

Safety Briefing



Accident Review 2016

There has been an average of just over one fatality per year at BGA clubs in the nine years since 2008. This is a dramatic reduction from the nine-year average of more than 5 fatalities per year from 1974-2007. The reduction stems from fewer winch accidents, successful bailing out after collision, and fewer serious accidents in other categories. *Inadvertent spins, however, have continued.* This booklet offers guidance on how everyone can help to avoid a repetition of inadvertent spins and other accidents.



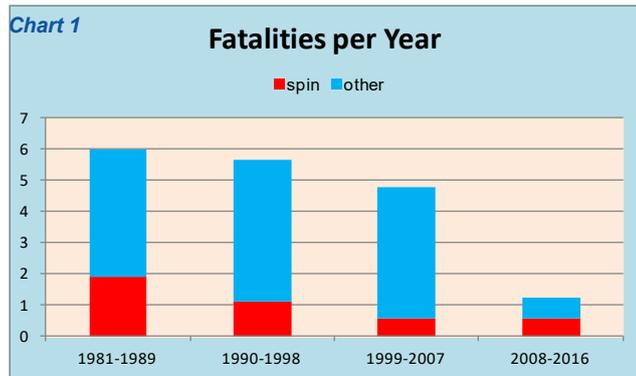
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Accident Review 2016

Fatal Accident Trends

The year 2008 was the first since at least 1974 with no BGA fatalities. In the 9 years since 2008 a total of 11 persons (9 glider pilots) have died in glider accidents - an average of just over one per year. The previous 9-year average was more than 5 fatalities per year. Chart 1 shows that while fatalities from winch launching, collision, and other categories have declined dramatically since 2008, spin fatalities have continued. Five of the 9 glider pilot fatalities since 2008 were from inadvertent spins.



This review covers the 12 months to 30 September 2016. There were two fatal accidents on 4 December 2016. One was a mid-air collision between a glider and a Cessna 150, fatal to the glider pilot. The other was from a failed winch launch. These accidents are being investigated by the AAIB and will be included in the 2017 report.

Accidents in 2016

Fatality

The single fatality in 2016 is under investigation by the AAIB.

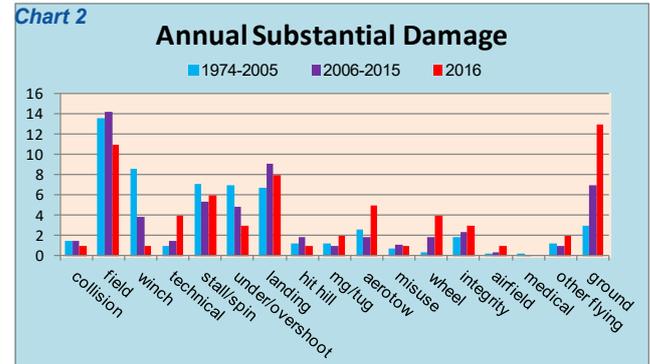
Serious Injury

Six people were seriously injured in 5 accidents:

- First take-off in Silent 2, climb gradually steepened until the aircraft stalled
- Distracted by possible lift, stalled on approach to field landing
- Glider flown over a flat area behind the ridge of a Spanish mountain, unable to glide back over the crest
- TMG, simulated approach into a field, engine did not respond, turn, wingtip caught ground.
- Glider being moved by hand, wing hit club member who fell, breaking leg.

Substantial Damage

Chart 2 compares substantial damage accidents in 2016 by category with the annual averages for the previous 10 years and the period 1974-2005. There were 6 stall/spin accidents in 2016 and just one winch accident. There were more non-flight accidents on the ground than from field landing.



Accidents by Category

1. Stall / Spin

Inadvertent spin can kill.

The stall/spin accidents in 2016 were:

- First take-off in Silent 2, climb gradually steepened until the aircraft stalled
- Distracted by possible lift, stalled on approach to field landing
- Pilot spun, recovered very low, and stalled at 20ft from a slow approach
- Flying close to the slope below the crest of a ridge, stalled and sank onto a plateau.
- 4 stalled landings at heights of 7 to 15ft.

