Grob G115D 2, G-BVHG

AAIB Bulletin No: 9/2003	Ref: EW/G2003/02/07	Category: 1.3
Aircraft Type and Registration:	Grob G115D 2, G-BVHG	
No & Type of Engines:	1 Lycoming AEI0-320-D1B piston engine	
Year of Manufacture:	1994	
Date & Time (UTC):	10 February 2003 at 0948 hrs	
Location:	Plymouth City Airport, Devon	
Type of Flight:	Training	
Persons on Board:	Crew - 2	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Nose leg collapsed, propeller ground strike and shock-load of engine	
Commander's Licence:	Private Pilot's Licence and Instructor Rating	
Commander's Age:	57 years	
Commander's Flying Experience:	14,446 hours (of which 670 were on type)	
	Last 90 days - 76 hours	
	Last 28 days - 30 hours	
Information Source:	Air Accident Report Form submitted by the pilot	

History of flight

The aircraft had just completed four uneventful dual circuits with a student and an instructor. The next student did a 'running change'; that is, the students changed with the engine running and the instructor remaining in place. The aircraft was then taxied for takeoff. The taxi route included a sharp left turn (110°) to backtrack along Runway 13 and during this manoeuvre the nose landing gear collapsed, splintering the propeller and stopping the engine. The pilots secured the aircraft and made a safe exit.

Engineering examination

The aircraft was recovered to a hangar where initial examination suggested that the leg had collapsed because of the failure of the upper torque link. Further examination showed that the failure of the torque link, and other components, had resulted from the incorrect assembly of part of the nose leg.

In the Grob 115 the main vertical components of the nose leg are: an outer nose leg tube; a sliding tube connected to the nosewheel fork; and a gas spring strut mounted within this sliding tube and providing the spring and damper functions of the nose leg. This gas spring strut is similar to those used for lifting the tailgates of estate and hatchback cars. At its top end the strut is secured to the top

of the outer nose leg tube and at its bottom end to a 'T' fitting secured, by a single bolt, to the lower end of the sliding tube and to the housing mounted on top of the nosewheel fork.

Conclusions

In G-BVHG it was found that this bolt was securing the 'T' fitting to the housing but had not secured the lower end of the sliding tube. As a result, the sliding tube had migrated upwards out of the housing and thus induced bending loads into the lower end of the gas spring strut. This led to the failure of the strut, the torque link and the collapse of the nose leg.

Preceding the day's flying there had been a replacement on G-BVHG of the housing mounted on top of the nosewheel fork, due to elongation of the hole used for attachment of the lower torque link. Re-assembly of the noseleg would have included insertion of the bolt securing the 'T' fitting, the housing and the lower end of the sliding tube, requiring the 'drilling-through' of one side of the housing. In the period between the initial alignment of the components and the eventual fitting of the bolt, the sliding tube had migrated upwards but, with the procedures existing at that time, this would not have been apparent to the maintenance engineers.

Safety action

As a result of this accident, the maintenance organisation has added an extra inspection stage to the procedure and has communicated this additional step to the manufacturer. In turn, the manufacturer has stated that the company is modifying the instructions within the Component Maintenance Manual.