ACCIDENT

Aircraft Type and Registration:	DA 40 NG, G-CTSR
No & Type of Engines:	1 Austro E4-A piston engine
Year of Manufacture:	2015 (Serial no: 40.N304)
Date & Time (UTC):	3 September 2021 at 1257 hrs
Location:	Cranfield Airport, Bedfordshire
Type of Flight:	Training
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - 1 (Minor) Passengers - N/A
Nature of Damage:	Damaged beyond economical repair
Commander's Licence:	Student pilot
Commander's Age:	42 years
Commander's Flying Experience:	23 hours (of which 23 were on type) Last 90 days - 23 hours Last 28 days - 14 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB

Synopsis

While flying a solo visual circuit the student pilot elected to go around due to an unstable approach. During the go-round the aircraft descended as it flew along the runway. It subsequently struck the airport perimeter hedge and came to rest in an adjacent field. The pilot sustained minor injuries.

It was discovered that the aircraft did not have the performance to climb during the go-around as the engine power applied during the go-around was recorded to be about 13%.

History of the flight

The student pilot was planning to fly some solo visual circuits at Cranfield Airport, Bedfordshire having recently completed her first solo. Runway 03 was in use and the weather was good with a wind from 030° at 6 kt. The aircraft completed the circuit without event until it was on the approach.

During the final approach, on the first circuit, the pilot realised the aircraft was too fast and high. Despite trying to correct the approach by selecting flaps to FULL, the pilot realised the approach was still unstable so elected to execute a go-around (GA). The flaps were retracted to TAKE OFF and the aircraft was pitched up, and the pilot believed that full power was applied. However, it soon became apparent that the aircraft was not climbing as expected and the pilot felt there was not enough power. Upon looking at the ASI it was

noticed that the IAS was decreasing, so the aircraft's nose was lowered to maintain the airspeed. This resulted in the aircraft descending.

The pilot continued to lower the nose to maintain an appropriate airspeed but the aircraft was by now at a low height and approaching the end of the runway. The pilot momentarily retracted the flaps, to see if that would help, before re-selecting them to TAKE OFF and then FULL.

As the aircraft crossed the end of the runway the pilot noted that the IAS was "dangerously low". The flaps were retracted to the takeoff position to try to extend the aircraft's range and clear the approach lights to Runway 21 and the hedge on the airfield boundary. However, the aircraft continued to descend and struck the hedge. As it did so, the stall warning sounded and the pilot noted that the IAS was about 60 kt. The aircraft came to rest in a field on the other side of a road that bounded the airfield (Figure 1).

The pilot completed the shutdown checks and vacated the aircraft unassisted with minor injuries. A passer-by stopped to assist the pilot, and the local and airport's RFFS were quickly on scene where they administered first aid and made the aircraft safe.

The aircraft was damaged beyond economical repair.

Figure 1

G-CTSR after the accident

Pilot's comments

The pilot commented that she was convinced she selected full power, and she did not remember if there were any caution messages during the event. She added that a lack of experience contributed to the accident in that she focused on trying to solve the lack of performance and continued trying to get the aircraft to climb when it would have been preferable to convert to a landing.

Recorded Information

Electronic flight instrument system

The aircraft was fitted with an integrated electronic flight instrument system (EFIS), and its removable memory card was downloaded. Pertinent data from the flight is shown in Figure 2. The data shows that the GA was initiated at about 215 ft aal, at which point the IAS was 100 kt, and the pitch attitude of the aircraft slowly increased to about 4° nose up. The IAS then decreased to 68 kt as the height increased slightly to about 240 ft aal. The aircraft then began a descent during which the IAS increased to about 80 kt. The aircraft's height then varied slightly, although it stayed predominantly below about 60 ft aal, and the IAS began to reduce again. Finally, the aircraft descended further and struck the hedge. Throughout the GA the engine power remained stable at about 13%.

Throttle and flap positions and stall warning were not recorded by the EFIS.

