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WARNING ! Please read these notes on installation carefully, as defect installation and application may invalidate your warranty.

It is impossible to cover every installation and tuning situation and these notes are recommended guidelines only. Should there be any doubt regarding correct installation or assembly then contact your nearest agent immediately (list enclosed).

SPARCRAFT has been manufacturing cruising and racing yacht spars for over 30 years, supplying many of the worlds leading production and specialist boat builders.

The SPARCRAFT OCEAN range concentrate on specialised cruising sections, manufacturing from two large factories based in Europe. One of the worlds largest mast anodising baths (almost 20 mtrs - 64') is based in France, enabling mast tubes to be supplied whenever possible without spliced joints.

SPARCRAFT PERFORMANCE supply a range of performance oriented sections for cruiser/racer and racing applications.

SPARCRAFT GRAND PRIX is the custom range specially designed to the highest standard WHITBREAD or Admiral's cup racing boats to the maxi cruising yachts. Many of the sections, fitting and accessories have been continuously developed and improved, ensuring that the whole range of high performance products are designed to be practical, whether for cruising or racing. Spars and products are manufactured to be as light as possible, yet strong and reliable in the worst of weather conditions.

SPARCRAFT is committed to a fast and efficient technical service and back-up supply for parts and accessories, with agents established at key yatching centres around the world.



ONE YEAR WARRANTY

All our products enjoy a One Year Warranty against defect, or faulty workmanship.

INSTALLATION

You will need to plan your work area to allow for the width of spreaders and an adequate area at each end. Lay out a range of standard tools so that they are easily to hand. You will require vinyl tape and a sharp knife but no specialist tools are needed other than those you would normally have in your tool box.

Be careful not to cut through any messenger lines when unwrapping and use the packing material for padding. Check the spars carefully for transport damage and make sure that there are no loose fittings in the packing materials.

Check that all the messengers are in place and secured separately and fit the mast collar into place immediately.

Electrical wiring should be installed using the messenger (if not already fitted) and fit your mounting brackets for electrical equipment to the masthead (but not the equipment). Lighting can be checked with a 12 volt battery if required.



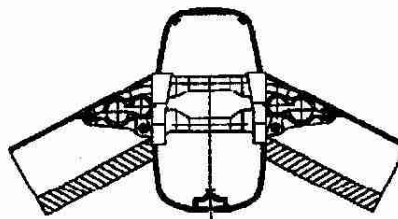
Shell Terminal

SPREADERS

Identify all the standing rigging, main, intermediate, forestay, backstay, etc. and fit them to the mast. They will be one of 4 types.

Swaged Eye Into External Tang. Fit pin and secure with split pin, ensure that the pin is taped over to stop rigging and sails catching on the split pin.

Shell Terminal. The shell terminal will be fitted to the shroud. To fit simply manoeuvre the shell through the hole in the mast wall. If you wish you can tape the shroud in position around the mast to ensure that there is no movement of the shell during the stepping procedure. Once the mast is in place the shells are securely held in place by the rigging tension.



Sparcraft Performance Spreader Bracket

On SPARCRAFT OCEAN masts with cast spreader brackets, drop the shrouds through the relevant holes in the spreaders - they will be held captive by the rigging tension. Ensure there is a stainless steel cup fitted between the stemball and the spreader bracket.

With double spreader rigs fit the cap shroud in the forward hole of the spreader and the intermediate in the aft hole.

Through Bar Spreader Fittings On Sparcraft Performance Spans. Push the stemball through the larger hole in the spreader bar then locate it on the seat provided. Follow the instruction provided. ①

T Terminal. Offer up to the T Terminal seat at a 90°C angle to allow the T to enter its seat, then swing through 90°C to secure it. Fit rubber stopper or stainless retaining plate to avoid accidental release of T Terminal (especially important with running backstays). Continued overleaf:

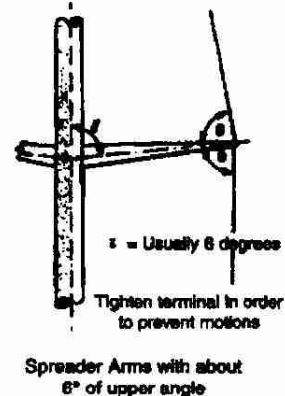
Next fit the spreaders using the pins provided and tape over the whole assembly to stop ropes or sails snagging the spreader pins. Secure the rigging to the spreaders with the cap shrouds at the front and intermediate shrouds at the back of the spreader tip fitting.

