

ACT WHEN THE LAUNCH FAILS

If followed correctly, training will enable safe recovery from failure at any stage of a winch launch

IN THE 16 years before the BGA's safe winch launch initiative of 2006, winch launch accidents to UK glider pilots led to over 50 fatal or serious injuries. Many of these were stalls or spins following a cable break or other launch failure. This was a pattern of accidents and injuries that had varied little since our records began in 1974.

New analysis of glider flight during and after a winch launch led to changes in training and a national campaign to educate pilots about the hazards and their avoidance. The 16 years since then have seen 70 per cent fewer serious winch launch accidents.

Many of these were cartwheels following a wing-drop [1]. Serious injuries from accidents associated with winch launch failure are down by a factor of five.

Down – but not eliminated.

Four ways to stall the glider

There are at least four points during recovery from a launch failure when the glider can stall if the correct actions are not performed.

A,B: Recovery to normal flight.

If the pilot maintains the glider's launch attitude after the cable breaks or the winch fails (A in Fig 1), the glider will slow down and, after typically just two or three seconds in the full climb attitude, stall. The high rate of descent and nose-down attitude mean that if the glider reaches the ground in its stalled state, substantial damage and often serious injury result.

The reliability of modern glider winches means that genuine launch failures can be rare and hence unexpected. The first action is therefore to recognise that the launch has failed. Sometimes, the pilot will hear or feel the cable breaking or releasing – though, especially with modern materials, such as Dyneema, even a break can be smooth. A progressive loss of winch power can only be detected by monitoring the glider's airspeed.

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- *Expect the launch to fail, and brief yourself on the eventuality before flight.*
- *Monitor the airspeed for any power loss.*

Moving the stick forwards to lower the nose unloads the wings, reducing the stall speed, and reduces the rate of climb and consequent loss of airspeed; it also retains good control authority, and indicates to the winch driver that the power is inadequate.

- *If the airspeed falls towards the minimum acceptable, begin to lower the nose so that, if the winch driver does not compensate, the glider approaches the normal gliding attitude with adequate flying speed.*

- *If the launch fails, move the stick forwards immediately so that the glider follows a 'push-over' of much reduced or even zero g.*

The only exception is when the launch fails while the glider is close to the ground.

Action must be taken promptly: every half second counts. Note that it is rarely urgent to release what remains of the cable.

If the glider is returned to normal (1g) flight before adequate airspeed has been restored, it will again stall (B in Fig 1). The push-over must therefore be maintained until the nose is well below the normal gliding attitude. With the glider held at this 'recovery attitude', it will accelerate rapidly to a safe manoeuvring speed.

- *Maintain the push-over until the glider has reached a recovery attitude.*
- *Hold the recovery attitude until there is sufficient speed for the next manoeuvre.*
- *Once a safe manoeuvring speed has been achieved, the nose may be raised gently to the normal attitude for that speed.*

The manoeuvring speed needs to take into account any margin for turbulence and wind

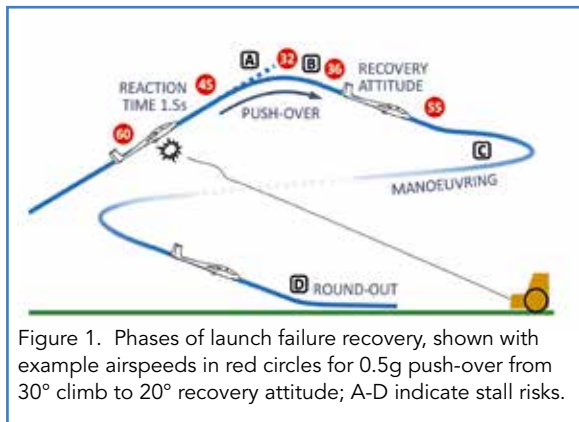


Figure 1. Phases of launch failure recovery, shown with example airspeeds in red circles for 0.5g push-over from 30° climb to 20° recovery attitude; A-D indicate stall risks.

■ For further advice on all aspects of winch launching, see the BGA Safe Winch Launching website [4] and section 16 of the BGA Instructor Manual [5].

