

NATIONAL TRANSPORTATION SAFETY BOARD

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



7/31/2017

MATERIALS LABORATORY FACTUAL REPORT

Report No. 17-058

A. ACCIDENT INFORMATION

Place : Georgetown, Delaware
Date : January 28, 2017
Vehicle : Piper PA-22, N3659Z
NTSB No. : ERA17LA097
Investigator : Heidi Kemner

B. COMPONENTS EXAMINED

Fire damaged aircraft wreckage

C. DETAILS OF THE EXAMINATION

The wreckage examined belonged to an aircraft that had experienced an in-flight fire and managed to land at the originating airport. The pilot described smoke suddenly pouring out from the instrument panel and then from behind the glare shield. The pilot stated that while trying to land he noticed flames down by his feet. After landing, the aircraft was substantially damaged by fire (figures 1, 2). The pilot's description of the onset and growth of the fire is consistent with a fast-growing fire such as a liquid fuel-fed fire instead of a fire initiating with solid combustibles.

The wreckage examination took place at an aircraft recovery facility. The remains of the aircraft's fuel system were examined for potential sources of leaks. The fuel lines were constructed out of aluminum and in many areas, did not survive the heat of the fire. Inside the passenger compartment there is a fuel tank selector valve to the pilot's left and an engine priming pump on the instrument panel to the pilot's right. The fuel selector valve was thermally damaged and its function could not be verified (figure 3). The heat from the fire had melted the output fuel line from the selector valve up to the firewall. The input fuel line from the right-side wing tank was also missing with the exception of a small stub. The engine primer pump was missing and could not be located among the collected wreckage. Small stubs of the copper primer pump fuel lines were visible on the firewall with melted ends (figure 4). No remains of the primer pump fuel lines were found inside the cockpit. The fuel primer lines in the engine compartment remained intact and did not appear to have leaked. In the engine compartment, the main fuel line from the fuel strainer to the carburetor was found to be loose. Figure 5 shows a diagram of the fuel system and the fuel lines remaining are indicated with a green highlight.

Overall, the right side of the aircraft received more thermal damage than the left. This could be attributed to the way the aircraft came to rest and the damage to the right wing after landing. The engine compartment was overall the least thermally-damaged part of the aircraft. There was more thermal damage on the lower left portion of the engine than there was on the lower right (figure 6). This area is consistent with the location of the loose fuel line supplying the carburetor.

The lower engine cowling was removed and examined. Although on the exterior, this lower cowling exhibited comparable thermal damage on both the left and right sides (figure 7) on the interior there was more thermal damage to the left side than the right side (figure 8). Additionally, the overall thermal damage to the left side of this cowling was greater on the interior than on the exterior.

Joseph Panagiotou
Fire Protection Engineer



Figure 1: Aircraft remains after fire extinguishment.



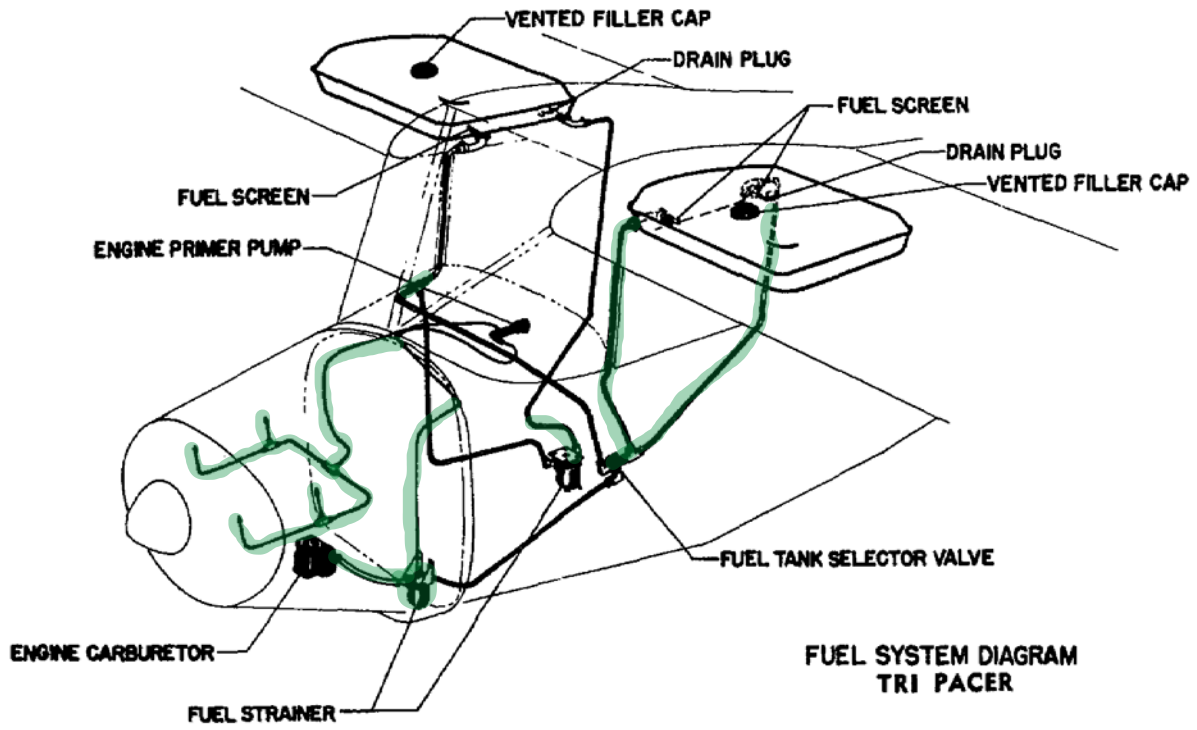
Figure 2: Aircraft remains after fire extinguishment.



