DELTA 4

Pilots Manual - EN

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THANK YOU

Thank you for choosing to fly Ozone. As a team of free flying enthusiasts, competitors and adventurers, Ozone's mission is to build agile paragliders of the highest quality with cutting edge designs, performance and maximum security.

Confidence and belief in your paraglider is a far greater asset than any small gains in performance - ask any of the Ozone pilots on your local hills, or those who have taken our gliders on ground-breaking adventures or stood on podiums around the world. All our research and development is concentrated on creating the best handling/performance characteristics possible with optimum security. Our development team is based in the south of France. This area, which includes the sites of Gourdon, Monaco and Col de Bleyne guarantees us more than 300 flyable days per year which is a great asset in the development of the Ozone range.

As pilots we fully understand just how big an investment a new paraglider is. We know that quality and value for money are essential considerations when choosing a new wing, so to keep costs low and quality high we manufacture all of our products in our own production facility. During production our wings undergo numerous rigorous quality control checks that are fully traceable, this way we can guarantee that all of our paragliders meet the same high standards.

It is essential that you read this manual before flying your wing for the first time. The manual will help you get the most out of your new wing, it details information about the design, tips and advice on how best to use it and how to care for your wing to ensure it has a long life and retains a high resale value. For the latest updates, including all technical datas please refer to the online version found on the product's page on at www.flyozone.com.

If you need any further information about any of our products please check flyozone.com or contact your local dealer, school or any of us here at Ozone.

Safe Flying!
Team Ozone

WARNING

- Paragliding is a potentially dangerous sport that can cause serious injury including bodily harm, paralysis and death. Flying an Ozone paraglider is undertaken with the full knowledge that paragliding involves such risks.
- As the owner of an Ozone paraglider you take exclusive responsibility for all risks associated with its use. Inappropriate use and or abuse of your equipment will increase these risks.
- Any liability claims resulting from use of this product towards the manufacturer, distributor or dealers are excluded.
- Be prepared to practice as much as you can - especially ground handling, as this is a critical aspect of paragliding. Poor control while on the ground is one of the most common causes of accidents.
- Be ready to continue your learning by attending advanced courses to follow the evolution of our sport, as techniques and materials keep improving.
- Use only certified paragliders, harnesses with protector and reserve parachutes that are free from modification, and use them only within their certified weight ranges. Please remember that flying a glider outside its certified configuration may jeopardise any insurance (e.g. liability, life etc) you have. It is your responsibility as the pilot to verify your insurance cover.
- Make sure you complete a thorough daily and pre-flight inspection of all of your equipment. Never attempt flying with unsuitable or damaged equipment.
- Always wear a helmet, gloves and boots.
- All pilots should have the appropriate level of license for their respective country and third party insurance.
- Make sure that you are physically and mentally healthy before flying.
- Choose the correct wing, harness and conditions for your level of experience.
- Pay special attention to the terrain you will be flying and the weather conditions before you launch. If you are unsure do not fly, and always add a large safety margin to all your decisions.
- NEVER fly your glider in rain, snow, strong wind, turbulent weather conditions or clouds.
- If you use good, safe judgment you will enjoy many years of paragliding.

Remember, PLEASURE is the reason for our sport

TEAM OZONE

Everyone at Ozone continues to be driven by our passion for flying, our love of adventure and our quest to see Ozone's paraglider development create better, safer and more versatile paragliders.

The design team consists of David Dagault, Luc Armant, Fred Pieri, Russell Ogden, Honorin Hamard and Sam Jobard. Dav started flying when he was 12 years old and has accumulated a wealth of experience in competition flying, XC and paraglider design. Luc, a dedicated XC and competition addict has a background in naval architecture. Fred, our resident geek is a mathematician, mechanical engineer and vol Biv specialist. Russ is a competition pilot and test pilot with 1000s of hours testing experience. World and European champion Honorin is a naturally talented pilot who has been flying since he was 13 years old. Sam designs and develops our range of harnesses, he has a great deal of experience both flying paragliders and designing harnesses. Between them, they bring a wealth of knowledge, ideas and experience and work closely together in the design, development and testing process.

