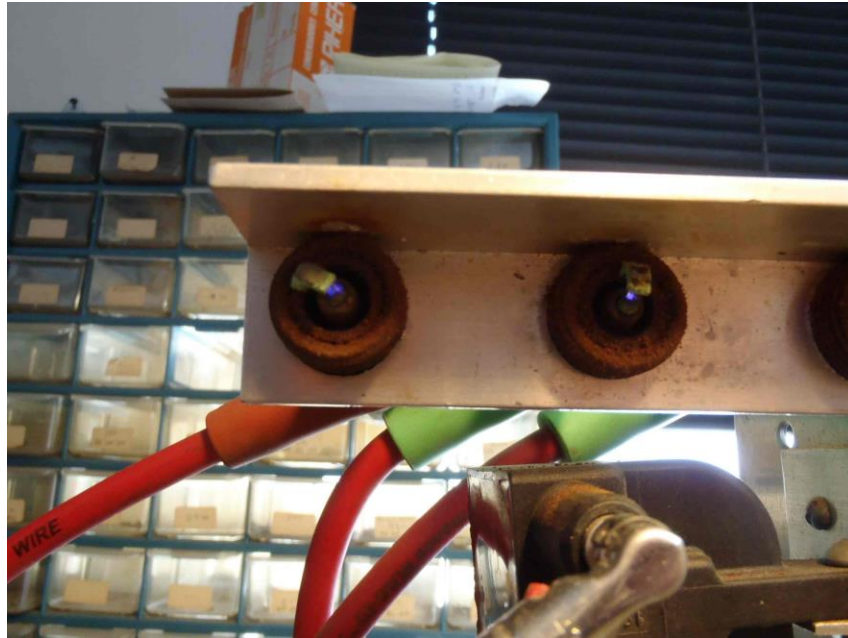


Photo 4 - Test Bench Spark Plugs



Photo 5 - Hall Effect Module



Photo 6 - Hall Effect Module Circuit Board



Photo 7 - Hall Effect Module Rotor

Submitted by: Elliott Simpson