

To Prof. Dr. Mark D. Maughmer

OSTIV is doing a great job in terms of improving the safety of gliding and gliding competitions, but I have two additional topics that I haven't seen to be addressed. I would like to share my recent observation based on my unpleasant incident. What happened is a result of a hard landing in the mountains near Pavullo. Luckily for me, I got away with only broken thoracic (Th3 and Th4) vertebrae, which should be possible to cure without any future complications.

The first problem I would like to point out is the reliability of engines installed in gliders. There is no system, no piece in an aviation design with minor importance. Sooner or later everything is important and here we have reliability below any reasonable standards. Faulty engines are the cause of many landings in a hurry and add up to many disasters. I also know of cases where pilots were killed because they relied on the engine.

My experience shows that this problem applies not only to new producers, not only to old gliders, but also to very experienced and established makes. I have already had failed engine starts in Arcus, Ventus, Nimbus, Duo Discus, Schleicher ASH 25 Mi, ASG 29, JS1, JS3, GP 14. So if one person has experienced so many, the problem is very common. By the time I got used to it and accepted the situation, it was only a matter of time to be in a situation when the engine could help, but you don't know that there was no plan B. In a long valley with many fields, but all on steep slopes, I was trapped not knowing it.

My proposal would be to monitor such fails and, based on it, put up some norm or solutions providing reliability. For example, the first OSTIV recommendation could be to double the end position switch in pylons or it should be possible for the pilot to bypass this switch. Many times only the switch fails and the system forbids the pilot to crank the engine.

The second problem is the position of the pilot in a cockpit. What happened to me is a result of a hard landing in the mountains in Pavullo. But the point of the injury (TH3/4) is unusually high. For someone with a weaker skeleton, it could be a disastrous injury with oncoming paralysis and breathing difficulties. When falling on one's bottom, first to break should be the lower part of the spine in the lumbar region. In my opinion, much higher injury is a result of the inappropriate position of the body in the cockpit. Narrow and short cockpits force pilots to squeeze in narrow space and, as a result of bending and twisting the spine initially they make it prone to break.

Hard landings in terms of forces acting on a pilot's body may be considered similar to forces acting during catapulting with an ejection seat. This is very well described in publications and the first conclusion is that the cause of injuries is the inappropriate position of the pilot. The asymmetric position, bent lumbar section not tightly supported by the seat, bent cervical section with head down, loose seatbelts are some of the causes. As a rule, the forces acting on a spine should be as much as possible symmetric and acting along its axis through centres of a mass through sciatic tubers, the centre of fifth lumbar vertebra, the centre of mass of the thorax and centre of mass of the head.

In the case of glider cockpits, manufacturers have recently tended to minimise cockpit space beyond reasonable limits. There are also reinforcements of older designs, taking out space necessary for pilots' shoulders. This forces pilots to push shoulders forward and to bend the neck forward, which in the event of a collision could cause deadly injuries itself. If the pilot feels discomfort, pain after a flight in such a position, in the case of a hard landing exactly this painful spot will become a weak point and would be the first part to break. There is no point producing a very strong cockpit if the pilot in it can't survive safely.

I propose OSTIV panelists take this into account and propose minimal cockpit width for future designs, and to reconsider if such regulations should not be taken in competitions as soon as possible. Cockpits should also allow pilots to be in a comfortable position with a tightened harness and this position should be as symmetric as possible while controlling the glider without a need to reach very far to control stick.

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