

ACCIDENT

Aircraft Type and Registration:	Eurofox 912(S), G-CGYG
No & Type of Engines:	1 Rotax 912 ULS piston engine
Year of Manufacture:	2011 (Serial no: LAA 376-15081)
Date & Time (UTC):	29 May 2021 at 1040 hrs
Location:	Highland Gliding Club, Easterton Airfield, Elgin
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - 1 (Minor) Passengers - N/A
Nature of Damage:	Nose leg broken and damage to engine cowling, wing struts and airframe
Commander's Licence:	Commercial Pilot's Licence
Commander's Age:	31 years
Commander's Flying Experience:	499 hours (of which 132 were on type) Last 90 days - 22 hours Last 28 days - 6 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB

Synopsis

During the third landing following the replacement of the nosewheel tyre, the nosewheel detached from the aircraft and the nose leg fork dug into the soft ground. The nose leg broke and the aircraft flipped over onto its roof causing substantial damage. The investigation determined that the nosewheel had not been refitted correctly to the aircraft following the tyre change.

Three safety actions have been taken by the manufacturer and the LAA.

History of the flight

The aircraft was on its third landing following the replacement of the nosewheel tyre. Shortly after touching down the nosewheel and fairing detached from the nose leg fork which then dug into the ground and snapped. The remains of the leg, still attached to the aircraft, also dug into the ground flipping the aircraft onto its roof (Figure 1).

The pilot suffered a blow to the arm but was held in the seat by the harness. After releasing the harness, the pilot exited the aircraft without assistance or further injury and was taken to the local hospital and discharged the same day.

Examination of nosewheel assembly

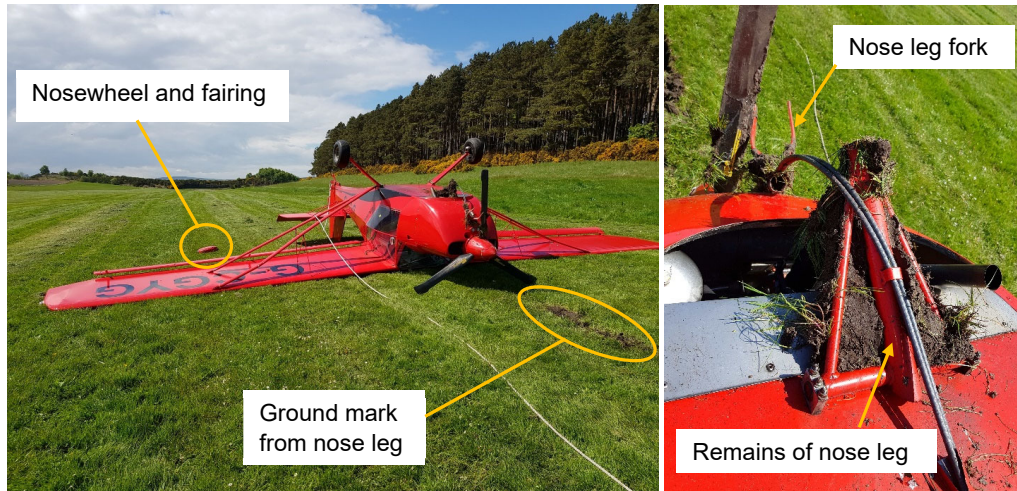


Figure 1

The aircraft pitched over onto its roof and, right, the snapped nose leg

The nosewheel fairing was found a short distance from the aircraft with the nose wheel and axle still fitted. There was evidence of paint transfer between the wheel hub and fairing (Figure 2) and the nose leg fork had paint worn away around the axle holes. Both wheel axle locating holes in the nose leg fork were undamaged.

The nose leg was bent downwards from its fitted orientation and had snapped at the point where the shock absorber bracket had been welded to the upper surface of the nose leg. Examination of the leg and the fracture surfaces showed that it failed in overload.

