

NATIONAL TRANSPORTATION SAFETY BOARD

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



12/18/2018

MATERIALS LABORATORY FACTUAL REPORT

Report No. 18-098

A. ACCIDENT INFORMATION

Place : Rio Oso, CA
Date : 12/4/2017
Vehicle : Beech A36, N251E
NTSB No. : WPR18LA043
Investigator : Tealeye Cornejo

B. COMPONENTS EXAMINED

The components submitted for examination were a fuel selector valve trim panel with attached wires, a fuel flow valve with fuel lines attached, and portion of electrical wiring figure 1.

C. DETAILS OF THE EXAMINATION

The trim panel for the fuel selector valve consisted of a molded plastic panel with a metal plate attached where the valve stem would protrude from behind the trim panel. The trim panel exhibited melting and carbonization along the bottom, top and forward edge (figure 2). The trim panel also included two indicator lamps and their associated wiring. The wiring exhibited melted and missing insulation consistent with exposure to a fire environment. The wiring that was attached to this trim panel did not exhibit evidence of electrical arcing.

The fuel selector valve exhibited sooting on some of the fuel lines as well as a fuel line with a rough spot and pin hole near a 90-degree bend (figure 3). Examination of the rough spot revealed cratering and re-solidified metal splatter adhering to the fuel line surface as well as a hole through the fuel line wall (figure 4). These features are consistent with electrical arc erosion of the fuel line.

Examination of the trim panel and fuel selector valve placed together as they would have been installed in the accident aircraft (figure 5) revealed that the damaged portion of the fuel line was in alignment with the damage observed on the trim panel.

The portion of electrical wiring (figure 6) consisted of two conductors fastened together. One end of the portion of wiring was cut for removal and the other end had terminal connectors attached. The end of the wiring with the terminal connectors attached exhibited missing and charred insulation. Examination of the terminal

connectors revealed surface features on one of them consistent with electrical arc erosion (figure 7).

Joseph Panagiotou
Fire Protection Engineer



Figure 1: Accident parts as received.



Figure 2: Inboard and outboard facing sides of the trim panel.