Make sure that when the mast is stepped the spreaders have a slight angle upwards to ensure the proper transfer of load from the shroud through the spreader to the mast.

Again make certain that the cup washers are in the stemball rigging seats where fitted, and that the mast collar is fitted if the mast is keel stepped. Check that the turnbuckles can be fully adjusted and that the threads are not damaged. These should be lubricated with WD 40 or similar.

All the running rigging should be fitted using the messenger lines, which should be tied and taped to the new halyards. Finish installation with "figure of eight" knots on the halyard ends.

Prepare for stepping by tying all rigging loosely to the lower part of the mast, except the forestay (furling jib) which should be loose, ready to attach when the mast is hoisted.



MAST FITTINGS

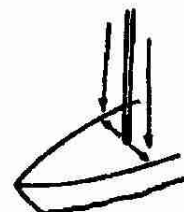
It is convenient to install the wind indicator and instrument sensors whilst the mast is on the Quay. If your appointed crane driver is experienced it is unlikely to be damaged, but the safest way is to fit the masthead instrumentation after the mast is stepped.

MAST POSITIONING

Before stepping it is wise to check that the mast step is centrally fitted along the centreline of the boat as any inaccuracy can create mast tuning problems.

Check the chainplate deck fittings to be sure that the turnbuckles are compatible in pin size, width and clearance.

If you are stepping a mast to the keel then measure the distance from step to deck and check this against the "bury", the distance between the mast base and deck point. This should ensure that there are no embarrassing moments when the mast is offered into place.

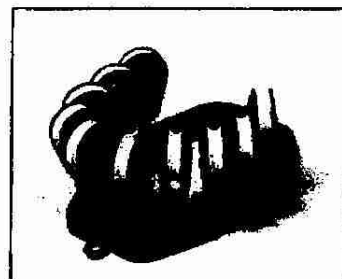


MAST LIFTING

Before stepping, make sure that there is a clear run for electrical wires.

When hoisting by crane, it is best to rely on experienced staff who regularly step masts as they are aware of the loads and wind effect involved. The mast should be lifted with a soft stop at, or just above the centre of gravity. The stop must be secured so that it cannot slip upwards. The heel can then be swung into position.

Secure the forestay and cap shrouds, steadying if necessary with the halyards. Once the mast is secure, the stop can be removed and you can start on the important task of rig tensioning.



Mast Step and Halyard Sheaves

The top of the mast must be vertical in the yacht, so use the main halyard and measure carefully to a fixed point on each side of the yacht. Hand tighten the cap shrouds to centre the mast.

The shrouds can now be tensioned by adjusting each turnbuckle in turn by approximately 3 turns at a time per side. The mast stays in alignment as the tension is increased.

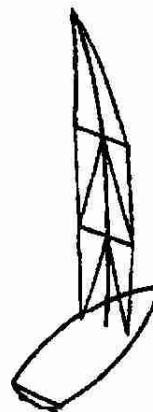
The forestay and backstay should be tightened to about the same tension as the upper shrouds, allowing for approximately 1° to 1.5° of aft rake. This rake will improve upwind performance and allow the rig to set in the correct position when the sails are set. For a 10 metre mast, the top needs to be set aft by approximately 200 mm.

Mast rake will also contribute to the weather or lee helm affect on your yacht. Increasing the rake aft will increase helm and vice versa. Some weather helm, when sailing is desirable for best performance and control.

