Robinson R22 Beta, G-OSEE

AAIB Bulletin No: 10/98	**Ref: EW/G98/05/15 Category: 2.3**
Aircraft Type and Registration:	Robinson R22 Beta, G-OSEE
No & Type of Engines:	1 Lycoming O-320-B2C piston engine
Year of Manufacture:	1988
Date & Time (UTC):	17 May 1998 at 2007 hrs
Location:	10 miles east of Manchester Airport
Type of Flight:	Private
Persons on Board:	Crew - 1 - Passengers - None
Injuries:	Crew - None - Passengers - N/A
Nature of Damage:	Main rotor/tail boom and rotor
Commander's Licence:	Private Pilot's Licence (Helicopters)
Commander's Age:	46 years
Commander's Flying Experience:	239 hours (of which 189 were on type) Last 90 days - 3 hours Last 28 days - 2 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

The helicopter was about 2 minutes into the flight, climbing away from a private site, when the engine lost power, causing the aircraft to yaw. The low rotor RPM horn sounded and, as the pilot initiated autorotation, he noticed that the red **OIL** and **ALTERNATOR** warning lights were on indicating that the engine had stopped. The aircraft was flared as it approached the ground and the collective raised to cushion the landing, but on touchdown the main rotor struck the tail boom.

Subsequent inspection revealed that the fuel vent line to the main tank had kinked and, although the main tank contained 5 or 6 gallons, no fuel came out during a ground test. (See report of accident to G-OTYA in this bulletin)

The original standard of fuel vent pipes for R22s fitted with both main and auxiliary fuel tanks consisted of two vertical aluminium pipes connected to each tank by short (3 ins and 2.25 ins) lengths of plastic tubing. This arrangement proved to be unsatisfactory, and SB-83 introduced revised aluminium pipes connected to the tanks by longer (9 ins and 6.75 ins) plastic tubes. The

service bulletin documentation did not give a clear indication of which tube length was to be fitted to which tank. A further change introduced another plastic tube connecting the vent systems of the two tanks, this allowed either tank to vent through the other tank; this modification was not fitted to either G-OTYA or G-OSEE.

All three vent systems described above used single walled general purpose plastic tubing. The tubing had little resistance to kinking and was easily softened by the heat encountered in its location between the fuel tanks and above the engine heat shield.

At the end of July 1998 the UK agent made a recommendation to the manufacturer that he carry out an engineering review of the fuel tank vent system, with particular consideration being given to the choice of material for the flexible hoses, the introduction of vented fuel filler caps and the addition of a Flight Manual warning, describing the actions to be taken in the event of unbalanced fuel consumption between the two tanks.

Safety recommendation

98-57 Loss of engine power on Robinson helicopters has on previous occasions resulted in a loss of rotor RPM with catastrophic consequences. It is therefore recommended that:-

The Federal Aviation Administration should monitor the manufacturers response to the UK agents proposals and ensure that Robinson helicopter fuel tank vent systems are modified to ensure adequate tank venting under all operational circumstances.