

**NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF AVIATION SAFETY
WASHINGTON, D.C. 20594**

October 1, 2019

Examination Notes – Solenoid Tests

ANC19LA036

A. ACCIDENT

Operator: Murray Marien
Aircraft: Stoddard Hamilton Glasair II
Location: Dunlap, TN
Date: July 17, 2019
Time: 1540 EST

B. SYSTEMS GROUP

Member Steve Magladry
 National Transportation Safety Board
 Washington, DC

C. SUMMARY

While enroute to Oshkosh, the airplane experienced a "full electrical failure" and then the engine stopped producing power. The pilot landed off-airport and was seriously injured. Some electrical system components were removed by the FAA and shipped to NTSB HQ. Two of the components were solenoids, which were tested in the NTSB lab. The following summarizes the findings.

D. DETAILS OF THE INVESTIGATION

One of the solenoids was labelled as a White-Rogers, Part number 70 111226-5. The data sheet was found at the Emerson website and is provided as an attachment. From the data sheet, this part number is a 12 VDC continuous use Normally Open contactor with a 16 ohm coil. The coil is common to the terminal labelled BAT.

For reference, the terminals are identified as shown in Figure 1. The resistance between the terminals was measured:

A-B Open
A-C Open
B-C 16 Ohms

A 12 VDC, 3A power supply was applied to Terminal B, ground was applied to Terminal C and the solenoid made an audible sound of actuation. 11.56 V was measured at Terminal A.

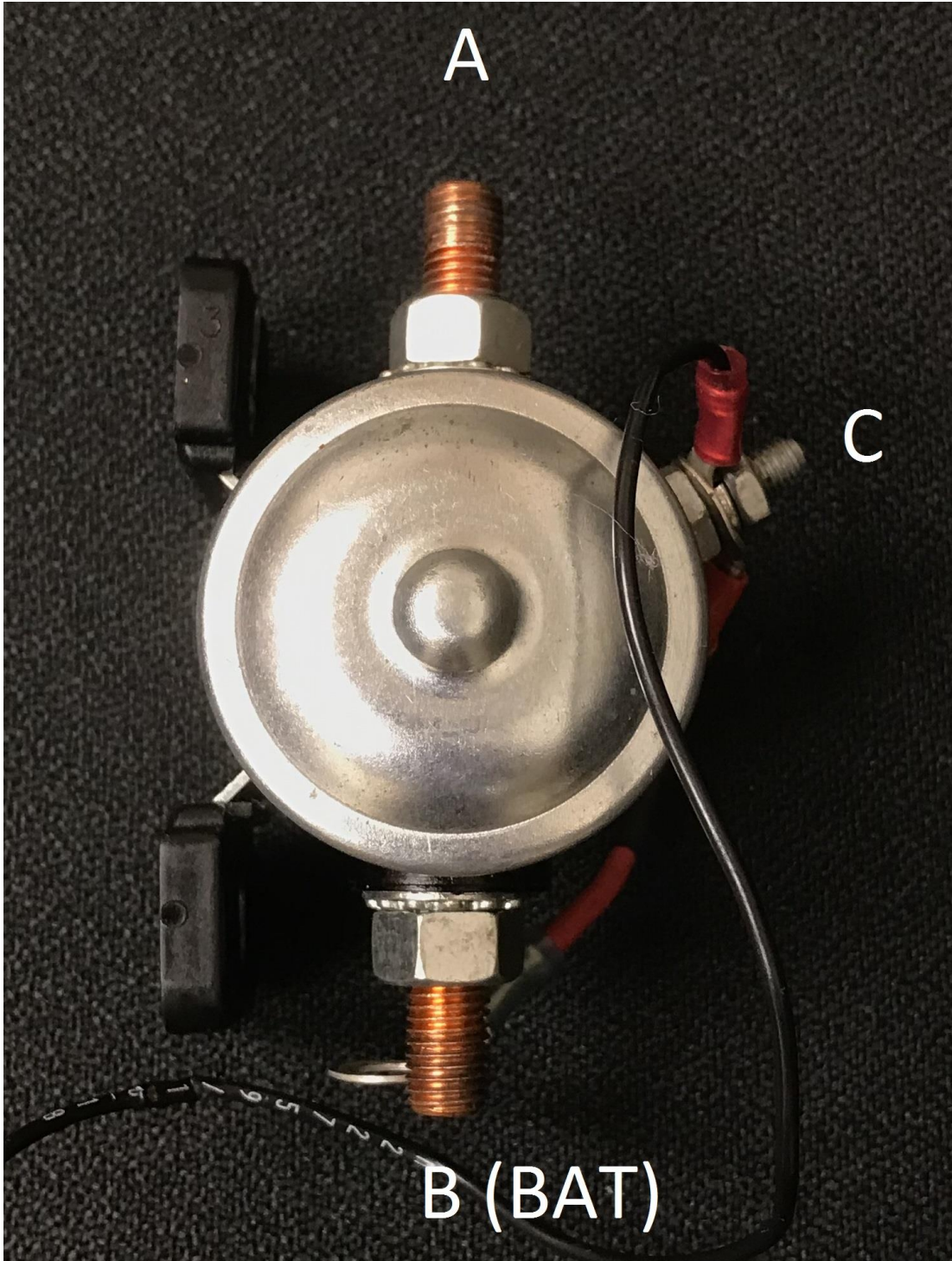


Figure 1

The other solenoid was only marked with a label RAN1006. No data sheet could be found. It appears to be a Starter Solenoid because one of the terminals was labelled S and another I. For reference, the terminals are identified as shown in Figure 2 (G is used for the metal housing or ground).

