

NATIONAL TRANSPORTATION SAFETY BOARD

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



May 20, 2019

MATERIALS LABORATORY FACTUAL REPORT

Report No. 19-031

A. ACCIDENT INFORMATION

Place : Bettles, Alaska
Date : 7/29/2018
Vehicle : Robinson R44 II N744AK
NTSB No. : ANC18LA058
Investigator : Brice Banning

B. COMPONENTS EXAMINED

Images of the failed components were submitted by the IIC rather than physical parts.

1. Image of an idler gear, idler gear shaft and flange, mounting bolt pieces, and mounting stud pieces with nut from a Lycoming IO-540-AE1A5 series engine.
2. Image of the engine crankcase in the region of the shaft flange threaded mounting holes.

C. DETAILS OF THE EXAMINATION

Figure 1 shows the idler gear shaft and flange installed on the idler gear. The mounting holes exhibit good circularity with some batter around the right-most mounting hole on the side that faces the crankcase.

Pieces of a mounting bolt and safety wire fragments are shown in Figure 1 (lower left). The bolt head is separated from the shank due to wear-loss of the bolt's cross-sectional area accompanied by final fracture.

A mounting stud, nut, and safety wire fragments are also shown in Figure 1 (lower right). The stud threads have been worn off over 80% of the stud length to an extent that the remaining diameter is free of threads and is smaller than the thread root diameter.

Figure 2 shows damage to the crankcase in the region of the idler gear shaft flange mounting holes. Specific damage to the threaded mounting holes and the shaft flange mounting face is identified in the image. The damage is consistent with the partial or complete loss of bolt and stud clamping force of the shaft flange to the crankcase.

Michael Budinski
Chief, Materials Laboratory Division

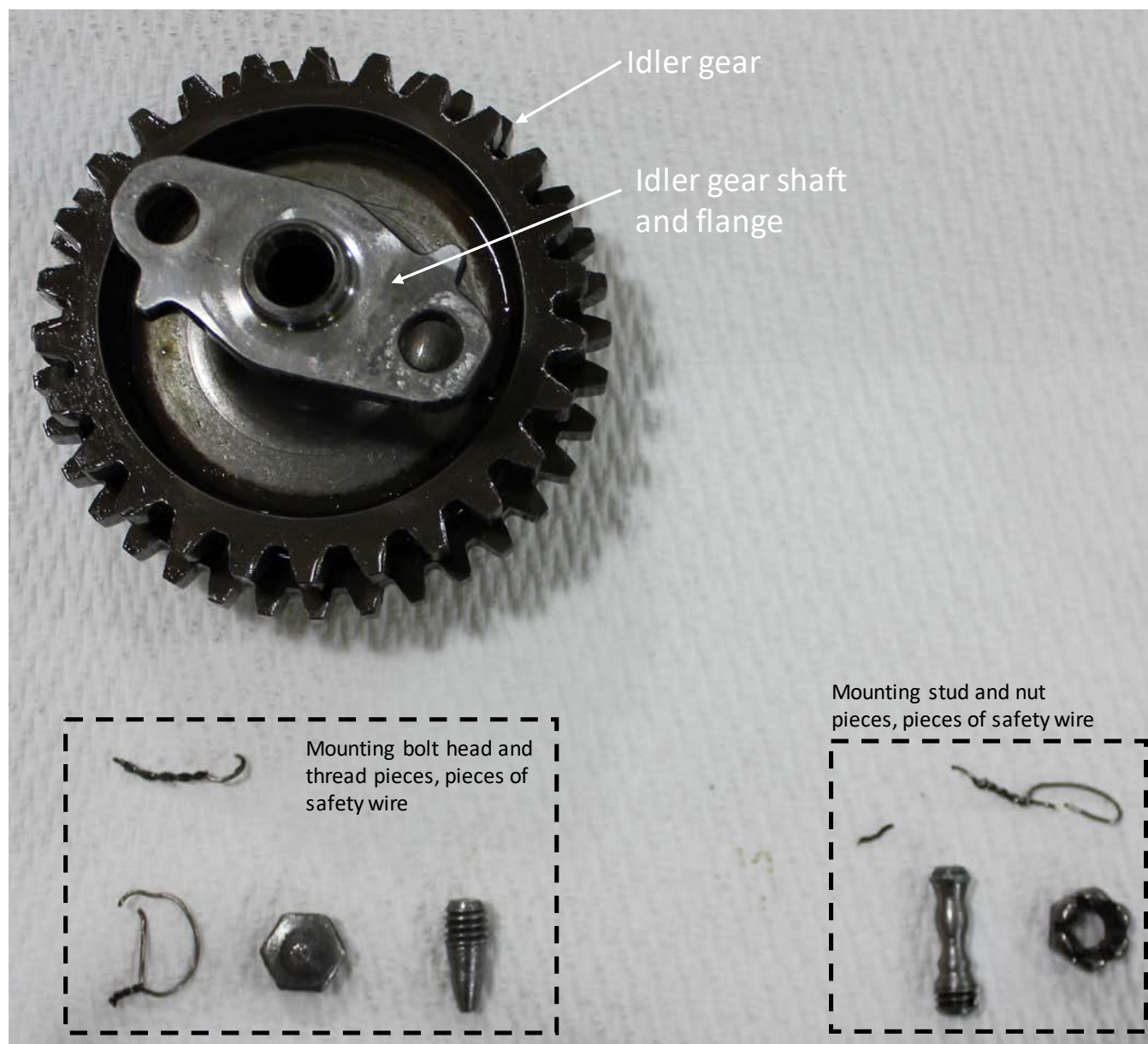


Figure 1 Image of an idler gear, idler gear shaft and flange, mounting bolt pieces, and mounting stud pieces with nut.



Figure 2 Image of engine crankcase in the region of the idler gear shaft and flange threaded mounting holes.