

**ACCIDENT**

<b>Aircraft Type and Registration:</b>	Robinson R22 Beta, G-BTHI	
<b>No &amp; Type of Engines:</b>	1 Lycoming O-320-B2C piston engine	
<b>Year of Manufacture:</b>	1991 (Serial no: 1732)	
<b>Date &amp; Time (UTC):</b>	14 August 2012 at 1230 hrs	
<b>Location:</b>	Leicester Airport	
<b>Type of Flight:</b>	Training	
<b>Persons on Board:</b>	Crew - 2	Passengers - None
<b>Injuries:</b>	Crew - 2 (Minor)	Passengers - N/A
<b>Nature of Damage:</b>	Substantial	
<b>Commander's Licence:</b>	Commercial Pilot's Licence	
<b>Commander's Age:</b>	66 years	
<b>Commander's Flying Experience:</b>	22,215 hours (of which 10,098 were on type) Last 90 days - 77 hours Last 28 days - 44 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot	

**Synopsis**

During approach, the helicopter was subject to severe vibration, a clutch warning and low rotor rpm warnings. The pilot initiated an autorotation but the aircraft began to yaw to the right uncontrollably. The helicopter landed heavily in a field and turned over and the two crew members suffered minor injuries.

**History of the flight**

G-BTHI was on an instructional flight and the instructor was the handling pilot. The helicopter was on final approach to Runway 24, at approximately 150 to 200 ft agl and 50 kt, when severe vibration was felt through the airframe and controls. The pilot stated that the vibration was so severe he could not read any of the instruments and he instinctively increased airspeed and made a short

MAYDAY call. While he was transmitting, the clutch warning light illuminated followed immediately by the low rotor rpm light and warning horn. The pilot entered autorotation but, instead of yawing left as expected, the aircraft yawed right despite the subsequent application of full left yaw pedal. The helicopter was turning towards a public road and so the pilot increased the rate of turn using the cyclic control to ensure that the helicopter did not pass over it.

The helicopter had turned through approximately 280° as it approached the ground. The pilot applied full up input on the collective control to try to cushion the touchdown but the aircraft landed heavily, with little forward speed but considerable right yaw, and rolled onto its left side.

The student exited the helicopter through the right door and the instructor exited through the broken front windscreen. Both occupants were treated at the scene for minor injuries.

### **Pilots Operating Handbook (POH)**

The R22 POH states that a loss of tail rotor thrust in forward flight is usually indicated by nose right yaw which cannot be corrected by applying left yaw pedal. Pilots are advised to enter autorotation immediately, maintain at least 70 kt airspeed if practical and perform an autorotation landing.

### **Pilot's assessment of the cause**

The pilot assessed that he had suffered a tail rotor failure. After inspection of the wreckage, he found that:

1. The tail rotor drive had failed at the intermediate flex plate coupling, which is just aft of the clutch actuator.
2. There was a large quantity of wire wrapped around the tail rotor drive shaft, which was probably the power supply for the anti-collision light.
3. The drive shaft damper assembly within the tail boom had broken from its bracket.
4. The clutch fuse was found out of its housing (if the clutch fuse fails, the clutch light illuminates).

He did not determine whether the drive failed at the intermediate flex plate coupling first, or whether the initiating failure was the drive shaft damper assembly separating from its bracket.