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Congratulations on purchasing a Laser Stratos sailing dinghy. This premium product will give you many years of sailing pleasure. Laser are totally committed to you receiving the maximum benefit from your purchase.

## LASER STRATOS RIGGING INSTRUCTIONS

The Laser Stratos Rigging instructions are a comprehensive guide to rigging your Laser Stratos. Due to production supplies certain parts may be slightly modified from those shown. This instruction manual is not a guide to sailing your craft and it should not be considered suitable for the task of learning to sail a dinghy.

## LASER CENTRE

Options, accessories and spare parts for your Laser Stratos can be purchased from the Laser Centre. Laser Centre staff will be able to offer knowledgeable advice on all aspects of rigging and maintaining your knew boat.

Details of your nearest Laser Centre please contact:

Performance Sailcraft Europe Limited Station Works Long Buckby Northamptonshire NN6 7PF UK

t +44 (0)1327 841600 f +44 (0)1327 841601 www.lasersailing.com

## **LEARNING TO SAIL**

It is recommended that you obtain expert instruction to sail your Laser Stratos. The Laser Centre can advise you on a convenient sailing school to suit your requirements

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### **GLOSSARY**

Aft: towards the back of the boat.

Bow: the front of the boat.

Burgee: a flag normally flown from the top of the mast.

Batten: a thin plastic strip which fits into a long narrow pocket in the sail.

Boom: spar to which the foot of the mainsail is attached. Centreboard: a pivoting plate that reduces sideways drift.

Cleat: a fitting to which ropes can be attached or lead through and made fast.

Clew: the lower aftmost corner of a sail, to which the sheets or boom is attached.

Fairlead: a fitting that leads a rope in the most convenient direction for working.

Foot: the bottom edge of a sail.

Forward: towards the bows of a boat.

Forestay: the wire supporting the mast in a fore and aft direction.

**Gennaker:** large foremost sail, hoisted only when sailing away from the wind.

Gooseneck: a hinge fitting connecting the boom to the mast.

Gunwhale: the outermost edge of a boat.

Head: the top corner of a sail.

Hounds: the connecting point on the mast for rigging that gives it support.

Halyard: a rope or wire used to hoist or lower sails.

Halyard rack: a toothed rack over which a halyard can be tensioned to control tension at the sail luff.

Jib: foremost sail (excluding gennaker.)

Jib sheet: the rope used to control the position of the jib when under sail.

Kicking strap: a line, or series of lines between the base of the mast and the underside of the boom to control twist in the mainsail and position of the boom.

Leech: trailing edge of a sail.

**Leeward:** the side of the boat on which the mainsail is set while sailing, furthest from the direction from which the wind is blowing.

Luff: the front edge of a sail: also, to turn toward the wind.

Mainsheet: the rope controlling the position of the mainsail whilst sailing.

Mast heel: the casting at the base of the mast.

Mast step: the position on the hull or deck in which the mast heel is located.

Port: the left-hand side of a craft looking forward:

Reefing: the ability to shorten sails in high winds to aid control of the boat.

**Shroud:** a wire securing the mast in position at the hounds, preventing it from falling sideways.

Shackle: a "u" shaped piece of metal, secured with a pin, used for securing halyards to sails and many other tasks.

Spreaders: metal struts placed in pairs on the mast, with their outermost end connected to the shrouds, providing support to the middle of the mast.

Starboard: the right-hand side of the boat looking forward.

Stern: the back of the boat.

