

AVIATION INVESTIGATION REPORT

A01P0207

ENGINE POWER LOSS

PITTS S2A-E C-GMWT

INVERMERE, BRITISH COLUMBIA

24 AUGUST 2001

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 Investigation Report

Engine Power Loss

Pitts S2A-E C-GMWT

Invermere, British Columbia

24 August 2001

Report Number A01P0207

Summary

The Pitts Special aerobatic aeroplane, serial number K0051, took off from Runway 33 at Invermere, British Columbia, at about 1815 mountain daylight time. The pilot/owner was at the controls in the rear seat, and a passenger was in the front seat. The sky was clear, the temperature was about 24°C, and the wind was from the northwest at about eight knots. The flight was to take the passenger for a ride. On the climbout, the aeroplane was seen making a right turn and then a descending left turn, which steepened as it came through about 120° from the departure runway heading. The aeroplane's nose was pointing toward the ground but appeared to rise just before the aeroplane struck the ground in a field, about 650 feet off the end of the runway. The aeroplane flipped over and came to rest on its back about 25 feet from the initial impact point. The pilot was fatally injured on impact, and the passenger suffered serious life-threatening injuries. There was no fire.

Ce rapport est également disponible en français.

Other Factual Information

On 03 August 2001, three weeks before the accident, this pilot and aeroplane were climbing out after take-off from Pendleton, Oregon, when the engine lost power. The pilot was able to manoeuvre the aeroplane back to the aerodrome and land without further incident. The aeroplane was inspected by a certificated aircraft mechanic, and water was found in the fuel system.¹ The mechanic cleaned the fuel system and showed the pilot how to correctly drain the fuel to check for contamination. The fuel tanks were not removed. The aeroplane was flown for about 11 hours without any reported problems between 03 August 2001 and the time of the accident. However, a small amount of contamination, including water, was found in the aeroplane's fuel drain samples on 15 August 2001 when the aeroplane was in Regina, Saskatchewan. The aircraft had not been left out in rain during the days leading up to the accident. Just before the flight on the day of the accident, the pilot pushed the aircraft to the refueling system in Invermere and put 30.3 litres of blue fuel (100LL) into the main tank.

The wreckage was examined at the accident site. The propeller damage was consistent with the propeller not being powered at impact. Contaminated fuel was seen in the auxiliary fuel tank and found in a sample taken from a fuel drain. The main fuel tank was ruptured, and fuel had spilled on the ground. The fuel caps appeared to seal. Parts from the belly of the aeroplane were found in the initial impact scar. The flight and engine control systems were connected except where they were cut by rescue personnel or broken from impact forces.

Fuel samples were taken from the refuelling unit that was used for this aeroplane just before the accident flight. This fuel was blue (100LL), as was the fuel purchased at Springbank airport before the flight to Invermere. No contaminants were found in the fuel that came out of the nozzle, but some contaminants, including water, were found in the in-line filter.

A more detailed examination was later conducted to assess the engine's fuel system. No fuel was found in the fuel distributor (spider). Contaminated fuel was found in the line between the distributor and the engine baffle. The fuel sample from the auxiliary tank was green (100), as was the contaminated fuel in the line; the fuel contaminants were particulate matter and water. All other fuel samples were blue (100LL). The valve that allows fuel to flow from the auxiliary tank to the main tank was found closed.

The aeroplane's instruments had left indications consistent with the engine operating at less than full power at impact. The engine exhaust manifold was examined and analyzed to determine heat at impact. The available samples were not ideal for testing; however, two of the six ports were hot. The engine was disassembled for a detailed examination and found to have no mechanical malfunction that would have caused a loss of power before impact. Nevertheless, the fuel injectors and the lines from the fuel distributor contained no fuel.

Analysis

The propeller damage and the instrument marks were consistent with that found when an engine is not delivering power at impact, and contaminated fuel was found in the aeroplane's fuel system. The investigation therefore concluded that the engine lost power in flight as a result of fuel contaminants. The engine might have been running at low power but was not likely developing full power at impact.

¹ The fuel system has an auxiliary tank that drains into a main tank, which feeds the engine via fuel lines, a fuel servo, and a fuel distributor (spider).

The pilot was most likely attempting to return to the aerodrome in Invermere after the engine lost power. His proximity to the runway and the performance of the aeroplane without engine power would require the pilot to initiate the steep, descending turn to line up with the runway. His attempt to arrest the rate of descent was not successful because of his low altitude and speed.

The aircraft fuel systems had green (100) and blue (100LL) fuel; however, contaminants were found only in the green (100) fuel. The original source of the green fuel could not be determined. The contaminated fuel was not a mixture of green and blue fuel. The auxiliary fuel tank drains into the main tank before it goes to the engine, and the valve that allows fuel to flow from the auxiliary tank to the main tank was found closed. From the information available, it could not be determined when the contaminated green fuel was introduced to the line between the distributor and the engine baffle, or if came from the auxiliary tank.

Findings as to Causes and Contributing Factors

1. The engine lost power because of contaminated green (100) fuel, which was found in the aeroplane's fuel systems.
2. The pilot was most likely attempting to return to the aerodrome of departure. Because of his proximity to the runway and the aeroplane's performance—without full engine power—the pilot could not arrest the high rate of descent before the aeroplane struck the ground.

Other Findings

1. The source of the green (100) fuel could not be determined.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 16 April 2002.