ADVANCE EPSILON 9

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ADVANCE

Content

Thank you for flying ADVANCE

Congratulations on your choice of an EPSILON 9 – a quality product from ADVANCE. We are sure that you will spend many rewarding hours in the air with it.

The user manual is an important part of the glider. Here you will find instructions and important information about safety, care of the glider and maintenance, and that's why we recommend that you read this document carefully before your first flight.

Register your EPSILON 9 online on www.advance.ch/garantie, so that you will receive product updates or safety-relevant information about the EPSILON 9 direct from us. This information can also be downloaded from our website on www.advance.ch. The latest version of the manual as well as additional information can similarly be found on www.advance.ch.

We wish you a lot of enjoyment with your EPSILON 9, and always «happy landings».

Team ADVANCE

About ADVANCE

ADVANCE is a worldwide leading paraglider manufacturer based in Switzerland. Since its founding in 1988 the company has continued to follow its own policies and ideas in both development and production. The result is fully-finished products with distinctive characteristics.

The team of experts behind the ADVANCE brand share both the passion for and confidence in their ADVANCE products. At home in the air themselves, they bring valuable personal experience and dedication to the workplace.

Thorough checking of the production process and supervision of the working practices in ADVANCE's own factory in Vietnam guarantee high quality work. A long-standing relationship with cloth and line manufacturers means that ADVANCE know-how finds its way directly into the development of new materials.

ADVANCE place great importance on after-sales service, and have a well-developed worldwide service network. A continuous exchange of experience with customers keeps new knowledge flowing in, which has an influence on ADVANCE products – and so the «Circle of Service» is completed.

EPSILON 9 – The Joy of Flying

It is nothing special to introduce a flying-mad earthling to paragliding. What is special is to deliver the positive experiences and high feel-good factors of the sport that keep him there for years – long after the licence. That's exactly what our EPSILON series does ...

Feeling good from the pull up

Nothing upsets the EPSILON 9: with pitch and directional stability it forges on through turbulent air. Steering demands are answered precisely, without delay. These features combined are responsible for its defining fun and feel-good factor in the air, and as life-long partners of passive safety they share the credit for a long-lasting and uninterrupted enjoyment of flight.

Latest techniques for good performance

Whether we consider the internalised Miniribs, latest Hybrid lining layout or Low Drag Stabilos, the marked EPSILON 9 performance boost results from intensive development work and subsequent technology upgrades. Needless to say the Intermediate also has all the expected state-of-the-art features like Sliced Diagonals, Advanced Airscoop and Double 3D Shaping.

Straightforward in every respect

Starting with wing size choice, then to line sorting, clipping in, big ears to speedbar: the EPSILON 9 is intuitive and simple to manage. The new Automatic Dust Remove even sweeps the wing interior for you while you are flying!

Pilot requirements

Right from the start the EPSILON 9 gives the improver or leisure pilot the safety they need when they lift off into the third dimension. A sense of achievement is guaranteed from your first flights, encouraged by the knowledge that you can always trust the EPSILON 9 completely. The EPSILON 9 provides improving pilots with continued flying enjoyment, with maximum passive safety, long after they have finished their training.

General advice about paragliding

Flying a paraglider calls for appropriate training and a sound knowledge of the subject, as well as, of course, the necessary insurance cover and licence. A pilot must be able to correctly assess the weather conditions before taking off. His or her capabilities must be adequate for the paraglider used. The paraglider pilot is also required bear a sense of responsibility towards the natural world, especially regarding the preservation of wildlife and landscape.

Wearing an adequate helmet, suitable boots and clothing, and the carrying of an emergency parachute are essential. Before every flight all items of equipment should be checked for damage and airworthiness. A proper pre-takeoff check must also be carried out.

Every pilot bears sole responsibility for their participation in the sport of paragliding. Neither the manufacturer nor the seller of a paraglider can guarantee or be held responsible for the pilot's safety.

Getting started

The EPSILON 9 belongs to the “Light sport aircraft” category with an empty weight of less than 120 kg.

Delivery

Every ADVANCE paraglider has to be flown by the dealer before delivery to check for correct settings and trim. The dealer finally enters the date of the first flight on the type placard fastened on a rib at the centre of the wing. This entry confirms that defects in the product that can be attributed to manufacturing faults are covered by the ADVANCE warranty. Register your paraglider under www.advance.ch/warranty, and benefit from the ADVANCE warranty for three years. See under “Warranty” in the “Service” section.

Delivery of a EPSILON 9 includes a COMFORTPACK 3 rucksack, a COMPRESSBAG, a repair kit, a mini-windsock in the wing colours and a «Getting Started» booklet.

Basic settings

At delivery the basic set up of the EPSILON 9 will be the original trim situation that the ADVANCE test team found to be best. Certification was also gained in this condition. Any alterations or changes to the paraglider, such as altering the line lengths or fitting different risers or quicklinks, will result in a loss of the glider’s certification. See section «Certification».

Adjusting the brake lines

The length of the brake lines has been set at the factory so that, with hands fully up, the trailing edge remains unbraked in accelerated flight – (no crease in the wing). Basically, this setting should be kept.

If the brake line length does have to be reset there should be 8 -10 cm (depending on the glider size) of initial free brake line movement between the brakes fully released position in unaccelerated flight, and that point where the lines first affect the trailing edge. We recommend a bowline knot for attaching the handles. See illustration in the appendix.

Speedsystem with SPI

Optimal cross country glide between two thermals requires an ongoing choice of glider speed as a function of current headwind component, expected next climb quality and the influence of sinking air. The EPSILON 9 speed (accelerate) system has a Speed Performance Indicator (SPI) which helps the pilot make this choice of ideal speed-to-fly. Three positions 1 are indicated on the back of the rear risers: neutral/0 %, 30 % and 80 %. Depending on the relevant parameters the chosen SPI position can be accurately set. A red marker on the front riser 2 serves as an accelerate indication.

Each of the EPSILON 9 SPI positions has an icon with quality for headwind, expected climb and sink rate. These indicated positions are effective for only one of their three parameters, taken in isolation – considered by itself. This means that either the headwind, or the expected rate of climb, or the sink rate applies to that position. The SPI principle is based on the simple (using headwind and sink) and the extended (including expected climb rate) McCready Speed-To-Fly theory.

