

NATIONAL TRANSPORTATION SAFETY BOARD

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



June 15, 2020

MATERIALS LABORATORY FACTUAL REPORT

Report No. 20-030

A. ACCIDENT INFORMATION

Place : Monroe, WI
Date : August 27, 2019
Vehicle : Beech V35 Bonanza, N6245V
NTSB No. : CEN19LA290
Investigator : Joshua Lindberg (AS-CEN)

B. COMPONENTS EXAMINED

Two piston wrist pins.

C. DETAILS OF THE EXAMINATION

Two piston wrist pins were submitted for examination, an exemplar one that was sectioned and provided for comparison purposes, and one that had fractured. The exemplar wrist pin is shown in Figure 1. The fractured wrist pin is shown in Figure 2.

Heavy secondary damage obscured the features on the fracture surfaces of the fractured wrist pin, as shown in Figure 3. Due to the heavy damage, the exact reason for the separation of the pin could not be determined.

A comparison of the two pins revealed the fractured wrist pin had separated at the shear section between the head and the shaft. The shear section on the exemplar wrist pin is indicated by the white brackets in Figure 4. Figure 5 shows the profile view of the fractured wrist pin. The yellow arrows point to a lip of material that had been pushed over the side of the pin following separation. Yellow arrows in Figure 3 point to the lip of material as seen on the fracture surface. The red dotted line in Figure 3 outlines the approximate diameter of the shaft as manufactured and highlights the movement of the lip of material.

Adrienne V. Lamm
Materials Engineer



Figure 1: Overall photos of the exemplar sectioned wrist pin.



Figure 2: Overall photos of the fractured wrist pin.

