National Transportation Safety Board
Office of Research and Engineering
Washington, DC 20594

ERA23FA137

MATERIALS LABORATORY

Factual Report 23-094

November 17, 2023

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A. ACCIDENT INFORMATION

Location: Lindenhurst, NY
Date: 3/5/2023
Vehicle: Piper PA28-161
Investigator: Brian Rayner

B. COMPONENTS EXAMINED

Photographs from the initial on-scene examination and the aircraft wreckage during a lay out at an aircraft recovery facility.

C. EXAMINATION PARTICIPANTS

Group Chair	Joseph Panagiotou National Transportation Safety Board Washington, DC
Group Member	Jonathon Hirsch Piper Aircraft Inc Vero Beach, FL

D. DETAILS OF THE EXAMINATION

The resting position of the wreckage was photo documented by investigative party members from Lycoming. These photos of the wreckage were taken after the fire fighting and emergency response efforts had been completed.

The aircraft had impacted trees while on descent after reporting an in-flight fire. The impacts with trees resulted in a path of debris leading up to the main portion of the wreckage (Figure 1). Some portions of the aircraft burned after coming to rest. The post-crash fire was fueled by gasoline released from the impact damaged wing tanks. A portion of the left wing, upstream of the main wreckage, in the debris field exhibited fire damage (Figure 2). This portion of left wing included the landing gear and part of the fuel tank. Further upstream, inside a fenced in lot, some personal watercraft resting on trailers exhibited fire damage on their covers. A portion of the engine cowling was also found upstream of the main wreckage near the portion of left wing (Figure 2). The fuselage and forward portion of the cockpit had been almost entirely consumed and melted during the fire (Figures 3, 4).

The aircraft wreckage was collected and transferred to an aircraft recovery facility where it was made available for inspection. The portions of the aircraft were

laid out and arranged in their relative positions to the extent possible. Examination of the portion of empennage and the vertical and horizontal stabilizers of the tail section did not reveal any burn patterns or soot deposition patterns on the surfaces that could be attributed to an in-flight fire (Figure 5). The fire damage on the empennage and its associated flight control surfaces was consistent with exposure to a fire while on the ground and at rest. Portions of the left (Figure 6) and right (Figure 7) wings were examined for burn patterns and soot deposition consistent with in-flight fire. No evidence of fire damage or sooting consistent with an in-flight fire was observed on the portions of the left and right wings. The fire damage to the portions of the left and right wings was consistent with burning while on the ground and at rest. A portion of the engine cowling consisting mostly of the top and left sides of the cowling was examined for evidence of fire. Neither the exterior (Figure 8) or interior (Figure 9) surfaces exhibited any thermal damage or soot deposition.

Very little material remained from the fuselage and cockpit area of the aircraft. The parts that could be identified from the cockpit area consisted mostly of the steel seat frames, some electronic components from the instrument panel, control cables, and portions of aircraft skin under the seat frames (Figure 10). Examination of these components did not reveal any clues as to the cause and origin of the reported in-flight fire.

The firewall between the engine compartment and fuselage interior had been exposed to fire and exhibited thermal damage on both sides (Figures 11, 12). Although the firewall panel was composed of sheet steel and remained intact it exhibited deformation and thermal discoloration. The thermal damage to the firewall and the attached components was relatively uniform and consistent on both sides. Examination of the firewall and components remaining attached to the engine side of the firewall did not reveal any discernable evidence of concentrated thermal damage beyond the overall thermal exposure exhibited by all the materials in the area. Examination of the firewall and components remaining attached to the cockpit side of the firewall did not reveal any concentrated thermal damage on the firewall panel but did identify two copper tubes (associated with the fuel priming pump) and a fitting on a copper tube (oil pressure line) that exhibited localized areas of melting (Figure 13). These components exhibited a sharp demarcation between the melted area and the adjacent material. The fuel priming lines were standard equipment consistent with the aircraft design. The fitting on the oil pressure line was not standard equipment and was not consistent with the design of the original oil pressure line. Both the fuel primer lines (Figure 14) and the fitting on the oil pressure line (Figure 15) were retained for further examination.

The aircraft's maintenance logs contained an entry dated 1/16/2023 describing a pilot's report of smoke in the cockpit during a flight on 1/7/2023 (Figure 16). The entry did not indicate that a source of the smoke was found during trouble shooting or that any repairs were made before returning the aircraft to service.

Submitted by:

Joseph Panagiotou
Fire Protection Engineer

Figure 1. Resting position of the aircraft at the accident site. The aircraft spun around and was facing opposite the direction of travel.

Figure 2. A portion of left wing with main landing gear attached. A portion of the engine cowling can be seen at the base of a tree.

