

Slingsby T61F Venture T Mk 2, G-BUFP

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Aircraft Type and Registration: Slingsby T61F Venture T Mk 2, G-BUFP

No & Type of Engines: 1 Rollason RS Mk 2 piston engine

Year of Manufacture: 1982

Date & Time (UTC): 12 May 2000 at 1445 hrs

Location: Dunstable Downs Airfield, Bedfordshire

Type of Flight: Aerial Work (Instruction)

Persons on Board: Crew - 2 - Passengers - None

Injuries: Crew - 2 (serious) - Passengers - N/A

Nature of Damage: Extensive

Commander's Licence: Private Pilot's Licence with Flying Instructor Rating

Commander's Age: 61 years

Commander's Flying Experience: 2,443 hours (of which 12 were on type)
Last 90 days - Not known
Last 28 days - 5 hours

Information Source: AAIB Field Investigation

History of flight

The aircraft was being operated from the grass gliding site at Dunstable Downs Airfield, using the 'north east run' which is a northerly take-off direction. The first half of the run is uphill, then over the crest of a hill to a downhill section, then level to the airfield boundary, around 1,000 metres overall. The airfield boundary in this area is composed of low cut trees and bushes. Just beyond the airfield boundary, the ground drops away into a valley, through which runs a public road and the access road to the airfield.

The instructor had successfully completed one local instructional flight in G-BUFP earlier in the afternoon, departing from the 'north east run' at 1315 hrs and finishing some 35 minutes before the accident. There was then a change of student, in order to undergo a field landing selection exercise. A pre-flight briefing took place with the aircraft parked close to the commencement of the take-off run. The instructor indicated that some light rain occurred for a period of three to five minutes while this was taking place.

The pre-flight vital actions were carried out and there was a delay of about ten minutes while the appropriate launch signalling personnel were available at the mid-field position. The instructor was the handling pilot for the take off and estimated that the aircraft was some 35 lbs lighter than for his previous take off, so he was not anticipating any performance problems. However, during the take-off run, at his nominated take-off abort decision position, the aircraft was still on the ground, but felt 'light' as though about to become airborne. The instructor assessed that the aircraft became airborne shortly after this, but brushed a tree top on the upwind boundary. This reduced the aircraft's speed such that it stalled and impacted with the adjacent road in a near vertical but slightly inverted attitude, with the engine stopped and propeller stationary.

The student recalled noting the rainfall during the pre-flight briefing and the instructor's comment that the flight would be postponed if the rain became any heavier. However, the rain did not become heavier prior to the commencement of the take off. The student recalled the aircraft hitting bumps during the take-off roll, becoming airborne briefly before touching down again. After the third such bounce, the stick was pulled back slightly and the aircraft became airborne briefly before beginning to descend. By this time, the aircraft was overflying the airfield boundary hedge and descending into the adjacent valley. The left wing dropped and there was the noise of the left wing striking a tree. The aircraft hit the road and slid across to the far side, coming to rest by the kerb.

Fuel began to leak into the cockpit from the fuel tank and a fire started under the engine cowling. Both occupants were trapped in the wreckage initially. Witnesses from the gliding club and passing motorists came to their assistance. They managed to return the aircraft to the upright position and to extinguish the fire. The passenger became free of the wreckage during the righting process, but the instructor was released after the arrival of the emergency services a short time later.

Three eyewitnesses at the airfield all gave similar accounts of the aircraft's trajectory, indicating that the aircraft was airborne at only a very low height crossing the airfield boundary and disappeared from view into the valley thereafter.

Impact parameters

Evidence of any initial brush by the aircraft with branches of some low trees situated at the edge of the airfield could not be found. The first major impact was with some substantial boughs of a large tree that was situated next to the gliding club's entrance road from the B 489 Dunstable to Tring road. The top of this tree was approximately 25 feet below the height of the departure end of the take-off run that was in use. This major impact was by the aircraft's outer two thirds of the left wing which effectively destroyed it. The fuselage and right wing pivoted around the left wing and the nose pitched down rapidly. This resulted in the remains of the aircraft impacting the B 489 road in a nose down, yawed to the left and inverted attitude and travelling in the general direction of the take-off run. Following the initial impact the aircraft slid, inverted, across the road until arrested by the kerb at the northern edge. Upon coming to rest a small fire started in the upper engine area which spread to the lower sides of the cockpit before it was extinguished.

Wreckage examination

Examination of the aircraft revealed that at the time of impact with the tree all the flying control surfaces were correctly attached and that the flying control systems were connected and not restricted. None of the aircraft's panels or engine cowlings had become detached prior to the initial impact. Evidence at the accident site indicated that the propeller was not being driven at high power at the time of the impact with the tree or the road. The position of the throttle and carburettor hot air

controls at the initial impact could not be determined with any degree of certainty. There was evidence that there was a reasonable quantity of the correct type of fuel present in the fuel tank. The main landing gear tyre pressure was checked and found to be slightly in excess of the recommended inflation pressure.

The engine, which had been zero time overhauled about 50 engine hours prior to the accident was taken to an approved overhaul organisation and in the presence of the AAIB strip examined and, where possible, components were tested. No evidence was found to indicate that a power reduction or loss could have occurred due to the mechanical condition of the engine or its components. The general condition of the engine reflected its recent overhaul.

Performance aspects

An aftercast from the Met Office indicated that, at the time of the accident, the surface wind was from 070° at 4 kt, visibility around 8 km in light rain, with broken cloud base 2,000 feet and overcast cloud base 7,000 feet. The temperature was +15°C and the mean sea level pressure was 1021 mb.

Other pilots familiar with the airfield indicated that, given the prevailing surface wind conditions, some light turbulence or sink was to be expected immediately after departure in this take-off direction as a result of the local topography. They also indicated that the wind was lighter at the time of the accident than it had been earlier in the afternoon.

Handling notes produced by the Gliding Club for the operation of G-BUFP indicated that take off should not be attempted with wet wings. The T-61 series of aircraft are categorised as being in the 'Unclassified' performance group, and detailed performance figures were not available. However, there was documented evidence which suggested that the deterioration in take-off performance with wet wings could manifest itself as a doubling of the normal take-off run required and impairment of the initial climb performance. One report also suggested that even though the engine may be developing full power, the aircraft (with wet wings) may still be firmly on the ground with the airspeed 10 kt above the normal stall speed.

The undulating surface of the take-off run was composed of mown grass, but this was variable in length, the tallest grass being present towards the end of the available take-off run, thus having an adverse effect on the overall take-off performance.

Given these factors, and a lack of any significant defect identified with the engine, it is likely that the aircraft's failure to become safely airborne within the distance available was related to the adverse combination of the presence of moisture on the wings, the length of the grass along the take-off run and the prevailing surface wind conditions. For take off with the presence of any adverse conditions, the pre-determination of a 'go/no go' decision point is required, such that unless the aircraft is actually airborne at a safe speed on passing the decision point, then the decision must be made to abandon the take off and sufficient stopping distance should be available to bring the aircraft safely to a halt within the airfield boundary. Details of the various performance considerations are contained in the CAA Safety Sense leaflet 7B, Aeroplane Performance.