

INCIDENT

Aircraft Type and Registration: Replica Campbell Cricket Gyroplane, G-BORG

No & Type of Engines: 1 Rotax 503 piston engine

Year of Manufacture: 1992

Date & Time (UTC): 14 May 1994 at 1330 hrs

Location: Melbourne Airfield, Humberside

Type of Flight: Private

Persons on Board: Crew - 1 Passengers - None

Injuries: Crew - None Passengers - N/A

Nature of Damage: Propeller destroyed, pre-rotator mechanism damaged, small dent in main rotor blade lower skin

Commander's Licence: Private Pilot's Licence with Instructor Rating

Commander's Age: 45 years

Commander's Flying Experience: 700 hours (of which 190 were on type)
Last 90 days - 11 hours
Last 28 days - 6 hours

Information Source: Aircraft Accident Report Form submitted by the pilot and examination by a Popular Flying Association Inspector

The gyroplane had been constructed as a homebuilt project from plans for the Campbell Cricket, with modifications including substitution of the original Volkswagen engine by a Rotax unit. The machine was being flight-tested for a renewal of its Permit-to-Fly. About 15 minutes into the flight the pilot commenced a timed climb from 500 feet but at about 700 feet he heard a loud bang and felt vibration. Throttling back the engine followed by shutting it down caused the vibration to cease and an uneventful forced landing was made back onto the runway.

Inspection showed that the propeller had been destroyed by the pre-rotator shaft which had fallen into the propeller arc due to failure of the upper Universal Joint (UJ). The owner advised that the joint was new and had not flown before and could offer no explanation for its failure, particularly since the pre-rotator mechanism should be disengaged and stationary during flight. A Popular Flying Association (PFA) Inspector was therefore asked to examine the machine and report on his findings.

The PFA Inspector reported that the plans to which G-BORG was constructed, being based on original manufacturing drawings for the Campbell Cricket, were somewhat lacking in detail in certain areas, including the correct orientation of the upper UJ. Further complications arose as a result of the substitution of the Rotax engine for the original Volkswagen engine which tended to present the upper UJ at a less favourable angle to the rotor head, resulting in unnecessarily high eccentric loads on the joint. He also believed that there may have been some residual drag on the drive wheel sufficient to cause pre-rotator shaft rotation in flight.

The PFA have announced their intention to explore, with the original designer of the Cricket, the possibility of devising some form of restraint on the shaft which would prevent it falling into the propeller in the case of UJ failure. At the same time they intend to establish the standard of UJs currently fitted to Campbell Cricket and Everett gyroplanes and to produce a drawing specifying the orientation of the joints.