Glider Accidents in 2012

When we are flying a glider the potential for an accident is ever-present.

Although we can never completely eradicate this potential, we can all take simple steps to minimise the likelihood and mitigate the seriousness of gliding accidents.

This review of accidents occurring during the BGA 2011/12 year is designed to:

- highlight some of the main areas with serious accident potential
- offer advice about the steps we can all take to avoid repetition

Most serious and fatal accidents result from a small number of causes. These accidents occur over and over again. By understanding these and ensuring that they do not re-occur, we can make gliding significantly safer.

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REVIEW OF ACCIDENTS IN 2012

Fatal Accidents

There were three fatal accidents in 2012. Two occurred to pilots flying their own glider who stalled and spun close to their home airfield. The other followed a wing drop and cartwheel on a winch launch. All are being investigated by the AAIB.

We reported last year that the most recent 4-year total of 5 fatal accidents (2008: 0, 2009: 4, 2010: 1, 2011: 0) represented a large reduction on the long term 4-year average of 16. Three fatal accidents in 2012 makes 8 in the last 5 years which is a deterioration but still only half the previous 5-year average of 20 (Chart 1). Until 2008, there had never been a BGA year free from fatal accidents. We accomplished this again in 2011. That proves it is possible.

Every serious or fatal accident is a personal tragedy. Obviously, we need to take every possible action to reduce these. However, we also need to minimise accidents to avoid over-regulation and to retain the ability to get insurance cover at a reasonable cost.

Serious Injury Accidents

There were 5 serious injury accidents in 2012:

- descent through cloud, attempted field landing, spun
- field landing, in Australia
- landing collision, serious injury to microlight pilot
- hit mountain in Spain
- landing, bounced, pitched inverted

Substantial Damage Accidents

Chart 2 shows the number of substantially damaged aircraft by accident category for the average year from 1974-2011, 2011, and 2012. The most significant features for 2012 are: a) fewer field landing accidents; and b) 20% of the aircraft were damaged on the ground, for example by wind and when being towed.

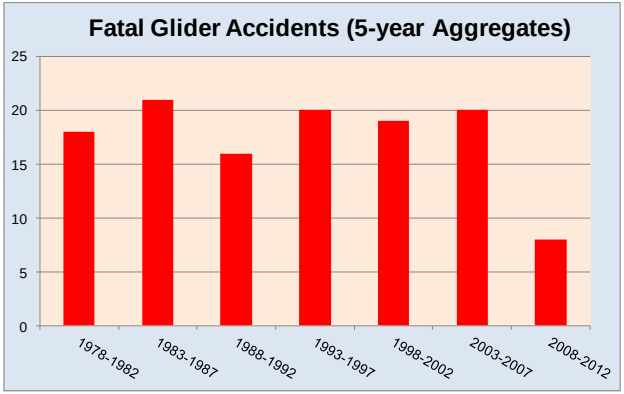

Chart 1

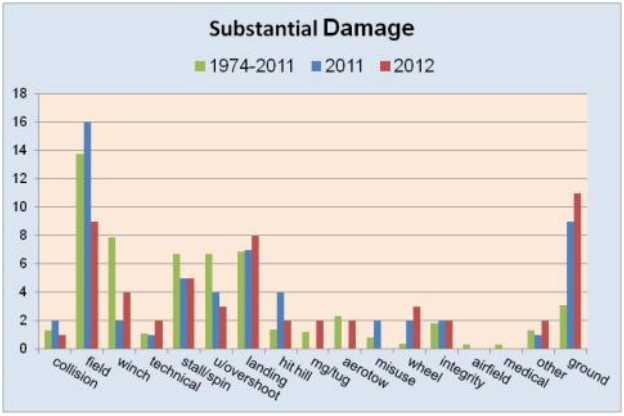

Chart 2

The challenge for us all is to avoid fatal accidents in 2013.

Please read this review carefully and consider what you can do to anticipate hazards and prevent them resulting in an accident. We all have a role to play, whether club official, instructor, private owner or club member.