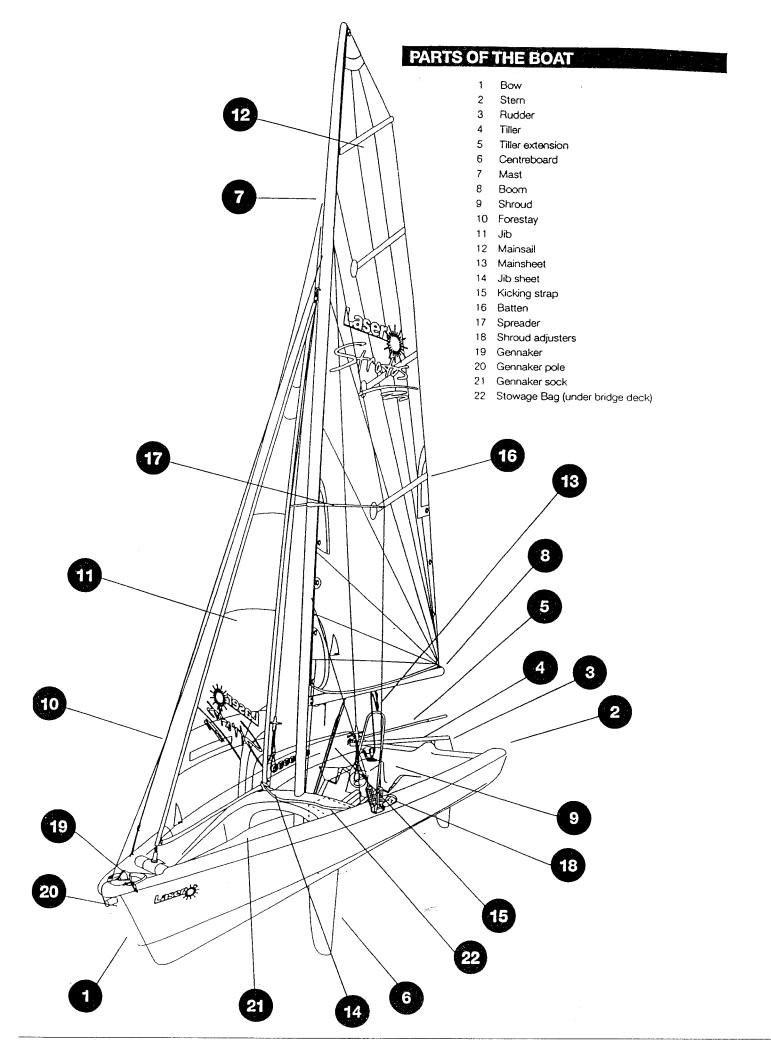
Tack: the lower foremost corner of a sail: also, to turn through the wind until the sails fill on the other side of the boat.

Tiller: a length of aluminum or wood inserted into the rudder head.

**Tiller extension:** a length of aluminum or wood connected to the end of the tiller by a universal joint, allowing the helm to steer whilst leaning out.

**Transom:** the flat area across the back of the boat from which the rudder is hung.

Windward: the side of the boat opposite to which the mainsail is set during sail, which is nearest to the direction from which the wind is blowing.

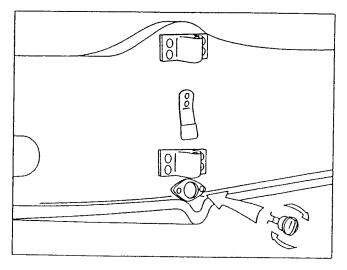


# **UNWRAPPING YOUR NEW BOAT**

Remove all securing straps.

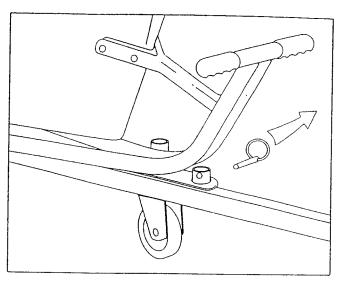
Remove the spars (mast and boom).

Secure the bung in the transom drain hole and secure all hatches.



# REMOVING FROM THE TRAILER

Release the trolley from the road base by releasing the pin shown and carefully slide the boat and trolley backwards off the road base, which should be held securely, by hand or by remaining fixed to the tow bar of a car.



# **UNPACKING THE PARTS**

Your Laser Stratos is supplied with the following parts:

77100 Hull, complete with centreboard (22492) already rigged with the ropes you will require to sail.

In addition the is a rope pack containing mainsheet, jibsheet and gennaker sheet, which may be taped to the mast bridge deck.

77300 Mast

77360 Boom

77210 Rudder blade, rudder head and tiller assembly

77400 Mainsail

77420 Jib

in a single bag

77430 Gennaker, packed in a polybag

Sai numbers, in an envelope

Owners Manual

This Rigging Manual

Also required:

PVC tape, to cover sharp objects that may catch the sails

# **OPTIONS**

77301 Trapeze Kit

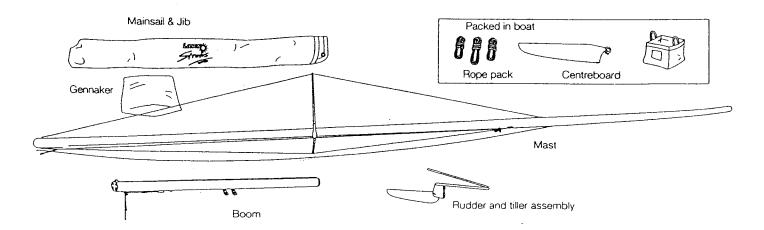
77121 Gunwale Fendering

77600 Top Cover

77602 Under Cover

77646 Jockey Wheel with handle

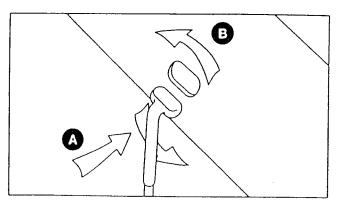
77647 Ratcheted Winch for hoisting boat onto trailer



