

**Aviation Safety Investigation Report  
198902571**

**Grumman GA-7 Cougar**

**07 August 1989**

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**Occurrence Number:** 198902571                      **Occurrence Type:** Accident  
**Location:** 2 kms NE of Cessnock Airport NSW  
**Date:** 07 August 1989                      **Time:** 1854  
**Highest Injury Level:** Serious  
**Injuries:**

	Fatal	Serious	Minor	None
Crew	0	2	0	0
Ground	0	0	0	-
Passenger	0	1	0	0
<b>Total</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>

**Aircraft Details:** Grumman GA-7 Cougar  
**Registration:** VH-UNP  
**Serial Number:** 390GA  
**Operation Type:** Aerial Work  
**Damage Level:** Destroyed  
**Departure Point:** Cessnock NSW  
**Departure Time:** 1823  
**Destination:** Cessnock NSW

**Approved for Release:** 31st October 1990

#### **Circumstances:**

The student pilot was undergoing a period of dual circuit training at night as part of an initial multi engine aircraft endorsement. Another student pilot, who was also programmed for night circuit training, was on board the aircraft as an observer. Weather conditions were reported as suitable for night circuit training, although there was no visible horizon. There were no reports of turbulence. Night circuits were conducted to the east of the aerodrome due to high terrain on the western edge of the circuit area. The student pilot completed four circuits on runway 35, before the instructor took over control of the aircraft and demonstrated a circuit. After landing, the instructor selected flaps up, applied full power to both engines and handed over control to the student. After takeoff the landing gear was retracted and the initial climb proceeded normally until the aircraft reached a height of about 190 feet above ground level (400 feet above sea level). As the aircraft was accelerating to a climb speed of 95 knots, the left engine, without any prior warning suffered a complete loss of power. The instructor immediately resumed control, identified the failed engine, and feathered the propeller. During this activity the aircraft descended to 340 feet above sea level. The airspeed was stabilised at the recommended single engine climb speed of 85 knots and the aircraft was banked slightly towards the right engine. As the vertical speed indicator and altimeter indicated that the aircraft was not climbing, the instructor told the student to transmit a Mayday call. This was received by Sydney Flight Service who declared a Distress phase. The instructor, being aware of higher terrain to the north of the aerodrome, commenced a gentle turn to the right until the aircraft was heading approximately 150 degrees magnetic. Darkness prevented an off-aerodrome forced landing being considered as a suitable option. Shortly after the completion of the turn, the right wing struck a pylon of a 330 KV Transmission line approximately 347 feet above sea level. The aircraft cartwheeled through the transmission lines and dived vertically to the ground. As the aircraft passed through the power lines the failed left engine, propeller, and cowling were severed from the wing. The aircraft came to rest in a slightly nose low, right wing down attitude. The right engine was partially buried in soft earth and torn away

from the right wing. Although a fire broke out in the accessory section, it subsequently self extinguished. A considerable amount of fuel escaped from broken fuel lines. All three occupants were seriously injured. The observer in the rear seat suffered two broken legs, but was able to vacate the cabin without assistance, although he subsequently had no recollection of how he did so. The student assisted the instructor from the aircraft then returned to the cockpit to switch off electrical power. Police and emergency services arrived at the scene with minimum delay. The occupants were given first aid then conveyed to hospital. A technical investigation, which included operating the left engine in a test bed, revealed the cause of the power loss to be air ingestion into the left engine fuel system. A loose connection was found where the left engine priming solenoid is located in the fuel line. This permitted the engine driven fuel pump to draw air instead of fuel and resulted in fuel starvation at the carburettor. Maintenance records indicated that no work had been carried out on the left engine primer solenoid since the aircraft arrived in Australia in late 1988. It was not possible to determine why the connector at the priming solenoid had loosened sufficiently to permit air ingestion. The reason for the inability of the aircraft to climb on one engine was not determined. Aircraft having a maximum take off weight of less than 5700 kgs are not certificated to provide a minimum net single engine climb gradient following an engine failure after takeoff. The carriage of the observer was considered to have had an adverse effect on the asymmetric performance of the aircraft. In addition, the general level of cockpit instrument illumination, particularly of the skid ball, may not have facilitated precise attitude control by the pilot.

### **Significant Factors:**

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

1. Inadequate inspection/maintenance of fuel system.
2. Loose fuel line connection at left engine priming solenoid.
3. Sudden, total loss of left engine power at a critical stage of flight.
4. Inadequate asymmetric performance of the aircraft under the conditions existing at the time.
5. Darkness.
6. Pilot unable to see and avoid fixed obstruction.

### **Recommendations:**

It is recommended that the Civil Aviation Authority

1. Review the cockpit lighting of Grumman Cougar GA-7 aircraft, specifically to improve illumination of the turn and balance indicator.
2. Advise operators to consider the requirement that multi engine aircraft of less than 5700 kgs MTOW, engaged in night flying circuit training to be loaded in accordance with IFR Aerial Work limitations.