

ACCIDENT

Aircraft Type and Registration:	Rotorway Executive 90, G-BVTV	
No & Type of Engines:	1 Rotorway RI 162 piston engine	
Year of Manufacture:	1995 (Serial no: 5243/6599)	
Date & Time (UTC):	6 August 2016 at 1323 hrs	
Location:	Landmead Farm Airfield, Oxfordshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Main rotor and tail rotor blades, main rotor shaft, airframe and tail-boom damaged. Minor damage to epennage and right skid	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	54 years	
Commander's Flying Experience:	1,210 hours (of which 82 were on type) Last 90 days - 75 hours Last 28 days - 14 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The helicopter was damaged when landing heavily after the pilot discontinued its takeoff. It had not achieved the required takeoff performance, possibly due to a combination of high ambient temperature, fuel vapour-locking and operational technique.

History of the flight

The pilot reported that after an uneventful flight from Membury Airfield, Hungerford, the helicopter was left in the sun for several hours. At approximately 1315 hrs, he started the aircraft for the return flight. When he lifted to the hover, with carburettor heat applied, he noticed the helicopter needed full throttle to maintain its normal rotor rpm and he was unable to maintain the normal hover height. He commented that he considered the helicopter "somewhat underpowered" and that the lack of power on this occasion was probably due to the high ambient temperature of 24°C. He manoeuvred the helicopter to a position from where he performed an into-wind 'cushion creep' takeoff¹, along the grass strip.

Footnote

¹ A 'cushion creep' takeoff in a helicopter requires less power than a normal transition into forward flight by utilising ground effect until translational lift is achieved.

The aircraft had achieved an indicated airspeed of 50 mph, at a height of around 75 ft agl, when the pilot perceived he had a power problem. Even with translational lift and full throttle, he was having to lower the collective lever to maintain the rotor rpm, and the helicopter was no longer climbing.

Concerned the helicopter was at a combination of height and velocity from which it was not possible to achieve a safe autorotation, and that the engine might fail, the pilot turned back towards the airfield, initially with the intention of performing a running landing downwind. However, with 8 kt of tailwind, he thought he would have insufficient cyclic authority to cushion the touchdown and so, once over the strip, turned back into-wind. The aircraft was now sinking, with a low rotor rpm, and landed heavily, rolling onto its starboard side. The pilot, who was unhurt, vacated the aircraft through the broken windscreen.

Comment

The pilot considered that the high ambient temperature, his use of the carburettor heat² and perhaps some vaporisation issues with Mogas³ may have contributed to the engine not producing its maximum power. He also considered “a lack of finesse” in managing the rotor rpm, and his use of a speed lower than that for the best rate-of-climb, may have given him the impression of an engine problem, and prompted his decision to turn back for a landing downwind.

Footnote

- ² On the Rotorway Exec 90 the carburettor is heated by hot water, and there is no substantial performance penalty for using carburettor heat.
- ³ Technical Leaflet TL 2.26 Issue 1, July 2015, published by the Light Aircraft Association, states that the initial boiling point of Mogas is only slightly above ambient temperature. It will begin to vapourise with only a slight raise in temperature or drop in pressure making it more likely than Avgas to cause vapour-lock or vapourisation problems.
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