

## ACCIDENT

<b>Aircraft Type and Registration:</b>	Piper J5A Cub Cruiser, G-BSXT	
<b>No &amp; Type of Engines:</b>	Rolls Royce O-200A	
<b>Year of Manufacture:</b>	1940 (Serial no: 5-498)	
<b>Date &amp; Time (UTC):</b>	20 July 2018 at 1310 hrs	
<b>Location:</b>	Felthorpe Airfield, Norwich	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - None
<b>Injuries:</b>	Crew - None	Passengers - N/A
<b>Nature of Damage:</b>	Right wing and left rear fuselage damaged	
<b>Commander's Licence:</b>	FAA Private Pilot's Licence	
<b>Commander's Age:</b>	73 years	
<b>Commander's Flying Experience:</b>	876 hours (of which 0 were on type) Last 90 days - 4 hours Last 28 days - 2 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and enquiries made by AAIB	

## Synopsis

During a check flight, a newly repaired Piper J5A Cub Cruiser overran the runway and struck a gate at Felthorpe Airfield near Norwich. This was because the aircraft was travelling too fast in the final stage of the landing. It floated a long distance and landed a long way down the runway. The pilot had no time on type and the aircraft had heel brake controls that he found difficult to use.

The LAA did not have the opportunity to assess the suitability of the check pilot, in part due to a misunderstanding between the LAA and one of its Inspectors about what airworthiness process to follow. In response to this accident, the importance of clear and unambiguous communications with members has been reinforced at LAA HQ. The LAA has also informed inspectors of the circumstances of this event and issued a decision-making flow chart to help them determine what process should be followed.

## History of the flight

The flight took place at Felthorpe Airfield, where there was a light headwind of 3 to 5 kt along the runway.

The aircraft had been repaired recently following a stalled landing accident. It was authorised by an LAA Inspector for check flying on 9 July 2018.

Check flying of a newly repaired LAA aircraft is intended to<sup>1</sup>:

- Check the aircraft is basically flyable.
- Check each of the systems.
- Set up and trim the aircraft properly.
- Complete the LAA test schedule.

The pilot was the owner of the aircraft and had performed most of the repair work. On 20 July 2018 he considered the weather suitable for the first check flight.

The pilot planned to do between three and five circuits and landings using Runway 23 before performing a “full check flight” and completing the LAA test schedule with the LAA Inspector on board. As the aircraft had been rebuilt, the pilot was unsure of the stall speed. He wanted to “add a margin of safety” so decided to approach at 60 mph and land at 55 mph.

The ground run, takeoff and circuits were normal. The pilot attempted two approaches and considered the aircraft too high and too fast (65 mph) so elected to go around. On the third approach, he was comfortable with speed and height and elected to land.

After flaring, the aircraft floated for some distance before making a three-point touch down. The aircraft was still moving at speed and the pilot applied full brake but was already over half way along the 487 m runway.

At the end of the runway there was a hedge with a public road behind. The pilot decided to turn to increase the landing distance. He turned the aircraft gradually to the right using braking and rudder. There was a fence ahead so he “attempted to ground loop” to the right. Full depression of the brake was not enough to turn the aircraft in time.

The aircraft struck a gate with the right fore and aft wing struts causing it to swing to the right and its left wing tip hit a tree. The right wing and left rear fuselage were damaged (Figures 1 and 2).

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#### Footnote

- <sup>1</sup> LAA (2008) Initial test flying of LAA aircraft. TL 1.19 Issue 1.  
<http://www.lightaircraftassociation.co.uk/engineering/TechnicalLeaflets/Building,%20Buying%20or%20Importing/TL%201.19%20Initial%20Test%20Flying%20of%20LAA%20Aircraft.pdf> (accessed on 12/12/2018)



**Figure 1**  
G-BSXT after the accident



**Figure 2**  
Damage to the right wing

## Accident site

Figure 3 shows significant locations in the accident sequence.



**Figure 3**

Sequence of the accident and accident site (edited image from Google Earth)

## Aircraft information

The Piper Cub Cruiser J5A is a high wing, strut-braced monoplane with a steel frame, fabric covered, fuselage. G-BSXT had been modified to replace the original engine with a Rolls Royce 0-200A engine.

G-BSXT was originally registered in the UK under LAA administered permit to fly arrangements. It was exported to the Republic of Ireland in 2013 and registered there as EI-AXT. Due to its export, the LAA permit to fly was revoked. It was involved in a landing accident in 2016. In 2017 the pilot purchased it and re-registered it in UK using the original registration of G-BSXT. It was repaired by the pilot with some tasks done by contractors.