Caution: Even though the EPSILON 9 has a high degree of stability in accelerated flight you should only use as much speedbar as you feel comfortable with.

McCready Speed-To-Fly positions

- With no headwind (or with a tailwind), little or no expected thermal, and the glider's normal sink rate (ca.1.2 m/s vario) you should fly without speed bar application (0%).
- With a headwind of 10 km/h, or an expected next climb (vario) of 0.4 (+/- 0.1) m/s, or a sink rate (vario) of 1.4 (+/- 0.1) m/s set the 30% position. If two or more of these values apply at the same time you can already use the 80% position.
- With a headwind of 20 km/h or an expected climb rate (vario) of 1.2 (+/- 0.1) m/s or a vario sink rate of 2.3 (+/- 0.1) m/s choose the 80% position.

Setting up the speed system

The EPSILON 9 speed system can, with the help of the SPI, be adjusted so that the whole speed system travel can be used. The system is correctly set when pushing the first speed step gives you the 30% position, and pushing the second achieves 80% accelerate. Both toes fully extended should then reach 100% (pulleys touching).

The EPSILON 9 speed system is arranged so that the profile shape of the wing is fully retained over the angle-of-attack range of the speed system. This maintains the beneficial qualities of the profile at high speeds.

Caution: The speed system is correctly adjusted when you can use the full travel available on the risers. Make certain that the speed lines are not set too short, thus causing the wing to be pre-accelerated all the time.

Suitable harnesses

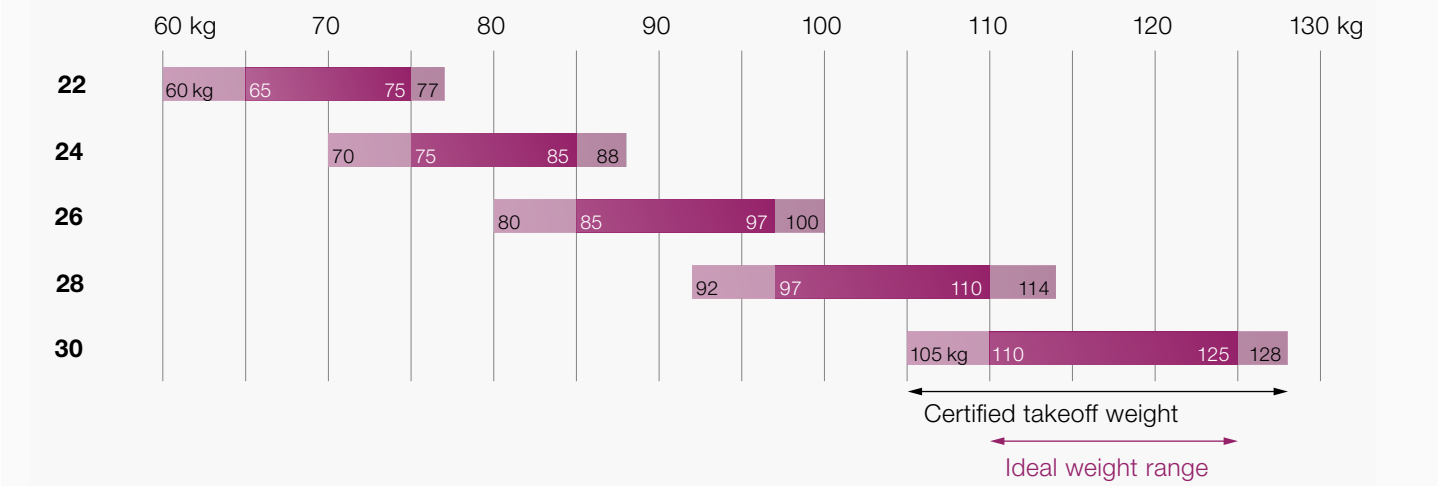
Basically the EPSILON 9 can be flown with any harness that does not have rigid cross bracing (see section “Certification“).

The chosen harness should ideally have a carabiner distance of ca. 45 cm and a support height of between 40 and 48 cm.

For the tests the following settings were used for the harnesses:

- All-up in-flight weight less than 80 kg: carabiner distance 40 ± 2 cm, height 40 ± 1 cm
- All-up in-flight weight 80 to 100 kg: carabiner distance 44 ± 2 cm, height 42 ± 1 cm
- All-up in-flight weight more than 100 kg: carabiner distance 48 ± 2 cm, height 44 ± 1 cm

Info: Experience has proved the theory – a streamlined harness can significantly improve gliding performance.



Weight range

For the first time a EPSILON 9 comes out in five sizes. The weight ranges for the different wing sizes are listed in the “Technical Data“ section. The figures given there refer to total take-off weight. This includes the pilot’s body weight including clothing, as well as the weight of all the equipment (paraglider, harness, instruments, etc. – everything that’s going to fly).

Seamless Weight Ranges

The EPSILON 9 was planned for Seamless (continuous) weight ranges, with no overlapping. These arrange that any particular flying weight features in only one glider size. These EPSILON 9 Ideal takeoff Weight Ranges provide the best comprise between speed and climbing performance for all normal conditions, for each glider size.

For special requirements the choice of size still remains in the overlapping sections of the wider Certified Weight Ranges, as for previous models.

Flying outside the Seamless Weight Ranges, in other words near the lower or upper certified weight limits, can alter a paraglider’s flying behaviour and handling, but without affecting your safety. Glide performance remains the same over a complete weight range, but climb performance is altered.

If the EPSILON 9 is flown outside its Seamless Weight Range, in the upper part of its Certified Weight Range, the higher wing loading will raise its trim speed and produce more dynamic and agile flying characteristics.

Flight characteristics

We recommend that you make your first flights with your new glider in quiet conditions, in a familiar flying area. A few pull-ups at an easy site will give you confidence in the EPSILON 9's handling qualities, from the very beginning.

Takeoff

Connecting the Risers

The EPSILON 9 has an "Easy Connect System" on the risers, to simplify connecting the risers. Each riser has coloured sewing running up the back of the C-riser, red for left and blue for right, in the direction of flight.

