

NATIONAL TRANSPORTATION SAFETY BOARD

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



May 17, 2022

MATERIALS LABORATORY FACTUAL REPORT

Report No. 22-036

A. ACCIDENT INFORMATION

Place : Bethel, Alaska
Date : November 20, 2021
Vehicle : Cessna 207
NTSB No. : ANC22LA007
Investigator : Mark Ward AS-ANC

B. COMPONENTS EXAMINED

Fuel line and wire harness

C. DETAILS OF THE EXAMINATION

A fuel line and adjacent wire harness was submitted to the Materials Laboratory for examination. The components are shown in Figures 1-3.

The fuel line was not intact. A section was missing and exhibited melting. The rest of the line also show signs of thermal exposure in the form of thermal fractures and sooting. The fuel line is shown in Figure 4. The damaged (melted) area of the fuel line was examined in a scanning electron microscope using energy-dispersive x-ray spectroscopy to determine if material transfer was present. No foreign material was found on the examined area.

The submitted wire harness section was largely intact with most of the wire insulation in place except for one area near the center of the of the harness where the insulation was missing. The harness exhibited heavy sooting and thermal discoloration to the remaining wire insulation. In the area with the missing insulation, the bare wire conductors exhibited a range of thermal and electrical damage from thermal discoloration and sooting to beading and welding in areas on individual conductors. The electrical damage to several conductors is shown in Figures 5-8. This damage is consistent with the wire being energized at the time the damage occurred.

Nancy B McAtee
Fire and Explosion Specialist



Figure 1. Wire harness from accident aircraft.



Figure 2. Brake line and one section of fuel line from accident aircraft.



Figure 3. Second section of fuel line from accident aircraft.