If you have a double spreader rig then tension the intermediates next. These should be tensioned slightly looser than the cap shrouds to allow for natural mast bend and stretch from the shroud.

Check the alignment of the mast by regularly sighting up the rear sail track. When you are confident that the mast looks correct so far, proceed with the tensioning of fore and aft lower shrouds, or lower shrouds and inner forestay.

Certain classes may have specific measurement and tuning information which can be used as a supplement to these guidance notes.



SPREADER RIG

with spreaders raked aft

Aft raked spreaders support the mast sideways and additionally fore and aft. When the tension is increased the spreaders drive the mast forward creating pre-bend. It is essential to work carefully stage by stage to achieve the correct rake, pre-bend and tension.

Start with the cap shrouds, centring the mast in the yacht (see how to centre the mast in the "Tensioning the Masthead Rig" section). Adjust rake with the forestay and then tension the backstay to induce mast bend. Work from the top tensioning each cap shroud about two turns at a time, followed by the lower shrouds and intermediates. Return to the caps and repeat the exercise until the mast is under the required tension. The required tension won't be known exactly until you go out sailing, but each shroud should be fairly snug (see Masthead Rig Tuning for Safety & Performance).

Check regularly for vertical alignment along the sail track.



SPREADER RIG

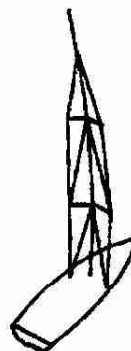
with spreaders raked aft

Adjust the forestay to get the required amount of rake. Then each cap shroud should be tightened by two or three turns to increase tension, checking that the mast stays vertical. As tension is increased this will drive the mast forward, creating pre-bend.

If fitted, tighten the intermediates and lower shrouds which will reduce pre-bend. Some pre-bend is however desirable, so leave about 6-7 cms set. At this point the caps, lower shrouds and intermediates should be tight.

Backstays are the last adjustment to make, as they tension against the other rigging. When the spreader angle is about 15° or less then more tension is required in the backstay to support the mast correctly aft.

When large angle spreaders are fitted (more than 15°), they will also support the mast, so the backstay do not have to be tightened so much.



For keel stepped masts, the mast should be standing centrally in the deck hole and tie rods between deck and mast may have to be fitted and tensioned. When this is complete, mast chocks (either rubber or wood) can be firmly knocked into position to secure the mast both sideways and fore/aft. Now your boom and other equipment can be fitted into place and sail trials started.

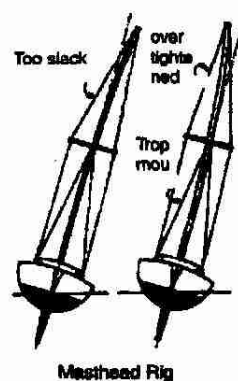


MASTEAD TUNING

You have now completed as much as possible by "dock tuning" the mast. If it is out of column then go over the procedure again, starting from the caps. Now plan to tune the rigging on the water!

On your first sail trials take a crew with you then can sail the boat whilst you concentrate on adjustments. Choose flat water with no more than a force 3 wind. Sailing to windward check up the mast track for alignment which should be straight. Make adjustment to the leeward shroud which should be under very little load, then track the boat to adjust the other side.

With the sails up it is useful to mark the halyards in their sailing position with an indelible pen or twine.

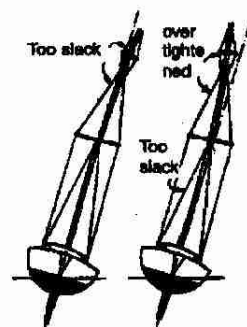


Masthead Rig

MASTEAD TUNING for Safety & Performance

Systematically alter each shroud, working from the top set, keeping the number of turns the same from side to side. Adjustments should be carried out on the leeward side where pressure is slack or reduced. Check the reaction before proceeding. With increasing pressure on the sailplan (about 20% of heel) the leeward shrouds and intermediates should just begin to slacken.

