

No: 2/85

Ref: EW/G84/10/11

Aircraft type and registration: Yakolev (C11) Yak 11 G-KYAK (light single engine fixed wing aircraft)

Year of Manufacture: 1953

Date and time (GMT): 21 October 1984 at 1430 hrs

Location: In a field adjacent to Duxford Aerodrome

Type of flight: Private (flying display)

Persons on board: Crew — 1 Passengers — None

Injuries: Crew — None Passengers — None

Nature of damage: Damage to underside of fuselage and propeller

Commander's Licence: Airline Transport Pilot's Licence with IMC Rating

Commander's Age: 49 years

Commander's total flying experience: 2560 hours (of which 16 were on type)

Information Source: Aircraft Accident Report Form submitted by the pilot

The aircraft was giving a flying display at Duxford airfield when, whilst performing a roll down the line of runway 08 at approximately 200' AGL, the engine stopped. The pilot climbed to gain a little height, and considered turning back to land on runway 26. During the left turn, with a speed of 130/140 kt, it became apparent to the pilot that he was too low to glide to the airfield, so he elected to make a wheels-up landing in a small field. The aircraft touched down approximately 30 yards into the field and slid for some 75 yards, turning through 180° before coming to rest.

The pilot suffered a compression injury to his back in spite of the relatively smooth touchdown, but was able to shut down the aircraft systems and vacate the cockpit without assistance. There was no fire.

The aircraft was recovered to Duxford where an investigation into the engine failure was carried out by maintenance personnel. After an exhaustive investigation, only two factors were identified which, when acting together, would account for the failure. Firstly, the engine oil tank was not considered of suitable internal construction for inverted flying in that no horizontal baffles were present to prevent oil from uncovering the scavenge pump inlet. Secondly, the ability of the engine to minimise oil pressure loss following a loss of 'pumped' oil was very poor. This was in direct contrast to previous checks carried out on the engine.

These two factors were of significance as the throttle/fuel injection system is servo controlled, its motive power being generated by engine oil pressure. The system is such that if oil pressure is lost for any reason in flight, the throttle effectively closes and the fuel/air mixture is set to approximately 80% full rich. In normal operation, the oil pump capacity on this engine is sufficient to overcome high internal oil leakage.

On test, an unusually high oil leakage was discovered from the rear engine bearing into the sump. This was discovered to be due to seal failure and bearing wear. It was thought that, on completion of the rolling manoeuvre, oil pressure was not re-instated sufficiently quickly for the engine to recover due to the relatively low rotational speed of the engine at that time.