The aircraft's main wheels were fitted with brakes which were operated by the pilot's heels.

According to a manual published by Piper Aircraft Corporation, the landing speed for the Piper Cub Super Cruiser is 45 mph<sup>2</sup>. According to the 1940 edition of *Jane's All The World's Aircraft*, the landing speed for the lighter J5A variant is 40 mph<sup>3</sup>.

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## Footnote

<sup>2</sup> Piper Aircraft Corporation (1945). *How to fly a Piper Cub*.

<sup>3</sup> Grey, C.G and Bridgman, L (1941). *Jane's All The World's Aircraft 1940*. Sampson Low Marston and Co. Thanks to the Royal Aeronautical Society National Aerospace Library for providing access to this publication.

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## **Airfield information**

Felthorpe is an unlicensed airfield, 4 nm north-north-west of Norwich that has two grass runways.

## **Personnel**

### *Pilot*

The pilot was the owner of the aircraft. He reported that he was an FAA licenced engineer for 15 to 20 years and had been an LAA member and inspector for 2 to 3 years.

He had received training and endorsement and flown as pilot in command in a Stinson 108 tail wheel aircraft in 1993. He had no experience in the Piper Cub Cruiser. His recent experience was on a Cessna 172 which has a tricycle undercarriage.

G-BSXT was the first aircraft the pilot had owned that would be administered under the LAA permit to fly arrangements.

### *LAA Inspector*

The LAA Inspector ran an aircraft inspection and maintenance business. He stated he is also an EASA licensed engineer for single engine light aircraft and an inspector for the LAA, BMAA and BGA.

## **LAA processes and guidance**

The LAA administer permits to fly for some types of aircraft on behalf of the CAA.

To be considered airworthy, LAA aircraft require a non-expiring permit to fly issued by the CAA on the recommendation of the LAA and an annual certificate of validity. When an aircraft owner wishes their aircraft to be managed under LAA arrangements, they must make an application to the LAA. Each application is considered on an individual basis and the LAA specifies what process needs to be followed to obtain a permit to fly and certificate of validity. There are various routes depending on the type and history of the aircraft.

The pilot planned for G-BSXT to be managed under the permit to fly arrangements administered by the LAA. He had not yet officially applied to the LAA.

### *Process followed for G-BSXT*

The pilot and LAA Inspector were following the process for renewal (revalidation) of a permit to fly.

The renewal process consists of inspection of the aircraft and its paperwork by an LAA inspector and a check flight or flights. In the renewal process, check flights may be authorised by an LAA inspector providing that the certificate of validity has not expired by more than 12 months. The '*Form LAA/FWR 1 October 2017 version*' documents the process.

An LAA inspector signs Section 4 of Form LAA/FWR 1 to certify that the aircraft and its paperwork has been inspected and is considered fit for the annual check flight. The top of this section states the 12-month expiry rule in red italic text. It also refers to guidance notes on the final page of the form. The 12-month rule is restated and expanded in the guidance notes as follows:

*'Where a check flight for renewal of a permit to fly is to be conducted any time more than twelve months after the expiry of the permit to fly, then Section 4 will have to be completed by LAA Engineering before flight.'*

In this situation the LAA assesses the application form and any related documentation. If satisfied, the LAA issues a similar Permit Flight Release Certificate, an appropriate check flight schedule and any special check flight requirements.

The guidance notes also state:

*'Persons acceptable to conduct this check flight are qualified pilots with a minimum total experience of 100 hours flying including 10 hours on type or a similar type.'*

LAA technical leaflet TL1.19<sup>4</sup>, '*Initial test flying of LAA aircraft*' states:

*'The choice of pilots for carrying out test flying is another issue where owners put forward their suggestion and LAA Engineering have to vet the proposal, based on the previous flying experience of the person put forward, currency on aeroplanes of the type concerned, or at least, similar or related types...'*

Very similar guidance, including that relating to flying experience is also given in LAA technical leaflet TL2.06 issue 3<sup>5</sup>.

On 9 July 2018, the LAA aircraft worksheet and check flight authorisation were signed indicating that the pilot and the LAA Inspector considered the aircraft was fit for a check flight. However, the aircraft did not have a permit to fly because it was revoked when the aircraft was exported.