Mike Cavanagh is the boss and multiple winner of the UK XC league, when not out flying he generally keeps control of the mayhem. He is helped by Jean Christophe Skiera (JC) who manages our distribution network and the product range. Promotion and marketing are co-ordinated by BASE jumping legend Matt Gerdes.

Back in the office Karine Marconi, Chloe Vila and Isabelle Martinez run the show. These wonderful ladies look after the ordering system, the dealers, the design team and the general day to day running of the company - without them it would be chaos.

Our own manufacturing facility in Vietnam is headed up by Dr Dave Pilkington who works relentlessly manufacturing gliders and producing prototypes as well as researching materials and manufacturing processes for our future products. He is backed up by a superb team managed by Khanh and Phong with over 1000 production staff.

YOUR DELTA 4

With class leading performance and easy, comfortable handling the Delta series has long been considered the reference in the EN C category. The Delta 4 continues the legacy, exhibiting the biggest gain in performance we have yet seen, whilst retaining the safety, comfort and ease of use the Delta is famed for.

The Delta 4 features a new line-layout with a classic 3-line design supporting the middle section but with two-lines in the wing tips, this not only significantly reduces drag but also improves the spanwise lift distribution, especially in accelerated flight. The new profile, developed from the M7 with smaller openings and Ozone G-strings also contributes to the performance increase. The Delta 4 is an efficient cross country weapon with class-leading performance without compromising safety.

The solidity in accelerated flight has been greatly improved thanks to the new profile and optimised internal structure. The Delta 4's structure is the strongest we have yet made, even in aggressive turbulence the profile remains undisturbed, retaining its shape and efficiency and does not suffer from the loss of performance associated with chordwise deformations.

The pilot is connected intuitively to the wing thanks to the Active Control Risers / Full-chord Risers / Attack Risers*, inherited directly from the Mantra M7. These innovative risers give the pilot full control over the angle of attack of the wing throughout the speed range without deforming the camber of the profile. They act on both the B and C lines and offer 2- line-esque levels of control with the comfort of a 3 line package. Intuitive and efficient AoA control, an improved airfoil design, and a highly balanced structure, makes the Delta 4 an impressive glide machine in turbulent air.

The Delta 4 is the best behaved Delta yet. The wing is inherently very resistant to collapse, even at full speed in strong turbulence and the post-collapse behaviour is the mildest of the series. Thanks to the Shark nose profile the wing is very resistant to both spin and stall and can be flown safely at very low speeds making top landings, or landings in tight spots relatively easy for such levels of performance.

A lot of work has gone into fine tuning the handling and improving the precision of the brakes to make the Delta 4 and absolute pleasure to fly. The brakes are linear - precise in the first part of their range and effective in the second - making it easy to adjust the angle of bank and place the wing exactly where you want it, in the middle of the core. The climbing efficiency is aided by the strong chord structure and excellent sail cohesion, even in turbulent thermals the wing retains excellent levels of roll and yaw response for an agile, pleasurable feel.

Certified EN C and available in 6 sizes. The Delta 4 is ideal for intermediate to advanced pilots who fly between 70-100 hrs per year and who have SIV experience. The ease of use makes it accessible for those moving up from a high end EN B whilst the performance and pure flying pleasure makes it suited to more experienced pilots who want to fly with higher margins of safety.

Rucksack

As standard, your wing is supplied with a specially designed bag that is light and comfortable. It features a padded hip belt, ergonomic adjustable shoulder straps and extra pockets to store keys, accessories and all those extra bits. Its large volume allows you to store all of your equipment whilst distributing the weight for comfortable hiking. We have a large range of bags and you can choose from any of them at the time of order.

Brake Lines

The brake line lengths have been set carefully during testing. We feel it is better to have slightly long brake lines and to fly with a wrap (one turn of the handle around the hand). However, if you do choose to adjust their length please keep in mind the following:

- Ensure both main brake lines are of equal length.
- If a brake handle has been removed, check that its line is routed through the pulley when it is replaced.
- When the brakes are fully released in flight, the brake lines should be slack. There must be a substantial bow in them to guarantee no deformation of the trailing edge when accelerated.
- There must be a minimum of 5-10cm of free play before the brakes begin to deform the trailing edge. This prevents the trailing edge from being deformed when using the speed system.

