

**AAIB Bulletin No: 6/94**

**Ref: EW/G94/03/12**

**Category: 2.3**

**Aircraft Type and Registration:** Rotorway Executive 90, G-RHYS

**No & Type of Engines:** 1 RI 162 piston engine

**Year of Manufacture:** 1994

**Date & Time (UTC):** 18 March 1994 at 0855 hrs

**Location:** Chirk Airfield, Clwyd, Wales

**Type of Flight:** Private

**Persons on Board:** Crew - 1                      Passengers - 1

**Injuries:** Crew - None                      Passengers - None

**Nature of Damage:** Moderate damage to skids and landing gear and slight damage to fuselage

**Commander's Licence:** Private Pilot's Licence

**Commander's Age:** 40 years

**Commander's Flying Experience:** 469 hours (of which 391 were on type)  
Last 90 days - 19 hours  
Last 28 days - 8 hours

**Information Source:** Aircraft Accident Report Form submitted by the pilot and telephone enquiries by the AAIB

The aircraft was brand new and was being put through the Airworthiness Flight Test Schedule by the UK main distributor for the type. After takeoff for the next phase of test flying, a clearing turn to the right was executed and the aircraft was brought to a stable low hover, heading into wind. As the pilot applied slight forward cyclic control to move away, it started to turn rapidly to the left.

The pilot maintained the power and allowed the aircraft to continue rotating, through about three full turns, whilst bringing it back over the landing pad. The pilot then levelled the aircraft before cutting the power, after which the aircraft made a hard landing, damaging the skids and landing gear. Subsequent examination showed that the tail rotor drive had failed.

The tail rotor drive on this aircraft type is by three 'Vee' belts in series and the rearmost of the three had broken. The belt was returned to the aircraft manufacturer for investigation and the preliminary report indicated that the belt had failed as a result of over-tension, but further testing is being conducted.

The tail rotor drive belt system is tensioned by adjusting the position of the rearmost pulley and measuring the tension of the front belt. The two intermediate idler pulleys are free floating 'jockey wheels' and experience has shown that if a belt stretches exceptionally, the floating mechanism can 'bottom out' or the mechanism may become stiff. The agent was well aware of these possibilities. The belts fitted to this aircraft were of a make recently introduced by the manufacturer as a replacement for the type originally used. This new make had been noted to stretch considerably during its initial running period. The manufacturer is currently evaluating a new type of Kevlar reinforced drive belt which stretches very little during the initial running period and appears to be more durable.