The forestay can be finally adjusted for the correct amount of rake.

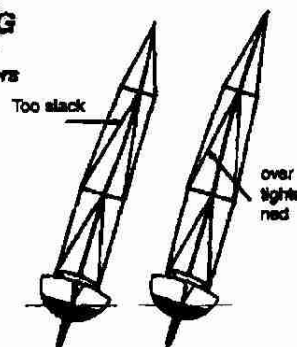


Fractional Single Spreader Rig

MASTEAD TUNING with aft facing spreaders

This type of configuration requires increased shroud tension to ensure that the rig does not go slack. It is important to keep these masts relatively straight as this will provide best performance. Too much bend will cause rigging to slacken with an associated reduction in performance. As before, adjust the leeward shroud whilst it is not under pressure.

CAUTION : If standing backstays are fitted they should be used to carefully trim the topmast to improve upper sail shape and reduce mast panting in waves. If it is overtightened the backstay could induce too much bend allowing the shrouds to go slack.



Fractional Single Spreader Rig

MASTEAD TUNING with in-line spreaders

The in-line fractional spreader configuration should be set up as for the masthead rig, the only difference being the addition of running backstay to tension the forestay. More mast bend can be expected and the sailmaker will cut the mainsail accordingly. The mast should always be set up with some fore/aft bend as these masts can invert, particularly in stronger winds.

More experienced crew handling is required to control both tacks and gybes. If the runners are not made up in time after a gybe there will be nothing to stop the whole rig falling over the bow. When tacking keep some tension on the mainsheet as this should hold the mast in position if runners are not secured.

CAUTION : The checkstays allow you to trim the exact amount of fore/aft mast bend around the middle section. Over tightening them relative to the running backstay could cause a mast inversion!



SAFETY CHECKS

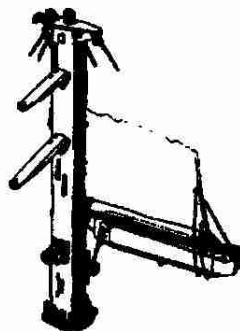
At the completion of every stage remember to fit and open split pins, to lock the rigging to the yacht. When you have completed tuning it is advisable to seal these pins with tape so that they cannot catch sails or fall out.

REEFING

As the wind increases in your sails you need to progressively flatten them to reduce power. This can be achieved by ensuring that halyards are tight (with no sail wrinkles along the luff) and that the clew of the main is at maximum out position.

If you then still have too much pressure the sail area has to be reduced, either by changing sails or reefing. Modern systems are now so efficient that with a little practice on the system, it is straightforward to reef sails, even shorthanded in strong wind.

You will probably need to re-adjust the leech line. Tension it just enough to stop the leech flapping and remember to release it when you shake out the reef.



HOW TO REEFING

Before you leave the dock, the reefing lines should be rigged. It is very difficult to do this later, often when you may need to, on a rolling or sloping deck with the boom end over the water. Your boom is fitted with all the equipment for reefing. Reef lines should be loaded so that they pull the new clew down to the boom track and aft, to flatten the sail. When reefing ease the boom vang. Ease the halyard and the luff on the sail will fall. Hook on the required tack cringle to the boom reef hooks and re-tension the luff.

Now tighten the reef line by turning it around a winch. Use the locking lever at the forward end of the boom to secure the reefing line. Sheet the mainsail and re-adjust the boom vang.

Shaking out reefs is just as easy. Just reverse the process, but watch out for the outer end of the boom falling and swinging into the cockpit. For single line reefing, see separate details.

SINGLE LINE REEFING

With SPARCRAFT's automatic reefing boom system, one sailor working from the cockpit can reef a sail in under 30 seconds by tensioning one of the reef lines and easing the main halyard. The tension on the other lines is automatically adjusted and sail reduction can be as much as 75%.

This system offers outstanding efficiency and safety for short handed or single handed sailing.



