



Dynamic Flight School

17 Tansey Court, Trawalla, Victoria, 3373
Phone – 0409 678 734

Email : Rohan@dynamicflight.com.au
Web : www.dynamicflight.com.au

Manta



Hang Gliding Harness

Owners Manual

Manta Harness by Dynamic Flight

Congratulations on your purchase of the Manta Harness by Dynamic Flight. Your harness has been constructed from the finest materials available and should reward you with years of reliable service. As with all your flying equipment, periodic maintenance and adjustment will be required. Please take the time to read this manual and familiarise yourself with your new harness before taking your first flight.

Contents

1. Description of design
2. Warning and disclaimer
3. Using your new harness for the first time
4. Usage instructions
5. Packing your harness
6. Emergency procedures
7. Maintenance and care
8. Periodic inspection schedule

1. Description of design

The Manta harness is a contemporary front entry design representing years of development work. Split main risers attached to a dual slider arrangement allowing movement of the harness centre of gravity (CoG) which accommodates the differing requirements of take off/landing and prone flight. The use of split main risers supports both sides of the pilot and provides a solid feeling in all phases of flight with no tendency for the pilots body to roll around.

For take offs and landings the sliders assume a forward position which places the main riser webbing in front of the pilots CoG. This enables an excellent head up position to be effortlessly maintained. There are two spectra lines which connect the sliders to the boot. With the sliders fully forward the boot is compressed and pulled out of the way of the pilots legs to accommodate the take off run and ensure trouble free landings. After take off the pilot places their feet in the boot and extends their legs. This action extends the boot so that the spectra lines pull the sliders into their rearward position. This results in the slider borne main risers moving behind the pilots CoG. With the main risers/sliders in this rearward position the pilot rotates into a head down position. The degree of head up/down is adjustable in flight using the adjustment rope and cleat.

The boot is opened and closed using the zip lines which are held at a convenient waist position on velcro tabs. The zip itself is attached to the harness with velcro, which allows the pilot to kick their legs free in the event of a zip failure/jamming.

Full continuous webbing is used throughout to ensure that you would remain safely suspended even if all the fabric used in constructing the harness was to fail. Mil spec skydiving buckles are used on the shoulder straps. Stubai 13kN (1,300kg) breaking strain buckles secure the chest and waist webbing. A 4,000kg+ breaking strain steel carabiner is supplied as standard.

The frame is constructed of aircraft grade 6061 aluminium alloy with custom injection molded spacers. The frame spreads the load on the pilot and helps maintain comfort without pinching on those long flights.

2. Warning and disclaimer

Hang gliding is a high-risk sport. The safe operation of this harness ultimately rests with you – the pilot.

This harness will require periodic inspection and maintenance as outlined in the maintenance schedule of this manual. Failure to adhere to the maintenance schedule may result in your harness failing to function as designed.

The owner and operator must understand that due to the inherent risks involved in flying a hang glider no warranty of any kind is made or implied against accidents, bodily injury or death, other than those which cannot by law be excluded.

3. Using your new harness for the first time

Before taking your first flight in your new harness it is strongly recommended you become familiar with its operation whilst remaining safely on the ground. We suggest you hang your harness from a suitable point and practice using it. You should be familiar with the position and operation of the head up/down adjustment and the zip lines. You should also be able to get in and out of prone without difficulty. When transitioning from prone to hang you will notice a small clunk as the sliders come forward, this will be associated with the assumption of a head up position. When transitioning from hang to prone you will notice that some effort is required to extend your legs and pull the sliders back; as they move behind your CoG you will feel yourself rotate head down.

Your harness has been custom made to fit you. The only adjustment you may need to make is to the shoulder strap length. When in the harness, with the boot zipped up, the shoulder straps should be snug but not tight. They are adjusted by removing the webbing from the velcro tabs, sliding the webbing through the buckles and then replacing the webbing on the velcro tabs.

If you are going to mount a parachute in your harness you should follow the directions in the maintenance and care section. It is vital that you can reach the deployment handle and that pulling it releases your parachute. ***This must be tested before flight.*** It is also equally important that your parachute cannot accidentally deploy. If you are not familiar with parachute packing procedures we strongly recommend you enlist the help of a qualified rigger.

