

**Aviation Safety Investigation Report
199003086**

Beech 65-A80

18 July 1990

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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.

Occurrence Number: 199003086
Location: Roma QLD
Date: 18 July 1990
Highest Injury Level: Nil
Injuries:

Occurrence Type: Accident

Time: 1935

	Fatal	Serious	Minor	None
Crew	0	0	2	2
Ground	0	0	0	-
Passenger	0	0	0	0
Total	0	0	0	2

Aircraft Details: Beech 65-A80
Registration: VH-AEL
Serial Number: LD-208
Operation Type: Private
Damage Level: Substantial
Departure Point: Roma QLD
Departure Time: N/A
Destination: Townsville QLD

Approved for Release: 28th August 1991

Circumstances:

The pilot reported that he was making an adjustment to the fuel selector, at the top of climb, when he noticed a lower than expected reading on the right outboard fuel quantity gauge. Suspecting a loose fuel cap, he advised the co-pilot to carry out a visual inspection of the right wing area with a torch. Although the fuel cap appeared to be seated properly, the decision was made to return to the DEPARTURE runway and carry out a more thorough investigation. During the landing roll the right engine lost all power, and the pilot attempted several unsuccessful restarts. At the end of the runway the aircraft was turned tail into wind and another restart was attempted. As the engine started the co-pilot observed flames under the right wing area and activated the engine fire extinguisher. The co-pilot then exited the aircraft to investigate and returned immediately to inform the pilot that the aircraft was on fire. Both engines were shut down and the pilots exited the aircraft. The investigation showed that the rubber fuel cells inside the right wing had collapsed upward towards the fuel filler inlet. The fuel drain fitting located directly behind the right engine exhaust was missing. Rubber fuel cells are known to collapse in this manner when a fuel filler cap comes loose in flight. The fuel is then sucked out through the filler neck into the low pressure area above the wing. This occurs faster than the vent system can cope, causing the inner cell to collapse. In this case, the fuel caps were found properly secured. However, the rubber sealing ring on the right fuel cap was perished and cracked in several places. The steel mating ring around the filler neck, which accepts the fuel cap, was also badly corroded over the entire sealing surface area. It is probable that the fuel syphoning began as a result of the poor seal around the cap. The syphoning would have been assisted by the tanks having been filled to the top of the filler neck for the flight. (The tanks had not been filled to this level for at least two years.) The outboard fuel (water) drain fitting attaches to a section of the fuel cell which protrudes through the lower wing surface. This fitting is located immediately behind the right engine exhaust outlet. When the fuel cell collapsed inside the wing, the fitting was unable to pass through the wing cut-out and was pulled from its attachment point on the cell. This then allowed fuel

to flow freely into the airstream directly behind the engine exhaust. When the engine start was attempted with the aircraft tail into wind, the stream of fuel was blown directly back against the exhaust outlet. The investigation confirmed the right outboard exhaust as the ignition source for the fire.

Significant Factors:

The following factors were considered relevant to the development of the accident

1. Inadequate maintenance of the fuel filler cap.
2. The fuel tanks had been filled to the top of the filler neck.
3. Fuel from the right wing tanks had siphoned overboard, causing the inner fuel cells to collapse.
4. The pilot attempted to start the right engine with the tail of the aircraft into wind.
5. Exhaust gases from the right engine ignited the fuel draining from the tank.