# Safety Briefing

## Accident Review 2018

This booklet offers guidance on how everyone can help to avoid accidents. The detail is relevant to all glider pilots, regardless of experience. Please read it carefully.

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## CONTINUING SAFETY GUIDANCE

**Safety Information**

Safety information on the BGA website includes Managing Flying Risk, a range of safety briefings, and the 2017 annual review which summarises guidance for:

- Avoiding a mid-air collision, and action if you collide
- Safe winch launching
- Avoiding an inadvertent spin
- Preparing the glider for flight
- Safe mountain flying

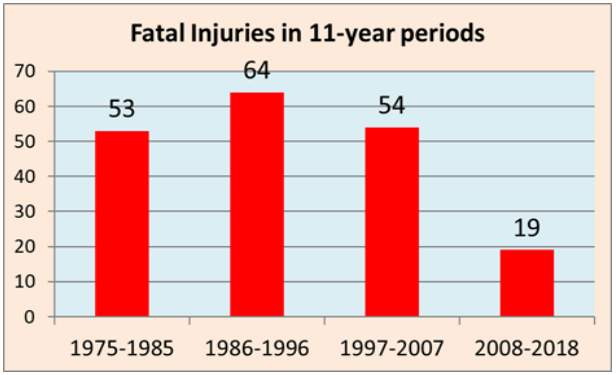
**BGA website safety Information links**

Click on the following BGA website links for safety information that is supplied for all pilots and instructors to use to learn about or refresh on important safety topics;

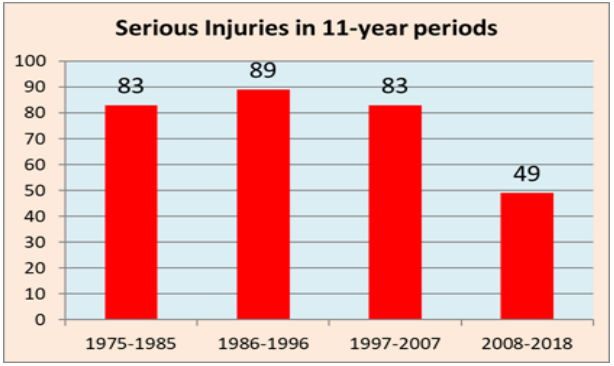
- Safety home page
- Managing Flying Risk
- Safety Briefings
- Collision Avoidance
- Safe Winch Launching
- Safe Aerotowing
- 2017 Safety Review

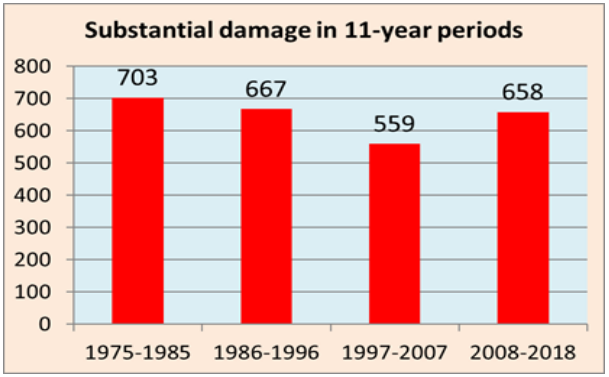
## AN 11 YEAR PERSPECTIVE

The year 2008 was the first year since at least 1974 without a gliding fatality. In the 11 years since 2008 BGA fatalities and serious injuries have declined but we have continued to substantially damage about 60 aircraft each year. These three charts quantify these observations.




Avoiding fatal and serious injury is of course much more important than avoiding broken gliders but the latter affects all of us through insurance premiums. It would seem many of the accidents in 2018 could have been avoided. Please read the summaries in the appendix.



## ACCIDENTS IN 2018

In 167 accidents and incidents there were two fatalities, two serious injuries, 13 minor injuries, 50 substantially damaged aircraft, and 60 instances of minor damage to aircraft.

