Spitfire IXT, G-BMSB

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Aircraft Type and Registration:	Spitfire IXT, G-BMSB
No & Type of Engines:	1 Rolls-Royce Merlin 76 piston engine
Year of Manufacture:	1943
Date & Time (UTC):	25 April 1998 at 1335 hrs
Location:	Coventry Airport, West Midlands
Type of Flight:	Test Flight
Persons on Board:	Crew - 2 - Passengers - None
Injuries:	Crew - None - Passengers - N/A
Nature of Damage:	Damage to propeller, lower engine cowling and carburettor air intake, left and right radiator fairings
Commander's Licence:	Private Pilot's Licence
Commander's Age:	56 years
Commander's Flying Experience:	7,860 hours (of which 930 were on type) Last 90 days - 45 hours Last 28 days - 15 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and subsequent telephone inquiries

The aircraft had taken off from Coventry Airport on a 'pre-display flight shakedown'. The undercarriage had been retracted normally but, a few minutes later when it was selected down again, the pilot found that the undercarriage lever could not be moved fully into the DOWN position and hence the wheels remained locked up. In the Spitfire, the lever has a large throw since it both directly operates the Up/Downlock and also controls the porting of hydraulic fluid to the retraction jack. The pilot states that the lever could not be moved the final inch or so to the fully DOWN position. Two further attempts were made to reselect the undercarriage but, although it appeared that it would lock in the up position, it would only unlock to an unsafe condition (downlocks not engaged).

Many further attempts were made to move the lever fully down from both cockpits under flight conditions ranging from +5g to -1g for more than an hour but to no avail. The pilot considered using the pneumatic 'blow-down' system but decided that if he did this he could be left in the position of having both undercarriages down-but-not-locked or, even worse, one locked down and the other unsafe, without being able to retract them. He therefore elected to perform a full-flap, power-off landing on the grass at Coventry with the undercarriage selected up. He instructed the rear seat occupant to tighten and lock his harness and latch his canopy open. He jettisoned his own canopy over the airfield (subsequent advice from this very experienced Spitfire pilot is that the front canopy will not latch open in-flight in the two-seat variants). Touching-down at 65 kt, he switched-off the magnetos and the main fuel cock during the flare. The aircraft slid on its belly for somewhat less than 100 yards and, when it stopped, both crew evacuated the aircraft normally.

Initially, subsequent inspection suggested that there was no restriction in the undercarriage selector and the system appeared to work normally. However, the team recovered a small aluminium block, measuring about 3/8 in cubed from the floor of the rear cockpit which was identified as an electrical cable guide block from the inside of the undercarriage selector. This block was normally secured near the top of the selector by a 6BA screw but the screw had evidently come undone and liberated the block. On some Spitfires which have had the wiring re-worked (G-BMSB was one of these), the block is redundant and it will drop to the bottom of the selector in the absence of the retaining screw. Trials showed that, if it dropped into a particular location, it was possible to baulk the selector lever in the position reported by the pilot (see photographs). Witness marks on the block showed that this had occurred and it was deduced that the block had probably subsequently fallen out of the selector during the forced landing.

Subsequent airworthiness action

G-BMSB was one of a large number of Spitfires scheduled to participate in a display at Duxford aerodrome the following weekend. The owner immediately informed the CAA of his findings and they acted swiftly, producing a Mandatory Permit Directive (MPD) No.1998-008, applicable to all Spitfires and Seafires operating on a UK Permit-to Fly. The MPD became effective on 1 May 1998 and required an inspection to ensure that the block was firmly secured at the top of the undercarriage selector. Compliance was required before further flight and thereafter at 12-month intervals. If the block was no longer required, it could be removed and replaced with a suitable self-locking nut and washer. It is understood that a number of aircraft were found to have a similar, potentially hazardous, condition. Although not strictly affected by the MPD, a similar inspection was carried out on the Spitfires operated by the Royal Air Force.