ACCIDENT

Aircraft Type and Registration:	Replica Sopwith Triplane, G-BWRA
No & Type of Engines:	1 Warner Aircraft Corp, Scarab 165 piston engine
Year of Manufacture:	1988
Date & Time (UTC):	12 July 2008 at 1130 hrs
Location:	Near Rendcomb, Gloucestershire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Damage to propeller, engine cowling and upper wing
Commander's Licence:	Private Pilot's Licence
Commander's Age:	48 years
Commander's Flying Experience:	1,045 hours (of which 1 was on type) Last 90 days - 29 hours Last 28 days - 4 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

The pilot carried out a forced landing when he noticed the engine cowling starting to separate from its mountings. The aircraft touched down in standing crops, pitched forward, and came to rest inverted. The engine cowling forward mountings had failed allowing the cowling to move forward into the path of the propeller.

History of the flight

The pilot was flying from White Waltham Airfield in Berkshire to Rendcomb airfield, which is approximately 5 nm north of Cirencester, Gloucestershire. The weather for the flight was good, with a westerly wind of about 10 kt, visibility in excess of 25 km with scattered cloud above 4,000 ft. The surface temperature was 26°C and there were light, scattered rain showers in the area.

On approaching Rendcomb, the pilot could see a rain shower passing over the airfield and he decided to hold clear of the airfield until the weather improved. The area to the east of the A429 road was clear of the rain and he turned in that direction. As the aircraft crossed the A429, the pilot noticed that the rear left side of the engine cowling was proud of its normal position. Initially he thought that the wire which retained the rear edge of the cowling had failed which, in itself, was not a serious condition. However, approximately 15 seconds later banging noises and a shuddering from the nose of the aircraft indicated that the problem was serious. Concerned that the cowling may be broken up by the propeller, or that major internal damage was being caused to the engine, the pilot decided to make an immediate forced landing.

The aircraft was at a height of about 1,200 ft and the only suitable fields for landing were covered in standing crops. The pilot selected a field with a gentle upward slope which was into the wind. He hoped this would reduce the landing roll and help prevent the aircraft from nosing over. The final approach was made with power applied and the airspeed reduced to a safe minimum. The touchdown was gentle and at a low ground speed, the aircraft settling into the crops which were about two feet high. The main landing gear axle and wheels were retarded by the crops and this, combined with the soft ground, caused the aircraft to pitch forward and it came to rest inverted.

The pilot, who was uninjured, turned off the fuel and electrical system before vacating the aircraft unassisted.

Examination of the cowling mountings

The engine cowling on this aircraft is attached to the engine at four locations around its circumference. At each of these positions, an anti-vibration mounting is used as an insert between brackets on the cowling and engine. Each anti-vibration mounting comprises a pair of bolts with their shanks orientated on the same axis and their heads immersed in a block of rubber. The cowling is secured by means of nuts attached to the bolt tails, which were inserted through holes in the brackets on the engine and cowling.

It was found that all the mountings had failed in an identical manner in that the rubber had failed in between the bolt heads, thereby causing them to be separated. In this condition the cowling would no longer have been attached to the engine, which would have allowed cowling movement in rotational and longitudinal directions, such that contact with the propeller would have occurred.

The rubber in each of the mountings was tested for hardness and it was found that the two lower ones were slightly harder than the upper two. The rubber specification was not known, since the components had been obtained from an automotive supplier. However, in order to provide a rough datum, a rubber fuel system seal, of aviation quality, was similarly tested and found to be considerably softer. This, together with numerous cracks that were noted in the rubber from the failed components, gave rise to the suggestion that they were old stock.

Of more general concern, however, was whether this particular design of component was suitable for this application.

Conclusion

The engine cowling had moved forward into the path of the propeller following the failure of the four front rubber mountings. Forward movement of the cowling had released it from the rear retaining wire. The high centre of gravity of the triplane combined with the retarding effect of the landing gear axle and wheels passing through the crops meant the pilot was unable to prevent the aircraft from pitching forward onto its back.