The fatal rate in 2018 was similar to the new lower rate since 2008. The serious injury and substantial damage rates were lower than in the period 2008-2017.

| | Fatal | Serious injury | Substantial damage |
|---|---|---|---|
| 2018 | 2 | 2 | 50 |
| 2008-2017 annual average | 1.7 | 5 | 60 |

**FATAL ACCIDENTS**

There was one fatal accident in a TMG in which both pilots died. The AAIB report has not been published. The MOR states 'impacted tree while landing'.

**SERIOUS INJURY ACCIDENTS**

There were two, both on winch launches. One was on an instructing flight, the wing started to drop, a stop signal given, and the glider stalled at 30-50ft. In the other accident the wing dropped, the glider cartwheeled, and landed upside down.

**TRIAL LESSONS/INTRODUCTORY FLIGHTS**

In 2018 a glider hit a mountain in cloud after clear signals that the flight should be abbreviated. This could easily have been a double fatality. There were 11 other accidents and incidents, twice the annual rate in recent years. Two substantial damage in 2018 is exactly the same rate as in the previous 10 years. In other trial lesson reports:

- substantial damage from a heavy landing
- airbrakes opened on tow
- two ground-loops after landing
- overshot into the far hedge
- two wheel-up landings
- landed out
- visitor struck across the back, ground handling
- two members hit by a launching glider

It is crucial for many reasons that trial lessons are conducted safely. If you are an instructor, please re-read section 7 of Managing Flying Risk. This contains guidance on many aspects of keeping safe on flights with visitors.

The requirement that the safety of the passenger or student is paramount means the conditions may not be suitable for these flights even though club flying continues.

## ACCIDENTS IN 2018 BY CATEGORY

**Collision**
There was one mid-air collision. A tug descending from an aerotow collided approximately head-on with a glider in the circuit. AAIB bulletin 11/2018 refers. In another accident the rings on the rope trailed by a descending tug broke the canopy of a glider in flight.

The table indicates one glider pilot fatality in the last 11 years compared with 12 in the previous 11 years. The number of collisions halved from 22 to 11. In the last 11 years the majority of the collisions were at altitude and 7 pilots successfully bailed out. We cannot assume the fatality/collision proportion will stay at 10% after having been 50% for the previous 33 years.

Collision continues to be a threat to life. Please review the BGA documents collision avoidance, soaring protocol and what to do after a collision and BE PREPARED!! The G. Dale account of his bail out is very instructive.

Mid-air collisions 1975-2018

| Period | All glider | Fatalities | Bail Out |
|---|---|---|---|
| 1975-1985 | 17 | 7 | 4 |
| 1986-1996 | 15 | 8 | 2 |
| 1997-2007 | 22 | 12 | 7 |
| 2008-2018 | 11 | 1 | 7 |

**Winch**
The two serious injury accidents have been mentioned. In one of the two additional substantial damage accidents a PIO followed a low-level launch failure. In the other accident a safe recovery from a launch failure at 2-300ft was followed by a ground-loop when a wing caught in crop.

We are now in the 14th year of the BGA safe winch launch initiative. Some junior members would have been in prams when the initiative began. New adult members have joined. Some of the guidance may have been forgotten. Please do everything you can to ensure all members in your club are familiar with the guidance on the BGA website.

**Stall/spin**
There was one potentially fatal accident. After getting low the glider spun during the final turn when the pilot tried to land back on the ridge top airfield.

Four other gliders were substantially damaged after a low-level inadvertent stall.

The 2017 review contained guidance for experienced pilots to avoid an inadvertent spin in situations of high workload and stress by taking early action to reduce workload/stress and avoiding a state of denial ('I never land out!').

