

AVIATION OCCURRENCE REPORT

FIRE ON TAKE-OFF

**PIPER APACHE PA-23 C-FYXT
SAINT-MATHIAS AERODROME, QUEBEC
10 MARCH 1996**

REPORT NUMBER A96Q0034

The Transportation Safety Board of Canada (TSB) investigated this occurrence for the purpose of advancing transportation safety. It is not the function of the Board to assign fault or determine civil or criminal liability.

AVIATION OCCURRENCE REPORT

FIRE ON TAKE-OFF

PIPER APACHE PA-23 C-FYXT

SAINT-MATHIAS AERODROME, QUEBEC

10 MARCH 1996

REPORT NUMBER A96Q0034

Summary

After a training flight, the pilot owner, accompanied by his instructor, landed the Piper PA-23 at the Saint-Mathias aerodrome, Quebec, to refuel. After refuelling, which took approximately 30 minutes, the pilot taxied the aircraft for a flight to the Beloeil airport, Quebec. Prior to take-off, the pilot did a run-up of about five minutes. During the initial climb, shortly after take-off, at a height of about three feet above ground level, the instructor, who was sitting in the right-hand seat, observed smoke emanating from the rear of the right engine. He told the pilot to land the aircraft immediately. The pilot landed the aircraft on the runway ahead, and the aircraft came to a stop in a ditch located at the end of the runway.

The two occupants evacuated the aircraft quickly and without any difficulty. Shortly thereafter, the local firefighters arrived and extinguished the fire that had broken out under the aircraft's right nacelle, where fuel was running onto the ground. No one was injured.

Ce rapport est également disponible en français.

Other Factual Information

The crew was certified and qualified for the flight according to existing regulations.

The gravel runway measured 2,000 feet long by 50 feet wide. The aircraft landed with the landing gear down and locked. The fuel selector was in the "Main" position during take-off and during the inspection of the aircraft.

Examination of the aircraft confirmed that the source of the fire was under the right nacelle in the area occupied by the fuel supply selector for the right engine, the fuel filter, and the auxiliary fuel pump. The damage caused by the fire ran from the right engine, near the firewall, towards the back of the firewall. The spar had been completely destroyed by the fire and no longer supported the wing.

Examination of the electrical system did not reveal any sign of a short circuit. No circuit breaker had disconnected from the electrical system.

A single line in the hydraulic system was ruptured. The line was not actuated during the take-off run and was not in an area where a fire could have started in the event of a leak of hydraulic fluid.

The fire consumed the fuel filter and its adjacent parts as well as the fuel lines for selecting the tanks.

The fuel system was at the centre of the source of the fire. The auxiliary pump, also located in this area, fell off onto the ground during the fire. This pump is normally supposed to be fastened to the structure by two bolts and nuts, but only one retaining bolt was in place. The other retaining point did not show any trace of a bolt having been present before the fire. Further, the fitting that connected the fuel supply to the pump was not fully tightened, and fuel could leak out. The fuel filter was supposed to be fastened to the pump fitting, but no trace of the filter was found. The retaining points of the auxiliary fuel pump did not show any sign of electrical arcing.

The aircraft was certified and maintained in accordance with existing regulations and approved procedures. It was not fitted with a fire indicator, nor is one required for this type of aircraft.

Analysis

As the aircraft was not fitted with a fire indicator, the presence of the instructor permitted fast detection of the fire and interruption of the take-off.

No trace of the fuel filter was found. The absence of the filter, which should have been connected to the auxiliary fuel pump which

fell to the ground during the fire, coupled with the observed fuel leak, would seem to indicate that the filter was consumed by the fire, and that it was improperly installed. The fitting that connected the filter to the pump was not tight enough to prevent the possibility of a fuel leak.

The pump and the filter should have been held in place by two retaining bolts. As one bolt was missing and no part of it was found, it is impossible to determine whether the bolt broke off or came undone on a previous flight, or how long it had been missing.

Further, as the auxiliary fuel pump was fastened to the structure by only one bolt instead of two, the weakness of the installation of the pump and the filter, which connects to the pump at the fitting, might have contributed to causing a fuel leak.

The considerable damage in this area of the aircraft, however, made it impossible to determine exactly what factor initiated the fire in the fuel.

It was difficult for the pilot to stop the aircraft on the runway itself because the runway is only 2,000 feet long.

Findings

1. The fire broke out at the rear of the right nacelle in the area occupied by the filter, the auxiliary fuel pump, and the fuel selector.
2. The auxiliary fuel pump had only one retaining bolt holding it to the structure instead of two.
3. The fitting attaching the fuel filter to the auxiliary fuel pump inlet was not fully tightened and it was possible for fuel to leak.
4. The fuel filter was consumed by the fire, and no debris was found.

Causes and Contributing Factors

A fuel leak in the connection between the auxiliary fuel pump and the fuel filter allowed a fire to start in the right nacelle during take-off. The absence of one of the fastening bolts from the auxiliary fuel pump and an inadequately tightened fitting are factors that may have contributed to the fuel leak.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson, Benoît Bouchard, and members Maurice Harquail and W.A. Tadros, authorized the release of this report on 12 September 1996.