

NATIONAL TRANSPORTATION SAFETY BOARD

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



2/29/2016

MATERIALS LABORATORY FACTUAL REPORT

Report No. 16-024

A. ACCIDENT INFORMATION

Place : Port Townsend, WA
Date : September 28, 2015
Vehicle : Cessna 150F, N8529G
NTSB No. : WPR15FA268
Investigator : Tom Little

B. COMPONENTS EXAMINED

4 crankshaft gear bolts (PN: 22532), 1 crankshaft gear dowel pin (PN: 653012) and 1 crankshaft gear (PN:656072 / SN: N12HA044).

C. DETAILS OF THE EXAMINATION

The four crankshaft gear bolts all exhibited overstress fractures in their threaded portion (figures 1). Two of the four bolts remained safety wired to each other and did not exhibit gross plastic deformation. The other two bolts exhibited gross plastic deformation in the shank portion. One of the bolts had broken free of the safety wire and the other had a portion of safety wire still attached.

The bolt holes in the crankshaft gear had become elongated. This effect was less pronounced on the face of the gear that would have mated to the crankshaft (figure 2, crankshaft side) and more pronounced on the opposing face (figure 3 bolt head side). The crankshaft gear teeth appeared to be well formed and did not exhibit any irregularities or uneven wear.

The crankshaft gear dowel pin was fractured and partially missing. The portion that was submitted to the laboratory contained a flat fracture surface (figure 4). Examination of the fracture surface using a stereo microscope revealed crack arrest marks and ratchet marks consistent with a fatigue fracture. There were 3 prominent ratchet marks indicating a fatigue fracture with multiple origins. Examination of the body of the dowel pin revealed wear marks on one side (figure 5).

Joseph Panagiotou
Fire Protection Engineer



Figure 1: Crankshaft gear bolts.



Figure 2: Crankshaft gear (crankshaft side).



Figure 3: Crankshaft gear (bolt head side).



Figure 4: Portion of the crankshaft gear dowel pin.

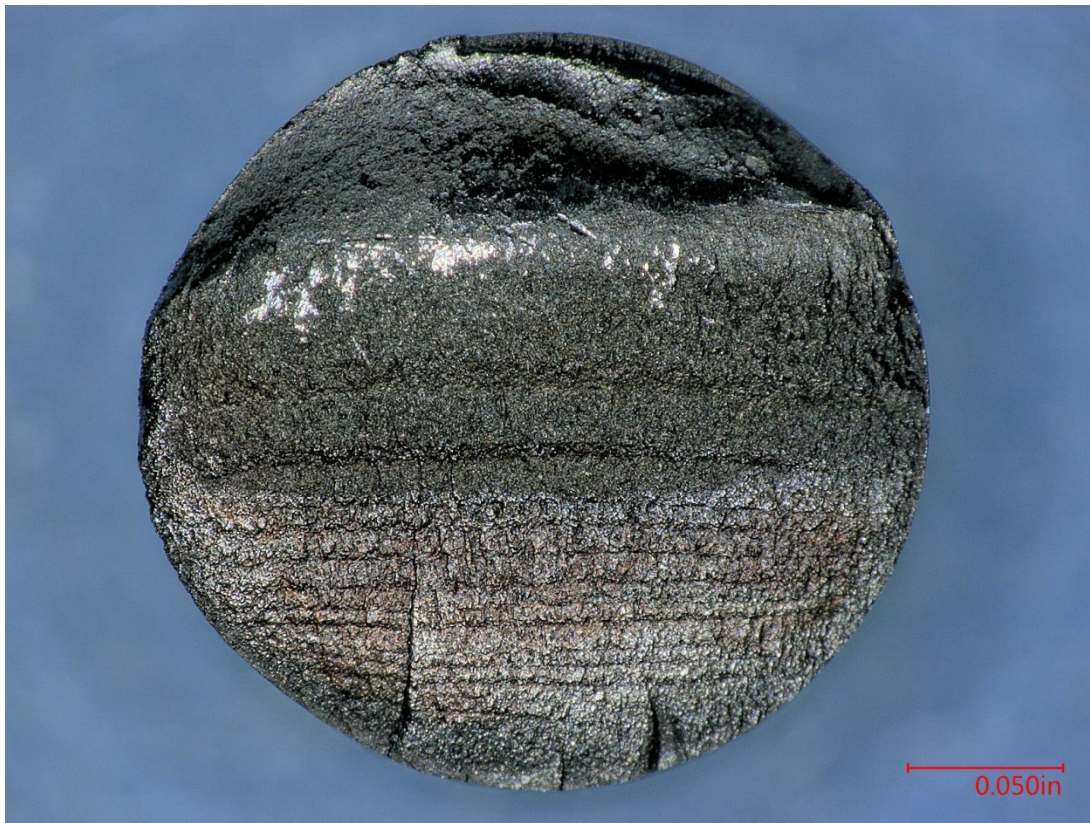


Figure 5: Crack arrest marks and ratchet marks on dowel pin fracture surface.

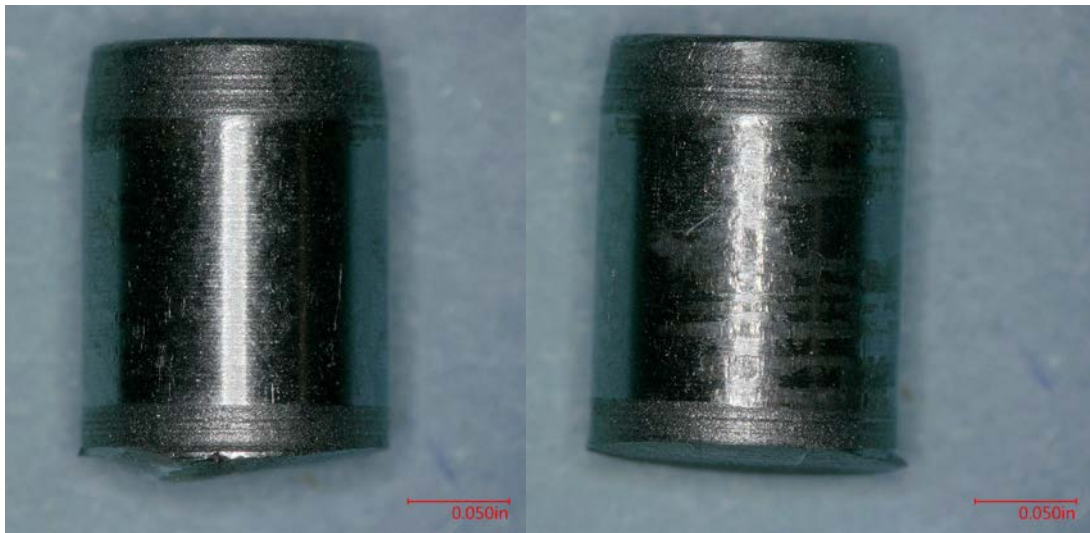


Figure 6: Opposing sides of crankshaft dowel pin body.