4. Usage instructions

Preflight your harness per the preflight schedule.

Suspend your harness from glider's hang loops with the carabiner and then lock the gate by turning the knurled knob.

Place your legs through the leg loops.

Engage the upper central zipper and close it down to your waist. Do not force it.

For side mounted parachute models close the two Stubai buckles located at your chest and waist. For front parachute models close the second zipper securing the parachute container in place, then close the two Stubai buckles.

Ensure all ropes are secured to their respective velcro tabs to prevent tripping over them or having them catching on objects such as tow dollies, ramps, etc.

Hang check. Ensure head up/down adjustment allows adequate clearance of the base tube. Double check your legs are through the leg loops and the Stubai buckles are closed. These checks are designed to ensure you do not fall out of your glider and will be comfortable in flight. History has shown that preflight checks are well worth the effort. Never skip them.

Take off as usual. The boot is pulled clear of the legs during the take off run.

Once in stable flight place feet in boot, and extend legs while transferring hands to base tube to assume prone flight position. ***Remember to aviate, navigate then pronate.*** Numerous accidents have occurred to pilots who have neglected this rule while trying to get into prone. If you are new to prone flight we recommend the following guidelines. Firstly remember this is no hurry to go prone – you can happily soar in hang. Once the glider is safely airborne check you are flying at trim (aviate) and not on a collision course with anything (navigate). Only after you have established this should you search for the boot with your feet. We recommend you do this by feel as if you spend much time looking down for the boot you are unlikely to be either aviating or navigating. Once the boot is found slip your feet in but do not push out. Aviate and navigate. Next place one hand on the base tube. Extend the legs without pushing or pulling on the A frame. As you drop into prone transfer your other hand to the base tube. Aviate and navigate. Once settled in prone flight and clear of the ground and traffic close the harness zipper using the zip up line. If you do not feel comfortable in prone drop back into hang and fly the glider.

Adjust the head up/down position to suit your preference using the head up/down rope and cleat. For your initial flights we suggest tying this rope off before you fly so you are limited to a slightly head up position.

Before landing you will need to extend your undercarriage and get into ahead up position. This is easily done by pulling the unzip line. Replace the unzip line on its velcro tab to prevent tripping on it during landing. Slip your feet out of the boot and rock gently upward into the upright position. You may find that gently pushing up on the base tube or using the head up rope aids this transition. Always transition to a head up position with plenty of altitude. Once again remember to aviate and navigate whilst transitioning.

5. Packing your harness

Your harness has been designed to enable you to pack everything needed for cross-country flight. We recommend you use the following method.

Lay your unzipped glider bag flat on the ground and fold it in half lengthways. Then fold it to form a flat package as wide as the harness frame. Place keys, wallet and other valuables in the external pocket of the harness bag and do the zip up. Then fold the bag into a small package also as wide as the harness frame. Place all the accessory pack up gear into a tip bag.

Lay the harness on the ground, carabiner side down, and open the full-length internal pocket zip. Place your drinking bladder in the bladder pocket. Place the folded glider bag along the full length of the internal bag. Place the tip bag containing the accessory pack up gear and the folded harness bag on top of this. Arrange this gear for a relatively even thickness along the back of the harness. Do up the internal pocket zip.

The streamlined low profile side pocket has been designed to fair the arm on glide and hold a small camera, radio and some snack food. All are easily accessible in flight.

Optional accessory camera/radio, oxygen and drogue chute pockets may have been fitted at your request.

6. Emergency procedures

.1 Failure to hook in

Your harness can only keep you suspended from your glider if you are correctly hooked into your glider. History has shown that this can be forgotten. In the usage instructions we recommend the procedure of always clipping your harness into your glider and then getting into the harness. We also strongly recommend a hang check as a double safety. If you do fail to hook in your options are to immediately release your glider and fall the (hopefully) short distance to the ground or to stay with the glider.

Staying with the glider is likely to mean you are hanging from the base tube. In this position the glider will trim at quite a fast speed and possibly begin to oscillate. Your options are:-

- a. to remain hanging on to the base tube if the landing is close at hand;
- b. to release one hand and deploy your parachute; or
- c. to try to climb into the A frame and either fly the glider in the A frame or try to hook in.

