Laser 4000 'Tweaking Tips'

1 Background

This document is aimed to be a guide to a number of the tweaks you can do to a Laser 4000 to make the boat easier to setup and sail. By reducing the potential for screwups you will improve your boat handling and naturally be faster round the corners. To be frank it's really nothing more than distilled wisdom from the chat page, together with the views of some members of the fleet.

However we've also tried to prioritise the order in which jobs are done, so that you can concentrate on fixing the major issues first – the earlier the item appears in this document the higher the priority to fix it!

2 The Biggies

2.1 Trapeze Handles, Rings & Ropes

Without doubt the most important change to make on a "laser standard" 4000. Given that the majority of owners tend to be helms, this change certainly helps to keep the crew happy and thus the boat faster.

If you still have the really nasty blue 'T-handles' on the trap wires (as supplied) then you will be slow mainly because the standard wire length is far too long to allow the crew to 'trapeze up' enough in medium winds or going downwind.

- Cut the wire down in length to a distance of between 3700-3900mm from the T-Terminal
- Fit a hard eye in the free end of the wire
- Use a piece of rope to join the wire to the top of the clamcleat, with a disc or similar for a handle. No need to replace the clamcleat with the Holt trapeze specific (as photo) but some people do. Whilst handles are personal taste, these ones reduce potential crews teeth damage and are very easy to use.
- Additionally if you are sailing with different crews, it's fairly easy to adjust the "upper rope" appropriately.

Additionally it's worth replacing the standard trapeze ring with a 'wider mouth' one as per the photo below as this makes hooking in / out easier – not to mention doing the "stuff the bungee through the eye routine everytime we go sailing"

2.2 The Foils

Due to the foil design they tend to vibrate when planning and apart from making it too noisy to chat too the crew, slows you down.

- Grab a sanding block and some 400 grit wet and dry.
- Mark a line on the foil with a pencil 70mm from the trailing edge
- Proceed to wet sand the sides of the foil from trailing edge inwards upto the line so that you get a sharper edge and remove the white paint back to the underlying high density foam
- When finished run down the trailing edge vertically with the block so that it's slightly squarer rather than a true "v", this reduces potential for damage.

The photos give examples of foils that have been somewhat finished.

2.3 Rudder retainer

If you have one of the new 'black' rudder stocks then make sure you fit (if required) and use the retaining clip through the top pintle. When you capsize and invert the rudder will fall off if not attached and they don't float. If you have an older "silver" stock then you can't use a clip, and most people just tie bungee tightly round the tiller tuber and top pintle as a solution.

2.4 Pins & Rings

On the shrouds it's permissible only to use standard "pin and rings" whereas on the lowers its' possible to use fast pins. If you don't have fast pins then you should fit them, either the cheap ("just pull") versions or the expensive ones.

Once you start getting used to sailing the boat you'll want to experiment with playing around with the rig settings, and it's really useful to be able to adjust the shrouds whilst out on the water. The problem is if you drop the pin over the side you might lose the rig. The solution to this is to use two pins at once, one above the other on either the back or front set of holes, as they will both fit through the eye in the standard shrouds.

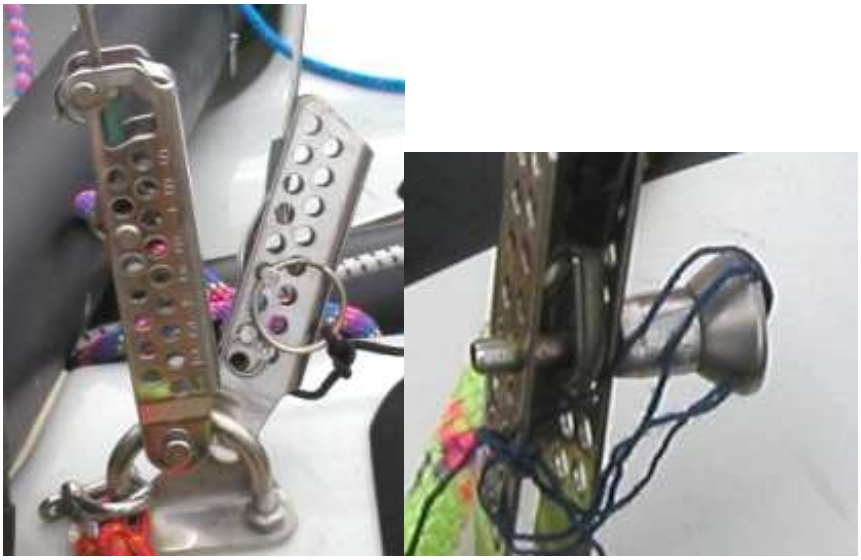
More rake needed: -

- Heave too, Drop the jib tension off until the top of the tensioner tackle is about three inches below the gooseneck
- Take out the upper pin, pull shroud down and place pin in the next hole down.
- Adjust lower whilst you're there (if needed)
- Rig tension back on (for safety), tack and repeat.

If you want less rake then just move the pins up (QED). It's also worth taking an extra couple of pins and rings each side, stuffing them through the bottom of the adjuster and taping them

up. Then if you drop the “second” pin over the side you have a replacement close too the job in hand!

