

Kolb Twinstar MK3 (Modified), G-MYOG

AAIB Bulletin No: 2/2000 **Ref:** EW/G99/10/06 **Category:** 1.4

Aircraft Type and Registration: Kolb Twinstar MK3 (Modified), G-MYOG

No & Type of Engines: 1 Hirth 2706 R06 2-stroke piston engine

Year of Manufacture: 1994

Date & Time (UTC): 6 October 1999 at 1230 hrs

Location: 4 kilometres west of Lydd Airport, Kent

Type of Flight: Private

Persons on Board: Crew - 1 - Passengers - 1

Injuries: Crew - Serious - Passengers - Minor

Nature of Damage: Distorted cockpit frame, nose cone shattered

Commander's Licence: Private Pilot's Licence

Commander's Age: 59 years

Commander's Flying Experience: 272 hours (of which 264 were on type)

Last 90 days - 19 hours

Last 28 days - 6 hours

Information Source: Aircraft Accident Report Form submitted by the pilot and AAIB examination of failed crankshaft

History of the flight

The pilot had planned a flight from Redhill to Lydd. The meteorological conditions were CAVOK in light winds with a surface temperature of +10°C. After having been airborne for about one hour the pilot contacted Lydd radio for circuit information. He then selected the alternate fuel tank which was full. Shortly afterwards the engine RPM reduced, the engine ran roughly for a few seconds and then stopped. The pilot transmitted a MAYDAY call to Lydd and then commenced his forced landing procedures. Having selected a field in which to land, the pilot experienced a steeper descent path than he had anticipated, probably as a result of the stationary propeller. In order to reach the selected field the pilot raised the nose, causing a reduction in airspeed, and he then had insufficient pitch authority to effect a controlled landing. After striking the ground heavily the aircraft came to rest inverted.

The pilot and his passenger vacated the aircraft and the emergency services quickly arrived on the scene, after the pilot had used his mobile telephone to direct them to the crash site. He reported that in hindsight he may have spent too much time describing his intended forced landing location to Lydd when he should have been concentrating on flying the aircraft.

Engine examination

Subsequent examination of the engine by the owner revealed that the crankshaft had failed immediately forward of the aft crank position. AAIB examination of the fractured surfaces revealed that the failure had occurred as a result of rotating/bending fatigue cracking at the intersection of the shaft with one of the rotating counterbalance weights, as illustrated in Figure 1. This intersection was 'sharp cornered' with little or no blend radius. Further examination of the crankshaft and its support bearings found that there was a loose fit between the crankshaft and its aft end support bearing, resulting in a radial clearance between the two (Figure 2). During running, the result of this would have been to significantly increase the bending stresses at the next bearing location, the point of failure. The fit of the other four bearings on the crankshaft was satisfactory. Since new, the engine had accumulated approximately 300 hours running time. The pilot reported that he has drawn the attention of this defect to the import agents for the engine.

Improved seat/cushion impact load attenuation

The pilot reported that Service Bulletin KSB1 had been incorporated. This introduced modification of the seat pans and cushions which he considered had absorbed a lot of the energy of the ground impact, minimising the injuries sustained.