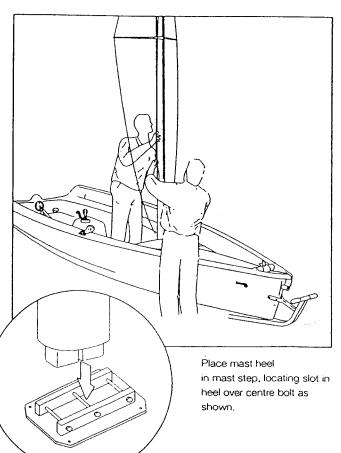
## STEPPING THE MAST

1 Unwrap the mast completely and lay it on the ground next to the boat.
Trapeze wire option

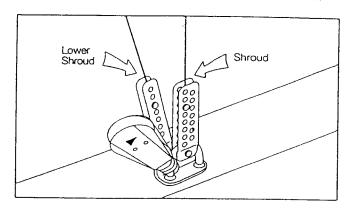
If you have purchased the optional Trapeze wires, insert the t-terminal from each wire into the sockets on each side of the mast, above the hounds. To insert the t-terminal, turn it one quarter of a turn, A insert it into the socket in the mast, It turn it back to the correct orientation. It will now be hooked securely into the mast.



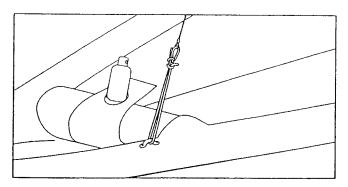
- 2 Danger: Before raising the mast ensure that your Laser Stratos is clear of any overhead cables or other obstructions. Contact with the mast could be fatal.
- 3 Two people will be required to raise the mast. One person should hold the mast heel firmly in place with their foot whilst the other person lifts the mast from the middle, and pivots it up over the mast heel. One person should then hold the mast upright whilst the other gets into the boat (don't walk too far back in the boat or it will tip backwards on its trolley.) The mast gate should be opened, and then the mast should be passed to the person in the boat and the slot in the mast heel should be located over the bolt through the centre of the mast step.



- 4 The mast gate can then be closed.
- 5 Attach the lower end of the shrouds to the shroud adjuster plates with the pin already inserted. The third hole down at the front is a good starting point. The lower shrouds are designed to restrict forward bend in the lower third of the mast. The should be attached and set on the third hold down as a mid range setting. Tighten a hole or two for light winds, and loosen one or two holes in windier weather.



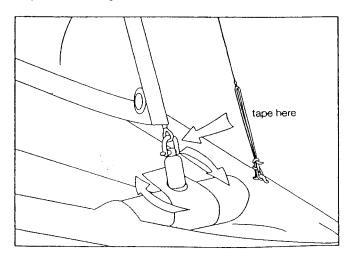
6 The person in the boat can then hold the mast steady, whilst their helper takes the forestay to the bow of the boat and ties it to the fixing shown. The elastic can then also the attached under tension to the same fitting (not shown, for clarity.)



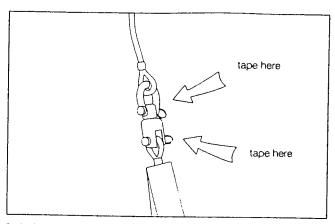
## RIGGING THE SAILS

**Important:** Ensure the boat is head to wind before proceeding with attaching and hoisting any of the sails.

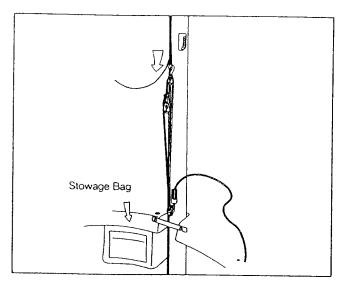
7 Ensuring that the furling line is free and uncleated, turn the furling drum on the bow of the Laser Stratos anticlockwise until this line is tight. You may then attach the jib tack to the furling drum with the shackle provided and tape over the shackle pin to prevent the gennaker catching.



