Enstrom 280FX, G-BSLV

AAIB Bulletin No: 2/2002	**Ref: EW/G2001/10/13**	**Category: 2.3**
Aircraft Type and Registration:	Enstrom 280FX, G-BSLV	
No & Type of Engines:	1 Lycoming HIO-360-F1AD piston engine	
Year of Manufacture:	1990	
Date & Time (UTC):	24 October 2001 at 1208 hrs	
Location:	Near Chesterton Golf Club, Shropshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Damaged tail rotor blades	
Commander's Licence:	Private Pilots Licence	
Commander's Age:	51 years	
Commander's Flying Experience:	807 hours (of which 158 were on type)	
	Last 90 days - 10 hours	
	Last 28 days - 1 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

History of the flight

The pilot had collected the helicopter from a maintenance organisation following the completion of an Annual Check. As this was to be the helicopter's first flight after the check, he reported that he had taken longer than normal to conduct the pre-flight inspection. During his inspection, he noticed that the throttle movement was stiff around the mid-travel position, but this was overcome with a little extra force and the throttle then operated smoothly. His other pre-flight checks were satisfactory.

After starting the engine, he hover-taxied the helicopter some distance to the fuel pumps and during this short flight the helicopter responded normally. After refuelling, he started the engine again and took off with the intention of flying back home. Approximately 1 minute later, when the helicopter was at 300 feet, the engine manifold pressure began to reduce and so he lowered the collective

lever to reduce main rotor blade pitch and retain rotor speed. However, since it appeared that level flight could not be maintained, he began to look for a suitable place to land. He chose a field and commenced autorotation, aiming to land on a flat area in the centre of the field. After a normal flare, the helicopter made a gentle touchdown with a short 'run-on' of some 6 feet. On shutting the helicopter down, an external inspection revealed that the tail rotor blades had been damaged on their leading edges, due to contact with the thick stemmed crop in the field which was about knee-height. The helicopter was subsequently repaired on site by the maintenance organisation, and flown back to their premises with no further problems.

Throttle system description

The engine was a turbocharged version of the Lycoming IO-360 piston engine. Wastegate control was effected by a link from the fuel servo, which moved in sympathy with the pilot's throttle. A demand for more power not only scheduled more fuel to the engine but via this link also moved the wastegate towards the closed position. This increased the exhaust gas flow to drive the turbine, increasing the compressor output (manifold) pressure, with a consequent increase in engine power. This link was designed to be collapsible such that should the wastegate become seized, particularly in the open position, then normal use of the throttle would remain available, although engine power would be limited. The helicopter Flight Manual stated that should turbocharger or wastegate failure occur, the engine could still produce sufficient power to sustain level flight.

The collapsible link was formed by a rod which could slide within a tube, but was held in a fixed relative position by a detent. This detent was effected by a spring loaded plunger, mounted on the outer tube, which engaged with a groove on the inner rod.

Examination of the fuel servo to wastegate linkage

When the linkage was examined, it was apparent that the detent had 'broken out' and caused the link to 'collapse', which explained the loss in engine power reported by the pilot. The link was inspected and reset, but no fault could be found. Subsequently the throttle linkage was functioned over its full travel but could not be made to break out. The maintenance organisation stated that it could not determine any reason why this detent should have broken out, but would check if the wastegate was free to function normally when the helicopter was returned to service.