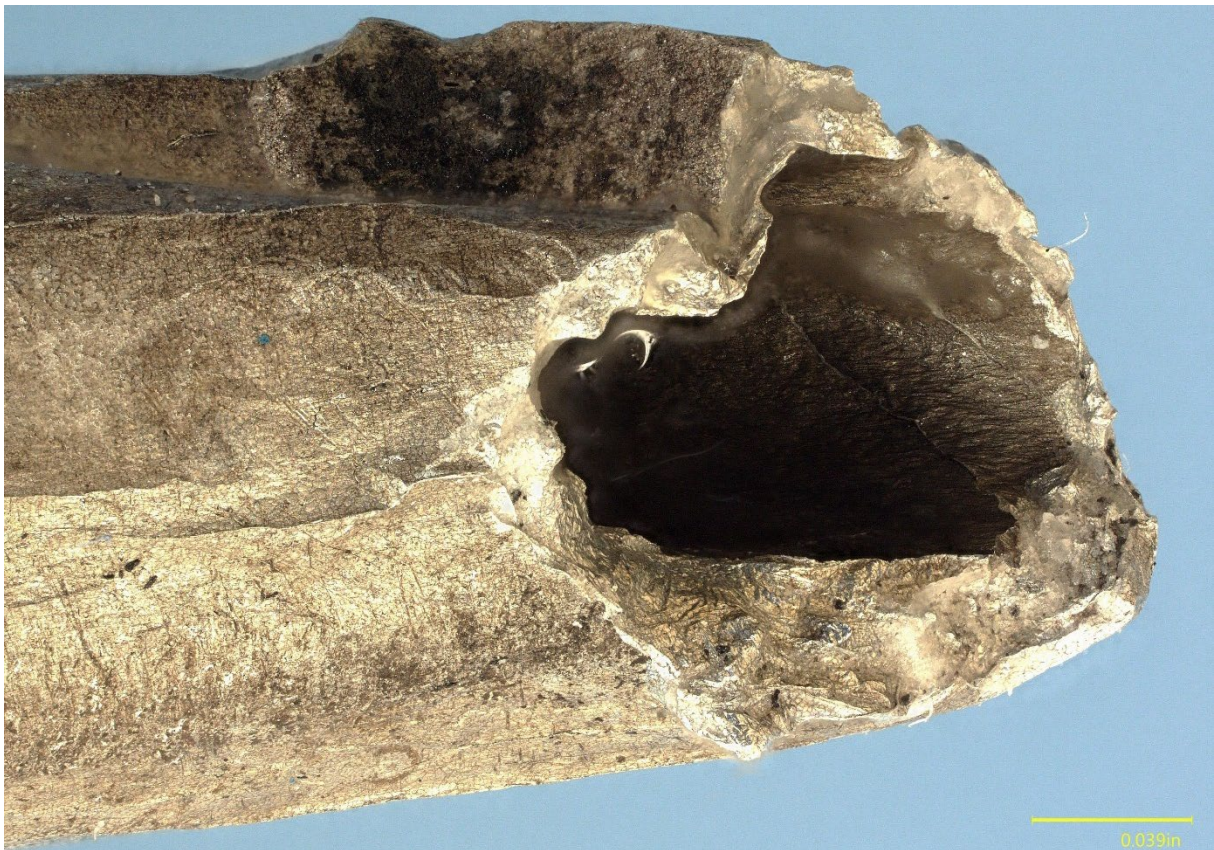


Figure 4. Closeup of thermal damage to end of fuel line section.



Figure 5. Wire conductor with multiple beads on the end.

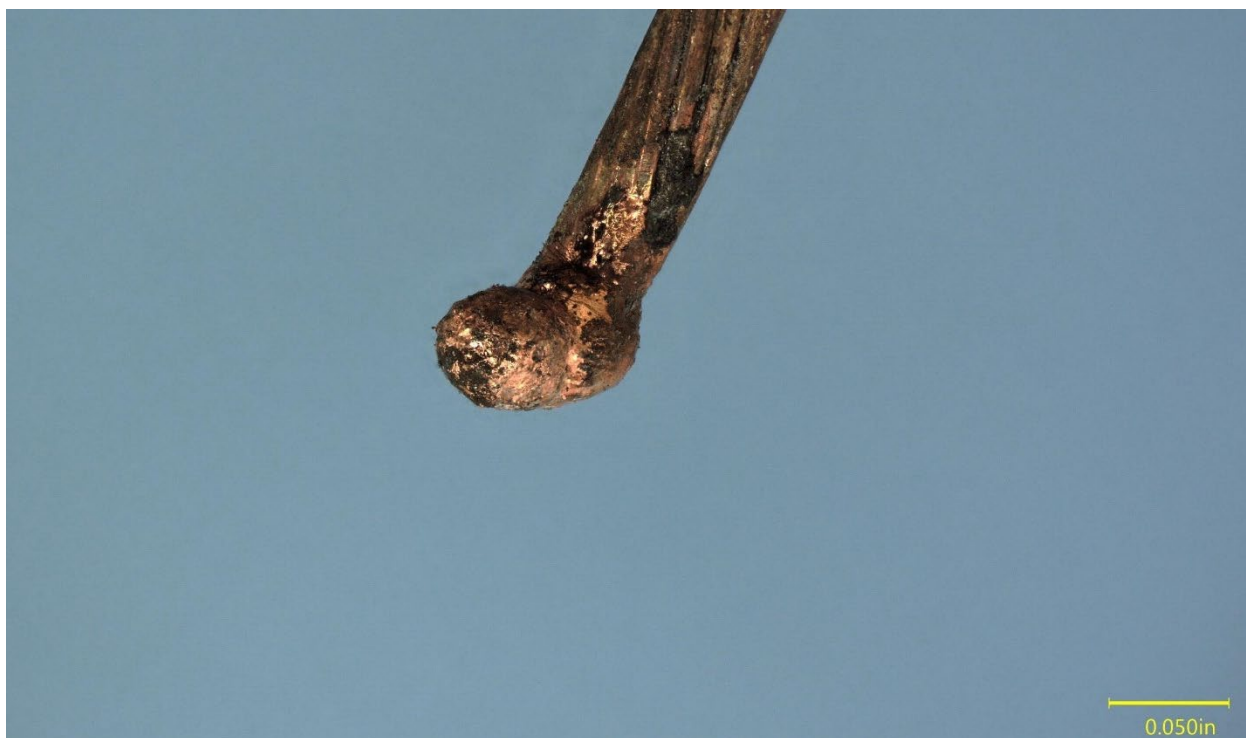


Figure 6. Wire conductor with beading on the end.

