

**Aviation Safety Investigation Report
199403176**

**Rockwell International
Commander**

30 October 1994

Readers are advised that the Australian Transport Safety Bureau investigates for the sole purpose of enhancing transport safety. Consequently, Bureau reports are confined to matters of safety significance and may be misleading if used for any other purposes.

Investigations commenced on or before 30 June 2003, including the publication of reports as a result of those investigations, are authorised by the Executive Director of the Bureau in accordance with Part 2A of the Air Navigation Act 1920.

Investigations commenced after 1 July 2003, including the publication of reports as a result of those investigations, are authorised by the Executive Director of the Bureau in accordance with the Transport Safety Investigation Act 2003 (TSI Act). Reports released under the TSI Act are not admissible as evidence in any civil or criminal proceedings.

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.

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: 199403176 **Occurrence Type:** Accident
Location: Phillip Island
State: VIC **Inv Category:** 4
Date: Sunday 30 October 1994
Time: 1605 hours **Time Zone** ESuT
Highest Injury Level: None

Aircraft Manufacturer: Rockwell International
Aircraft Model: 114
Aircraft Registration: VH-DDY **Serial Number:** 14280
Type of Operation: Non-commercial Practice
Damage to Aircraft: Substantial
Departure Point: Moorabbin VIC
Departure Time:
Destination: Moorabbin VIC

Crew Details:

Role	Class of Licence	Hours on	
		Type	Hours Total
Pilot-In-Command	Private	24.5	524

Approved for Release: Thursday, February 16, 1995

On arrival at Moorabbin the pilot asked a staff member the fuel state of the aircraft. The staff member said he thought it was full but for the pilot to check. The pilot said he checked the tanks visually during his pre-flight inspection and believed they were full. He could not recall what the fuel quantity gauges were indicating. Engine runup prior to departure was normal. The fuel selector was selected to the BOTH position and was left at that position for the entire flight.

The purpose of the flight was for the pilot to practise intercepts on the Cowes navigation aids. There was a safety pilot in the right seat whose task was to watch for traffic and to "keep an eye" on the pilot. The safety pilot was not familiar with the aircraft type. After completing the airwork and while preparing to return to Moorabbin, the engine gave a short miss. At this time the pilot said they were about five miles to the east of Phillip Island airstrip at an altitude of 3500 feet.

Shortly afterwards the engine missed again. This missing then occurred at more frequent intervals. The pilot therefore decided to make a precautionary landing at Phillip Island. At this time the aircraft was still at 3500 feet and in a high wide base position for the 220 degree strip, which he decided to use. The pilot said he checked the magnetos, turned the electric fuel pump on, checked the mixture was rich and checked the fuel selector was in the BOTH position. He did not move the selector.

Because the aircraft was high, the throttle was selected to the idle position and landing gear and full flap were extended. Some S turns were made on final approach to lose altitude but the aircraft still arrived over the strip far too high. At the upwind end of the strip the pilot pushed the throttle forward hoping there would be power available for a go around but there was no response from the engine. He then pulled the aircraft up into a left turn, to avoid going into the sea, and crash landed in sand dunes to the east of the airstrip.

The investigation revealed that there was approximately 40 litres of fuel in the left tank but the right tank was probably empty. The right wing tank fuel lines had been severed in the accident so fuel could have escaped from these lines after the accident. However, when refuelling records were checked against known fuel usage, 40 litres was about what should have been remaining and that much was drained from the left tank. The tank filler necks on this aircraft are fitted with anti-syphon (flapper) valves which have to be depressed to visually check tank contents. The pilot did not depress those valves during his pre-flight inspection.

After the wreckage was recovered, the entire fuel system was inspected and no faults were found. The engine was removed and placed in a test rig where it ran faultlessly through its entire power range. In the Emergency Procedures section of the Pilot's Operating Handbook, for the Engine Failure in Flight checklist, item 5 of the checklist says "Fuel Selector - FULLEST TANK (check other two positions)". In the Airstart checklist, item 2 of the checklist says "Fuel Selector - FULLER TANK". This item is followed by a note which says "To minimise restart time, select the fuller tank. Do not use the BOTH position".

Although the pilot was not attempting an airstart, he did leave the selector in the BOTH position. A study of the fuel system suggests that if one tank is empty and the other contains fuel, then it is possible that the engine will be supplied with a "fuel air cocktail" through the fuel selector if the selector is in the BOTH position. Tests done on another Rockwell 114 confirmed that this was probably the cause of the engine malfunction.

Significant Factors

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

1. The pilot was unaware of the fuel state of the aircraft prior to departure from Moorabbin.
2. When the engine started to miss, the pilot did not take appropriate corrective action.
3. The precautionary landing approach was badly misjudged.
4. When the pilot attempted to go around from the misjudged approach, engine power was not available.
5. The pilot then had no option but to land the aircraft on unsuitable terrain.

