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

October 21, 2015

MATERIALS LABORATORY FACTUAL REPORT Report No. 15-107

A. ACCIDENT INFORMATION

Place	:	Bristol, Wisconsin
Date	:	July 25, 2015
Vehicle	:	Zenith CH 601XL
NTSB No.	:	CEN15FA315
Investigator	:	Edward Malinowski, AS-CEN

B. COMPONENTS EXAMINED

Pieces of right distributor cap

C. DETAILS OF THE EXAMINATION

Pieces of the right distributor cap were submitted (Figure 1) for evaluation. The coil socket was fractured from the distributor cap housing. The purpose of this report is to document the fracture.

Images of the outside and inside of the top of the distributor cap showing the fractured center coil socket are shown in Figures 2 and 3, respectively. The fracture initiated at the step created by the identification boss shown in Figure 3b. A higher magnification view of the fracture initiation region is shown in Figure 4. For Mode I cracking opening, a bending force was applied to the central coil socket as indicated in Figure 2b. A closer view of the separated center coil socket is shown in Figure 5 with the fracture initiation region identified.

Scanning electron fractographs of the fracture initiation region are shown in Figures 6 and 7. As indicated in Figure 6a, the fracture initiated on the inside of the distributor cap dome at a step created by an identification boss molded into the part. A secondary crack is also noted in Figure 6. The hackle and fine fibril fracture surface features revealed in Figures 6b and 7, as well as the large fibrils at the outer surface of the cap (Figure 6a), are consistent with overstress fracture mode due to bending forces applied to the center coil socket (see Figure 2b). No evidence of progressive cracking, such as fatigue or slow crack growth, was noted.

