

NATIONAL TRANSPORTATION SAFETY BOARD

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



August 19, 2015

MATERIALS LABORATORY FACTUAL REPORT

Report No. 15-088

A. ACCIDENT INFORMATION

Place : Seward, Alaska
Date : July 14, 2014
Vehicle : Cessna 180H, N9083M
NTSB No. : ANC14LA054
Investigator : Brice Banning, ASI-ANC

B. COMPONENTS EXAMINED

Right main landing gear wheel axle with an attached torque plate assembly and four mounting bolts (2 fractured).

C. DETAILS OF THE EXAMINATION

A right main landing gear axle was received by the NTSB Materials Laboratory as shown in figures 1a and 1b. The axle is attached to the main landing gear spring assembly using four attachment bolts. As shown in figures 1a and 1b, the two forward bolts were intact and exhibited a comparatively slight bend in the aft direction. The two aft bolts were fractured and bent in the aft direction. A closer examination of the forward attachment bolts indicated that the threaded ends of those bolts exhibited longitudinal wear marks near the end of the threaded region, as indicated in figure 2. Near the middle of the threaded sections, helical strips of metal were observed, as indicated in figure 2, consistent with material from a stripped nut. The fracture surfaces on the two aft bolts (not shown) were consistent with overstress fractures. Taken as a whole, the features were consistent with an overload on the main landing gear axle in the aft direction.

The Cessna illustrated parts catalog listed the upper attachment bolts as type NAS145 while the lower attachment bolt were listed as type NAS146. Examination of the attachment bolt heads indicated that the upper bolts were stamped NAS145 and the lower bolts were stamped NAS146 in accordance with the catalog.

