

Glider Accidents in 2009

British Gliding Association



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This publication reviews gliding accidents in 2009 with special attention to those accidents involving personal injury and/or substantial aircraft damage, and those during instruction.

Overall, 2009 was very similar to earlier years in terms of the numbers of accidents and their characteristics.

Our accident record reflects how we do things. To achieve fewer accidents requires changes in how we do things. Please consider what you can do individually or in your club to achieve such change. This will probably mean shifting from 'taking steps to prevent a recurrence after an accident has happened', towards 'having systems in place to manage hazards'.

Contents

Safer Gliding	3
Survey of Accidents in 2009	4
2009 Accidents by Category	7
Conclusions	11

Full summaries of all accidents are published in the BGA's bi-monthly magazine, *Sailplane & Gliding*. *Sailplane & Gliding* also publishes a wide range of articles, many of which are aimed at safer flying. For details of how to subscribe to *Sailplane & Gliding*, please visit www.sailplaneandgliding.co.uk



SAFER GLIDING

Safer gliding means fewer accidents.

It should be possible to completely eradicate fatal and serious injury accidents from certain known causes such as launch failure, stall, spin, and mis-rigging.

It is important to distinguish the degrees of risk that are acceptable for trial lessons, club instructing, and sporting flying. There should never be even a minor accident on a trial lesson. Ideally there should be no accidents from club instructing but realistically a few minor accidents can be expected. On the other hand, it is accepted that experienced and current pilots may choose to hazard their glider and occasionally they will break it.

Why do we need safer gliding? There are three reasons:

- fewer tragedies
- avoid over-regulation
- retain insurance

From an insurance perspective, the accidents to which we are most vulnerable are those that can lead to large 3rd party claims. Accidents with this potential are predominantly instructing accidents in which P2 is fatally or seriously injured. These claims can easily exceed £1million.

It has been indicated in earlier reviews that 80% of personal injury and substantial damage accidents arise from six hazards. Two of these are susceptible to better basic training. The other four require different measures (see table):

What might the characteristics of a safer gliding operation be? The following outline was recently offered to a group of club chairmen:

- pilots with skill and knowledge and equipped to evaluate risk
- few accidents from
 - inadvertent stall/spin
 - incomplete winch launches
 - landing on the home airfield
- no accidents on trial lessons
- no serious accidents from club instructing
- acceptance of accidents from expert pilots knowingly taking risks e.g. flight over unlandable country

Hazard	Predominant Immediate Cause	Indications for Fewer Accidents
Winch Launch	Incorrect technique and/or unable to cope with an emergency	Better training
Stall/ Spin, excluding Winch Launch	Overload, distraction	Flying the glider must always be the 1st priority
Collision	Inadequate lookout	Better lookout; technology
Landing (on home airfield)	Unable to cope with normal problems	Better training
Field Landing	The field is picked too late	Pick a field in good time
Integrity	Rigging incomplete	More careful rigging

Safer gliding is about not repeating accidents that have occurred many times before, in some cases hundreds of times. That requires knowledge, skill, good airmanship, and an ability to evaluate risk. The BGA is not proposing rules and regulations that would take the fun out of gliding.

What measures can you take individually, or in your club, to achieve fewer accidents in 2010?



SURVEY OF ACCIDENTS IN 2009

The BGA accident reporting year for 2009 ran from 1st October 2008 to 30 September 2009. In that period there were 4 fatal accidents and 3 serious injury accidents. 58 aircraft were substantially damaged.

Fatal and Serious Injury Accidents

There were 4 fatal accidents in 2009, the same as the long term average. These accidents were:

- collision
- winch
- in field, cross country
- in field, local

The investigations into these accidents are conducted by the AAIB.

There were 3 serious injury accidents in 2009:

- winch, cable break at 300ft, instructor lowered nose, turned, stalled
- 1st solo in motor glider (2nd circuit), drift, go around, turned, spun
- hand turning live tug propeller

Trend of Fatal and Serious Injury Accidents

Chart 1 shows the numbers of fatal and serious injury accidents and Chart 2 shows the rates per 100,000 launches in each year from 1974 to 2009.

The fatal and serious injury accidents are mentioned again in the analysis of substantial damage accidents by category.

