ACCIDENT

Aircraft Type and Registration:	Enstrom F-28A-UK, G-BBPN
No & Type of Engines:	1 Lycoming HIO-360-C1A piston engine
Year of Manufacture:	1973
Date & Time (UTC):	12 June 2007 at 1415 hrs
Location:	Ormonde Fields Golf Course, near Codnor, Derbyshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - 1 (Minor) Passengers - N/A
Nature of Damage:	Substantial
Commander's Licence:	Private Pilot's Licence
Commander's Age:	65 years
Commander's Flying Experience:	220 hours (of which 220 were on type) Last 90 days - 6 hours Last 28 days - 6 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

The pilot carried out a go-around following an unsuccessful approach to a private landing site. During the go-around the helicopter did not climb sufficiently and sank into some trees. The pilot was not in regular flying practice until shortly before the accident and was attempting to land in a confined site in tailwind conditions.

Background to the flight

The pilot had previously held a PPL(H) for a number of years and during that period had owned his own helicopter. However, his licence had lapsed and he had not flown for about six years. He decided to restart helicopter flying and bought G-BBPN in May 2006. After he bought the helicopter it was damaged during a transit by road and was not available to fly again until 2007.

In June 2007 the pilot started training for his licence renewal on G-BBPN. On the first training flight the flight was terminated because the instructor felt the helicopter was not performing well and the collective did not have a full range of movement. A maintenance engineer conducted a thorough check of the helicopter, including the rigging, and could not find any defects. He asked the instructor if he was aware that the helicopter had long range fuel tanks fitted. The instructor responded that he had not known this because the fuel gauge fitted was of a type normally associated with standard fuel tanks.

The instructor was now satisfied that the poor performance of the helicopter was because they had been operating at above the maximum permitted weight; he was further reassured because it had been thoroughly checked. The training continued over the next few days and on the morning of the accident the pilot completed his licence skill test.

History of the flight

Having completed his skill test the pilot decided to fly the helicopter to the landing site at his home. The instructor offered to accompany him but the pilot declined the offer; he said he was familiar with the site having flown in there many times in the past.

The weather conditions recorded at East Midlands Airport (12 nm to the south) at 1420 hrs included a surface wind from 240º at 13 kt and a temperature of 21ºC.

The landing site at the pilot's house was approached from the south-west. The approach path was over an open field but the landing area was relatively confined. At a late stage of the approach the pilot felt uncomfortable and decided to go-around. The go-around was carried out straight ahead, crossing a main road and then a golf course that was situated on rising ground amidst some trees. The helicopter cleared the streetlamps on the main road, but as the pilot tried to climb away he described experiencing a loss of power and the helicopter settled into trees on the golf course; it then fell to the ground and rolled over onto its right hand side. The pilot was able to release his harness and evacuate from the helicopter unassisted.

Helicopter information

This particular helicopter was not fitted with a throttle correlator, therefore the throttle was manually operated. As delivered by the manufacturer, the helicopter was fitted with two 15 USG fuel tanks, giving a total fuel capacity of 30 USG and a maximum fuel weight of 180 lb. At some stage during its various ownerships, the aircraft had been fitted with larger, 20 USG tanks, giving a maximum fuel weight of 240 lb. This modification required simultaneous fitment of a different fuel gauge, amongst other items. The pre-modification gauge simply read 'E' and 'F' with graduations at ¼ capacity increments. The post-modification gauge had figures in lbs at the 120 and 240 lb positions. G-BBPN, despite having the increased fuel capacity, still had the pre-modification gauge fitted. However, it was reported that the gauge was still reasonably accurate, reading FULL when full and EMPTY when the unusable fuel level was reached. Neither the agent who had sold the aircraft to the owner nor, presumably, the many previous pilots and owners of the helicopter had noticed, or seen fit to comment on, the disparity. The increased capacity cannot be detected externally, and there was also no decal around the filler cap advising of the capacity.

Examination of the aircraft

The helicopter was not inspected by the AAIB until it had been recovered to the premises of the agent who had sold it to the pilot. The aircraft was now upright on its landing skids, but exhibited damage to the cockpit and tailboom consistent with an impact at low forward speed with the trees and subsequent fall to the ground. The main rotor blades had been cut off near the root by the recovery crew, all three showing distinctive upward bending along their length, characteristic of the distortion seen when blades are subject to overpitching at low rotor rpm in-flight.

Two of the three pitch control links at the top of the rotor mast had broken on impact, but one remained intact. It was therefore possible to check the range of

movement of the collective lever and confirm that the rotor was able to travel through its specified range, on this blade at least. It was noted that it is possible to rig the collective lever, ostensibly to personal preference, such that the fully lowered and raised positions are different, ie the fully raised position can vary from aircraft to aircraft with a corresponding change in the fully lowered position. The total range of movement should however, remain the same.

Analysis

The go-around manoeuvre is one which requires the pilot to co-ordinate the collective pitch with the rotor/engine rpm to make best use of the power available. Overpitching of the main rotor blades or failing to ensure that the throttle is fully open will reduce the performance and may prevent the helicopter from achieving a climb.

The pilot had only just re-qualified for his licence after a break from flying of six years. Although he was familiar with the landing site he had not flown in there for a number of years and therefore was not in recent practice. He made a sensible decision to go-around when he became uncomfortable with the approach, however the missed approach path contained obstacles and was over rising ground. In the tailwind conditions and the ambient temperature the helicopter's climb gradient would have been reduced. Given these circumstances, it is possible that the power demanded by the pilot exceeded the power available; this might then cause the pilot to overpitch the main rotor, thus reducing rotor rpm and consequently climb performance. To the pilot this would appear as though a loss of power had occurred.

One other point of note is that during the refresher training neither the owner nor the instructor appeared to be aware that the helicopter was fitted with an extended range fuel tank option. This lead to the aircraft being inadvertently overloaded for that flight. As noted above, there were no cues to this available to either pilot, beyond the misleading fact that the fuel gauge was of a type fitted to aircraft with the smaller fuel capacity.

However, fuel quantity was not a factor on this flight where, with only one occupant and some fuel having been consumed during the transit, it was certainly well within its maximum gross weight.