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**ACCIDENT**

<b>Aircraft Type and Registration:</b>	Cirrus SR22, Perspective N770CP	
<b>No &amp; Type of Engines:</b>	1 Teledyne Continental Motors IO-550N piston engine	
<b>Year of Manufacture:</b>	2008	
<b>Date &amp; Time (UTC):</b>	4 November 2008 at 1436 hrs	
<b>Location:</b>	East of Staverton Airport, Gloucestershire	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - 1
<b>Injuries:</b>	Crew - 1 (Serious)	Passengers - 1 (Minor)
<b>Nature of Damage:</b>	Substantial; aircraft beyond economic repair	
<b>Commander's Licence:</b>	Private Pilot's Licence	
<b>Commander's Age:</b>	20	
<b>Commander's Flying Experience:</b>	218 hours (of which 61 were on type) Last 90 days - 53 hours Last 28 days - 16 hours	
<b>Information Source:</b>	AAIB Field Investigation	

**Synopsis**

Shortly after takeoff, the aircraft lost power and a forced landing was carried out. The aircraft struck a tree before landing heavily in a field causing substantial damage. No cause has been established for the power loss.

**History of the flight**

The pilot was to deliver the aircraft back to its home base, following a 100 hr maintenance inspection at Gloucestershire. During the pre-flight inspection, he noted that there was approximately 30 USG of fuel in the left tank and 35 USG in the right tank, and that the engine contained 7 quarts of fresh oil; he also drained clean samples from the fuel tanks.

The pilot elected to fly the aircraft from the right seat, and his passenger, who was also a qualified private pilot but had not flown a Cirrus aircraft previously, sat in the left. The aircraft taxied to the runway holding point, where the pilot carried out a power check, noting that each magneto produced a drop of about 60 rpm, and the engine idled smoothly at about 750 rpm. The Multi-Function Display (MFD) on the right side of the instrument panel was set to the engine page for the duration of the flight.

The pilot completed the pre-flight check and the aircraft entered the runway. The pilot increased power to 2,000 rpm against the brakes, noted that all the engine

indications were correct, and released the brakes. He reported that he then applied full throttle and the engine responded “flawlessly”; the MFD showed that normal takeoff power was being produced. He rotated the aircraft at 65 kt and allowed the aircraft to accelerate through 85 kt, when he retracted the flaps. He then allowed the aircraft to accelerate to 100 kt for the initial climb, assessing that the aircraft’s performance until this time was normal.

The pilot described how, as he reached across to switch off the electric fuel pump, at approximately 150 ft aal, there was a “loud metallic bang”, and the power reduced rapidly but smoothly. He pitched the nose down to keep a safe flying speed, identified a possible landing field ahead and transmitted a MAYDAY call. His selection of a landing site was made difficult by the presence of the motorway and power lines in front of the aircraft. The pilot reported that he had considered deploying the Cirrus Airframe Parachute System (CAPS) parachute, but recognised that there was insufficient height to do so safely.

The pilot traded speed for height, stretching the glide to cross the motorway, and avoided banking the aircraft as he was aware that the aircraft was close to the stall. The aircraft struck a tree, which caused a “heavy deceleration”, and it landed heavily in a field in a fully-stalled condition.

The pilot reported that he had not attempted to diagnose the cause of the engine problem when it occurred, as there was insufficient height to do so. He stated that he had not moved any cockpit control immediately before the engine note changed, nor had he been wearing loose clothing which could have snagged on a control. The passenger in the left seat stated that he had not moved any cockpit control.

The passenger sustained a spinal injury in the landing but was able to open his door and pull himself out onto the wing. The pilot switched off various services in the cockpit, including the battery switches but power remained applied. He then pulled all of the circuit breakers, which removed power from the aircraft’s systems and attended to his passenger. Other aircraft in the aerodrome circuit assisted ATC in identifying the accident site, and the Aerodrome Fire and Rescue Service (AFRS), and other emergency responders, arrived promptly.

The pilot had not switched the fuel selector off or re-installed the safety pin in the CAPS rocket assembly but AFRS personnel carried out these tasks under the pilot’s guidance.

### **Witnesses**

A number of witnesses heard and/or saw the engine failure. One experienced air traffic controller described that as the aircraft crossed the painted numbers marking the beginning of Runway 27, the engine sound changed, indicating “an instantaneous loss of power”, not “a gradual throttling back like a practice engine failure”. He stated that there was no “popping or banging” following the change in note. He estimated that the aircraft’s height was in excess of 150 ft aal when the engine note changed.

Another controller, on duty at the time, described that the engine noise “wound down to nothing”. He cautiously estimated the aircraft’s height to be about 80 ft aal at the time.

### **Flight recorders**

The aircraft was fitted with a digital flight recorder, which was not crash-protected, but had not suffered damage in the accident. A representative of the

manufacturer downloaded data from the recorder after the accident, but the recorder appeared to have stopped recording some months earlier. The recorder was removed from the aircraft and sent to the recorder manufacturer, who confirmed that a fault had led to the recorder's ceasing to function. The manufacturer has identified the cause of the fault and has taken steps to modify all in-service recorders to prevent recurrence.

### **Engineering**

The aircraft had been declared damaged beyond economic repair by its insurers and thus the wings could be cut off for transportation by road to the AAIB. All three landing gears had collapsed and all three propeller blades had been bent, indicating rotation but not under significant power.

After inspection and consultation with the representatives from the aircraft and engine manufacturer, it was decided that it would be possible to run the engine in the aircraft after fitting a replacement propeller. The fuselage was then strapped to a trailer and a fuel supply was jury-rigged using a plastic fuel drum connected to the exposed fuel feed and return pipes in the right wing; the drum contained fuel which had been drained from the aircraft after the accident. The damaged silencers had to be removed and a fuel leak, from the damaged gascolator drain, had to be rectified before the engine was started.

The engine started and ran at idle normally before being accelerated to full power with the two manufacturer's

representatives monitoring the engine parameters in the cockpit. After about 10 minutes of running at various power levels, the engine was shut down. No abnormalities had been observed during the test run.

### **Analysis**

The flight was unremarkable until the pilot reached to switch off the fuel pump shortly after takeoff. Although his recollection was that he had not moved the switch before power reduced, the possibility exists that he did, in fact, select the fuel pump off. If this were the case, then it is possible that a power reduction may have occurred and caused the power loss.

The possibility that the pilot inadvertently moved the throttle to the closed position, or turned the fuel selector to off, was considered. Both the pilot's and passenger's recollections were that this had not been the case, and had the pilot done so, it seemed likely that he would have attempted, quickly, to restore power. No evidence of an attempt to restore power was identified, and witness accounts did not substantiate this theory. Action by the pilot and emergency services to render the aircraft safe after the accident meant that the investigation was unable to validate the control positions in the cockpit. No conclusion has been reached regarding the engine failure.