

# Eurocopter EC120B, G-EMCM

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| <b>AAIB Bulletin No: 5/2004</b>        | <b>Ref: EW/G2004/03/12</b>                           | <b>Category: 2.3</b> |
| <b>Aircraft Type and Registration:</b> | Eurocopter EC120B, G-EMCM                            |                      |
| <b>No &amp; Type of Engines:</b>       | 1 Turbomeca Arrius 2F turboshaft engine              |                      |
| <b>Year of Manufacture:</b>            | 2000   |                      |
| <b>Date &amp; Time (UTC):</b>          | 17 March 2004 at 1135 hrs                            |                      |
| <b>Location:</b>                       | Kidlington, Oxfordshire                              |                      |
| <b>Type of Flight:</b>                 | Training   |                      |
| <b>Persons on Board:</b>               | Crew - 2   | Passengers - 1       |
| <b>Injuries:</b>                       | Crew - None  | Passengers - None    |
| <b>Nature of Damage:</b>               | Substantial damage                                   |                      |
| <b>Commander's Licence:</b>            | Air Transport Pilot's Licence with Instructor Rating |                      |
| <b>Commander's Age:</b>                | 64 years   |                      |
| <b>Commander's Flying Experience:</b>  | Approximately 13,000 hours (93 on type)              |                      |
|  | Last 90 days - 40 hours                              |                      |
|  | Last 28 days - 20 hours                              |                      |
| <b>Information Source:</b>             | Aircraft Accident Report Form submitted by the pilot |                      |

## History of the flight

The instructor was carrying out conversion training with the pilot, who held a Private Pilot's Licence and had about 250 hours flying experience. With the helicopter on the airfield's grass training area the student pilot attempted to lift the aircraft into the hover prior to taking off into the circuit.

When the aircraft had become light on its skids it started to move gradually to the right until the right-hand skid caught either a bump in the ground or a clump of grass. It then started to roll to the right at which point the instructor took control in an attempt to correct it. The instructor estimates that at the time he did so the aircraft was passing through about 5° angle of bank but, despite applying full left cyclic control, the aircraft continued to roll until it came to rest on its side. The instructor immediately shutdown the engine and everyone on board evacuated uninjured through the left-hand doors.

## Analysis

On takeoff a helicopter is susceptible to a lateral rolling tendency termed 'dynamic rollover'. This phenomenon may occur if the helicopter drifts sideways and a skid or wheel is in contact with the ground. The helicopter tends to pivot about the grounded wheel or skid and if the aircraft roll is

allowed to continue it will reach a critical angle beyond which recovery is impossible, regardless of the cyclic position, due to the rolling moment provided by the main rotor thrust.

Should a roll be induced on takeoff which is not correctable by cyclic inputs alone, the collective lever should be quickly lowered to prevent the dynamic rollover developing. This is due to the effect of reducing main rotor thrust and its associated rolling moment. Raising the collective lever should be avoided as this can induce an abrupt rolling moment in the opposite direction.

Despite his considerable experience the instructor commented that the speed at which the rollover developed caught him completely by surprise. His instinctive reaction to try and control the roll solely by use of the cyclic is understandable in the very short time the accident took to occur.