Michael Budinski
Chief, Materials Laboratory Division

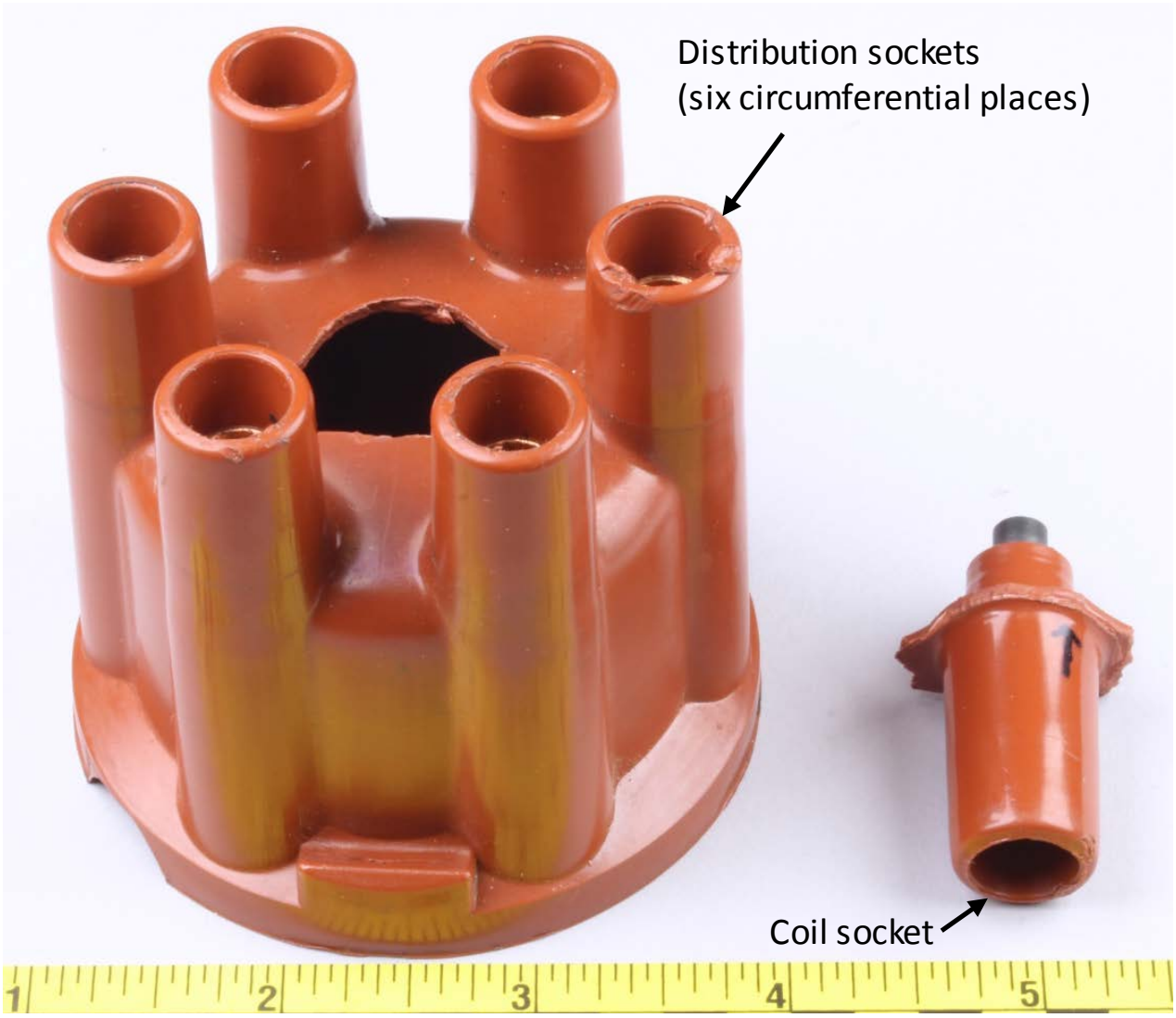
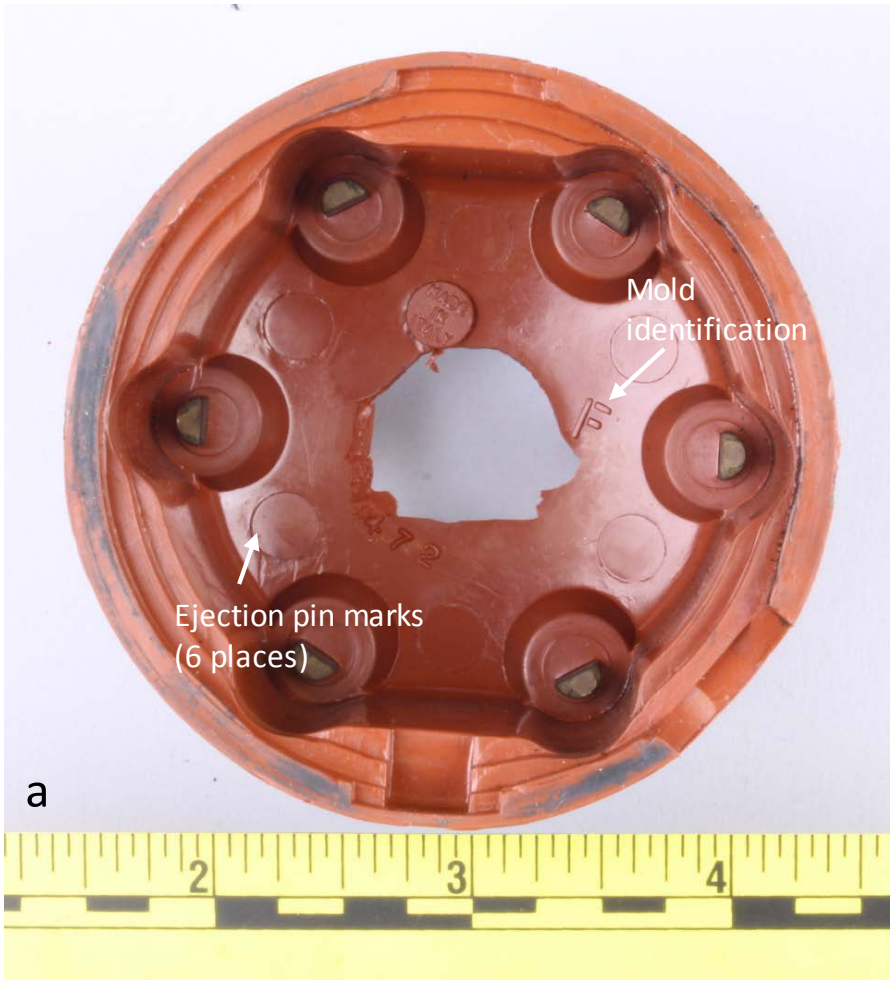


Figure 1 As received distributor cap pieces.