IMPORTANT
In the unlikely event of a brake line snapping in flight, or a handle becoming detached, the glider can be flown by gently pulling the rear risers (C-risers) for directional control.

Risers

The Delta 4 has been designed with 3 risers per side. The A risers are covered with coloured webbing for easy identification - the smaller riser, holding only the outermost A line, is for an easier application of big ears.

The risers feature attachments for a foot operated accelerator system, they do not feature trimmers or any other adjustable devices.

The Delta 4 features new Active Control Risers (ACR) for full control whilst accelerated. Acting on both the B and C risers, this new innovative system offers direct, efficient angle of attack control - without deforming the profile. The intuitive feel and feedback from the risers allows the pilot to increase the solidity of the wing whilst accelerated in turbulent air.

Total Weight in flight

Each Ozone glider has been designed and certified for a defined weight range. We strongly recommend that you respect these weight ranges. If you are between sizes the following information may help you make a decision as to which size to buy:

- For the most precise and dynamic handling or if you generally fly in mountains and/or in strong conditions, you should chose to fly in the top part of the weight range.
- If you want a better sink rate, or if you generally fly in flat lands and/or in weak conditions, you may choose to fly nearer the middle part of the weight range. Remember, you can always add ballast when conditions are stronger.
- It is not recommended to fly at the very bottom of the weight range.

Towing

The Delta 4 may be tow-launched. It is the pilot's responsibility to use suitable harness attachments and release mechanisms and to ensure that they are correctly trained on the equipment and system employed. All tow pilots should be qualified to tow, use a qualified tow operator with proper, certified equipment, and make sure all towing regulations are observed. When towing you must be certain that the paraglider is completely over your head before you start. In each case the maximum tow force needs to correspond to the body weight of the pilot.

Limitations

The Delta 4 has been designed as a solo sports performance XC wing and is not intended for beginner pilots, tandem flights or aerobatic manoeuvres. The Delta 4 shows no unusual flying characteristics, turns are smooth and co-ordinated and it remains solid and well pressured throughout the accelerated speed range. It has a very high resistance to both collapses and stalls. However, it is a high performance XC wing and is therefore only suitable for experienced pilots who fly approximately 70 - 100hrs per year and who have SIV experience.

The Delta 4 was certified without the use of collapse lines.

PREPARATION

Accelerator System

To set up the accelerator system, first route the lines supplied with the speed system through the harness. Make sure this is done correctly and that the lines pass through all of the pulleys (check your harness manual for instructions). Attach the speed system lines to the accelerator system on the risers with the Brummel hooks.

A basic set-up can be performed on the ground: ask a friend to pull the risers tight into their in-flight position whilst you sit in the harness on the ground. Now adjust the lengths of the lines so that the main bar sits just beneath your seat. You should be able to hook your heel in to the lower loop of the accelerator.

There must be enough slack in the speed system to ensure the A risers are not inadvertently pulled during normal trim speed flight, but not so long that it is impossible to use the full speed range of the glider. Fully extending the lower loop of the speed bar will accelerate the wing to approximately half its accelerated speed range. For full speed, hook your heels on to the upper bar and smoothly extend your legs, maximum speed is when the pulleys on the risers overlap. Once set up, test the full range of the accelerator in calm flying conditions and ensure that both risers are pulled evenly during operation. Fine-tuning can be completed when you are back on the ground.

IMPORTANT

Using the accelerator decreases the angle of attack and makes the wing more prone to collapse, therefore using the accelerator near the ground or in turbulent conditions should be avoided.

Harness

It is important to set up your harness correctly before flying the wing. Make sure to spend time adjusting your harness's different settings until you are completely comfortable. We recommend a chest strap setting between 44cm and 48cm (measured between the centre of the hang points).