Figure 3. Remaining portions of the aircraft fuselage.

Figure 4. Cockpit portion of fuselage.

Figure 5. Portion of the empennage and tail section components.

Figure 6. Portion of the left wing.

Figure 7. Portions of the right wing.

Figure 8. Exterior surface of the portion of engine cowling.

Figure 9. Interior surface of the portion of engine cowling.

Figure 10. Cockpit portion of the fuselage.

Figure 11. Engine side of the firewall.

Figure 12. Cockpit side of the firewall.

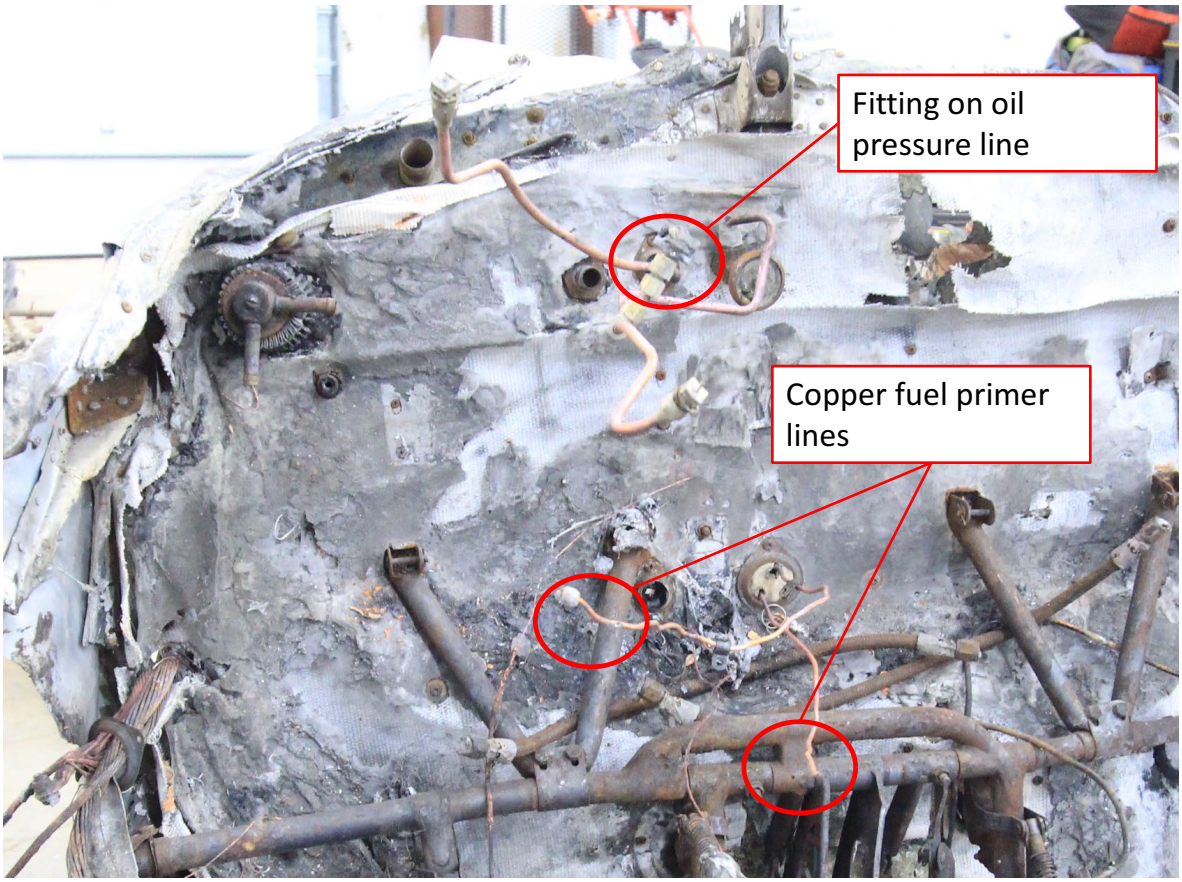

Figure 13. Components exhibiting localized melting on cockpit side of the firewall.

