Piper PA-15 Vagabond, G-BOVB

AAIB Bulletin No: 11/99 Ref: EW/G99/09/04 Category: 1.3

Aircraft Type and Registration:	Piper PA-15 Vagabond, G-BOVB
No & Type of Engines:	1 Lycoming O-145-B2 piston engine
Year of Manufacture:	1948
Date & Time (UTC):	5 September 1999 at 1529 hrs
Location:	Lulhams Farm, Ripe, East Sussex
Type of Flight:	Private
Persons on Board:	Crew - 1 - Passengers - 1
Injuries:	Crew - None - Passengers - None
Nature of Damage:	Transparency overhead pilot and passenger detached
Commander's Licence:	Private Pilot's Licence
Commander's Age:	30 years
Commander's Flying Experience:	284 hours (of which 26 were on type)
	Last 90 days - 21 hours
	Last 28 days - 6 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

The aircraft was being flown on a local flight from a private strip at Twineham when, at 1500 feet and 85 mph, the transparency overhead the pilot and passenger detached and fell from the aircraft. Due to the loss of lift and increase in drag the pilot executed a forced landing.

The transparency, about 800 x 700 mm, was fixed in place directly above the seats. Its forward edge butted up against the top edge of the windshield and the attachment fixings on all sides incorporated cap strips.

The incident was investigated by three members of the operating group and they concluded that a number of factors had contributed to the failure:-

1. UV exposure had probably reduced the flexibility of the transparency.
2. It was Acrylic, which has been found to suffer from stress fractures.
3. The self tapping screws where exactly the same size as the pre-drilled holes leaving no room for thermal expansion/contraction.

4. The fixings had possibly been overtightened causing stress fractures around the pre-drilled holes.
5. The area above the seats (between the wings) is a low pressure area, causing continual, but slight, outward and inward bowing.
6. The cap strip obscures the areas most prone to cracking, so not obvious during pre-flight inspections.

The group are replacing the transparency using a heavier gauge polycarbon, 'Lexan', material which reportedly does not suffer from UV damage or stress fractures. In addition they are drilling oversize holes for the fasteners and plan periodic removals of the cap strips to allow inspection of the fasteners and surrounding transparency.