

**ACCIDENT**

<b>Aircraft Type and Registration:</b>	Acrosport 2, G-CGAK	
<b>No &amp; Type of Engines:</b>	1 Lycoming O-360 A1A piston engine	
<b>Year of Manufacture:</b>	2010	
<b>Date &amp; Time (UTC):</b>	20 August 2011 at 1236 hrs	
<b>Location:</b>	Duxford Airfield, Cambridgeshire	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - 1
<b>Injuries:</b>	Crew - None	Passengers - None
<b>Nature of Damage:</b>	Damage to the right landing gear, wing and propeller. , engine shock-loaded	
<b>Commander's Licence:</b>	Private Pilot's Licence	
<b>Commander's Age:</b>	55 years	
<b>Commander's Flying Experience:</b>	2,821 hours (of which 70 were on type) Last 90 days - 29 hours Last 28 days - 7 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and AAIB enquiries	

**Synopsis**

Following a normal landing, the right landing gear collapsed during the ground roll as a result of a failure of the right landing gear cross-strut.

detected at the time, or during the subsequent pre-flight inspections, and the aircraft handled normally up to the time of the accident.

**History of the flight**

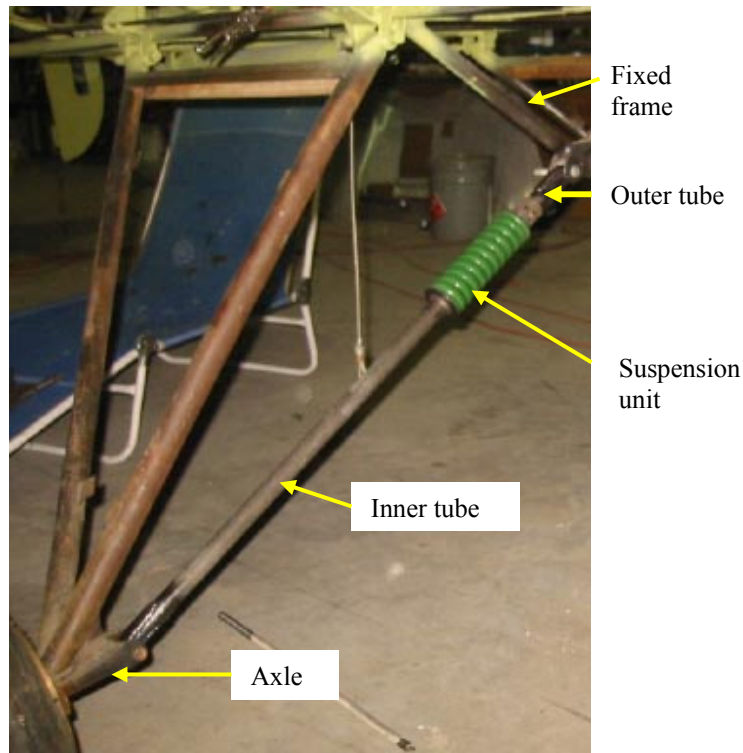
The pilot, who was also a flying instructor, made what he considered to be a normal "into wind" landing and during the ground roll the right landing gear collapsed.

The owner of the aircraft advised the investigation that in March 2011, approximately 15 flying hours and 20 landings prior to the accident, the aircraft landed firmly on the right main wheel. No damage was

**Description of main landing gear**

The Acrosport 2 is equipped with a fixed main landing gear that incorporates a suspension unit in the cross-strut. During the landing the leg pivots outwards and the spring in the cross-strut compresses and absorbs the landing loads. See Figure 1.

The cross-strut consists of an inner tube, which is connected to the axle of the mainwheel, and an outer



**Figure 1**

Right landing gear cross-strut

tube which is connected to a fixed frame at the fuselage. See Figure 2. A spring is fitted over the outside of the outer tube and is retained in place by a lower collar welded to the tube and an upper collar which is held in place by Bolt 'A'. Bolt 'A' passes through a slot in the outer tube and a hole in the inner tube and insert. As the landing leg moves outwards, the inner tube moves downwards causing the upper collar to compress the spring. On G-CGAK an insert had been welded in two positions into the end of the inner tube in order to increase the maximum 'tear out' force that the tube could sustain.

### Damage to landing gear

#### *Right cross-strut*

The repair organisation reported that on the right cross-strut the welds securing the insert to the inner tube had failed, allowing the insert to separate from the