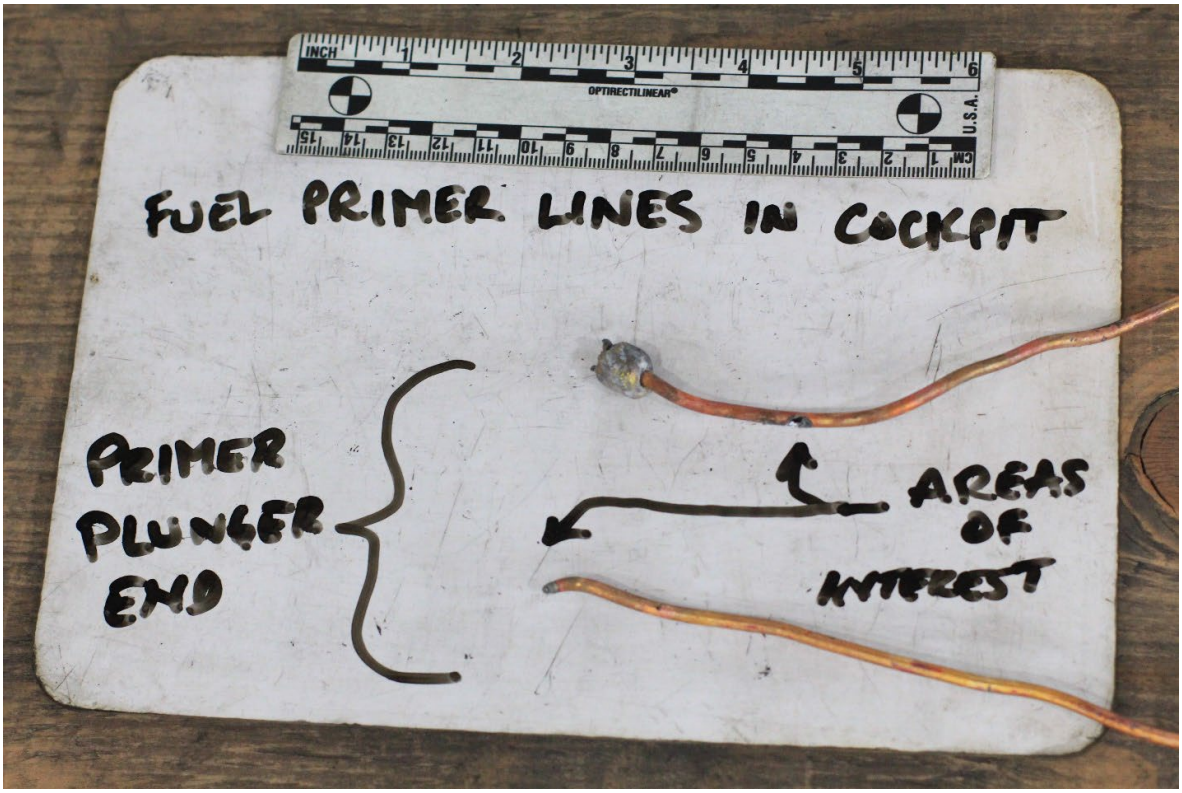

Figure 14. Portions of the fuel primer lines.

