NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Materials Laboratory Division
Washington, D.C. 20594

September 2, 2011

MATERIALS LABORATORY FACTUAL REPORT Report No. 11-101

A. ACCIDENT INFORMATION

Place	:	Richmond, Virginia
Date	:	April 11, 2011
Vehicle	:	Piper PA-31-350, registration: N3547C
NTSB No.	:	ERA11LA240
Investigator	:	Dennis Diaz, AS-ERA

B. COMPONENTS EXAMINED

Pieces from right engine fuel servo.

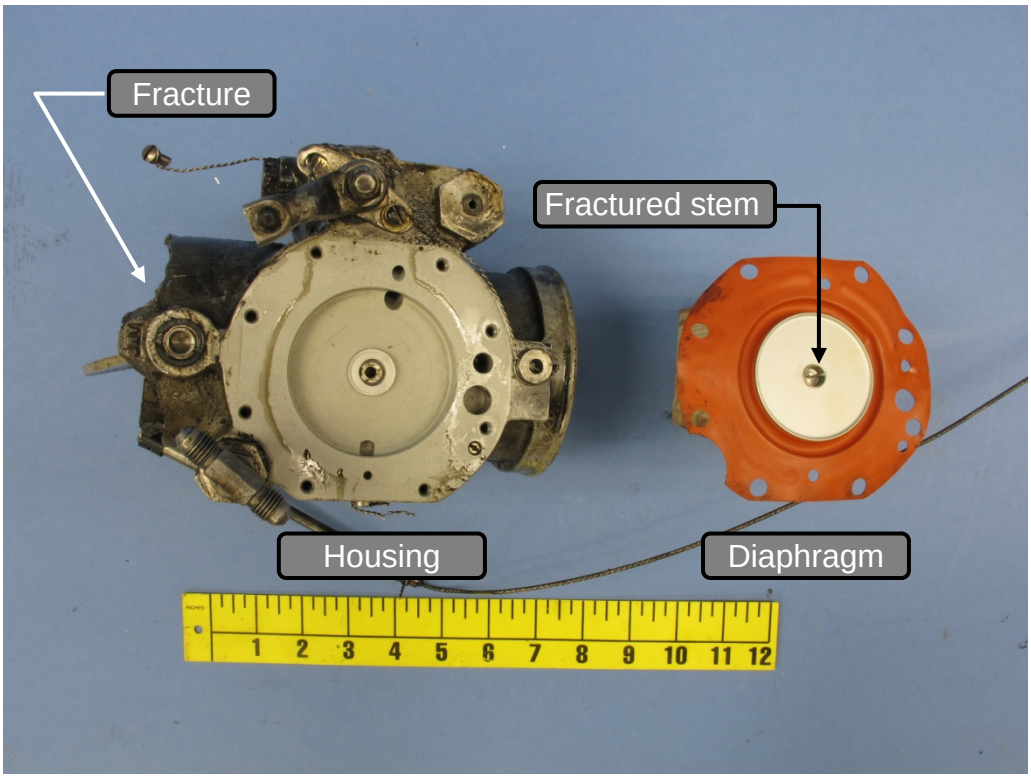
C. DETAILS OF THE EXAMINATION

Pieces from the right engine fuel servo were received by the Materials Laboratory as shown in figures 1a and b. The fuel servo housing was fractured at one end and the fuel servo diaphragm had a fractured stem. The fracture was in the threaded portion of the stem and the stem was bent. The mating half of the fractured stem is shown in figure 1b.

The fractured stem piece shown in figure 1b was cleaned with acetone and examined by scanning electron microscopy. The fracture was at the root of a thread as shown in figure 2a. A higher magnification view of the fracture surface was taken at the location shown in figure 2a and is shown in figure 2b. One small section of the fracture surface exhibited features consistent with smearing. The rest of the fracture exhibited dimple-shaped features, consistent with ductile fracture.

