

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Materials Laboratory Division
Washington, D.C. 20594



September 18, 2018

MATERIALS LABORATORY FACTUAL REPORT

Report No. 18-056

A. ACCIDENT INFORMATION

Place : Chesapeake, Virginia
Date : May 22, 2018
Vehicle : PA28-140, Piper Cherokee
NTSB No. : ERA18FA150
Investigator : Adam Gerhardt, AS-ERA

B. COMPONENTS EXAMINED

Gyro rotor and housing for the vacuum powered attitude indicator and gyro for the electric powered attitude indicator.

C. DETAILS OF THE EXAMINATION

Figure 1 shows a photograph of the as-received gyro rotor and housing for the vacuum powered attitude indicator and rotor for the electric powered attitude indicator. The surface of these parts was covered with black soot and oxide from exposure to a fire. Bench binocular examination of the outer surface of the rotors and the inner surface of the housing for the rotor revealed no evidence of circumferential score (gouge) marks.

The parts were immersed in a solution of Evapo-Rust, a commercial cleaner. The Evapo-Rust cleaning process exposed the bare surface of the gyro rotors for the vacuum and electric powered attitude indicators but did not remove black oxide from the surface of the housing for the vacuum powered attitude indicator. The housing for the vacuum powered attitude indicator was immersed in a heated chromic solution, a cleaning solution prescribed in ASTM G1, Designation C.1.1, titled "Standard Practice for Preparing, Cleaning and Evaluating Corrosion Test Specimens" for cleaning corrosion products on aluminum alloys. Bench binocular examination of the cleaned outer surface of the rotor and the inner surface of the housing for the vacuum powered attitude indicator revealed no evidence of circumferential gouge marks. The cleaned surface of the rotor for the electric attitude indicator revealed evidence of a circumferential gouge mark in the area between arrows "1" in figure 2. The length of the gouge mark measured approximately 0.3 inches. Another gouge mark was found in the area between arrows "2" in figure 2 that was on a slight diagonal relative to the circumference. The length of this gouge mark measured approximately 0.7 inches. Both gouge marks were found on the same side of the rotor.

