

**Aviation Safety Investigation Report  
199001984**

**Grumman 690-B Gulfstream  
Commander**

**01 May 1990**

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**Occurrence Number:** 199001984  
**Location:** Griffith NSW  
**Date:** 01 May 1990  
**Highest Injury Level:** Nil  
**Injuries:**

**Occurrence Type:** Accident

**Time:** 1512

	Fatal	Serious	Minor	None
Crew	0	0	2	2
Ground	0	0	0	-
Passenger	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>

**Aircraft Details:** Grumman 690-B  
Gulfstream Commander  
**Registration:** VH-LTK  
**Serial Number:** 96075  
**Operation Type:** Aerial Work  
**Damage Level:** Substantial  
**Departure Point:** Canberra ACT  
**Departure Time:** 1420  
**Destination:** Griffith NSW

**Approved for Release:** 3rd September 1990

#### **Circumstances:**

The aircraft was engaged on a training flight involving instrument flying and circuit practice. At Griffith the pilot carried out a VOR let down from which the aircraft was positioned for a circling approach to runway 24. The landing gear was extended during the instrument letdown procedure and the cockpit indicator showed the landing gear was safely down and locked. When the aircraft was on final approach, both pilots checked that the landing gear indication was unchanged. The pilot reported a normal touched down, when without warning, the right maingear leg collapsed. The pilot was able to bring the aircraft to a halt on the runway. The wind conditions at the time were variable at 5 knots. A technical examination revealed the right main landing gear had collapsed as a result of material failure. It was determined that the lock nut which secured the rod end of the piston rod of right hydraulic actuating cylinder had loosened. This permitted the rod end to screw into the piston rod, shortening the length of the piston rod. The shortening of the hydraulic actuating cylinder rod travel prevented the drag brace from being positioned in the over centre position to complete the extension cycle. The locknut had progressively loosened due to contact with the rear end of the clevis yoke in the final stages of leg extension. As a result, the loads from the right maingear were taken by the right hydraulic actuating cylinder and its mountings. The right clevis on the landing gear strut consequently failed in overload. The pilots were unaware of an unsafe right maingear. The down lock micro switch was incorrectly adjusted, such that a green light "safe" indication appeared in the cockpit before the drag brace was in the over centre or locked position.

#### **Significant Factors:**

The following factors were considered relevant to the development of the accident

1. Insufficient clearance existed between the clevis yoke and the rod end locknut.
2. The locknut progressively loosened when it contacted the mounting yoke for the rod end on the right main gear strut.
3. The piston rod of the right hydraulic actuating cylinder shortened when the lock nut on the rod end loosened.
4. The shortened piston rod prevented full extension of the right main gear leg and overcentering of the drag brace.
5. The down lock micro on the right main gear leg was incorrectly adjusted and indicated "safe" when the extension sequence was incomplete.
6. The mounting yoke on the strut for the right hydraulic actuating cylinder failed in overload. SAFETY

**Recommendations:**

It is recommended that the Civil Aviation Authority review main landing gear rigging and particularly maintenance procedures for all Grumman 695 aircraft, the clearance between rod end lock nuts and clevis yokes, and the adjustment of the piston rod length settings and of the down lock micro switch.