No: 10/92 **Ref: EW/G92/06/26** **Category: 2c**

Aircraft Type and Registration:	Enstrom F-28A-UK, G-BAWI
No & Type of Engines:	1 Lycoming HIO-360-C1A piston engine
Year of Manufacture:	1973
Date & Time (UTC):	26 June 1992 at 1300 hrs
Location:	Bosworth Hall, Leicestershire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - Minor Passengers - Minor
Nature of Damage:	Serious damage to fuselage, main and tail rotors and landing skids.
Commander's Licence:	Private Pilot's Licence
Commander's Age:	39 years
Commander's Flying Experience:	145 hours (of which 87 were on type) Last 90 days - 2 hours Last 28 days - 1 hour
Information Source:	Aircraft Accident Report Form submitted by the pilot

The helicopter was taking off from a lawn, which was bounded by trees, in front of an hotel. It was close to maximum all up weight and the ambient temperature was 86°F. The pilot's intended departure route necessitated the helicopter climbing vertically to approximately 100 feet agl before transitioning to forward flight. After starting and warming up the engine, the pilot lifted-off, completed a clearing turn and climbed vertically to clear the trees. During this manoeuvre he reported that the manifold pressure gauge was indicating 26 inches but, as he began the transition into forward flight, the engine speed dropped. He lowered the collective lever in an attempt to regain rotor RPM but it was not possible to re-establish normal rotor RPM in the height available and the aircraft descended rapidly. Collective pitch was re-applied to try to 'cushion' the landing but the helicopter landed heavily, damaging the skids, fuselage, tailrotor and tailboom. The pilot quickly shut the helicopter down and he and his passenger, who were both wearing full harnesses, were able to evacuate the helicopter unaided. There was no fire.

Subsequent examination of the helicopter revealed that all three main rotor blades were similarly deformed upwards in a gentle curve (coned), this distortion being indicative of a low rotor speed

whilst in flight. The transmission system was examined and found to be free of any pre-accident defects and all engine and flying controls were found intact. Distortion of the fuselage precluded any meaningful rigging checks. The fuel system and magneto wiring in the helicopter were examined and found to have been serviceable.

As the engine had survived the accident in an undamaged condition, it was removed from the helicopter (with minimal disturbance of its systems) and installed on a test bed to establish if is was capable of producing the full specified power, for the type, of 205 Brake horsepower (BHP). Using fresh 100LL fuel, the engine was put through a shortened version of the appropriate test schedule and shown to be capable of running at a maximum power level of 199.87 BHP. During the early part of this test a severe drop in RPM was experienced when running at 2100 rpm on the right magneto only. This defect was traced to the lower spark plug of No 4 cylinder on which the central electrode was found to have been 'bridged' to earth by a small amount of contamination. This was analysed and found to be a mixture of lead, aluminium and copper. Subsequent to replacement of this spark plug the engine was run again on fuel taken from the helicopter's tanks, and it then produced a maximum of 203.15 BHP.