

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



ERA22LA333

MATERIALS LABORATORY

Factual Report 23-057

July 18, 2023

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A. ACCIDENT INFORMATION

Location: Batesburg, South Carolina
Date: July 23, 2022
Vehicle: Stinson 108 3
Investigator: Timothy Monville

B. COMPONENTS EXAMINED

Fractured crankshaft gear (2 pieces); flat tab washer; intact Woodruff key; and fractured Woodruff key (4 pieces).

C. EXAMINATION PARTICIPANTS

Senior Metallurgist Frank Zakar
 NTSB
 Washington, DC

D. DETAILS OF THE EXAMINATION

Figure 1 shows a photograph of the as-received parts. The crankshaft gear fractured into two pieces. The fractures were on diametrically opposite sides. Stereo microscope examination of the fractures revealed crack arrest marks, typical of fatigue cracking, emanating from multiple origins at the corner of the keyway, in the area indicated by arrow "O" in figure 1 and bracket "O" in figure 2. Fatigue cracking was in the general direction indicated by arrows in figure 2 and terminated in the area indicated by a dashed line in figure 2. The area located outside of the fatigue region and on the other submitted pieces exhibited coarse and irregular fracture features on slant planes typical of overstress separation.

Submitted by:

Frank Zakar
Senior Metallurgist

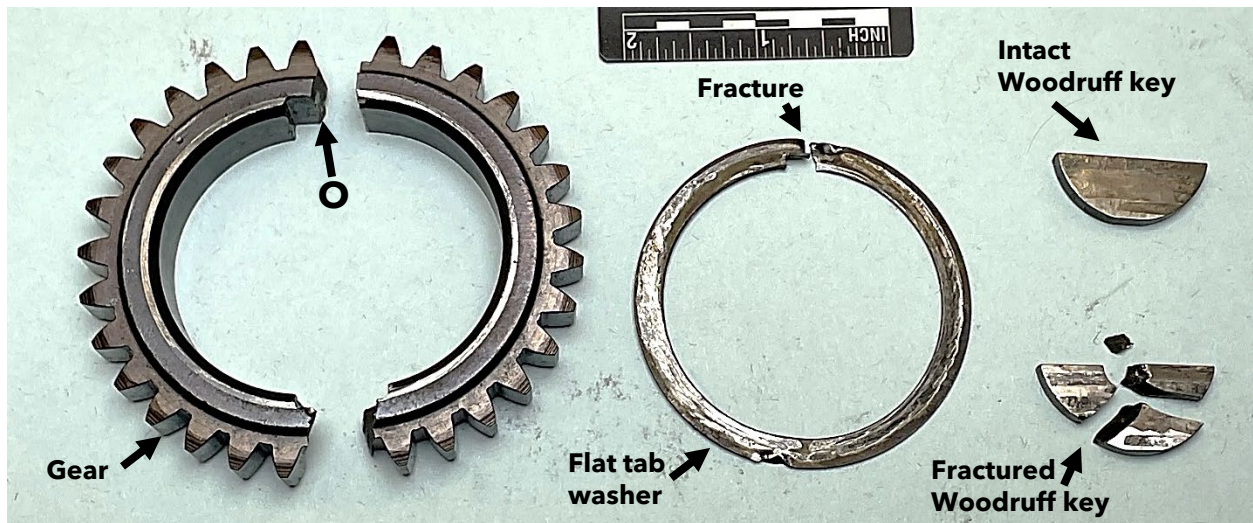


Figure 1. As- received fractured crankshaft gear (2 pieces); flat tab washer; intact woodruff key; and fractured Woodruff key (4 pieces).

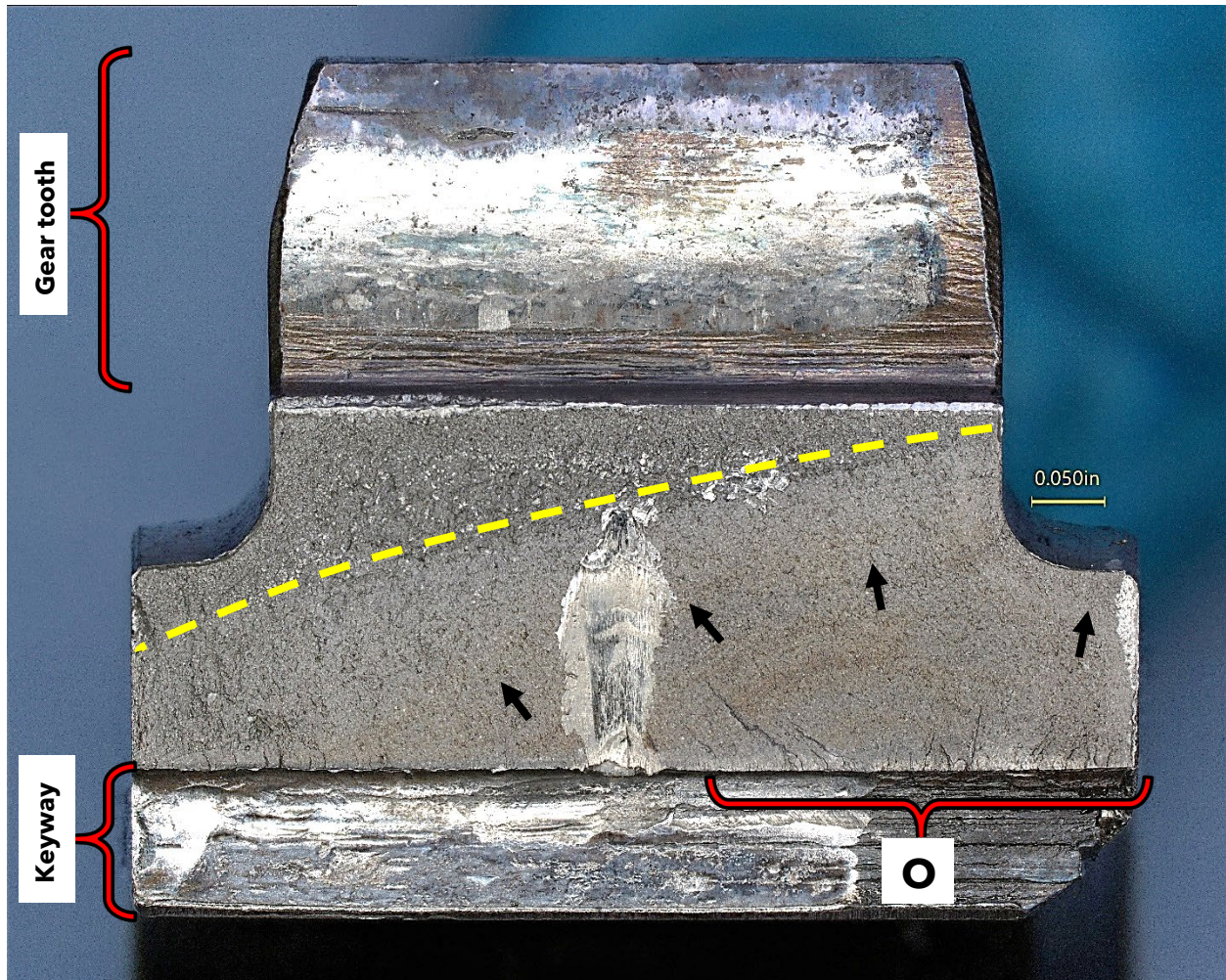


Figure 2. Close-up photograph of the fractured gear showing a fatigue crack that emanated from multiple origins at the corner of the keyway, in the area indicated by bracket "O".