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Report RL 2002:19e

***Accident involving the aircraft SE-XRX
at Skövde airport, Ö County, Sweden,
on the 29th of March 2002***

Dnr L-013/02

SHK investigates accidents and incidents with regard to safety. The sole objective of the investigations is the prevention of similar occurrences in the future. It is not the purpose of this activity to apportion blame or liability.

Translated from the original Swedish by Dennis Lynn Anderson; at the request of The Board of Accident Investigation.

In the event of discrepancies between the English and the Swedish texts, the Swedish text is to be considered the authoritative version.

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The Board of Accident Investigation (Statens haverikommission, SHK) has investigated an accident that occurred on the 29th of March 2002 at Skövde airport, O County, Sweden, involving an aircraft with registration SE-XX.

In accordance with section 14 of The Ordinance on the Investigation of Accidents (1990:717) the Board herewith submits a final report on the investigation.

Carin Hellner

Sakari Havbrandt

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Report finalized 2002-08-26

<i>Aircraft: registration, type</i>	SE-XRX, Europa
<i>Class, airworthiness</i>	Experimental, valid test flight permit
<i>Owner/operator</i>	Private ownership
<i>Date and time</i>	2002-03-29, 18:30 hours in daylight <i>Note:</i> All times in this report refer to Swedish Standard Time= (UTC + 1 hour)
<i>Place of occurrence</i>	Skövde airport, O County, Sweden, position (5827N 01359E; 98 meters above sea level)
<i>Type of flight</i>	Private
<i>Weather</i>	According to SMHI's analysis: wind southwest at 5–10 knots, visibility > 10 km, no clouds, temp./dew point +10°/–7 °C, QNH 1024 hPa
<i>Persons on board: Crew</i>	1
<i>Injuries to persons</i>	None
<i>Damage to aircraft</i>	Substantial
<i>Other damage</i>	None
<i>Aircraft Commander/Instructor/ Flying pilot:</i>	
<i>Age, certificate</i>	53 years old, Private Pilot License
<i>Total flying time</i>	471 hours, of which 3.5 hours on the type
<i>Flying hours previous 90 days</i>	9 hours, of which 0.2 hours on the type
<i>Number of landings Previous 90 days</i>	20, of which 1 on the type

The Board of Accident Investigation (SHK) was notified on the 2nd of April 2002 that an accident involving an aircraft with registration SE-XRX had taken place at Skövde airport, O County, Sweden, on the 29th of March at 18:30 hours.

The accident has been investigated by SHK represented by Carin Hellner, Chairman, and Sakari Havbrandt, Chief Investigator Flight Operations.

The investigation has been followed by The Swedish Civil Aviation Administration through Gun Ström.

History of the flight

After having completed a taxi test, the pilot performed the first flight with the amateur construction aircraft. He took off from Skövde airport utilizing the asphalted runway 19 and performed a short flight. Thereafter he landed on grass strip 19. Subsequent to having inspected the aircraft he taxied out and took off from grass strip 19. Immediately after liftoff, at a height of approximately one meter, the aircraft yawed to the left, which the pilot unsuccessfully attempted to counteract with right rudder. At this point he realized that something was amiss and discontinued the takeoff by setting the aircraft back onto the strip. After bouncing back into the air the aircraft landed crossways. The propeller, engine cowling, right-hand wing flap, right-hand wingtip, landing gear and aft fuselage were damaged.

A technical investigation revealed that the rudder yoke had separated from the rudder assembly. The material fracture consisted of a clean break

within the epoxy glue that secures the yoke laminate with the rudder shell. According to JAR-VLA 397 c, the pilot shall be able to subject the rudder pedals to 1000 N (100kp) individually. The durability calculations that SHK has accomplished show that the yoke attachment only withstands a pedal force of somewhere between 120 and 500 N (12–50kp).

The rudder yoke attachment laminating was for all intents and purposes carried out as well as possible using the allotted construction method. The result however, did not completely correspond with the theoretical blueprint of the attachment, which had not taken into consideration the fact that woven fiberglass must have a radius when it is bent down into a 90° corner.

The Popular Flying Association in England and the EAA in Sweden have carried-out technical examinations of the aircraft with approved results. These examinations were conducted on the aircraft in its basic design, which had a completely different rudder control construction. The actual design on the aircraft in question was a result of a recommended modification from the construction kit manufacturer (mod. 43), issued to the aircraft builder during the construction process.

Conclusions

The accident was caused by failure of the rudder yoke attachment due to insufficient construction strength, which resulted in loss of rudder control function.

The design construction of the rudder yoke attachment does not satisfy the applicable material durability requirements, nor does it permit satisfactory results in workmanship with the construction method indicated.

The technical investigator who is assigned to the construction project shall examine and approve modifications. This however, normally applies to modifications that the builder himself has developed. When a recommended modification is issued by the construction kit manufacturer, it can be easy to view this as an original part of the construction basis.

SHK has noted that the EAA has demanded that the rudder system on the Europa aircraft shall be modified prior to further flights with the aircraft type.

Therefore SHK sees no reason to issue any recommendation in this case.