Frank Zakar
Senior Metallurgist

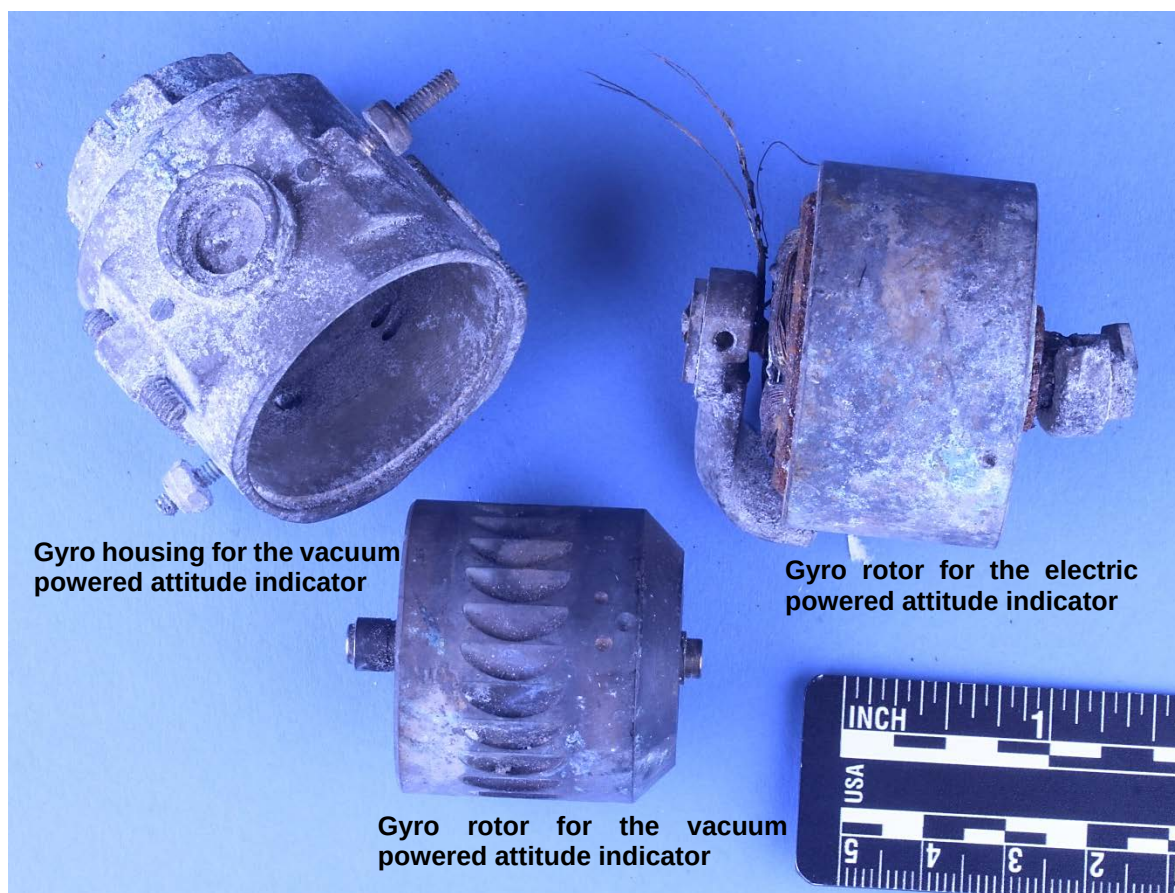


Figure 1. As-received gyro parts for the vacuum and electric powered attitude indicators.

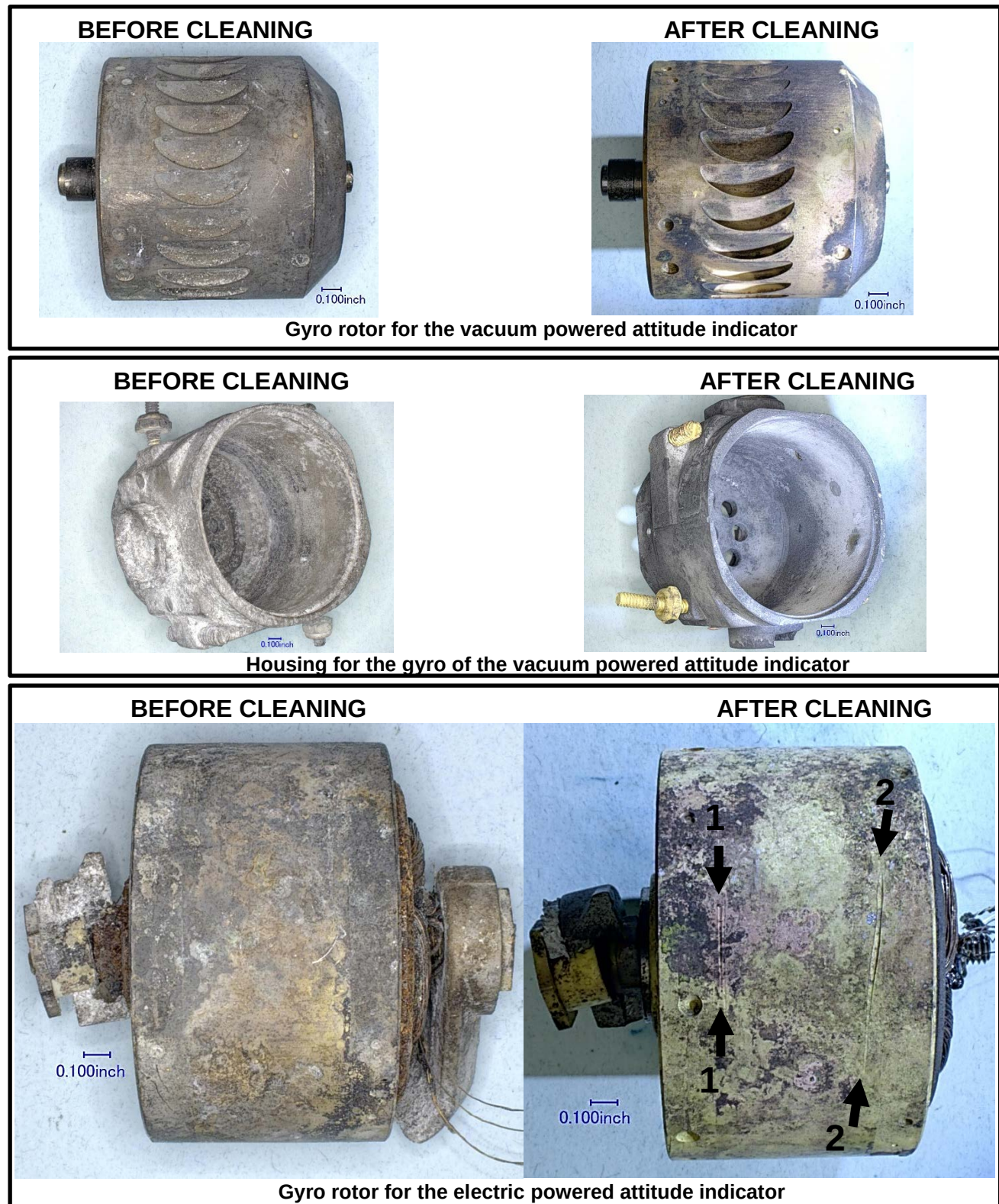


Figure 2. Photograph of the gyros parts before cleaning (left side of page) and after cleaning (right side of page).