

## ACCIDENT

<b>Aircraft Type and Registration:</b>	Cirrus SR22, N588CD	
<b>No &amp; Type of Engines:</b>	1 Continental IO-550-N piston engine	
<b>Year of Manufacture:</b>	2006	
<b>Date &amp; Time (UTC):</b>	6 November 2006 at 1025 hrs	
<b>Location:</b>	Chichester (Goodwood) Airfield, West Sussex	
<b>Type of Flight:</b>	Training	
<b>Persons on Board:</b>	Crew - 2	Passengers - None
<b>Injuries:</b>	Crew - None	Passengers - N/A
<b>Nature of Damage:</b>	Damage to nose gear leg, main landing gear legs, left wing leading edge, fuselage underside and propeller	
<b>Commander's Licence:</b>	Commercial Pilot's Licence (with Instructor rating)	
<b>Commander's Age:</b>	38 years	
<b>Commander's Flying Experience:</b>	8,055 hours (of which 150 were on type) Last 90 days - 195 hours Last 28 days - 55 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB	

## Synopsis

The accident occurred during a takeoff attempt on the student pilot's second training flight, with an instructor. At 60 kt the student inadvertently closed the throttle instead of applying back pressure to the control stick. The instructor took control and decided to abort the takeoff. The wet grass reduced the aircraft's braking action and the aircraft overran the length of the runway and struck a tyre barrier at approximately 10 to 20 kt.

## History of the flight

The student pilot was undertaking her second training flight, with an instructor, as part of a course to obtain an AOPA<sup>1</sup> Flying Companion's Certificate. The course

is designed to enable those who fly regularly with a private pilot to be more involved in the flights and be able to take over and land the aircraft if the pilot were to become incapacitated. The course is conducted with the student pilot flying from the right seat and the instructor in the left.

The weather was good with a calm wind, but the grass runways were wet from heavy dew. The main runway, 14/32, was closed for grass cutting, so the intersecting Runway 24 was active. This runway had a takeoff run available and a takeoff distance available of 845 m. The instructor briefed the student pilot on how to carry out the takeoff run and explained that the aircraft would try to veer to the left when power was

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## Footnote

<sup>1</sup> Aircraft Owner's and Pilot's Association.

applied and this would need to be controlled with the rudder pedals. He also said that they would perform the rotation together.

The student taxied the aircraft and lined up on Runway 24. After a final briefing from the instructor, the student applied power. The aircraft veered to the left and the student stated that she was both distracted and alarmed by the extent to which this happened. She found that she could only concentrate on trying to control the aircraft's direction. At approximately 60 kt the instructor told her to pull back on the stick to initiate rotation. However, the student was so consumed with trying to maintain control with her feet that she confused the throttle lever in her left hand with the control stick in her right hand and inadvertently pulled back with her left hand, closing the throttle. At this point the instructor took control and he reported that, with the throttle closed and the speed already decaying, he decided to abort the takeoff. He applied the brakes but found no braking action on the wet grass. He released the brakes and reapplied them but still found no effect. He continued to pump the brakes, pulled the mixture lever to idle cut-off and switched off the electrics. The aircraft crossed over the motor circuit track at the end of the runway and hit the tyre wall on the other side. The instructor estimated the impact speed at between 10 and 20 kt. The aircraft came to an abrupt stop and both he and the student were able to evacuate safely. The airfield's fire service arrived within a minute but there was no fire (see Figure 1).

### Eyewitness account

The airfield's flight information service officer (AFISO) on duty at the time, who was also a private pilot, observed the aircraft's takeoff run from the control tower. He reported that as takeoff power was applied the aircraft immediately yawed to the left but the turn was arrested. He then witnessed the aircraft making small turns from side to side as it continued down the runway while accelerating at a slower rate than he expected. The AFISO believed that he then heard a marked reduction in engine power which was followed by two separate slight increases but it did not sound like takeoff power to him. He estimated that at this point the aircraft was 200 to 300 m from the end of the runway and he became concerned that the aircraft would not be able to complete the takeoff. When the aircraft was just short of the runway intersection he heard a burst of power which sounded like takeoff power. As the aircraft passed the intersection he heard the power being cut, and by then he had his hand over the crash alarm. He thought the aircraft



**Figure 1**

Aircraft in its final resting position against the tyre barrier

might still stop in time, but when it hit the tyre barrier he activated the crash alarm.

The instructor's recollection differed slightly from that of the AFISO. He has since stated that he thought the student maintained a fairly straight line down the runway without assistance from himself, although the student applied power slowly. The instructor also stated that after the student inadvertently reduced power he did not reapply power at any stage.

### **Takeoff performance**

The aircraft's weight at takeoff was 1,326 kg, which was 219 kg below the aircraft's maximum takeoff weight. For the weather conditions of the day the aircraft's performance figures predict a takeoff ground roll of 229 m (this includes a 15% increment for dry grass) and a takeoff distance to 50 feet of 344 m. These figures assume a liftoff speed of 70 kt. The landing distance ground roll is given as 343 m for a dry paved runway and 478 m (40% more) for a dry grass runway. The aircraft's flight manual does not provide performance figures for wet grass runways. The CAA recommends in *Safety Sense Leaflet 7* on aeroplane performance that a factor of 15%+ should be used for dry grass runways and 35%+ for wet grass runways. However, it warns that very short wet grass may be slippery and may increase landing distances by up to 60%. (The CAA factors should be multiplied by the landing distance from a height of 50 ft so cannot be directly compared to the manufacturer's factors which are multiplied by the landing distance ground roll.)

### **Grass cuttings**

The pilot expressed concern that the grass cuttings on the last third of the runway might have reduced the braking action on the wet grass. The CAA's Aerodrome Standards Department were consulted about the grass cuttings and were sent photographs of the cuttings that were in the path of N588CD. The CAA regarded the grass cutting clumps as small and stated that they would not have had an effect on braking action.

### **Analysis**

If the takeoff had been carried out normally with no deviations and no delay in achieving takeoff power, then the aircraft should have reached 60 kt having used less than 229 m of runway. At this point there would have been 616 m of runway remaining. The aircraft's landing distance ground roll can be used to estimate the stopping distance required from 60 kt. Had the grass been dry it should have been possible to stop the aircraft within 478 m – which was less than the distance remaining. However, short wet grass can be significantly more slippery, as evidenced by the CAA's safety factor of 60%. It is therefore not possible to determine definitively if the aircraft would have stopped in the remaining distance available had the takeoff run been carried out normally.

The contributory factors in this accident were: the delayed application of full power during the takeoff run, the student pilot's apprehension and inadvertent closing of the throttle, and the slippery wet grass.