

REPORT INTO AN ACCIDENT INVOLVING A JONKER JS3 ON 15th JUNE 2023

Background

The accident occurred at about 1320 hours local time. Prior to the accident the pilot had been involved in assisting the winch launching operation by driving the vehicle which retrieved the launching cables back to the next aircraft to launch. At his turn to fly, he entered the cockpit and performed his pre-flight preparation as normal. The pilot was a very experienced glider pilot and had flown this particular aircraft on 9 previous occasions amassing 20 hours and 16 minutes on type. His initial conversion flight was by aerotow. He subsequently did most of his flying on this type from winch launches. The winch at the Nympsfield site is a Skylaunch system with a powerful V8 internal combustion engine. The standard operating procedure for the Skylaunch is for the winch driver to increase power to the target setting in about 4 seconds from being given the instruction "all out", which initiates the launch.

The Accident Flight

The ground run and lift off appeared completely normal but the glider then rotated more vigorously than normal into a steep climb. During this pitch up the left wing was seen to drop and the aircraft entered autorotation to the left. The nose then dropped and the aircraft impacted the ground in a steep nose down attitude. The winch driver reacted quickly and correctly, cutting power and applying the drum brake.

The glider was damaged beyond economic repair. The cockpit area was significantly disrupted, and the pilot received injuries which were initially assessed as life threatening. The club accident plan was put into operation and the emergency services responded in an exemplary manner. The pilot was removed to hospital by air ambulance. The pilot received major lower limb injuries and one of his legs had to be amputated below the knee. He subsequently made very good progress and was able to be discharged after about three weeks. His injuries will need ongoing treatment, but he should make a reasonably good recovery. Once he was sufficiently recovered the pilot was asked of his recall of the accident flight. As is often the case in circumstances of major trauma he was unable to remember any details of the accident flight although subsequently he stated that he had an impression of sliding backwards in the aircraft.

Tests and Research

The LX 9000 flight computer installed in the aircraft contains an integral EMMC memory chip which it was hoped would provide data for the accident flight. The device was removed from the aircraft and returned to the manufacturer in an attempt to recover a useful IGC trace. Data was found for the previous flight, but nothing could be recovered for the accident flight.

The aircraft's manufacturer M&D Flugzeugbau GMBH and the designers of the JS3, Jonker Sailplanes GMBH, were of great assistance in providing data regarding the aircraft's performance. The aircraft was found to stall at 80 KPH at minimum weight and 91 KPH when loaded this is with the flaps selected to flap 4 the recommended winch launch position. If the pitch up on launch had generated a load factor of 1.7G, which is a reasonable assertion, these speeds would increase to 104 KPH and 118 KPH respectively.

The aircraft was found to be within its weight and balance limitations, with the centre of gravity at about 80% of its permitted distance aft of datum. It is likely, but impossible to prove due to the extent of the damage, that the glider was carrying up to 5 Kgs of water ballast in the fin as is normal practice.

There was a possibility that the flaps had retracted due to inadvertently knocking the flap lever out of the detent. This would precipitate a movement of the centre of pressure forward which could give an additional small pitch up moment additionally the stall speed would increase by up to 6 KPH. This theory tested on a winch launch in a JS1, a very similar glider with identical control geometry. It was found that there was minimal movement of the lever and thus it is very unlikely that this would be a causal factor.

The Jonker Sailplanes CEO, chief designer and company chief test pilot Uys Jonker flew a number of test flights where the winch driver was instructed to apply full power as the launch was initiated to generate rapid acceleration. The seating position in the JS3 is more reclined than in many other gliders so the test was to discover if the pilot would slide rearwards in such circumstances. The test pilot was of a smaller stature than the accident pilot. It was found that the pilot did indeed slide back such that he was only able to control the aircraft with his fingertips. This problem did not occur if the pilot was tightly strapped into the seat.

The owner of this particular glider was 6 feet tall and 91 Kgs. The accident pilot was 5 feet 11 inches tall and about 95 Kgs boarding weight. The owner examined the seat adjustments in the aircraft post-crash and found that both pilots used the same upper seat position but that the accident pilot had the lower setting one position further forward. This would have had the pilot slightly more reclined than the owner.

Conclusions

Modern powerful winches have had a major safety benefit in that many of the hazards of slow acceleration and transition into the climb can now be avoided. These winches do however accelerate the glider more quickly and there is a possibility that a pilot can move back in the seat and thereby inadvertently apply a rearward movement to the control column pitching the glider up more than was intended. This risk is exacerbated the more prone the pilot sits in the aircraft. The winch cable attachment point in gliders is low on the airframe frequently close to the mainwheel. This also gives a nose up pitching couple which become greater as power increases. It is highly probable that both these factors contributed to the rapid pitch up as observed from the ground and the glider then stalled. There was a crosswind of up to 10 kts at the site which may have caused some yaw, or the aircraft may have been yawing at this time. Having yaw present would have precipitated the spin which from a very low height was irrecoverable.

Recommendations

1. Many flights in gliders can be of long duration and thus to operate the glider efficiently pilots need to find a comfortable seating position. However, this position may be sub-optimal during the critical launching phase of flight.

The BGA should remind pilots of the hazard of being forced rearwards during acceleration on a winch launch and highlight the need for the pilot to be adequately restrained during this phase of flight.

2. The BGA's Safe Launching initiative has had a marked effect on accident rates. The BGA should continue to bring this material to the attention of BGA clubs and their members.

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