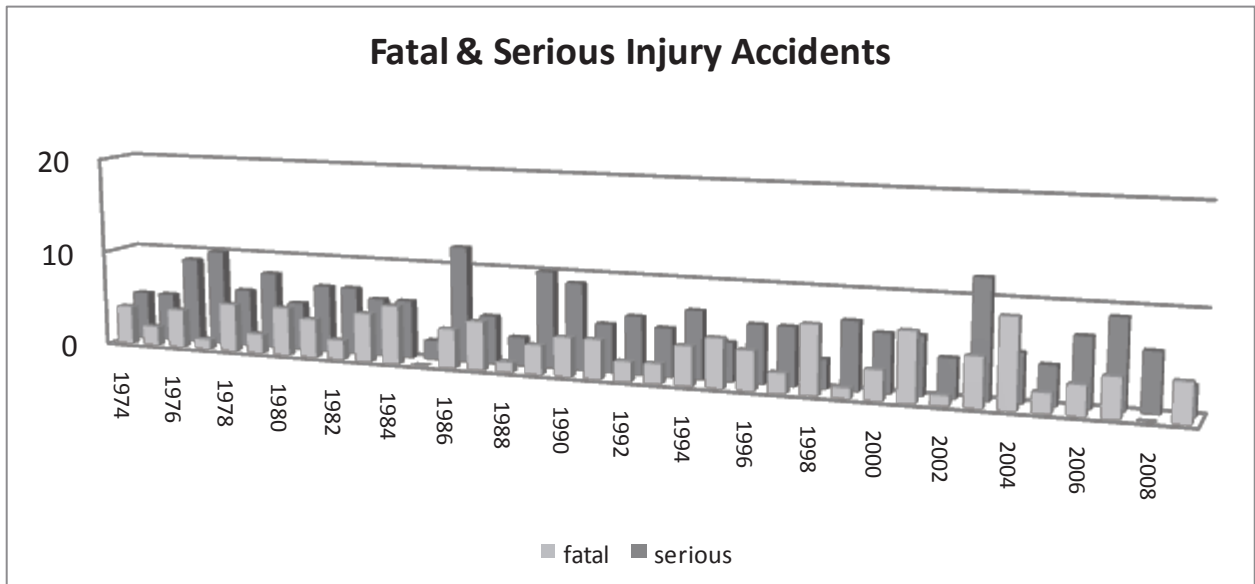


Chart 1

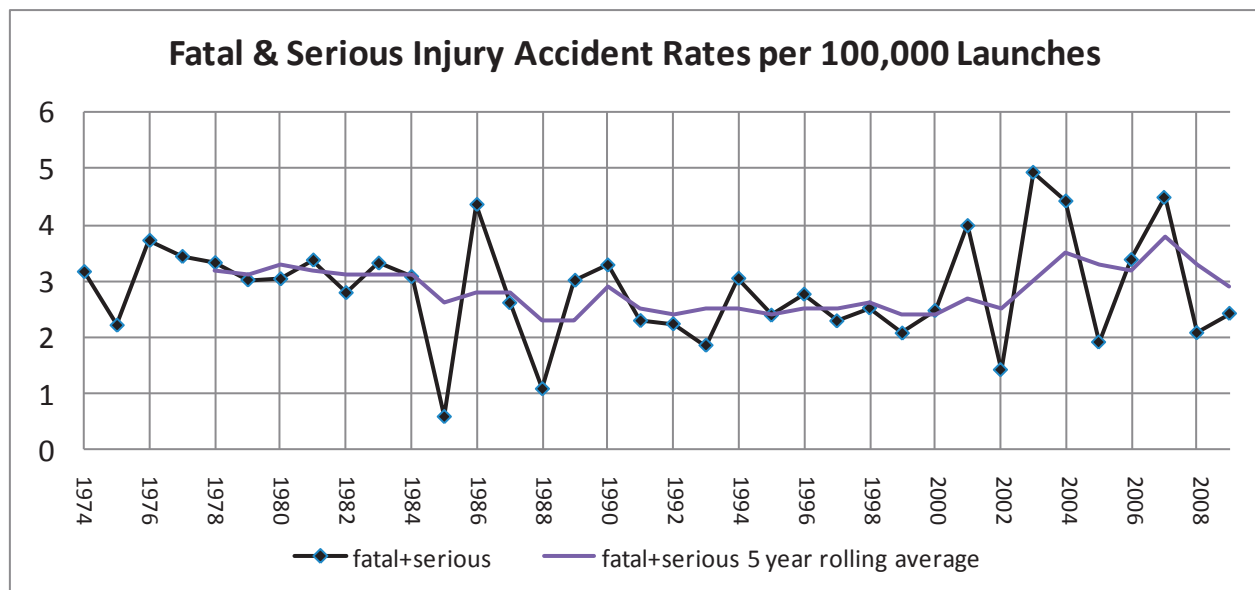


Chart 2

As detailed club returns were not available at the time of writing, throughout this document the number of launches in 2009 has been assumed to be the same as in 2008.



Substantial Damage Accidents

In 2009 a total of 58 aircraft were substantially damaged.

