

NATIONAL TRANSPORTATION SAFETY BOARD

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



March 16, 2016

MATERIALS LABORATORY FACTUAL REPORT

Report No. 16-030

A. ACCIDENT INFORMATION

Place : Charlotte Vermont
Date : August 7, 2015
Vehicle : Zenith STOL CH 750
NTSB No. : ERA15LA381
Investigator : Brian Rayner

B. COMPONENTS EXAMINED

Portion of nose landing gear fork and doubler.

C. DETAILS OF THE EXAMINATION

An engineering drawing of the nose landing gear is shown in Figure 1, with the submitted fork and doubler identified. Figures 2 and 4 show the as-received fork with the doubler attached. Visual examination revealed bending deformation of the fork tangs and the top portion of the fork. The approximate angles of deformation are shown in Figure 3. Based on the deformation pattern, a simple sketch showing the approximate kinematic deformation of the fork due to a side-oriented force is shown in Figure 5.

According to the engineering drawings, the fork and doubler are specified to be 0.187 inch thick aluminum alloy type 6061-T6 plate or sheet. The thickness of the aluminum plate used for the fork and doubler met specification as determined with a micrometer. Using a Thermo Scientific Niton XL3t-980 x-ray fluorescence (XRF) alloy analyzer, the fork is fabricated from aluminum alloy type 6061. In accordance with AMS 2658, the hardness of the fork is 59.8 HRB (average of 5 measurements) and the conductivity of the fork aluminum alloy is 43.8 % IACS (average of 3 measurements). Based on the hardness and conductivity data, the temper is T6 per AMS 2658.