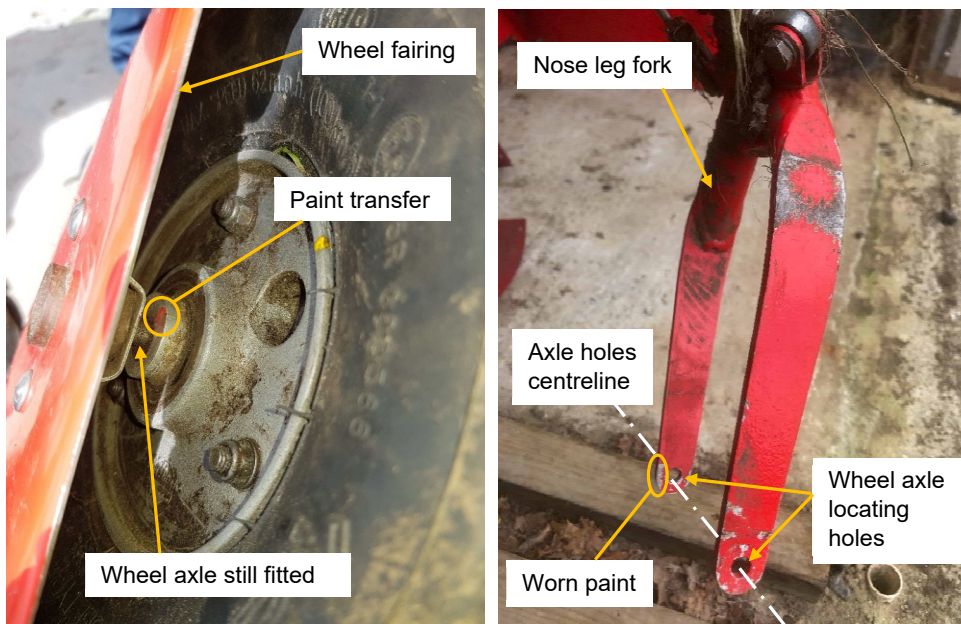


Figure 2

Nosewheel and fairing showing paint transfer and nose leg fork showing paint wear

Replacing the nosewheel tyre

Two of the club's pilots, who were experienced in LAA pilot authorised maintenance, had replaced the nosewheel tyre three days earlier. The aircraft's maintenance manual (AMM) had been checked prior to starting the task and the pilot's noted that there was a procedure for removing the nosewheel and replacing the tyre, but there was no procedure for refitting the wheel.

The pilot's reported that a visual check through the axle holes in the fairing appeared to show clear daylight indicating that the fairing and nose leg fork axle holes were aligned. Once the tyre was replaced, the wheel was offered up to the nose leg fork and fairing. The wheel axle was inserted through the fairing until it protruded through the opposite side and then bolted into place. The wheel spun freely and appeared to be firmly located when pulled. The route of the axle through the nose leg and wheel assembly was not visually checked.

Fitting the nosewheel incorrectly

The potential to incorrectly fit the nosewheel to the leg fork was recreated during a visit to the manufacturer's UK facility. Figure 3 shows a correctly assembled nosewheel and Figure 4 is a view from underneath the fairing with the axle in place, but the wheel removed.