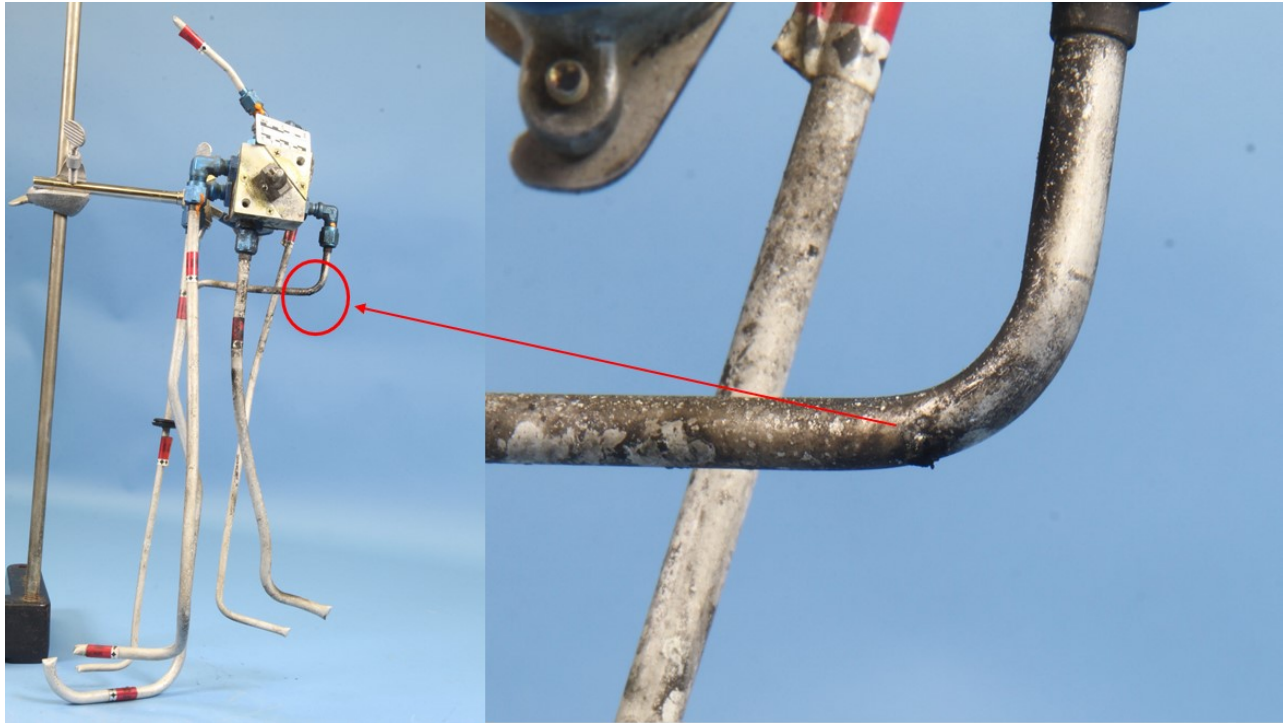


Figure 3: Fuel selector valve with fuel lines exhibiting sooting and arc erosion damage.

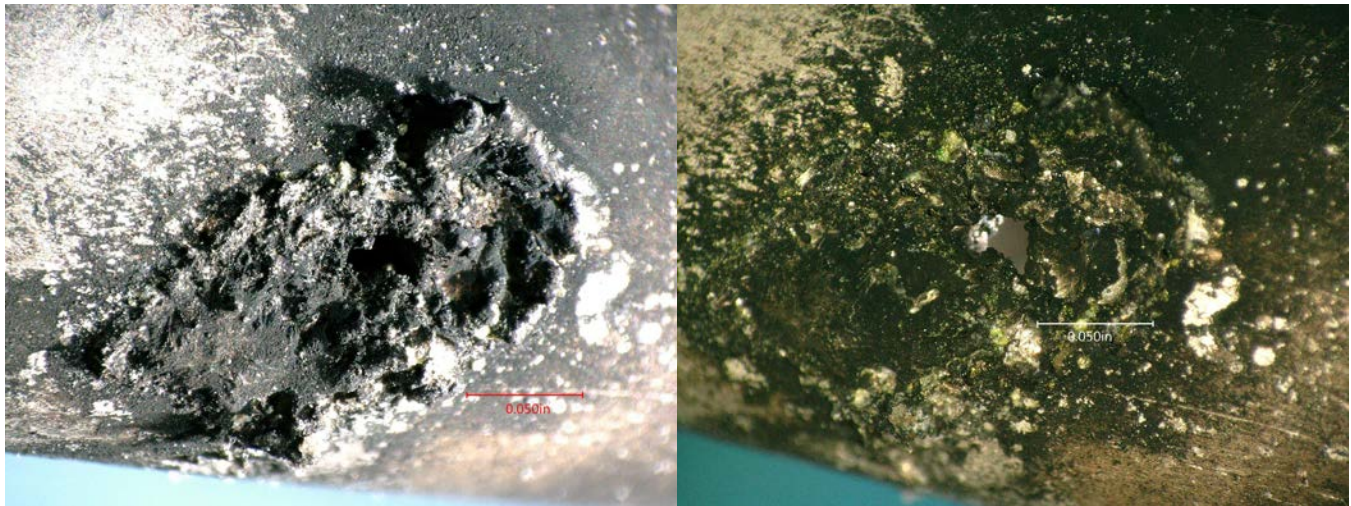


Figure 4: Images from digital microscope showing arc erosion and a hole through the fuel line wall.