The 6 substantial damage accidents is similar to the annual average in the past 10 years and from 1974-2005 (chart 2). Stall/spin accidents remorselessly continue in spite of repeated exhortation to Fly the Glider as the first priority regardless of the circumstances.

In the last 20 years, pilots with more than 20 hours as P1 accounted for 90% of stall/spin accidents with substantial damage. The accidents took place in circumstances of high workload and/or distraction. Nearly half of the accidents were while field landing, especially in strong winds. One-fifth followed an attempt to return to the home airfield.

These accidents are occurring to proficient pilots who had momentarily ceased to give priority to flying the glider. This may only have been for a few seconds, and this lapse may be the first in decades of accident-free flying. Survivors accounts speak of the spin being completely unexpected and surprise when pulling the stick back failed to raise the nose. These pilots knew how to fly. They were presumably in shock and reacted intuitively.

Please review and consider the following guidance in respect of your own flying and (if you are an instructor) how you teach pilots to keep safe.

- **Before the event**
Identify how stress could affect you. Perhaps speed control or general handling deteriorates, or your ability to analyse. Do you find decisions harder to take? Perhaps goal focus makes it harder to recognise the inevitable, in particular a field landing. Is your glider sensitive to mishandling? Explore the low speed end of the flight envelope at a safe height to avoid surprises.
- **Spot high stress situations before you are in them**
For example, fatigue, difficult soaring, marginal glidepath, field landing, engine deployment, wind and turbulence, poor visibility, airspace, air traffic control, hunger, dehydration, full bladder. Are you heading towards tougher conditions? Have you elected to continue the flight in spite of deteriorating conditions?
- **Take mitigating action**
Reduce distractions and prepare for the conditions - for example set the GPS to the nearest airfield, monitor your airspeed, attitude, and altitude more frequently. Consider a more spacious circuit, be prepared to choose between unpalatable alternatives. *Avoid a state of denial.* Think explicitly about AVIATE, navigate, communicate.

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2. Collision

There were no glider-glider or glider-aircraft mid-air collisions in 2016. This makes two successive collision-free years, after the four collisions in 2014 involving 10 pilots; 5 of these pilots bailed out - all successfully.

The advice to avoid a collision is unchanged:

- maintain **SITUATIONAL AWARENESS** and **INTENSIVE LOOKOUT**. **Flarm** is an **AID** to lookout.
- follow the guidance in the **BGA safe soaring protocol**.



<https://members.glidering.co.uk/?p=16726>

To bail out successfully:

- review the **BGA advice on getting out after a collision** at <https://members.glidering.co.uk/?p=16710>. Your life may depend on taking the correct actions immediately.

3. Glider Integrity

Shortcomings in preparing a glider for flight can be lethal and are completely avoidable.

Rigging faults were detected on four occasions in 2016:

- Unlocked Astir wing collars were found at DI, after 11 flights on 3 days
- A K21 hotelier airbrake disconnected in flight, after 92 flights since rigging
- A newly acquired Pirat was difficult to fly; at the next DI a pivot ball was found to be missing
- A DG505 had flown several times since rigging; at the next DI a drag pin was found to be incompletely inserted and insecure

The members conducting these DIs did well; previous DIs had not detected the shortcomings. In addition:

- 6 canopies opened in flight in 2016 and there were 7 instances of flight with airbrakes open, loose articles, and a tail dolly



A BGA booklet on safe preparation of a glider is available. It includes advice on making hotelier connections. Please read it.

<https://members.glidering.co.uk/?p=23161>

- **Rigging should be directed by a person experienced on the type, in accordance with the flight manual, without interruption or distraction.**
- **A newly rigged glider should always have a daily inspection (DI).**
- **The DI should be conducted by a person experienced on the type, without interruption or distraction.**
- **Positive control checks should be carried out every time a glider without automatic control connection is rigged.**
- **The pilot should carry out proper pre-flight checks, again without interruption or distraction.**