Chart 3 indicates the number of substantial damage accidents by year since 1987 and Chart 4 shows the corresponding substantial damage accident rates per 100,000

launches. The 2009 substantial damage accident rate of 23 per 100,000 launches is much higher than the 1987-2005 average of 15. This is the fourth year in succession where this trend has been apparent. On a 5 year rolling average basis the increase is from 15 for the period 1987-2005 to 19 in 2009.

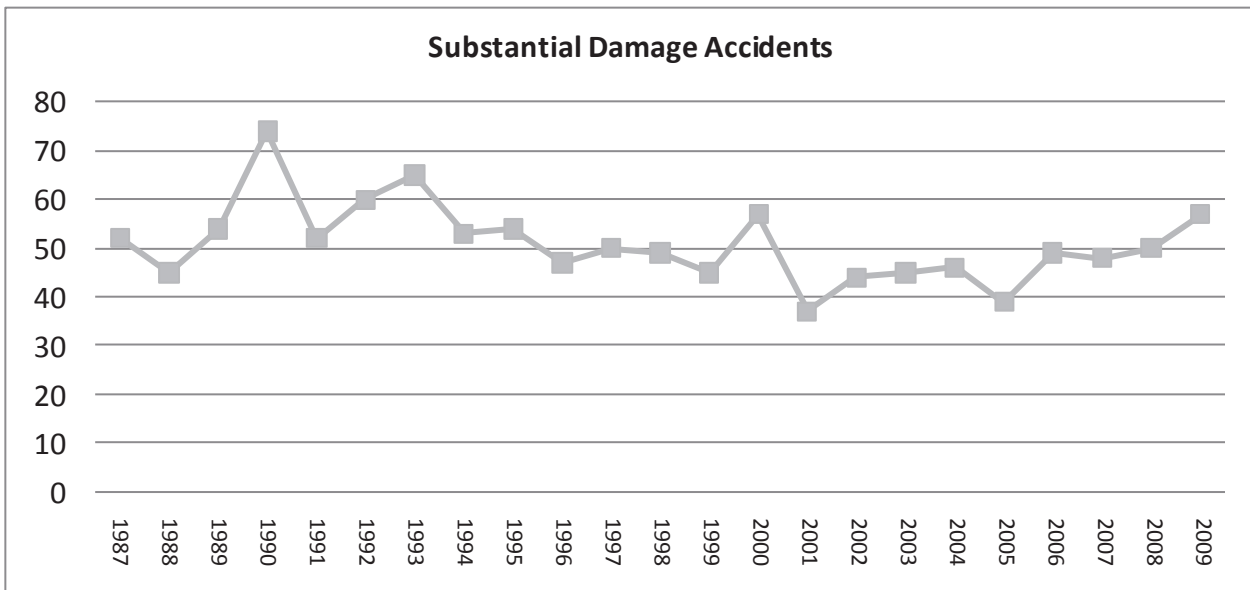


Chart 3

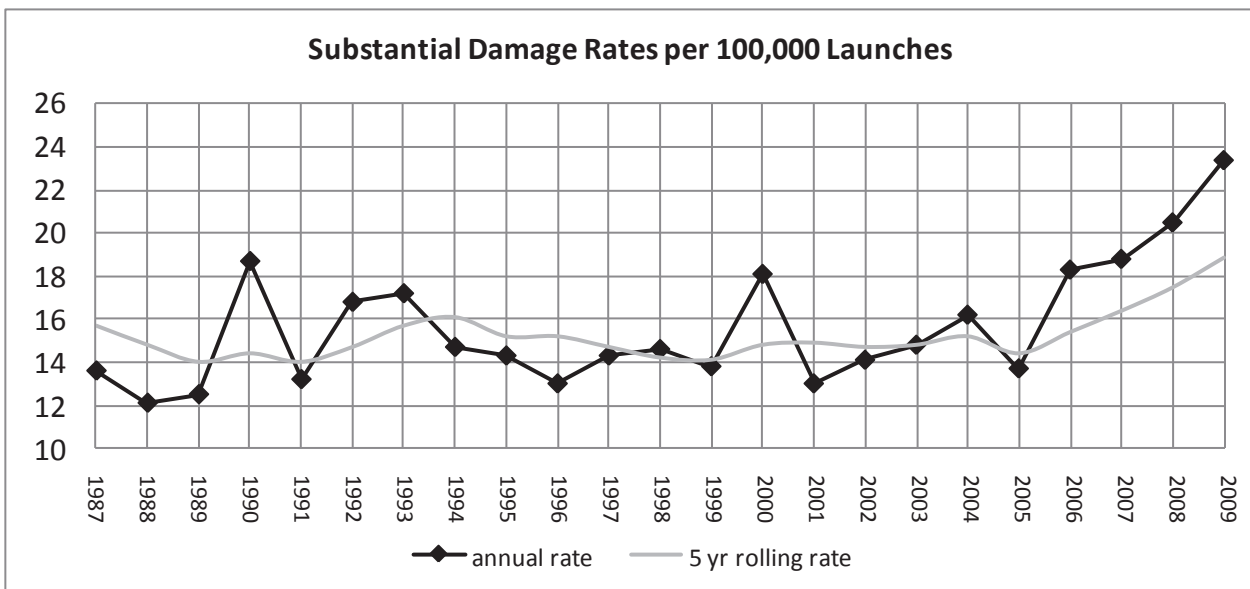


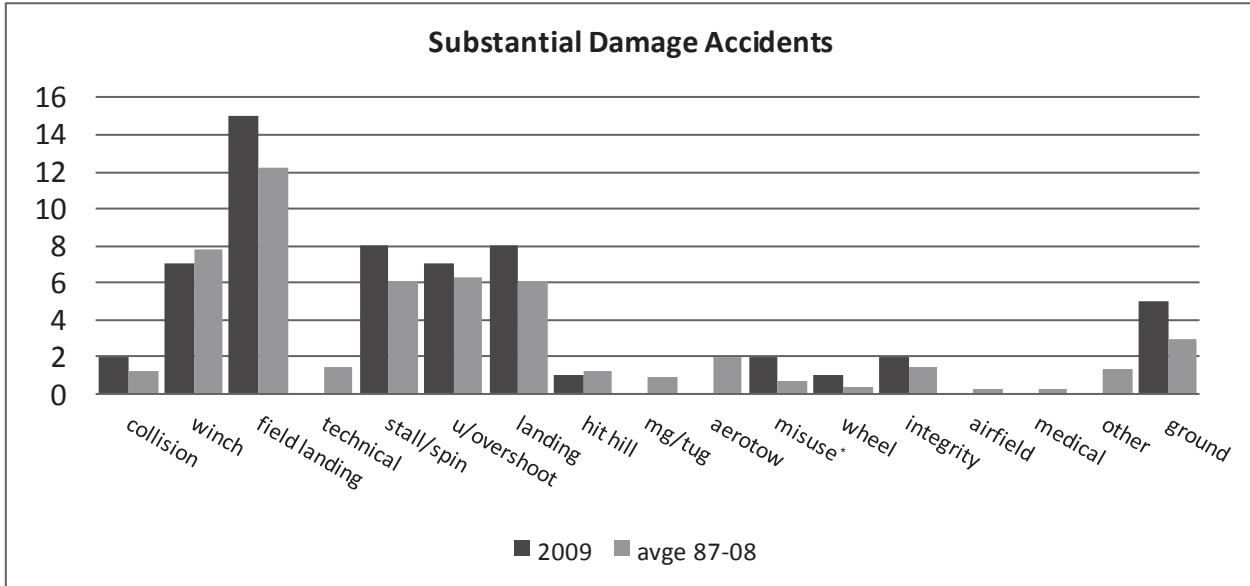
Chart 4

RAFSGA accidents are excluded from the above two charts because data prior to 1998 is unavailable.



Pattern of Substantial Damage Accidents in 2009

Chart 5 shows that the pattern of substantial damage accidents in 2009 by category was almost identical to the annual average from 1987-2008.



*'misuse' = control confusion

Chart 5

Trial Lesson Accidents

We cannot accept accidents during trial lessons. This has been stressed repeatedly. Yet in 2009 there were 8 trial lesson accidents with a total of 4 gliders substantially damaged. This is the highest trial lesson accident rate of the last 23 years. The trial lesson substantial damage rate is higher than for sporting gliding! This is utterly unacceptable.

We must have no accidents during trial lessons in 2010.

The four substantial damage accidents in 2009 related to lessons conducted by full or assistant category instructors. Supervision is necessary for all trial lesson flying, not just that undertaken by relatively newly qualified BIs.

The 4 substantial damage trial lesson accidents are summarised below. They are cross referenced to the lists in the category sections:

- stall on approach; wind over 40kt at 2000ft (stall/spin 2)
- low final turn, bounced landing, stick moved forward, nosewheel hit ground (landing 3)
- deteriorating weather, P1 giving P2 maximum hands on time, out of gliding range in circuit, turned, wing hit ground (undershoot 6)
- visiting instructor, little time on type, used flap as airbrake, flew length of airfield, wing hit ground turning back (misuse 1)

The BGA chairman has written to every club chairman asking them to formally take action with their CFI to ensure that the management of trial lesson operations and the day to day supervision of trial lesson flying makes these flights as safe as it is possible to make them.