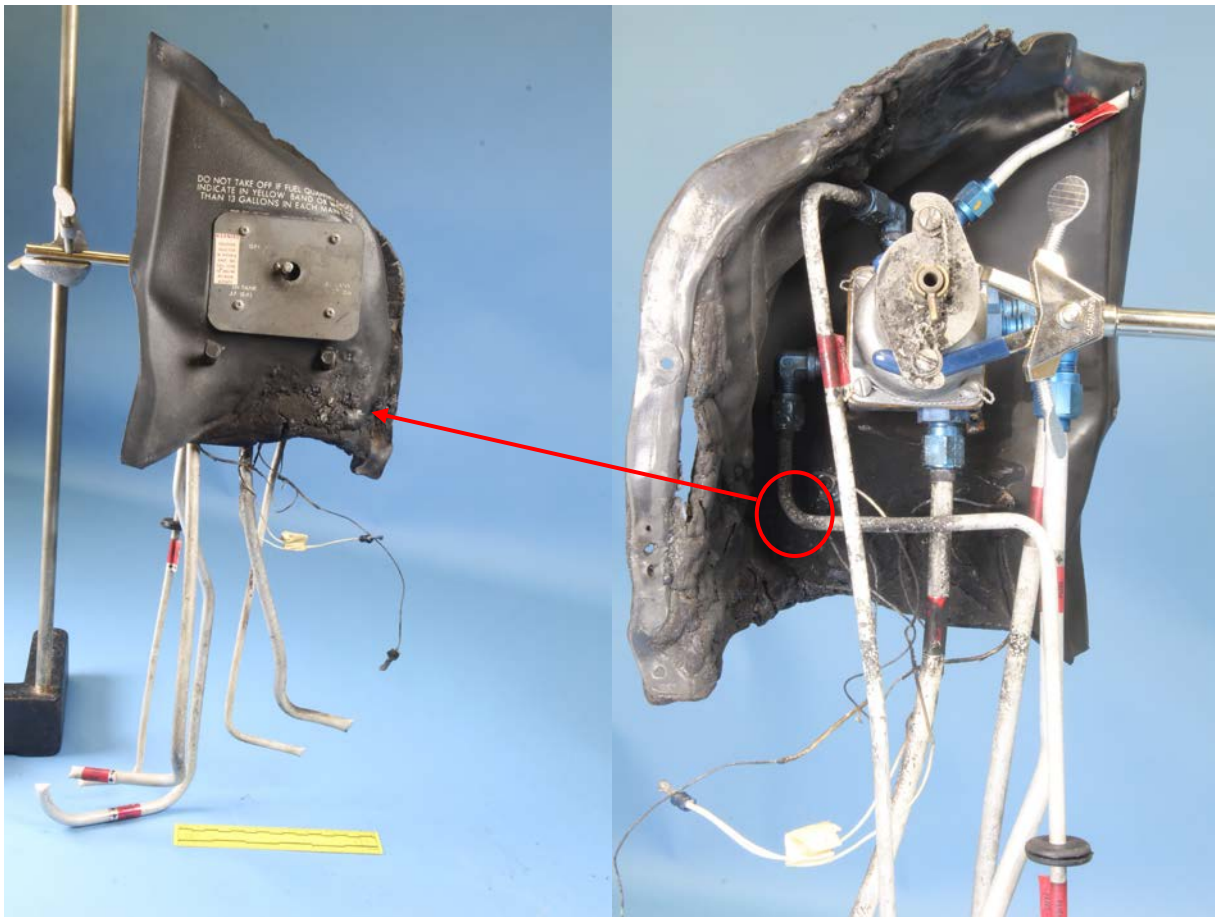


Figure 5: Alignment of fuel selector valve and trim panel. The location of the damaged fuel line is shown by the red circle.

