

NATIONAL TRANSPORTATION SAFETY BOARD

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



May 10, 2017

MATERIALS LABORATORY FACTUAL REPORT

Report No. 17-044

1. ACCIDENT INFORMATION

Place : Newton, North Carolina
Date : April 27, 2017
Vehicle : Robinson R44 II, N728CB
NTSB No. : ERA17LA168
Investigator : Bob Gretz, AS-ERA

2. COMPONENTS EXAMINED

Fractured halves of an anti-torque pedal control tube

3. DETAILS OF THE EXAMINATION

Figure 1 shows the fragments of the anti-torque pedal control tube, as received. The markings on the tube stated "C343 11H LOT 34". The tube had fractured perpendicular to the direction of the tube, approximately 0.90 inches from the end on the left of Figure 1. There was a slight outward bend of the short tube fragment near the fracture surface on one side.

Figure 2 shows one of the mating fracture surfaces of the tube. The fracture surface exhibited a dull luster with a generally rough texture. A small step was present in the fracture surface, as shown in the lower right side of Figure 2.

The fracture surface in Figure 2 was examined using a scanning electron microscope. As typified in Figure 3, the fracture surface exhibited dimple rupture, consistent with overstress failure. No indications of other failure modes were observed. The microscopic fracture features, as well as the macroscopic tube characteristics at and on the fracture surface, were all consistent with failure from overstress in torsion.

Erik Mueller
Materials Research Engineer



Figure 1 – The fractured anti-torque pedal control tube halves, as received.



Figure 2 – The fracture surface from the shorter fragment of the broken tube.

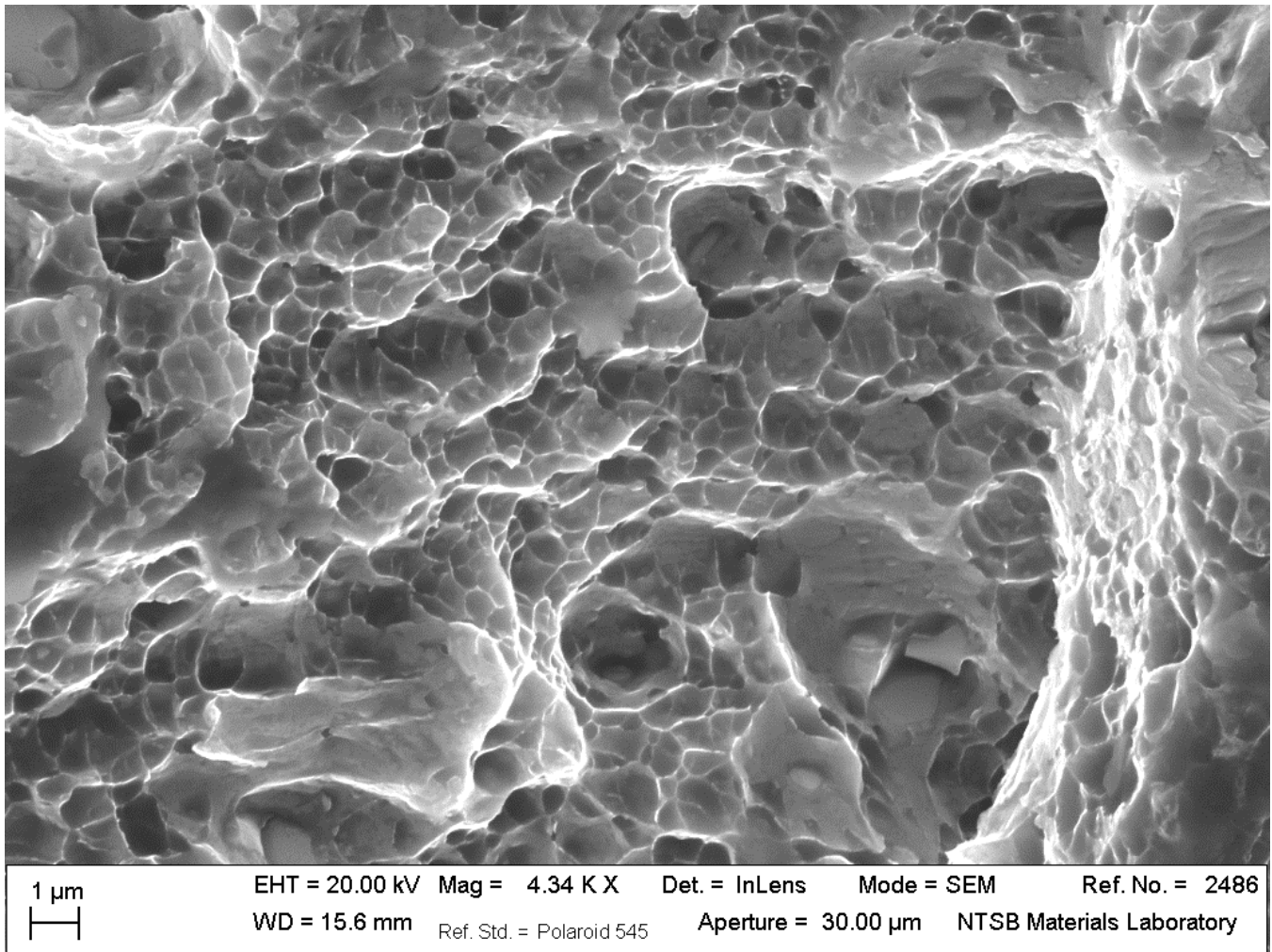


Figure 3 – Secondary electron micrograph of a typical area of the tube fracture surface, showing dimple rupture consistent with overstress failure.