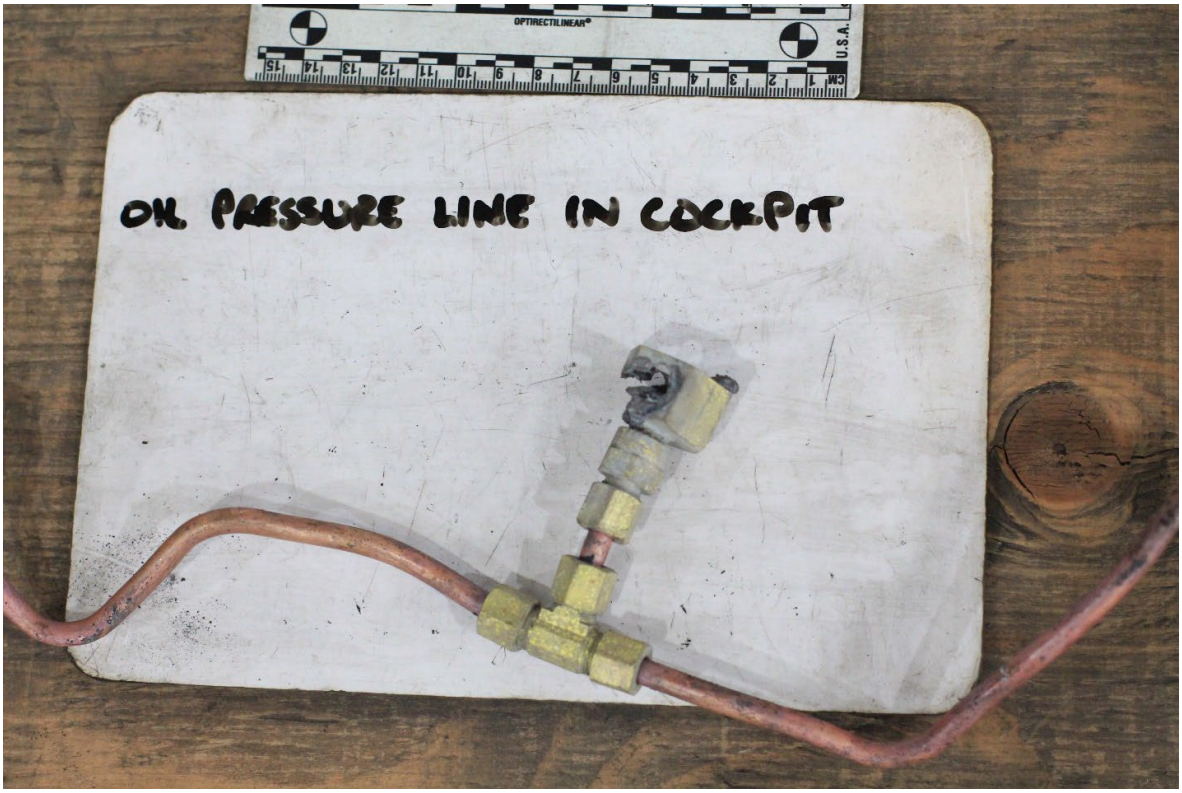

Figure 15. Portion of oil pressure line with fitting.

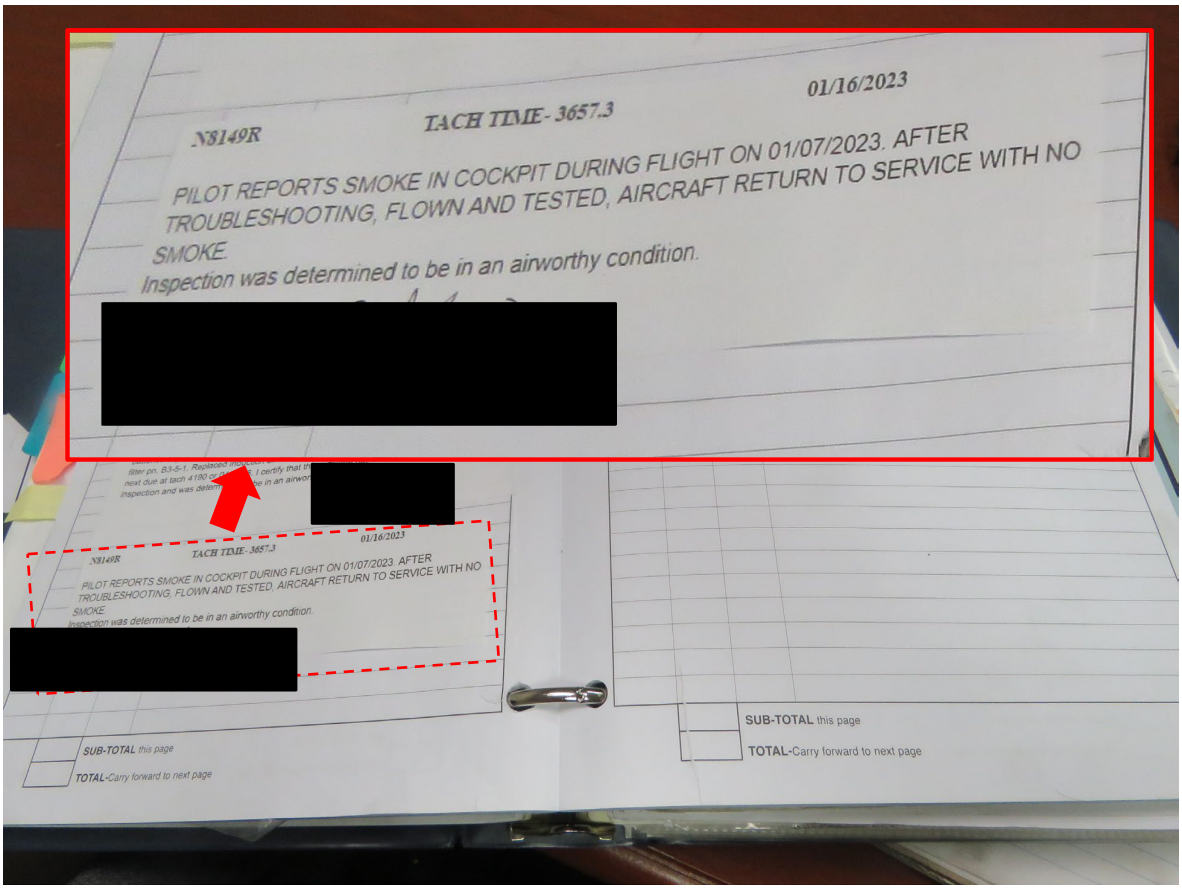

Figure 16. Logbook entry describing previous issue with smoke in the cockpit.