The coloured sewing facing the pilot, and the riser running cleanly upward to the lines confirm that the riser has not been connected with an 180 degree twist. For additional assistance all ADVANCE harnesses have the same marking on their suspension loops (red to red, blue to blue).

The "Easy Connect System" also enables you to clip in while facing the wing, This can be helpful for a reverse takeoff in windy weather.

Takeoff preparation

Before every takeoff carry out the following pre-takeoff:

1. Reserve checked: pins and cables correct, reserve handle stowed?
2. Harness and helmet secured?
3. Lines free?
4. Canopy open?
5. Wind direction and strength assessed?
6. Airspace and field-of-view clear?

The EPSILON 9 takeoff behaviour is very smooth and easy for both forward and reverse takeoffs. The canopy inflates quickly and rises progressively, without hanging back or shooting in front.

Because the EPSILON 9 rises very easily it is very important to match the pull-up impulse to the conditions. This means:

- In a lot of wind and/or on a steep slope the EPSILON 9 needs little or almost no pull-up impulse.
- In calm conditions and/or flat land a relaxed pull-up makes sense.

The EPSILON 9 has split A risers. We recommend that you use all the A risers for takeoff. The EPSILON 9 inflates reliably from the middle out, and rises very straight with little exertion.

Tip: Before takeoff get your canopy into the right shape. Do this while sorting the lines, by pulling the brake lines in until you have the perfect curved shape.

Info: You can also use the inner A lines for an EPSILON 9 takeoff, but handling is easier using all the A risers

Takeoff in light wind (forward takeoff)

The EPSILON 9 only needs a moderate pull-up impulse even in a light wind. It is not necessary to step back and 'run' into the lines. Guide the glider up with pronounced leaning forward, but without too much of a pull on the A-risers, until the canopy is overhead. During the pull-up phase any correcting should only be done by decisive going-under-the-wing, without using the brakes. After any necessary correcting and a satisfactory visual check a few determined steps with good leaning forward will achieve lift off, even in little wind.

Takeoff in stronger wind (reverse takeoff)

The reverse takeoff is mainly recommended for stronger winds. During the pull-up you should walk towards the EPSILON 9 as necessary. Turning round and taking off with the EPSILON 9 will then prove to be easy.

Tip: Playing with the glider on flat ground in some wind gives a good feeling for the wing. You can get to know the EPSILON 9's characteristics very well, and try out takeoffs, stalling, shooting forward tendency and collapses – while remaining safely on the ground. The ADVANCE test team have a motto: one hour ground training is worth 10 high flights. N.B: Ground handling practice can increase wear on your glider.

Info: The EPSILON 9 is very easy to take off. Just as for the forward takeoff you should also suit your pull-up impulse to the wind and slope when making a reverse pull-up (as described in section "Takeoff")..

Normal flight

In calm air the EPSILON 9 best glide is achieved with fully released brakes. Light braking brings the glider to its minimum sink condition. When flying into a headwind, through descending air, or when proceeding to the next thermal, glide performance will be distinctly improved by appropriate use of the speed system. The SPI helps you do this. See section “Speed-Performance-Indicator (SPI)”.

Despite the wing’s high stability an active flying style is recommended – collapses can be almost completely avoided. This means keeping the lightly-braked glider directly above you, in other words, countering roll and pitch disturbances.

- When the angle of attack increases (flying into a thermal; wing swings back) the brake lines should be temporarily released fully, until the glider returns to its overhead position.
- When the angle of attack reduces (glider dives forwards, pilot swings back) the wing should briefly be braked more..

It is often more efficient to disregard minor pitching rather than correct it by overcontrolling with the brakes.

Turning flight

The EPSILON 9 has short and precise brake travel when steering. It responds very directly and progressively to increasing steering inputs, as soon as brake line free travel has been taken up When starting a turn be careful how you apply the steering brake – just the right amount; not too much. Active weight shift effectively assists steering. Angle of bank can always be increased, stabilised or reduced by brake line load.

The EPSILON 9 makes a very agreeable companion in thermals. You do not have to correct for large pitching movements, and this improves your climbing behaviour – and therefore your performance – significantly. When thermalling, choose the desired angle of bank and corresponding radius, and try to let the glider turn steadily at this attitude. Outside brake should be used to steady the wing tip and, in particular, control the rate of turn. Anything stronger will slow the wingtip down and lose the glider’s good steering qualities.

A harness specifically designed to match the flying characteristics of the EPSILON 9 helps you to initialise and stabilise turns of this type, which should be as even as possible. See also section «Suitable harnesses».

Caution: to keep good manoeuvrability make sure to fly your EPSILON 9 with enough airspeed while turning in thermals – not too much outside brake.

Tip: if a brake line breaks you can steer the EPSILON 9 using the C risers.

Accelerated flight

The EPSILON 9 has a weight–optimised line and wing design as well as very balanced pitch behaviour in bumpy air. All this retains a very good glide performance with only modestly increased sink rate in accelerated flight. 3 line levels, and the profile chosen for the EPSILON 9 enable the wing to be efficiently accelerated with little expenditure of pilot energy.

The EPSILON 9 wing remains stable even in accelerated flight. However, paragliders operate at a lower angle of attack while flying at their higher speeds, and the degree of stability is generally reduced. The higher aerodynamic forces involved at higher airspeeds mean that a collapse can be more dynamic (see also section «Collapses»).

When encountering severe turbulence while flying accelerated release the speedbar fully before applying the necessary stabilising brake. The EPSILON 9's high degree of structural stability allows it to be flown in normally turbulent air while accelerated. Active speedbar should be employed for adjusting angle of attack under these conditions, instead of brake. Pitch attitude disturbances can be minimised in this way, and optimal glide performance can be maintained. See also section «Speed system with SPI».

- when the angle of attack increases (e.g. wing pitches back when entering lift), the speed bar is briefly pressed harder
- when the angle of attack decreases (e.g. wing pitches forward), the speed bar is released

Caution: even though the EPSILON 9 is very stable in accelerated flight you should only use as much speedbar as you feel happy with.

Tip: make sure that brake is not applied at the same time as speed bar, otherwise you will find yourself in the worst possible gliding situation, without gaining any advantage.

