

ACCIDENT

Aircraft Type and Registration:	Flight Design CTSW, G-CGVG	
No & Type of Engines:	1 Rotax 912ULS piston engine	
Year of Manufacture:	2011 (Serial no: 8575)	
Date & Time (UTC):	8 October 2016 at 1638 hrs	
Location:	Hunsdon Airfield, Hertfordshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damage to left wingtip, left landing gear leg and surrounding structure	
Commander's Licence:	National Private Pilot's Licence	
Commander's Age:	62 years	
Commander's Flying Experience:	1,534 hours (of which 867 were on type) Last 90 days - 38 hours Last 28 days - 19 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

Whilst taxiing across a grass parking area, the aircraft's left main landing gear leg collapsed due to a fatigue crack originating at the main attachment bolt hole. It was unclear for how long the leg had been cracked and, as the aircraft was built in 2011, it was not subject to a dye penetrant crack inspection at 300 flying hours as per Service Bulletin CT123. The UK agent intends to issue a new Service Bulletin, CT145, requiring all CT2K and CTSW main landing gear legs to be removed from the aircraft and dye penetrant crack inspected at periods of 300 flying hours, or following heavy landings.

History of the flight

After a normal landing on grass Runway 03 at Hunsdon Airfield, the pilot was taxiing the aircraft across a grass parking area when the left main landing gear leg collapsed. The aircraft settled onto its left wingtip, causing damage to the left wingtip and left fuselage adjacent to the main landing gear leg. The pilot shut the engine down normally and he and his passenger, who were both uninjured, vacated the aircraft without further incident.

Aircraft information

The CTSW is a two-seat microlight with a fixed tricycle landing gear. The main landing gear legs are tapered 7075-T6 aluminium alloy beams, supported at their upper ends by a bolted joint in a welded tubular steel socket, and restrained approximately a third along their length

by an M8 steel main attachment bolt. The main attachment bolt passes through a fuselage frame, a hole drilled through the leg and a glassfibre rear reinforcement plate, which covers the leg in this area (Figure 1).

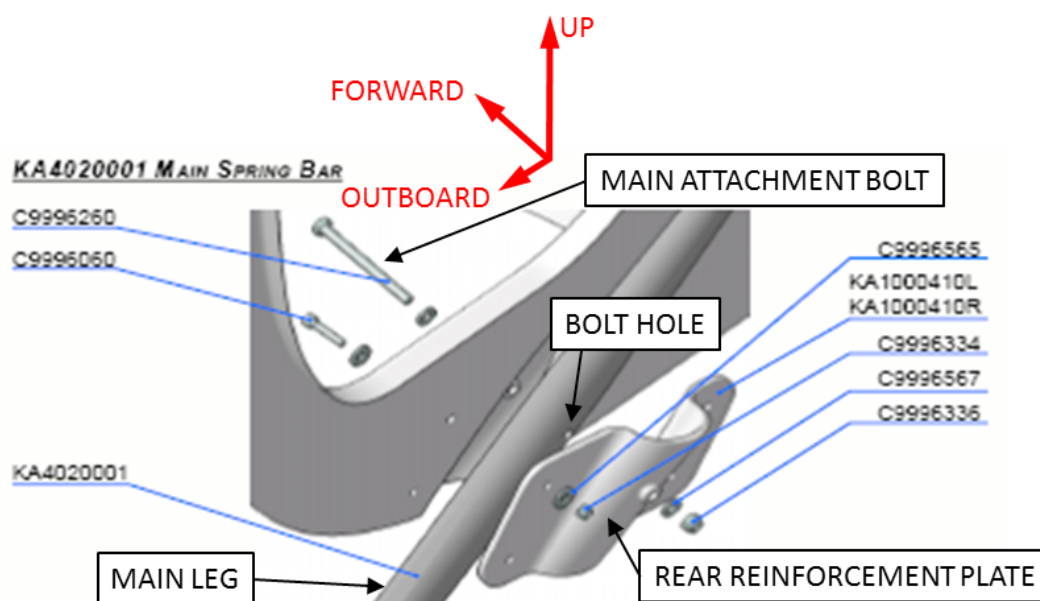


Figure 1

CTSW left main landing gear leg and support structure

Aircraft examination

The landing gear leg had failed due to a fatigue crack propagating from the aft lower edge of the main attachment bolt hole (Figure 2). The crack had propagated through approximately 60% of the thickness of the lower section of the leg, before the leg subsequently failed in ductile overload.

The left fuselage was locally damaged in the area where the leg passes through the fuselage skin, due to excessive upward rotation of the leg during the landing gear collapse. The left rear reinforcement plate was delaminated. The left wingtip was damaged due to ground contact.

Other information

Previous event

Following a similar failure on a CT2K¹ main landing gear leg in July 2006, the UK agent issued Service Bulletin (SB) CT123 in February 2007, requiring removal of both main landing gear legs for dye penetrant crack inspection at the top of the legs and at the main attachment bolt hole positions. This one-time inspection is applicable to all CT2K and CTSW aircraft, registered before 22 February 2007, at 300 flying hours. It is also applicable to all CT2K and CTSW aircraft that have experienced a heavy landing.

