

ACCIDENT

Aircraft Type and Registration:	Cessna F150L, G-AYKL	
No & type of Engines:	1 Continental O-200-A piston engine	
Year of Manufacture:	1970	
Date & Time (UTC):	16 August 2006 at 1322 hrs	
Location:	Netherthorpe Airfield, Nottinghamshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - 1 (Minor)	Passengers - 1 (Minor)
Nature of Damage:	Severe damage to propeller, fuselage and wings	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	57 years	
Commander's Flying Experience:	459 hours (of which 325 were on type) Last 90 days - 5 hours Last 28 days - 1 hour	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The aircraft was departing from Runway 24 at Netherthorpe. During the takeoff the initial acceleration was normal, but as the aircraft became airborne the engine power appeared to reduce. The pilot attempted to increase airspeed by lowering the nose, but after a short distance the right wing dropped and the aircraft struck the ground.

uplifting 29.5 litres. A visual inspection of the fuel tanks, following the refuelling, showed them to be just under half full. The weather was good with a surface wind from 270° at 5 kt, visibility of approximately 8 km and broken cloud at 3,000 ft. Whilst the temperature was not recorded, the pilot described the ambient conditions as warm but not hot.

History of the flight

The pilot had planned to take a friend on a local flight before returning to Netherthorpe. They arrived at the airfield at approximately 1240 hrs and the pilot carried out the normal daily inspection. The fuel sample check was satisfactory with no indication of water contamination. As the fuel state was low the pilot refuelled the aircraft,

Netherthorpe Airfield has two runways, Runway 06/24 and Runway 18/36: Runway 24 was the active runway at the time of the accident. Runway 24 is 553 metres long and 36 metres wide with a grass surface; at the time of the accident the surface was dry, hard and had recently been mown. It also has a 1.9% uphill slope and the airfield elevation is 254 ft amsl.

The engine start and the power checks were normal and the pilot explained to his passenger the actions that he was performing. He emphasised the importance of checking for a drop in rpm during the magneto and carburettor heat check, and ensured that the rpm returned to normal when both magnetos were selected and when the carburettor heat was selected OFF. Having completed the relevant checks the pilot taxied the aircraft to the holding point for Runway 24.

At the holding position the pilot carried out the pre-takeoff checks following his checklist. This included another check for carburettor icing, although none was evident. It was also the pilot's practice to keep his hand on the carburettor heat knob until he pushed it back in; this was to prevent leaving it inadvertently selected to ON. The pilot selected the flaps to 10°. Having completed the pre-takeoff checks, the aircraft was lined up on Runway 24 ready for departure. The windsock was hanging limply in the light breeze with the general wind direction from 270°.

The pilot applied full throttle; the engine responded and the aircraft accelerated normally. The intersection of the two runways was the point at which the pilot normally decided whether to continue or abandon a takeoff. At this point the IAS was 45 mph, which was normal, and the pilot continued towards the 55 mph required for lift off. The pilot reported that, shortly after the intersection, the rate of acceleration reduced. He considered abandoning the takeoff but believed that there was insufficient runway remaining to stop and, with the aircraft responding to aft control column inputs, he raised the nose and lifted off.

The aircraft climbed slowly to approximately 50 ft, at which point the pilot lowered the nose in an attempt to increase the airspeed. Approximately 400 metres from

the up-wind end of the runway, the right wing dropped and the aircraft impacted the surface of a grass field. The airframe was heavily disrupted and both persons on board were slightly injured. The pilot and his passenger were able to release their harnesses and vacate the aircraft through the normal access doors. The airfield Rescue and Fire Fighting Service attended the scene promptly.

Weight and CG

The calculated weight of the aircraft for the departure was 1,591 lbs, with the CG at + 34.9 inches from the manufacturer's datum. The aircraft was thus close to its maximum takeoff weight of 1,600 lbs with the CG near the mid-point of its permitted range.

Performance

The Owner's Manual provides performance data for the pilot to determine the Take-Off Run Required (TORR) and Take-Off Distance Required (TODR) to 50 ft. The manufacturer's performance data was applied to the following conditions: a level, hard, dry, grass surface at 254 ft amsl, with an ambient temperature of 15°C, a zero headwind component and flaps set to 10°. The resultant TORR was 220 metres and the TODR was 460 metres. The manufacturer's data required these distances to be increased by 10% for each additional 35°F; thus at an ambient temperature of 34°C the TORR was 242 metres and the TODR was 506 metres. No distance increment for the up slope was available in the Owners Manual. The CAA Safety Sense Leaflet 7C '*Aeroplane Performance*' suggests an increment of 10% for a 2% uphill slope. This increases the TORR to between 242 metres and 266 metres for the temperature range considered.

The following information is included in the Owner's Manual regarding the use of flap during takeoff:

FLAP SETTINGS

Normal and obstacle clearance take-offs are performed with flaps up. The use of 10° flaps will shorten the ground run approximately 10%, but this advantage is lost in the climb to a 50 foot obstacle. Therefore the use of 10° flaps is reserved for minimum ground runs or for take-off from soft or rough fields with no obstacles ahead.

If 10° of flap are used in ground runs, it is preferable to leave them extended rather than retract them in the climb to the obstacle. The exception to this rule would be in a high altitude take-off in hot weather where climb would be marginal with flap 10°. Flap deflections of 30° and 40° are not recommended at any time for take-off.

The CAA Safety Sense Leaflet 7C 'Aeroplane Performance' recommends that the appropriate Public Transport factor should be applied for all flights. For takeoff this factor is 1.33 and applies to all single-engined aeroplanes and to multi-engined aeroplanes with limited performance scheduling (Group E). This factor takes into account:

- Lack of practice
- Incorrect speeds / techniques

- Aeroplane and engine wear and tear
- Less than favourable conditions

Analysis

The aircraft was operating close to its maximum weight with the CG at a mid-position. The pilot had operated from Runway 24 at Netherthorpe in similar weather conditions and close to the maximum weight on previous occasions. With 10° of flap selected the performance during these departures had been adequate. However, the Owner's Manual states that normal and obstacle clearance takeoffs should be performed with the flaps up.

The pilot had carried out the engine pre-takeoff checks, which were normal, and had checked the carburettor heating, which he then selected off immediately prior to departure. The runway length available was sufficient in accordance with the manufactures performance requirements, even allowing for the Public Transport takeoff safety factor of 1.33.

No explanation for the loss of power was identified and although the ambient temperature was not recorded, it was described as warm rather than hot. The wing drop and loss of control were considered to be the result of the pilot attempting to maintain or increase height, with a subsequent loss of airspeed leading to a stall.