LAZYJACK SYSTEM

A lazyjack system can be fitted to collect the sail when it is reefed or lowered. This is particularly useful for fully battened sails. You may need to check that the lines do not foul the batten ends when hoisting.

BOOM VANG

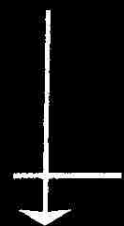
The boom vang is a powerful sail control and should always be used with care. It tensions the leech of the sail and will improve sail shape on the wind and when running. In stronger winds the correct vang tension will stop the leech from twisting and creating a rolling motion downwind with light winds, it is easing the mainsail leech and replace boom topping list.

It is always a good practice when bearing away in windy conditions to ease the boom vang, in order to avoid overloading which can cause loss of control or damage to the boom.



SPINNAKER POLE

Good crew preparation will make spinnaker setting easy. Plan who will do what jobs, including spinnaker halyard, guy and sheet. Launch and set the spinnaker as quickly as possible to reduce handling problems. Always take care when setting the pole, making sure that it is steadied by both a pole uphaul (to support the weight) and downhaul (to stop the pole skying).



SAIL SETTING

For best performance your sails need to be set correctly, achieving an aerofol shape with the correct amount of depth (draft). It is important for adjustments to be made for differing wind conditions.

Start by tightening (or slackening) the luff of both mainsail and genoa so that wrinkles just disappear when sailing to windward, as any slackness will make the sail full, reducing pointing ability. Make sure that the foot is adjusted correctly for the conditions. In light winds your sails need to be more powerful, so some foot fullness is required in the mainsail. Do not oversheet the genoa. In stronger winds (when the boat is heeling) reduce mainsail power by securing the foot very tightly. This will reduce the fullness throughout the whole mainsail area. The genoa can be sheeted harder. The sheeting position for the genoa should be moved progressively aft as the wind increases. This will open the upper leech, reducing pressure mainsail backwinding and heel.

When sailing downwind, trim the leech of the mainsail so that there is some twist, but not too much. Downwind rolling can start when the wind is strong and the leech is too far open.

Always be ready to reef the mainsail, or reduce genoa area if the weather is getting worse. In strong conditions, all sails need to be as flat as possible to reduce power and heel. Remember to adjust the leech lines. Left flapping, the material will shatter and remain slack. If left tight, the leech will hook and probably stretch.

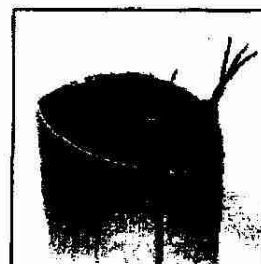
Different sailmakers use various techniques in achieving the desired sail shapes for particular boats. Consult your local sailmaker for the ideal settings for your sails.

CORROSION

Masthead cables are fitted to all new masts, via a plastic conduit tube. These exit at the masthead, heel and at half height, ready for installation of lighting or other equipment.

Check that there is no damage to the outer PVC cover before installation. It is especially important because any electrical discharge can create corrosion, particularly around fittings.

We recommend that all electrical work is carried out by experienced specialists who are familiar with the problems relating to salt corrosion and electrical discharge.



HAARDS

When changing or checking halyards always load a messenger line through the mast and sheaves. If halyards are jamming, check if it is twisted with others. A new messenger line can be dropped to clear twists, if required.

MAINTENANCE

Regular maintenance will ensure that your spars remain trouble free and safe. At the beginning of the season, all moving parts (sheaves, gooseneck, cleats, boom vang, etc.) should be cleaned and lubricated. Check also for signs of stress cracks around joins, or halyard exits. The anodised spars can be polished if required to protect them from staining.

Regularly wash the spars and fittings, preferably with hot soapy water to remove salt and grime. Make sure that all sharp edges are fully taped for protection. At the end of the season thoroughly wash, and lubricate fittings to ensure that they do not corrode during the winter. Secure all rigging away from the surface of the spars as there could be corrosion between the different metals, or chafe caused by the wind.