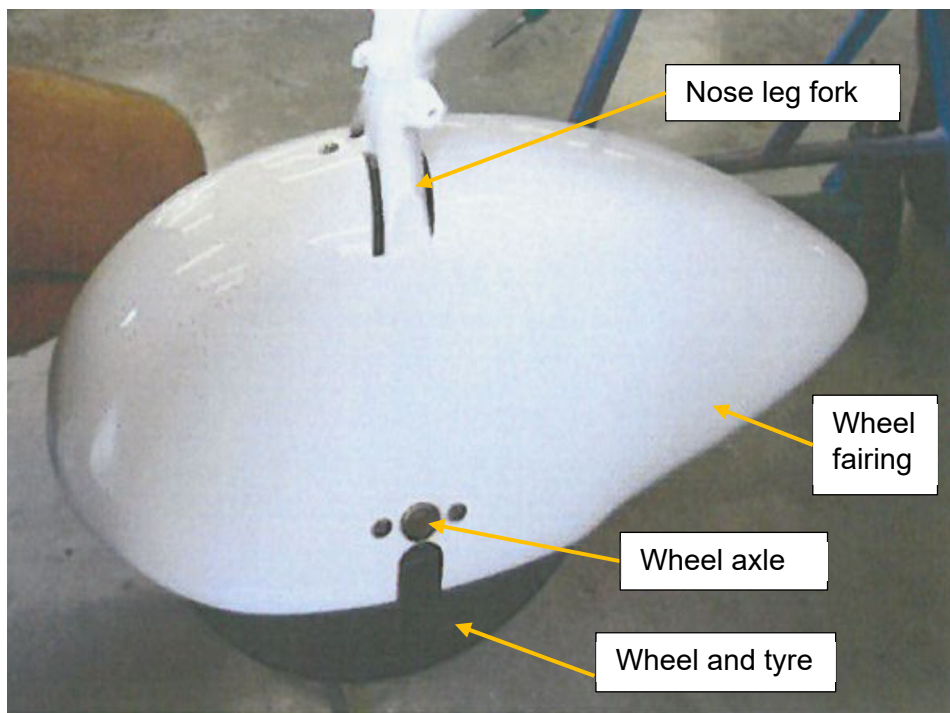


Figure 3

Example of an assembled nosewheel

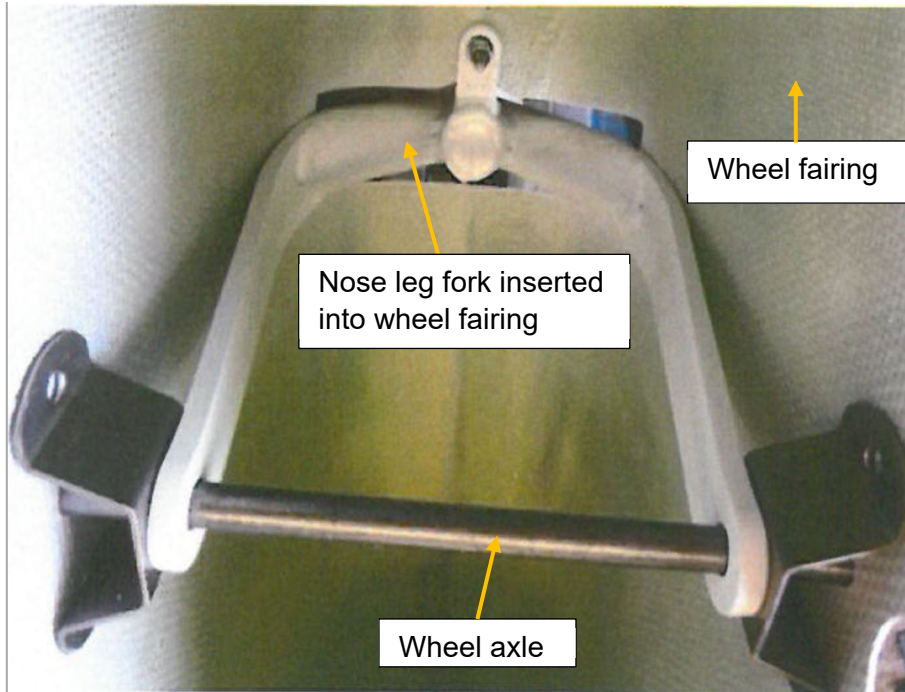


Figure 4

Nose leg fork and axle with the wheel removed

Figure 5 shows the axle not routed through the nose leg fork. Instead, the nose leg fork is clamped between the wheel hub bearings and the fairing.

