ACCIDENT

Aircraft Type and Registration:	Aeronca 7ACA Champ, G-HAMP
No & Type of Engines:	1 Continental Motors Inc C85-8F piston engine
Year of Manufacture:	1971
Date & Time (UTC):	1 September 2011 at 1135 hrs
Location:	Lowfold Farm Airstrip, Wisborough Green, West Sussex
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - None Passengers - None
Nature of Damage:	Damage to propeller tips, belly fabric and tailwheel spring
Commander's Licence:	Private Pilot's Licence
Commander's Age:	62 years
Commander's Flying Experience:	21,500 hours (of which 560 were on type) Last 90 days - 67 hours Last 28 days - 25 hours
Information Source:	AAIB Field Investigation

Synopsis

The aircraft landed heavily having encountered downdrafts on approach to a farm strip. One Safety Recommendation was made concerning the use of energy-absorbing foam cushions.

History of the flight

At the conclusion of a local flight the aircraft approached to land at a farm strip. The strip is aligned approximately 020° and has a flat area near the threshold but the remainder of the strip slopes downhill; pilots normally takeoff in this direction and land uphill in a SW direction. There is a stand of trees to the east of the southern threshold area. The wind strength had unexpectedly increased during the flight and the pilot decided that a downhill landing into wind was required. As he positioned the aircraft he observed that the windsock indicated wind straight along the strip. However, the position of the windsock was such that it could not be seen in the later stages of the approach. As the aircraft approached the threshold, it encountered downdrafts from the trees and landed heavily in a three-point attitude, sufficiently hard for the belly of the aircraft to strike the ground. After landing the pilot noted that the wind had veered and increased.

Impact protection

Neither the pilot nor passenger suffered any injury, despite the hard landing. The pilot had recently fitted to the aircraft new seat cushions manufactured from energy absorbing foam material. He believed that, had

he not fitted these cushions, the occupants may have suffered back injuries.

Research on the use of energy-absorbing seat cushions to reduce the effect on the pilot of vertical impact loads was carried out by the Royal Air Force Institute of Aviation Medicine in 1986, and by the Defence Evaluation and Research Agency, Farnborough in August 1996. Test results showed that conventional seating foam cushions could increase the spinal load induced by vertical deceleration forces, whereas a cushion of energy absorbing seating foam, fitted on a rigid structure, reduced these loads and offered a good level of protection against vertical deceleration forces.

Following this research, the British Gliding Association has recommended, for over 10 years, that gliders should be fitted with energy-absorbing seat cushions.

In 2008, the AAIB investigated a gyroplane accident in which the aircraft landed heavily and the occupants suffered fractured vertebrae. The report stated that the foam cushions fitted to the aircraft were not designed to absorb the energy of a heavy landing and the AAIB recommended that the CAA promote the benefits of fitting energy-absorbing seating foam to microlights and gyroplanes. The CAA accepted this recommendation and published advice in General Aviation Safety Information Leaflet issue 10/2009 and at GA Safety Evening briefings. However, light aircraft such as G-HAMP were not covered by the advice, therefore the following Safety Recommendation is made:

Safety Recommendation 2012-028

It is recommended that the Civil Aviation Authority promote, on an ongoing basis, the benefits of fitting seat cushions made from energy absorbing foam in light aircraft.