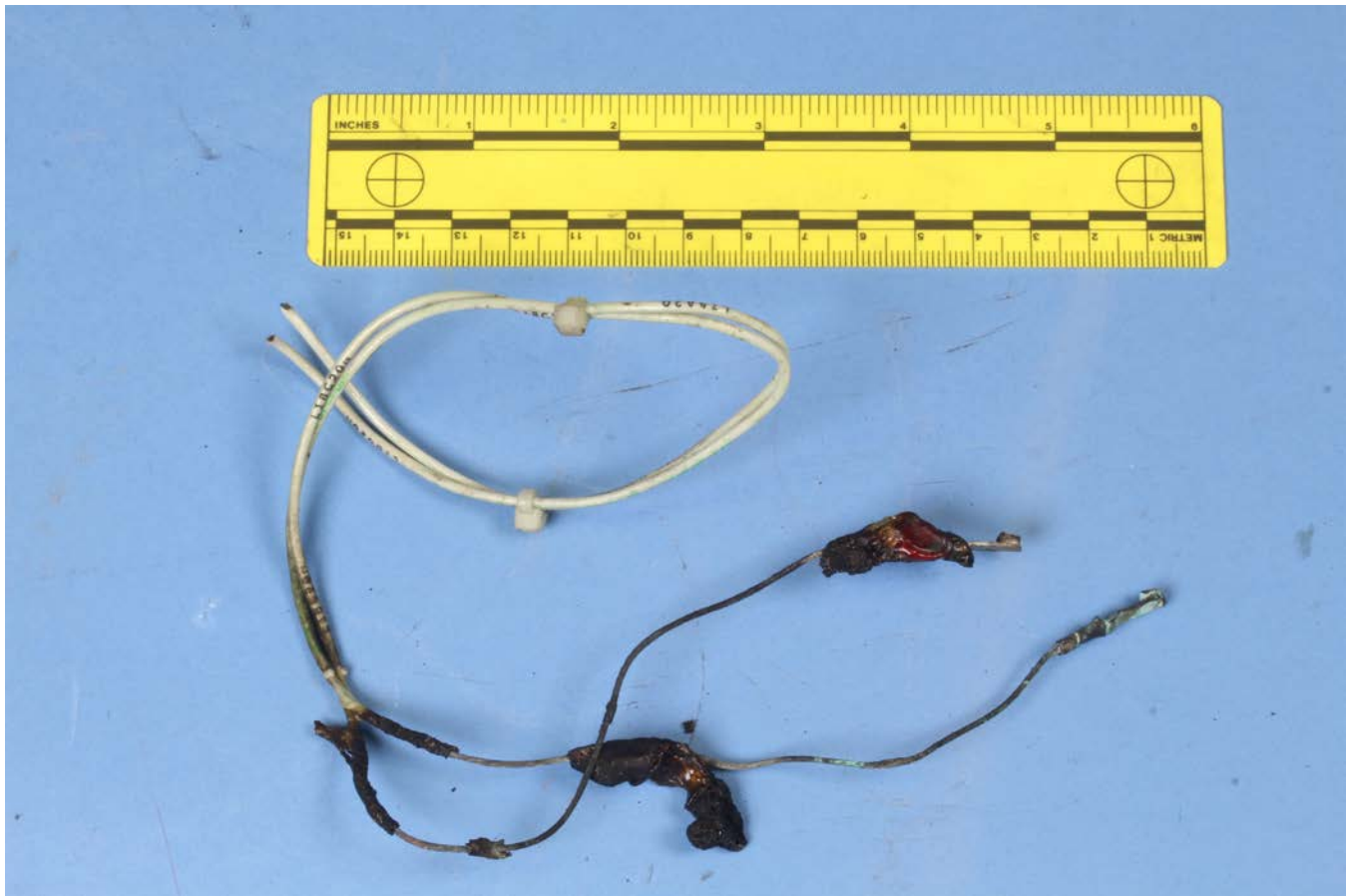


Figure 6: Portion of electrical wiring exhibiting fire damage.



Figure 7: Terminal connector exhibiting electrical arc erosion.