Figure 2 Top view of the distributor cap pieces.



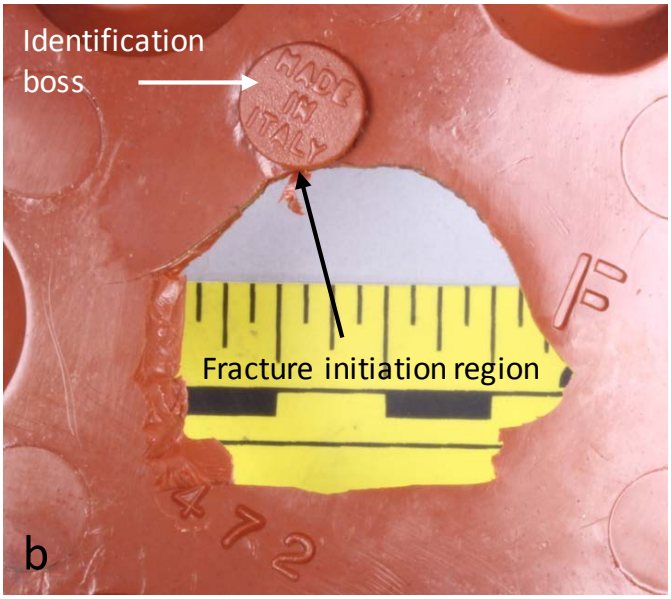


Figure 3 Bottom or inside view of the fractured region on the distributor cap body.

