



Transportation
Safety Board
of Canada

Bureau de la sécurité
des transports
du Canada

Air Transportation Safety Investigation Report A18C0064

STALL AND COLLISION WITH TERRAIN

Clayton Air Service
Cessna A188B AGtruck (crop sprayer), C-GMXO
Carrot River, Saskatchewan, 3.5 nm E
12 July 2018

About the investigation

The Transportation Safety Board of Canada (TSB) conducted a limited-scope, fact-gathering investigation into this occurrence to advance transportation safety through greater awareness of potential safety issues. It is not the function of the Board to assign fault or determine civil or criminal liability.

History of the flight

At approximately 1400¹ on 12 July 2018, the Cessna A188B AGtruck (registration C-GMXO, serial number 188-03762T) operated by Clayton Air Service departed Arborfield Airport (CJM6), Saskatchewan, for a crop-spraying flight of a flax field approximately 3.5 nautical miles (nm) east of Carrot River, Saskatchewan (Figure 1). At 1500, on completion of spraying, the pilot texted the company to notify them that he had completed his spraying of the field and was returning to Arborfield. He also sent electronically the completed work order to the company, which included the local weather during the application.

Shortly afterward, a bystander heard a loud aircraft engine noise, followed by an explosion, and saw smoke. As the bystander was approaching the wreckage from the east, a second explosion occurred. The bystander reached the site within 5 minutes of the initial explosion, quickly surveyed the site, then went to call for emergency services. The pilot was fatally injured. The aircraft was destroyed by impact forces and post-impact fire.

¹ All times are Central Standard Time (Coordinated Universal Time minus 6 hours).

The Arborfield fire department attended the site along with members of the Carrot River Royal Canadian Mounted Police. The aircraft's emergency locator transmitter did not activate because it had been severely damaged by impact forces and fire.

Figure 1. Map of the occurrence aircraft's route and accident site (Source: Google Earth, with TSB annotations)



Aircraft information

The Cessna A188B AGtruck is a single-engine, low-wing aerial application (crop sprayer) aircraft. It is a single-occupant aircraft, powered by an IO 550 Teledyne Continental engine. It has a total usable fuel capacity of 52 U.S. gallons supplied from two 27 U.S. gallon fuel tanks (1 in each wing). It has a 280 U.S. gallon hopper used to carry various types of chemical products for aerial application purposes. The aircraft is operated under a restricted type certificate that allows a maximum gross take-off weight of 4200 pounds. At the time of the occurrence, the aircraft's hopper was empty, and there was approximately 27 U.S. gallons of fuel on board. The Cessna A188B is equipped with an aural stall warning system. The aircraft was not equipped with a flight data recorder or cockpit voice recorder, nor was it required to be by regulation.

The aircraft was certified, equipped, and maintained in accordance with existing regulations and approved procedures. There were no known pre-existing defects or anomalies, and no operational problems were reported during any of the trips before the accident. Information provided indicated

that at the time of the accident, the aircraft was operating within its certified weight and balance envelope.

Pilot information

The pilot held a Canadian airline transport pilot licence, which had been issued on 23 August 2017, and a valid Category 1 medical certificate. His last medical had been completed on 21 March 2018. He had accumulated 3500 hours total flight time, of which approximately 45 hours were on the Cessna A188B. Information gathered by the investigation indicated the pilot was fit and qualified to perform his assigned flight duties.

Weather information

The nearest recorded weather was observed at Prince Albert, Saskatchewan (79 nm west of occurrence site). At 1500, the weather was reported as follows:

- wind: 260° true at 13 knots, gusting to 16 knots;
- visibility: 15 statute miles;
- few clouds at 6500 feet above ground level and few clouds at 25 000 feet above ground level;
- temperature: 27 °C; dew point: 15 °C;
- altimeter setting: 29.92 inches of mercury (inHg).

Local weather information submitted by the pilot to the company during the occurrence flight reported wind 278° true at 19 km/h and a temperature of 25 °C. The weather was not considered to be a factor in this occurrence.

Wreckage examination

The aircraft struck the ground in a wooded area at a very shallow pitch angle with a high rate of vertical descent, likely in a left turn, and came to a rest facing a northwesterly direction (Figure 2). The aircraft had little forward speed and did not leave a wreckage trail. This type of surrounding damage is indicative of an aerodynamic stall² from a low altitude.

The airframe and cockpit were inspected for any pre-impact anomalies; however, the inspection was inconclusive as most of the aircraft was destroyed by the

Figure 2. Wreckage site



² An aerodynamic stall occurs when the wing's angle of attack exceeds the critical angle at which the smooth airflow begins to separate from the wing. When a wing stalls, the airflow breaks away from the upper surface, and the amount of lift is reduced to below that needed to support the aircraft.

post-impact fire. An inspection of the flight control cables revealed continuity of the elevator, rudder, flaps, and the left aileron. The right aileron cables were found severed and frayed. Analysis of the fractured cable ends revealed cup and cone fracture surfaces, which are indicative of an overload failure during the impact sequence. Damage to the surrounding trees by the propeller indicated that the propeller was rotating and a substantial amount of power was being produced by the engine at the time of impact.

Torching of the grass forward of the wreckage site indicated that there was a substantial amount of fuel on board the aircraft at the time of impact. A fuel sample taken from the fuel source at the operations base revealed the fuel was characteristic of 100/130 low lead aviation fuel that was clear and bright, with no signs of contamination.

Due to the lack of witnesses and the lack of flight data information, as well as the level of destruction by the fire, the investigation could not determine the sequence of events prior to the aerodynamic stall and collision with terrain or the reasons why the aircraft experienced such a stall.

This concludes the TSB's limited-scope investigation into this occurrence. The Board authorized the release of this investigation report on 16 January 2019. It was officially released on 23 January 2019.

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Le présent rapport est également disponible en français.