**Inadvertent spin mitigating action**

- Reduce distractions, set instruments
- Stow articles. Eat/drink something
- Fly faster? Manoeuvre more gently?
- SPIN risk. Monitor speed, balance and attitude
- Prepare mentally, expect hard decisions
- Avoid a state of denial
- Evaluate risks; beware field landings
- **Aviate, navigate, communicate**

**Aerotow**

Tug upsets can kill the tug pilot. There were four in 2018. After an upset at 250ft the tug pilot managed to release. The glider pilot was not current on aerotowing and this was his first flight on type, in a glider without a nose hook. There was another low level upset in which the glider pilot released. Two upsets were from not ensuring the rope had separated before the glider pilot turned.

**Glider integrity**

Two L'Hotelier connections came undone, and a glider was flown with unsecured drag pins.

Seven unlocked canopies opened in flight. One detaching canopy hit the tail. Unlocked canopies is a chronic problem. The BGA database has 213 reports of canopies opening in flight, of which 59 were in the 10 years from 2008-2017.

Other shortcomings in preparing a glider for flight included unlocked airbrakes opening during an aerotow, tail ballast moving during a winch launch and causing a control restriction, and a launch with a tail dolly attached.

**The following guidelines have been repeatedly published in recent years:**

- 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), which should be conducted by a person experienced on the type without interruption or distraction.

- A newly rigged glider should always have positive control checks. It is *essential* for positive control checks to be carried out every time for every rigging of a glider without automatic control connections
- The pilot should carry out proper pre-flight checks, again without interruption or distraction

**Please follow this advice!**

**Landing**
There were 5 substantial damage landing accidents in 2018, compared with an annual average of 8 for the previous 10 years.

**Field landing**
There were 22 field landing accidents of which 13 resulted in substantial damage.

Field landings rarely cause personal injury unless the pilot stalls in the final turn or on the approach. But the broken gliders affect insurance premiums.

**Pick a field early!**

**Other significant accidents and incidents**
Three pilots undershot in strong winds. One pilot overshot. One pilot overshot the airfield using the undercarriage lever as the airbrake. Another bounced while using the trim lever as airbrake.

**Accidents unconnected with flight**
In 2018 eleven gliders were damaged while being towed, 4 of them substantially. There has been a dramatic recent increase in this kind of accident with 41 substantial damage in the last 10 years compared with 5 in the previous 10 years. The total of ten substantial damage on the ground comprised 20% of all substantial damage in 2018.

**These accidents are expensive and avoidable!**

**Technical issues**
An aircraft component broke or did not work as intended. The 17 reports are summarised on page 9. These failures are of relevance to all pilots and instructors as well as to inspectors.

## APPENDIX – ALL ACCIDENTS AND INCIDENTS IN 2018

**Collision**
Two (page 5)

**Winch**
There were 6 accidents /incidents in addition to the two serious injury accidents (page 4)

- a near cartwheel following a wing drop.
- a glider was flown by a short pilot with inadequate seat restraint. The launch was snatched, and the glider went nearly vertical.
- the cable went on top of a wing after the glider had been allowed to stall during a simulated power loss.
- the weak link broke near the top of the launch. The weak link and 2m of hose embedded itself in the underside of the leading edge of the tail plane.
- in the other two reports a low-level power loss demonstration resulted in a ground-loop to avoid the boundary fence, and a glider slewed on take-off.

**Stall/spin** (not associated with winch launches)
The 5 accidents were:

- spin in final turn (page 5)
- P2 reached a nose-high attitude and stalled while landing
- TMG dropped suddenly at 50ft when full airbrake was opened
- loss of speed on the approach, broke undercarriage
- ballooned to 10ft, stalled, and landed nose first

**Field landing**
There were 22 accidents:

- 3 heavy landings
- 3 landings in crop
- 4 ground-loops
- 1 undershoot and 1 overshoot
- 1 collision with an obstacle
- 6 gliders were damaged by the surface of the field
- 3 from local soaring; one was on a trial lesson and two pilots were lost

**Technical**

An aircraft component broke or did not work as intended. There were 17 incidents:

