

Socata TB10, G-BHER, 17 May 1998 at 1319 hrs

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Aircraft Type and Registration:	Socata TB10, G-BHER
No & Type of Engines:	1 Lycoming O-360-A1AD piston engine
Year of Manufacture:	1980
Date & Time (UTC):	17 May 1998 at 1319 hrs
Location:	Biggin Hill Airport, Kent
Type of Flight:	Private
Persons on Board:	Crew - 1 - Passengers - None
Injuries:	Crew - None - Passengers - N/A
Nature of Damage:	Substantial to right wing and right landing gear leg
Commander's Licence:	Private Pilot's Licence with IMC Rating
Commander's Age:	37 years
Commander's Flying Experience:	238 hours (of which 129 were on type) Last 90 days - 7 hours Last 28 days - 6 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot, and AAIB examination of the aircraft

After making a short flight to Redhill Aerodrome, followed by several flights in the Redhill local area, the aircraft returned to Biggin Hill. After a normal landing, the aircraft was taxied at normal speed via a grass taxiway and the perimeter track to the parking area, where it was parked between two other aircraft. The duration of the taxi was approximately 5 minutes.

The pilot reported that after he had shut down the engine and opened the left door, he was aware of a smell of smoke. Having completed his paperwork and tidied the cockpit, he again noticed the smell of smoke, which this time was stronger and more acrid. He vacated the aircraft and walked round to check the right door. As he was then about to walk round to the left side, he noticed smoke emanating from the front of the right main gear tyre. Within seconds, this smoke increased

considerably and he saw flame. He estimated that approximately 3 minutes had elapsed since the engine had been shut down.

The fire was initially difficult to extinguish, due to it being enclosed within the wheel spat. However it was then quickly extinguished by the Airfield Fire Service, but not before it had destroyed the right hand (fibreglass) wheel spat together with the hydraulic flexible hose to the wheel brake, and had melted the lower wing skin above the right wheel. The flying club instructor attributed the fire to dried grass coming into contact with a hot brake disc, dried grass having being found after the incident in one of the other wheel spats.

The parking brake system comprised a knob on the instrument panel attached to a push/pull cable which connected, forward of the panel, to the mid point of a transverse rod. The outer ends of this rod operated separate push/pull cables connected to sprag plates which acted against the piston rods of the left and right wheel brake master cylinders respectively; the piston rods being connected to the left and right brake pedals. It was reported by the maintenance organisation that the system was inherently prone to sticking, the cable system being difficult to balance so that both of the brake pedals would release cleanly. Furthermore, the location of the cable runs was such that it was difficult to manually free the mechanism in the event of it becoming stuck.

The pilot stated that the 'brake switch' (ie for the parking brake) was known to be unserviceable, but that there had been no indication of 'brake binding', or of any other brake defect, on the day of the incident or when the aircraft had last been operated 7 days previously. When the aircraft was inspected by AAIB after the incident, the parking brake mechanism was found in the 'brakes released' condition.

Due to the extensive damage to the brake unit and wheel assembly, it was not possible to positively establish the cause of the fire. However, whilst the possibility of dried grass igniting on a hot brake disc cannot be discounted, hydraulic fluid can ignite spontaneously under certain conditions when in contact with hot surfaces, at temperatures of the order of 270°C, or higher. A period of fluid contact with the hot surface is usually necessary before ignition will occur and there must be restricted ventilation, sufficient to allow some mixing of hydraulic fluid vapours with oxygen in the air, but not enough to prevent the mixture from remaining in contact with the hot surface. In the incident in question a slightly sticking wheel brake, giving rise to an abnormally hot brake disc, and the protected environment within the wheel spat may have provided the conditions in which a leakage of hydraulic fluid could have resulted in spontaneous ignition within a short time of the aircraft stopping.