

NATIONAL TRANSPORTATION SAFETY BOARD

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

November 1, 2018



MATERIALS LABORATORY FACTUAL REPORT

Report No. 18-086

A. ACCIDENT INFORMATION

Place : Culpeper, Virginia
Date : October 12, 2018
Vehicle : RV-8
NTSB No. : ERA19FA010
Investigator : Eric Alleyne (AS-ERA)

B. COMPONENTS EXAMINED

Left and right aileron control rod end assemblies.

C. DETAILS OF THE EXAMINATION

Figure 1 shows a photograph of the as-received left and right aileron control rod end assemblies. The rod end assemblies contained no evidence of a mark to indicate whether they were a left or right aileron control rod end assembly. Each rod end assembly fractured at the thread portion. The fractures were covered with light brown iron oxide (rust). The thread portion was disassembled from each rod end assembly and ultrasonic cleaned with Alconox, a detergent that removes oxide from ferrous metal. The ultrasonic cleaning procedure exposed the fracture features. Scanning electron microscope examination of the thread portion from each rod end assembly revealed the fracture face contained evidence of micro-void coalescence features with an isolated portion at the core containing quasi-cleavage fracture features, both typical of overstress separation. Each fracture face showed no evidence of crack arrest marks, such as fatigue cracking. Figure 2 shows a fracture at the thread portion of a rod end. Figure 3 shows an SEM photograph of typical fracture features found on the fracture face of a thread portion.

Frank Zakar
Senior Metallurgist

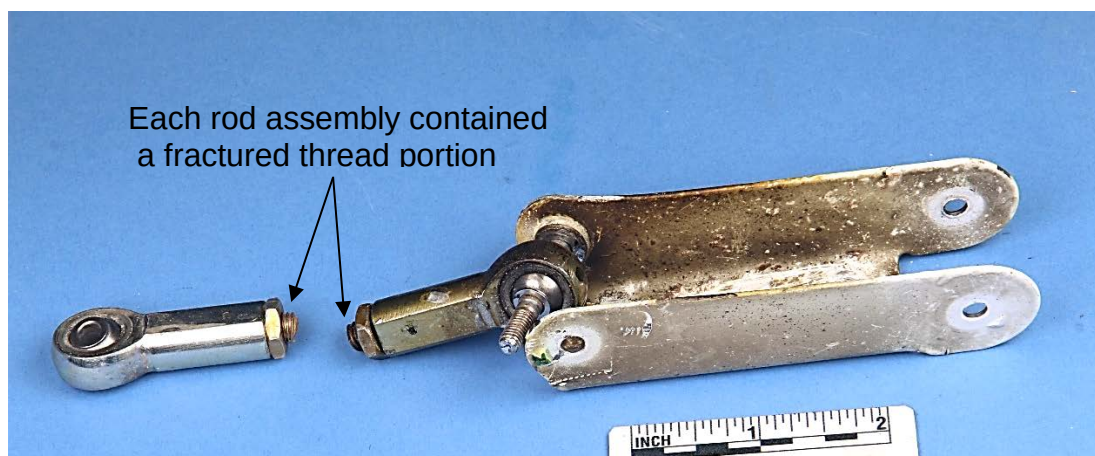


Figure 1. As-received left and right aileron control rod end assemblies.