Donald Kramer
Materials Engineer

a)



b)

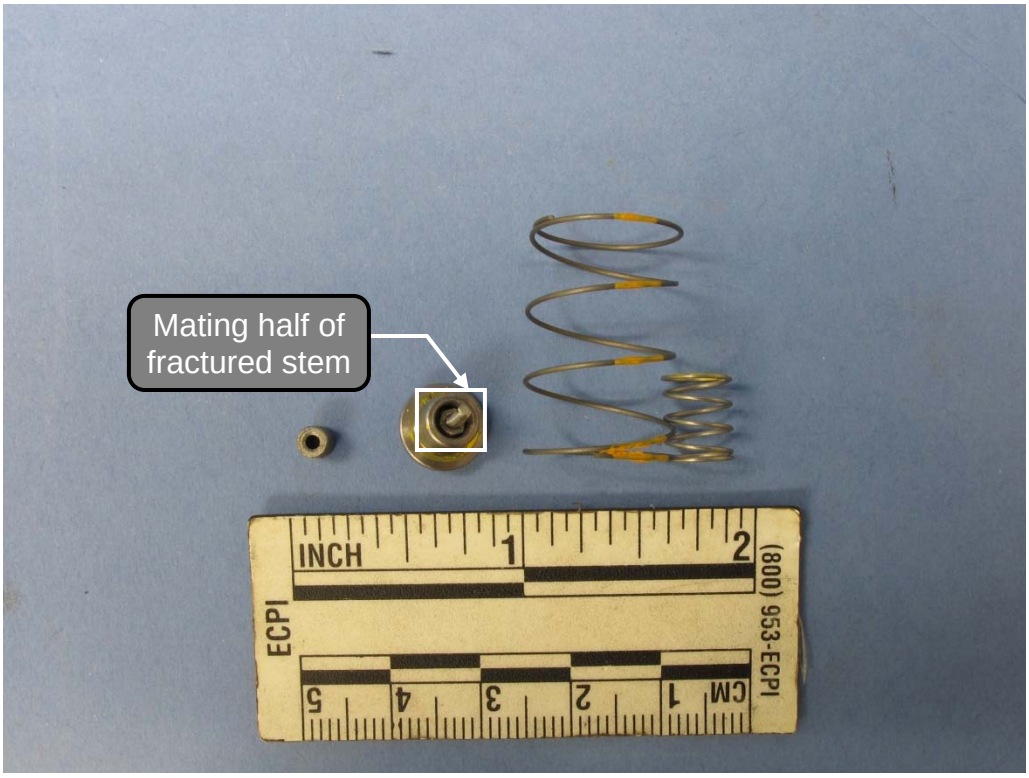
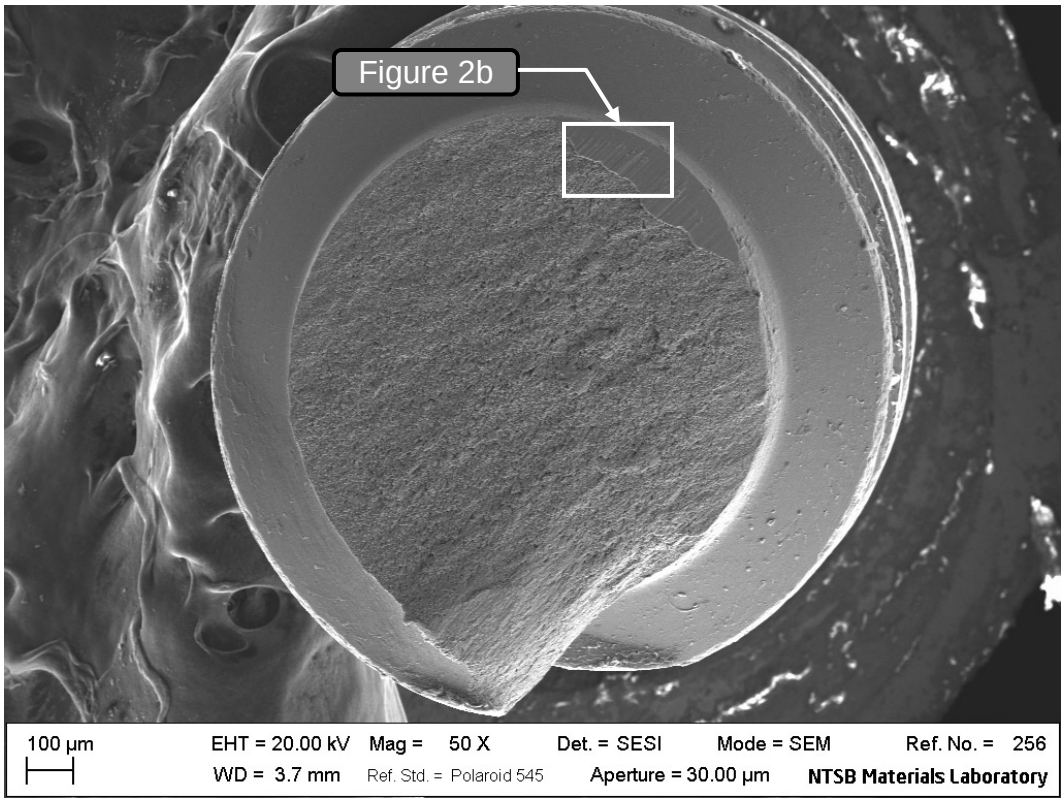
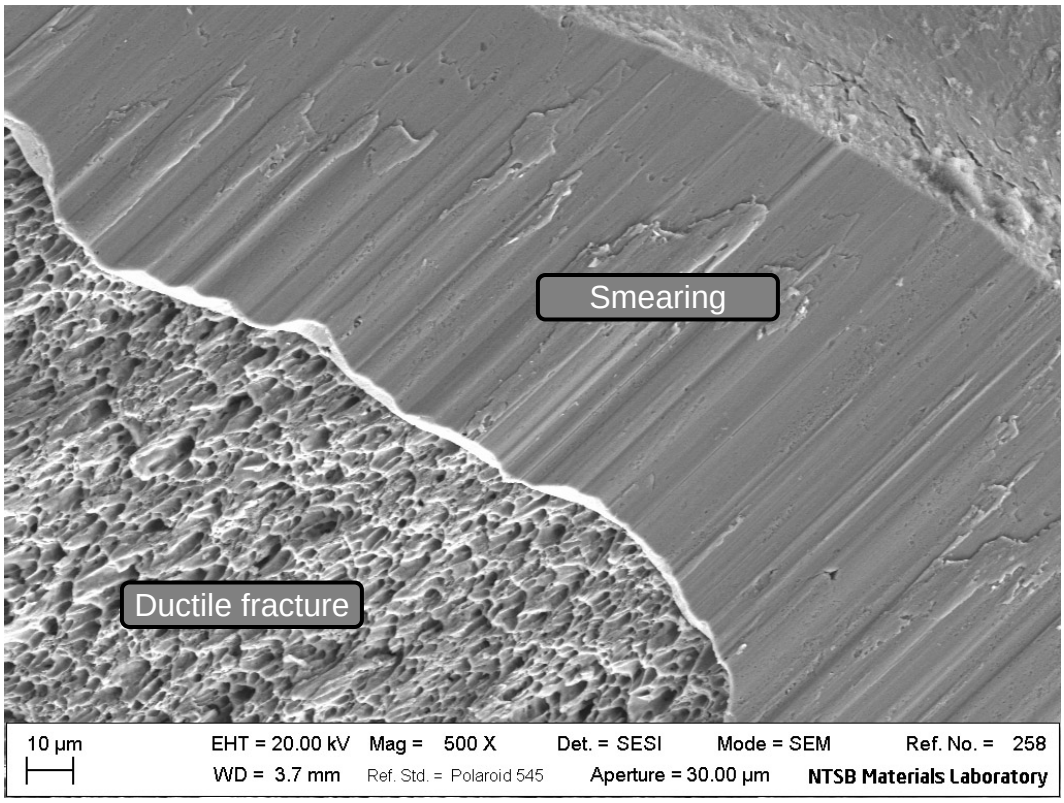


Figure 1: Fuel servo housing and diaphragm with fractured stem; b) fuel servo assembly components including mating half of fractured diaphragm stem.



a)



b)

Figure 2: Scanning electron microscope images of fractured stem from figure 1b; a) overview of fracture surface; b) higher magnification view showing smearing and ductile fracture.