AAIB Bulletin No: 12/96 **Ref: EW/G96/09/07** **Category: 1.3**

INCIDENT

Aircraft Type and Registration:	Slingsby T67B, G-BLLS	
No & Type of Engines:	1 Lycoming O-235-N2A piston engine	
Year of Manufacture:	1984	
Date & Time (UTC):	12 September 1996 at 1010 hrs	
Location:	Bluebell Farm, Penton Grafton, Hampshire	
Type of Flight:	Training	
Persons on Board:	Crew - 2	Passengers - 0
Injuries:	Crew - 1 minor	Passengers - N/A
Nature of Damage:	None	
Commander's Licence:	Commercial Pilot's Licence with FI Rating	
Commander's Age:	42 years	
Commander's Flying Experience:	1,938 hours (of which 16 were on type) Last 90 days - 186 hours Last 28 days - 79 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and AAIB examination of the aircraft	

After taking off from Thruxton, the aircraft was levelled at 1,500 ft amsl. Following a few minutes of level flight, the canopy suddenly blew open. On this type of aircraft, the canopy and windscreen is a one-piece assembly in which, when in the closed position, the base of the windscreen is held against the forward fuselage. The assembly is supported on either side by struts which allow an upwards and rearwards movement when the canopy is opened. During this incident, the canopy opened through its normal motion, and came to rest in its open position. The instructor's headset was wrenched from his head and hung suspended by its lead over the side of the fuselage. The base of the windscreen struck the student on the head, causing a wound which bled freely, with his blood spattering around the cockpit and on the inside of the canopy.

The instructor immediately took control and turned the aircraft towards the airfield. The canopy was acting as an 'airbrake', with the aircraft losing altitude and becoming generally difficult to control. In view of this, together with his inability to make or receive radio transmissions and the apparent

severity of the student's injury, the instructor decided to make a precautionary landing in a suitable field, which was successfully achieved. An ambulance was called, but in the event the student's injury was assessed as minor and hospital treatment was not required.

Neither the aircraft nor the canopy had suffered any damage in the incident, and an engineering examination revealed no defect in the latching mechanism. The aircraft was returned to service with no subsequent problems being experienced.

A diagram of the canopy latching mechanism is attached, and it can be seen that the latching hooks locate within channel sections fixed between the two transverse frame members at the forward base of the canopy. Operation is via the interconnected external handle or the push-pull handle on the instrument panel. The linkage has an over-centring action controlled by a spring. In the correctly engaged position the hooks, which are painted red, are clearly visible from both crew positions.

During an examination of the aircraft, it was apparent that the scope for mis-locating the hooks during the latching operation was limited. If a side load was imposed on the canopy whilst it was being closed, it was possible for the hooks to pass down the side of the channels, thus missing the dowels within them. Scratch marks on the outer surfaces of the channels indicated that this had occurred at some time. However the forces required to push the handle towards the fully locked position were so high as to serve as a warning that incorrect engagement had occurred.

Another possibility was to push the handle fully home before lowering the canopy. This resulted in the canopy resting on the tops of the hooks such that it left a large and obvious gap at the base of the windscreen. Alternatively, the canopy could have been closed and the handle simply left in the unlocked position. However this would have left the handle standing proud of the instrument panel and both crew members of G-BLLS were adamant that this was not the case in this incident.

Consideration was also given to the possibilty of mis-location of one, or both, of the guide lugs (or 'tongues') mounted on either side of the cockpit coaming adjacent to the seat backs. Upon closing the canopy, each tongue locates into a slot in a fitting attached to the canopy. It was found that it was relatively easy to close the canopy such that at least one tongue would miss its slot and rest against the side of the fitting. This appeared to generate a small amount of distortion in the canopy frame, with the result that slightly more force was required to lock the canopy. More significantly, the over-centring action then seemed less positive, such that slightly less force was required to pull the handle aft in order to unlock the canopy.

Finally, some potentially relevant information was received from an organisation that maintained a fleet of T67 aircraft. It was noted that on one aircraft, it was possible to close the canopy with the dowels being held by the toes of the hooks, as opposed to being fully engaged. The hooks are spring-loaded in the forwards direction, and it was thought that a temporary fouling of the coaming cover on the hooks may have caused the hooks to be retained in their rearwards position at the time of the latching operation.

A similar case of a canopy opening in flight occurred to a T67B, G-BLTT which is reported in the next report.