Aviation Safety Investigation Report 199401685

Air Tractor Inc AT-502

27 June 1994

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NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at www.atsb.gov.au.

Aviation Safety Investigation Report

199401685

The Bureau did not conduct an on scene investigation of this occurrence. The information presented below was obtained from information supplied to the Bureau.

Occurrence Number: 199401685 **Occurrence Type:** Accident
Location: Alma (60km N Parafield)
State: SA **Inv Category:** 4
Date: Monday 27 June 1994
Time: 1450 hours **Time Zone** CST
Highest Injury Level: None

Aircraft Manufacturer: Air Tractor Inc
Aircraft Model: AT-502
Aircraft Registration: VH-ODR **Serial Number:** 502-0108
Type of Operation: Commercial Aerial Agriculture/Baiting
Damage to Aircraft: Substantial
Departure Point: Alma SA
Departure Time: 1225 CST
Destination: Alma SA

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	Commercial	1100.0	10985

Approved for Release: Tuesday, August 20, 1996

FACTUAL INFORMATION

The aircraft was making its last spray run before refuelling when it suffered a loss of engine power. The pilot climbed the aircraft while attempting to restart the engine.

When the engine failed to respond, a forced landing was carried out into a paddock but during the landing roll the aircraft entered a 2-metre deep ditch at low speed, causing damage to the propeller and left wingtip.

Subsequent inspection revealed that while there was a small amount of fuel in one wing tank, the header tank feeding the engine was empty.

ANALYSIS

When the aircraft type was originally designed, it was fitted with a radial piston engine. A turboprop engine was fitted to later models and the fuel system was redesigned with a small header tank in the fuselage between the wing tanks and the engine. The header tank should supply fuel to the engine for a short time if the tank outlets become uncovered by fuel during manoeuvring with small amounts of fuel remaining.

If the fuel supply to a turboprop engine is interrupted and then restored, the engine is not likely to restart without action from the pilot unless an automatic re-ignition system is installed. There was no such system on the accident aircraft.

Other similar engine failures have been experienced with this type of aircraft due to the location of the fuel tank outlet, which can become uncovered when the fuel level in the tank is low and the aircraft is in a nose-down attitude. This was the most likely situation which led to interruption of the flow of fuel to the header tank and to the engine of VH-ODR.

SIGNIFICANT FACTORS

1. The aircraft was operating with a small amount of fuel in the wing tanks.

2. Although there was some fuel in one wing tank, the header tank feeding fuel to the engine was empty probably because a nose-down attitude allowed the tank otlets to become uncovered.

3 The engine failed, probably because of fuel starvation, at too low a height for the pilot to effect a restart.

SAFETY ACTION

As a result of the investigation into this and a subsequent occurrence (BASI No. 9601185, VH-XST), the Bureau of Air Safety Investigation forwarded the following Safety Advisory Notice to the Civil Aviation Safety Authority (CASA) on 1 July 1996.

SAN960052

The Bureau of Air Safety Investigation suggests that the Civil Aviation Safety Authority, in consultation with the US Federal Aviation Administration (FAA), review the fuel system design of aircraft conforming to Type Certificate A17SW to ensure the adequacy of the fuel system with all applicable airframe/engine combinations.

The CASA response dated 18 July 1996 stated in part: 'I have written to the President of Air Tractor, and the Small Airplane Directorate of the Federal Aviation Administration, advising them of the fuel starvation incidents in Australia and asking for their comments. I will advise you of the responses when I receive them.'