FASTENINGS

Chemical corrosion can take place between alloy and stainless, so it is very important to introduce a chemical barrier between spars and fittings. Corrosion will take place under the fitting often where it cannot be seen so use a zinc chromate paste, silicone or butyl rubber layer for any new fitting.

When using fastening, stainless screws are strong but check for corrosion regularly. Cut them to the correct bury length otherwise they may snag or damage halyards. Monel rivets are strong, with less possibility of chemical reaction with the alloy.

When drilling, take care not to drill into the electrical conduit.

It will be necessary to work aloft at times to carry out maintenance. If you are unhappy aloft get a crew member who is experienced to undertake the work. Don't put off the work!

Check your equipment, starting with the Bosun's Chair and halyard. You will need to be comfortable aloft otherwise it will be difficult to concentrate. The halyard must be in good condition particularly around the sheave and top three feet. A second halyard must always be connected for safety. Never rely on snap shackles as these can snag and release. Use a deep bag for your tools, remembering that any tool dropped may injure someone below, or the deck. A messenger line can be useful for longer jobs, enabling tools to be raised and lowered. Use an experienced assistant who is familiar with winches. Climb with your feet and hands as your assistant winches with at least three turns around the drum. This is faster and more efficient. Make sure that your assistant makes off the halyard end to a secure cleat, or ties it off around a winch. Trim your height so that you can work efficiently and tie yourself to the mast with a short line to lock yourself in position.

Your assistant should follow your progress, warning of passing waves which magnify the yacht's movement at mast height. Instructions should be shouted clearly. When lowering, make sure that the halyard tail is clear and ease the halyard around the winch drum. It is important to have a good footing and to be watching the person up the mast. The safest and most comfortable way down is slowly and smoothly.



FURLING MASTS

Hand operated SPARCRAFT furling masts use exclusively furling systems equipped with endless screws. This system is the only one allowing for a safe guidance of the furling control while avoiding overfurling, and also it is the only one which may be operated by a single person (two hands control).

The diameter of the endless screws has been optimized in order to reduce furling stress under load. They are made out of anodized aluminium and fitted on stainless steel roller bearings with a special protection.

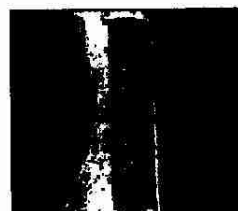
The surface treatment of the furling cavity is the same as the one applied to the mast (anodization or painting) in order to prevent any rusting which might in the long term stain the sail and damage the mast.

The furling rod is left floating within the cavity, with no interior tensioning cable. With this type of assembly there is no increase in the compression inside the profile (and thus a weight decrease) and a guarantee for a perfectly smooth furling.

The furling rod diameter is much larger than the sail's clearance in the mast profile and therefore can in no way get blocked or ejected.

The swivel block's upper part is fitted to the mainsail halyard and its lower side receives the mainsail. The swivel block acts as guide for the furling rod in the upper section. It is possible to remove it from the furling mast for maintenance purposes.

The furling control sheet is rolled onto the endless screw in the plant. It is easy to replace (refer to maintenance instructions).



SPECIFIC FEATURES

A furling mast comprises two cavities, forward the mast portion with all its components and aft a fairing protecting the furling system and the mainsail.

No camber shall be introduced during tuning of the furling mast. However it may be fitted with a slight rake in order to grant smooth steering. Because of the mainsail reduced surface, a yacht equipped with a furling mast is always easier to steer than one equipped with a standard mast carrying a larger sail surface.

MAST SETTING

The preparation and installation operations regarding a furling mast are the same as for standard masts. However, as the aft part of the mast is open, it is important not to exert any overpressure on it during lifting, in order to avoid distortions. The best trick to prevent this is to introduce a wooden wedge into the cavity at the level of the sling. The wedge will be removed once the mast is secured by the rigging.

