

**Aviation Safety Investigation Report
199400540**

**Cessna Aircraft Company
P206B**

06 March 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.

Occurrence Number: 199400540 **Occurrence Type:** Accident
Location: Nowra
State: NSW **Inv Category:** 3
Date: Sunday 06 March 1994
Time: 1050 hours **Time Zone:** EST
Highest Injury Level: Serious
Injuries:

	Fatal	Serious	Minor	None	Total
Crew	0	0	1	0	1
Ground	0	0	0	0	0
Passenger	0	3	2	0	5
Total	0	3	3	0	6

Aircraft Manufacturer: Cessna Aircraft Company
Aircraft Model: P206B
Aircraft Registration: VH-RDR **Serial Number:** P2060358
Type of Operation: Miscellaneous Parachute Jump
Damage to Aircraft: Substantial
Departure Point: Nowra NSW
Departure Time: 1048 EST
Destination: Nowra NSW

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	Commercial	17.0	4100

Approved for Release: Thursday, January 11, 1996

The aircraft was engaged in parachute-jumping operations which involved free-fall jumps from 10,000 ft. Five parachutists were carried on each flight. The aircraft had operated normally during earlier flights that day and the pre-takeoff engine run-up revealed no abnormalities.

The pilot reported that as the aircraft approached 300 ft and he was about to make the first power reduction shortly after takeoff, there was a momentary power fluctuation. He decided to turn back towards the runway but during the turn the engine started to miss significantly and lose power to the extent the aircraft could not maintain height. The engine failed to respond to the normal trouble-checks which included switching the electric fuel pump on.

As the aircraft descended through 100 ft it was apparent that the engine was producing no power. The pilot extended full flap when he heard the aural stall warning and subsequently commenced the landing flare too early and had to lower the nose before attempting a second flare for the landing. The aircraft impacted heavily and almost immediately rolled over onto its back. The five parachutists, who were unrestrained, were injured in the accident and the pilot received minor injuries when his seat detached from the floor rails.

The loss of engine power was the result of an excessively rich fuel/air mixture. Investigation revealed rubber deposits jammed under the variable adjustment needle in the engine-driven fuel pump, blocking the return port. This resulted in an oversupply of fuel to the metering unit and an excessively rich fuel/air mixture. The rubber had originated from the internal lining of the fuel hoses between the pump and the metering unit. The fuel/air mixture was further enriched when the pilot switched on the electric fuel pump, resulting in the complete loss of engine power.

Distracted with troubleshooting the engine problem, the pilot allowed the airspeed to decay to the point where the stall warning activated. The airspeed decreased further during the initial flare and a high sink rate developed which the pilot was unable to correct, resulting in the heavy touchdown. The nosegear leg failed in overload and the aircraft nosed over onto its back.

Investigation of the pilot's seat revealed it had been repaired some time prior to the accident. The repair differed from the original design and compromised the lock function. During the accident sequence, the lock withdrew and the two unrestrained parachutists who were located behind the seat moved forward and pushed the seat out of the tracks. Single-point restraint lines were fitted for use by the parachutists but they had not been used.

Significant factors:

The following factors were determined to have contributed to the accident.

1. Rubber debris had detached from the internal lining of engine fuel hoses, contaminating the engine-driven fuel pump and resulting in an excessive fuel supply to the engine with subsequent loss of power.
2. Activation of the electric pump in accordance with the flight manual procedure resulted in an oversupply of fuel to the engine with a complete loss of power.
3. The airspeed decayed sufficiently to preclude a safe forced landing.

SAFETY ACTION

As a result of the investigation, interim recommendation IR950014 was issued to the Civil Aviation Authority on 16 February 1995. It stated:

The Bureau of Air Safety Investigation recommends that the Civil Aviation Authority and the Australian Parachute Federation evaluate the adequacy of current legislation with regard to restraints for parachutists in aircraft.

The Civil Aviation Authority response to this recommendation dated 27 April 1995 stated:

I refer to BASI Interim Recommendation IR950014 regarding an accident involving parachute operations at Nowra.

The report notes that no restraints were being worn by the occupants of the aircraft, and opines that their injuries would have been more severe had the single-point restraints (which were fitted to the aircraft) been used.

In 1991 the Authority conducted a study in response to a request from the Australian Parachute Federation (APF) to delete the requirement to wear any restraint on take-off, landing and below 1000 ft. CAO 20.16.3 permits the use of approved single-point restraints for parachutists in lieu of the normal seat belts or safety harness. The APF expressed some concerns about the possibility of a restraint snagging a parachute and causing premature opening. The Federation was also of the view that the use of single-point restraints could cause more injuries than not using them.

The Authority concluded that the advantages and disadvantages of single-point restraints were fairly evenly balanced. However, at about this time a fatal crash occurred to an Army Pilatus Porter aircraft, where the main cause of injuries and deaths was unrestrained bodies flailing around the cabin. Also, several accidents occurred in the USA to larger aircraft in parachuting operations, which were attributed to loss of control following movement of the centre of gravity. As a result of these accidents it was decided to confirm the requirement for some form of restraint. The APF at the time indicated that they preferred the single-point restraint option over a full seatbelt or safety harness.

Notwithstanding, our earlier study of this requirement, it is agreed that this issue needs further examination. A review will be carried out in conjunction with the APF.

Response status: Closed-accepted

The Bureau of Air Safety Investigation intends producing an article for inclusion in a future edition of the Asia-Pacific Air Safety magazine concerning the problems associated with non-standard aircraft repairs.