

**Aviation Safety Investigation Report
199002017**

De Havilland DHC-2/A1

26 October 1990

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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: 199002017
Location: Somersby NSW
Date: 26 October 1990
Highest Injury Level: Serious
Injuries:

Occurrence Type: Accident

Time: 840

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

Aircraft Details: De Havilland DHC-2/A1
Registration: VH-AAX
Serial Number: 1411
Operation Type: Private
Damage Level: Substantial
Departure Point: Somersby NSW
Departure Time: 838
Destination: Camden NSW

Approved for Release: 16th December 1991

Circumstances:

The aircraft was being ferried to a strip in the Hunter Valley to carry out parachute dropping. En route, although performance appeared normal, the pilot sensed a possible problem with the turbine engine and landed at Somersby. After landing, a visual inspection of the engine was undertaken and several ground runs carried out, without any defect being found. The pilot elected to return to Camden where further checks could be made. The aircraft took off towards the south and climbed to a height of about 1000 feet, at which point the pilot heard a bang from the engine compartment which was followed soon after by a very loud bang associated with noises described by the pilot as like "forcing a crowbar into the engine". During the ensuing forced landing in fine, calm conditions, the pilot misjudged the final stage of the landing approach, resulting in the aircraft landing very heavily and sustaining considerable damage. A subsequent engineering investigation found the engine had suffered a catastrophic malfunction resulting from fatigue failure of a helical thrust washer from the high speed pinion assembly. The fatigue crack growth resulted from applied alternating loads, probably due to excessive wear of the helical gearshaft bearing. About one week prior to the flight, an engine oil sample and filter element had been removed in accordance with Airworthiness Directive AD/TPE 331/9. Although the samples had not been immediately sent for laboratory analysis, the owner was allowed to operate the engine for a further 50 hrs before satisfactory test results were received. When the samples were examined during the investigation, ticks were found which indicated bearing deterioration prior to the engine failure. Earlier in the year, the aircraft had sustained a propeller ground strike, resulting in the engine being removed and returned to an overhaul facility for inspection. It has been reported that when the engine was re-installed in the aircraft, a torque meter calibration check was not carried out in accordance with the procedures published in the manufacturer's maintenance manual. Although not positively established, the mode of engine failure was consistent with an excessive torque setting.

Significant Factors:

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

1. Probable excessive wear of the helical gearshaft bearing.
2. Torsional loading of the helical thrust washer from the high speed pinion gear assembly.
3. Fatigue failure of the helical thrust washer.
4. Pilot-in-command misjudged distance, speed and altitude during forced landing approach.