Of course if you want to splash out, then change the standard shroud plates for one of these fancy ones in the photo on the left below, which achieves the same captive effect. Note though that they use the cheaper “pull pins” on the lowers compared to the true fast pins as in the photo on the right that are about 25 quid each.



2.5 Spinnaker bits.

Getting it up (well the kite anyway) is a key component of speed “around the track” as well as managing decent drops and gybes. Detailed below are a number of points that definitely seem to help.

Kite Sheet Attachments

There are a number of different ways of doing this that are legal under the rules, including a shackle or using bowlines in the end of the kite sheets – however a favoured system is to take a loop of rope at the midpoint of the sheet and stuff it through the clew of the sail. Make sure that when you run the ends of the sheets through the ratchet blocks, you knot them together and then tape that up. This method has a couple of advantages:-

- Less chance of catching on the jib luff when gibing
- Easy to undo a sheet, if you’ve screwed up rigging it up!

Bobbles and Bungee!

Take a piece of 5 mm rope, and tie it in a clovehitch at the outboard end of the spinnaker pole, approximately 5 cm in from the end of the pole. Cover this rope with tape, and then when the pole is retracted there's little danger of it disappearing up under the kite sock.

Note the bobble near the end of the kite tack line, this helps prevent any danger of the knot pulling into the end of the pole. It's important to make sure that they tack of the kite is pretty close to the end of the pole (especially when it's windy). A number of people leave to big a loop in the end of there tack line. On the halyard put a booble about 5cms above the bowline for the head of the kite. This helps to keep the sail out from the mast and set better.

As to bungee well there's a couple of useful bits.

- Attach bungee round the base of the cleat and around the corrector weights retainer pole. This helps stop the swivel jammer from spinning around the wrong way. Note in the photo that the plastic fairlead has been replaced with a metal one, as if the crew hoists from this fitting they will soon burn out the plastic one.

- Tie a bowline in bungee around the centre of the wing wang lines and lead thru the centre toestrap fitting and out to a rack. This helps from getting the wing-wangs twisted up forwards, either around their cleats or around the mainsheet fitting.

Turning block spring

Perhaps a trivial point, but the standard spring is too rigid and prevents the halyard block from turning easily. By rotating the spring round, as in the photo, you can reduce the effective "springyness" and thus make the turn block rotate more easily. A number of people have replaced the standard spring with a softer one altogether.

Lube me up!

The last one and one that needs repeating before every major event is to get busy with the lubrication. Prior to fitting the kite, pull the spinnaker sock inside out through it's mouth and then spray "McLube" or similar all over the inside of the sock. Additionally it's worth spraying along the pole to help that slide in and out.

2.6 Righting Lines

However good you are, it's definitely worth fitting righting lines – yes they sound lame, but they really help getting the boat up from a capsize, especially if its wavey. I capsized on the first beat in Garda, and managed to only loose about three places because I'd fitted righting lines.

- Get a bit of 5 mm spectra approx ?m in length
- Tie on end of around the bar under the spinnaker sock where the wing wang lines are dead-ender
- Run the other end to the eye on the gunwhale where the kicker/cunningham lines are dead ended (note, not on the rack!)
- If the boat is on the trolley then make sure that there's enough slack in the line so that it reaches the floor fairly readily – this should make sure theres enough slack so that it's actually useful when upside down
- Tie a bowline in a length of shockcord around the righting line and tie the other end up around the after rack attachment. Some people tie a plastic hard eye into the bowline to reduce friction. The shockcord should be the right length to take all the slack out of the righting line
- Remember to use them when you do capsize!

3 Other Interesting Changes

3.1 Mainsheet Blocks & Systems

Mainsheet systems are one of the most fiddled with systems on the 4000. This is probably as its' one of the most unrestricted things on the boat, and because the sheet loads are very high when the crews trapezing as the harder you pull the better you go (more or less)

The first things you need to do are: -

- Put an extra shackle in between the swivel base and the ratchet block; this raises the ratchet and usually makes it easier to uncleat the main

- Remove the "raiser" under the Harken cleat – again makes it easier to uncleat which will be a problem on the first couple of sails in an f4-5. It's a moot point as to whether this needs to be refitted under the swivel arm from a rule compliance point of view.

The rest is a matter of personal taste and don't' go mad until you've sailed the boat a couple of times, but you can consider: -

- Installing a bigger ratchet – the large hexaratchet helps to hold the loads
- Put on a five to one mainsheet – replace the strop block with a double and dead end the tail back onto the boom – see photo

Note: The extra deadeye on the boom and the use of the shackle on the strop are on questionable compliance with the class rules. (IMHO)

- Consider removing the swivel jammer altogether and replacing with a simple base (a number of top boats have adopted this technique) Then go down the gym and work those arm muscles (you'll need them!)

- Do something somewhat different (the theory here is that the cleat is not used apart from times of emergency – and the bungee keeps it out of the way)

It's also worth considering replacing the standard strop block, with one of the new ones with a big hole in the middle. Then the mainsheet can be dead-ended with a stopped knot after going through the block, and you will be able to sheet more "block to block". This photo below shows a better block but uses a clunky knot, which eliminates all the benefits of the block.