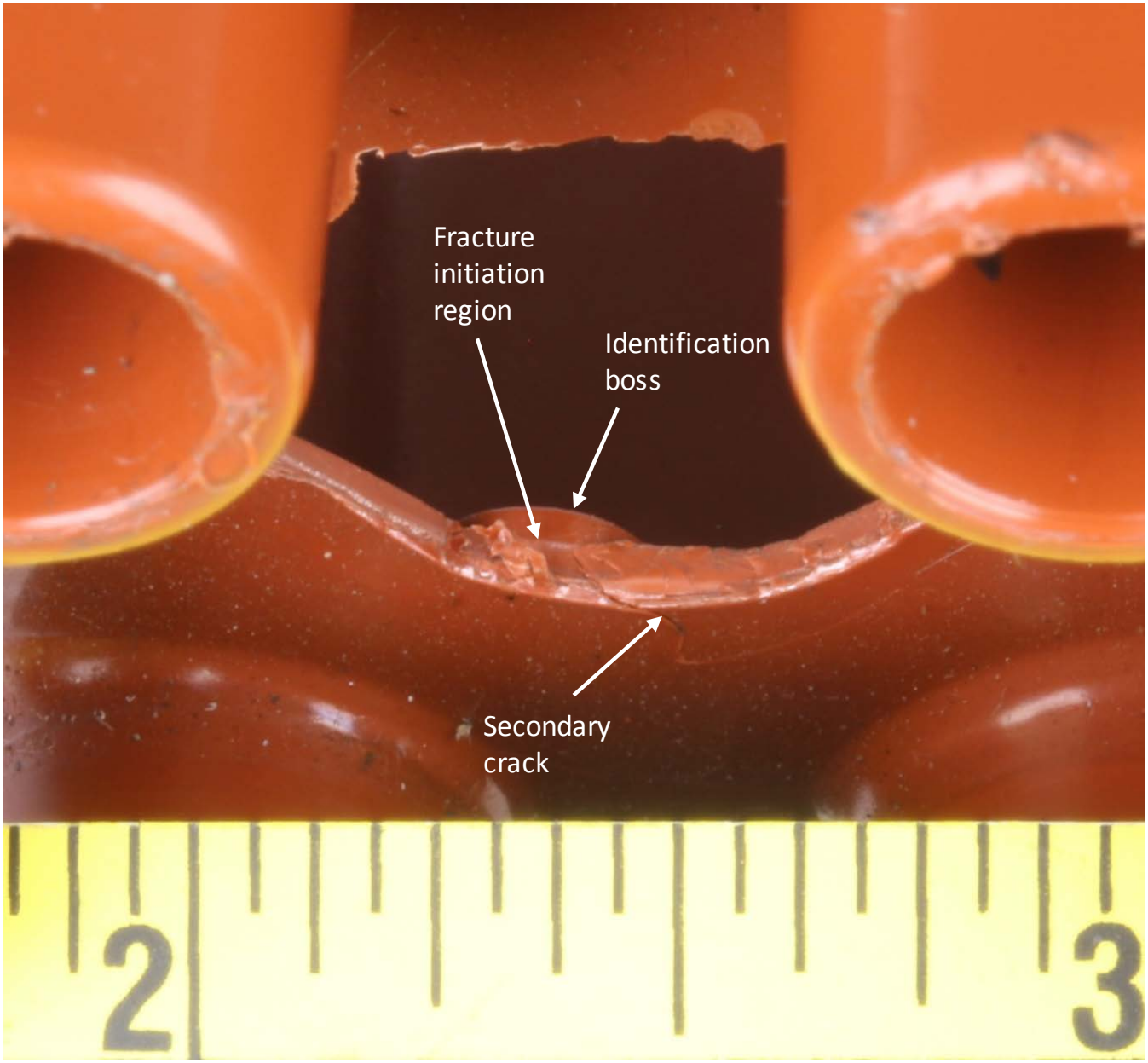


Figure 4 Closer view of the initiation region of the cap fracture.