Tip: Always choose a suitable speed for best glide taking into account the actual headwind, sink rate (descending air) and expected next climb.

Collapses

The EPSILON 9 features a very taut and stable canopy. With an active flying technique in normal flying conditions, collapses can be almost completely prevented. The wing gives very precise canopy feedback and makes it possible to sense an impending collapse early on, thus helping timely pilot reaction. Should a collapse occur the wing will fold in a predictable and progressive manner from wing tip towards the centre.

Asymmetric collapsing of the canopy

If the glider does, however, suffer a side collapse at trim speed, it will respond to collapses of 50% or more with a slight turning tendency, allowing heading to be easily held with light counter-steering. Normally, the wing will reopen without pilot action. With an asymmetric collapse in accelerated flight the wing will react more impulsively because of the higher forces associated with higher airspeed. The turning behaviour caused by a collapse at full speed is more dynamic, but can be well controlled.

If a collapse is slow to reopen, a deep but brief pull on the closed side brake will help. It is important to completely release the brake again to let the glider keep its flying speed. Be careful with the brake on the open side, and only apply enough to keep straight – so as not to stall the wing.

Poorly flown wingovers can cause a wingtip to fold inwards from the side, causing it to catch in the lines and create a cravat. Due to the high drag they produce cravats can lead to strong rotation (spiralling). Stop an increase in rotation rate by just the correct amount of outside brake. Then open the cravated wingtip by pulling the orange stabilo line. Clearing a cravat can be also done more quickly by ‘pumping’. The appropriate brake should be applied to 75% brake travel within a maximum of two seconds, and then released immediately.

Caution: If you want to make an accelerated collapse during safety training we recommend that you lead up to it slowly – starting with unaccelerated and then partially accelerated attempts.

Symmetric collapse (frontstall)

After a spontaneous or A-riser provoked collapse the airflow breaks away from the profile and the canopy will pitch back. The pilot swings back underneath after a short delay. Wait, without applying brake, until the wing is again above you and returns to normal flight. After a big collapse reopening may be delayed, but do not forcibly encourage reopening by the use of excessive brake, because of the risk of a fullstall.

Caution: to simulate a front collapse all A-risers must be taken hold of and pulled down.

Caution: after a very impulsively provoked front collapse in accelerated configuration (for example during SIV training) it can happen that the front of the canopy does not open by itself. Help the wing to open with a brief brake impulse by pulling the brakes to 75% within one second, immediately and completely release them, then be prepared to control the forward surge.

Rapid descents

For quick and efficient ways of getting down the ADVANCE test team recommend big ears (with or without speed bar) or the spiral dive – the choice depends on the situation.

Tip: fast descents should be practised now and then in quiet conditions – so they won't become emergencies when you need them.

Symmetrical collapsing of the wingtips (big ears)

The EPSILON 9 has split A-risers, which make it easy to apply big ears.

To do this pull both outer A-risers quickly down at the same time. The wingtips will fold, and can be easily held in this position. To reopen release the risers; if the wingtips do not open by themselves a brake impulse will help them.

Sink rate can be further increased by using the speedbar. Depending on the situation the glider can be steered using weight shift.

Remark: big ears is also possible using two lines (per side) with the EPSILON 9. Here it is important that the glider must be accelerated as well, and the trailing edge must not be braked.

Caution: do not fly spirals or sharp changes of direction with big ears applied; the increased loading carried by fewer lines can damage the structure.

Caution: be aware that flying with big ears brings the stall closer. Be careful with the brake lines when big ears are applied, and do not use this descent method if the wing is wet. See also section «Flying with a wet paraglider».

Tip: if you want to lose height as quickly as possible and fly away from a danger zone at the same time we recommend the following: apply big ears and use as much speedbar as conditions allow.

Spiral dive

For the most comfortable way of doing this we recommend a neutral sitting position without active weight shift, and a shoulder-width carabiner distance (approx 45 cm).

Enter the spiral by progressively pulling one brake. Your head and field of view should be directed in the turn direction. As the angle of bank increases so will the rate of turn and centrifugal force.

The behaviour of the spiralling paraglider can be separated into two phases: in the beginning the glider begins with a normal turn which progressively tightens, with increasing angle of bank. In the second phase the paraglider engages its spiral mode. This means that the wing dives forward with an increase of acceleration. During this phase of the manoeuvre try to keep a neutral sitting position and give way to the centrifugal force – your body will be pushed to the outside.

Recovery from the manoeuvre is achieved by progressively releasing the inside brake. The body weight should be slightly displaced to the outside of the turn. While coming out of a spiral dive with high vertical and rotational speeds it is essential to release the brake carefully, and/or reapply a little inside brake if necessary, so that you can prevent the wing pitching back excessively, and then diving in front. Make sure that you start the recovery with plenty of height remaining above the ground. Generally speaking you should allow the same amount of time to recover as it took to enter the manoeuvre, but remember that the sink rate will be higher.

The EPSILON 9 is a very agile and precise wing; this means that it goes into a spiral easily and quickly, and a very high descent speed (more than 14 m/s) can result - easily and quickly..

Caution: the EPSILON 9 only comes out of a spiral dive by itself if the pilot is in a neutral sitting position. From a steep spiral with a high sink rate – more than 14 m/s – recovery requires active outside brake with weight shift to the outside at the same time.

Caution: weight shifting to the inside of the turn results in increased acceleration and stable continued rotation. In this case, active counter-braking with simultaneous weight transfer to the outside of the turn is required to end the manoeuvre (push your body outwards).

Caution: the EPSILON 9 is approved for harnesses in group GH (without rigid cross-bracing). Harnesses in group GX (with cross-bracing) or those with very low suspension points (carabiners) may drastically change the flying characteristics in a spiral.

Caution: do not fly spiral dives or aggressive changes of direction with big ears applied: the raised wing loading carried by fewer lines can damage the glide.

Caution: after recovering from a spiral dive it could be that the pilot flies into turbulence that he has caused. Fly actively to prevent a collapse.

