

AAIB Bulletin No: 12/94

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Category: 1.3

**Aircraft Type and Registration:** Denney Kitfox Mk3, G-BTNR

**No & Type of Engines:** 1 Rotax 582 piston engine

**Year of Manufacture:** 1991

**Date & Time (UTC):** 21 August 1994 at 1330 hrs

**Location:** Runway 08, Eaglescott Airfield, Devon

**Type of Flight:** Private

**Persons on Board:** Crew - 1 Passengers - 1

**Injuries:** Crew - None Passengers - None

**Nature of Damage:** Minor damage to right-hand wingtip, radiator and propeller

**Commander's Licence:** Private Pilot's Licence

**Commander's Age:** 36 years

**Commander's Flying Experience:** 243 hours (of which 110 were on type)  
Last 90 days - 22 hours  
Last 28 days - 7 hours

**Information Source:** Aircraft Accident Report Form submitted by the pilot

The pilot and passenger were returning from a local flight of some 45 minutes. The wind was 180°/7 to 8 kt so the landing was onto Runway 08. The approach was normal and the pilot reports that the landing was well-executed and gentle but that, very shortly after touchdown, the right-hand main landing gear collapsed.

The main landing gear in this design is of the classic 'swinging arm' type, similar in principle to designs such as the Piper PA-18 Super Cub and other light aircraft with steel tube fuselages. The main undercarriage leg is formed from a simple fabrication of welded steel tubes and is hinged at its upper end along the longitudinal axis of the aeroplane. When the aircraft lands, upward deflection of the wheel results in the undercarriage leg rotating outboard and upwards and this action is reacted by a diagonal brace which attenuates the landing gear loads through a rubber 'bungee' arrangement.

Examination of G-BTNR following the accident showed that the collapse of the landing gear was due to the fracture of a number of the steel tubes and the structure was supplied to AAIB for examination. This examination showed that all the fractures in the undercarriage leg assembly had resulted from

overload conditions and that there was no evidence of tube weakening by fatigue, corrosion or stress corrosion. Data was acquired from the aircraft kit manufacturer in the United States and all the tubes were found to conform to their specifications, both in dimension and tensile strength.

The pattern of the failures indicated that, at some point, the aircraft had landed with sufficient side force on the right main landing gear to put a compressive load into the diagonal brace and to disrupt the horizontal brace between the hinges and the 'bungee' arrangement. This had allowed, at a later stage or on a later landing, the diagonal brace to fail under mainly tensile loads and the landing gear leg to collapse.

The kit manufacturer comments that a number of landing gear collapses have been reported in the United States and that a number have been attributed to side loads during landing applying compressive loads to the diagonal brace. In this respect, it is noted that the Kitfox sits rather more 'straight-legged' than many designs; a front view drawing shows the main landing gear legs inclined at some 65° to the horizontal whereas a similar drawing of a PA-18 Super Cub shows an angle of 46°.