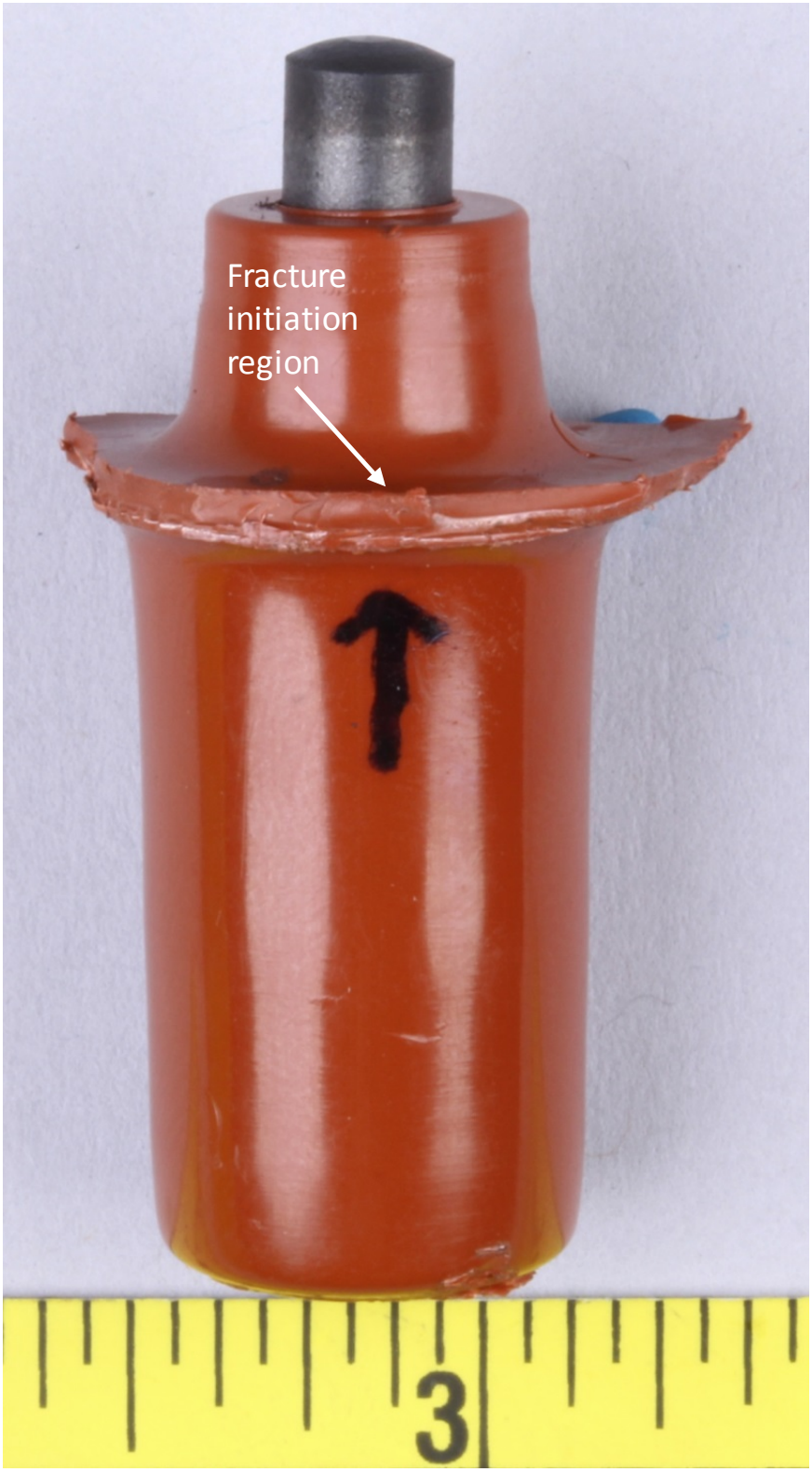
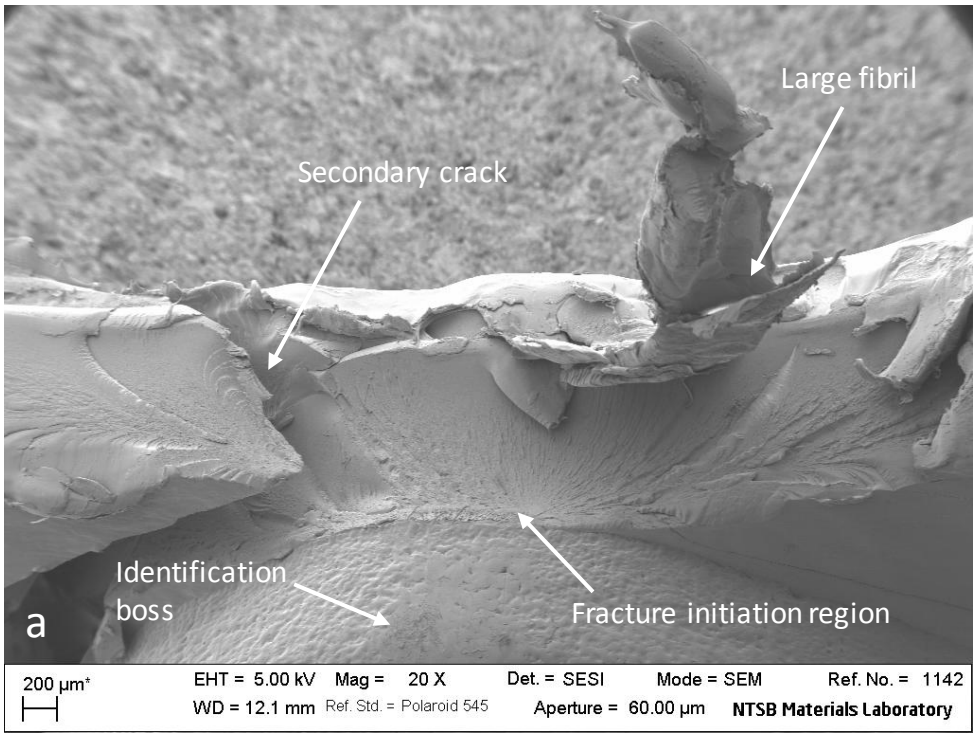


Figure 5 Closer view of the initiation region on the separated coil socket.