#### *Applicable process for G-BSXT*

According to the LAA this aircraft should have followed the process for the issue of a new permit. Under the new permit process, a Certificate of Clearance must be issued by the LAA before a check flight. Part of this process is intended to assess the suitability of the

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#### Footnote

<sup>4</sup> LAA (2008). Technical Leaflet TL 1.19. *Initial test flying of LAA aircraft*. Issue 1. <http://www.lightaircraftassociation.co.uk/engineering/TechnicalLeaflets/Building,%20Buying%20or%20Importing/TL%201.19%20Initial%20Test%20Flying%20of%20LAA%20Aircraft.pdf> (accessed on 13 December 2018)

<sup>5</sup> LAA (2008). Technical leaflet TL 2.06. The permit renewal test flight fixed wing aircraft. Issue 3, 1 Jan 2008. <http://www.lightaircraftassociation.co.uk/engineering/TechnicalLeaflets/Operating%20An%20Aircraft/TL%202.06%20Annual%20Permit%20Renewal%20Flight%20Test.pdf> (accessed on 15 January 2019)

nominated check pilot<sup>6</sup>. Based on the nature of the aircraft and the repair work that had been undertaken, the written minimum requirements for the check pilot would have been the same as for the renewal process (100 hours total and 10 hours on type or similar)<sup>7</sup>. However, in practice, pilots for the testing of recently built, imported or repaired aircraft are assessed on a case by case basis.

#### *Flying guidance for aircraft owners*

At the time of the accident, the LAA did not provide guidance for owners regarding first flights on type. The LAA are not responsible for pilot licensing or training. The LAA offers an optional Pilot Coaching Scheme where qualified instructors provide tuition on flying new types of aircraft<sup>8</sup>.

#### **Pilot's comments**

The pilot had conducted self-study familiarisation training regarding the performance and landing technique for the Piper Cub Cruiser using various sources. He found that most sources advocated a 55 mph final approach speed. He also found sources that quoted stall speeds of up to 49 mph.

He had concluded that the landing area available at Felthorpe was sufficient. The pilot said that he had not gained any instruction on type because it was not required by the insurance company. The consensus among his flying community peers was that the type was very easy to fly. He also stated he was not sure where he could obtain instruction.

The pilot said he intended to add 5 mph to what he believed to be the recommended landing speed for the aircraft. He reflected that he had overcompensated for stall speed and made assumptions that the landing drag would be greater than it was.

The pilot indicated that the brakes were effective and no problems with them were identified after the accident. However, he found it difficult to use the brake and rudder at the same time because heel brakes were unfamiliar to him.

The pilot did not consider there to be any problems with the aircraft that may have contributed to the accident.

The pilot commented that he was not aware of the guidance in Section 4 of Form LAA/ FWR 1 stating the 12-month expiry rule. He accepted the permit flight release certificate without question.

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#### **Footnote**

<sup>6</sup> LAA Flight Testing Guidance for new permits: [http://www.lightaircraftassociation.co.uk/engineering/Warning%20FlightTesting/LAAFT\\_NEW.html](http://www.lightaircraftassociation.co.uk/engineering/Warning%20FlightTesting/LAAFT_NEW.html) (accessed on 19 October 2018)

<sup>7</sup> LAA exposition, section 5.5, p30.

<sup>8</sup> LAA Pilot Coaching Scheme. <http://www.lightaircraftassociation.co.uk/PCS/pcs.html> (accessed on 13 December 2018)

### LAA Inspector's comments

The LAA Inspector said that he telephoned the LAA when he became involved with the aircraft and spoke to the LAA Chief Inspector. After this conversation he had the impression that the aircraft should follow the normal permit renewal process. The LAA Inspector followed this process on approximately one aircraft per month.

He was aware that G-BSXT had previously held a permit to fly but did not investigate further. He indicated that he did not read the text on Section 4 of the permit renewal form that stated that LAA Inspectors cannot authorise a check flight if the permit to fly has expired by more than 12 months.

### LAA Chief Inspector's comments

The LAA Chief Inspector stated he was aware that the pilot had imported an aircraft and was repairing it. He recalled several conversations with the pilot. He could not specifically recall any conversations with the LAA Inspector about the aircraft but stated he had no doubt that he did talk to him.