3.2 Mainsheet Strop

Mainsheet strop lengths are critical to boatspeed, too short and you can't centreline the boom without over sheeting, too long and you'll never point as you can't get enough sheet tension. There's not a lot you can do with them as the rules are tight and the fancy Herzog strops have been banned on an interesting interpretation of a different rule. However the points to note are: -

- You must use on piece of rope only
- It can be adjusted on the water
- The easiest solution is a bowline on each end, but keep them about 20 cm long, and whip the end back onto the loop, then there's no danger of it coming undone and with some jigging around you can make the strop longer or shorter.
- If you rake the rig back, remember to shorten the strop
- Once you've adjusted the strop then make sure it's central by taking it forward until the block touches the top of the centreboard, and it's really easy to see which side needs lengthening or shortening.
- If you've got a decent setting then mark both sides of the bowline with a black marker for repeatability. Alternatively people mark lines on the top of their centreboard acrossways at 1cm intervals for calibration of the strop

3.3 Progrip

One the racks the original white "non slip" is probably good (if new) for your first season but many people choose to replace this with Progrip which is a rubber type stuff that stops you from slipping about the place. To grip the racks you need to do the following.

- Buy some progrip – sheet form from LDC rather than rolls.
- Buy some evostick, and some disposable rubber gloves (it's a messy job)
- Remove the old white tape if required
- Cut the progrip long enough so that it fits into the slots at the top and bottom of the racks as this makes for a tidier job.
- Important thing is to key the surfaces and degrease them. - Use a very fine wet & dry (1200/1500 grade) or steel wool to key the ali bars without cutting all the way through the anodising and give the underneath of the ProGrip a pass over with 180 grit. Wipe both with meths and you should have no problems.
- Lump some glue on the bars and the progrip – and allow to start going off (check the instructions first) – if doing in the middle of summer it takes lots less time than on the packet.
- Stick the progrip on, feeding the top and bottom into the groove. Some people recommend wrapping a piece of rope tightly round and around the racks – thus helping it to set firm.
- Leave for 24 hrs before going sailing.
- A good tip is to cover the good side of the ProGrip with 2" masking tape. Bear in mind that when you coat bthe Pro Grp it will want to curl up (good side inwards).

3.4 Compasses

There are many different compasses and ways of fitting them, but the best is to buy the £220 tacktick from the laser centre, specifying its for a 4000. If you buy it from the Laser centre you get a bracket that works for the 4K, if you don't then you will get a bracket nowadays that sticks out too far from the mast. After raising the jib, mount the tacktick bracket under the gooseneck and above the jib adjuster. The kicker wire will run in front of the device and the cunningham purchase runs up through the gap in the bracket.

Other people have suggested: - “Alternatively as I found my crew' s head came into contact with the fitting and twisted the compass on the mast all too frequently then giving a false reading etc, you could file down the thread on two pan head M10 bolts, until you have a 5mm flat about 3.5mm to 4mm thick. Using butterfly nuts you can [using the standard bracket] put the pan headed bolts into the two holes in the centre of the bracket and then slide the bolts down the mast track until in the same position as if it were velcro' d. Only this time its the crews head that moves when it comes into contact not the compass, thus helm is happy.”

Other solutions include fitting the Silva goldfishbowls on the back of the mast in a similar place, or lower down but they are then harder to read.

4 Bits ‘n’ Pieces

4.1 Calibration!

Calibration is important as it helps get repeatability of your settings. If you find yourself going fast one day, by noting your settings (and writing down!) you can ‘find your fast settings again’ when those conditions arise. If you take the tuning guide from the website and set your boat up in accordance you’ll soon get used to “Shrouds 3B, Lowers 4B and Jib on 9” is fast in these conditions.

At it’s most basic level you need to calibrate the following:-

- Jib Halyard
- Kicker – put a strip on each side of the boom where the slider runs
- Outhaul (ditto)
- Mainsheet strop (mark both sides of the bowline at bottom of strop)

It’s really hard to get “repeatability” on the jib sheet settings due to tying of differing knots, but some people mark the inside of the gunwhale around the midpoint of the jib. By ‘measuring’ the distance between the middle of the jib and the gunwhale you’ve got a good idea of how sheeted, or lose the sheets are

4.2 Centreboard bungee

Forget whatever it says in the rigging manual about this. Simply take some bungee around the racks and wither lead it through the deck fitting (as in the photo) or just tie it back over the racks. This means the board will stay down readily even if the boat inverts.

4.3 The Trolley / Trap Handles Rope

It's worth fitting a proper piece of rope on the front of the trolley with a metal clip. Then when you need drop the jib just bring a trap wire forward, clip onto the ring and pull up on the adjuster

4.4 Drinks n food.

The obvious points to attach drinks and food are onto the back racks. I've mounted a couple of water bottle carriers here which are fairly easy to get to even during races. If you want to take food out then attach some kind off waterproof bag or container here (e.g. small old flare pack)

Photos by Carole / Rob / Greg
Copy Greg Eaton
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