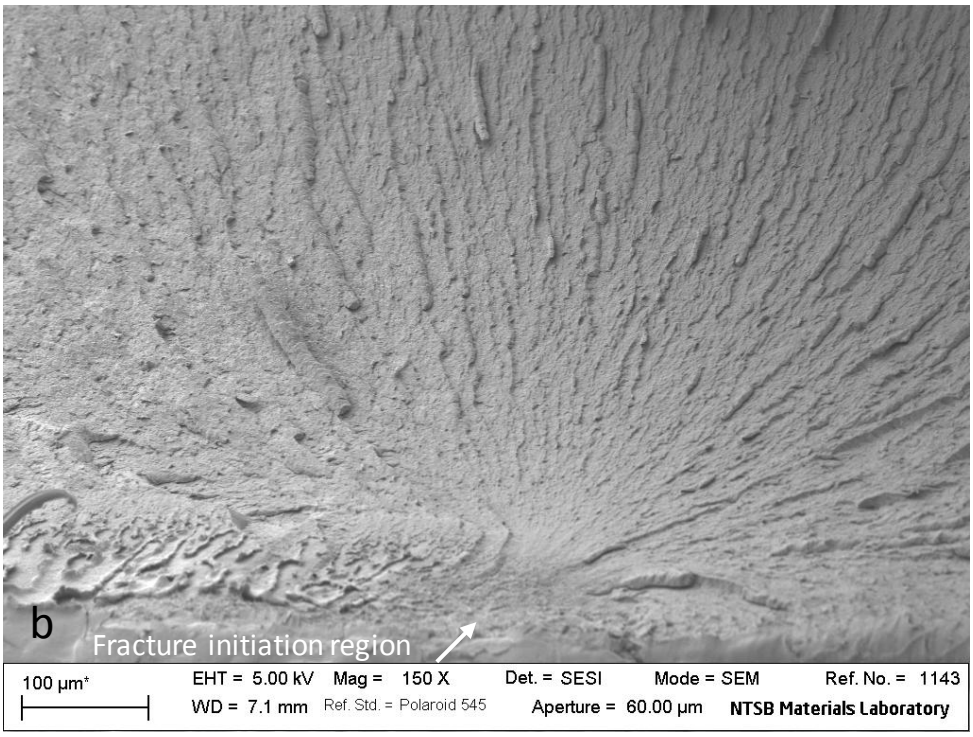


Figure 6 Scanning electron fractographs of the initiation region of the fracture in the distributor cap. In view a, the fracture initiated at the base of the step created by the identification boss molded into inner surface of the cap.

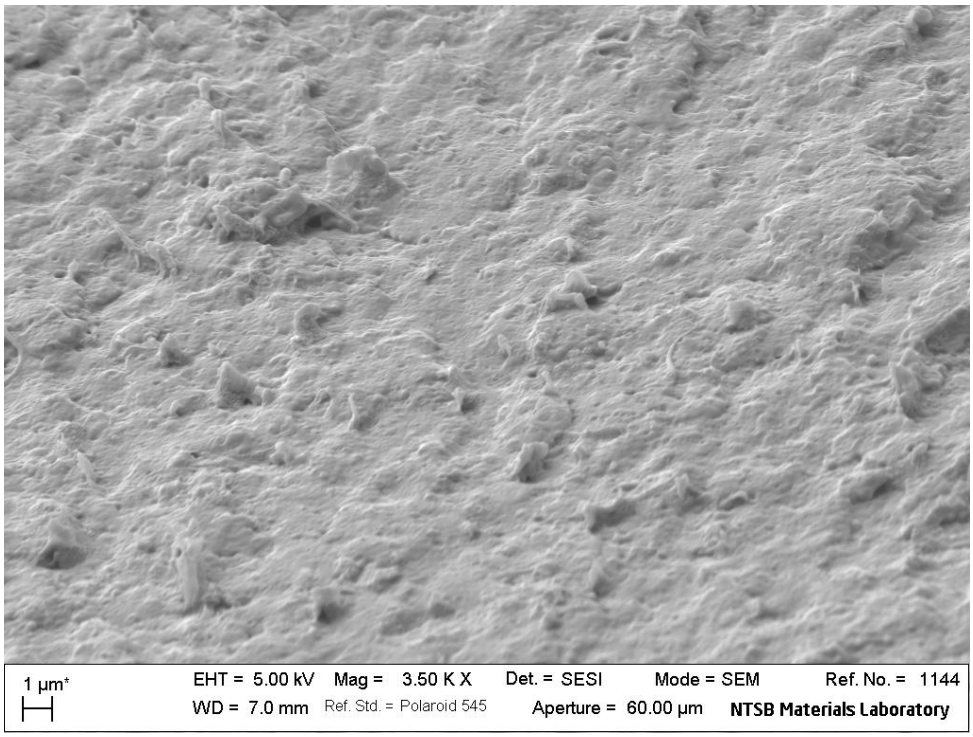


Figure 7 Closer scanning electron fractograph of the facture surface near the initiation region.