ACCIDENT ISSUES IN 2012

1. Correct Preparation of Gliders for Flight

Errors or omissions in rigging, DIs, and pre-flight checks are extremely common. Since 1974 there have been 131 reports of gliders being flown improperly rigged (18 fatal or serious injuries), and 282 reports of other shortcomings of which 179 were canopies that opened in flight.

This glider integrity issue has been highlighted in the reviews of accidents in 2010 and 2011, on the BGA website, in messages to clubs and to private owners, and elsewhere. However, accident and incident reports of this kind *continue to increase*. The table opposite shows the annual number of reports doubled in 2010, was higher in 2011, and in 2012 at 20 was the highest ever. The accidents and incidents in 2012 were as follows:

- elevator disconnected, pilot bailed out
- loose tailplane
- drag pin shims missing, flutter
- aileron linkage detached in flight
- ballast in tail, full forward stick needed
- loose articles under seat
- loose battery jammed airbrake
- TMG take off with unlocked airbrakes
- 12 canopies opened in flight

Shortcomings in glider integrity usually arise from the universal human failings of distraction and forgetfulness. For example, rain had interrupted the rigging of the glider which took off on a winch launch with an unconnected elevator. The pilot bailed out successfully. In an earlier serious injury accident with an unconnected elevator, the glider had been rigged to allow a repair to the trailer. On the next day the pilot assumed the glider was ready for flight.

The way to guard against integrity accidents is by carrying out rigging, DIs, and pre-flight checks diligently, competently and WITHOUT INTERRUPTION OR DISTRACTION. If you are interrupted, start again. Do not interrupt people who are rigging, carrying out a DI, or conducting their pre-flight checks. If you are engaged on these activities and someone speaks to you, send them away. As an instructor or club official, try to develop a culture which makes everyone aware of the crucial importance of conscientious rigging, DIs, and pre-flight checks.

	Total	Rigging	Canopy	Other
2012	20	4	12	4
2011	18	6	7	5
2010	16	6	5	5
2009	6	1	4	1
2008	8	1	4	3
2007	9	4	5	0
2006	8	3	3	2
Avg 1974-2005	10	3	4	3

SHORTCOMINGS IN PREPARING A GLIDER FOR FLIGHT CAN BE LETHAL AND ARE COMPLETELY AVOIDABLE. Please ensure:

- *Rigging is directed by a person experienced on the type, in accordance with the flight manual, without interruption or distraction*
- *The DI is conducted by a person experienced on the type, without interruption or distraction*
- *You carry out proper pre-flight checks, again without interruption or distraction*

2. Tug Upsets

There were 6 known tug upset incidents in 2012. 5 were vertical upsets and one was lateral. Fortunately, no tug pilots were killed.

In a vertical tug upset the glider gets high behind the tug forcing the tug nose down. The slingshot vertical upset is particularly dangerous. The glider in effect does a winch launch behind the tug.

After a spate of fatal accidents some 30 years ago there was a BGA educational campaign to teach pilots how to aerotow safely. The frequency of tug upset incidents declined, with just two between 1996 and 2003. But tug upset incidents have increased in recent years with 17 since 2004, of which 6 were in 2012. Any of these could have killed a tug pilot. They were saved by the rope or weak link breaking, the rope back releasing, or the tug pilot or glider pilot releasing.

The incidents in 2012 are summarised below:

- glider turned without verifying that the rope had separated
- glider pilot trying to turn on master switch at 600ft, tug in 40° dive before tug pilot managed to release
- P2 struggling to maintain position at 1800ft, tug experienced nose down pitch and roll, tug pilot released (lateral upset)
- turbulent, tug nose pitched down, tug pilot released
- glider pilot attending to unlocked canopy, glider pitched up, glider pilot released
- glider pilot lost sight of the tug at 3-400ft, tail of tug pulled up, tug pilot released and just climbed away from the trees below

The circumstances which make tug upsets more likely are:

- belly or C of G hook intended for winch launching
- short rope
- pilot with little aerotow experience
- near aft C of G
- turbulent conditions
- all flying tailplane, or light elevator forces

Several recent tug upsets have been preceded by pilots attending to ventilation and instrument problems, by the use of incorrect technique for vertical positioning, and by pulling the release and turning without confirming that the rope had detached.

