

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

**Year of Manufacture:** 1980

**Date and time (GMT):** 20 August 1984

**Location:** Coventry Airport

**Type of flight:** Private (business)

**Persons on board:** Crew — 1                      Passengers — Nil

**Injuries:** Crew — Nil                      Passengers — N/A

**Nature of damage:** Damage to tailboom and stabiliser, rotor blades and fuselage

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

**Commander's Age:** 35 years

**Commander's total flying experience:** 5257 hours (of which 1929 hours were on type)

**Information Source:** Aircraft Accident Report Pro-forma submitted by pilot.

After de-planing one passenger at the Coventry Airport Terminal, the helicopter began to hover taxi towards the heli-pad at a height of between 10 and 12 feet and at a ground speed of approximately 15 kt. After 300 ft had been covered the pilot commenced a turn in preparation for landing when he became aware of a decay in the rotor speed, which was accompanied by the onset of audio warnings and illumination of several central warning panel captions.

The helicopter landed heavily, the rotor blades striking the horizontal stabiliser end plates and damaging the tail boom. After applying the rotor-brake and making all switches safe, the pilot abandoned the helicopter. Having ascertained that there were no signs of fire, he returned a short while later to check the indicated fuel contents. He noted a reading of 115 lbs.

The fuel system on this helicopter is comprised of 3 internal fuel tanks holding a total of 640 lbs of fuel (refer figure 1). The main tank, which forms the cabin rear seats (494 lbs), is connected to two forward tanks, one under each cabin forward seat (73 lbs each). Fuel is supplied to the engine system from two boost pumps fitted in the case of the rear tank via a shut-off valve and airframe mounted fuel filter. The fuel from the forward tanks is automatically transferred to the rear tank by a dual jet pump installation, powered by tapping pressurised fuel from each boost pump.

The layout of the system is such that when the tanks are replenished the lower part of the main tank (260 lbs) fills up to the level of the forward tanks transfer pipe. Fuel then flows into these tanks until full, whereupon the level in the rear tank continues to rise. When the engine is operating fuel is fed to it, via two check valves, from the boost pumps which also cause fuel to re-circulate between the forward and rear tanks. Once the rear tank level falls to uncover the jet pump transfer pipe (260 lbs) in rear tank, the forward tanks fuel is used to maintain this level until they are exhausted. The level in the rear tank then continues to fall.

Examination of this fuel system by maintenance personnel after the accident revealed that, with the exception of the airframe mounted filter, it was heavily contaminated with paint chips and ferrous metallic particles. Both boost pump check valves were found jammed in the open position and one transfer jet pump was found to be partially blocked by a relatively large paint flake. It was not determined how such a relatively large flake apparently came to pass through the jet pump nozzle supply filter, although these filters are a relatively coarse mesh.

It is a known feature of this fuel system, ref AIB Bulletin 15/81 EW/C759/01, that any significant degradation of the jet pumps performance can lead to an insufficient rate of fuel transfer from the front tanks. A condition can then arise in which all fuel in the rear tank is exhausted but with indicated fuel still present in the forward tanks.

Minimum fuel for the helicopter is quoted as 60 lb, with an unuseable fuel figure of 6½ lbs.