

**Aviation Safety Investigation Report
198703479**

Bell 206B Jet Ranger II

23 May 1987

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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: 198703479
Location: 33 km SSW of Coen QLD
Date: 23 May 1987
Highest Injury Level: Fatal
Injuries:

Occurrence Type: Accident
Time: 811

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

Aircraft Details: Bell 206B Jet Ranger II
Registration: VH-BLI
Serial Number: 2167
Operation Type: Charter
Damage Level: Destroyed
Departure Point: Coen QLD
Departure Time: 0752
Destination: Holroyd River QLD

Approved for Release: February 23rd 1989

Circumstances:

The helicopter was chartered to transport two hydrographers to various remote sites on the Cape York Peninsula. During the two days preceding the accident, the helicopter experienced a series of engine chip warning lights. Following the third chip warning, the pilot consulted the aircraft operator. The operator in turn consulted an engineer licenced on the type of engine fitted to the aircraft. It was decided to continue operations because the size of flake was below the 0.8mm stipulated as a maximum in the engine manufacturers operations and maintenance manual. The following morning, 19 minutes after departing Coen, the engine chip warning lamp again illuminated. This was followed by a sharp mechanical noise emanating from the engine bay. A sudden yaw reaction and illumination of the engine out warning light confirmed that the engine had failed. The pilot initiated an autorotational descent from about 500 feet above ground level. His MAYDAY call indicated that the helicopter was under control. Both passengers stated that the helicopter crashed through trees without any appreciable change in the rate of descent, landing some 20 metres short of a small clearing. The helicopter struck the ground very heavily and broke into several sections. The two passengers managed to get clear of the wreckage before it was destroyed by fire. The survivors were located by searching aircraft about an hour after the accident. An inspection of the wreckage determined that the aircraft was on fire prior to impact and had suffered an engine failure following an explosive burst of the power turbine. The turbine failure resulted from the failure of the number 4 engine bearing. The primary cause of the bearing failure was masked by the extensive secondary damage to the inner race of the bearing. However, there was evidence to suggest that the failure was initiated due to spalling of the inner race. The progressive nature of the failure indicates that the engine was "making metal" for a period prior to the final failure and that this caused the illumination of the chip detector warning light. Despite the report that the size of the metal flakes picked up by the chip detector were below the maximum allowable size, the manufacturers maintenance manual does call up certain maintenance procedures to be followed after the illumination of the chip detector

warning light. It is apparent that these procedures were not observed. It was determined that at the time the main rotor blade struck trees, just prior to ground impact, the main rotor rpm was below 90 . 90 main rotor rpm being the lower limit allowable during an autorotational descent. No mechanical reason could be found to explain the low rpm. The low main rotor rpm, combined with the high rate of descent and the lack of flare suggests that the pilot may have been endeavouring to stretch the glide in an attempt to reach a more suitable landing area and that insufficient rotor energy remained for a flare prior to landing.

Significant Factors:

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

1. Neither the operator nor the engineer the pilot consulted provided adequate maintenance advice;
2. The operator and pilot did not follow approved maintenance procedures;
3. The pilot operated the aircraft with a known deficiency - engine making metal;
4. Pilot exercised poor judgment;
5. No.4 engine bearing failed, leading to an uncontrollable engine overspeed, power turbine burst and aircraft fire;
6. Reason for the lack of a controlled flare prior to landing was not determined.

Reccomendations:

The Civil Aviation Authority publish an educational article in the Aviation Safety Digest emphasizing the importance of adhering to the Engine Manufacturer's Maintenance Procedures with regard to engine chips warnings. The article should be aimed at Pilots, Operators, and Licenced Aircraft Maintenance Engineers. It may be prudent to publish the manufacturer's data regarding engine chips in the article.