

Aircraft type and registration: Bell 206L-1 Longranger G-HBUS (light single-engined helicopter)

Year of manufacture: 1980

Date and time (GMT): 5 October 1983 at 1620 hrs

Location: Ingatestone, Essex

Type of flight: Private (business)

Persons on board: Crew — 1 Passengers — Nil

Injuries: Crew — Nil Passengers — N/A

Nature of damage: Engine internal damage (contained failure) tailcone severed main blade damaged, nose transparencies broken

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

Commander's Age: 34 years

Commander's total flying experience: 4855 hours (of which 1480 hours were on type)

Shortly after take-off, at about 40 feet AGL the aircraft yawed left and a change in engine and rotor noise was heard. The turbine outlet temperature was seen to rise towards the 'red line' temperature of 800°C and the 'Engine Out' audio warning was heard. The engine twist grip control was closed to the 'Flight Idle' position and a forced landing carried out with the aircraft straight and level and with a run on speed of about 10 knots. The touch down area was freshly ploughed and soft. The left skid dug into the ground and the helicopter pitched nose down and swung to the left. The main rotor blades struck and severed the tailcone.

An initial investigation of the engine failure showed that a build-up of carbon between the gas generator drive shaft ('peashooter') and the bore of the power turbine shaft assembly had caused interference between the two rotating systems and failure of the power turbine to gearbox coupling shaft.

The Allison Model 250-C28 engine is subject to an oil flow rate check together with other oil system checks at each oil change at 100 hour intervals. These checks had been carried out 40 hours prior to the accident.

On strip-down it was found that the O ring seal on the compressor spur adaptor gear shaft was damaged. Such damage could disrupt the oil mist flow between the concentric shafts.

The operator reports that, in co-operation with the manufacturer, he has introduced extra inspections of oil condition and a partial strip inspection at each 300 hours. No other case of similar carbon build-up has been found as a consequence of these checks. Three Commercial Engine Bulletins, nos CEB 72-2099, CEB 72-2101 and CEB 72-2104, have recently been introduced and are applicable to the area of failure in this engine.

The operator also emphasises the importance of observing the 2 minute cooling time requirement prior to shut-down of these engines though there is nothing to suggest that this was a contributory factor in this case.

The Civil Aviation Authority has been informed of the circumstances of this accident.