The wing has been certified with a standard seated harness, XS/S sizes are certified with a chest strap set to 42cm, the MS/ML between 44-46cm, and the L/XL between 46-48cm. Do not fly with a chest strap setting too tight (below 42cm) or too wide (above 48cm) as this will affect the behaviour and feedback of the wing.

Using a pod harness in a laid back supine position does not invalidate the certification but it may have an influence on the behaviour of the wing. Pod harnesses increase the risk of twists occurring during a large asymmetric collapse.

Wing

To prepare the wing, lay it out on the top surface and perform a thorough daily check. You should inspect the top and bottom surfaces for any rips and tears or any other obvious signs of damage. Lay out the lines one side at a time, hold up the risers and starting with the brake lines, pull all lines clear. Repeat with the stabilo, D (uppers), C, B and A lines, laying the checked lines on top of the previous set, and making sure no lines are tangled, knotted or snagged. Mirror the process on the other side and then inspect the lines for any visual damage. Then inspect the risers for any signs of obvious damage. The general rule is if it looks OK then it is OK, however if you have any doubts please get advice from an experienced pilot or your local dealer or instructor.

To familiarise yourself with the glider it is a good idea to perform practice inflations and small flights on a training hill. This will enable you to set up your equipment correctly.

Take-off checklist:

1. Check reserve parachute - pin is in and handle secure
2. Helmet on and fastened
3. All harness buckles closed - check leg-loops again
4. Risers connected to the harness correctly with carabiners and maillons tight
5. Accelerator system connected
6. Holding the A risers and your brake handles correctly
7. Leading edge open
8. Aligned in the middle of the wing and directly into wind
9. Airspace and visibility clear

BASIC FLIGHT TECHNIQUES

Launching

Your Delta 4 will launch with either the forward or reverse technique. The wing should be laid out in a pronounced arc, with the centre of the wing higher than the tips.

Forward Launch - Nil to Light winds

When the wind is favourable, whilst gently holding the A risers move forward positively, your lines should become tight within one or two steps and the Delta 4 will immediately start to inflate. You should maintain a constant pressure on the risers until the wing is overhead. Do not pull down or push the risers forward excessively, or the leading edge will deform and possibly collapse making taking-off more difficult and potentially dangerous.

Move smoothly throughout the entire launch, there is no need to rush or snatch at it. You should have plenty of time to look up and check your canopy before committing yourself. Once you are happy that the Delta 4 is inflated correctly, accelerate smoothly off the launch.

Reverse Launch - Light to Strong Winds

Lay out your wing as you would for the forward launch. However, this time turn to face it, passing one entire set of risers over your head as you turn. Now you can inflate the glider with your body weight and the A-risers. Once the wing is overhead, release the risers, brake gently if necessary, turn and launch.

In stronger winds, be prepared to take a few steps towards the glider as it inflates. This will take some of the energy out of the glider and it will be less likely to overfly you. This reverse-launch technique can be used in surprisingly light winds too.

IMPORTANT

Never take off with a glider that is not fully inflated or if you are not in control of the pitch/roll of your wing.

Speed to Fly

Flying at trim speed (hands-up), the Delta 4 will achieve its 'best glide' speed for still air. You should fly at this speed when gliding downwind or when the air is not excessively sinking. For better penetration in headwinds and improved glide performance in sinking air, crosswinds or headwinds, you should fly faster than trim speed using the accelerator system. Using up to half bar does not degrade the glide angle or stability significantly and will improve your flying performance. You will reach the next thermal faster and higher. At full speed the Delta 4 is stable, however we recommend that you do not fly at full speed close to the ground or in turbulent air.

By applying approximately 20cm of brakes the Delta 4 will achieve its Minimum-Sink rate; this is the speed for best climb and is the speed to use for thermalling and ridge soaring.

Turning

To familiarize yourself with the Delta 4 your first turns should be gradual and progressive. To make efficient and coordinated turns, first check the airspace is clear and then lean in the direction you want to go. The first input for directional change should be weight-shift, followed by a smooth application of the brake until the desired bank angle is achieved. To regulate the speed and radius of the turn, coordinate your weight shift and use the outer brake.