[1] *Stop the Drop, S&G* (Feb/Mar 20) <https://tinyurl.com/flyright2124>

[2] *The Effects of Wind Gradient, S&G* (Oct/Nov 19) <https://tinyurl.com/flyright2125>

[3] *Safe Rotation, S&G* (Oct/Nov 20) <https://tinyurl.com/flyright2126>

[4] BGA Safe Winch Launching <https://tinyurl.com/flyright2127>

[5] BGA Instructor Manual, section 16 <https://tinyurl.com/flyright2128>

gradient [2]; your chosen approach speed will generally be a good target.

C,D: Manoeuvring. If the launch failure occurred well into the launch, your next manoeuvre could be a well-banked turn, in which the stall speed will be higher than in straight flight – and in the excitement of the moment it's easy to pull too aggressively and stall (C in Fig 1). If the turn is over-ruddered, the pilot can easily provoke a spin. Spins into the ground generally result in serious or fatal injuries. For this reason, unnecessary turns are not recommended.

● **Land ahead if it is safe to do so.**

It can be difficult to judge the available space until the glider's attitude has stabilised.

If there is not enough space to land ahead, there will generally be enough height for the rest of the flight to be flown unhurriedly.

● **Manoeuvre carefully, monitoring airspeed and coordination.**

The final manoeuvre in any flight is the round-out which, like rotation at the start of a winch launch, requires extra wing lift to provide the centripetal acceleration [3]. If the airspeed is insufficient, the glider will once again stall (D in Fig 1), commonly damaging the glider and potentially injuring the pilot's back. It follows that recovery from a launch failure must leave the glider with both the speed and height to round out from the approach or recovery attitude without stalling.

Provided that the rotation was flown at a measured rate with adequate speed, the recovery attitude allows brisk acceleration to the manoeuvring speed without leaving the glider too great an angle through which to round out – even after a low launch failure.

Ultra-low launch failure

The above advice needs to be adapted for the case of an ultra-low launch failure, when there is insufficient height to adopt and recover from the usual nose-down recovery attitude. If the rotation has been approached correctly, the glider should still be close to the normal gliding attitude. The pilot's job is to make small adjustments to keep the glider flying until the held-off stage of landing.

● **Use the stick to compensate for any change of trim following the launch failure, and arrest any rate of climb.**

● **Lower the nose to as close to the normal gliding attitude as is possible given the height.**

● **Fly the latter stages of the approach, round-out and landing as normal.**

● **Avoid using the airbrakes unless you are**

sure you can deploy them without losing pitch control or causing the glider to drop to the ground.

Launch failure training

A number of launch failure accidents have occurred when an instructor did not take over a poorly handled recovery in time. Since the margins with an ultra-low launch failure are very slim, these are taught only by demonstration – often as a simulation by closing the airbrakes in the float from a normal approach.

● **Instructors must take over immediately if a student does not respond correctly to a launch failure.**

● **Recovery from ultra-low launch failures is taught by demonstration only.**

Safe winch launching

UK glider pilots fly about 150,000 winch launches each year. Failures occur, but if followed correctly our training will let us recover safely from a failure at any stage of the launch. Recovery from launch failures can be practised at height, and instructors will be happy to help.

Tim Freearge and the BGA safety team

PREVIOUS 'FLY RIGHT' ARTICLES

The Perils of Distraction (Apr/May 19)

Keeping Safe in Thermals (June/July 19)

Why It Is Good to Think Ahead (Aug/Sep 19)

The Effects of Wind Gradient (Oct/Nov 19)

A Fun but Safe Introduction (Dec19/Jan20)

Stop the Drop (Feb/Mar 20)

Avoiding Upset (Apr/May 20)

Backroom Boys (June/July 20)

Cockpit muddle (Aug/Sep 20)

Safe rotation (Oct/Nov 20)

Cockpit remedies (Dec 20/Jan 21)

Covid currency (Feb/March 21)

Eroded margins (April/May 21)

A good lookout (June/July 21)

Trouble with turbos (Aug/Sept 21)

'Hopefully' is not an option (Oct/Nov 21)

■ **Clubs can obtain printed copies of Safety Briefings from the BGA Office.**

ARE YOU THINKING ABOUT NEXT YEAR?

Now is the time to book courses and expeditions to ensure availability

We are open most flyable days during the winter and offer second club membership to members of other clubs. We welcome expeditions and of course are always looking for new members who want to learn to fly or already can.

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