Stalling

One-sided stall (spin)

When circling tightly in a thermal the EPSILON 9 indicates clearly, by strongly increasing brake load, the risk of a stall. Even so, if a wing does stall you will feel a marked reduction of brake load on the inside of the turn. If this happens you must immediately release both brake lines, so that the EPSILON 9 can return to normal flight by itself.

If a wing stalls completely the paraglider will go into a spin / negative rotation. The EPSILON 9 will react dynamically, but will still be manageable by the less experienced pilot. Even so – depending on the situation from which the paraglider is allowed to fly again – the reaction can be quite vigorous (shooting forward with a raised risk of collapse). The canopy can be arrested while shooting forward by well-judged braking. Normal flight can then be resumed without a further collapse.

Tip: basically, in all out-of-control flight situations, but especially the onset of a one-sided stall, you should immediately release both brakes fully – hands up.

B-Stall

The whole paraglider structure and its profile shape would be severely strained by a B-stall. We recommend that you don't fly B-stalls on a regular basis. If the B-Stall is to be flown however, recovery must consist of a complete and hesitation-free release of the B-risers, so that normal flight is resumed within two seconds. The B-stall is difficult for light pilots to do because of the high force required.

Caution: when B-stalling do not pull the B-riser quicklinks lower than the upper speed system pulleys on the A-risers, otherwise you will also pull the outer A-risers down! This gives you the risk of a rosette.

Fullstall

Although the EPSILON 9 responds early to brake input it has very long brake travel, and very high brake load at the stall point. This means a large safety margin for the pilot.

Entry into a fullstall is achieved by progressively and symmetrically pulling down both brake lines. Forward speed reduces. Airflow and wind noise reduce. After reaching minimum speed the paraglider first goes into a brief phase of parachutal stall. Then further brake will cause complete airflow breakaway, and the wing will fall back in fullstall. The EPSILON 9 has a strong desire to fly again, but is easy to hold in the

stall. A half wrap of the brakes is recommended to fly fullstalls.

To recover, the canopy has to be pre-inflated. To do this the brakes should, at first, be released slowly and symmetrically, and only fully released when pre-inflation is complete. The EPSILON 9 then flies away relatively cleanly, without shooting forward too much.

Tip: as a basic principle you should immediately and fully release both brakes in all out-of-control situations, then be prepared to control the resulting surge carefully.

Deep stall

Stable parachutal stall cannot be established, whether attempted by brake or B-stall. In rain, or if the canopy is wet, the EPSILON 9, like all paragliders, is more vulnerable to parachutal stall. If the wet glider were to go into parachutal stall you should recover only by accelerating using the speedbar. See also section «Flying with a wet paraglider».

Landing

Always make a proper landing circuit with a well-planned final approach. As the ground approaches progressively increase brake to level the flight-path, before applying full brake to completely arrest the forward speed.

Caution: Steep turn reversals lead to strong swinging of the pilot, and should not be done near the ground.

Caution: Braking will reduce your speed and increase your sink, but it will certainly seriously restrict your ability to manoeuvre.

Caution: Getting below minimum speed leads to stalling: this should unquestionably be avoided when top landing, and on final approach.

Handle with care: Never let your glider fall to the ground on its leading edge. The overpressure so caused inside the wing can rip the cell walls and damage the leading edge.

Handle with care: After landing in water the canopy can quickly fill up, and become very heavy. The canopy should be lifted out of the water by its trailing edge, giving the water a chance to run out . Otherwise it might tear under this unaccustomed heavy load.

Flying with a wet paraglider (risk of deep stall)

Flying with a wet glider creates a risk of deep stall. Deep stall is often the result of a combination of factors. The weight of the wet canopy goes up, and this increased weight increases the angle of attack, which always puts the glider nearer the deep stall limit. Added to this,

water drops on the top surface have a detrimental effect on the laminar flow of the boundary layer near the leading edge, which distinctly reduces the maximum lift coefficient. If the wet glider is also being flown at its lower weight limit there is a further small effect of increasing the angle of attack, as well as there being a lower airspeed because of the reduced wing loading.

In order to avoid the risk of deep stall with a wet glider, the wing should be braked as little as possible, and big ears not used at all. As a further preventative measure apply moderate (25-40%) speed bar. These actions have a small effect in reducing the angle of attack. If the wet glider does go into deep stall you should recover by using the speed bar only. See also section “Deep stall“.

Winching

The EPSILON 9 is suitable for winch launching. When taking off in windless conditions, ensure that the paraglider is laid out in an arched or even wedge shape (to avoid risk of the glider rosetting):

Winch launch is only permitted if:

- the pilot has completed a tow training course (only Germany/DHV);
- the winch system is certified for use with paragliders;
- the winch operator has been fully trained in paraglider winching.

Acrobatics

Assuming adequate pilot ability and correct technique, the EPSILON 9 lends itself well to flying such manoeuvres as wingovers, SAT, helicopter and asymmetric spiral. The wing was tested to the usual 8g load factor, but is not specially strengthened for industrial strength acro.

Be aware that dynamic manoeuvres put greater loading on the structure and can shorten the glider’s life. This means that a regular check of the paraglider is essential for your safety. In addition there will be the special requirements of your country to be observed.

Paramotoring

The EPSILON 9 is certified for paramotoring. You can find the paramotoring appendix to the EPSILON 9 manual on www.advance.ch. under Downloads.

Tandem flying

The EPSILON 9 is not certified for tandem flying.

Packing

Packing

Always pack your EPSILON 9 rib on rib, so that the plastic rods at the leading edge lie flat on each other at the same height. This will preserve the EPSILON 9's long life. It will also maintain the fast and reliable inflating qualities at takeoff.

To reduce wear at the wing centre you should randomly change the lane which carries the final chordwise fold. Always store your wing in a dry and dark place.

Packing with the Tubebag

Packing in a sausage bag is good for the wing, and is easy to do. It avoids undesirable sliding over the ground. Also the shape-retaining storage in a Tubebag promotes long glider life.

Lay your wing, mushroomed as after landing, on the spread Tubebag. Next spread the centre chord out to Tubebag length. Arrange the lines and stow the risers on their tabs. Now gather the leading edge cells as described in "General" above, except that all cells make up one pile – no secondary folding into the centre. Then fasten the upper Tubebag strap over the collected leading edge foils so that it holds them neatly together. Follow the same basic process at the trailing edge. Pull the centre lane straight then flatten and collect the outlying cells as already described above. Do this gently: do not disturb your leading edge positions. Final close the Tubebag then fold the Tubebag ends at the same wing positions as described in "General" above.