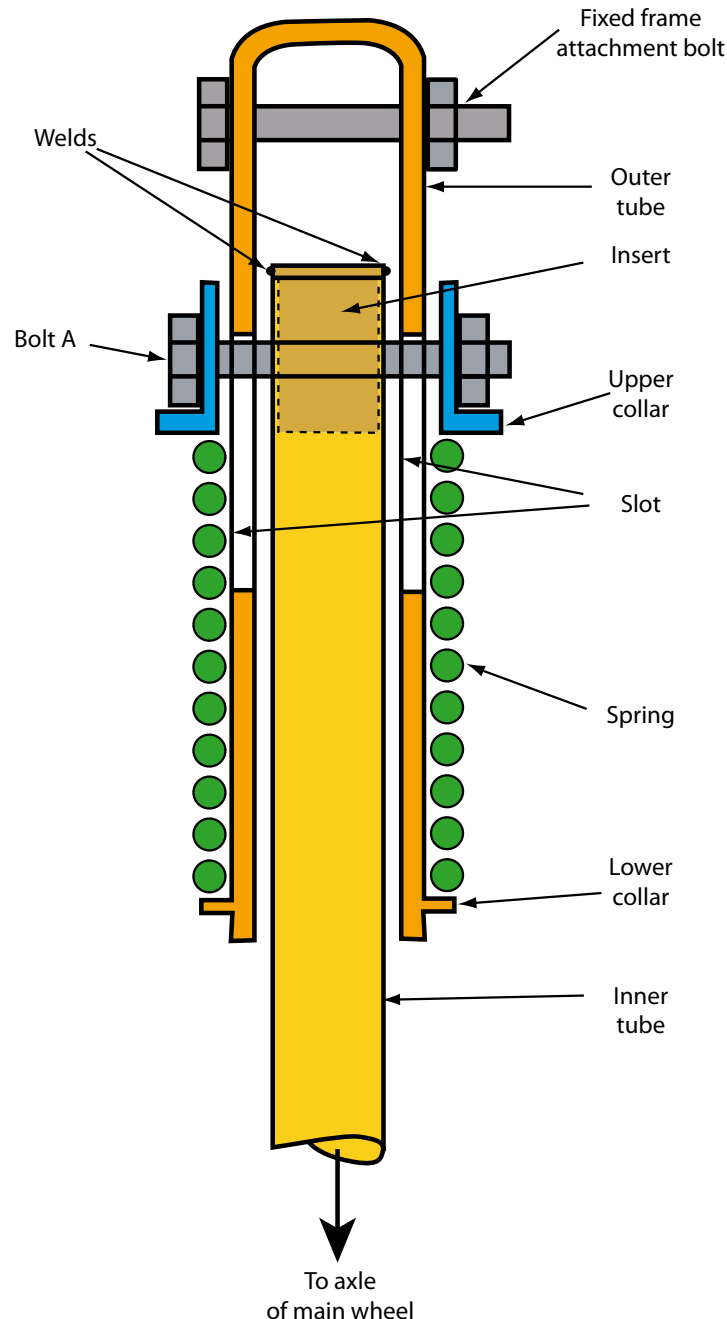
inner tube. Additionally, Bolt 'A' had bent and pulled out of the end of the inner tube. See Figure 3.

#### *Left cross-strut*

While the left cross-strut and landing gear remained intact, there were a number of cracks on the side of the inner tube below the axis of the hole for Bolt 'A'. See Figure 4.

### Comment

The damage to left and right inner tubes was consistent with the aircraft having landed heavily with Bolt 'A' on the right strut bottoming on the end of the slot in the outer tube. This damage could not have been sustained in the firm landing that occurred in March 2011 as it is unlikely that the right cross-strut would have remained intact during the subsequent flights.

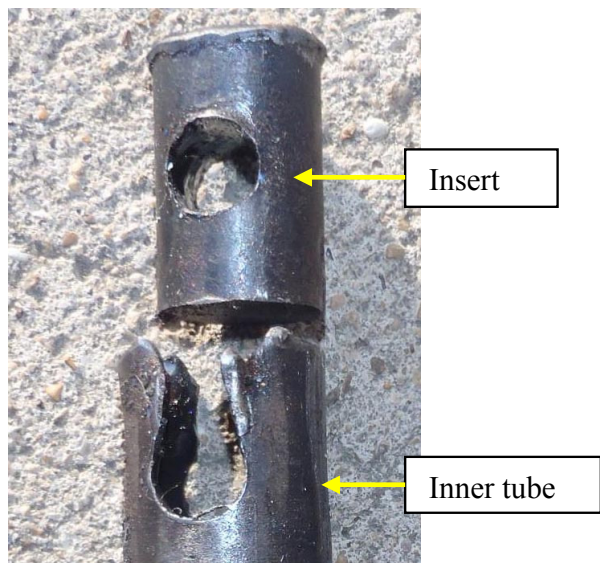


**Figure 2**

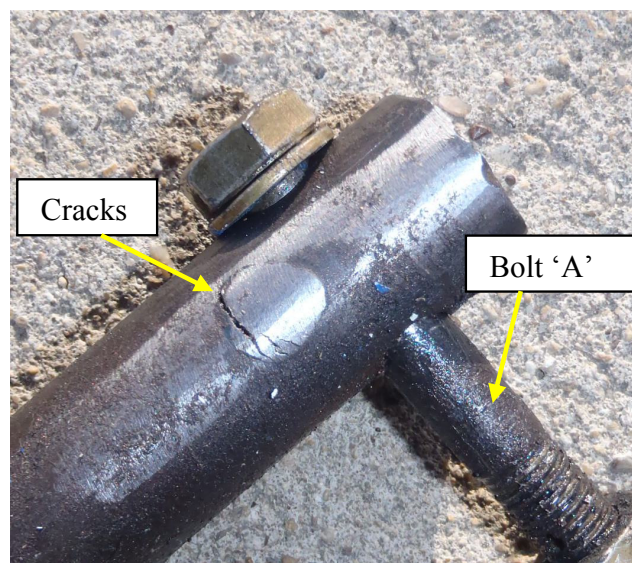
Schematic drawing of the cross-strut

It is a possibility that the right inner tube might have been damaged during the firm landing in March 2011, with Bolt 'A' having been partially torn out of the inner tube such that there was a reduced amount of intact metal left between the hole for Bolt 'A' and the end of the inner tube. This would have left the end of the inner tube in a weakened state and additional damage

may have accumulated during the following landings. Eventually, the bolt would have been torn out of the end of the inner tube and the landing gear would collapse. It should be noted that following the firm landing it would not have been possible to identify damage at the end of the inner tube without first having disassembled the cross-strut.

**Figure 3**

Right inner tube

**Figure 4**

Left inner tube

The aircraft had only flown 32 hours since it had been built from plans and consideration was given to the possibility that the welds on the insert or the hole in the inner tube might not have been correctly formed. It is also possible that there might have been a defect in the

material used to form the inner tube such that it was not strong enough to withstand the normal landing forces indefinitely. However, the AAIB was not presented with evidence to support or eliminate these possibilities.