Accident

Aircraft Type and Registration:	Westland Wasp HAS1, G-CMBE	
No & Type of Engines:	1 Rolls Royce Nimbus 10301 turboshaft engine	
Year of Manufacture:	1966 (Serial no: F9664)	
Date & Time (UTC):	15 March 2025 at 1142 hrs	
Location:	Marston Doles, Warwickshire	
Type of Flight:	Private	
Persons on Board:	Crew - 2	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Aircraft fuselage, main and tail rotor impact damage	
Commander's Licence:	Commercial Pilot's Licence	
Commander's Age:	66 years	
Commander's Flying Experience:	5,108 hours (of which 331 were on type) Last 90 days - 71 hours Last 28 days - 39 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

An instructor and student pilot were carrying out pre-flight checks. One of the checks required the deselection of the hydraulic system to ensure mechanical flying control continuity and freedom of operation in the correct sense. As the instructor selected the hydraulic system OFF[1], the collective lever 'jumped' upwards and the aircraft lifted into the air. The instructor was unable to regain control and the helicopter struck the ground and rolled over. The cause of the abnormal collective movement could not be positively determined but a transient system malfunction could not be ruled out.

History of the flight

An instructor was preparing for a routine instructional type rating flight with an experienced rotary wing pilot. They were running through the post engine start pre-flight checks with the rotors running. One of these checks required the hydraulic system to be cycled OFF, to carry out an assessment of the flight control forces without hydraulic servo assistance. When completed the hydraulic system is selected back ON for flight. Immediately the instructor selected hydraulics OFF, the collective lever forcefully lifted taking the instructor by surprise.

Footnote

[1] Hydraulic system (HYD) selector switch on the collective is marked POWER/MANUAL. For simplicity the words ON/OFF are used in this bulletin report.

The helicopter became airborne to a height of 5 or 6 ft and ”lurched” forward and to the right towards a nearby hangar door. The instructor was unable to select the hydraulic system back ON but immediately attempted to regain control. The helicopter moved back away from the hangar and tipped rearwards causing the tail rotor to contact the ground. As this happened the main rotor hit the ground and the helicopter rolled onto its side. The instructor then shut down the engine and made the aircraft safe, after which he extricated himself and assisted the student to vacate the cockpit. The helicopter sustained severe main, tail rotor and structural damage during the accident.

Sequence of events

The instructor had carried out pre-flight checks on this helicopter numerous times before and was very familiar with its characteristics. When instructing, sitting in the left seat, he would move his hand from the collective to the cyclic control and with his right hand lean over to cycle the hydraulic system using the toggle switch on the collective lever next to the student in the right seat. Taking care to ensure the collective friction was applied and then to hold the collective down whilst operating the toggle switch with his index finger.

The forceful reaction of the collective on this occasion took him by surprise and he described how, with his right arm outstretched, he did not have the strength to lower the collective lever quickly enough and despite moving his hands rapidly back to his own controls was unable to regain control and land the helicopter.

Analysis

The instructor sought an independent technical assessment of the helicopter hydraulic system, flying controls and rotor head, which found no obvious evidence of system malfunction or component failure. However, it was found that the single piston hydraulic collective pitch servo jack was fully extended (Figure 1) after the accident. He considered that this may have been an artefact of the roll over and subsequent damage to the helicopter. This was plausible because the servo would not have been in hydraulic lock, therefore free to extend and retract, because the system had been set to OFF for the check. Nevertheless, it was unexpected.

Figure 1
Collective servo extension

He also consulted other Wasp and Scout helicopter pilots. In their experience, during this particular check, the collective lever was known to move upwards, but never more than a few centimetres. Its movement can easily be arrested by hand pressure. This matched the instructor's experience when regularly carrying out or demonstrating this check.

The abnormally forceful upward movement of the collective lever, immediately after the hydraulic system was selected OFF, and the post-accident position of the servo jack, suggest the possibility of a transient system malfunction.