

## ACCIDENT

<b>Aircraft Type and Registration:</b>	De Havilland DH82A Tiger Moth, G-BYTN	
<b>No &amp; Type of Engines:</b>	1 De Havilland Gipsy Major 1C piston engine	
<b>Year of Manufacture:</b>	1939 (Serial no: 3993)	
<b>Date &amp; Time (UTC):</b>	16 April 2015 at 1245 hrs	
<b>Location:</b>	Near Netherthorpe Airfield, Nottinghamshire	
<b>Type of Flight:</b>	Aerial Work	
<b>Persons on Board:</b>	Crew - 1	Passengers - 1
<b>Injuries:</b>	Crew - None	Passengers - None
<b>Nature of Damage:</b>	Severe damage to lower right wing, fin, propeller and possible distortion of fuselage	
<b>Commander's Licence:</b>	Commercial Pilot's Licence	
<b>Commander's Age:</b>	29 years	
<b>Commander's Flying Experience:</b>	1,050 hours (of which 10 were on type) Last 90 days - 46 hours Last 28 days - 13 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot	

## Synopsis

The pilot and passenger were taking off for a pleasure flight in the local area. The aircraft had full fuel and was just below its Maximum Takeoff Weight (MTOW). After lift off, the pilot found that he was unable to climb out of ground effect and decided to land in a field of crops. During the subsequent landing, the aircraft flipped inverted. The pilot believes that a slight reduction in available power, coupled with calm wind conditions and the short runways at Netherthorpe, contributed to the accident.

## History of the flight

The aircraft was operated by a company specialising in scenic experience flights, principally in the Tiger Moth aircraft. On the day of the accident, the pilot had flown 'TN' four times and the aircraft itself had flown six times. He elected to use grass Runway 24, which has a Takeoff Run Available (TORA) of 490 metres, since there was no discernible wind. This runway has a 1.9% upslope.

After his second flight of the day, the pilot had been advised by an observer to use more of the TORA since it appeared that he was starting the takeoff roll from the intersection with the cross runway 18/36. Having assured the observer that this was not the case and he was, in fact, starting adjacent to the runway numbers, he resolved to make better use of the TORA and start further back during subsequent takeoffs.

After his last successful takeoff, the aircraft was refuelled whilst the pilot briefed his next passenger. He was aware that, with full fuel and a passenger weighing 101 kg, the aircraft would be heavy, but some 32 kg less than the 828 kg MTOW. After briefing his passenger, the pilot started the engine and backtracked along the southern side of Runway 24 to position the aircraft just before the beginning of the displaced threshold arrow for the start of the takeoff run.

The first part of the run seemed normal and he let the tail rise. The aircraft then struck an undulation and briefly became airborne but, despite the pilot's attempt to stay airborne, it touched down again. He tried again, aware that he had used about 250 metres of the runway compared with some 175 metres on previous takeoffs. Conscious of the extra weight, he briefly allowed the aircraft to stay in ground effect in order to accelerate, before raising the nose to climb away. At this point, the pilot felt that there was a general lack of energy and the climb rate reduced. He glanced at the airspeed indicator and recalls it reading 36-37 kt, so he lowered the nose to try and regain some energy, but this inevitably caused the aircraft to sink. He later noted from his GPS that he had reached a maximum height of 20 ft, although it had appeared to him at the time more like 30-50 ft.

Aware that the aircraft was sinking and that there were buildings and hedgerows ahead hidden underneath the nose, the pilot decided to put the aircraft down in a field and chose an oil seed rape field at about his 11 o'clock position. He touched down in the field but was still applying left bank to steer the aircraft away from a hedgerow. The left lower wingtip brushed the crop and then the ground. In trying to straighten up, the right lower wingtip and the main landing gear struck the ground, causing the aircraft to flip inverted at a speed the pilot estimates to have been about 35 kt. The passenger evacuated the aircraft first, followed by the pilot.

The pilot believes that there was insufficient power to climb out of ground effect and advocated a more restrictive weight limit than the MTOW when operating out of Netherthorpe in calm conditions. He also had anecdotal evidence that the Tiger Moth's Gipsy engine was prone to a reduction of available power when operating continually over a lengthy period, due to heat build-up. Both the organisations with Type Responsibility for the Tiger Moth and Gipsy engines are not aware of such an issue with correctly set up and maintained engines.