Maintenance and checks

Maintenance

Ultraviolet light, heat, humidity, sea water, aggressive cleaning agents, unsuitable storing and physical abuse (dragging across the ground) speed up the ageing process.

The life of a paraglider can be extended significantly by observing the following advice:

- Allow a wet or damp glider to dry by leaving it completely unpacked at room temperature, or outside in the shade.
- If the glider gets wet with salt (sea) water rinse it thoroughly with fresh water.
- Clean the glider only with fresh water, and a little neutral soap if necessary. Do not use solvents under any circumstances.
- If the glider has been subjected to increased stress (such as a tree landing) have it examined by an expert.
- Regularly remove sand, leaves, stones and snow from the cells. Openings with Velcro closures are provided at the wing tips for this purpose.
- Do not leave the glider out in the sun unnecessarily before and after flight (UV light).
- Do not subject the packed glider to excessive temperature fluctuations, and do ensure adequate air circulation to prevent condensation forming.
- Do not drag the glider across the ground.
- When landing, make sure that the canopy does not fall on its leading edge.

Check

A new ADVANCE paraglider must be given a check every 24 months (2 years). With intensive use (> 150 flying hours per year, or especially demanding use) an annual check is needed, after the first check. When a check is carried out the condition of all materials is assessed in accordance with strict guidelines, and tested with great care. Finally the overall condition of the glider is rated and recorded in a test report. You can find additional information about the check in this manual in the section “Service“, or at www.advance.ch.

Repairs and disposal

Repairs

A paraglider is a lifting surface of complex construction. Seams and lines have been made with great precision. In general, therefore, an unauthorised individual should not carry out paraglider repairs. Only the manufacturer or an authorised Service Organisation should replace components with identical parts, or refit complete cells.

Small repairs become exceptions to this principle. Examples could be repairs to small tears or holes with self-adhesive Ripstop material, or replacing lines. In every case of repair or line change the paraglider must be pulled up on the ground before its next flight, and visually checked.

Your paraglider is delivered with a repair kit containing self-adhesive Ripstop. Other parts, such as lines, quicklinks, softlinks or risers can be obtained from your ADVANCE dealer, an ADVANCE Service Center or direct from ADVANCE. Addresses are on www.advance.ch.

Canopy Repairs

Tears up to 3 cm in length, and very small holes that do not meet a seam, can be patched with the self-adhesive Ripstop from your repair kit. Make sure than the patch is cut out in a round or oval shape, and is big enough to generously overlap the damage. The similar piece of sticky Ripstop on the inside of the repair should be of a different size. Detailed instructions can be found on Eine detaill www.advance.ch.

Line repairs

A damaged line must be changed, without exception. The easiest option is to go to an ADVANCE Service Centre or your ADVANCE dealer. Alternatively you can order the specific replacement line direct from ADVANCE or an ADVANCE dealer and fit it yourself. All the addresses are on: www.advance.ch. Under “Service” on www.advance.ch there are detailed instructions for identifying your line so that you can order it, and then fit it correctly on the wing.

What to do if the leading edge gets damaged?

If a leading edge wire breaks or its seam rips the glider must be taken to an ADVANCE checking facility where the wire can be replaced or sewn back in. To guarantee a long lifespan it is important that the wing is not allowed to fall on its leading edge after landing, otherwise the fabric can be damaged by abrasion. But mainly there is a risk, as in all paragliders, that the crossports could tear.

Disposal

Environmental protection plays an important role in the selection of materials and the manufacture of an ADVANCE product. We use only non-hazardous materials that are subjected to continuous quality and environmental impact assessments. When your paraglider reaches the end of its useful life in a number of years time, please remove all metal parts and dispose of the lines, canopy and risers in a waste incineration plant.

Technical details

EPSILON 9		22	24	26	28	30
Flat surface	m^2	22.1	23.9	25.9	27.8	29.8
Projected surface	m^2	18.5	20.0	21.7	23.3	25.0
Ideal weight range * **	kg	65–75	75–85	85–97	97–110	110–125
Certified takeoff weight **	kg	60–77	70–88	80–100	92–114	105–128
Glider weight	kg	4.15	4.40	4.65	4.95	5.25
Aspect ratio		5.2	5.2	5.2	5.2	5.2
Projected aspect ratio		3.68	3.68	3.68	3.68	3.68
Flat span	m	10.73	11.15	11.61	12.03	12.45
Projected span	m	8.26	8.59	8.94	9.26	9.59
Certification		EN/LTF-B	EN/LTF-B	EN/LTF-B	EN/LTF-B	EN/LTF-B
Number of cells		47	47	47	47	47
Number of risers		3+1	3+1	3+1	3+1	3+1
Maximum chord	m	2.59	2.69	2.80	2.90	3.00
Max lenght of the risers	cm	48.0	48.0	50.0	52.5	54.5
Accelerator tavel max.	cm	14.5	14.5	15.5	16	16.5
Max length of the lines with the risers	m	6.59	6.84	7.13	7.40	7.66
Trims		–	–	–	–	–
Max. sym. brake travel at max. weight	cm	64.5	65.5	70.5	73.5	76.5
Other adjustable / removable / variable devices		–	–	–	–	–

* Takeoff weight range in which the EPSILON 9 shows the best relationship between flying speed and climb
* ** Pilot, wing, equipment

Materials used

We routinely inspect and test our materials many times over. Like all ADVANCE products the EPSILON 9 is designed and produced as a result of the latest developments and contemporary knowledge.
We have chosen all the materials very carefully, under conditions of the strictest quality control.