Club Instructing

There were 11 club instructing accidents in 2009 of which 5 led to substantial damage. Including the 4 trial lesson substantial damage accidents there were 9 serious instructing accidents in 2009. Any one of these could have had horrendous insurance implications.

The 5 club instructing substantial damage accidents, with cross references to the category section, were:

- winch launch, cable break at 300ft, lowered nose, turned, stalled (winch 1)
- slow approach, P1 prompted, P2 pushed stick forward at 10ft, heavy landing (landing 4)
- nosewheel landing after 'difficult height' simulated cable break (winch 4)
- undershot into uncut grass, groundloop (undershoot 4)
- undershooting, late take over, heavy landing (landing 6)

Late take-over would seem to have contributed to several of these accidents. The accident record indicates that early take-over is vital in the following circumstances:

- to avoid a stall
- after power loss on a winch launch
- if the circuit is low
- if the approach is slow or undershooting
- if problems arise in the transition to the flare

If you are an instructor, what measures will you take in 2010 to reduce the possibility of having an instructing accident?

2009 ACCIDENTS BY CATEGORY

The 58 substantial damage accidents in 2009 are listed and numbered in this section. The fatal and serious injury accidents are highlighted.

These categories define accidents by the apparent immediate cause. Brief definitions of each category are provided.

Collision

(Hitting another aircraft in flight)

There were 2 collisions in 2009:

1. Between a glider and a light aircraft, in the bottleneck near Didcot, FATAL to the instructor and student in the light aircraft.
2. Between 2 gliders, in the same competition, while in the same thermal. Both gliders were damaged but made emergency landings.

Lookout and situational awareness are crucial at all times, especially when themalling.

Winch

(Any accident during or immediately following a winch launch which did not reach the normal height)

The BGA safe winch launch initiative began 4 years ago. In the first three years, from 2006-2008, there were 2 fatal or serious injury accidents whereas 7 would have been expected at the previous rate. There were 10 substantial damage accidents compared with an expectation of 21. Unfortunately, in 2009 the numbers of serious winch accidents have reverted to those before the initiative began, with 7 substantial damage accidents including 1 fatal accident and 1 serious injury accident. The fatal/serious and substantial damage totals by year are shown in Chart 6. The substantial damage accidents in 2009 are summarised below:

1. Cable break at 300ft, instructor lowered the nose, turned, stalled, SERIOUS INJURY.
2. Cable detached at 50-100ft, heavy landing.
3. Wing drop on ground, fuselage broken.
4. Simulated cable break, abbreviated circuit, fast approach, bounce, then nosewheel impact
5. Stall and flick roll during rotation, FATAL.
6. Pilot not current on winch launching, wing drop on ground, cracked fuselage.
7. Launching glider hit intruder's car which drove parallel to the launching glider and then in front of it.

