AAIB Bulletin No: 11/94 **Ref: EW/G94/06/07** **Category: 1.3**

Aircraft Type and Registration:	Tri-R Technologies KIS, G-OKPW
No & Type of Engines:	1 Continental 0-200 piston engine
Year of Manufacture:	1994
Date & Time (UTC):	9 June 1994 at 1236 hrs
Location:	Runway 25, Shoreham Airport, Sussex
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Landing gear nose leg failed, damage to one propeller blade
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	48 years
Commander's Flying Experience:	11,800 hours (of which 4 were on type) Last 90 days - 111 hours Last 28 days - 31 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

The aircraft was being operated on a local certification test flight. Returning to Shoreham Airport, the pilot performed a 'touch-and-go' landing on Runway 03, which is hard-surfaced, and then lined up for a landing on Runway 25, which is a grass runway. The pilot reports that the mainwheels touched down at 70 to 75 kt and the nosewheel was lowered onto the ground at 65 to 70 kt. There was a 'severe bump' as the nosewheel touched the ground so the pilot immediately applied full 'up' elevator. It was possible to maintain a nose-high attitude for approximately a further 20 to 30 metres, during which the pilot leaned the mixture to idle cut-off. The nose dropped with the decreasing airspeed and one propeller blade dug into the grass with the aircraft still travelling at 35 to 40 kt. The aircraft came to a halt and it was found that the nose leg of the landing gear had entirely separated from the fuselage.

In this design, which is a modern two-place homebuilt developed in California, the nose leg is a slender tube, cantilevered at its upper end from a mounting bracket on the forward face of the engine firewall. The leg is secured within the sleeve of the mounting bracket by two spot welds and the nosewheel is mounted in a castoring shoe, pin-jointed to the bottom of the nose leg and similar in

design to the AA-1/AA-5 series of light aircraft. The first KIS in the UK, operated by the importer, had experienced problems with the nose leg when operating from grass runways and G-OKPW had, therefore, been fitted with a modified nose gear, giving better clearance between rough ground and the castoring shoe.

The nose leg in G-OKPW had fractured at the point where the leg enters the mounting bracket and the leg was submitted to AAIB for metallurgical examination. This showed that the leg had failed rearward in simple overload bending, with no evidence of fatigue, and a hardness test showed hardness values consistent with the manufacturer's material and heat treatment specification.

The Popular Flying Association (PFA) has discussed this nose leg failure with the manufacturer of the KIS homebuilt kit. The PFA notes that a number of kit aircraft originating in the United States are designed for operation from runways with hard surfaces, or at least smooth grass, and these aircraft are not well suited to many UK grass runways. The PFA further advises particular care in ensuring that, in aircraft types with vulnerable nose legs, proper flared landings are performed whatever the runway surface.