

No: 2/91

Ref: EW/G90/11/05

Category: 1b

**Aircraft Type and Registration:** Cessna 421C, G-BSSS

**No & Type of Engines:** 2 Continental GTSIO-520-N piston engines

**Year of Manufacture:** 1986

**Date and Time (UTC):** 20 November 1990 at 1105 hrs

**Location:** Southampton Airport, Eastleigh, Hampshire

**Type of Flight:** Private

**Persons on Board:** Crew - 1                      Passengers - 2

**Injuries:** Crew - None                      Passengers - None

**Nature of Damage:** Damage to underside of nose and both propellers.

**Commander's Licence:** Commercial Pilot's Licence with Instrument and Instructor ratings

**Commander's Age:** 40 years

**Commander's Total Flying Experience:** 5,825 hours (of which 450 were on type)

**Information Source:** Aircraft Accident Report Form submitted by the pilot

Whilst on the base leg of a visual approach to runway 20 at Southampton in good weather the pilot selected the landing gear down at 800-1000ft agl. He observed three green lights and the red "unsafe" light extinguished, these indications being confirmed by another type-rated pilot sitting behind the co-pilot's seat. The throttles were closed immediately prior to touchdown and there was no "gear unsafe" warning horn. The landing was smooth and the pilot lowered the nose until the nosewheel contacted the runway. However the nose continued to lower until the propellers and then the nose underside touched the runway. The landing gear indicator lights still showed "three greens". The pilot brought the aircraft to a halt on the runway centreline using rudder and gentle differential braking. There were no injuries and the occupants left the aircraft by the normal exit. The pilot later returned to the aircraft in the company of the Station Fire Officer and they noted that the landing gear indication was still "three greens" with no red "unsafe" light. When the nose of the aircraft was eventually raised, it was found that this indication persisted regardless of the nose leg position.

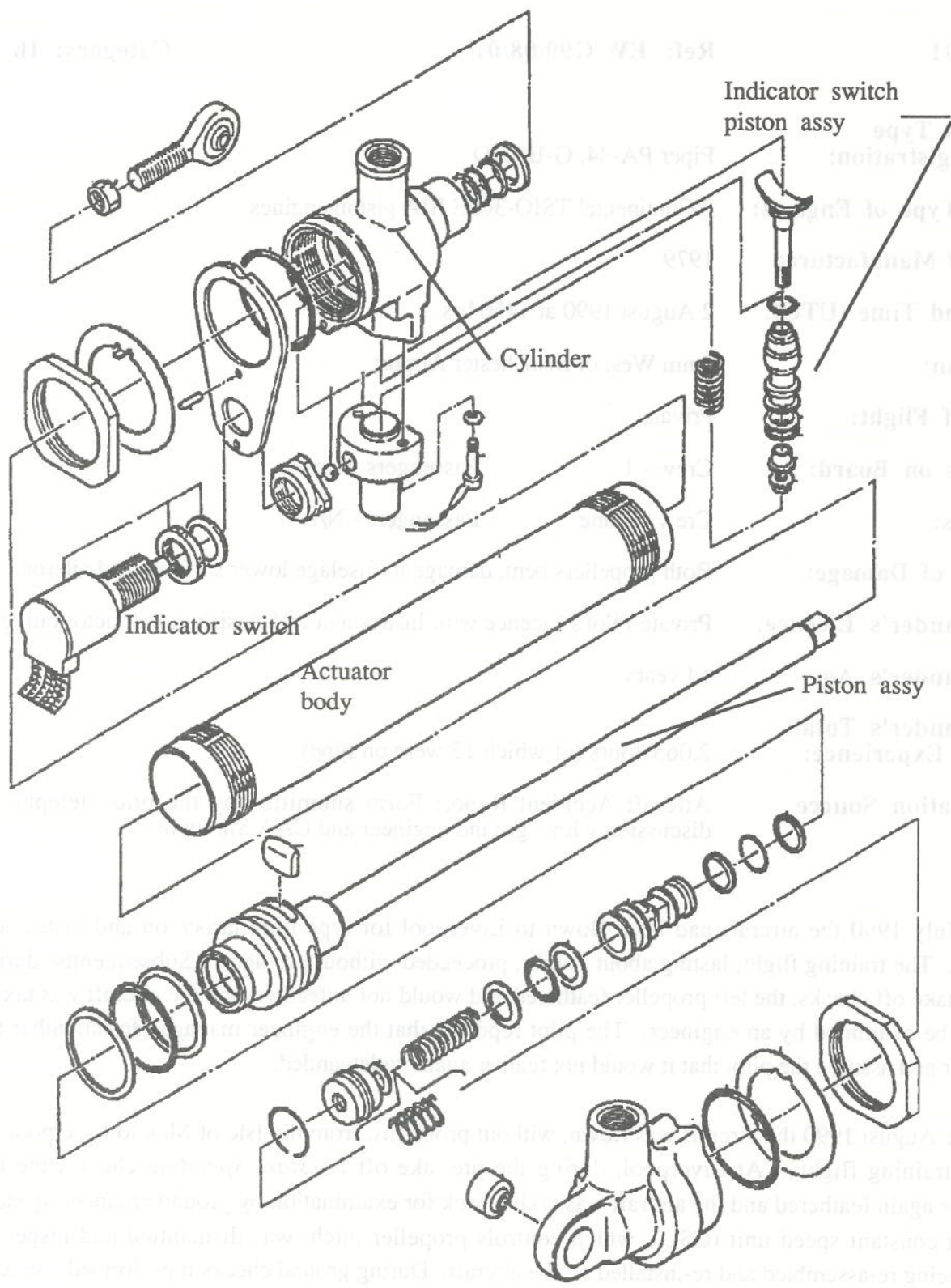
When the nose leg actuator was removed from the aircraft and subjected to an examination at an engineering organisation, an electrical check confirmed that the integral switch remained in the "down and locked" position irrespective of whether the actuator was extended or retracted. Disassembly revealed that the piston that operated the switch had "stuck" in the extended position. Upon further investigation, it was found that corrosion was present within the cylinder that housed the switch

operating piston. The accompanying diagram shows the primary components of the actuator, including the switch.

In the Cessna 421 landing gear system, hydraulic power is cut off when all three downlock switches are made. In the case of G-BSSS, as soon as the main gear actuators had reached downlock and with the nose downlock switch stuck in the down position, hydraulic power would have been cut off, regardless of the position of the actuator.

The actuator has been the subject of a CAA Airworthiness Directive (No 002-02-90) which called for the sealing of points where moisture ingress may be expected. However it is considered that this may not have been effective if moisture was already present.

Following the accident, the operator has proposed an "in house" procedure to overhaul all Cessna 421 landing gear actuators (nose and main) immediately, followed by a strip examination after two years.



**CESSNA 421 NOSE ACTUATOR COMPONENTS**