Leading edge	Skytex 38 Universal, 9017 E25
Upper surface	Skytex 38 Universal, 9017 E25
Lower surface	Skytex Easyfly 9018 E65
Profiles	Skytex 40 hard finish 9017 E29
Unsupported profiles	Skytex 40 hard finish 9017 E29
Main lines	PPSLS 260 / 200 / 125: covered
Gallery lines	A-8000U-190 / 130 / 090 / 070 / 050: uncovered
Brake lines	A-8000U-090 / 070 / 050: uncovered
Steering lines	A-7850-240: covered | A-8000U-190: uncovered
Risers	Polyester / Technora, 13 mm, 850 daN
Quick links	Strap 12 mm MR Delta 3.5 mm / S12

Certification

The EPSILON 9 has EN and LTF certification. The test reports can be downloaded from www.advance.ch.

Certification ratings can only provide limited information about a paraglider's flying behaviour in thermally active and turbulent air. The certification grading is based primarily on provoked extreme flight manoeuvres in calm air.

During the development of an ADVANCE paraglider, the emphasis is first and foremost on flying behaviour and handling, and not exclusively on the certification test. The result is a well-rounded product with the familiar ADVANCE handling. Nevertheless, the certification rating occupies a significant proportion of the specifications that have to be met.


ADVANCE

Service

ADVANCE Service Center

ADVANCE operates two company-owned service centres that carry out checks and repairs of all types. The workshops based in Switzerland and France are official maintenance operations, which have many years' experience and indepth product-specific expertise. The ADVANCE worldwide service network includes other authorised service centres that provide the same services. All service facilities use original ADVANCE materials exclusively. You can find all information on checks and repairs and the relevant addresses at www.advance.ch.

The ADVANCE website

At www.advance.ch you will find detailed information about ADVANCE and its products, as well as useful addresses which you can contact if you have any questions.

Among the things you will be able to do on the website are:

- complete the warranty card online up to 10 days after purchasing the glider, enabling you to enjoy the full benefits of the ADVANCE warranty.
- find out about new safety-related knowledge and advice concerning ADVANCE products.
- download an application form in PDF format which you can use when sending your glider in for a check at ADVANCE.
- find an answer to a burning question among the FAQs (Frequently Asked Questions).
- subscribe to the ADVANCE Newsletter so that you will be regularly informed by e-mail about news and products.

It is well worth visiting the ADVANCE website regularly because the range of services offered is continuously being expanded.

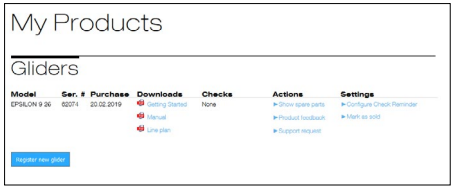
Registering your product

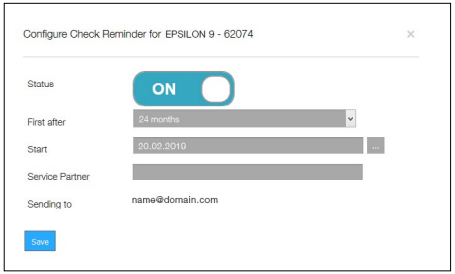
Set up a MyADVANCE-Account on www.advance.ch/garantie and register your wing direct online after purchase. You will then benefit from the extended ADVANCE Warranty. This is valid for 3 years and covers defects that can be attributed to manufacturing faults

In the MyADVANCE-Account you can arrange for a Check Reminder by E-Mail. In addition you can find all the documentation for your wing as PDF, e. g. manual, line plan, check protocol and other information. You can also look at spare parts for your product and ask ADVANCE support direct.

Warranty

As part of the ADVANCE warranty, we undertake to rectify any defects in our products that are attributable to manufacturing faults. In order for a warranty claim to be made, ADVANCE must be notified immediately on discovery of a defect, and the defective product sent in for inspection. The manufacturer will then decide how a possible manufacturing fault is to be rectified (repair, replacement of parts or replacement of the product). This warranty is valid for three years from the date of purchase of the product. Warranty and Service Intervals begin from the date of the glider's first flight, recorded on the identification plate. If no date is evident the applicable date is that on which the glider was transferred from ADVANCE to the ADVANCE dealer. The ADVANCE warranty does not cover any other claim. Claims in respect of damage resulting from careless or incorrect use of the product (e.g. inadequate maintenance, unsuitable storage, overloading, exposure to extreme temperatures, etc.) are expressly excluded. The same applies to damage attributable to an accident or normal wear and tear.