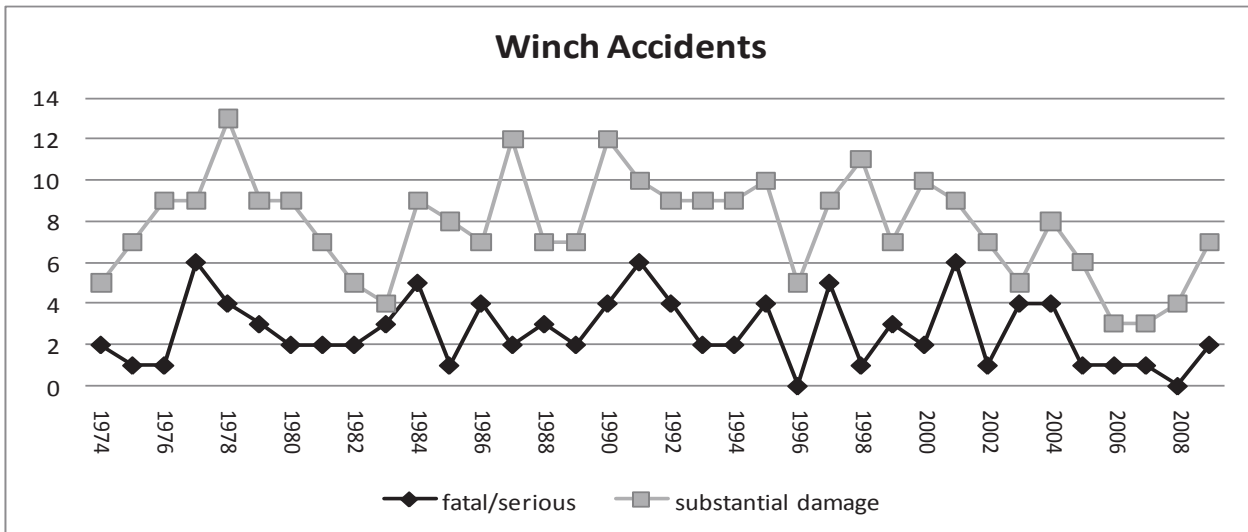


Chart 6

Page 3 of the downloadable safe winch launching booklet on the BGA website (<http://www.gliding.co.uk/bgainfo/safety/safewinchlaunching.htm>) lists six kinds of accident which characterise almost all of the 700 winch accidents since 1974. Substantial damage winch accidents in 2009 fall into these groups except for the case of hitting an intruder's car, a unique kind of winch accident.

In addition to the safe winch launching booklet that summarises the hazards of winch launching and how to avoid them, the BGA website contains a quiz to test your knowledge of safe winch launching, and video simulations of a wing drop and cartwheel, a flick roll during rotation and a spin after power loss in mid launch.

If winch launches are to be safe, the pilot must fly a safe profile, and be able to cope with an emergency. The essence of how to do this is found in the booklet.

Every pilot is requested to download a copy of the safe winch launch booklet and study it, try the quiz, and view the simulations. Practice winch failures with an instructor regularly to ensure you can do in practice what you know in theory.

If your club needs more hard copies of the booklet, ask the BGA for a new supply.

With your help we can bring the future winch launch accident rate down to at least the level of 2006-2008.

Stall / Spin

(Inadvertent stall or spin, excluding those associated with winch launches)

In 2009 there were 6 definite stall/spin substantial damage accidents unconnected with winch launches. One resulted in serious injury. Several others could easily have led to serious or fatal injury. Two additional accidents, both fatal, may have resulted from a spin:

1. Very experienced pilot, returning low, rejected downwind landing, stalled and spun in final turn at 100ft, hit tree which arrested arrival.
2. Trial lesson, 40kt wind at 2000ft, stall with wing drop on approach, nose and one wing impacted the ground.
3. 1st solo in TMG, 2nd circuit, yawed at 10ft on approach, landed leaving the runway, went around, turned, spun from 40ft, SERIOUS INJURY.
4. Glider found in field, presumed stall/spin, AAIB investigation, FATAL INJURY.
5. Glider found in field, local to launch site, presumed stall/spin, AAIB investigation, FATAL INJURY.
6. Silver distance flight, arrived with ample height, stalled on approach at 10ft while checking if wheel was down.
7. Strong wind, sink, turbo not fully retracted, did not turn in early, reduced speed to stretch the glide, stall with wing drop from 10-15ft.
8. Failed final glide, slow final turn into field, could not level wings, wing hit ground.

These stall/spin accidents illustrate the well known contributing factors of a wind gradient, a shallowing approach, rejection of unconventional circuit options only to find the conventional option is unavailable, distraction, and late field selection.

Whatever the circumstances, and however dire the emergency, the first priority is always to keep the glider under control. In the first instance that means an adequate airspeed.



Technical

(A component of the aircraft broke or did not work as intended)

There were no substantial damage accidents resulting from technical shortcomings. The only material lesser technical accidents were two cases of a wheel falling off a tug.

Field Landing

(Any field landing)

The field landing category continues to account for more substantially damaged gliders than any other category. Including the 3 stall/spin substantial damage accidents associated with field landings, there were 18 field landing substantial damage accidents in 2009. Five of these were in competitions which is a smaller number than in recent years. The 15 substantial damage accidents not involving a stall or spin were:

1. Out of range of airfield over unlandable terrain.
2. Hit unseen ridge in apparently good field.
3. Competition, final glide, late field selection, wingtip touched down leading to substantial damage.
4. Competition, late field selection, engine started but did not produce full power, heavy landing.
5. Competition, hit unseen ridge in field.
6. Attempting to soar low down, low final turn into field, undershot, went through barbed wire fence.
7. Aerotow, sink, airbrakes open but undetected, unable to reach airfield, groundloop in crop field.
8. Small field, overshooting, groundlooped, hit sapling.
9. Local soaring, lost sight of airfield, landed downwind in crop.
10. Ran out of height in circuit in moderate performance glider in wind gusting to 30kt, hit concealed earth bank in field.
11. Competition, landed in ploughed field after undershooting nearby airfield.
12. Unable to level wings in final turn, wind gusting to 30kt, wing hit ground in turn.
13. Downwind, down slope, touched down half way into field, high energy impact with far hedge.
14. Competition, downwind, downhill, turned, twisted undercarriage frame, undercarriage collapsed.
15. Motor glider, deteriorating weather, precautionary landing, groundloop.