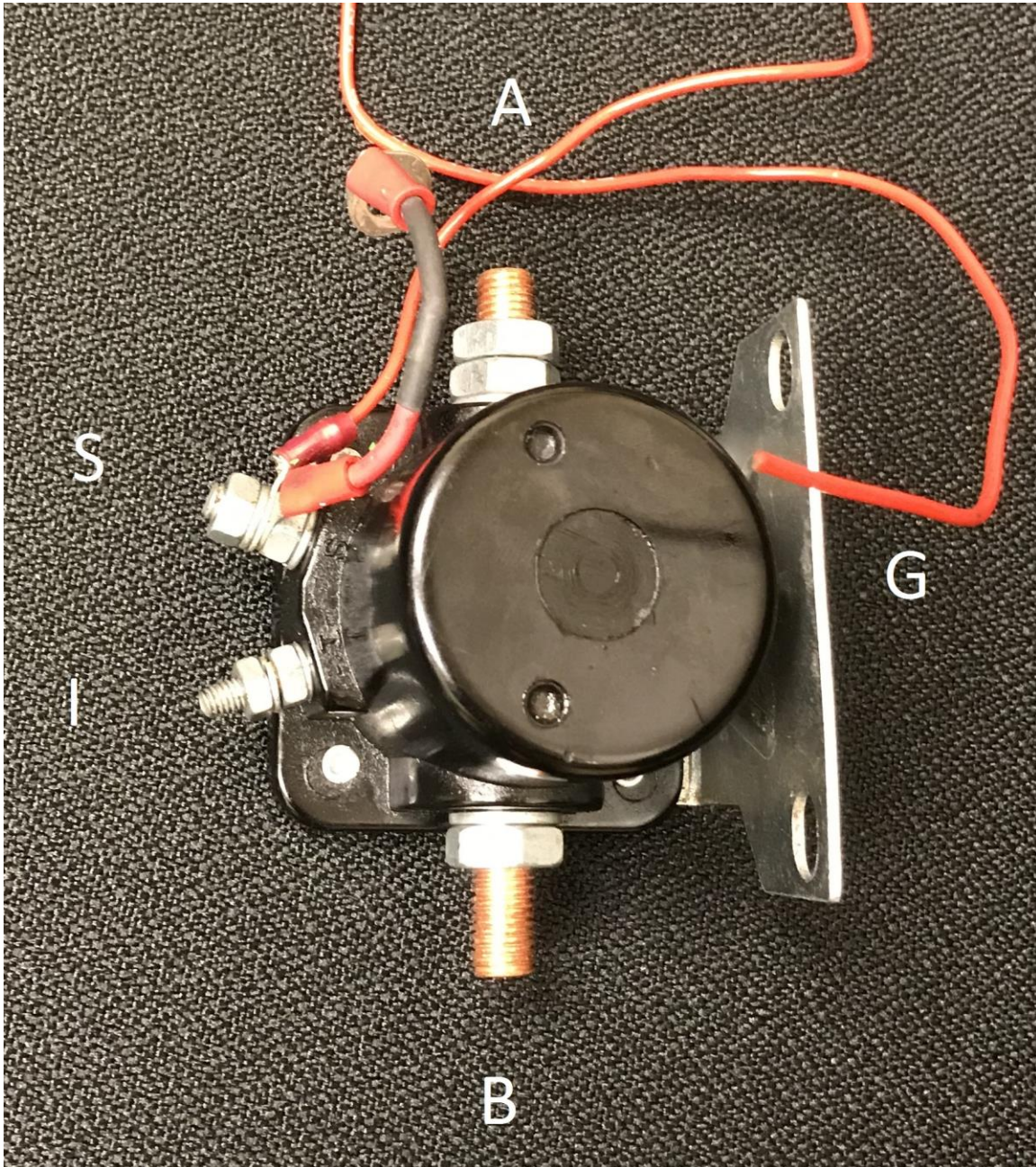


Figure 2

The resistance between the terminals was measured:

A-G Open
A-B Open
A-I Open
A-S Open
G-B Open
G-I Open
G-S 3.5 Ohms
B-I Open
B-S Open
I-S Open

Applied 12 VDC, 3A power supply to Terminal A and ground to G. Placed a jumper wire between Terminal A and Terminal S. The solenoid made an audible sound of actuation. The voltage at terminal B to G was 11.1 V, and the voltage at I to G was also 11.1 V.