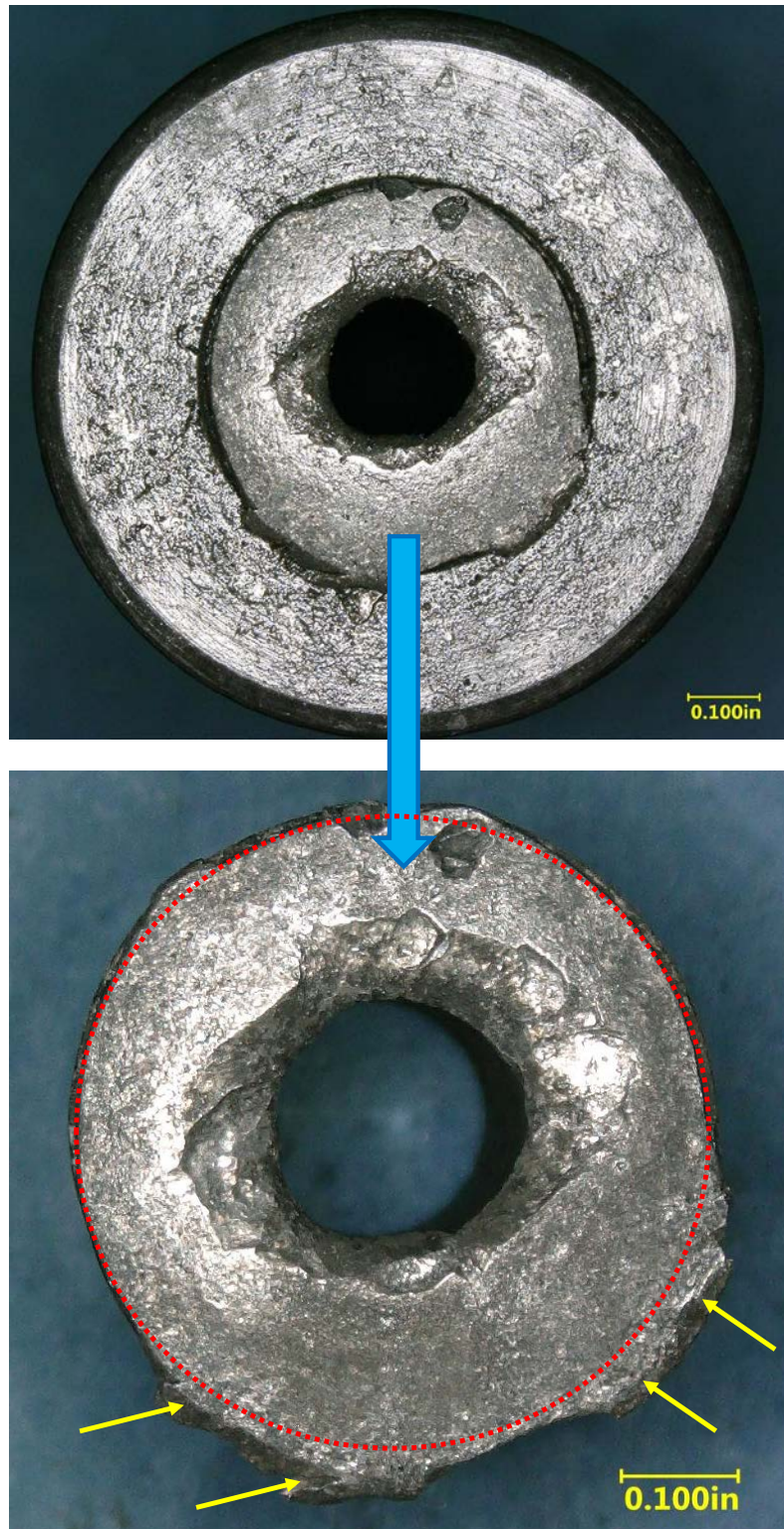


Figure 3: Digital microscope images of the fracture surface on the shaft of the fractured wrist pin (top) still assembled to the mating piece and (bottom) after removal and cleaning. The yellow arrows point to a lip of material on the fracture surface. The red dotted line outlines the approximate diameter of the shaft as manufactured.

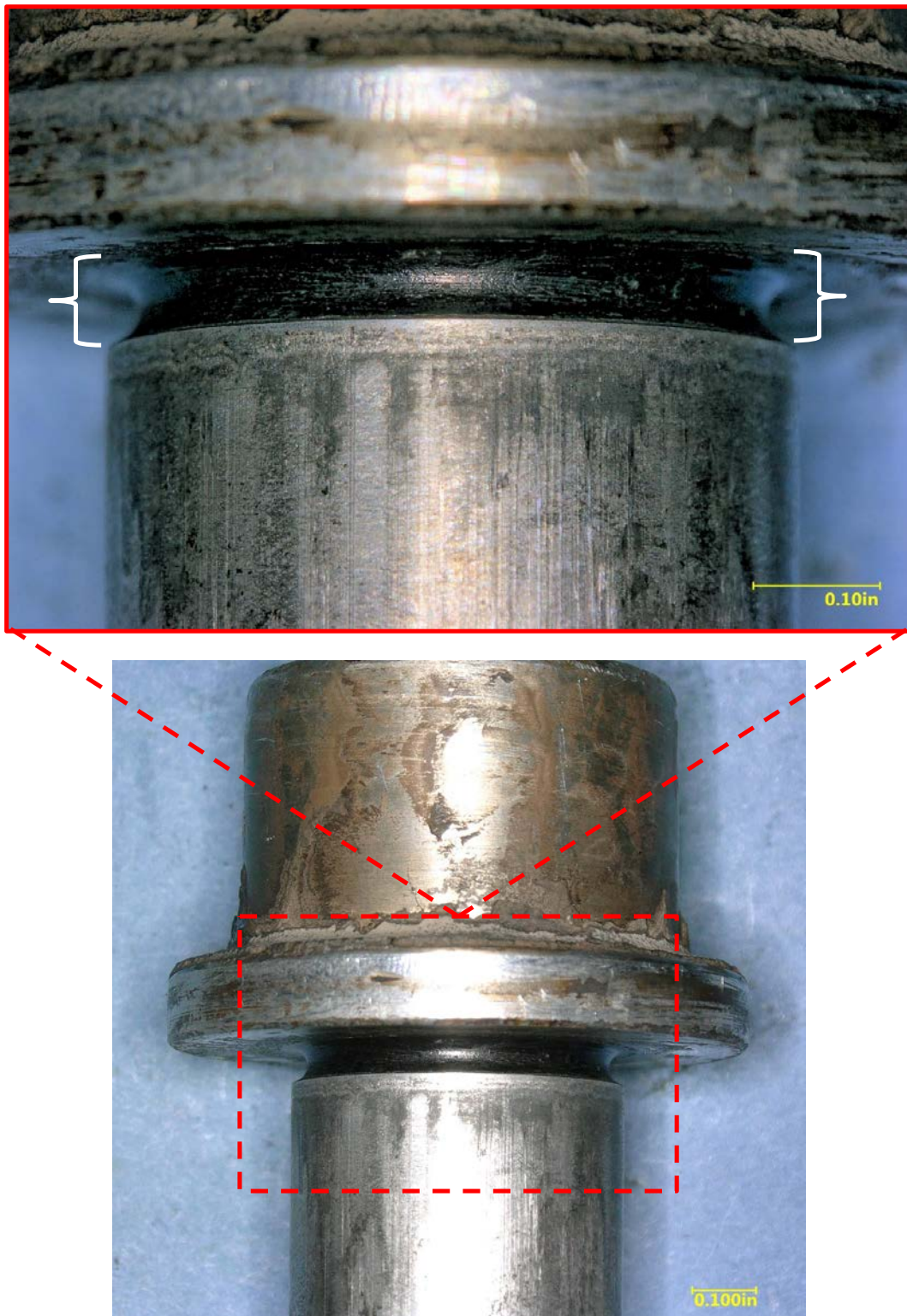


Figure 4: Digital microscope images of the exemplar wrist pin. The white brackets indicate the shear section between the head and the shaft of the pin.