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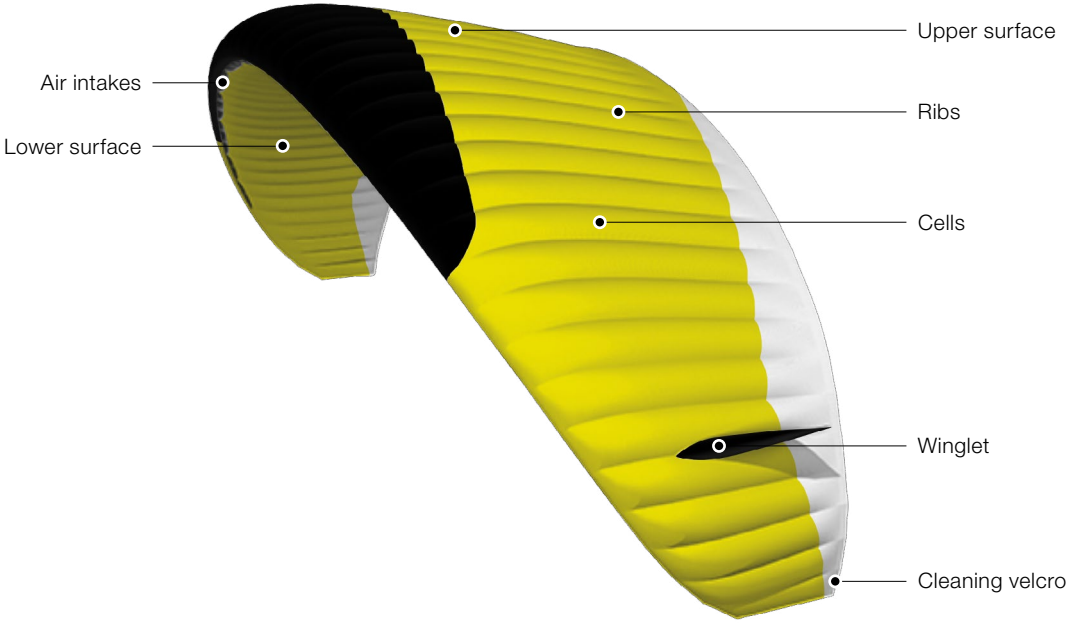
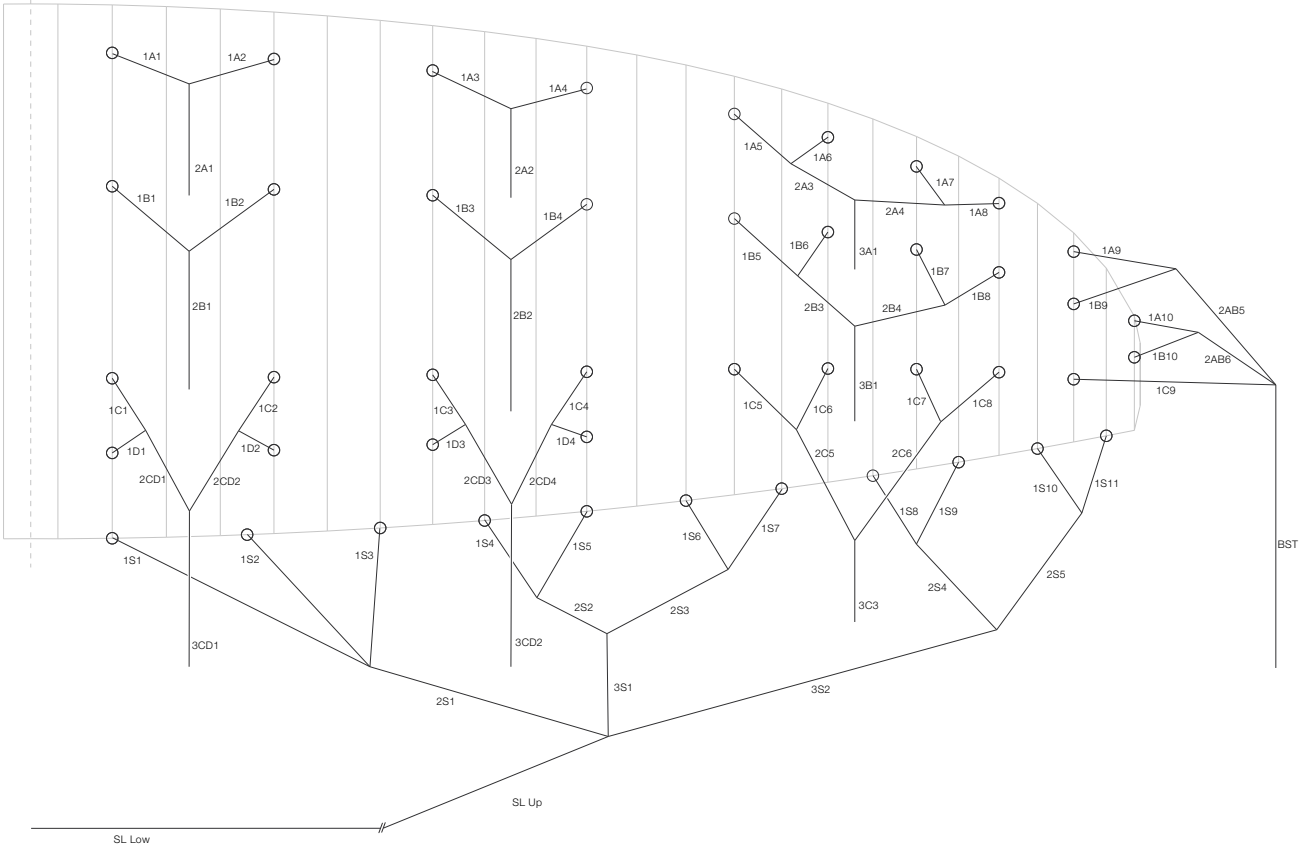
Wing parts


Upper surface
Air intakes
Ribs
Lower surface
Cells
Winglet
Cleaning velcro

Line plan


1A1
1A2
2A1
1B1
1B2
2B1
1C1
1C2
1D1
1D2
2CD1
2CD2
1S1
1S2
1S3
3CD1
2S1
1A3
1A4
2A2
1B3
1B4
2B2
1C3
1C4
1D3
1D4
2CD3
2CD4
1S4
1S5
2S2
3CD2
3S1
1S6
1S7
2S3
1A5
1A6
2A3
1A7
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1A8
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1B6
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3B1
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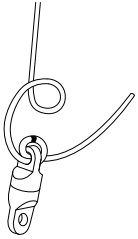
1C8
2C6
1S8
1S9
2S4
3C3
3S2
1A9
1B9
1A10
1B10
2AB5
2AB6
1C9
1S10
1S11
2S5
BST
SL Up
SL Low

Risers

1. Big ears system with «Quick Snap»
2. Quicklinks and clips
3. Speed system pulleys
4. Speed Perfomance Index (SPI)
5. Brummel hooks
6. Magnet clips
7. Swivel
8. Suspension loop with «Easy Connect System» marks
9. Easy-running Brake Pulleys

Bowline

Step **1**

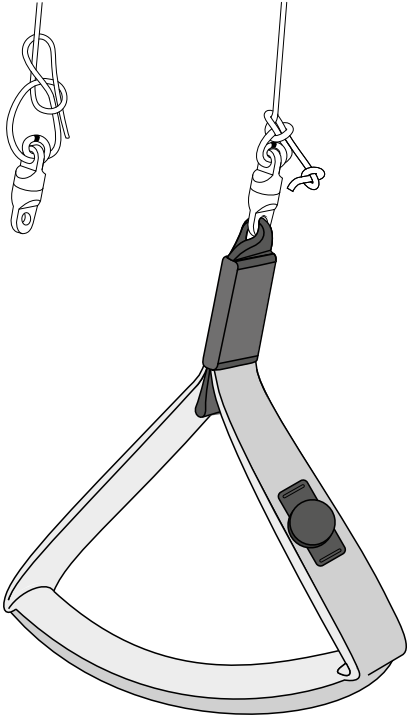


Step **2**

Step **3**

Step **4**

Step **5**



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