Donald Kramer, Ph.D.
Sr. Materials Engineer

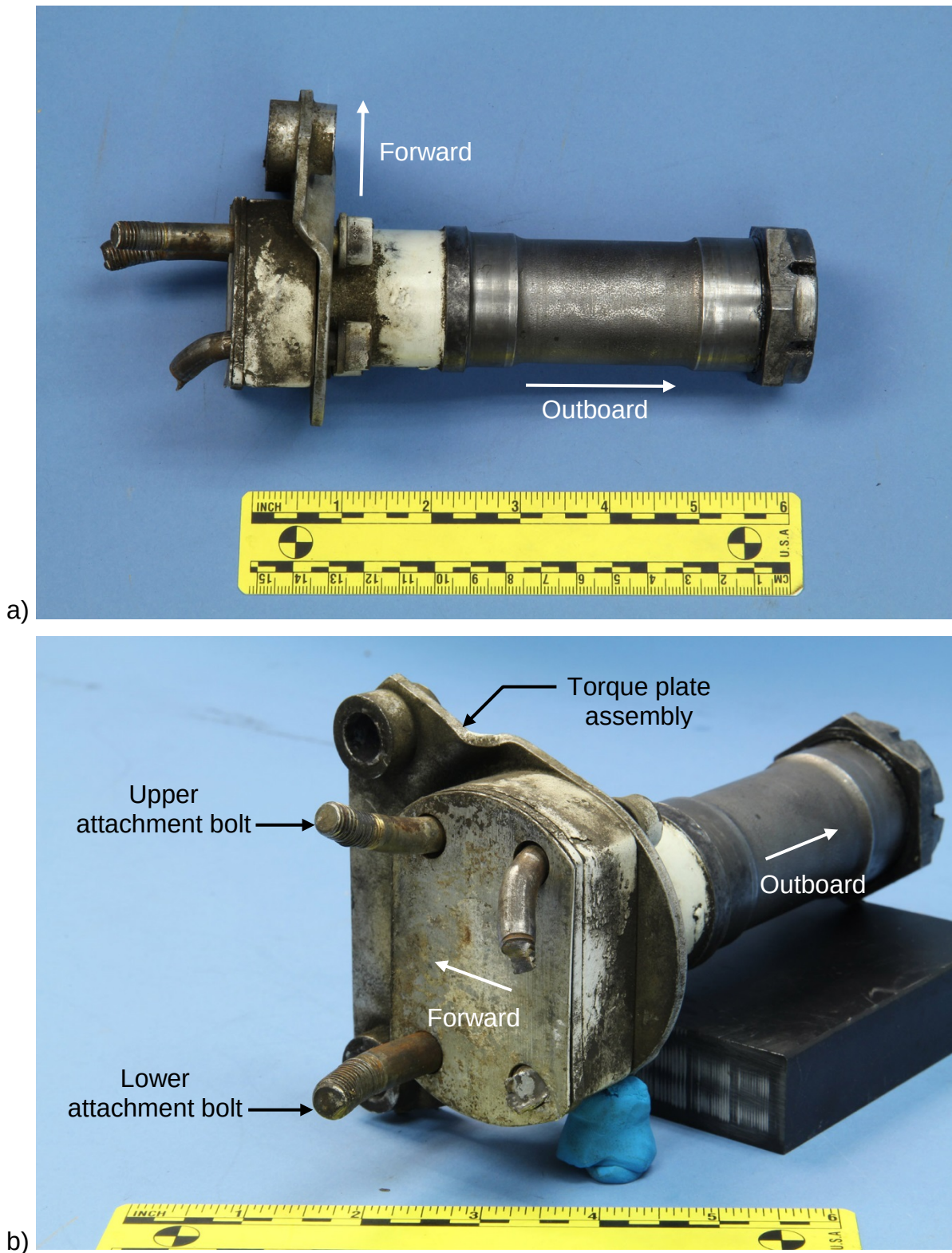


Figure 1: a) Image of the right main landing gear axle viewed from the top down and b) image of the axle viewed outboard and forward showing the deformed and fractured attachment bolts.

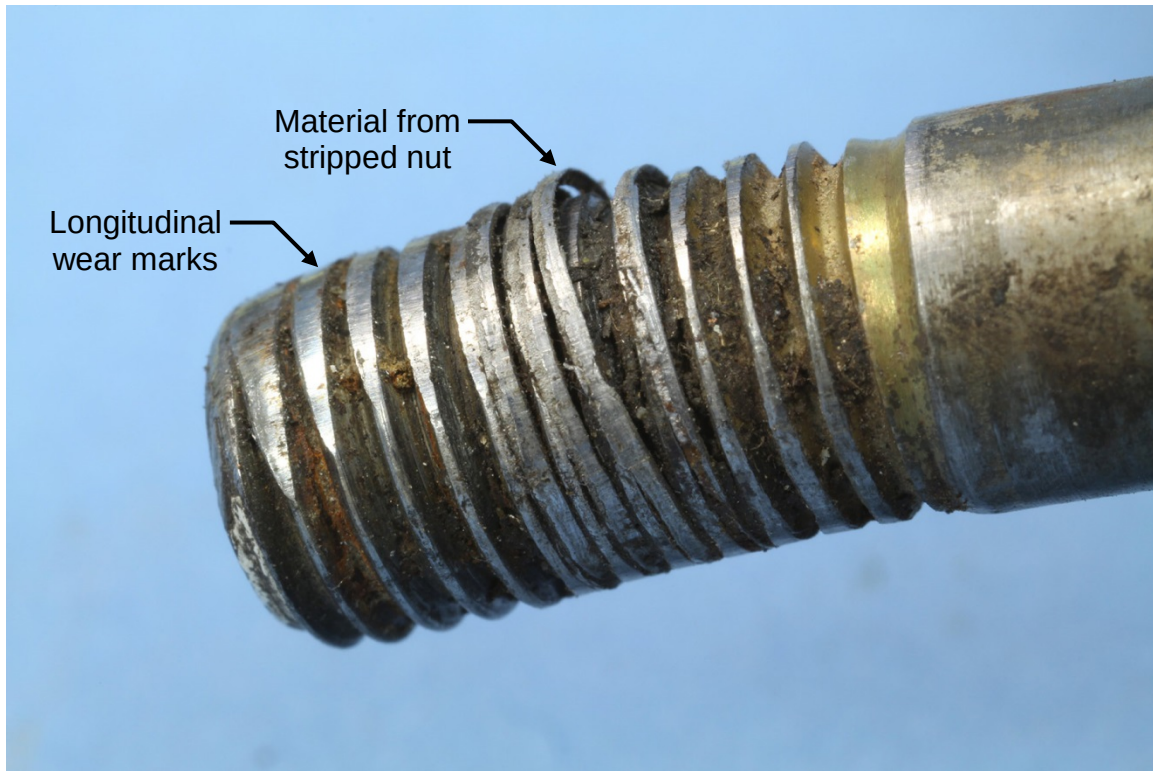


Figure 2: Image of the threaded end of the upper forward attachment bolt. Longitudinal wear marks were observed on the end of the bolt and a strip of metal was observed retained in four consecutive threads near the middle of the threaded section, consistent with material from a stripped nut.