IMPORTANT
Never initiate a turn at minimum speed (i.e. with full brakes on) as you could risk entering a spin.

Active Flying

To minimize the likelihood of suffering collapses in turbulent conditions, it is essential to use active flying. These are skills that are best learnt by playing with the glider on the ground. Flying with a small amount of brake applied (approx. 20cm) will allow you to feel the feedback from the wing. In turbulent conditions the internal pressure of the wing is constantly changing and by using a small amount of brake will you feel these changes. The aim of active flying is to maintain a constant pressure through the brakes, If you feel a reduction or loss of pressure quickly apply the brakes until you feel normal pressure again. Once you have normal pressure, raise the hands back to the original position. Avoid flying with continuous amounts of deep brake in rough air as you could inadvertently stall the wing - always consider your airspeed. The brake inputs can be symmetric or asymmetric; you may have to apply both brakes or just one. These subtle adjustments will keep the glider flying smoothly and directly above you and dramatically reduce the likelihood of a collapse. If the glider pitches in front of you, use the brakes to slow it down. Equally, if the glider drops behind you, release the brakes to allow it to speed up, but be ready to anticipate the following pitch forward. The goal is to maintain the wing directly overhead with a constant level of internal pressure.

IMPORTANT
Always keep hold of your brakes. Do not fly in turbulent conditions

No pilot and no glider are immune to collapses however correct active flying will reduce the chances significantly. When the conditions are turbulent, be more active and anticipate the movements of your wing, always be aware of your altitude and do not over-react.

We strongly advise you to keep hold of your brakes at all times and to not fly in turbulent conditions.

Active Control Risers

The Delta 4 features Active Control Risers, a new innovative control system that acts on both the B and C risers for an improved feel and intuitive angle of attack control over the wing. This enables you to fly actively without using the brakes. Using brakes whilst accelerated causes drag, not only is this inefficient but it also reduces the inherent stability of the profile whilst using the ACR risers increases the angle of attack more evenly across the chord and does not weaken the profile. The direct feel allows you to stop collapses before they happen and maintain higher speeds and higher levels of efficiency through turbulence.

To fly with the risers, keep hold of your brake handles (remove any wraps) and take hold of the ACR handles. If you see or feel the leading edge lose pressure, at the same time as releasing some or all of the accelerator you can also apply pressure to help keep the nose open. The amount of pressure and size of the input is dependent on the amount of turbulence/loss of pressure, but always be gentle at first or you risk stalling part or all of the wing if you are over enthusiastic. Learn the feel of the wing - how much speed bar to release and the force required on the risers to keep the nose open without inducing unnecessarily large pitch movements.

ACR control is very effective throughout the speed range, in strong turbulence we recommend to control the pitch of the wing actively using a combination of the speed bar and ACR input. If you feel the nose of the wing start to collapse or pitch forward whilst accelerated the first action should be to release the speed bar impulsively and then make any necessary riser input. Using the combined active speed bar/ ACR control technique you will be able to maximise your speed and efficiency whilst minimising the likelihood of collapses.

This control method is suitable for gliding in good ‘normal’ air, it does not replace proper active flying with the brakes in strong turbulent conditions. If you are unsure about the air return the glider to trim speed, release the risers and fly the glider actively with the brakes.

Landing

The Delta 4 shows no unusual landing characteristics but as a reminder, here are some tips:

