Slingsby T61A, G-AZHD

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Aircraft Type and Registration:	Slingsby T61A, G-AZHD
No & Type of Engines:	1 Stark-Stamo MS 1500/1 piston engine
Year of Manufacture:	1971
Date & Time (UTC):	14 September 1996 at 0945 hrs
Location:	2 NM SE of Winthorpe Airfield
Type of Flight:	Private
Persons on Board:	Crew - 1 -Passengers - 1
Injuries:	Crew - None - Passengers - None
Nature of Damage:	Loss of Propeller and attachment flange
Commander's Licence:	Private Pilot's Licence with FI Rating
Commander's Age:	68 years
Commander's Flying Experience:	3,050 hours (of which 2,250 were on type) Last 90 days - 50 hours Last 28 days - 11 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot together with telephone discussions with pilot and engineer

Whilst flying in the vicinity of the airfield circuit, shortlyafter take-off, the propeller separated. Shortly afterwards thepilot found himself in conditions of zero sink and was able tocontinue his glide and make an uneventful landing back at theairfield.

The engine in this aircraft design is an adaptation of the Volkswagenautomobile engine and utilises a propeller attachment flange whichis in turn fitted to the tapered end of the crankshaft by meansof an internal taper and key, with corresponding keyways in boththe flange and the crankshaft. The flange is secured by a centralbolt.

The British Gliding Association inspector who maintained the aircraftreported that he had been aware for some time that the propellerwas close to the specified run-out limit and he wanted to improvethe situation. During a programme of work to correct an oil leakin the forward crankshaft area, he decided to have the face ofthe propeller flange machined to improve the propeller alignment. The machinist however, considered that the problem centred aroundthe geometry of the

tapered portion of the flange unit and persuadedthe inspector that light machining of the taper was appropriate. Once this was done, the propeller flange was re-fitted to thecrankshaft and the propeller re-installed. A ground run was thencarried out satisfactorily, although it was terminated earlierthan the inspector would have wished, since no cylinder head temperatureindication was available.

The incident is understood to have occurred on the subsequentflight. Investigation revealed that the machining of the taper,had allowed the flange to move slightly further aft than hithertowhen installed on the crankshaft bringing it into contact withthe face of a gear positioned on the shaft. This prevented thetaper within the flange from fully engaging the correspondingtaper on the crankshaft. The layout of the end of the crankshaftand the crankcase made it difficult, after assembly, to identifythat the two tapers were prevented from engaging fully. The tighteningof the bolt secured the flange adequately for the short groundrun but the lack of correct engagement of the tapers allowed slightrelative movement, permitting the bolt to slacken during the subsequentfull-power operation, thus releasing the flange and propeller.