Footnote

¹ The CT2K is an earlier model of the CTSW, and is similar in most respects apart from having a longer wingspan. The landing gear design is identical on both aircraft.

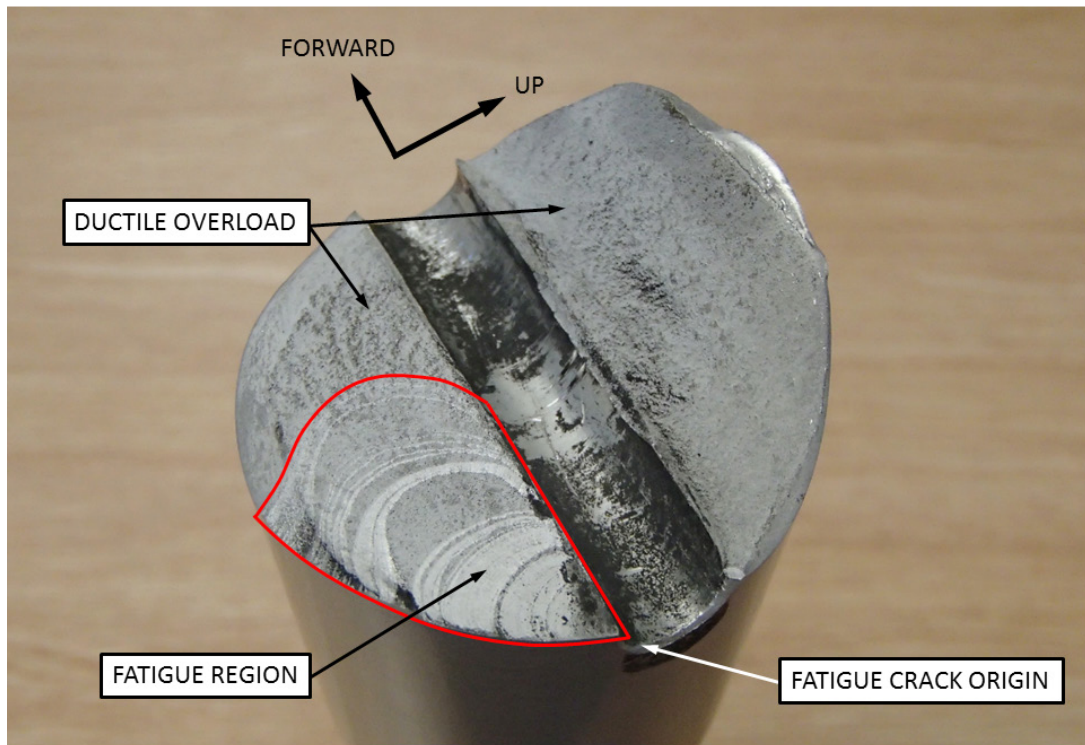


Figure 2

Fracture surface of upper part of the left main landing gear leg

As G-CGVG was manufactured in 2011, and no heavy landings had been reported in its 478 flight hours accumulated since new, it was not subject to the dye penetrant inspection specified in SB CT123.

Maintenance Instructions

Scheduled maintenance instructions are contained within the CTSW Operator's Manual² and require that the main landing gear legs are dye penetrant crack tested, whilst installed in the aircraft, every 300 flying hours:

Every 300 hours or after any heavy landing, the main undercarriage leg bolt rear plate must be removed and the leg dye penetrant tested for cracks/distortion at the mounting holes. If removed, legs must be replaced in the same orientation that they were removed in.

It was not possible to ascertain whether this inspection had been performed on G-CGVG as the aircraft's logbook, covering the period the inspection was due, had been lost in a burglary. Since the main landing gear inspection as defined in the CTSW Operator's Manual does not require removal of the landing gear legs from the aircraft, it would not detect a crack on the forward edge of the main attachment bolt hole as this area is not accessible without removal of the main landing gear legs.

Footnote

² Currently at Issue 1.2.

Analysis

The left main landing gear leg collapsed due to propagation of a fatigue crack originating at the aft edge of the main attachment bolt hole. It was unclear for how long the leg had been cracked, and no heavy landings had been reported that would have triggered removal of the leg for dye penetrant inspection as per SB CT123. As the aircraft was manufactured in 2011, it was not subject to the main landing gear leg dye penetrant inspection at 300 flying hours as required by SB CT123. It is not known whether the leg was dye penetrant inspected in situ at 300 flying hours, as required by the CTSW Operator's Manual, as the relevant aircraft records had been lost.

Safety actions

In response to this accident the UK agent intends to issue Service Bulletin CT145, which requires removal and dye penetrant crack inspection of the main landing gear legs of all CT2K and CTSW aircraft at intervals of 300 flying hours. Service Bulletin CT145 will supersede SB CT123. Service Bulletin CT145 will also introduce modification M309, in which the edges of the main attachment hole in the legs are peened, leaving residual compression stress at the hole edges intended to suppress fatigue crack initiation. Service Bulletin CT145 continues to include the requirement to inspect the legs for cracks and straightness following heavy landing events.