Hughes 269, G-BXMY

AAIB Bulletin No: 3/98 Ref: EW/G97/12/07Category: 2.3

Aircraft Type and Registration:	Hughes 269, G-BXMY
No & Type of Engines:	1 Lycoming HIO-360D1A piston engine
Year of Manufacture:	1974
Date & Time (UTC):	13 December 1997 at 1545 hrs
Location:	Between Clevedon and Portishead, Somerset
Type of Flight:	Private
Persons on Board:	Crew - 1 - Passengers - None
Injuries:	Crew - None - Passengers - N/A
Nature of Damage:	Minor damage to engine cooling system
Commander's Licence:	Private Pilot's Licence
Commander's Age:	45 years
Commander's Flying Experience:	93 hours (of which 85 were on type) Last 90 days - 34 hours Last 28 days - None
Information Source:	Aircraft Accident Report Form submitted by the pilot and AAIB telephone enquires with the helicopter's maintenance organisation

On the day of the accident, the helicopter had been collectedby the owner/pilot from a maintenance organisation at Chichester/Goodwoodairfield after completion of a Star/Annual check and issue ofa new Certificate of Airworthiness. During this inspection, crackswere discovered in the engine cooling impeller and this was replacedwith a used, but serviceable, impeller. Subsequently whilst inthe cruise at a height of 3,000 feet over the River Severn nearBristol, a loud bang was heard, the helicopter became 'very unsteady'and began to descend. The pilot declared a Mayday, immediatelyentered autorotation and turned towards the coast. It was apparentto him that he could not make landfall, but at about 500 feethe tried opening the throttle and then realised that the enginewould still produce power, although this was accompanied withviolent vibration. By raising the collective control lever, thepilot was however able to clear a sea wall and land in an adjacentfield. After reporting on the RT to Bristol ATC that he was onthe ground, due to the poor radio reception another helicopterwas asked to overfly the location and was able to confirm thatthe

helicopter had carried out a successful forced landing. Apolice unit attended the scene a short time later.

Subsequently, a local licensed engineer called to examine thehelicopter discovered a hole in the top of the engine coolingair scroll, and that one of the twelve cooling air impeller attachmentbolts was missing. There was evidence that this bolt had struckthe underside of a lip on the main gearbox and that the remainingattachment bolts were all loose. The maintenance instructionsfor installing an impeller onto the engine starter ring gear statethat it should be loosely fastened initially at four equally spacedpositions using the appropriate bolts, washers and nuts. Afterinstalling the remaining bolts, every fifth nut in a clockwiseprogression, starting at the 12 o'clock position, should be tightenedto a torque of between 90 and 100 inch-pounds, following whichall torques should be re-checked. The instructions also requiredthat a check be made to ensure that a minimum of two full threadson each bolt extend past the end of the nuts, that the nuts havenot 'bottomed-out' on the bolt shanks, and that after 100 hoursof operation the torque setting on all the nuts be re-checked. In an open and frank conversation with the maintenance organisationwhich installed the replacement impeller, it appeared that thenut tightening sequence described above was inadvertently omitted,and not detected, during the Star/Annual check. Since this accident,the organisation concerned have discussed their maintenance practiceswith the CAA and have taken steps to improve their procedures.