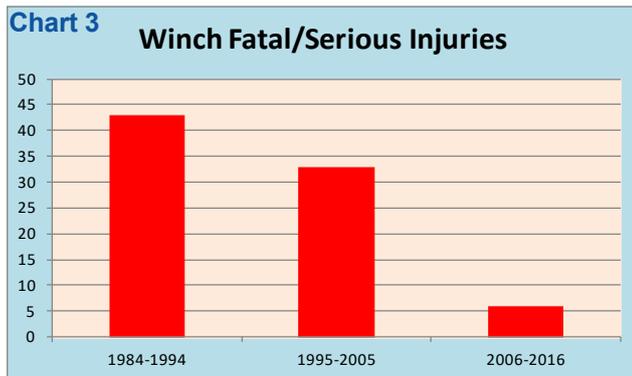
4. Winch

There were no fatal or serious injury winch accidents in 2016 and only one substantial damage accident.

There were three wing drop accidents and incidents:

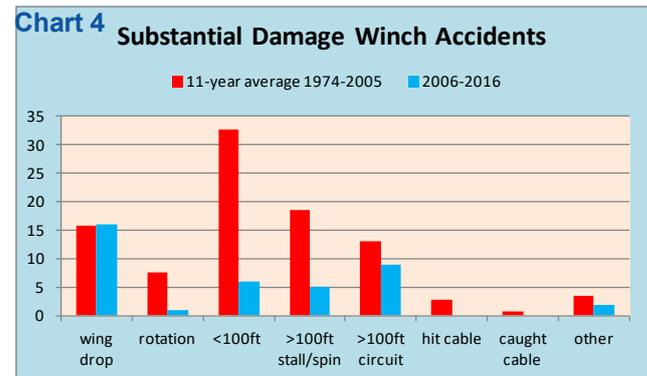
- wing drop, stop signal, pilot picked up wing, rotated too rapidly and too steeply, power cut at about 40ft, glider descended stalled through the wind gradient
- wing drop, late release, groundloop
- wing drop, continued with the launch; a video of this incident is available (<https://members.glidering.co.uk/?p=28059>) showing how little time there is to release before the wing touches the ground, and hence the importance of keeping the hand on the release and releasing IMMEDIATELY if there is difficulty in keeping the wings level.

Chart 3 shows that in the 11 years of the safe winch launch initiative there have been 6 fatal or serious injuries from winch accidents compared with totals of 33 and 43 in the two preceding 11-year periods.



Fewer fatal or serious injuries from winch launches has been driven by fewer injuries from an accelerated stall during rotation, from a stalled landing after launch failure below 100ft, and from a spin after launch failure in mid launch. There were 3 such stall/spin injuries in the most recent 11 years compared with a previous 11-year average of 31 such injuries.

Potentially fatal wing drop/cartwheel accidents continue. Three of the six fatal/serious injury accidents since 2006 followed a wing drop and cartwheel. Chart 4 shows that the substantial damage wing drop accident total in the last 11 years is exactly the same as the previous 11-year average.



5. Ground

In every wing drop accident the wing dropped immediately after the wing tip holder let go. That means there was an up or down force at the stationary tip that the wing tip holder was resisting. Guidance for the wingtip holder to stop the launch if there is an up or down force at the tip is included in the current edition of the safe winch launch booklet and leaflet but this has clearly not reached everyone.

The wing tip holder has a safety critical role in a winch launch and should be trained accordingly to STOP THE LAUNCH while the glider is still on the ground if there is an up or down force at the tip. Please ensure all your members are aware of this guidance.

Advice to the pilot needs continual reinforcement, not least to new members. Please ensure all club members are aware of the safe winch launch booklet (<https://members.glidering.co.uk/library/safety/safe-winch-launching-booklet/>) and have access to a hard copy, available from the BGA office. The essence of safe winch launching is unchanged:

- If you have difficulty in keeping the wings level before take-off, release before the wing touches the ground
- After take-off, maintain a shallow climb until adequate speed is seen with continued acceleration. Then allow the glider to rotate at a controlled pace. If power is lost near the ground, immediately lower the nose to the appropriate recovery attitude.
- After power loss in mid-launch, adopt the recovery attitude, wait until the glider regains a safe approach speed, and land ahead if it is safe to do so.
- If you are an instructor and P2 makes a mistake, take over immediately and demonstrate a safe recovery.