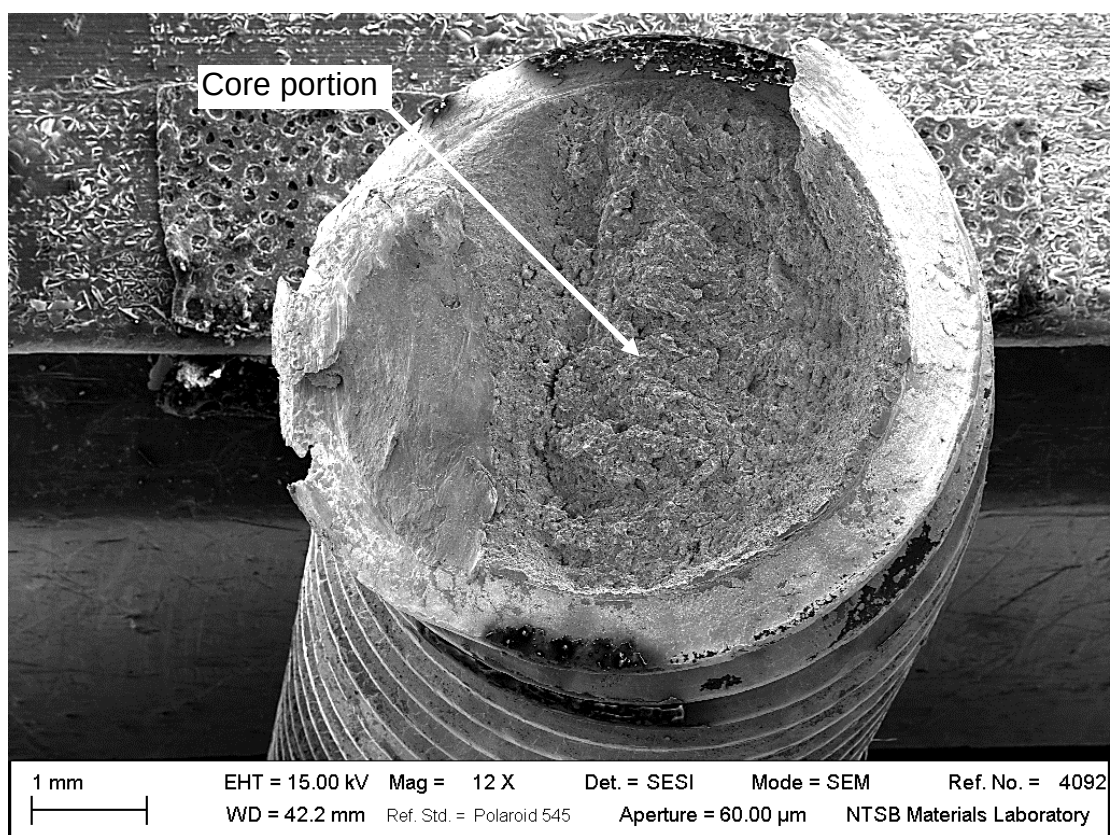


Figure 2. Scanning electron microscope (SEM) photograph showing a fracture at the thread portion of a rod end.

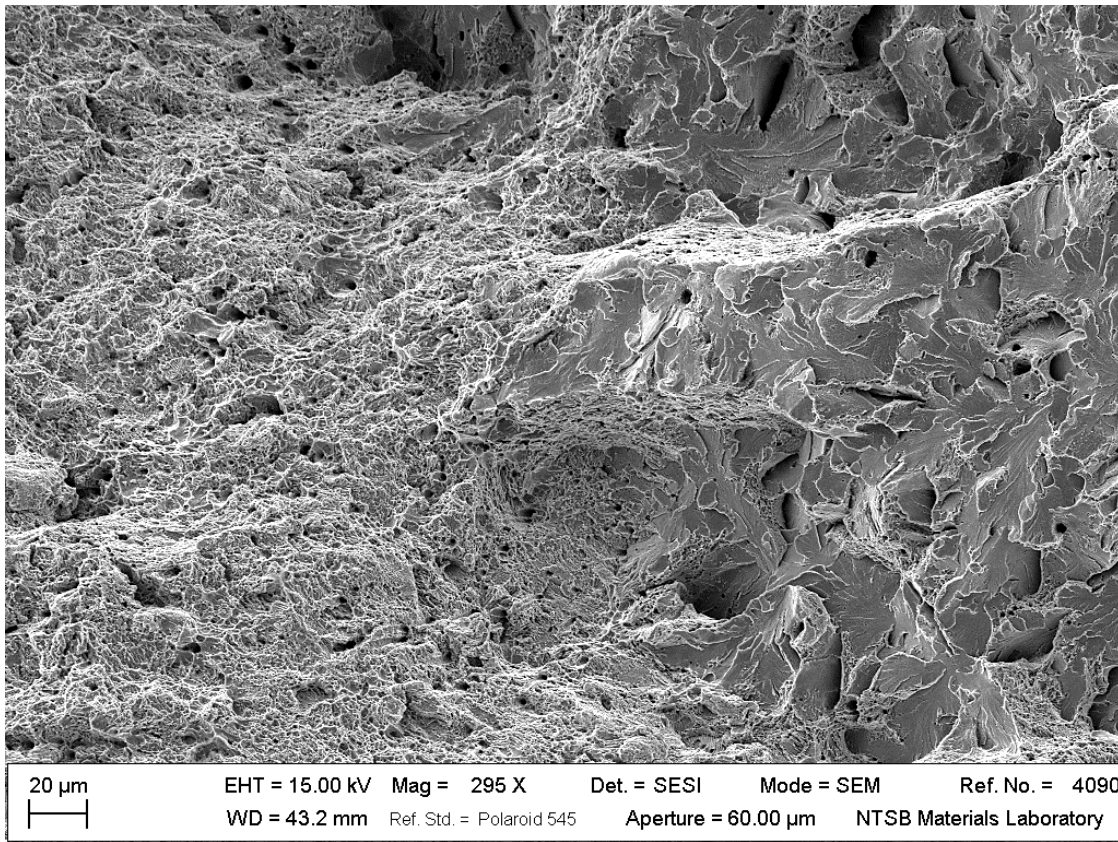


Figure 3. SEM photograph of a portion of the thread fracture face showing the transition region between the quasi-cleavage fracture features at the core (right side of page) and micro-void coalescence features (left side of page), both typical of overstress separation.