**Accident**

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| **Aircraft Type and Registration:** | Bellanca (American Champion) Decathlon 8KCAB, G-TALX | |
| **No & Type of Engines:** | 1 Lycoming AEIO-320-E1B piston engine | |
| **Year of Manufacture:** | 1980 (Serial no: 595-80) | |
| **Date & Time (UTC):** | 30 June 2025 at 1223 hrs | |
| **Location:** | Tatenhill Aerodrome, Staffordshire | |
| **Type of Flight:** | Training | |
| **Persons on Board:** | Crew - 1 | Passengers - 1 |
| **Injuries:** | Crew - None | Passengers - None |
| **Nature of Damage:** | Damage to left landing gear leg, left side of forward fuselage, left wing struts, and propeller | |
| **Commander's Licence:** | Commercial Pilot's Licence | |
| **Commander's Age:** | 65 years | |
| **Commander's Flying Experience:** | 6,321 hours (of which 72 were on type)<br>Last 90 days - 195 hours<br>Last 28 days - 57 hours | |
| **Information Source:** | Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB | |

**Synopsis**

During a routine landing at Tatenhill Aerodrome, the left landing gear leg fractured, causing the pilot to lose directional control. The aircraft came to rest in grass beside the runway. Both occupants were uninjured.

The investigation found that the leg fractured due to fatigue cracking, which was initiated by surface corrosion. A manufacturer service letter regarding preventative maintenance inspections for corrosion existed, but this was not mandatory under the Approved Maintenance Program. It could not be determined whether these additional inspections would have effectively detected any pre-existing damage or corrosion.

**History of the flight**

G-TALX was being flown by a flight instructor, who was conducting an introduction to aerobatics flight with a student pilot. The flight was the instructor's second flight of the day; the previous flight in the same aircraft was uneventful.

The instructor flew the approach to land on Runway 24. Shortly after touching down, he reported that the left landing gear leg separated at the bend at the top of the leg. He applied aileron to hold the left wing up until the airspeed reduced. The left wing subsequently dropped, touching the runway, and the aircraft veered to the left coming to rest off the runway in a grass area. The propeller also struck the ground and suffered damage . Neither occupant sustained injuries, and they exited the aircraft unaided.


**Figure 1**

Photo of G-TALX after coming to rest in a grassy area

## Aircraft information

The 8KCAB Decathlon is a high-wing, two-seat monoplane with tailwheel configuration, used primarily as a sports and aerobatic trainer and manufactured by American Champion Aircraft. At the time of the accident, 10 aircraft were registered in the UK, including G-TALX.

The Decathlon is normally fitted with steel landing gear legs, although the manufacturer offers an option to retrofit aluminium landing gear legs.

G-TALX was equipped with steel landing gear legs, which had been installed at 4,999 airframe hours when the aircraft underwent extensive repairs following an unrelated failure of a landing gear attachment bolt during an engine ground-run in May 2018. The engine and propeller were also replaced, and the aircraft returned to service in April 2020.

When the accident occurred, G-TALX had accrued 5,612 airframe hours.

## Maintenance Information

*Manufacturer Service Letter regarding corrosion*

In May 2018, the manufacturer published Service Letter SL-449 *'Corrosion Inspection and Preventative Maintenance',* applicable to several of its aircraft types, including the Decathlon. The SL included specific checks for the landing gear legs, stating that there had been reports of both the steel and aluminium landing gear legs having suffered corrosion. The SL description stated:

> *'Corrosion has been reported on several aircraft based in moderate and severe operating environments. This service letter is intended to supplement Advisory Circular 43-4A and provide guidance for affected components.'*

Though the SL did not specify what was considered *"moderate and severe operating environments",* the referenced FAA Advisory Circular 43-4B[1] (which now supersedes version 43-4A), includes *Corrosion Severity Maps* in Section 4.12. The map for Europe indicates that most of the United Kingdom constitutes a "moderate" operating environment, with coastal areas and Northern Ireland shaded as regions of "severe" corrosion.

Regarding steel landing gear legs, the SL stated:

> *'Steel gear legs have been reported with intergranular and exfoliation types of corrosion. Gear leg material is 4130, 4340, or 6150 steel with protective finish per American Champion specification CFP-1… While not a structural concern (the cracks are located in areas of low stress) corrosion may develop. Visually inspect the gear leg for corrosion and finish condition.'*

The SL provided information regarding the frequency of inspection. According to the corrosion severity map in the FAA Advisory Circular, Tatenhill Aerodrome lies within an area considered 'Moderate Zone', which the SL considered requiring a corrosion inspection every 45 days. The investigation did not find any Airworthiness Directives mandating the implementation of the SL by operators or maintenance organisations.

*Annual Inspection*

The aircraft logbook indicated the last 100-hour Annual Inspection check was performed on 20 March 2025, and 40 airframe hours later the accident occurred. G-TALX had a valid Certificate of Airworthiness, Airworthiness Review Certificate, insurance, and certificate of registration.

The Work Pack for the most recent 100-hour inspection in March 2025 included a check for the presence of corrosion on the landing gear. The Work Pack indicated that no corrosion was detected on the landing gear legs. There was no evidence that the recommendations of SL-449 had been embodied.

