

NATIONAL TRANSPORTATION SAFETY BOARD

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



May 31, 2018

MATERIALS LABORATORY FACTUAL REPORT

Report No. 18-045

A. ACCIDENT

Place : Russian Mission, AK
Date : October 16, 2017
Vehicle : Cessna 210
NTSB No. : ANC18FA003
Investigator : Shaun Williams

B. COMPONENTS EXAMINED

AID, Model # CA-22-7, S/N 901599

C. DETAILS OF THE EXAMINATION

Figure 1 shows two views of the as-received attitude indicator. The corrected model number is observed to be RCA22-7. The unit was overhauled on February 22, 1996. The Materials Laboratory examination included disassembly to inspect for operational damage to the unit. Figure 2 shows a front (facial) view prior to disassembly while figure 3 is a top view of the unit after removing the outside cover. Note the corrosion build-up on many of the parts. The gyro was removed from the unit and disassembled. Figure 4 compares the rotor before (top left image) and after cleaning (top right image) ultrasonically for 10 minutes using a soap/water solution. The bottom image is of the boxed area of a line feature found on the surface of the clean rotor. The line feature, when magnified is a series of horizontal scratches part way across the rotor. Figure 5 shows the two halves of the aluminum rotor housing after cleaning. The housing halves were first cleaned ultrasonically using a soap/water solution. Residual corrosion was observed so a chromic acid/hydrochloric acid/water solution was heated to 75°C and the parts were soaked for 2 minutes.

The indicator's glass face was intact with slight scratching damage. There was no significant deformation damage to the outside of the case. After disassembly, the gimbals were found to move freely. Further disassembly to the gyro revealed that although wetness and corrosion were visibly present, the rotor spun freely on the shaft within its housing. No scoring or deep gouge marks were observed in either the rotor or gyro housing surfaces.



Figure 1. Two views of the as-received attitude indicator.

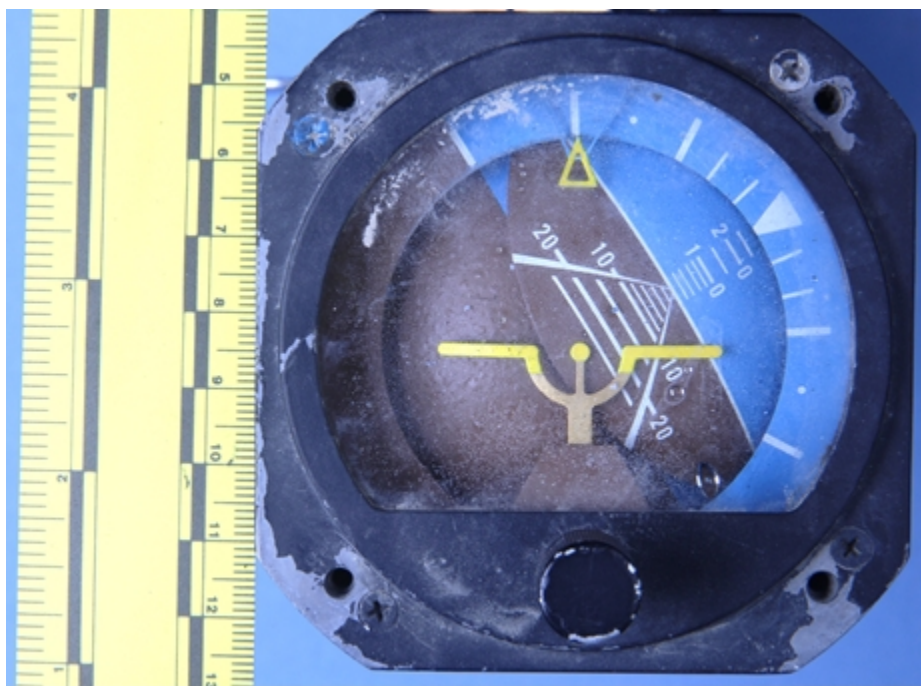


Figure 2. Facial view before disassembly.

