

Safe winch launching

Patrick Naegeli and Hugh Browning offer vital reminders about winching, based on new BGA research into 18 years' worth of accident statistics. If you read only one article this issue, make it this one...

WINCHING is the predominant launch method in the UK, with more than 70 per cent of all glider launches being by winch.

The majority of pilots have been trained in winch launching. Many would regard themselves as sufficiently adept to be able to take a launch without a moment's thought.

With so much winching going on, so broad a base of competent pilots across the gliding movement, and a winch accident rate of only one in 14,000 launches, it would be natural to assume that we ought not to be too concerned with the quality of our winch launching.

We could not be more wrong.

The winch launch gives rise to more accidents in which pilots are either killed or injured than any other type of UK gliding accident.

Table 1 (above right) puts this statement in the context of other accident categories for the period 1987 to 2004. Winch – and other – accidents happen to pilots of all experience levels.

So, why do we have such a problem? More importantly, what do we need to do to improve matters?

Understanding the problem

The winch launch is one of the most demanding phases of gliding flight. The pilot needs to concentrate on a set of flying priorities that change in a very short space of time as the launch progresses. They also, importantly, need to anticipate, recognise,

	Fatal	Serious Injury	Total Accidents
Winch	18	36	379
Collision	12	1	35
Stall/spin (excluding winch and field landing)	8	18	124
Field landing	2	21	489
Landing		8	385
Undershoot/overshoot		7	257
All others (rigging, technical, high ground, etc)	27	15	922
TOTAL	67	106	2591

(source: BGA Safety Initiative, 2005)

assess, and perhaps manage several potential hazards in the course of a launch.

▶ During the **ground roll** the glider can cartwheel if a wing touches the ground while the glider is attached to the cable. *Are you ready to release immediately if you cannot keep the wings level?*

▶ Accidents during **rotation** from a stall and flick roll are rare but often fatal. The stalling speed is strongly dependent on the rate of rotation. Did you know that a glider with a 1g stalling speed of 34 knots will stall at about 50 knots if it is allowed to rotate at 20° per second? That rotation rate achieves a 40° climb in 2 seconds. A safe rotation to a 40° climb takes about 6 seconds.

Do you ever allow a more rapid rotation than this?

How many launches do you see trace out a "hockey stick" launch profile as they rotate dangerously quickly into the climb?

▶ The most frequent winch accident happens **after launch failure below 100ft**, often below 50ft. While trying to land ahead the glider hits the ground stalled or nose first. The climb angle and airspeed of a glider will significantly determine whether

or not a recovery can be made before a stall occurs.

If the pilot is not prepared for a launch failure it will increase the time it takes for him or her to respond to one. This reaction time has a very significant effect on the likelihood that the glider can be prevented from stalling during the recovery. A glider in a 25° nose-up climb will decelerate at 9 knots per second unless the nose is lowered; at 45° the deceleration rate is approximately 14 knots per second.

Do you anticipate a power failure on every launch?

▶ Accidents **after launch failure above 100ft** with no recovery to controlled flight are rare but often fatal, typically from an inadvertent spin. *After a launch failure at several hundred feet do you always maintain the recovery attitude until you have your approach speed?*

▶ A successful recovery to controlled flight **after launch failure above 100ft** may mean that the ensuing circuit planning is demanding. Typical accidents include undershooting, overshooting, and hitting an object on the ground. *Do you plan your circuit options before take off?*

Table 2 (left) shows the number and severity of UK winch accidents in each of the above categories over an 18-year period.

	Fatal	Serious Injury	Total Accidents
Ground Roll		1	57
Rotation	7	8	18
Launch failure below 100ft	1	17	125
Launch failure above 100ft; no recovery to controlled flight	7	8	20
Launch failure above 100ft; controlled flight achieved			61
Others	3	2	98
TOTAL	18	36	379

(source: BGA Safety Initiative, 2005)

Improving matters

In almost all cases these winch accidents would not have happened if the launch had been prepared and flown correctly.

There are signs that many pilots are unaware of, or have forgotten, the principal hazards that they need to anticipate and avoid during a winch launch.

Over the coming months the British Gliding Association will be disseminating information designed to remind pilots of the principal hazards of winch launching, and

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STAGE	HAZARD	AVOIDANCE
Ground Run	Wing touches the ground, glider cartwheels or groundloops violently	<ul style="list-style-type: none"> = Start the launch with your hand on the release = If you cannot keep the wings level, release immediately
Rotation	Stall/spin during rotation	<ul style="list-style-type: none"> = Avoid taking off with a significant amount of yaw present = Delay rotation until adequate speed is seen and continuing acceleration is present = Ensure the transition from level flight at take off to a 40° climb is controlled, progressive, and lasts about 6 seconds
	Stall or heavy landing after launch failure below 100ft	<ul style="list-style-type: none"> = If the launch fails, immediately lower the nose to the appropriate recovery attitude at zero g. Minimising the reaction time is crucial = Do not use the airbrakes until the glider has attained an appropriate attitude combined with a safe speed = (Instructors: Simulated power loss with less than 50ft and 55kt by instructor demonstration only.)
Climb	Stall, spin, or heavy landing, after launch failure	<ul style="list-style-type: none"> = Adopt the recovery attitude; do not turn or use the brakes until the approach speed is attained = Land ahead if it is safe to do so
	Controlled flight achieved after launch failure but subsequent stall, undershoot, overshoot, heavy landing, or collision	<ul style="list-style-type: none"> = Plan provisional circuit options before taking off

Table 3, left: Truncated advice such as this is necessarily simplified

Site-specific factors may require many other considerations; however, the key points listed, if rigorously applied, should help to prevent many sad and unnecessary winch launch accidents

Pilots should consider the hazards listed in the table before every winch launch



Above and opposite top: winching at Lasham. Some benefits of winching include the fact that it is relatively inexpensive and has less impact on local communities

(Photos: Paul Holiday)

> how to anticipate, avoid, and manage them. This information and guidance is being promulgated through the instructor community at each club. CFIs will be advised to make winch launches a priority part of their refresher courses and check flights.

The above table is an extract from the leaflet on safe winching (see end of article) that has been published recently by the British Gliding Association Safety Initiative.

Conclusion

Winch launching provides gliding clubs with many benefits. It is relatively inexpensive, has less of an impact on local communities around a gliding site and can be used at sites where aerotowing is either restricted or not permitted.

There is no need to be afraid of winch launching. With proper training, an appropriate degree of currency, and careful consideration given to each launch, a pilot will be able to fly the winch within safe bounds and confident of their ability to deal with any type of launch failure.

If you need any further information on safe winching please speak to your CFI. As people often observe, safety is no accident.

This article is associated with the leaflet shown below, which is being widely disseminated through the UK gliding movement as S&G goes to press: firstly to BGA Examiners, Chief Flying Instructors and club chairmen, next via clubs to the instructor community and then ultimately to individual pilots.

The authors of this article, Patrick Naegeli and Hugh Browning, are members of the British Gliding Association Safety Initiative team. The Initiative comprises representatives from the BGA's instructors and safety sub-committees.

If you have further questions on the subject of this article or on any other aspect of the Initiative, please direct them to safetyinitiative@gliding.co.uk or via the BGA, Kimberley House, Vaughan Way, Leicester LE1 4SE

