

ACCIDENT

Aircraft Type and Registration:	DH60G Gipsy Moth, G-ABDA	
No & Type of Engines:	1 De Havilland Gipsy 1 piston engine	
Year of Manufacture:	1931	
Date & Time (UTC):	5 May 2008 at 1117 hrs	
Location:	1 km south of Perth Aerodrome, Perthshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Landing gear collapsed, engine detached from fuselage, propeller broken, leading edge of wings and fuel tank damaged	
Commander's Licence:	Commercial Pilot's Licence	
Commander's Age:	57 years	
Commander's Flying Experience:	2,442 hours (of which approximately 1,000 were on type) Last 90 days - 30 hours Last 28 days - 22 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

Shortly after takeoff, the pilot noticed the engine was running roughly and that power was decreasing despite full throttle being selected. As the aircraft was unable to maintain altitude, a MAYDAY was declared and a forced landing was carried out in a field of standing crop. The aircraft sustained substantial damage in the landing, but both occupants were uninjured and able to leave the aircraft unaided. Weather conditions at the time were highly conducive to the formation of carburettor ice.

previous day and was parked in a hangar overnight. The owner, together with a pilot accompanying him on the trip, arrived the following morning with the intention of making a short flight to Strathallan. Although not an instructional flight, the pilot, an experienced Tiger Moth instructor, was to fly the aircraft from the front cockpit to allow the owner, a qualified private pilot with limited time on type, to gain experience flying the aircraft from the rear cockpit.

History of the flight

The aircraft, a biplane of, primarily, fabric covered wooden construction, was on a touring trip from its base in southern England. It had arrived in Perth the

The planned departure was delayed to allow the early morning mist to clear sufficiently for the flight to proceed. The aircraft was parked on the grass apron where the engine was started without any problems with the owner

in the rear cockpit operating the controls, and the pilot outside hand-swinging the propeller. The aircraft is not fitted with brakes so, as usual, the engine warm-up and power checks, which were satisfactory, were conducted in the parking position using chocks to prevent the aircraft moving. The pilot then removed the chocks and boarded the aircraft.

As the aircraft is not fitted with wheel brakes, the pilot taxied the aircraft across the grass to holding point 'B' for a departure off Runway 09. After completion of the pre-takeoff checks, the aircraft was lined up on the runway, which enabled approximately 420 m of the 609 m runway to be used. The pilot considered this to be sufficient for the takeoff and avoided the need to complete a back-track manoeuvre as, due to the landing gear design, the aircraft has limited turning ability on the ground. He also wished to avoid scraping the tail skid on the hard runway surface.

The takeoff and initial climb appeared normal. At approximately 300 ft, the pilot asked the owner to confirm that the carburettor air heat was in the OFF position as the engine appeared to have lost power, the only control for this being in the rear cockpit. Shortly afterwards, at between 300 ft and 400 ft, the engine was still losing power and the aircraft had started to descend, despite full throttle being selected. The pilot turned the aircraft approximately 30° left to avoid houses and power lines, and prepared for a forced landing in a large field of oilseed rape crop. A MAYDAY was declared with Perth Radio. In focussing upon the landing, the pilot reported that the carburettor air heat control remained in the OFF position.

The landing was made in a three-point attitude. The initial landing run was normal until a deep furrow was encountered by the left wheel, causing the aircraft to

yaw left. The aircraft suffered substantial damage and came to rest tipped on to its nose. Both occupants were uninjured and able to leave the aircraft unaided. There was no fire.

On hearing the MAYDAY, the radio operator alerted the Airport Fire Service, who arrived quickly on the scene. The radio operator then attempted to contact the aircraft, but a reply was received only when the pilot determined it was safe to return to the aircraft.

Initial examination of the aircraft's engine revealed no obvious signs of any failure.

Discussion

In the absence of any obvious defects or failures, the pilot, with hindsight, considers that carburettor icing may have been one potential cause of the engine's loss of power. He reported that the heat control remained in the OFF position for the duration of the flight. The flight had waited for the early morning mist to clear but the grass in the parking area, where the power checks were made, and along the taxi route, were wet. Both of these are cited as indicators of high humidity and, therefore, a high risk of carburettor icing would have existed in these conditions, reference CAA Safety Sense Leaflet No 14b, *Piston Engine Icing*. The weather report from the nearest major airfield, RAF Leuchars, 17 nm to the east, indicated similar conditions. The surface temperature was reported as 20°C.

This accident highlights some human factor issues related to the configuration of the aircraft. Many Tiger Moth aircraft have an automatic carburettor air heat system, whereas the accident aircraft had a manual carburettor air heat control, with the operating lever fitted to the rear cockpit only. Thus, whenever the aircraft is flown from the front cockpit, any selection of the control has to be

made by the occupant of the rear cockpit at the handling pilot's request. The pilot on this occasion considers that, on reflection, his familiarity with a similar type of aircraft which has the automatic carburettor heat system, and the lack of a carburettor air heat control in the front cockpit to act as a trigger for its use, may have contributed to it not being used before takeoff. However, the pilot did

ask the owner to check the carburettor heat control was selected to OFF when initially trying to diagnose the loss of power¹.

If any relevant failures are identified during subsequent repair/overhaul activity, they will be reported upon in a future AAIB Bulletin.

Footnote

¹ Selecting carburettor air to hot directs unfiltered warmed air into the carburettor, to melt any ice that may have formed; the warm air, however, causes a reduction in power output, and may cause the engine to run more roughly as the consequent water is ingested by the engine.