## Landing gear leg examination

The fractured landing gear leg was retrieved, and the attachment point to the fuselage subsequently removed during repairs. The AAIB obtained both parts, shown in Figure 2.

**Footnote**

[1] US Federal Aviation Administration Advisory Circular 43-4B, 11 September 2018, available at https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_43-4B.pdf [accessed 5 December 2025].


**Figure 2**

The two parts of the fractured left landing gear leg, recovered by the AAIB

The fracture occurred near the fuselage attachment point. There was some abrasion damage to the paintwork at points on the leg, which was attributed to it having scraped along the runway following the fracture, as the leg remained attached to the aircraft via the hydraulic brake fluid line.

The AAIB commissioned further metallurgical examination of the fracture surfaces. It observed mechanical damage on the lower side of the section of the leg which remained attached to the fuselage, likely caused by contact with the runway. The upper section was undamaged but exhibited signs of corrosion.

There was a loss of paint on the underside of the leg along the line where the fracture had occurred, with corrosion evident on the exposed surface. This is shown in Figure 3. The red arrow indicates a region in which corroded thumbnail-shaped features were observed along the edge of the fracture, shown by Figure 4.


**Figure 3**

Corrosion on the underside of the landing gear leg


**Figure 4**

Zoomed in view of thumb-nail shaped corroded features

After the surface was cleaned to remove corrosion artefacts, examination of the thumbnail shaped features under a scanning electron microscope (SEM) indicated that the largest thumbnail feature was 1.66 mm deep. Detailed examination of these regions exhibited features characteristic of fatigue crack propagation. An examination of the remainder of the fracture surface revealed features characteristic of an overload failure in high-strength steel. There was no evidence of manufacture defects such as impurities in the material.

## Related events

Although the AAIB has had no previous reports of similar events in the UK, the investigation identified two accidents bearing similarity to G-TALX that have been reported, also involving Decathlon aircraft.

The first, N5026B in Alaska, USA, in 2012, involved a failure of the left landing gear leg on landing. The investigation[2] found that:

> *'The spring steel left main landing gear assembly was fractured approximately 5 inches from the fuselage attach point. An examination of the landing gear assembly was performed by the NTSB Materials Laboratory, and revealed the gear leg fractured due to fatigue that initiated from pits on the lower surface of the leg.'*

The associated metallurgy report[3] identified features in the surface fracture which appear almost identical to those identified by the metallurgy analysis shown in the *Landing gear leg examination* section of this report.

**Footnote**

[2] N5026B Aviation Investigation Final Report, NTSB, Published 12 June 2013, available at https://data.ntsb.gov/carol-repgen/api/Aviation/ReportMain/GenerateNewestReport/84611/pdf [accessed 31 July 2025].

[3] Materials Laboratory Factual Report for N5026B investigation, NTSB, available at: https://data.ntsb.gov/Docket/Document/docBLOB?ID=40384518&FileExtension=.PDF&FileName=Materials%20Laboratory%2015%20-%20Factual%20Report%2012-148%20(10%20Embedded%20Images)-Master.PDF [accessed 31 July 2025].

LN-LCU, in Norway on 2 October 2015[4]. The investigation reported that:

> *"The right landing gear collapsed under the strain of the hard landing as a consequence of latent weaknesses in terms of steel fatigue cracks. AIBN has reason to believe that these cracks, and thus the latent weakness, was not easily discovered during visual inspection."*

## Analysis

Upon landing, the left landing gear leg failed due overload failure, because of fatigue crack propagation which was initiated by surface corrosion, likely resulting from surface paint loss or damage. G-TALX was operated frequently for flying training, involving multiple takeoffs and landings. Such conditions are conducive to accelerating fatigue crack growth.

The aircraft was maintained in accordance with the CAA Approved Maintenance Programme, which included a 100-hour corrosion check, but not the manufacturer's additional inspections as these were not mandatory. The investigation could not establish whether corrosion was present at the last inspection; its location and underside paint loss may have hindered detection. A previous similar investigation into an accident involving a Decathlon experiencing a landing gear leg failure remarked that corrosion and fatigue cracks in this area are not easy to visually identify.

It was not possible to determine whether the non-mandatory inspections in Service Letter SL-449 would have detected the damage before the accident to G-TALX occurred. However, operators of this aircraft type may wish to consider incorporating SL-449 into their maintenance programmes, as this would still provide additional opportunities to detect corrosion.

## Conclusion

The accident occurred because the left landing gear leg suffered an overload failure on touchdown, resulting from fatigue crack propagation which had initiated where surface corrosion had developed.

The corrosion was likely able to occur because paint loss had exposed the steel surface to the environment. While the investigation could not establish whether corrosion was present at the last inspection, similar investigations remarked that it is not easy to identify fatigue cracking and corrosion from visual inspections in this part of the landing gear leg.

The manufacturer has produced a service letter pertaining to inspection for corrosion prevention, but this is not a mandatory maintenance requirement. Had it been incorporated into the aircraft's maintenance program, it was not possible to determine whether this would have detected the presence of corrosion or the onset of fatigue cracks.

**Footnote**

[4] NSIA (Norway) investigation into LN-LCU, available at https://nsia.no/Aviation/Aviation/Published-reports/2016-12 [accessed 31 July 2025].