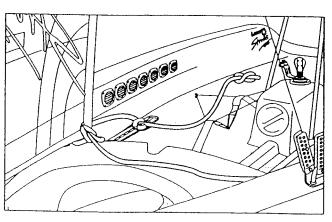
8 Attach the jib halyard and swivel to the head of the jib and cover the split rings and the wire loop with tape.



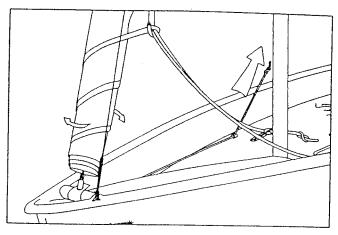
9 Hoist the jib, until you can hook the jib tensioner onto the wire loop in the tail of the jib halyard where it emerges from the mast. Ensure that the rope tail of the halyard is not trapped between the hook and the wire before applying tension. The halyard should then be tensioned until the jib luff wire and shrouds are "firm". The rope halyard tail can then be coiled neatly and placed in the stowage bag under the port fairing.



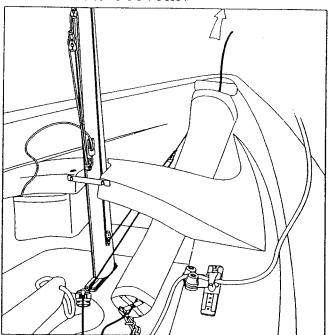
10 Attach the jibsheets to the clew of the jib, and after leading a sheet through the jib fairlead on each side of the boat, tie a figure of eight knot in the end of each.



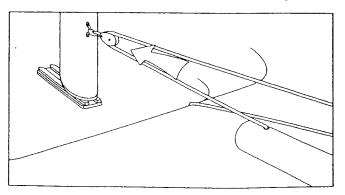
11 The jib can then be furled until you wish to go sailing. To do this, check that both of the jib sheets are free and not cleated and then pull the furling line. The jib will then twist around its luff wire keeping it out of the way while you rig the rest of the Laser Stratos.



12 Tie off the end of the gennaker halyard on the gooseneck to prevent it being pulled out of reach up the mast. You can then feed the tail of the halyard through the blocks on the boats as shown, and up through the back of the gennaker sock. You may need to tie the halyard tail to a batten or the tiller extension to enable you to reach the tail from the bow end of the sock.



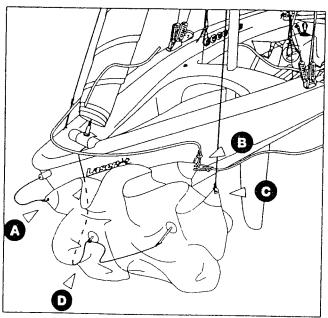
13 Clip the "flyaway pole" elastic to the inglefield clip on the front of the mast. Over time the elastic will stretch and should be tightened.



## **RIGGING THE GENNAKER**

To rig the gennaker, continue with step 14. If you are going to sail without the gennaker, you may skip to rigging hint 18.

14 Tie the tack of the gennaker to the tack line emerging from the tip of the gennaker pole. You can then attach one end of the gennaker sheet to the clew, and feed it round through the two ratchet blocks (with the arrows facing to the stern of the boat) and back outside the forestay to the gennaker clew.



- 15 Until the gennaker halyard from the eye by the gooseneck and check that it runs outside everything from the point it emerges from above the hounds on the mast. Tie it to the head of the gennaker with a bowline.
- 16 Take the end of the gennaker halyard tail where it emerges from the front of the gennaker sock and feed it under the gennaker sheet, and then through an eyelet in the lower half of the gennaker. The tail can then be tied off at the webbing loop on a patch a little way above this eyelet on the gennaker.
- 17 Pull the gennaker into the sock by pulling the gennaker halyard through the block just aft of the rear end of the sock. Take care to ensure that the gennaker does not catch on the trolley handles, or anything else in the vicinity.

If the wind is light, you can safely hoist the gennaker to check it is rigged correctly. Try pulling both gennaker sheets in to check the sail would set on both sides of the boat. The gennaker should then be carefully lowered again into its sock.

# **USING THE GENNAKER**

The gennaker on the Laser Stratos gives the boat remarkable performance downwind, but requires care in its use.

#### Hoisting the gennaker

With the boat sailing down wind, pull the gennaker halyard until the gennaker is fully up and the pole fully extended. The sheet can then be pulled in until the gennaker fills, taking care to keep it trimmed as loose as possible without it collapsing. The helm should now notice that the rudder become the power control — luff towards the wind and the power increase, bear away from the wind and it decreases.