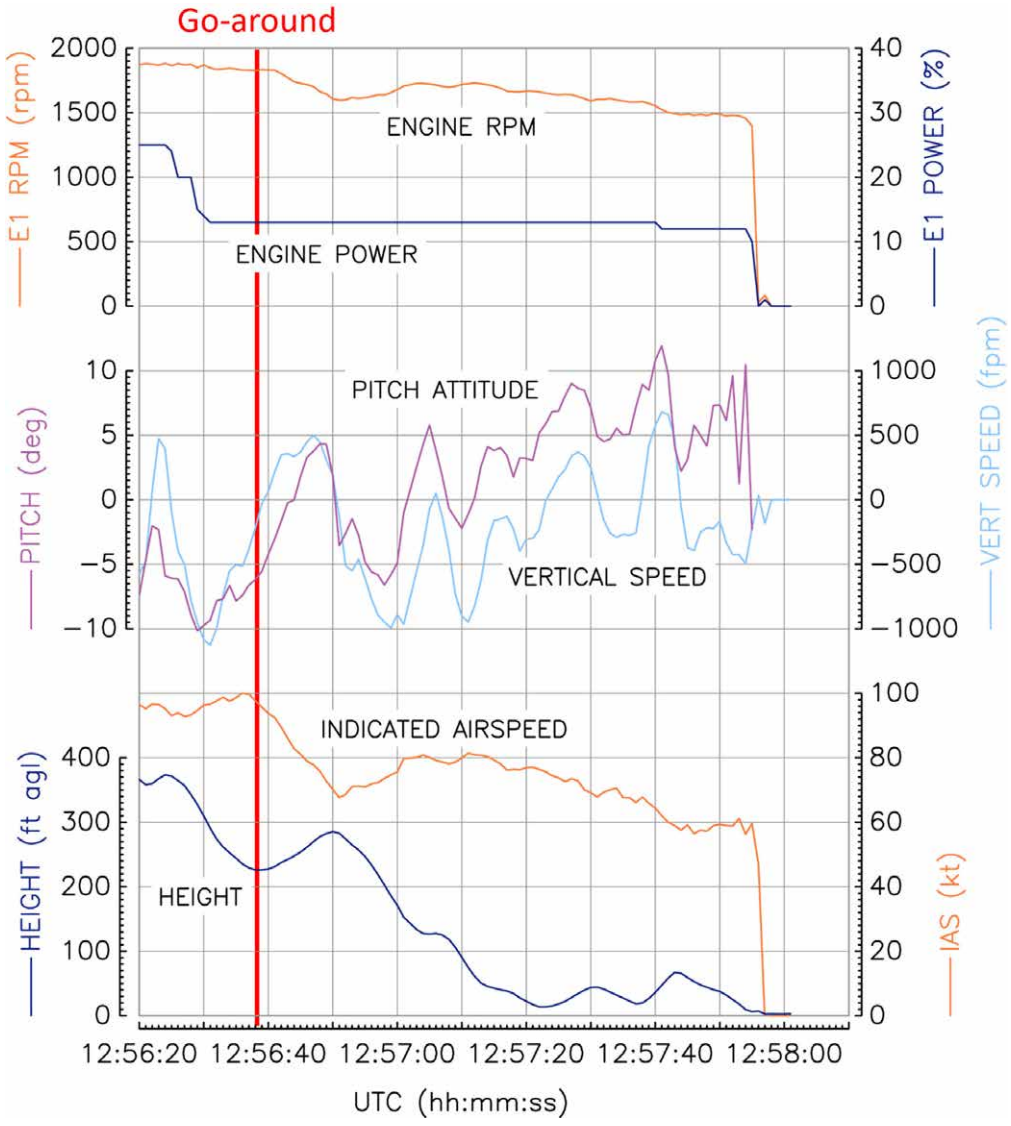

Figure 2

Graph showing pertinent data from the EFIS

Engine control unit

The engine control unit was sent by the operator to the engine manufacturer for analysis. There was no electrical failure recorded and all the engine parameters were correct and in the normal range. The manufacturer concluded there had been no technical issue with the engine or its control system.

Analysis

This was the student pilot's second solo flight. Having noticed that the approach was unstable, the pilot's decision to execute a GA was in accordance with CAA guidance[1]. However, the evidence from the EFIS was that the power did not increase above 13% during the GA, and the aircraft's subsequent lack of performance indicated that this was insufficient power for the aircraft to climb.

The pilot commented that a lack of experience contributed to the accident as she tried to solve the lack of performance and became slightly distracted by moving the flaps down and up. While distractions can be difficult to ignore, especially when inexperienced, the first priority is always to fly the aircraft, which during a GA includes ensuring full power is applied. The pilot closely monitored the IAS and made appropriate corrections to keep the aircraft at a suitable speed, although this resulted in it descending. Had the pilot not done this, it is possible the aircraft would have stalled at a low height, after which the outcome may have been more serious.

Conclusion

The aircraft did not have enough performance to climb after a go-around was initiated by the pilot. The pilot was insistent that the throttle was advanced, but the recorded data from EFIS showed the power remained at 13%. The manufacturer considered that the engine and its control system were operating normally, and no cause could be established to explain why the power did not respond to the reported throttle movement. While the pilot lowered the nose to maintain an appropriate speed, the aircraft descended and eventually struck a hedge on the boundary of the airfield.

Footnote

[1] CAA Safety Sense Leaflet 1e, *Good Airmanship,* paragraph 30. Available: http://publicapps.caa.co.uk/docs/33/20130121SSL01.pdf [Accessed June 2022].