### CAA Safety Sense Leaflets

Safety Sense Leaflet 7 – '*Aircraft performance*' offers practical guidance on how to fulfil the pilot's responsibility to check aircraft performance, including landing distances. It states:

*'When landing at places where the length is not generous, make sure that you touch down on or very close to your aiming point (beware of displaced thresholds). If you've misjudged it, make an early decision to go around – don't float half way along the runway before deciding.'*<sup>9</sup>

Safety Sense Leaflet 12 – '*Strip flying*' similarly advises:

*'If your approach is bad, or a touchdown at the correct place is unlikely, make an early decision to go-around.'*<sup>10</sup>

### Analysis

The pilot decided to land at a speed he believed was 5 mph higher than the recommended speed. According to figures found during the investigation, it may have been as much as 15 mph higher than the appropriate landing speed. This resulted in a much longer float and therefore landing distance required. The pilot did not decide to go around after recognising the long float. He had already performed two go-arounds and it appears that he performed the third approach with a mindset that he would definitely land.

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### Footnote

<sup>9</sup> Safety sense leaflet 7: *Aircraft performance*. <http://publicapps.caa.co.uk/docs/33/20130121SSL07.pdf> (accessed on 14 November 2018)

<sup>10</sup> Safety sense leaflet 12: *Strip flying*. <http://publicapps.caa.co.uk/docs/33/20130121SSL12.pdf> (accessed on 14 November 2018)



The pilot's tailwheel training was a long time ago on a different aircraft, so the skills acquired would have faded and may not have been relevant to the Piper Cub Cruiser. The pilot's lack of time on type contributed to the outcome. His difficulty using the brakes may also have contributed to his inability to stop in the available distance.

The pilot and the LAA Inspector were both mistaken about the airworthiness process required before flying. The airworthiness of the aircraft was the pilot's responsibility as the owner. The work on the aircraft was considered by the pilot to be straightforward and this may have created an expectation that the application process would be straightforward as well. In addition, the pilot had asked for the assistance of the LAA Inspector who was much more experienced with LAA processes. The pilot relied on this guidance. The LAA Inspector believed that the required process was normal permit renewal. This may have been the result of miscommunication between him and LAA headquarters. The misunderstanding resulted in a flight that did not comply with the regulations.

Both the process followed, and the new permit processes, incorporated the same written guidance regarding the minimum experience of the check flight pilot. The pilot did meet the written minimum criteria for performing the check flight because it does not include any requirement for how recently the pilot has flown the type or a similar type.

The LAA Inspector stated that he had not read the clause about the 12-month limit. This may have been due to over-familiarity with the form because he used it so frequently. This could have caused him to focus on the parts he needed to complete and to disregard the static parts of the form that he had often seen before. This clause would have prompted him to realise that the renewal process was not appropriate for the aircraft. Had the new permit process been applied instead, the chance of an accident may have been reduced because the LAA probably would have considered the nominated pilot to be unsuitable due to lack of recent time on type.

## **Conclusion**

The pilot was unable to land and stop the aircraft in the distance available because the landing speed was too high, and touchdown occurred approximately half way along the 487 m runway. The pilot had selected a higher than recommended landing speed to compensate for not knowing the stall speed of the aircraft, which was newly repaired. The pilot's lack of experience on type contributed. His difficulty using the heel brake controls may also have contributed.

The airworthiness process followed for the aircraft was not the appropriate one. As a result, the LAA did not have the opportunity to assess the suitability of the check pilot. The opportunity for the accident would have been reduced if they had considered the pilot's lack of currency on type and required he have instruction or use an alternative pilot for the check flight.

## Safety actions

In response to this accident, the LAA has re-emphasised to its staff the importance of clear and unambiguous conversations between LAA headquarters, aircraft owners and LAA inspectors.

The LAA has also produced a communication for LAA inspectors that describes this event and provides advice regarding inspector responsibilities in this type of case. It has also produced a decision-making flow chart to assist inspectors to determine what process should be followed.

As a safety action in response to the accident involving G-BXON, the LAA has published Technical Leaflet 2.30 *Converting to a new type*<sup>11</sup>. This contains relevant guidance for pilots transitioning between aircraft types.

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### Footnote

<sup>11</sup> LAA (2018). Technical Leaflet 2.30. *Converting to a new type*. Issue 1. 19 December 2018. <http://www.lightaircraftassociation.co.uk/engineering/TechnicalLeaflets/Operating%20An%20Aircraft/TL%202.30%20Converting%20to%20a%20New%20Type.pdf> (accessed on 15/01/2019).