- Always set up for your landing early, give yourself plenty of options and a safe margin for error.
- Once below 30 metres avoid turning tightly as the glider will have to dive to accelerate back to normal flight. If you are at low altitude, or if you hit sink, this could mean you hit the ground harder than necessary.
- Lean forward out of your harness before the actual landing (especially if it's turbulent), with your weight leaning forward against the chest strap, and make sure your legs are ready for the landing and a possible PLF (parachute landing fall).
- Allow the glider to fly at hands up (trim) speed for your final descent until you are around 1 metre above the ground (in windy or turbulent conditions you must fly the glider actively all the way). Apply the brakes slowly and progressively to slow the glider down until groundspeed has been reduced to a minimum and you are able to step onto the ground.
- In light winds/zero wind you need a strong, long and progressive flare to bleed off all your excess ground speed. In strong winds your forward speed is already low so you are flaring only to soften the landing. A strong flare may result in the glider climbing upwards and backwards quickly, leaving you in a vulnerable position.
- If the glider does begin to climb, ease off the brakes (10-20cm) - do not put your hands up all the way - then flare again, but more gently this time. Keep the brakes at mid speed, stand up, be ready to run and make sure you brake fully as you arrive on the ground.
- Choose the appropriate approach style in function of the landing area and the conditions.
- In strong winds you need to turn towards the glider the second your feet touch the ground. Once facing the wing pull smoothly and symmetrically down on the brakes to stall the wing. If the glider pulls you, run toward it.
- If the wind is very strong, and you feel you might be dragged, or lifted again, stall the glider with the C risers. This stalls the wing in a very quick and controllable way and will drag you less than if you use the brakes.
- Always land heading into wind!

ADVANCED FLIGHT TECHNIQUES

Ozone would like to remind you that the following manoeuvres should be learnt under the supervision of a qualified instructor and always used with caution. Never forget that properly analysing the conditions before launch will help avoid the need to use these techniques.

Big Ears

Folding in the wingtips increases the sink rate without radically changing the airspeed. This is useful for staying out of cloud or descending quickly through the lift band of the hill, for example when top landing.

To pull big ears, keep hold of your brake handles and take the outermost A-line on each side, then pull out and down (preferably one at a time) until the wingtips fold under. The Outer A line is attached to the Baby A riser, making identification and use of the big ear system easier. The size of the big ears can be adjusted by pulling more line, or reaching higher up the line. For directional control while using the Big Ears, you should use weight shift. To reopen the ears, release both A lines at the same time. To help reinflation, brake gently one side at a time until tips regain pressure. Avoid deep symmetric applications of the brake as this could accidently induce parachutal or full stalls.

DO NOT perform spiral dives with the big ears engaged.

You may use Big ears for the final landing approach but they should be released before making the final flare. Ozone advise to not use this technique in turbulent or windy conditions due to the reduced ability to fly actively and the risk of an inadvertent stall whilst descending through the wind gradient.

Once the big ears are engaged you can further increase the sink rate by pushing on the accelerator bar, however NEVER try to pull the Big Ears in if the accelerator is already pushed. The lower angle of attack and the act of deflating the tips can lead to a major deflation. Always make the Big Ears first and then apply the speed bar.

Ozone strongly recommend to NOT perform Spiral Dives with Big Ears engaged.

B-Line Stall

B-stall is for fast descents in emergency situations only. It is faster and safer to lose altitude with a spiral dive than a B-stall.

To initiate the B-stall, keep the brakes in your hand and take hold of both the B risers, or place your fingers between the lines above the maillons. Pull down smoothly and symmetrically to enter the B-stall. To exit release the B-risers symmetrically in one smooth, progressive motion. The glider will resume normal forward flight without further input. Check you have forward flight again before using the brakes.

If you pull too much B-line the glider may horseshoe and move around a lot. If this occurs, slowly release the B lines until the wing stabilises or simply exit the B line stall by immediately release the B risers. Do not attempt to maintain a B line stall that is not stable.

Spiral Dives

The spiral dice is the most effective form of rapid descent. If you turn your glider in a series of tightening 360's it will enter a spiral dive. This will result in rapid height loss. To initiate a spiral, look and lean in to the direction you want to go, then smoothly and progressively pull down on the inside brake. The Delta 4 will first turn almost 360 degrees before it drops into the spiral. Once in the spiral you should re-centre your weight shift and apply a little outside brake to keep the outer wing tip pressured and inflated.

Safe descent rates of more than 8m/s (1600 ft/min approx.) are possible in a spiral dive, but at these rates the associated high speeds and g-forces can be disorientating. Always pay particular attention to your altitude. To exit the spiral dive, smoothly weight shift in the opposite direction of the spiral and smoothly release the inside brake whilst applying the outside brake. As the Delta 4 decelerates allow it to continue to turn until enough energy is lost for it to return to level flight without an excessive climb and surge.

