

AAIB Bulletin No: 4/94

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Aircraft Type and Registration: Tri-R Technologies Kis, G-OKIS

No & Type of Engines: 1 Cam 100 piston engine

Year of Manufacture: 1993

Date & Time (UTC): 16 November 1993 at 1415 hrs

Location: Hungary Hall Farm Airstrip, Cambridgeshire

Type of Flight: Private

Persons on Board: Crew - 2 Passengers - None

Injuries: Crew - None Passengers - N/A

Nature of Damage: Nose landing gear collapsed, propeller damaged and right wingtip holed

Commander's Licence: Basic Commercial Pilot's Licence with IMC, Night and Flying Instructor Ratings

Commander's Age: 58 years

Commander's Flying Experience: 6,680 hours (of which 28 were on type)
Last 90 days - 32 hours
Last 28 days - 5 hours

Information Source: Aircraft Accident Report Form submitted by the pilot and telephone inquiries by the AAIB

The aircraft is a homebuilt two-seat low-winged monoplane of composite construction, with a Honda Civic type engine and a tricycle landing gear. The kit is USA designed and manufactured; there are reportedly around 10 of the type in the UK. The purpose of the flight was for the commander, on behalf of the owner, the European agent for the type, to continue flight testing a recently fitted four-bladed propeller and to evaluate the aircraft for a magazine article. The aircraft was being flown by an Airline Transport Pilot's Licence holder in the left seat, with the commander in the right seat. It was operating from a 730 metres long grass-surfaced private strip with a runway direction of around 265°M. The weather was good, with the reported wind from the south at 5 to 10 kt.

The first 45 minutes of the flight were uneventful but during the landing run the aircraft drifted to the left side of the runway. Full right rudder failed to correct this and the commander had to apply considerable right wheel braking to regain the runway centreline. As rudder pedal movement felt normal, the commander attributed the problem to the handling pilot's lack of familiarity with the type.

Prior to a second takeoff the standard checks for full and free movement of the flying controls were conducted; these felt normal to the crew and appeared to be normal to the owner who was standing nearby, and the takeoff was commenced. A swing to the left occurred during the ground run, which was consistent with the effects of propeller torque and the crosswind, the rudder normally becoming effective at 40 mph, and was initially countered by differential braking. However, the swing continued above this speed, despite the application of full right rudder pedal and wheelbrake and the commander took control. As flying speed had not been reached and the aircraft was very close to the left edge of the runway he aborted the takeoff. At around 50 mph the aircraft drifted off the strip into a ploughed field planted with winter wheat, the nose landing gear failed and the aircraft came to rest in soft ground. The crew members were uninjured.

The rudder system comprises two sets of pedals linked together at the cockpit and driving a cable system attached to either side of a rudder actuating horn. The system is not connected to the nose landing gear. The rudder horn (Type KS10) was of steel, 0.032 inch thick. Inspection showed that the right side of the horn had bent downwards through 90° and had twisted in such a way as to prevent the rudder from moving to the right. The failure allowed the rudder cable to become slack, thus permitting rudder pedal movement but without corresponding rudder movement occurring. It was noted that the rudder cannot be seen from the cockpit.

While it was not possible to positively establish when the horn failure had occurred, no other plausible reason for the directional control difficulties was found. Since the accident the kit manufacturer has reportedly issued each UK owner with a modified rudder horn (Type KS10A) made of approximately 3/16 inch thick aluminium.

It was noted that the full-travel stops for the rudder system are located at the rudder and that no rudder pedal stops in the cockpit are provided. Thus any loads applied to a rudder pedal at the full-travel position will load the entire rudder control system downstream of the pedal.