

# AIB Bulletin

# 5/85

No: 5/85

Ref: EW/G84/07/28

<b>Aircraft type and registration:</b>	Cessna 340 G-BALM (light twin engine fixed wing aircraft)
<b>Year of Manufacture:</b>	1972
<b>Date and time (GMT):</b>	24 July 1984 at 1000 hrs
<b>Location:</b>	Leeds-Bradford Airport
<b>Type of flight:</b>	Private (business)
<b>Persons on board:</b>	Crew — 1                      Passengers — None
<b>Injuries:</b>	Crew — None                      Passengers — None
<b>Nature of damage:</b>	Slight right wing damage, severe right propeller damage, right engine shock loaded
<b>Commander's Licence:</b>	Private Pilot's Licence
<b>Commander's Age:</b>	50 years
<b>Commander's total flying experience:</b>	800 hours (of which 110 were on type)
<b>Information Source:</b>	Aircraft Accident Report Form submitted by pilot, discussions with repairers and examination of some failed components.

Following a flight from Ronaldsway, Isle of Man, the aircraft made a straight-in approach to Runway 10 at Leeds-Bradford Airport. The weather was good, with wind easterly at 8 to 10 kt. The pilot reported that pre-landing checks indicated that all was normal, with indications of all three retractable landing gears locked down. Immediately after a smooth touchdown on the main wheels, at 85 kt the right leg collapsed and the aircraft veered off the runway, coming to rest on the grass.

Inspection showed that the leg had partially retracted. The downlock comprises (Fig 1) a folding side link between aircraft structure and the leg, held in an overcentre position by a lock link. The lock link and its actuating bell-crank are themselves held over-centred by tension in the landing gear operating mechanism, assisted by a spring. A microswitch, sensing lock link/bellcrank overcentring, operates the cockpit gear down indicator.

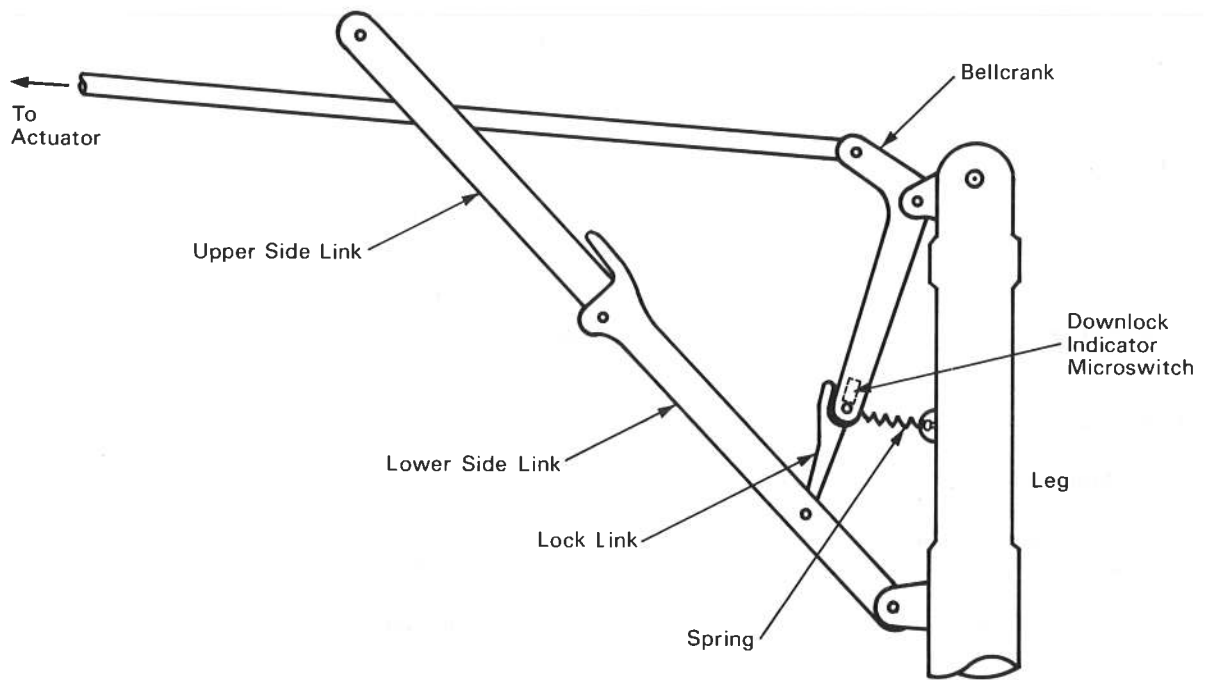
This Bulletin contains facts relating to the accidents which have been determined up to the time of issue. This information is published to inform the public and the aviation industry of the general circumstances of the accidents at the preliminary/stage and must necessarily be regarded as tentative and subject to alteration or correction if additional evidence becomes available.

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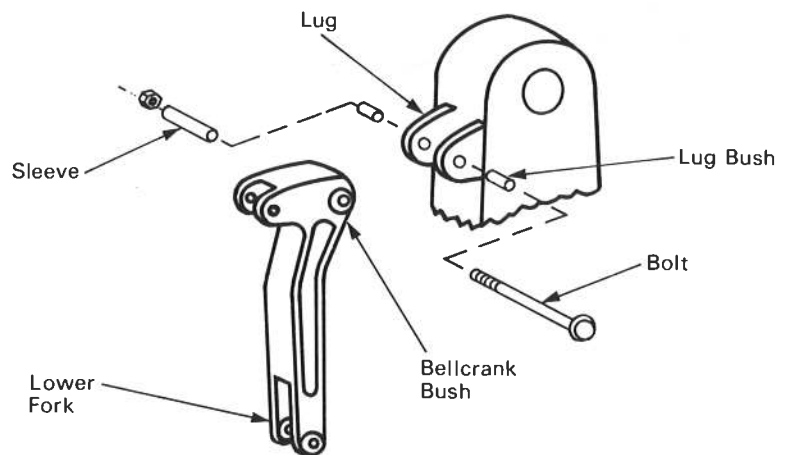
The bellcrank lower fork (Fig 2) was found fractured causing disconnection of the bellcrank from the lock link. The failure was consistent with the effects of overload applied by the side link folding from a non-overcentred position under the influence of ground reaction forces on the undercarriage. The bellcrank had also detached from its pivot point on the leg by virtue of fracture of both the pivot bolt and the forward pivot attachment lug. These failures had clearly resulted from overload applied during gear collapse when the leg contacted the bellcrank.

It was noted that the bellcrank pivot bearing was extensively corroded. The bolt, sleeve and bushes comprising this bearing are of steel. The pivot was not fitted with a grease nipple and could only be effectively lubricated following dis-assembly. The Maintenance Manual reportedly does not specify any lubrication or inspection requirements. The repairers reportedly found on checking four other aircraft with a similar undercarriage type (subsequent to the accident) that all bellcrank pivots were stiff and required re-working.

The evidence from the examination of G-BALM indicated that the sleeve had seized to the bellcrank bushes some time prior to the accident, and that bellcrank rotation during gear operation had caused the normally static bolt to rotate in the pivot attachment lug bushes. The associated stiffness could possibly have prevented the gear from entering downlock, although a gear locked down indication should not have been obtained in this case. However, some variability in downlock microswitch operating position was noted with a similar assembly, possibly because of the long spring leaf used to actuate the switch.



**Fig 1 Main Landing Gear Schematic**



**Fig 2 Bellcrank Pivot Detail**