

**Serious Incident**

<b>Aircraft Type and Registration:</b>	Socata TB-20 Trinidad, G-BSCN	
<b>No &amp; Type of Engines:</b>	1 Lycoming IO-540-C4D5D piston engine	
<b>Year of Manufacture:</b>	1990 (Serial no: 1070)	
<b>Date &amp; Time (UTC):</b>	25 January 2025 at 1756 hrs	
<b>Location:</b>	Blackbushe Airport, Hampshire	
<b>Type of Flight:</b>	Training	
<b>Persons on Board:</b>	Crew - 1	Passengers - 1
<b>Injuries:</b>	Crew - None	Passengers - None
<b>Nature of Damage:</b>	Abrasion to right wingtip flap, and aileron	
<b>Commander's Licence:</b>	Commercial Pilot's Licence	
<b>Commander's Age:</b>	69 years	
<b>Commander's Flying Experience:</b>	5,400 hours (of which 90 were on type) Last 90 days - 2 hours Last 28 days - 2 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot	

**Synopsis**

The aircraft had been flown on a night navigation exercise and returned to Blackbushe Airport. The pilot was configuring the aircraft to land and selected landing gear DOWN. However, initially only the right main and nose landing gear indicated down and locked whilst the left gear down-and-locked light remained unlit, indicating an unsafe condition. Various attempts to rectify the problem by recycling the landing gear and using the emergency extension system were unsuccessful, with all three landing gears now showing as not locked down. During a low flypast the airfield staff confirmed the landing gear appeared down so the pilot decided to continue with a landing. Soon after touchdown the right landing gear collapsed and the aircraft came to a stop. The landing gear malfunction was caused by a failure of the electrically driven hydraulic power pack.

**History of the flight**

The owner of the aircraft was under instruction for a night qualification and was returning to Blackbushe Airport after a long night navigation exercise. After flying a circuit, the pilot was preparing the aircraft to land. When he selected the landing gear DOWN, only the right main and nose landing gear indicated down and locked. The left main gear down-and-locked light remained unlit indicating an unsafe condition.

The pilot recycled the landing gear but it continued to indicate an unsafe condition. The pilot flew out of the circuit and despite several more attempts, including using emergency

extension procedures, none of the green landing gear down-and-locked lights illuminated. The single red landing gear unlocked warning light remained illuminated during the various attempts to raise and lower the landing gear. This showed that the nose, left and right main landing gear were now all in an unsafe condition.

Low fly pasts were carried out to enable the airfield staff to visually assess the landing gear condition and although it appeared to be down, it could not be determined whether it was in a safe condition. The pilot then flew a circuit and landed the aircraft. A couple of seconds after touchdown the right main landing gear collapsed. The right wing dropped and contacted the runway, slewing the aircraft to the right before quickly coming to a stop. The pilot and instructor were uninjured. The aircraft sustained abrasion damage to right wing flap, aileron and wing tip.

### **Landing gear system description**

The aircraft is fitted with retractable tricycle landing gear. Landing gear extension and retraction is carried out by hydraulic actuators. Hydraulic pressure is produced by an electrically driven hydraulic power pack which starts and runs automatically when landing gear retraction and extension is selected. A pressure switch starts and stops the power pack to maintain a residual 'up' pressure within the system when the landing gear is retracted.

Landing gear position lights indicate the status during retraction and extension. When the landing gear is down and locked three separate green lights illuminate. A single red gear unlocked light illuminates when any of the landing gear is not locked down or not fully up.

Articulated spring-loaded latches fitted to the nose and main landing gear legs provide a mechanical locking in the down position. Microswitches are actuated by the latches which close the circuit when they are correctly in the locked position and the green status lights illuminate.

### **Cause**

The aircraft landing gear system was examined, and functional checks performed whilst the aircraft was on jacks showed a malfunction of the electrically driven hydraulic power pack. It was found to run sporadically, stopping and starting at random. The emergency lowering system was also tested. This worked correctly provided the landing gear was in or near the fully up position. It was also demonstrated that if the power pack motor stopped before the down lock latches were made, the landing gear appeared visually to be down although indicating an unsafe condition. However, whilst in this position the emergency landing gear release was ineffective because the landing gear could not generate the momentum under gravity to engage the downlock latches.