

No: 3/90

Ref: EW/C1142

Category: 2c

Aircraft Type and Registration: Bell 206B III, G-TREE

No & Type of Engines: 1 Allison 250-C20B turboshaft engine

Year of Manufacture: 1979

Date and Time (UTC): 15 December 1989 at 1608 hrs

Location: Lovelands Farm near Chobham, Surrey

Type of Flight: Air Taxi

Persons on Board: Crew - 1 Passengers - 4

Injuries: Crew - None Passengers - None

Nature of Damage: Major damage to: tail boom; main rotor blades; landing skids; severed tail rotor assembly and damage to cockpit transparencies

Commander's Licence: Air Transport Pilot's Licence (Helicopters)

Commander's Age: 31 years

Commander's Total Flying Experience: 3,865 hours Rotary Wing (of which 155 were on type)

Information Source: AAIB Field Investigation

The purpose of the flight was to convey four passengers from Great Milton, Oxfordshire, to Fairoaks Airport, Surrey. There was a light easterly wind and a cloudbase at about 1,500 feet. The flight had progressed normally at 1,000 feet amsl until, when about 2 nm west of Fairoaks, the aircraft suddenly yawed to the left and the engine note changed.

The commander swiftly diagnosed an engine malfunction and established the helicopter in an autorotative descent. He observed that the engine speed indicated around idle rpm and turned towards an open area suitable for a forced landing. An attempt to recover engine power by opening the throttle was unsuccessful and so the commander decided to transmit a Mayday message. Because of continuous RT on the Fairoaks frequency, it was not until the aircraft had descended to about 350 feet that the commander was able to transmit the message. He has since stated that it was this enforced delay which pre-occupied him to the extent that he failed to appreciate that he was going to overshoot his selected landing point until after he had transmitted the Mayday. At this stage, the little height remaining necessitated concentration on the imminent landing rather than shutting down the engine before touchdown. He selected a new landing point and at about 70 feet and 60 kts was entering the 'flare' when he saw that the landing would straddle a large ditch running across track. By gently raising the collective lever, the commander was able to decrease the angle of descent slightly and the helicopter

cleared the ditch at a height of about 20 feet, albeit with rapidly decaying main rotor rpm. The aircraft landed very heavily 11 metres beyond the ditch and bounced for another 10 metres, swinging some 150° to the left. On the second impact the helicopter rocked forwards onto the chin windows before settling back onto the now splayed skids. The main rotor had chopped off the tail boom just aft of the horizontal stabiliser but the commander is unable to recall at what point this occurred. Having shut down the engine, which was still running at around idling speed, the commander applied the rotor brake but it failed to function. He therefore delayed the passenger evacuation until the main rotor had almost stopped. All restraint harnesses and seats had withstood the impact and there was no fire.

When the passengers had vacated the helicopter via their respective doors and moved clear, the commander returned and advised ATC of the accident and their location. The Airport Fire Service and the Police arrived a few minutes later, but their services were not required.

The helicopter was recovered to Fairoaks where the pipe delivering compressor discharge air pressure (P_c) to the fuel control unit (FCU) was found to be disconnected. The FCU is a pneumatic-mechanical unit and senses rotor speeds and P_c . Variation in fuel flow schedules is obtained by modulating the P_c pressure, and its loss will restrict the fuel flow to an amount below that necessary to sustain ground idle.

The engine had been fitted on 13 October 1989 after work by a repair organisation, during the subsequent ground run a heavy oil leak was discovered and the repair agency elected to carry out a repair in situ at Fairoaks. This operation required the removal and refitting of the heatshield and various pipes, including the P_c air pipe; access to which is restricted by the other pipes to the FCU. The aircraft had flown 20 hours since that operation and there is no record of further work in that area.

The SDAU database shows two previous instances of Allison 250 series engine run-downs caused by loose pipes following maintenance activities.