

# DH60M Moth, G-AAHY, 18 August 1996

## AAIB Bulletin No: 10/96 Ref: EW/G96/08/19 Category: 1.3

<b>Aircraft Type and Registration:</b>	DH60M Moth, G-AAHY
<b>No &amp; Type of Engines:</b>	1 De Havilland Gipsy 1 piston engine
<b>Year of Manufacture:</b>	1929
<b>Date &amp; Time (UTC):</b>	18 August 1996 at 1226 hrs
<b>Location:</b>	Woburn Abbey, Bedford
<b>Type of Flight:</b>	Private
<b>Persons on Board:</b>	Crew - 1 Passengers - 1
<b>Injuries:</b>	Crew - None Passengers - Minor
<b>Nature of Damage:</b>	Damage to propeller, landing gear, lower wings and fuselage
<b>Commander's Licence:</b>	Private Pilot's Licence
<b>Commander's Age:</b>	50 years
<b>Commander's Flying Experience:</b>	640 hours (of which 50 were on type) Last 90 days - 24 hours Last 28 days - 5 hours
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot

The aircraft had performed normally on a flight from Audley End to Woburn, where the pilot had entered the Gipsy Moth air race. The subsequent engine start at Woburn was normal, as were the power checks and idle running. However, when the throttle was opened in order to taxi the aircraft, a "rich stumble" was apparent, which the pilot describes as typical engine behaviour on a hot day. The aircraft was last in line to take off, and in consequence had to wait some time. During the take off, the engine developed its normal 1800 plus RPM. The aircraft climbed away, and was about to overtake a preceding aircraft, when the engine suddenly misfired and then lost all power. At this point the aircraft was over some trees, and the pilot was forced to attempt an 'out-of-wind'

landing in the nearest clear area. There was insufficient time to flare the aircraft properly and a heavy landing resulted, which caused substantial damage, but no injury to the pilot.

Subsequent inspection of the engine revealed no mechanical reason for the failure, and the pilot has concluded that the problem was most probably due to a fuel vapour 'lock', despite the aircraft having previously flown successfully on hot days. The fuel line passes close to the exhaust pipe on the Gipsy Moth installation (unlike a Tiger Moth) and is thus susceptible to absorption of heat from the engine. The fuel temperature would also be influenced by the ambient temperature, and the time that the aircraft had been standing, possibly in direct sunlight, prior to take off. The Meteorological Office has indicated that the temperature at the time in question was 29°C, with a dew point of 11°C.

The aircraft was running on motor gasoline (MOGAS), and had been approved for its use by CAA Airworthiness Notice (AN) No. 98. Whilst the AN expressly states that carburettor icing is more likely when using MOGAS (in comparison with aviation gasoline), there is no similar statement regarding the greater probability of a vapour lock. Nevertheless, this latter characteristic is implied in paragraph 2.2 (e), which advises the following precaution:

*After any prolonged period of "heat soak" at low fuel flow (eg hot day ground idling), establish the ability to maintain full power before commencing a take off.*

In addition to the above, the Appendix to the AN contains the following condition;

*No flight shall be made.....unless.....the temperature of the fuel in the tank prior to the commencement of the flight may reasonably be assumed to be less than 20°C and the aircraft is flown below a pressure altitude of 6000 ft.....*

AN 98 includes a Schedule of engines and aircraft approved for use with MOGAS. The AN is revised periodically, in the light of practical experience, with additions and deletions from the Schedule.