It is possible for the Delta 4 to remain neutral in a spiral dive under certain circumstances: unsuitable chest strap setting (too tight), total weight in flight outside of the certified weight range, or being in a very deep spiral at a very high sink rate >14m/s.

You should always be prepared to pilot the wing out of a spiral dive. To do so, use opposite weight shift and smoothly apply enough outside brake until you feel the wing start to decelerate, the glider will then start to resume normal flight. Recovering from a spiral with hard or quick opposite inputs will result in an aggressive climb and surge and is not recommended. Always be prepared to manage the energy, bleed off the speed if necessary. Never perform spiral dives close to the ground.

IMPORTANT
Always be prepared to pilot the wing out of a spiral dive. Use opposite weight shift and apply enough outside brake to stop the wing from spiralling.

INCIDENTS IN FLIGHT

Deflations

Due to the flexible form of a paraglider, turbulence may cause a portion of the wing suddenly to collapse. This can be anything from a small 30% (asymmetric) collapse to a complete (symmetric) collapse.

If you have a collapse, the first thing to do is to control your direction. You should fly away from the ground or obstacles and other pilots. Asymmetric collapses should be controlled by weight shifting away from the collapse and applying enough brake to control your direction. This action alone will be enough for a full recovery of the wing most of the time.

Once a glider is deflated it is effectively a smaller wing, so the wing loading and stall speed are higher. This means the glider will spin or stall with less brake input than normal. In your efforts to stop the glider turning towards the collapsed side of the wing you must be very careful not to stall the side of the wing that is still flying. If you are unable to stop the glider turning without exceeding the stall point then allow the glider to turn whilst you reinflate the collapse.

If you have a deflation which does not spontaneously reinflate, make a long smooth progressive pump on the deflated side. This pumping action should take about 1-2 seconds per pump. Pumping too short and fast will not reinflate the wing and pumping too slow might take the glider close to, or beyond, the stall point.

Symmetrical collapses reinflate without pilot input, however 15 to 20cm of brake applied symmetrically will speed the process. After a symmetric collapse always consider your airspeed. Make sure the glider is not in parachutal stall before making any further inputs.

If your Delta 4 collapses in accelerated flight, immediately release the accelerator and manage the collapse using the methods described above.

IMPORTANT

Never apply the brakes whilst using the speed system - it makes the wing more prone to collapse.

Cravats

If the tip of your wing gets stuck in the lines, this is called a 'cravat'. This can make your glider go into a spiral, which is difficult to control. The first solution to get out of this situation is to stabilise the glider into normal flight, i.e get control of your direction and then use strong deep pumps of the brake on the cravated side. When doing so it is important to lean away from the cravat otherwise you risk spinning or deepening the spiral. The aim is to empty the air out of the wing tip, but without spinning. Correctly done, this action will clear the cravat quickly and is the most efficient and effective method. You can also try pulling on the stabilo line to free small stubborn wing tip cravats. Whichever method you use, be careful with any brake inputs as you may stall the opposite wing.

If it is a very large cravat and the above options have not worked then a full stall is the next option. Only attempt this if you have enough altitude and you know what you are doing. Remember if the rotation is accelerating and you are unable to control it, throw your reserve parachute immediately whilst you still have enough altitude.

Deep Stall / Parachutal Stall

It is possible for gliders to enter a state of parachutal stall. This can be caused by several situations including; a very slow release from a B-line stall; flying the glider when wet; or after a front/symmetric deflation. The glider often looks as though it has recovered properly but carries on descending vertically without full forward motion. This situation is called 'deep stall' or 'parachutal stall'.

It is unlikely to happen on any Ozone glider, but should it do so your first reaction should be to fully raise both hands. This normally allows the glider to return to normal flight but If nothing happens after a few seconds, reach up and push the A-risers forwards or apply the speed bar to encourage the wing to regain normal flight. Ensure the glider has returned to normal flight (check your airspeed) before you use the brakes again.