Undershoot or Overshoot

(At home airfield)

In 2009 there were 7 substantial damage accidents:

1. TMG, undershot, hit fence post.
2. Visiting pilot, overshoot, impacted banked edge of perimeter track, groundloop.
3. Low, slow approach, descended into crop 20m short of landing area, hit lip of perimeter track.
4. P2 touched down 20m short of the landing area, groundloop.
5. Returning low, increased headwind, very low approach, just cleared threshold wall, landed heavily.
6. Trial lesson, deteriorating conditions, P2 flying the circuit went out of gliding range.
7. Hit wire and fence post 50m short of airfield.

If you cannot always judge a half to two thirds airbrake approach to a reference point, or if you sometimes make shallowing approaches, perhaps you could benefit from a session with an instructor.

Landing

(Uncontrolled arrival or a collision after touch down at the home airfield)

The 8 substantial damage accidents in 2009 were:

1. Turbulent, wing hit ground, bounce, slewed round.
2. Motor glider, 2nd approach, 1st solo, no round out, heavy landing, bounce, propeller tips broken, went around.
3. Trial lesson, low final turn, bounced, elevator moved down, heavy landing on nose wheel.
4. P2 flying, slow approach, instructor prompted, P2 pushed stick forward, nose hit ground.
5. Trial lesson, hit runway edge, but the substantial damage to the tailplane structure found at next DI may have been the cumulative damage from several heavy landings.
6. Gusty conditions, late take over, damaged tail-wheel housing.
7. Wingtip struck tractor during landing roll.
8. Returning low, downwind landing, PIO, nose down impact following bounce.

There are inevitable hazards associated with field landing. But these hazards can be minimised if pilots avoid flying over unlandable terrain unless able to glide clear, and select a field in time to fly a full circuit.

Instructors: can you do more at your club to ensure all pilots possess basic landing skills?



Aerotow

(Any accident during or immediately following an aerotow which did not reach the normal height)

Although there were no aerotow substantial damage accidents in 2009 there were at least 4 tug upset incidents, 2 of which could easily have been fatal:

- 1st flight on type, belly hook used in error, pilot distracted trying to close the clear vision panel at 2-300ft, glider got very high, tug airspeed reached 80-90kt, situation saved by the rope back releasing.
- glider with all moving tailplane and belly hook, PIO soon after take-off, severe nose down attitude of glider at 50ft, pilot pulled back, trim lever sprung to full nose up, glider reared upwards, weak link broke; tug pilot had experienced sudden deceleration, tug pitched 30-40° down with low airspeed, situation saved by the weak link breaking, tug pilot allowed the speed to build and was down to 100ft before climbing away.

In the typical tug upset accident the rope does not back release and the weak link does not break.

The main mode of vertical tug upset is the slingshot. The glider climbs rapidly from a position that is low in relation to the tug as illustrated by the second example. An alternative scenario is a windy day, the glider is left near the ground as the tug climbs through the wind gradient, the glider pilot pulls up too rapidly, enters the wind gradient which increases lift, and very quickly climbs much too far. This climb puts a large load on the rope which slows the tug down, it stalls, its nose drops, and the tug can hang vertically from the glider.

It is also dangerous to allow the glider to simply get too high as illustrated by the first example.

The recent safety flash sent to all clubs warns of the dangers of vertical tug upsets and points to the factors which can make them more likely (belly hook, light pilot, short rope, aft C of G, turbulence, inexperienced pilot).

Being left behind as the tug climbs does not normally matter. You are probably in an acceptable low tow position. As with all manoeuvring on aerotow, move back into the desired position slowly and deliberately.

If you lose sight of the tug release immediately.

Avoid fatal tug upset accidents!

Misuse of Controls

(Using one control to achieve the effect of another)

There were 2 substantial damage accidents from control confusion in 2009:

1. Trial lesson, instructor not experienced on type, P1 flew length of airfield, then a 360° turn, then another turn to land downwind, and in this turn the wing hit the ground. The flap lever was being used as airbrake.
2. Modified circuit leading to heavy sideways wheel up landing. The flap lever was being used as airbrake.

If you fly a glider with flap and/or airbrake levers adjacent to the undercarriage lever, be aware of the potential for confusion and note that some very experienced pilots continue to be caught out. Even the cable release has been used as the airbrake.

Glider Integrity

(Glider not rigged correctly, loose articles or loose ballast interfering with control, or canopy not secure)

1. Rear canopy of K21 came open and smashed on winch launch.
2. Large pieces of a Puchacz canopy departed on the approach.

Accidents caused by gliders that have not been properly prepared for flight are wholly avoidable. What do you need to do in your club to ensure that no future accident results from incomplete rigging, loose articles, or an unlocked canopy?