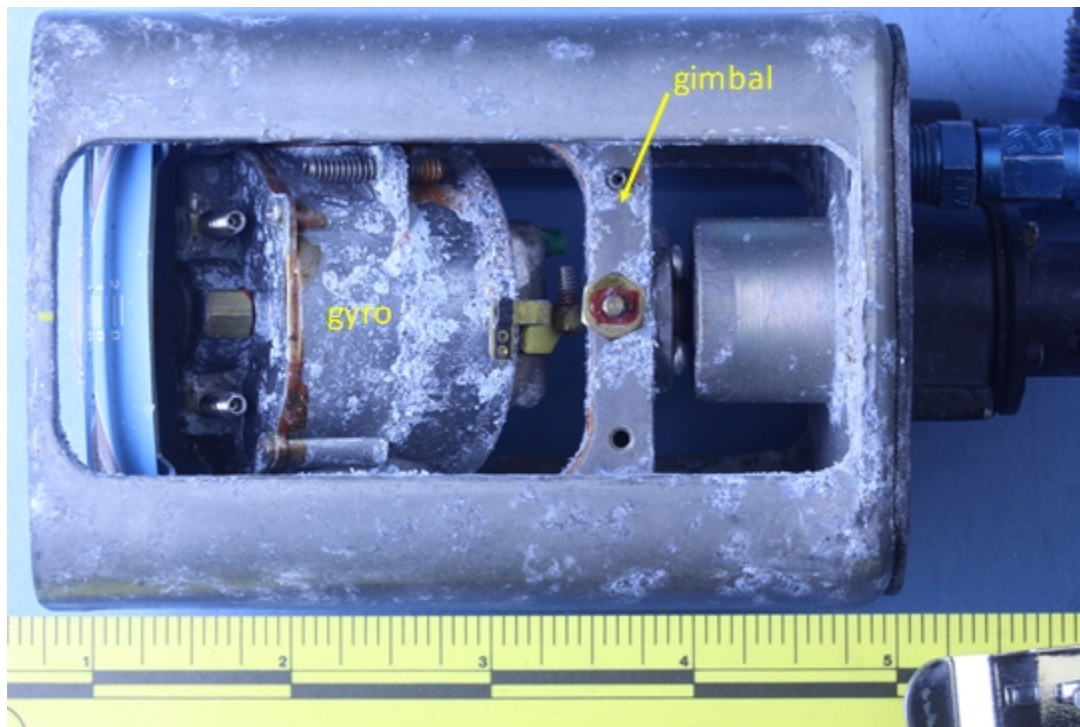


Figure 3. View of gimbal and gyro after removing the cover.