You will not be able to hold on for very long and will require considerable strength to climb into the A frame so deploying a parachute may be the best option in many cases. Any need for this knowledge is removed by always doing a hang check before flight.

.2 Failure to put your legs through the loops

The leg loops prevent you from slipping out of the harness when in the hang position. If you do not put your legs through them you will find yourself hanging by your armpits. Do not raise your elbows too high or you may fall out. If you can get your feet into the boot you can prone out and zip the harness up to secure yourself. You should either land still zipped up or keep your feet in the boot of the harness all through your landing approach and final bringing them out at the last moment to ensure you do not fall out of your harness.

.3 Failure of zip to do up

This simply presents you with an inconvenience. You can prone out and fly around but will not be as comfortable or warm as usual.

.4 Failure of zip to undo

If you are unable to get the zip to undo you have two options. If you have sufficient height and time before landing you can use your fingers to separate the velcro holding the zip to the harness on one side only. Your legs can then be used to separate the zip from the harness body allowing your legs to be extended so a normal landing can be achieved.

If you do not have sufficient height and time you will have to land still zipped up in prone. Pick out a long, smooth runway. Fly a normal final into the wind but round out lower and bleed off excess speed approximately one foot above the ground. The glider will slow down below normal stall speed due to ground effect. As the glider loses energy give a good flare. If you have wheels you will likely roll to a stop. If you do not have wheels you may well nose in when the base tube hits the ground. If you leave your thumbs below the base tube when it hits the ground they may break, this can be prevented by putting your hands on the uprights.

Proper care and maintenance should prevent any problems with your zip. Don't forget to tie up your shoelaces and secure any loose clothing which may jam the zip.

.5 Free fall parachute deployment

Your harness has been designed for hang gliding use and has ample strength in the unlikely event you need to deploy your parachute. You may have heard stories of pilots being sucked up into storm clouds and then jumping out of their gliders and deploying their parachutes when near the ground. Your harness should have adequate strength to survive the loading of a free fall opening but your parachute probably will not. Hang gliding parachutes are designed for lightweight, small size, and rapid deployment at low speed. These design features are in stark contrast to the design criteria of sky diving parachutes. The rapid deployment feature of our parachutes means they will generate extremely high (much higher than skydiving) loads if deployed at terminal velocity (-200kmh). We strongly recommend you exercise good judgement and do not place yourself in the situation where you are considering leaving your glider to parachute down.

7. Maintenance and care

.1 General

To keep your harness in top condition, store it in its protective bag in a dry place out of direct sunlight when not in use. Never store your harness damp as moisture promotes the growth of mildew. If it gets damp air-dry it out of direct sunlight. If it gets very wet you may also need to remove, dry and repack your parachute. Ultraviolet light, some petroleum products and alkaline detergents all attack the materials your harness is made from and will weaken it – avoid these coming into contact with your harness.

.2 Fitting a parachute

If you have never stowed a parachute in a container it is strongly recommended you seek help before attempting this procedure – it is much easier seen done than described.

Clover leaf parachute container stow technique:

- a. Place the harness open and interior down on a table.
- b. Ensure the 8meter (HG) bridle is attached to the steel carabiner and run down inside the covers provided (to protect it from UV) to the upper front corner of the chute container.
- c. Flat "S" fold the remainder bridle into the open chute container, place the chute in its deployment bag on top of folded bridle.
- d. Ensure the 4mm bungees with large knots are placed through the lower side flap eyelets with draw strings fitted.
- e. Draw through the upper side flap front hole and lock-stow with front lock rope on the chute handle (that comes with the harness and is hitched through your chute deployment handle) The two side flaps are now covering the chute and locked in place by their front holes. Ensure the handle has enough slack to pull the lock rope out when deployment is required.
- f. Join the rear upper and lower flap with the draw string, include the rear flap and front flap then lock-stow with the remainder rope of the deployment handle. Remove both draw strings and fit velcro flap down. The last lock-stow rope should protrude 20mm from velcro flap and the handle must finish on the zipper side of the container so it can be reached in flight by either hand.
- g. Ensure the handle has enough slack to pull both the lock ropes out when deployment is required.