Do not fly in rain, doing so significantly increases the likelihood of parachutal stalls occurring. To reduce the chance of stalling in rain avoid using deep brake movements or Big Ears. Find a safe area to land and using the speed bar, maintain a good airspeed at all times.

IMPORTANT

A bad preparation on launch, aerobatic flying, flying a wing of too high a level or in conditions too strong for your ability, are the main causes of cravats.

WARNING

Uncoordinated wingovers can lead to large asymmetric collapses and cravats, therefore they should never be executed near the ground.

IMPORTANT

Only a few cms of input from your brakes can maintain your wing in the stall. Always release your wraps if you have taken them!

Flying in the Rain

Modern wings are susceptible to rain and moisture, flying with a wet wing can result in the loss of normal flight.

Due to the efficient, wrinkle-free design of the sail, water tends to bead on the leading edge causing flow separation. Flow separation will make the wing more prone to entering inadvertent parachutal stalls, so flying in the rain, or with a wet wing (e.g early morning dew) should be avoided at all costs.

IMPORTANT
Never fly in the rain or with a wet glider.

If you are accidently caught-out in a rain shower, it is best to land immediately. If your wing becomes wet in the air it is advised to maintain accelerated flight using the speed bar and/or releasing the trimmers, even during the final approach. DO NOT use big ears as a descent technique, big ears increases drag, and with a wet wing this will further increase the chances of a parachutal stall occurring. Instead, lose height with gentle 360's and maintain your air speed at all times. If your wing enters parachutal stall when wet, immediately release the trimmers and accelerate the wing to regain airspeed.

CARE AND MAINTENANCE

Packing

To prolong the life of your wing and to keep the plastic reinforcements in the best possible condition it is very important to pack the wing carefully. We recommend to use the concertina packing method exactly as shown so that all of the cells rest alongside each other and the plastic reinforcements are not unnecessarily bent. It is also good practice to use the supplied inflatable folding pillow, although not absolutely necessary it does reduce the angle of the leading edge fold and helps preserve the plastic reinforcements. The folding pillow can be deflated and carried in your harness. Also, using the Ozone Saucisse pack will help preserve the life of the wing and aid with the speed and ease of packing.

Step 1. Lay the mushroomed wing on the ground or on the Saucisse pack if you are using one. It is best to start from the mushroomed position as this reduces the dragging of the leading edge across the ground.

Step 2. Group leading edge (LE) plastic reinforcements with the A tabs roughly aligned. Make sure the plastic reinforcements lay side by side. Note the glider is NOT folded in half; it is folded as a complete concertina from wing tip to wing tip.

Step 3. Group together the middle and the trailing edge (TE) of the wing by sorting the concertina folds near the B and C tabs.

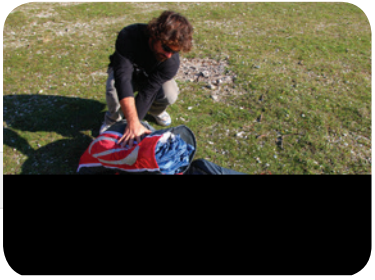
Step 4. Once the LE and TE of the wing have been sorted, turn the whole wing on its side.

If using a Saucisse pack go to Step 7.

Step 5. Place the Folding Pillow below the LE - at the point of the first fold. The pillow reduces the angle of the fold and helps preserve the plastics. Next fold the TE over the LE being careful to not fold with tight angles.

Step 6. Now place the folded wing into the stuff sack.

Step 7. If using a Saucisse, with the wing laid on its side carefully close the zip (or clips) without trapping any material.



Step 8. Turn the Saucisse on its side, lay the Folding Pillow in place and make the fold of the LE around it. Use 3 folds.

IMPORTANT: Do NOT lay the wing flat on the ground before packing the glider, this will cause abrasion damage to the top surface as you pull the glider towards the middle. ALWAYS pack from a mushroom or lift the wing off the ground when gathering the wing and grouping the leading edge.

IMPORTANT: Do not fold the glider in the centre, you will bend the plastics, instead pack the wing with a full concertina method from tip to tip before packing into the stuff sac.

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