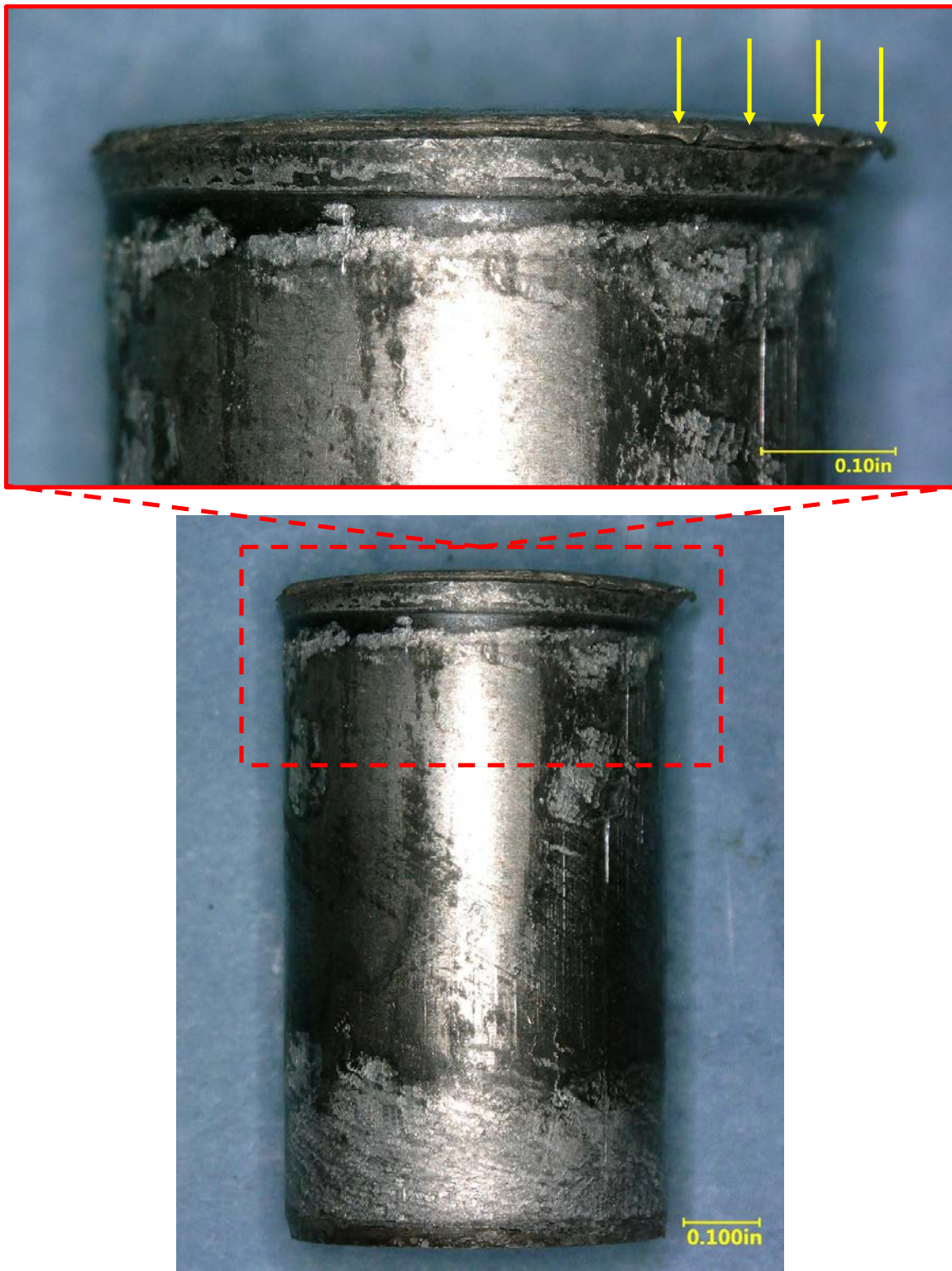


Figure 5: Digital microscope images showing the profile view of the fractured wrist pin. The yellow arrows point to a lip of material that had been pushed over the side of the pin.