Hit Hill

(Flew into high ground)

There was one substantial damage accident in 2009:

1. The glider turned towards hill and arrived on the ground.

Are you fully aware of the hazards of mountain flying and the techniques to minimise these hazards? If you have any doubts, get a briefing from an expert and/or seek dual instruction.



Glider Accidents in 2009

Wheel Up Landing

(Wheel not lowered)

1. Runway obstructed, raised wheel, found lift, overflew obstruction but forgot wheel.

Ground

(Accidents unconnected with flight)

There were 5 substantially damaged gliders and one serious injury:

1. Towing out, wingtip hit parked car.
2. Towing out, wing hit trailer.
3. Towing out, wingtip hit parked car.
4. Towing out, wing hit stake, tailwheel jumped out of the towbar, elevator and fin hit towing car.
5. Pilot drove over his wingtip.
6. Tug propeller being turned, switches off but magnetos live, SERIOUS INJURY.

Airfield & Medical

There were no substantial damage accidents in 2009 from the categories 'Airfield' (potholes etc) or 'Medical' (incapacitation in the air).

Motor Glider / Tugs

(Accidents exclusive to powered aircraft)

Accidents relating to landing, stalling etc in motor gliders or tugs are included in the relevant categories above. There were 5 such accidents in 2009 to motor gliders (first solo go-around and stall/spin, heavy field landing after engine failed to produce full power, precautionary field landing in bad weather, undershot and hit post, first solo landing broke propeller). There was also a serious injury on the ground from turning a live tug propeller.

Competition Accidents

There were 6 competition substantial damage accidents in 2009. This was fewer than in 2006, 2007, 2008 (chart 7). One was a collision. The other 5 were field landings.

Accidents can and do happen to anybody, however experienced and current. The advice in the Field Landing section is especially important when flying in a competition. Do not let the desire to do well get in the way of common sense. If you are getting low, pick your field in good time.

Competition Substantial Damage Accidents

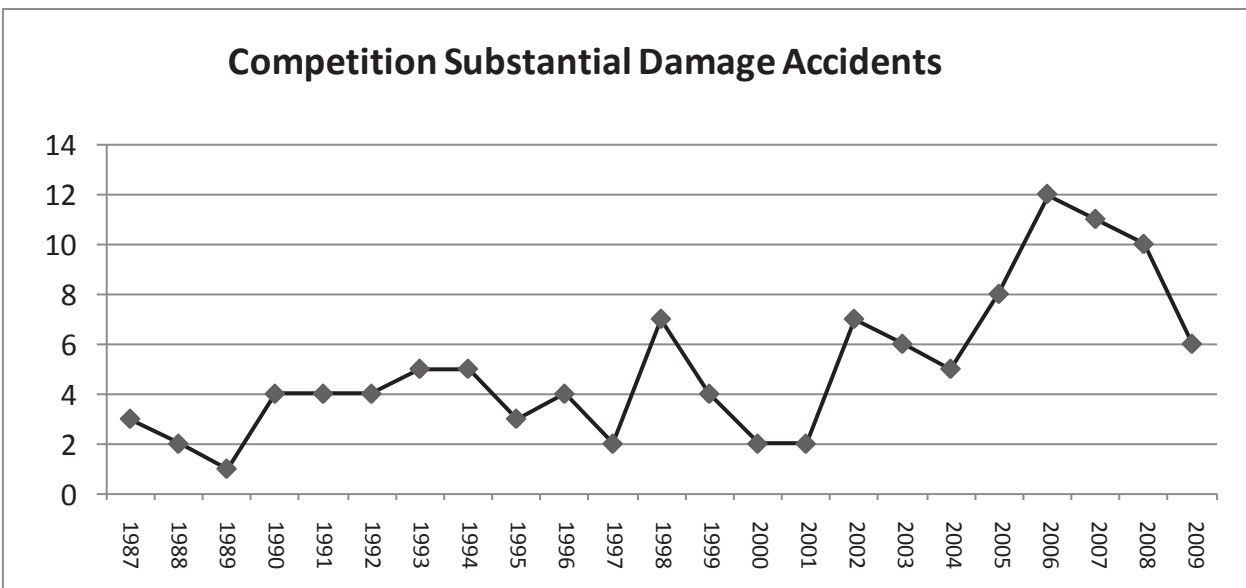


Chart 7

CONCLUSIONS

The first priority in 2010 is to avoid any trial lesson accidents and any serious instructing accidents.

It is in the interest of all of us to reduce the numbers of serious accidents. This calls for changes in behaviour by the BGA, by clubs, and by individual pilots. Can you contribute?



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