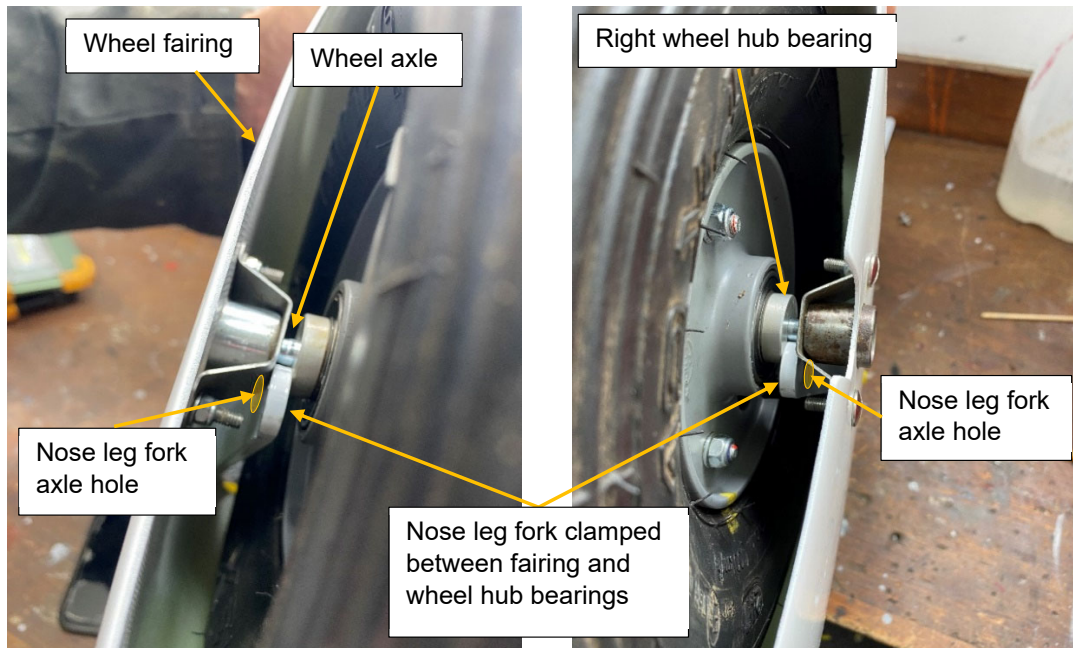


Figure 5

Nose leg fork clamped between the fairing and left and right hub bearings but with the wheel axle not routed through the nose leg fork axle holes

When clamped in this position, the wheel feels like it is firmly attached to the nose leg when force is applied and the wheel spins freely.

Comment

Both wheel axle holes in the nose leg fork were still intact after the accident and showed that the axle could not have been routed through the fork. Paint transfer between the nose leg fork and wheel bearing indicated that the nose leg fork might have been clamped to the wheel assembly between the fairing and the wheel bearing.

There were no instructions in the AMM for refitting the nosewheel to the nose leg. The LAA has included an Engineering Matters article in their January 2022 edition of the Light Aviation magazine to inform pilots of the possibility of incorrectly fitting the nosewheel. They have also updated the aircraft's Type Acceptance Data Sheet, TADS 376, to include reference to fitting the nosewheel.

Safety actions

The following safety actions have been taken by the manufacturer and the LAA:

The manufacturer will amend Section 5 of the AMM to include the procedure to refit the nosewheel and to highlight the potential for clamping the wheel onto the nose leg without correctly routing the wheel axle through the nose leg fork.

The LAA has produced an Engineering Matters article in their monthly Light Aviation magazine highlighting the potential to incorrectly fit the Eurofox 912(S) 3K nosewheel.

The LAA has updated the aircraft's Type Acceptance Data Sheet, TADS 376, to include reference to an incorrectly fitted nosewheel in paragraph 3.4 – '*Special Inspection Points.*'