

Slingsby T67A, G-BIZN, 23 July 1997

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Aircraft Type and Registration:	Slingsby T67A, G-BIZN
No & Type of Engines:	1 Lycoming O-235-N2A piston engine
Year of Manufacture:	1981
Date & Time (UTC):	23 July 1997 at 1425 hrs
Location:	Leicester Airport, Leicester
Type of Flight:	Private
Persons on Board:	Crew - 1 - Passengers - None
Injuries:	Crew - None - Passengers - N/A
Nature of Damage:	Propeller, nose landing gear, left main gear and left wing broken at mid-span
Commander's Licence:	Private Pilot's Licence with IMC & Night Rating
Commander's Age:	36 years
Commander's Flying Experience:	471 hours (of which 60 were on type) Last 90 days - 19 hours Last 28 days - 9 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

During initial climb-out from Leicester Airport the pilot noticed that one of the two canopy latches was not correctly located on its canopy mounted bolt. His immediate reaction was to relocate the canopy by partially releasing the mechanism sufficiently to release the latch and relocate it correctly. In the event, the canopy flew open and the in-rush of air blew maps and other loose articles around and out of the cockpit. At the same time the stall warning sounded and so the pilot lowered the aircraft's nose. There was insufficient runway remaining for him to land ahead and his headset was blown from his head as he lowered the nose. On evaluating his options, the pilot discovered that the aircraft would not climb. It was descending and he realised that unless he was able to close the canopy, he would have to perform a forced landing. He succeeded in pulling the canopy closed, but he was unable to latch it and a forced landing became inevitable. He retained

control, partly by using the secondary effect of rudder to maintain wings-level, and landed the aircraft in a field just beyond the airfield perimeter track. Unfortunately there was a hidden drainage ditch across the field which inflicted most of the damage to the aircraft during the landing roll. The pilot reported that he had often experienced problems with correct locking of the canopy during his pre-flight checks and had developed the habit of releasing the canopy and then relocking the latches. Unfortunately he had not noticed the incorrect closure on this occasion until he was airborne and he reacted instinctively and instantly in his usual manner.

Latching mechanism

The Slingsby T67 Firefly has been produced in A, B, C and M variants. Pre Mod 129/129B M, and the A, B and C variants, have a one-piece canopy which opens rearwards and upwards on struts. Later aircraft have a fixed windscreen, a smaller one-piece canopy and a different locking mechanism. The last aircraft to be produced without a fixed windscreen was made in 1985 and there are some 28 aircraft in existence of this standard. This canopy is locked closed by two red painted latching hooks, which protrude through the instrument panel coaming and which engage with two bolts mounted on the front of the canopy frame. These hooks are controlled from inside the cockpit by a push/pull handle located near the top of the instrument panel to the right of centre (Figure 1) and, externally, by a handle with a rotary locking and unlocking action in the centre of the fuselage immediately in front of the canopy. The latching mechanism, which is shown in Figure 2, incorporates an overcentre lock to ensure positive closure once the controls have been moved fully in the 'locked' direction. With reference to Figure 3, when the canopy controls are in the open position the hooks are in the 'ready' position. As the canopy is lowered, the hooks may be completely withdrawn by pulling the handle fully aft to allow the two bolts to pass forward of the hooks; release of the handle should then allow the hooks to engage with the bolts. Alternatively, if the handle is left in the open position, but not pulled fully aft, a camming action can take place with the bolts pushing the spring loaded hooks aft as the canopy closes, the hooks then springing back to the ready position. In this position, the canopy is closed but not locked: when the canopy handle is pushed fully forward a cam pulls the hooks downward to hold the canopy closed and locks in this position by the action of the overcentre mechanism.

Two previous incidents which occurred to UK registered T67 aircraft where their canopies opened in flight were reported in AAIB Bulletin 12/96. There are also reports of similar events having occurred to non UK registered T67 aircraft and persistent reports of canopies of this type failing to latch correctly, despite associated comments that the latches appeared correctly engaged during pre-flight checks. These problems have mostly been detected between start-up and flight. In an attempt to improve pilot awareness of the potential for incorrect latching, the manufacturer has recently issued modification M810 which introduces a placard, as illustrated in Figure 4, which indicates graphically to the pilot the correct latch position, along with possible incorrect positions. This modification has been classified as Mandatory by the CAA.

During this investigation, the latching mechanisms on several T67 aircraft of this standard were examined and the incorrect modes of latch engagement, as depicted on the placard, were reproduced. However, another mode was demonstrated, as shown in Figure 4a, where the tip of the latch abutted the canopy bolt. Following an incident which occurred to a foreign military T67 in November 1990 where the canopy opened in flight following *canopy confirmed locked and restrained during 'on R/W' checks*, a local modification led to the provision of latch markings to assist pilots in their visual confirmation that the latches were correctly positioned.

Safety Recommendation

In view of these findings, it is recommended that:

Recommendation 97-44

The manufacturer of Slingsby T67 Firefly aircraft should consider amendment of modification M810 to include the provision of appropriate markings, on and around the canopy latches, to assist pilot confirmation of the correct positioning of both latches when the one piece canopy is closed and locked prior to flight.