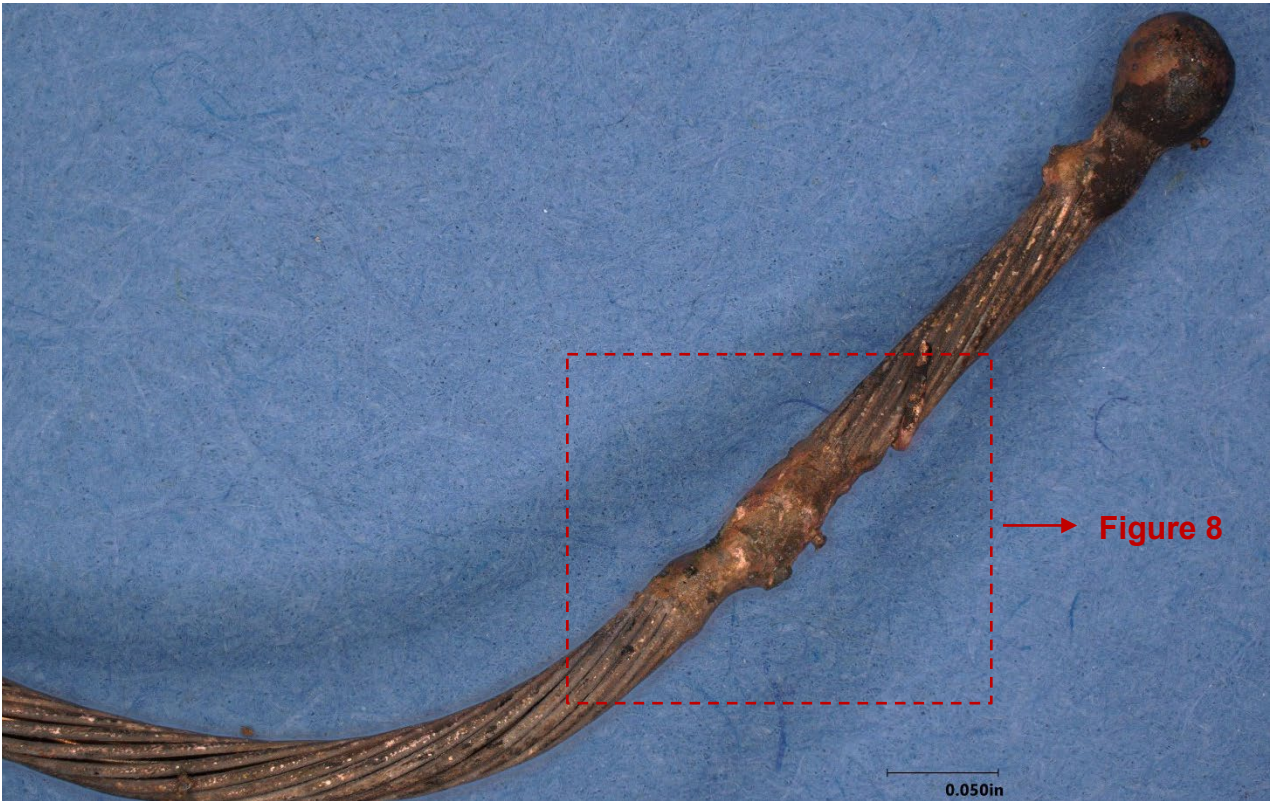


Figure 7. Wire conductor with arcing, welding, and beading.



Figure 8. Closeup of welded area on conductor in Figure 7.