## Gybing the gennaker

Bear away gently, keeping the gennaker sheet trimmed in, until the mainsail gybes. Immediately trim in on the new gennaker sheet.

#### Dropping the gennaker

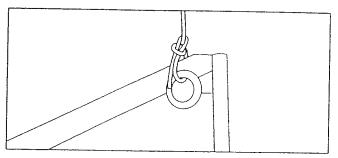
Bear away onto a run, pull in on the slack in the downhaul, pulling through the block behind the gennaker sock. Let off the halyard cleat and then swiftly pull the gennaker into the chute with the downhaul.

# **HOISTING THE MAINSAIL**

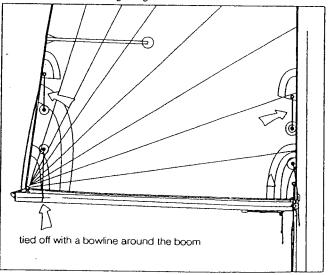
## Read this before hoisting the mainsail.

Before completing the next steps, you should consider the wind strength. If there is a strong wind blowing, you should leave hoisting the mainsail until immediately before you intend to launch. The CombiTec mainsail on the Laser Stratos is designed to make handling as easy as possible, however it is still very important to check that the boat is still head to wind before hoisting. You should also never leave the mainsheet cleated or the boat unattended whilst the mainsail is hoisted.

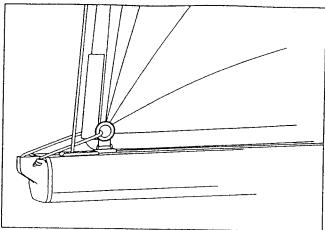
18 Attach the main halyard to the head of the mainsail with a bowline, as shown below. Before hoisting, check that the battens are securely inserted and fastened.



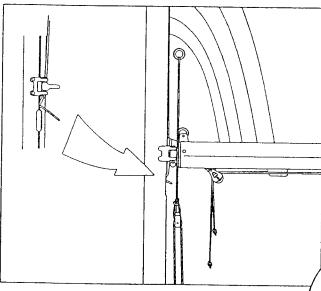
19 Hoist the mainsail until the first reefing eyelet reaches gooseneck level, then rig the reefing lines as shown, leaving plenty of stack in them. Care should be taken to ensure the lines are fed though the eyelets in the same directions at the front and back of the mainsail. Pull the main halyard until the mainsail is hoisted to the top of the mast and take up the stack on the reefing lines. The loose main halyard can be tucked into the stowage bag.



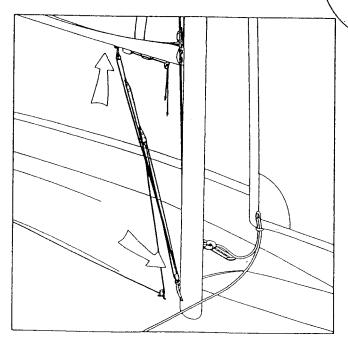
20 Attach the boom to the gooseneck fitting on the mast. Then insert the slug on the clew of the mainsail into the slot on the upper face of the boom and secire the tack with the pin. Release the outhaul at the forward end of the boom, thread the end through the clew of the main and lock into the slot on the outer end of the boom. The foot of the mainsail can now be tightened with the outhaul.



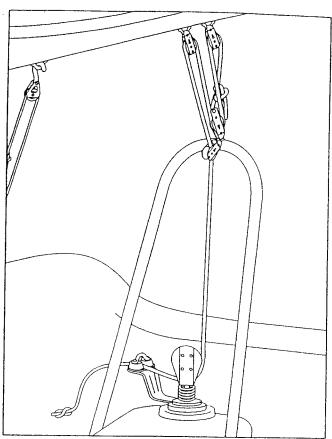
21 Feed the end of the cunningham through the eye in the luff of the mainsail. Tie a figure of eight knot in the end and secure in the slot in the mast below the gooseneck as shown.



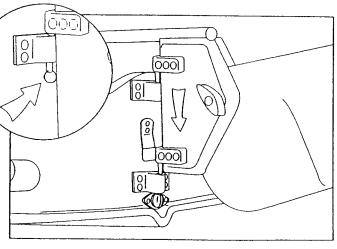
22 Shackle the bottom block of the kicking strap onto the base of the mast. After checking the lines are not twisted, hook the other end onto the eye on the boom and then.



23 Rig the mainsheet as shown below, tie a figure of eight knot in the free end.



24 Remove the clevis ring from the top pintle and attach the rudder assembly to the transom gudgeon fittings. Re-attach the clevis ring as shown on inset diagram.