Michael Budinski
Chief, Materials Laboratory Division

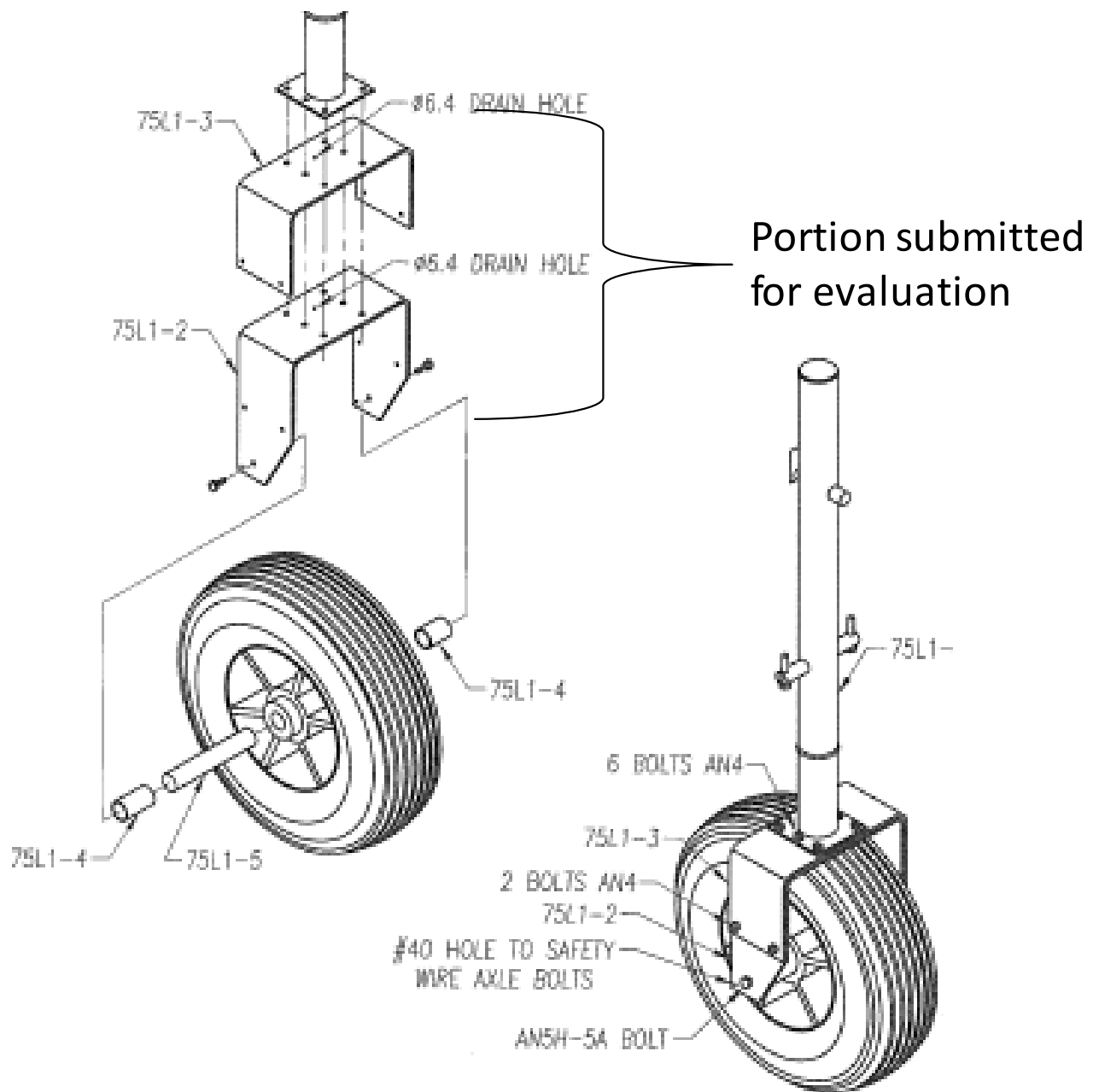


Figure 1 Isometric engineering drawings of the nose landing gear assembly.



Figure 2 View of the as-received portion of nose landing gear fork and doubler.

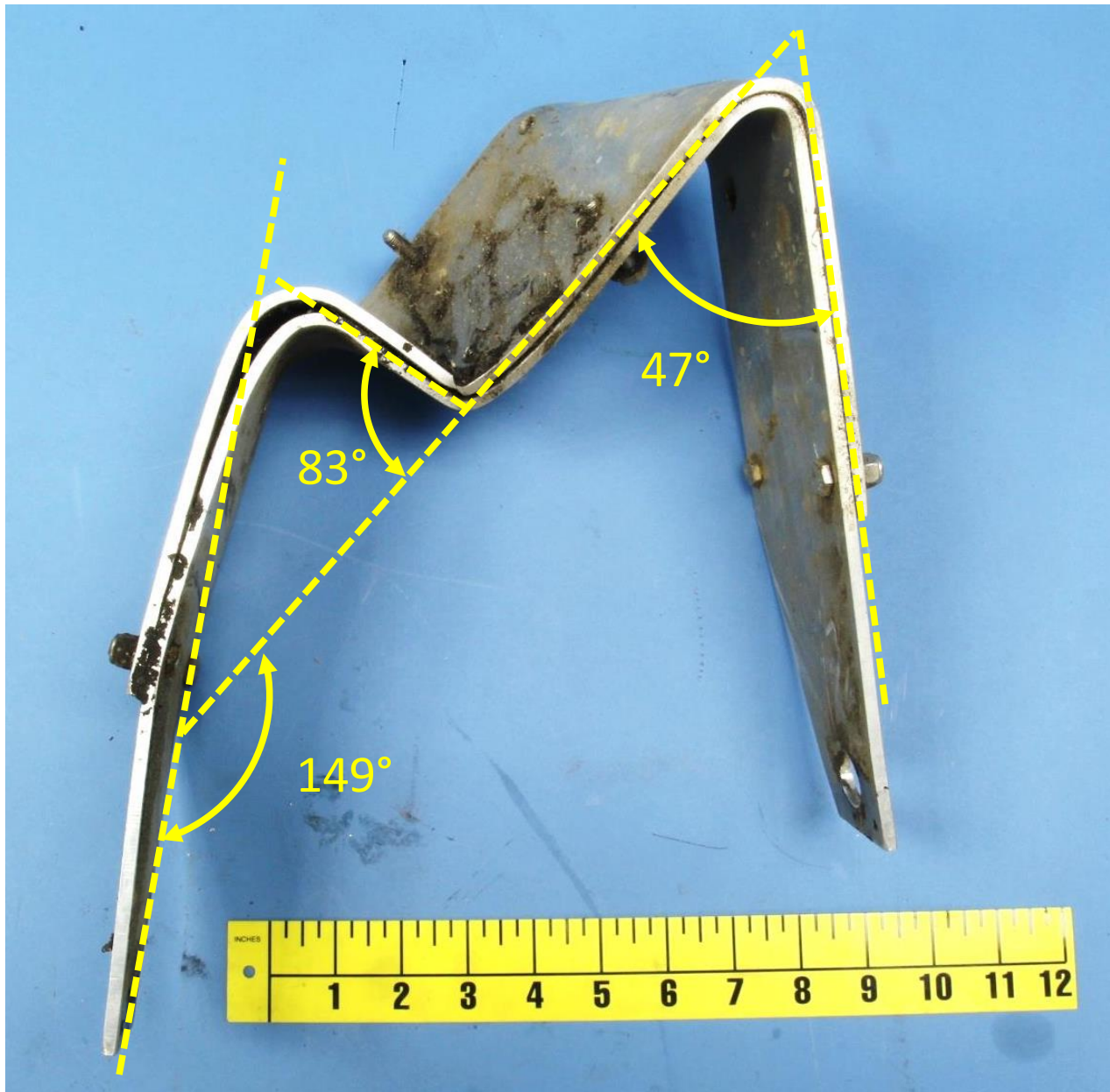


Figure 3 Same view as Figure 2 with the approximate angles of deformation indicated.