33 accidents/incidents in 2016 took place on the ground, unconnected with flight. These included one serious injury, 13 substantial damage, and 17 minor damage accidents:

Moving gliders by hand

- Wingtip struck a club member, knocked to the ground, breaking leg
- While being pushed back to the hangar, the tug's wingtip hit a glider rudder
- A K13 wingtip hit a K21 elevator as the glider was being pulled forward
- Glider incorrectly loaded onto hangar dolly

Injury/damage caused by vehicle

- Gator suddenly went backwards running over a person and damaging a glider
- Four instances of moving vehicles damaging parked gliders

Winch cable

- The instructor and a trial lesson visitor dived to avoid the wing of their landed glider when it was dragged 50 metres by a winch cable
- Cable break on ground, glider pushed forward, radio call then broken cable towed towards winch, parachute hit a club member and knocked him onto the glider's wing
- Tractor brought 4 cables to the launch point, one not released, tractor driven round back of manned glider, cable struck person and cable pulled over the stationary glider

Towed glider

- Retrieve vehicle drove off before the glider had been released, two people were knocked down by the moving glider which also damaged another glider
- Pilot hit by wing leading edge just above an eye. The glider had been hooked up to a retrieve buggy and the driver moved off before the pilot was ready

Safe Trial Lessons/Introductory Flights

- Nine instances of a towed glider hitting the towing car, a parked glider, a parked vehicle, a hedge, a pole, and a crop

Taxiing accidents

- Three collisions and two prop strikes

Other

- Canopy blown shut, canopy damaged by mower destroying charging cable, pilot's parachute caught on canopy catch, jockey wheel of trailer disengaged damaging glider in trailer, TMG engine fire

Accidents on the ground in 2016 resulted in one serious injury and had the potential for several additional serious injuries. There were more substantial damage accidents on the ground than in field landing!

Can you help to stop these unnecessary accidents?

6. All Other Categories

The appendix summarises each one of the 66 substantial damage accidents in 2016. The totals in each category are also shown in chart 2. Thirteen of these accidents were field landing (of which two were stall/spin). Of particular concern was the glider that hit the ground in the lee of a mountain, 8 landing accidents on the home airfield, a take-off performance accident on aerotow, an attempted landing holding the flap lever instead of the airbrake, and the TMG accident with serious injuries when the engine failed to respond while practicing a field landing.

There were too many incidents in 2016.

Please ensure everyone in your club follows the guidelines on the BGA website ([Laws and Rules/Managing Flying Risk/Flying With Passengers or Student Pilots](#))

Towards Fewer Accidents

The sources of serious accidents have not changed. Means of avoiding these accidents are summarised in the following table.

Accident	Principal Cause	Actions for Avoiding
Winch	Stall/spin, cartwheel	Follow leaflet guidance
Stall/spin	Overload, distraction	Fly the glider! Take action to mitigate potential overload
Collision	Poor lookout	Lookout, Flarm
Integrity	Rigging incomplete	No interruption/distracton
Tug Upset	Poor technique	Training
Landing	Poor technique	Training
Field Landing	Field picked late	Pick field early

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Appendix – Fatal, Serious Injury & Substantial Damage Accidents in 2016

Category	Accidents	Circumstances
Field Landing	11	Final glide aborted at 300ft, hurried field landing
		Cross-slope, groundloop
		Attempting to climb at low level, drifted downwind, undershot
		Groundloop
		Approach too fast, attempted to change direction on ground, groundloop
		Landed in crop thought to be grass, groundloop
		Landed downwind, downhill, overshot into far hedge
		Stressed pilot but skilful approach into 200m field in Italian alps, bounce and yaw
		At 100ft half way across the field, tried to reverse landing direction, cartwheel
		Farmer's strip, lifted wing over bale, groundloop
		Power wires seen late, overshot, ran over boulders and through wire fence
Winch	1	Wing drop, stop signal, pilot picked up wing, rotated too rapidly and too steeply, power cut at about 40ft, glider descended stalled through the wind gradient
Stall/spin (includes field stall/spin)	6	1st take-off on Silent 2. Climb gradually steepened until the aircraft stalled, SERIOUS INJURY
		Early solo pilot, low sun, round out too high, stalled from 10ft agl
		Flying close to the slope below the crest of a ridge, the glider stalled and sank onto a plateau.
		First flight on type, stalled at about 15' agl.
		Distracted by possible lift, stalled on approach, SERIOUS INJURY
		Very slow approach, stalled onto runway from 7ft agl