First slide the parachute bridle into the UV protective sleeve supplied. Next slip the bridle onto the carabiner behind the main riser webbing. Fasten the bridle to the main riser using the velcro sleeve. Lay the bridle into the parachute container using an S-fold method. Do not stow the bridle with rubber bands. Place the deployment bag on top of the bridle in the parachute container. If required securely attach the supplied deployment handle to the existing deployment bag handle then through itself. Close the container by passing the short bungee loops through the grommets in appropriate sequence, then use the deployment handle rope to trap these loops on the outside of the container. A packing string passed down through the grommets, starting from uppermost and working down to the bungee loop, then back up in reverse order will simplify this procedure by allowing the loops to be easily pulled up through the grommets. Close the velcro flap. Once the container is closed check that the parachute is secure by vigorously applying a knee behind the container to see if it causes an accidental deployment. Also ensure that sufficient bridle is free that the movement of the slider is not restricted. After fitting a parachute for the first time have a hang in the harness and ensure you can easily reach the deployment handle and that when you pull it your parachute comes out of the container. Failure to correctly pack your parachute into your harness may result in an inability to deploy your parachute when you need it. This may result in serious injury or death. If unsure consult your dealer.

.3 Cleaning procedure

It is recommended that you do not use any detergents to clean your harness. Most detergents are alkaline and will weaken the harness structure. If you insist on using a detergent use only one that has been specially formulated for cleaning sailcloth. It is preferable to use only a damp cloth to wipe off any dirt and then allow your harness to air dry out of direct sunlight. Better still keep your harness clean in the first place.

.4 Salt water immersion

If you land in the ocean and manage to retrieve your harness you must follow the following steps to avoid serious damage to your harness and parachute. When salt water immersed fabric dries microscopic salt crystals are left behind. These act like miniature knives, which cut the fibres of the harness webbing and fabric. The recommended procedure used by parachutists is to keep everything completely wet with salt or preferably fresh water. Do not let things dry out. Remove all removable metal items. Open all zips and pockets. The parachute will need to be removed from its container and deployment bag. The entire sodden mass is then placed in a garbage bin or bath tub and a series of fresh water flushes are applied – the more the better. Once all the salt has been rinsed out the material is air-dried out of direct sunlight. In testing decreases in strength of up to 50%+ have been reported following salt-water immersion and drying without rinsing. Correctly rinsed 90%+ of the original strength is retained. *Never land in surf.*

8. Periodic inspection schedule

These guidelines are based on experience with the problems, which can and do occur with harnesses. It is strongly recommended that you follow them to ensure your harness gives optimal service. Inspections are due after the stated number of flying hours or the elapsed period of time, whichever is the sooner.

Preflight

Check ropes are not tangled and make sure their ends are correctly located on their respective velcro tabs. Ensure internal zippers are closed, and boot zipper is fully undone. Check head up/down adjustment rope is cleated off so you will hang above the base tube when in prone. Check parachute container is securely closed. Check Stubai buckles and carabiner for positive locking function.

Every 10 hours or 1 month

Check zippers and sliders for smooth function and lubricate with silicon spray if necessary. Adjust boot-slider ropes if required (these may stretch in normal use). The slider ropes should be just tight when the boot is extended and the sliders are in their most rearward position.

Every 50 hours or 6 months

Check main risers for wear, these are easily replaceable. Check all stitching is secure. Check all ropes and webbing for wear. Check main body zip is in good condition. Check wear on head up/down cleat.

Every 100 hours or 12 months

Check main risers for wear and replace if necessary. Check all stitching is secured and repair as required. Check all ropes and webbing for wear and replace if necessary. Check main body zip for smooth function and replace if necessary. Check head up/down cleat for wear and replace if necessary. Inspect frame for wear. Inspect carabiner and all buckles for wear and positive spring and locking function.

Every 200 hours or 2 years

Replace main risers, main body zip, all ropes and head up/down cleat.

Every 500 hours or 5 years

Expected normal service life. Depending primarily on use and care your harness may last longer than this however it is recommended you return your harness to the manufacturer for full safety inspection and overhaul.

If you detect problems during any inspection do not fly in the harness until these are satisfactorily corrected.

Date of Manufacture

Serial Number

Made by
Name Signature

Final Inspection by
Name Signature

Safe flying and remember – it only gets better

Dynamic Flight Team