- Airbrake control rod failure; one airbrake went to full extension and stayed there; the pilot extended the other airbrake to retain control and made a safe landing (SF27A)
- Wheel up landing due to brake hose fouling the mechanism (DG1000M); another due to u/c hinge bolts failing during landing (LS1C); another due to u/c jamming (Twin Astir); another due to u/c control rod failing in flight (Arcus)
- Airbrake push rod weld failed during positives check (K13)
- Severely worn canopy hinges (Twin Acro)
- Release cable broke as the pilot released (Junior)
- Crack in aluminium casting connecting the wing mounts (Astir CS)
- Seat went backwards during launch. A cable had failed at a crimped joint (PIK 20D).
- Rudder restriction during pre-flight checks; cable was off the pulley (Puchacz)
- P2's stick detached in flight; refitted (SF25C)
- Abnormal aileron behaviour in flight; awaiting investigation (Ventus 2CT)
- Spinner disintegrated (Supermunk)
- Winch cable would not release; it eventually came off (G103 Twin III)
- Un-commanded retraction of engine while running (Arcus M)
- Engine out landing after electrical failure (Discus BT)

**Undershoot/Overshoot**

Three gliders were substantially damaged from an undershoot:

- Ridge soaring in 30kt wind, went too far downwind
- The glider crossed the remote finish line very low and slow and there was not enough time for the jet engine to spool up
- Early solo pilot failed to realise a full airbrake approach was undershooting

There were two overshoots:

- Turned final almost over the runway threshold
- Overshot into the far hedge on a trial lesson

**Landing**

There were 15 landing accidents of which 3 were on trial lessons:

- 8 heavy landings
- 1 following a bounce and PIO
- 3 involving a ground-loop
- 3 TMG prop strikes

**Hit Hill**

There was one accident, on a trial lesson, at a hill site. Showers were approaching. The flight had only lasted 20 minutes and P1 wanted to give 'value for money'. Two club gliders were seen to be returning. A safe retreat was rejected because it would inconvenience the club with a field landing. The pilot tried to return to the site by flying through cloud and hit a mountain in zero visibility.

**Glider Integrity**

18 reports related to ensuring the glider was fit for flight.

4 of these reports concerned rigging:

- Airbrake did not deploy during pre-flight checks; the L'Hotellier connector was unconnected; the glider had flown on several days after being rigged some weeks previously.
- The L'Hotellier connection disconnected during positive checks and the airbrake remained open. The glider had last been rigged earlier in the month and been subject to four daily inspections prior to this DI.
- Perkoz flown with drag pins unsecured. The report points out that if the insertion tool is fully screwed into the drag pin it can prevent the latching tangs from engaging against the rear face of the drag pin, even after the insertion tool is released.
- During DI a control lock safety pin was found to be installed incorrectly

There was one instance of airbrakes opening on tow (during a trial lesson)

7 canopies opened in flight

The other 6 incidents were:

- launch with tail dolly attached
- control restriction due to tail ballast moving during winch launch
- tug taxied to launch point with rudder lock attached
- water bottle hit pilot during aerotow
- two instances of loose articles found during annual maintenance

## SHORTCOMINGS IN PREPARING A GLIDER FOR FLIGHT CAN BE LETHAL AND ARE COMPLETELY AVOIDABLE

**Aerotow**

There were 9 reports.

4 related to tug upsets

- At about 250' the glider climbed steeply, lifting the tail of the tug and both pilots released before landing on the airfield. The glider pilot had flown only two aerotows in the previous 18 months and that this was his first flight on type. The glider only had a C of G hook
- In another low level upset both pilots released
- There were two instances of the glider pilot turning without having confirmed the rope had separated

In the other 5 reports:

- a glider was damaged after a wing drop
- a tug suffered partial engine failure at 500ft; both aircraft landed safely
- the tug undercarriage caught an electric fence on a hot day from a short runway
- a rope broke at low level over poor fields; the instructor did well to land safely
- two persons standing in front of the glider were struck at the beginning of the launch

**Misuse of controls**

One pilot made repeated bounces in attempting to land using the trim lever as the airbrake. In the other accident the pilot overshot the airfield, turned, and ground-looped in crop, using the undercarriage lever as airbrake.

