Aviation Safety Investigation Report 198904115

Beech 58 Baron

20 July 1989

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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: 198904115 **Occurrence Type:** Incident
Location: Cairns QLD
Date: 20 July 1989 **Time:** 1605
Highest Injury Level: Nil
Injuries:

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

Aircraft Details: Beech 58 Baron
Registration: VH-WBR
Serial Number: TH 71
Operation Type: Charter
Damage Level: Nil
Departure Point: Cairns QLD
Departure Time: 1600
Destination: Townsville QLD

Approved for Release: 8th September 1989

Circumstances:

The pilot reported that soon after takeoff from Cairns the right engine rapidly lost oil pressure accompanied by a rise in the oil temperature. There was also a noticeable drop in manifold pressure and engine rpm. The pilot feathered the propeller and advised the tower of his intention to returned to Cairns where a single engine landing was carried out. A local Licensed Aircraft Maintenance Engineer (LAME) was then engaged to investigate and rectify the defect. After checking the oil quantity and completing a visual inspection of the engine bay the LAME carried out a ground run to verify the extent of the oil pressure loss. All engine parameters including oil pressure and temperature indicated normal during the prolonged ground run. The LAME then advised the pilot that he considered the aircraft to be serviceable and explained to him that the probable cause of the pressure loss was that a piece of carbon had become temperarily lodged under the seat of the oil pressure relief valve. No further "trouble shooting" was carried out by the LAME. Soon after takeoff on the next flight the pilot noticed that the right alternator was not showing a charge. This defect was entered on the maintenance release on arrival in Townsville. The subsequent inspection of the aircraft discovered that the alternator drive "clutch spring" was badly distorted and had caused extensive scoring damage to the internal crankcase casting. The metal filings produced by this scoring action had contaminated the engine oil system. The extent of this contamination necessitated a bulk strip of the engine and accessories. It was found that the crankshaft all main bearings conrod bearings oil pump and oil pump housing had been substantially damaged.

Significant Factors:

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

1. Failure of the alternator drive "clutch spring".

2. Inadequate inspection of the aircraft by maintenance personnel during the original investigation for the cause of the oil pressure loss.

Reccomendations:

This incident was discussed with various maintenance and overhaul organisations servicing aircraft with similar powerplants. Industry wide experience has shown that the alternator gear drive hub which utilises the spring clutch assembly currently in use on many of the Continental powerplants is operating close to design limits. The alternative rubber shock pad type of clutch assembly is also prone to premature failure. Two large maintenance organisations canvassed have already incorporated a 500 hourly special inspection period into their respective maintenance schedules for these clutch types. Experience has shown the majority of failures occur in the later half of the engine life. As it would not be practical to continue to increase the capacity of the alternator clutch independent of the rest of the alternator drivetrain and gears it is recommended that the Civil Aviation Authority consider the following

1. A 500 hourly or similar "special inspection" period for the alternator clutch assembly or halving the current life of the alternator clutch assembly.

2. Highlighting to maintenance personnel (through the Airworthiness Advisory Circulars or similar) the importance of adhering to approved trouble shooting procedures when investigating defects.