

**Aviation Safety Investigation Report
199100526**

Cessna 210L

4 July 1991

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 CEO 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 CEO 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.

Occurrence Number: 199100526 **Occurrence Type:** Accident
Location: 148 km W Tindal NT (14°48' S - 130°52' E)
Date: 4 July 1991 **Time:** 1600
Highest Injury Level: Nil
Injuries:

	Fatal	Serious	Minor	None
Crew	0	0	1	1
Ground	0	0	0	-
Passenger	0	0	0	1
Total	0	0	0	2

Aircraft Details: Cessna 210L
Registration: VH-TRD
Serial Number: 21061047
Operation Type: Charter
Damage Level: Substantial
Departure Point: Yarralin NT
Departure Time: 1520
Destination: Darwin NT

Approved for Release: 10th February 1992

Circumstances:

The aircraft was approximately 40 minutes into the flight when the pilot noticed a substantial loss of oil pressure. He initiated a diversion to the nearest suitable aerodrome, but several minutes later, following an increase in RPM, the engine failed. A small quantity of oil appeared on the windscreen and the cabin filled with smoke. The propeller continued to windmill during the descent, causing moderate to severe vibration from the rotating engine. A successful wheels-up forced landing was carried out into a cleared area. Inspection of the engine revealed a hole in the top of the crankcase adjacent to and rear of the oil filler neck which was caused by the failure of the number four connecting rod. The screws attaching the oil filler neck flange to the crankcase were found to be excessively loose, allowing a gap between the flange and the crankcase. There were no other apparent oil leaks. The aircraft had undergone a major inspection and top overhaul 108 hours prior to the accident, and had flown 5 hours since the last periodic inspection. There was no reason to remove or loosen the oil filler neck at either of these inspections or during the salvage operation. Before further inspection of the engine could be carried out, it was discovered that the filler neck had been retightened. This caused metal fragments which had been suspended in the oil to become embedded into the gasket material. This confirmed that contaminated oil had exited the engine through this aperture. The pilot stated that he had checked the oil level and the security of the oil cap prior to the flight without noticing any looseness of the filler neck. The oil filler neck may have been loose during the earlier part of the accident flight, but was held in position by the screw threads catching and interfering with the holes in the filler neck flange. The pilot's twisting action on the cap, as well as vibration and crankcase pressure may have caused the filler neck flange to lift off the crankcase, probably with the gap between the flange and crankcase being positioned in such a way that a capillary action was created by the airflow, causing the hot oil to be drawn from the crankcase. The oil then flowed with the cooling air between cylinders number four and five to both the underside and lower left-hand surfaces of the fuselage via the nose wheel well, all of which were thickly coated in oil. There was an insignificant

amount of oil, with relatively dry carbon and sludge deposits in the crankcase breather outlet and associated plumbing, indicating that the oil had not escaped from the engine via that route. As the oil level in the engine decreased, oil pressure also decreased, and with insufficient oil flow and pressure to operate the propeller governor, normal rotational loads on the propeller moved the blades towards the fine pitch position increasing the engine RPM. Oil starvation caused overheating of the crankshaft, allowing the babbit alloy of the connecting rod bearings to melt. The number four connecting rod bearing was the first to fail, with separation of the bearing cap allowing the rod to flay about, causing the hole in the top of the crankcase. The small amount of oil thrown onto the windscreen indicated that most of the oil had already escaped from the engine prior to the failure.

Significant Factors:

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

1. The engine developed a serious oil leak.
2. The oil filler neck to crankcase attachment screws were excessively loose, probably allowing oil to escape from the engine through the gap between the oil filler neck and the crankcase. The reason why the screws were loose could not be determined.
3. The number four connecting rod failed due to oil starvation. This accident was not the subject of an on-scene investigation.