SUMMARY

A training flight in an aeroplane of the model Diamond DA42 was to be undertaken at Västerås Airport. On board were an instructor and a student in the front seats, with one further student in the back seat. During the training exercise – the plan for which included approaches and flying on one engine – the instructor should demonstrate a manoeuvre called "deep stall". It was dark during the flight, which was undertaken partly under instrument meteorological conditions, with overcast clouds with base of 300–400 feet and tops of approx. 2,000 feet, with icing conditions forecasted in clouds.

According to the instructor, the exercise was conducted in the following manner: The aeroplane was brought into a steep climb with an attitude of approx. 25–30º at the same time as an approx. 30º bank to the right was set. During the deceleration, both engines were set to full power and when the aeroplane was approaching stall speed, the stick was pulled fully back. However, the students gave evidence when interviewed that the pitch attitude during the climb was at least 50º (nose up). This information also supports the analyses conducted by the Swedish Accident Investigation Authority (SHK) on data recorded by units in the aeroplane.

At the top of this manoeuvre, the aeroplane rolled over to the left and entered a spin from an altitude of approx. 4,500 feet. The instructor attempted – e.g. by varying the engine power – to exit the spin. However, the aeroplane continued to spin and, following a sequence of events lasting just over 30 seconds, crashed into woodland close to Ängsjö Church. According to the data registered on units on board and the radar data that have been obtained, the rate of descent in the initial phase is determined to have been approx. 52 m/s (approx. 10 200 ft/min), which then gradually decreased to approx. 19 m/s (approx. 3 700 ft/min) prior to impact.

During the impact phase into the woods, a tree trunk entered the fuselage, causing the student in the back seat to be thrown out of the aeroplane. With the rate of descent and the rotation decreasing and with parts of the aeroplane remaining in the surrounding trees, the wrecked aeroplane finally impacted in the woodland and was totally destroyed. The two people in the front seats survived, but were seriously injured. The student in the back seat, who also suffered serious injuries, came to his senses standing in front of the aeroplane wreckage.

Both SHK and the type certificate holder, Diamond, have made the assessment that the manoeuvre performed can be classified as a type of aerobatic flying that is not permitted in accordance with the aeroplane's approved flight manual.

According to the applicable regulations, the flight training organization shall have a well-thought-out and functional quality and safety system for the identification and minimisation of potential hazards in its operations. This system is scrutinised during the Swedish Transport Agency's initial inspection and oversight inspections.

However, these inspections do not encompass any detailed inspection of practical realisation – or levels of risk – with respect to the aspects of practical flight training that may be associated with increased levels of risk. The applicable regulations also contain no guidance pertaining to the practical execution of such exercises.

All in all, SHK is of the opinion that it must be possible to guarantee students at flying schools the same level of flight safety as afforded to passengers on commercial flights. This accident shows that both regulations and supervision are deficient with respect to the identification of areas of risk and hazardous circumstances in conjunction with flight training.

The accident was caused by the following factors:

- The high risk factor of the exercise.
- Deficient planning of the training exercise with respect to the options for managing hazardous situations.
- Lack of guidance from the authorities concerned regarding practical implementation of certain exercises within flight training.

Safety recommendations

EASA is recommended to:

- Identify exercises in flight training that might entail an increased risk factor and to issue guidance material (GM) for the practical execution of these. *(RL 2017:04 R1)*