Figure 4 View showing the underside of the nose landing gear fork and doubler assembly.

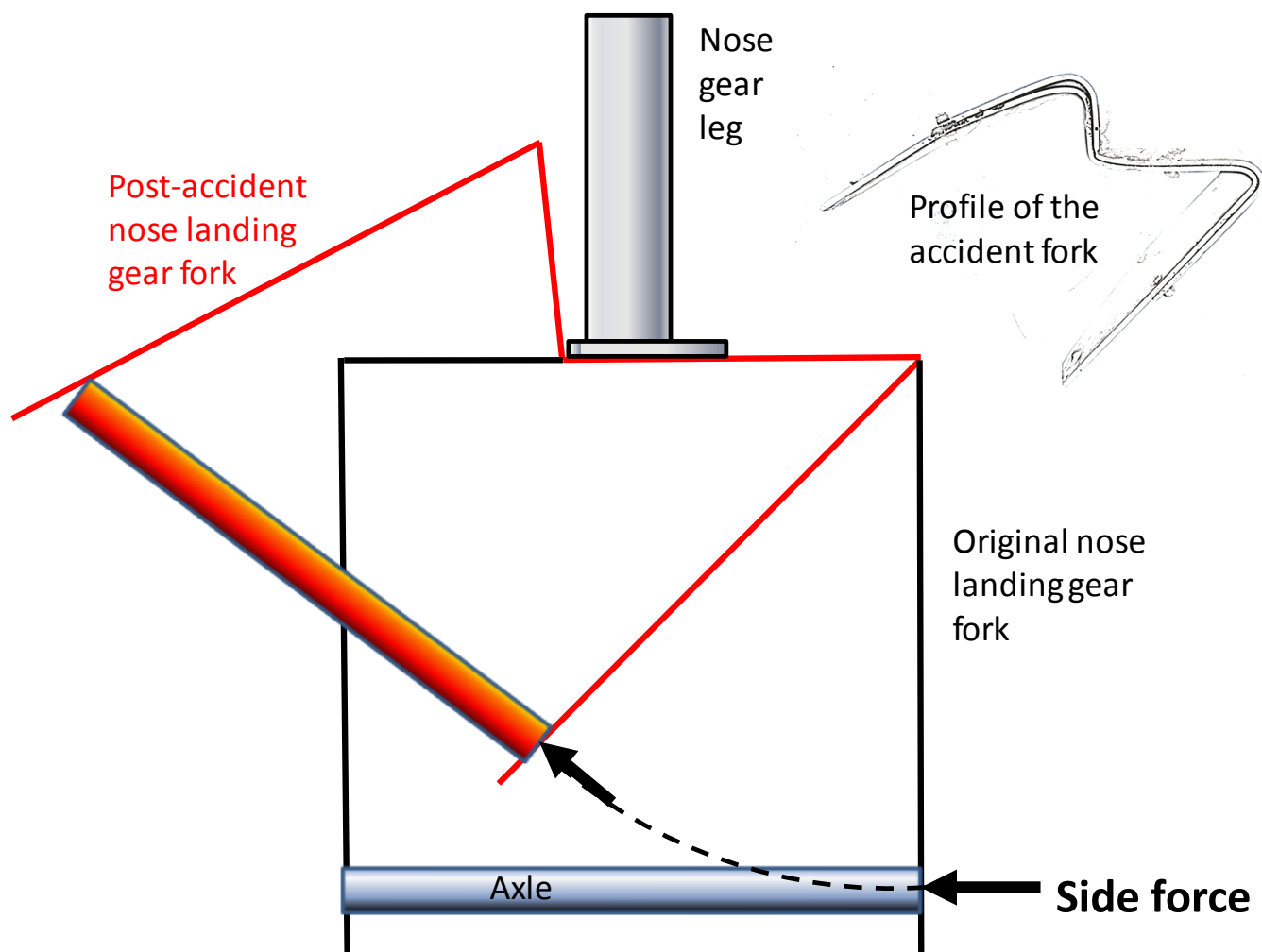


Figure 5 Schematic diagram showing the approximate kinematic deformation of the fork during the accident.