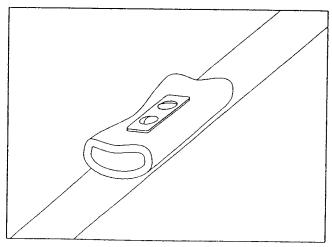
Check that the rudder retaining clip is preventing the rudder from falling off in the event of a capsize. The retaining clip is liable to damage and should be checked before every sail. Ensure that the wing nuts for the rudder stock pivot bolt are tight enough that the rudder blade will not drop down when ashore.

25 It is highly recommended that you attach the rudder with a safety lanyard to prevent any possibility of loss whilst afloat. The rudder assembly does not float.

To make a lanyard, simply tie a spare piece of rope between the rudder head and the rear toe strap fixing.

26 Whilst sailing the centreboard is operated by hand.

If during your sail you find that the centreboard will not stay down, tighten the screws on the plastic friction device after you return to the shore. This is to be found on the leading edge of the centre board within the centreboard casing.



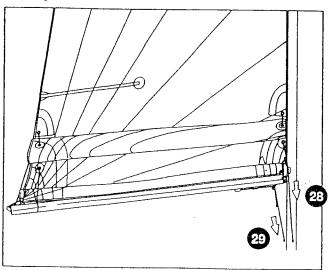
27 Check that the 4 hatch covers, cockpit bung and transom bung are securely fitted before launching the boat. When looking at the hatch covers, check that the rubber seal is in place inside the hatch.

## YOU ARE NOW READY TO LAUNCH YOUR LASER STRATOS

# REEFING THE MAINSAIL

If it is windy, and you feel that you will be overpowered in the Laser Stratos, it is wise to reef the mainsail, the "Slab Reefing" system on the Laser Stratos allows you to reef the mainsail whilst afloat if necessary, although the process will be easier to achieve on shore.

28 Slowly ease out the main halyard whilst pulling down on the forward reefing line.



29 Pull in on the aft reefing line to raise up the boom and tidy up the "slabs" of reefed main sail.

# **GENERAL MAINTENANCE & SERVICE**

#### Weekly:

- Your boat should always be tied down securely to ground fittings when not in use.
- 2 Any excess water in the hull should be drained via the transom bung.
- 3 The boat should be rested so that any water in the cockpit will drain through the cockpit bung.
- 4 Do not leave the jib hoisted and furled when the boat is not being sailed, and always drop off the tension from the jib halyard when the boat is not going to be used for an hour or so.

#### Monthly:

- Ropes and rigging should be checked periodically for wear and damage.
- 2 All moving parts such as jamming cleats and block should be lubricated lightly with WD40 or similar.
- 3 The rudder retaining strip on the transom should be checked for damage to ensure that the rudder cannot come free in the event of a capsize.

#### End of season:

- 1 At the end of each season it is a good idea to check your thoroughly for signs of damage or wear.
- 2 Damaged or worn parts should be replaced using the Laser Parts identification system.
- 3 The hull should be washed down with fresh water and a protective cover place over it.
- 4 Spars and rigging should be washed thoroughly, dried and placed in a protective area.
- 5 Sails should be thoroughly washed with fresh water, dried, checked for damage and stored in a dry place.
- 6 Road trailer and launching trolley should be washed, checked and greased where necessary.

#### Gelcoat repairs:

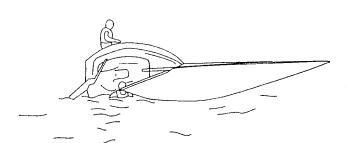
Should you damage the Gelcoat surface of your Laser Stratos you should repair it as soon as possible. Gelcoat of the correct specification and colour can be ordered through your Laser dealer.

- 1° Sand back the damaged or flaking Gelcoat until a solid area is produced. Make sure the area is clean and there are no sharp edges.
- 2º Mix the Gelcoat with approximately 2% of hardener and apply using a fine brush or similar. Cover the area with cellophane and allow to harden.
- 3 Brushes and other equipment used should be cleaned with acetone.
- 4 When hardened, carefully remove the cellophane and sand the area with wet and dry paper until it blends with the original surface.
- 5 Finally, polish the area using a fibre glass rubbing compound such as Feraclé or similar.

NB: If substantial damage is sustained to your Laser Stratos you should take it to your nearest authorised Laser Repair Centre or contact the Laser Centre at Banbury. Telephone 01295 268191.