Category	Accidents	Circumstances
Undershoot/ Overshoot	3	Overshot and ran into a stream
		Strong sink, undershot into rape
		Strong sink, undershot into rape (10min later)
Landing	8	P2 ballooned, P1 allowed the student to continue although the airspeed had decayed
		As the glider ballooned the pilot closed the airbrakes & then lowered the nose before landing heavily, bouncing and groundlooping
		Wind gradient, heavy landing
		Groundloop
		P2 locked onto the controls during undershooting approach
		Cartwheeled in wind in excess of 30kt
		Cross wind landing demo, collided with trailer; pilot fatigued
		Aerotow rope release at 400ft, heavy landing in turbulence
Technical	4	Undercarriage collapsed on landing, part of the operating system had failed
		Undercarriage collapsed during landing, the wheel fork was found to be fractured and bent.
		Undercarriage would not retract due to broken strut
		Tailwheel sheared off during normal landing
Hit Hill	1	Glider flown over a flat area behind the ridge of a Spanish mountain, unable to glide back over the crest, SERIOUS INJURY

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Appendix – Fatal, Serious Injury & Substantial Damage Accidents in 2016 (cont)

Category	Accidents	Circumstances
Motor gliders/ tugs (accidents different from stall/ spin, landing, etc)	2	Tow rope and rings hit glider.
		Successful simulated approach in TMG into a field, the instructor opened the throttle to climb away but the Limbach engine did not respond, wingtip caught on the ground during turn, TWO SERIOUS INJURIES
Aerotow	5	Wing drop, groundloop
		Canopy detached, tug upset, weak link broke
		Unfamiliar tug, unusual take-off run, tug stopped accelerating in long grass, tug pilot released, glider went through post and wire fence
		Wing drop, groundloop
		1st on type, belly hook, wing drop, late release, hit hedge
Control Misuse	1	Touched down long, PIOs, went through a/f boundary onto road, flap lever employed as airbrake
Wheel	4	P1 was coaching on circuit planning in high performance gliders, neither pilot performed pre-landing checks
		About to round out, swapped hands on the controls, tried to lower the undercarriage, heavy landing, bounce.
		On short final pilot thought wheel was still up, swapped hands on the stick, lost control of the glider, heavy landing
		Wheel up landing on runway
Glider Integrity	3	Rear canopy opened during aerotow.
		The pilot struggled to maintain a safe vertical position on aerotow, the airbrakes came open, the pilot shut them, released the rope at 100' agl, turn, wingtip caught on the ground
		Canopy detached on winch launch and hit tail
Airfield	1	Landing, pothole in runway

Category	Accidents	Circumstances
Other Flying	3	Bungee launch in 40kt wind, wing drop, glider blew over
		Birdstrike in Spain
		AAIB investigation, FATAL
Ground	14	Glider being moved by hand, wing hit club member who fell and broke leg. SERIOUS INJURY
		Retrieve vehicle drove off before the glider had been released, two people were knocked down by the moving glider which also damaged another glider
		Parked glider damaged by tow vehicle.
		Vehicle reversed into the rudder of a parked glider.
		Engine fire in parked TMG, 3 hours after flight.
		Glider being towed by a motorhome which made a tight turn, the ladder fixed to the rear of the motorhome damaged the glider's elevator.
		Club member forgot that the Nimbus was still attached to a club tow vehicle as he got into the car to put it away, Nimbus hit parked Vega
		Wing of towed glider hit crop
		Towed glider hit a parked car, then the towing car
		Wing struck towing vehicle
		Club landrover was reversed into the parked tug
Tug pilot taxied into parked glider		
Gator suddenly went backwards running over a person and damaged a glider		
Exiting glider, parachute caught on canopy catch		



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