Simulated tug upsets, even at altitude, are very dangerous and hence do not form part of the training syllabus. Two series of simulations were conducted at altitude about 20 years ago, with a photographic chase plane, to understand the nature of a slingshot. This resulted in frightening experiences for the test pilots.

Some of the essentials for safe aerotowing are:

- If you are inexperienced
  - avoid aerotowing on a belly hook
  - do not aerotow when close to the minimum weight; ballast to at least 15kg more than the placarded minimum weight
  - avoid aerotowing in turbulent conditions
- Don't attempt to be TOO low in the period between the glider taking off and the tug becoming airborne. This risks bouncing, especially on grass airfields. The subsequent possible Pilot Induced Oscillation can lift the tug tail violently.
- Keep the glider in the correct vertical position by monitoring the position of the whole tug in the canopy; if the tug becomes high in the canopy, move back into position SLOWLY; if you move upwards rapidly a slingshot can result within a couple of seconds, putting the tug into a vertical dive.
- Fly the glider! Leave any problems with the instruments or ventilation until after release. Leave the undercarriage down.
- When releasing, make sure it's clear, pull the release, raise the nose slightly, check the rope has detached before turning.

When on aerotow, never pull up rapidly, employ the correct vertical positioning technique, give full attention to flying the glider, and make sure the rope has detached before turning.

Tug pilots should not hesitate to dump the glider if losing control of the tug.

3. Safe Winch Launch Initiative

Accidents in 2012

The total was 6, the lowest since at least 1974, but one of these was a fatal cartwheel from a wing drop. Another wing drop and cartwheel could easily have been fatal. Two accidents stemmed from simulated cable breaks and a low circuit, one person fell over while holding the fin, and in one incident the strop fouled an axle. There were no accidents involving a stall on the wire or after a launch failure.

Fatal and Serious Injury Accidents 2006-2012

Chart 3 indicates the numbers of fatal or serious injury winch accidents by stage of launch in 7-year aggregates.

In the 7 years of the safe winch launch initiative there have been just 2 fatal/serious injury winch accidents involving a stall or spin. The average 7-year total from 1974-2005 was 17. The total in the preceding 7 years from 1999-2005 was also 17.

Stall/spin accidents have historically comprised 80% of fatal or serious injury winch accidents. These have declined dramatically. But in the last 7 years we have had two fatal and one serious injury accident from a wing drop and cartwheel.

We have to continue to avoid winch stall/spin accidents and find ways of combatting wing drop accidents.

Wing Drop

In previous publications attention has been drawn to the fact that the frequency of wing drop accidents has remained the same in spite of the advice to pilots to release the cable before the wing touches the ground. These accidents occur predominantly to experienced pilots. In some cases it is possible that the pilot did not realise the wing had dropped.

The advice on safe winch launching first published in the October 2005 leaflet has been refreshed each year with new communications. The DVD recently sent to all instructors is the latest such communication. It reiterates the advice on releasing before the dropping wing touches the ground. In addition it offers advice on how everyone involved in a winch launch can help to ensure a wings-level departure. This advice includes winch driving technique, positioning the cable, waiting until the glider begins to move before giving all out, and the wing tip holder stopping the launch if he is experiencing an up or down force on the stationary wing.

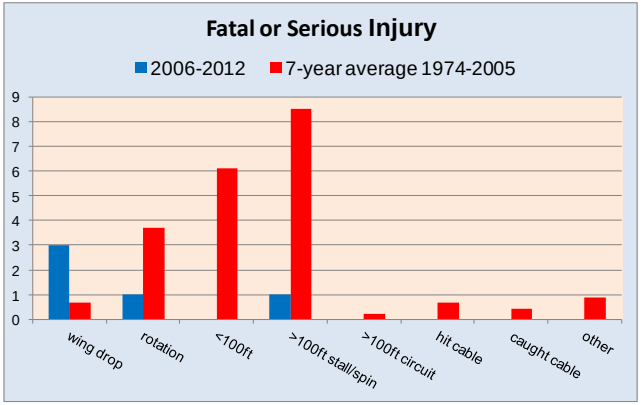

Chart 3

If you are an instructor, please use the DVD to help pilots avoid all winch launch hazards, particularly those from a stall or spin and from a wing drop and cartwheel.

