No: 10/91 **Ref: EW/G91/07/26** **Category: 1c**

Aircraft Type and Registration:	Percival Mew Gull, G-AEXF	
No & Type of Engines:	1 De Havilland Gipsy Queen II piston engine	
Year of Manufacture:	1936	
Date & Time (UTC):	17 July 1991 at 0935 hrs	
Location:	Near Old Warden Aerodrome, Bedfordshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - Minor	Passengers - N/A
Nature of Damage:	Aircraft damaged beyond economic repair	
Commander's Licence:	Commercial Pilot's Licence with Instrument rating	
Commander's Age:	61 years	
Commander's Flying Experience:	10,050 hours (of which 5 were on type)	
Information Source:	Aircraft Accident Report Form submitted by the pilot and engine test performed under AAIB supervision.	

The aircraft was being prepared for a renewal of its Permit to Fly. Engine ground runs performed a few days prior to the accident had shown a slightly high rpm drop associated with the left magneto but after checks on the plugs and magnetos no fault was found and further runs were satisfactory.

An engine run prior to the accident flight had produced a similar magneto drop but now associated with the right magneto. This apparently cleared itself and the engineer pronounced the aircraft fit for an air test. The pilot took-off from Old Warden and orbited into a position for executing a timed performance climb between 500 and 1500 feet. This was done with no abnormalities observed. However, as the pilot initiated a left turn and was advancing the propeller lever towards 2400 rpm prior to a stall test, the engine speed dropped by 300-400 rpm. Adjustments to the mixture, throttle and propeller controls gave no benefit and the engine rpm decayed further.

The pilot initially considered a forced-landing back at Old Warden but, with airspeed down to 100 kt and a height of only 1200 feet, he decided that the 180° turn required was not safe and headed instead for open farmland to the east of the airfield. Unfortunately, there were no mown fields available and he was forced to select a field of barley. The approach was made, with the engine still producing some

power, under power cables where the aircraft lightly brushed a bush and the initial touchdown was smooth in a tail-down attitude. After a ground roll of some 30 metres the wheel spats apparently became clogged with barley and first one wing, then the other, touched the ground resulting in their detachment. The fuselage remained largely intact and slid to a halt on its left-hand side after a total ground run of about 50 metres. Because of the attitude of the fuselage, the pilot was unable to open the 'clamshell' cockpit cover and had to be extricated by rescuers some 3-4 minutes later. He comments that he was surprised that, even though the cockpit was full of choking petrol fumes with the obvious likelihood of fire, this extreme motivation to evacuate the wreckage did not provide him with extra strength to force his way out as he might previously have expected. He was wearing a well secured 4-point harness which withstood the impact and his injuries were confined to a wrenched back and badly grazed left elbow.

Despite the severe damage to the airframe, the engine itself had suffered only superficial damage and was removed from the aircraft. It was then despatched to an overhaul agency where it was examined and tested under AAIB supervision. It was found to both start and run smoothly and developed its normal power characteristics according to the manufacturer's original specification. The agency did, however, comment on the fact that the automatic induction air temperature control mechanism had been removed. This device was linked to the throttle control and simply arranged for the carburettor to draw warm air from the cowling area at all times except those where full throttle was demanded. At this setting it opened a flap allowing cooler, ambient air to be inducted. The pilot and engineer of G-AEXF had already mentioned this modification during discussions with AAIB and expressed their concern that the cause of the engine failure may have been carburettor icing. The precise point in the engine's history at which the device had been removed is unclear. The trunking which connected it to the carburettor had been sawn through leaving a gap of several inches between the trunking and the intake duct on the nose cowl. The aircraft had therefore apparently been operating for some time with the carburettor drawing air from the cowling area but close to a ram-air source of ambient temperature. The aircraft was rebuilt following a serious accident in 1985, when it passed to its present owner/pilot. This rebuild had just been completed and the engineer had noted the lack of the automatic temperature control device. Initial tests had suggested that the engine was running slightly rich under certain conditions. It was therefore decided that the gap between the carburettor intake trunking and the nose cowl intake duct be eliminated with a specially fabricated metal adaptor. This meant that the engine was now being fed purely with ram air from the front of the nose cowl and it was in this configuration during the accident flight.

Information from the Meteorological Office shows that the weather conditions at 2000 feet in the Old Warden area, with a temperature of +11° and relative humidity of 69%, were conducive to a serious risk of induction icing at any power setting.