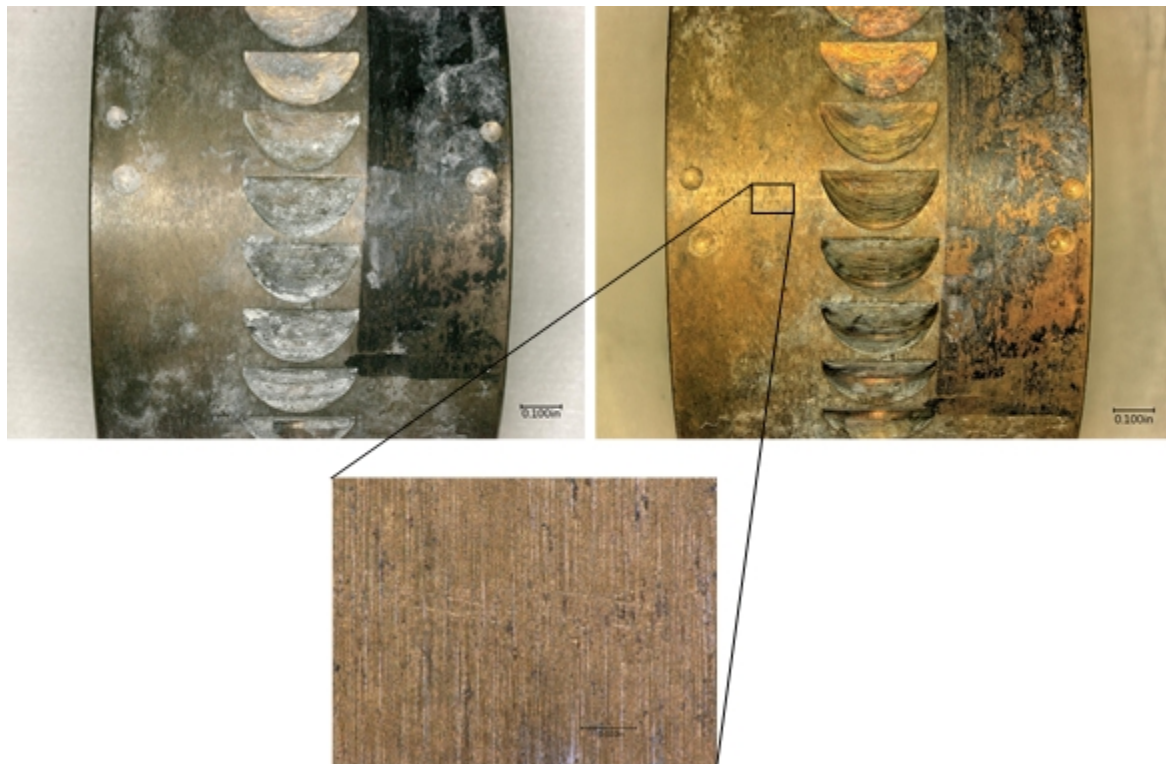


Figure 4. Top left view is of rotor before cleaning. Top right view is of rotor after cleaning. Bottom image is a closer view of scratches making up the horizontal line.

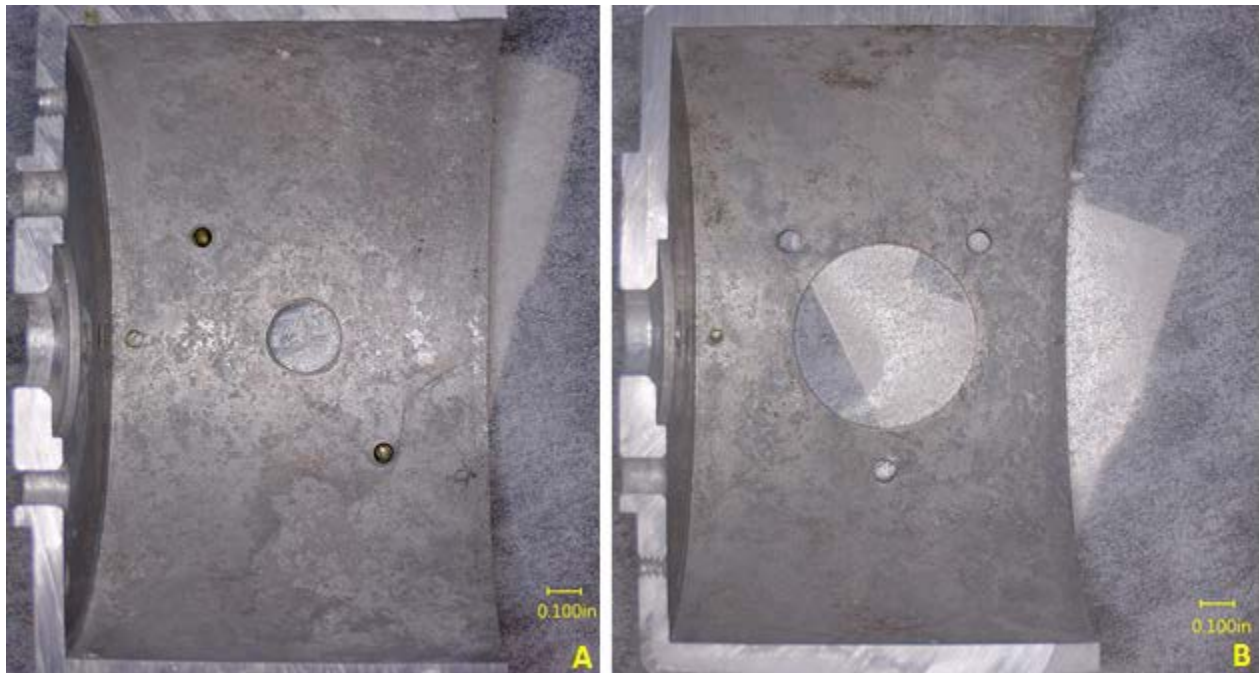


Figure 5. Two halves of the rotor housing after cleaning (halves are arbitrarily labelled).

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