If you are involved in winching in any capacity please ensure you view the DVD presentations on How to Fly a Winch Launch Safely part 1, Stop the Drop, and Winch Operations.

There were no fatal or serious injury winch accidents in 2010 or 2011. Can you help to ensure there are none in 2013?

SAFE GLIDING

It has been pointed out in previous reviews that 80% of the accidents that result in severe personal injury or damage arise from just six causes – winch launching, stall and spin, collision, landing, field landings and glider integrity. Advice on avoiding accidents of these kinds follows. Tug upsets have been added on account of their potential to kill tug pilots.

ACCIDENT AREA	PRINCIPAL CAUSE	ACTIONS FOR FEWER ACCIDENTS
Winch Launch	Incorrect technique and/or unable to cope with an emergency	Better training Fewer launch failures
Stall/spin, excluding winch launch	Overload, distraction	Flying the glider must always be the first priority
Collision	Inadequate lookout	Better lookout Technology
Landing (on home airfield)	Unable to cope with normal problems	Better training
Field landing	Field is picked too late	Pick a field in good time
Integrity	Rigging incomplete	Careful rigging
Tug upsets	Poor aerotow technique	Better training

Are you aware of this accident potential? Do you need to re-train or change your behaviour to remain safe?
Please consider, and act accordingly.

APPENDIX—SUMMARY OF SUBSTANTIAL DAMAGE ACCIDENTS IN 2012 BY CATEGORY

CATEGORY	TOTAL	CIRCUMSTANCES
Collision	1	In a collision in a competition gaggle the pilot successfully got out of his tail-less glider under negative g in a bunt, in spite of problems with removing the canopy and undoing the harness buckle *because his first action on sitting in the cockpit of any glider is to review how to exit in an emergency*.
Winch	4	2 wing drop (cartwheel) ONE FATAL 2 after simulated cable breaks and an abbreviated circuit
Technical	2	elevator problem, elected to land on hill airbrakes overstressed in flight
Under/overshoot	3	overshot, rough ground, glider thrown into the air late change of landing area, forgot airbrakes were open, undershot into car park undershot, caught edge of airfield, tail boom broke off
Wheel-up Landing	3	onto a tarmac runway, in a field, and a TMG prop strike

CATEGORY	TOTAL	CIRCUMSTANCES
Field Landing	9	late decision, low circuit, heavy landing hit house (in Australia) SERIOUS INJURY late selection, small field, hit sapling self launcher, battery flat, engine unavailable, landed in crop groundloop clipped tree on the approach hit wires overshooting, turned, cartwheeled small field, groundloop
Stall / spin	5	final turn too far back, stalled into undershoot field with full airbrake wave, descended through cloud, spun attempting field landing SERIOUS INJURY heavy rain, low sun, stalled on approach at 10ft spin close to home airfield FATAL spin close to home airfield FATAL
Landing	8	late roundout, instructing glider/microlight collision after landing on converging runways SERIOUS INJURY wing drop, groundloop bounce problem selecting landing flap, bounced on landing, pitched inverted SERIOUS INJURY early solo, gusty, bounce, pushed stick forward PIO on landing heavy landing
Hit Hill	2	hill soaring, rejected landable fields, sink, glider deposited in unlandable field hit mountain in Spain, instructing SERIOUS INJURY
Motor Glider/ Tug	2	prop strike on take-off go-around from practice field landing, upslope, hit trees
Aerotow	2	wing drop, hit runway light tug upset, tug pilot just climbed away from the trees below, glider groundlooped in field
Glider Integrity	2	rigging interrupted, elevator not connected, bailed out at top of winch launch canopy detached
Other flying	2	wing damaged after a birdstrike with a vulture in Spain (2 gliders)
Ground	11	wing blown over, rigging canopy blown open by wind tied-down TMG overturned by wind towing out, glider hit car or object (4) hail damage (2) glider blew away in a storm buggy driven into a glider

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