

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



ANC25LA021

MATERIALS LABORATORY

Factual Report 25-053

July 31, 2025

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A. ACCIDENT INFORMATION

Location: Lihue, Hawaii
Date: February 28, 2025
Vehicle: Gippsland GA-8, N699AV
Investigator: Mark Ward, AS-ANC

B. COMPONENTS EXAMINED

Right main landing gear leg.

C. EXAMINATION PARTICIPANTS

Specialist Matthew R. Fox, Ph.D.
NTSB
Washington, DC

D. DETAILS OF THE EXAMINATION

Overall views of the submitted right main landing gear leg pieces are shown in figure 1 as received. The leg was fractured near the middle of the bend at the upper end of the leg. As shown in figure 1 (c), paint was missing from areas of the lower surface adjacent to the fracture, and the exposed surfaces were corroded. The outboard piece had been cut below the fracture to facilitate shipment and examination at the NTSB Materials Laboratory.

The outboard side of the fracture was damaged from contact with terrain. The inboard side was relatively undamaged but appeared to be covered with loose greasy deposits and debris. However, a flat area with dark features and a curving boundary was observed on the lower side of the fracture, features consistent with fatigue.

After an initial optical examination was completed, acetate tape was used to clean the fracture surface and adjacent corroded area on the inboard piece. The acetate tape was softened with acetone and was then pressed against the fatigue region on the fracture surface and the adjacent lower surface area with missing paint. After the tape had hardened, the tape was removed, taking an impression of the surfaces while removing loosely adhering corrosion product. Next, the fracture surface was lightly cleaned using acetone and a soft bristle brush followed by an acetone rinse.

The cleaned fracture surface and adjacent lower surface on the inboard piece are shown in figures 2 and 3. At the lower side of the fracture surface, a portion of the fracture surface with no shear lip was covered with black, red, and orange oxides and had a curving boundary, features consistent with fatigue in relatively hard steel alloys

commonly used in main landing gear legs. Radial marks in the fatigue region emanated from a corrosion pit in the lower surface, identified as the origin in figure 2. The remainder of the fracture was primarily in the transverse plane and had a mostly matte gray appearance with small shear lips at the edges, features consistent with overstress fracture in the steel tubular section. The plane of fracture changed at the upper side of the fracture consistent with the final segment of fracture from bending loads.

Oxides and corrosion pits were observed on the lower surface adjacent to the fracture surface as shown in figure 3. Paint covering adjacent areas was bubbled, consistent with the presence of underlying corrosion damage.

As indicated in figure 1, the main landing gear had been attached to the fuselage at the inboard end of the leg, and the leg had been supported by the fuselage at a location inboard of the fracture location. As shown in the close view of the lower surface in figure 3, corrosion pits were also observed at the outboard edge of the support location.

Submitted by:

Matthew R. Fox, Ph.D.
Chief Technical Advisor, Materials Laboratory



Figure 1. Overall views of the submitted main landing gear pieces as received showing (a) the aft side and (b) the lower side. (c) Closer view of the lower surface at the fracture location.

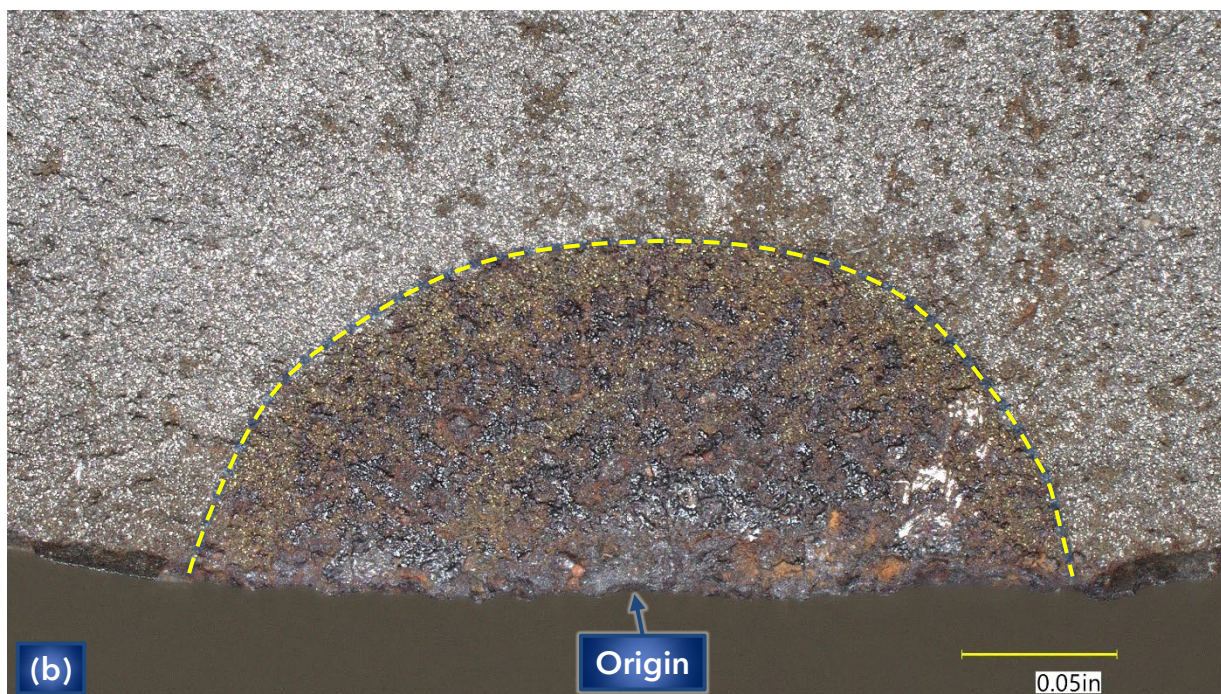


Figure 2. (a) Overall view of the inboard side of the fracture surface after cleaning with replicating tape and acetone. (b) Closer view of the fatigue region on the cleaned fracture surface. The fatigue crack origin is indicated, and a dashed line indicates the boundary of the fatigue region.



Figure 3. Closer view of the lower surface on the inboard piece of the right main landing gear after cleaning. The area showed bubbled and missing paint with substantial corrosion and pits adjacent to the fracture surface and at the outboard edge of the outboard support contact area.