Figure 3: Fuel selector valve with input from right wing tank missing and output fuel line also missing.



Figure 4: Melted engine primer pump fuel lines protruding into the cockpit from the engine compartment firewall.



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Figure 5: Fuel system diagram depicting the remaining fuel lines in green highlight.

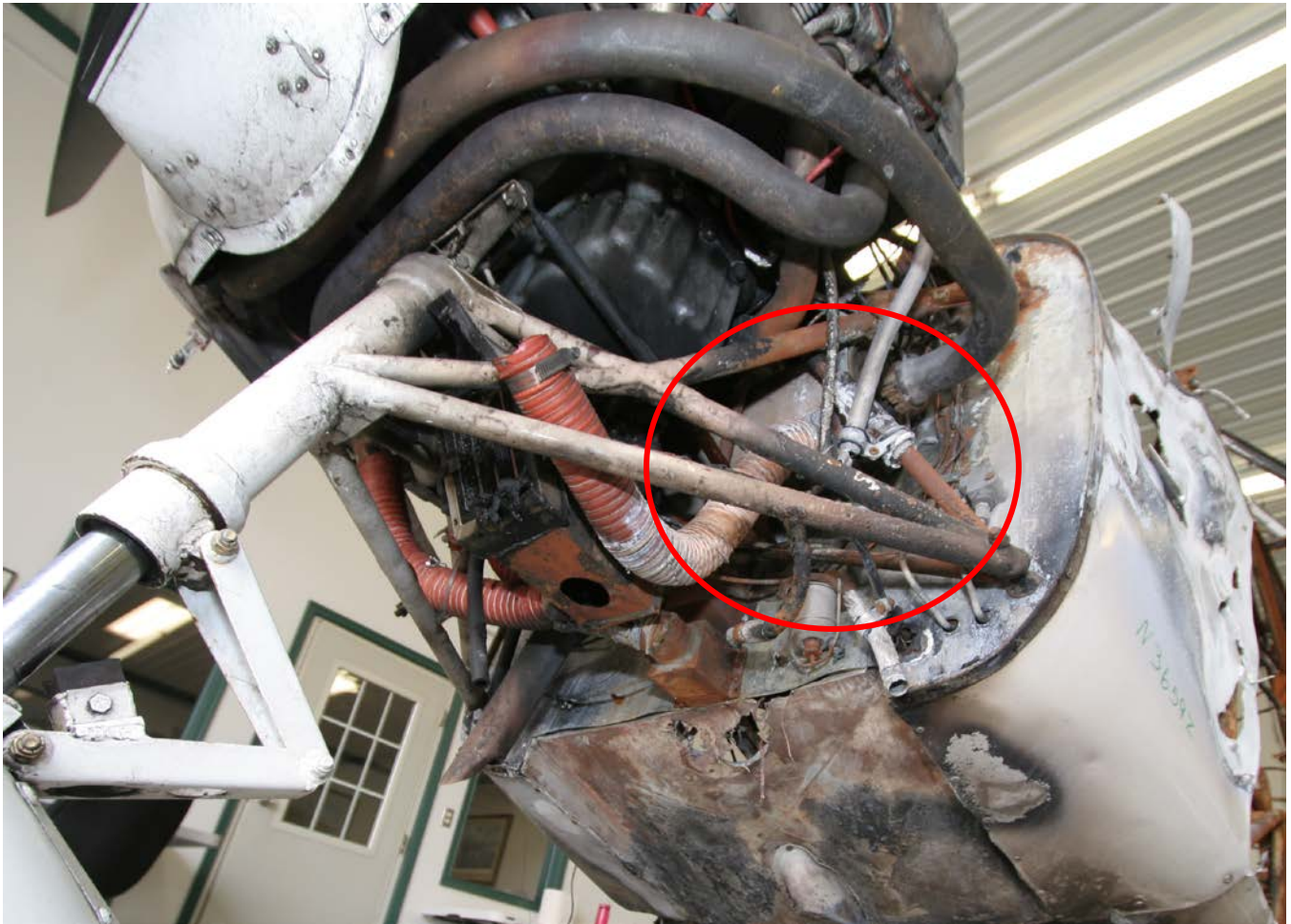


Figure 6: Area of thermal damage at the lower left side of the engine.



Figure 7: Engine compartment lower cowling (exterior side).



Figure 8: Engine compartment lower cowling (interior side).