**TMG/tug**

TMG and tug accidents are only placed in this group if they do not fit into the other categories of stall/spin, landing, etc

There were 9 reports:

- TMG hit tree, double fatality
- the pilot had not flown the aircraft for several months, the engine started at high power, the wheel brake did not halt the aircraft and a fence was approaching so the pilot took off and flew a circuit
- Aerotow wave off at about 50' agl. The tug pilot reported that the aircraft was not gaining speed and the engine was 500rpm slower than expected. After waving off the glider the tug landed straight ahead on the runway. After doing some power checks the pilot resumed tugging. A more detailed inspection later found that the fuel filter was contaminated and blocked fuel flow. Subsequent test flights discovered a faulty throttle position sensor
- At about 250' the P1 of the glider being aerotowed noticed a significant amount of black smoke trailing from the tug and radioed the tug pilot. The glider released at 500' on a downwind leg and both aircraft landed safely on the airfield. The radiator cap of the Rotax had come loose allowing coolant fluid to overflow into the engine bay.
- two instances of a trailing rope damaging a parked glider
- TMG prop strike on go-around
- TMG prop strike on take-off
- TMG slewed on take-off, punctured tail wheel

**Wheel up landing**

There were 18 reports. In 12 instances the pilot forgot to lower the wheel. In the other 6 instances the undercarriage collapsed.

**Other flying accidents/incidents**

The 5 reports were:

- three gliders flew overhead the winch while a glider was being launched. The winch driver stopped the launch but the lowest glider continued to fly down the winch line, narrowly missing the descending cable.
- broken winch cable and parachute landed on a commercial building adjacent to the airfield
- a glider operating within a military ATZ, without radio contact
- a landing glider flew dangerously low and close to the launch point; a member had to dive to the ground to avoid being hit.
- all out given to tug combination while glider was landing alongside

**Ground**

29 accidents and incidents, nearly 20% of all reports, took place on the ground in circumstances unconnected with flight:

- 11 reports from a glider being towed by a vehicle
- visitor struck across the back during ground handling
- a buggy was driven into a rudder
- 2 unlocked canopies were damaged by wind; a canopy was dropped
- a member fell off the winch ladder
- a member fell backwards, getting into the glider
- P1 damaged wing while boarding glider
- an instructor returned from a break to find his glider with a student in it had already been connected to the winch
- cut finger from Gadringer harness buckle spring.
- van driver followed GPS route across the active runway, driving over winch cables.
- glider in hangar over beer barrel which exploded and punctured wing
- wooden stringer overstressed while de-rigging
- 2 gliders damaged hangar packing
- a glider was damaged by wind
- 2 gliders with covers were damaged by hail at Gap

## TOWARDS FEWER ACCIDENTS

The main sources of serious accidents have not changed. Means of avoiding these accidents are summarised below:

| Accident | Principal cause | Actions to avoid |
|---|---|---|
| Winch | Stall/spin, cartwheel | Follow guidance in Safe Winch Launching booklet |
| Stall/spin | Overload, distraction | Fly the glider!! Take action to mitigate potential overload |
| Collision | Poor lookout | Maintain good lookout, fit and use FLARM |
| Integrity | Rigging incomplete | If interruption / distraction, start again |
| Tug upset | Poor technique | Training |
| Landing | Poor technique | Training |
| Field | Field picked late | Pick a field early |



Allianz Global Corporate & Specialty SE
**www.agcs.allianz.com**


Phone: 01765 690777
**www.hillaviation.com**

British Gliding Association, 8 Merus Court, Meridian Business Park, Leicester. LE19 1RJ
Telephone: 0116 289 2956
office@gliding.co.uk
www.glidng.co.uk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