SAIL INSTALLATION

The mainsail is installed only once the mast has been tuned and the boom set in place. The mainsail halyard is attached to the swivel block, the sail headboard is then rigged on the swivel lower shackle. The mainsail is then set carefully while guiding the halyard at the level of the rod trap.

Once the mainsail is almost fully hoisted absolutely before sweating it up it is necessary to rig the tack to the mast (furler nose). Once the tack has been fixed to the furler's nose, the mainsail shall be pulled out until a slight vertical fold appears along the rod.

The foot of the sail shall be inserted through the outhaul carriage then through the clew pulley before being returned and fastened on the outhaul traveller (ball traveller). The mainsail may then be pulled out on the boom.



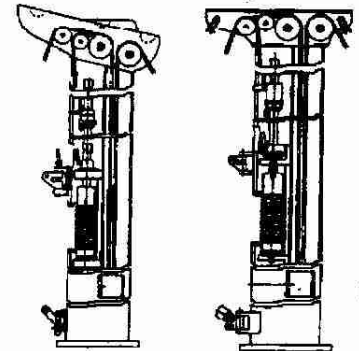
FURLING OPERATION

The mainsail is now set. Before furling, make sure that the boom is positioned slightly over the horizontal plane by means of the rigid downhaul or by the topping lift.

- 1 Ease out the mainsail sheet
- 2 Hold the furling control and while paying out, carefully control the foot tightness
- 3 Once you have rolled in the mainsail surface you wanted, secure the furling control and pull out the foot.
- 4 Ease out the boom topping lift and tune

the boom downhaul so that the mainsail leech is taut.

It is necessary to check on the furling along with the foot pulling out in order to make sure that the sail is properly rolled on the furling profile.



UNFURLING OPERATION

As for the furling, the boom has to be placed slightly higher than the horizontal plane by means of the rigid topping lift or the boom downhaul.

- 1 Keep the boat facing the wind, with the mainsail sheet eased out
- 2 Hold the foot outhaul while checking on the unfurling process of the furling control
- 3 Once you have unfurled the planned surface, secure the

furling control and pull out the foot

- 4 Trim the downhaul so that the mainsail leech is taut.
- 5 Bear away and sheet in the mainsail.

Never let the sail unfurl freely without checking the furling control, as this could damage the system.

MAINTENANCE

The maintenance of a furling mast is the same as for a standard mast, but some of the mechanical parts require a yearly verification. The mainsail has to be taken out once a year. At this time the halyard swivel and the endless screw will be checked. Halyard swivel. The adequate rotation of this part will be checked once a year. There shall be no hard point during rotation. Rinsing the part is sufficient. If you need to remove the swivel, unlock the furler's nose and lift the rod to have the swivel slide out of the furling cavity. On some models, the rod will be first pushed to the side before being lifted. The furling control sheet is made out of 10 or 12 m pre stretched double braid depending on the mast type. Changing this control is very easy.

Endless screw: Hardly any maintenance is required for the endless screw. Once a year check that it rotates correctly. Should it block, return it to a SPARCRAFT agent for examination.

FURLING CONTROL LINE REPLACEMENT

- 1 Remove the sail
- 2 Fully unroll the control from the endless screw.
- 3 Loosen the furling control locking screw on the endless screw
- 4 Remove the furling control from its housing
- 5 Install the new control and make sure that it is flush, but not sticking out.
- 6 Lock the new control with the locking screw.
- 7 Proceed with rotating the endless screw with the number of rotations required to roll in the new furling control
- 8 Re-set the mainsail.

ELECTRIC/HYDRAULIC EQUIPMENT

Some of the SPARCRAFT furling masts are equipped with electric or hydraulic engines. The operating principle is the same as for manual furlers. Though efforts are not felt during operation, the recommendations given in these instructions apply in the same way.

When operating with an engine, make sure that you never come to stop against the downhaul traveller when furling or unfurling. This may damage the furling system.

It is also important to check that the boom is in a right position during these operations. With a boom too low, the leech is going to be under stress and this will result in large folds in the sail lower