## LASER STRATOS CAPSIZE TECHNIQUE

The unique flooding side tank system used on the Laser Stratos ensures that in the event of a capsize, the boat can be righted quickly and with minimum effort. Immediately after a capsize the tank on the lower side of the boat floods which lowers the boat into the water making it more stable and reducing the height to the centreboard for crew access to right the boat. If the boat inverts, both tanks flood making the boat easier to bring on to it's side to commence righting. The secondary effect of the side flooding tank is that immediately after righting the ballast of the water stabilises the boat and helps prevent a secondary capsize whilst the crew re-boards the boat. The system is at its most advantageous when righting from a position where the mainsail is pointing into the wind but it also helps if the sail is pointing away from the wind. After righting, the tanks drain quickly allowing the boat to recover in a fully "dry" state.



#### Righting the boat

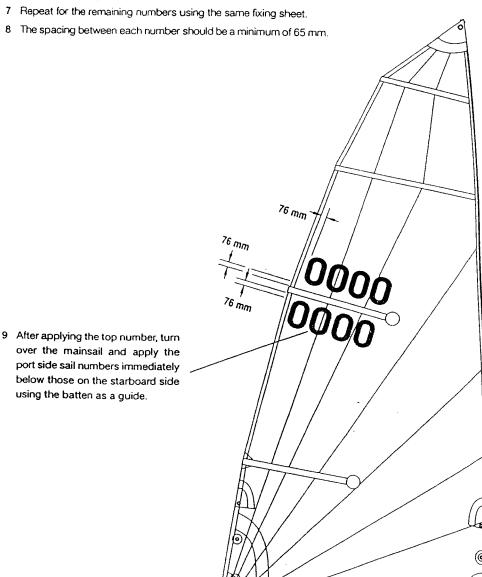
- 1 Ensure that all members of the crew are accounted for and safe.
- 2 if the asymmetric sail is deployed, fully recover the sail into the chute system. Recover any loose equipment.
- 3 Release the mainsail and jib sheets from their respective cleats. Ensure that the mainsail sheet is fully extended to avoid the boat sailing immediately after righting.
- 4 If the boat inverts, first recover the boat on to its side. The flooding ballast tank system favours the sail pointing towards the wind but the boat can be righted with the mainsail pointing into or away from the wind.
  - In adverse conditions and with more than two crew it is recommended that the largest crew member swims to the bow and holds the bow during righting and until all others have re-boarded after righting.
- 5 It is recommended to use the "scoop" recovery system for crew members not involved in the righting procedure. When the boat is on its side crew members to be "scooped" should move in a prone position to the inner lower side of the boat as close to the centre of the boat as possible. As the boat is righted these crew members will be inside the boat and ready to help others re-board. Two crew members can be "scooped" with comparative ease.
  - "Scooping" should not be attempted without practice and should only be commenced after the boat is stabilised on its side by a crew member who is securely located on the centreboard and holding on to the capsize righting line fully deployed from under the gunwale. This is to prevent the boat from inverting potentially trapping the crew.
- 6 Righting is effected by a crew member standing on the centreboard moving out towards the end of the board and leaning out whilst holding onto the righting line. The boat will recover to the upright position quickly. It should normally only require one average size person to effect righting on the centreboard.
- 7 Immediately after righting the tiller should be pushed fully towards the mainsail to stop the boat sailing until all crew have re-boarded.
- 8 Re-boarding can be undertaken over the weather side of the boat using the righting line as a step or over the transom, if you are attempting to re-board over the transom; it is recommended that a crew member in the water holds the bow to stop the boat from bearing away. If the righting lines are used then with both feet stepped on the line, first move to a crouched position then in one continuous movement rotate your heels and lower body away from the boat and extend to the standing position pushing the upper body over the gunwale. A grab rail is positioned on the lower face of the seat to assist with pulling yourself into the boat.
- 9 If the person in charge of the boat or the crew are inexperienced in capsize righting procedures it is advised to practice drills under skilled supervision and in any event, close to assistance before the drill is to be used in earnest.

All crew members should wear an approved suitable buoyancy aid at all times whilst

# SAIL NUMBER FIXING INSTRUCTIONS

Applying the numbers using the fixing sheet.

- 1 Remove the backing sheet from the clear fixing sheet.
- 2 Place the fixing sheet on a clean flat surface with the adhesive side facing upwards.
- 3 Smoothly fix a sail number fabric side downwards onto the fixing sheet.
- 4 Peel the backing paper off the sail number.
- 5 Place the number in position and smooth down well.
- 6 The less aggressive adhesive of the fixing sheet will allow this to be removed, leaving the sail number in position on the sail.



