ACCIDENT

Gyroplane Type and Registration:	Rotorsport UK Calidus, G-TGLG
No & Type of Engines:	1 Rotax 914-UL piston engine
Year of Manufacture:	2015 (Serial no: RSUK/CALS/028)
Date & Time (UTC):	18 March 2022 at 1251 hrs
Location:	Shobdon Airfield, Herefordshire
Type of Flight:	Training
Persons on Board:	Crew - 2 Passengers - None
Injuries:	Crew - 1 (Serious) Passengers - N/A 1 (None)
Nature of Damage:	Damage to the left side of the fuselage pod, wheels, propeller, left vertical stabiliser and rotor blades
Commander's Licence:	Private Pilot's Licence (Gyroplane)
Commander's Age:	70 years
Commander's Flying Experience:	1,253 hours (of which 1,251 were on type) Last 90 days - 19 hours Last 28 days - 8 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB

Synopsis

During an aborted takeoff, the student pilot pulled the throttle and stick back. This caused the gyroplane to abruptly, pitch-up and roll to the left. The gyroplane fell on to its side and slid to a stop.

History of the flight

The purpose of the flight was training for a student pilot on a gyroplane private pilot's licence course. The student, who already held a fixed-wing licence, had completed 17 hours of the course and had been progressing well. The objective of the flight was to finesse the student's landing technique. The instructor, who was occupying the rear seat, and student planned to fly several circuits at Shobdon. The first few circuits were planned to end with low passes along the runway. They planned to follow these with some landing practice, each landing coming to a full stop before commencing another takeoff.

The weather at Shobdon included light winds and clear skies, and the airfield was busy with general aviation traffic.

The start-up and taxi were uneventful but, due to other traffic, there were several delays before they were able to takeoff, and they had sat in the gyroplane for 31 minutes before being able to commence the first takeoff.

The first takeoff was normal and was followed by three circuits. Each circuit concluded with a low pass flying a few feet above the runway before climbing back into the circuit. The circuit was busy with other traffic and on several occasions they needed to vary the circuit to fit in with it.

After the fourth circuit they planned to land, stop, then commence another takeoff. The approach and landing were good and the gyroplane came to a stop on the runway. The student then advanced the throttle to commence another takeoff. However, as the gyroplane accelerated along the runway the instructor realised that the student had allowed the stick to move too far forward and the rotor speed was not increasing. He instructed the student to abort the takeoff, telling him to reduce power and put the stick forward. However, the student pulled the throttle and stick back together causing the gyroplane to pitch-up sharply. Both occupants described the stick shaking violently and the gyroplane instantly rolling to the left.

The gyroplane fell onto its side and slid along the runway, coming to a stop on the left side of the runway (Figure 1 and 2). The occupants were trapped and could smell fuel. Airfield personnel were on scene quickly and were able to right the gyroplane and extract the occupants. The instructor was uninjured; the student had chest pains and later discovered he had broken a bone in his back.

Figure 1

Marks on the runway with accident site in the distance

Figure 2

G-TGLG after righting by emergency services

Instructor's comments

The instructor commented that the student's previous takeoffs during his training had been good and they had briefed the procedure for stopping after landing then commencing another takeoff. He was therefore confident the student could handle the takeoff. When he instructed the student to abort the takeoff, he was loosely holding the controls but was not able to prevent the abrupt rearward movement of the stick.

With hindsight the instructor felt he should have taken control and aborted the takeoff himself rather than instructing the student to abort. However, at the time, he wanted to give the student the opportunity to correct the mistake himself to maximise his learning.

The instructor commented that he was not able to see the instruments in the front cockpit due to the shape of the canopy. Airspeed, altitude and vertical speed instruments were fitted in the rear cockpit[1] but no rotor speed indicator. Had he been able to see the rotor speed, he felt he would have noticed earlier that the takeoff was not preceding correctly. He intends to have a rotor speed indicator fitted instead of the vertical speed instrument when the gyroplane is repaired.

Footnote

[1] These additional gauges were fitted as an approved 'minor modification' when the instructor started using this gyroplane for instructional flights.

Student's comments

The student pilot could not remember exactly what happened in the moments before the accident. He remembered safely landing then commencing the takeoff. However, as he started the takeoff, he realised he had not completed the normal verbal checks which includes stating "stick fully back and centred". He had not mentally reset from thinking about the landing into thinking about the takeoff. With hindsight he realised he should have aborted the takeoff himself when he became aware he had not done the checks.

The student also described that as he was flying downwind prior to the landing he was feeling quite tired due to the exertion of the long delay on the ground in the warm cockpit, the extended circuits and the concentration required to fly the previous circuits. At this point he thought that they should make this the final circuit, but he did not communicate this to the instructor. He felt that his tiredness was probably why he did not complete his normal checks leading to the incorrect stick position on the takeoff roll.

AAIB comment

This accident shows how challenging it can be for instructors to know when and how to intervene effectively. Instructors need to give students the opportunity to make mistakes and recover situations for themselves whilst ensuring they maintain a safe operation. One author on flying instruction suggests:

> *'There is an extremely fine balance between allowing the student to maintain control of the aircraft for as long as possible and intervening before they do anything that would compromise safety.'* [2]

The CAA Handling Sense Leaflet 'Gyroplane Handling Performance'[3] contains guidance about aborting a takeoff in a gyroplane. It contains the following advice:

> *'Every pilot should develop the habit of putting the actions in the event of a mishap on take-off at the very forefront of their thinking. In the case of the gyroplane pilot, this is immediately before releasing the pre-rotator. Good practice would be for every pilot, on every take-off, to say out loud "in the event of an aircraft malfunction or poor acceleration on take-off, I will abort the take-off by …'*

Footnote

[2] Hatton, C. L. (2006) *You have control: being a better flying instructor*. Marlborough: The Crowood Press Ltd.
[3] Available at http://publicapps.caa.co.uk/docs/33/20120816HSL04.pdf