Starboard (right hand) side of Mainsail

# USING YOUR STRATOS KEEL

#### A Removing your Stratos Keel hull and trolley from the road base

- When removing the Stratos Keel and launching trolley from the road base, it is highly recommended to leave the road base hitched to your vehicle or to chock the front of the road base wheels. This is to prevent the road base shooting forwards as the boat and trolley are pushed aft. Failure to do this could lead to injury or damage.
- 2 If a winch is fitted to your trailer base. Release the ratchet. One person can control the aft movement of the boat and trolley on the winch handle, while the others push and guide the boat and trolley off the road base.

Warning: The Stratos Keel is a substantial product that requires care to avoid injury when manoeuvring on and off the water.

> Do not run aground at speed and avoid hitting solid objects with the keel.

#### B Launching your Stratos Keel

Select a launching area where there is deep enough water to float the Stratos keel off the trolley. Care must be taken to ensure that the keel passes through the gap in the trolley bunk.

#### C Lowering the Stratos Keel

#### Warning:

- The keel weighs approximately 120 kgs. and may damage the boat if dropped in an uncontrolled manner. Do not allow children or anyone of inadequate strength or experience to operate the keel mechanism without close supervision or assistance.
- Ensure that the operators and other crew members feet and fingers are well clear of the keel and operating mechanism when lowering and hoisting to avoid injury.
- · Suitable sailing shoes should always be worn when sailing to avid injury to your feet.
- Ensure that the hoist line is clear and free and that all other ropes are well clear of the hoisting mechanism. (A stray rope jammed in the keel box or hoist mechanism could be very difficult to remove).
- Ensure that the keel box and keel are free from sand, pebbles and other debris.
- Attach the hoist retaining line hook to the hoist frame.
- While holding the hoist rope securely pull the rope upwards and forward. This will uncleat the rope. Always maintain controlled tension on the rope whilst uncleated anticipating that the full weight of the keel will be controlled by the hoist rope. Never allow the keel to drop uncontrollably.
- Gently lower the keel in accordance with the water depth.
- When the keel is lowered. Secure the retaining rope/strap over the top of the keel and cleat in position. In the unlikely event of a capsize this will prevent the keel from falling back in the boat.
- The hoisting frame can now be lowered forward onto the cockpit floor.

Note: The sails are rigged and hoisted as per the standard Stratos rigging instructions.

#### D Hoisting the Stratos Keel

- Anticipate arriving in shallow water and always alow plenty of time to hoist the keel.
- Release the keel-retaining strap/rope.
- Raise the hoist frame above the keel and ensure that it is 3 fully upright.
- Attach the hoist retaining line hook to the hoist frame.
- Ensure that the keel and hoist system is free from obstruction, stray ropes and debris. Also, ensure that the genniker sheets are secured so as not to foul keel under
- While holding the hoist line firmly, progressively hoist the keel fully up and secure the rope in the cleat. For added security the rope end can be tied off onto the hoist frame.

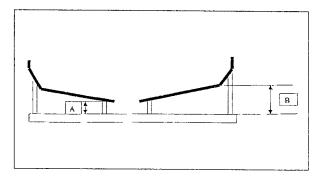
#### E Recovering Your Stratos Keel

- While one crew member holds the bow of the boat, another can lower the sail and then get the launching trolley.
- Position the troller in deep enough water so that your Stratos Keel can be floated back onto the trolley.
- Carefully guide the boat onto the trolley so that the keel passes cleanly through the gap in the trolley bunk.
- Secure the bow to the trolley and pull the boat out of the water.
- After de-rigging the boat, the boat and trolley can be pulled or winched onto the road base. It is essential the road base wheels are chocked aft or the road base must be hitched to your vehicle.
- Before trailing, lower the keel so that the weight of the keel is supported by the keel platform on the trolley.

#### Warning:

- We recommend that a trailer and road base supplied by Performance Sailcraft Europe is used, so that the keel and hull are correctly supported and to avoid damage.
- It is the owner's responsibility to maintain his trailer. The height of the trolley bunk should be adjusted and checked regularly to ensure that it is supporting the hull with the keel resting on the support platform. Also, the wheel bearing should be serviced regularly.

The following is a rough guide to the position of the troller bunk.



Dimension A = 195mm from the top of the Launching trolley axle to the underside of the trolley bunk measured by the inner face of the inner leg.

Dimension B = 280mm from the top of the launching trolley axle to the turn of the chine measured from the underside of the trolley bunk.