Laser 1 Tuning Guide

Tuning

The Laser sail can be anything from very full to extremely flat. There are two main ways to set the sail up.

1. By look with "measurement tuning guidelines" in mind
2. By feel, with the helm, relative speed, and boat behavior in mind

It is best to start with method #1, but to begin developing proficiency at "symptom tuning" through method #2 as soon as possible

UPWIND

Cunningham
Think of the cunningham as a wrinkle remover until it gets windy. When the mast is bent, overbend wrinkles appear along the luff, and run especially from the mast joint to the clew. This can cause the sail to "hinge" along these wrinkles and look particularly bad. Pulling cunningham on smoothes out the front of the sail and pulls the draft back where it belongs. When it gets really windy, more cunningham opens the leech at the top, depowering the sail further. It is not unreasonable to pull the tack grommet down past the top of the gooseneck in big breeze. To do this, the cunno must be rigged on one side of the boom.

- article by Ron Rosenberg circa June 1993? With pictures of Laser rig from behind

The Vang

Super-light - sheet block to block and take slack out. Some vang tension is necessary to keep the leech from hooking too much

Light - as long as there is enough wind to ensure good flow (4-5 knots or more), the vang is set for roll-tacking. With mainsheet blocks about 1’ apart take out slack

Medium - until overpowered, vang is set for tacking. Blocks a touch looser than two-blocked, take out slack

Windy- Pulling the vang on bends the mast and flattens the sail, just as the mainsheet does. However, when the mainsheet is eased without vang, the boom goes up and the sail gets fuller. With the vang on hard, easing the mainsheet moves the boom to

leeward without letting it up, just as dropping the traveler does on a big boat. A very tight vang becomes critical when it is necessary to depower by easing mainsheet. (Review technique for getting it on)

Other Thoughts
In flat water, err toward more vang less cunningham. When the water is flat, steering is very effective to help keep the boat flat. "Feathering" depowers the sail, and the boat keeps moving through the water. Having a tight vang and not too much cunningham keeps the entry flat, and means the front of the sail breaks evenly from bottom to top. With good mainsheet trim and good steering, the sail is very efficient.

In chop, err toward more cunningham, less vang. It isn't possible to control power in the rig by feathering in chop, because the boat stops dead in the water. Also, as the boat pitches up and down, a sail with even twist will either be trimmed perfectly, or it will be all wrong at once. It is better to have some twist, and for the top of the sail to open as the boat is hiked down over the top of waves. This means lots of cunningham. To have enough power in the lulls and troughs, the vang then needs to be a little looser.

Drill: With Laser rigged on dolly, some wind in the sail, and someone holding the boat flat, look at both of these settings. Which shape goes with which condition? In flat water a constant angle of attack from tack to head is good, because the whole sail is "looking at" the same breeze. In chop, some twist, so that at least part of the sail is always working properly, is better than a constant angle of attack bottom to top, in which case the sail is either "all right or all wrong".

Finally, when the boat is always overpowered, the cunningham is maxed and the vang is cranked, so the mainsheet can be eased at the top of the waves to keep speed up. When it's super windy, the sheet is left out 2-12", and the sheeting in and out done from that trim.

Outhaul
A great "ballpark", all-around setting for the outhaul is to have the foot four to eight inches from the boom at its deepest point. The distance from one's thumb to pinkie if they are spread apart to make the Hawaiian "Hang loose dude" sign will get most sailors close. It will even help calibrate the method appropriately for body size. The outhaul is perhaps the easiest (besides mainsheet or board) control to adjust by feel. If there's lots of helm upwind or on tighter reaches, or if the boat is really hard to steer (same thing sort of) it's too loose. If the boat seems to lack power and the cunningham and vang are correct, especially in choppier conditions, it's too tight. Downwind it may seem tempting to ease it way off. In fact, too full a sail is worse than too flat a sail on a run because the flow has a hard time getting around hooked battens. The condition for the loosest outhaul would be broad-reaching in 10-14 knots & chop.

Caution: One mistake sailors make is to pull the outhaul too hard when it is really windy. Too much outhaul causes the exit of the bottom leech to be too open and creates a block for the air trying to exit the leech on the leeward side. Easing just a little (an inch

or two at the cleat from max tight) will leave some shape in the sail and make the bottom exit more parallel to the wind when the sail is eased during vang sheeting.

Strap
The hiking strap is an often-neglected, but critical control on the Laser. It is by no means "set it and forget it". The most common error is too loose. An effort to hike way out with a loose strap is valiant but can be ineffective. Far better to have a tight enough strap that true straight legging is possible, with the goal to get the shoulders as far from the rail as possible and down to horizontal. A loose strap makes this difficult physically, and has the added drawback of reducing the sailor's "connectivity" to the boat. On hiking reaches, a bone-tight strap is essential.

Board
The board should be all the way down upwind except for small sailors who are very overpowered, or Radial sailors when it is very windy.

Symptom Tuning

Heavy helm, good pointing but no "forward mode" - try more outhaul, then more vang

Good forward, but no "height mode" - try less cunningham, then less vang

Neither mode - if sail is already full and it's not super windy try HIKING HARDER. If it's windy and sail is already completely depowered, with max vang, try easing mainsheet a few inches and sailing lower but much faster.

Coaching tip: Though counter-intuitive, footing is often the best move for lighter sailors when it's choppy, since pinching to depower stops the boat and it slips sideways, meaning no speed or height. This requires a VERY TIGHT VANG however.

DOWNWIND

Except on overpowered reaches, the cunningham should be all the way off downwind.

Half cunningham can be left on for very windy runs to depower, but some must be eased.

Caution: Having the cunningham on all the way on makes the top so open that the sail is pushing sideways into a deathroll up there. This is bad.

Vang adjustment and board height are most critical. Most Laser sailors go downwind

with too much vang. In a stayed rig, a snug vang means the leech doesn’t spill off to leeward and give up power. On the Laser, the vang should be eased until the mast comes straight or very nearly so. This gives the fullest sail, with the added and important benefit of making the leach "lively". As the boat goes through chop it opens and fans on its own from the mast bending. This activity is fast on reaches and especially on runs. The vang is too loose when the sail opens in a puff or chop and "never comes back" A tight vang has other drawbacks. On windy reaches, it makes the boom hit the water sooner and makes the mainsheet trim hyper-critical.

The one time a tighter than normal vang can be good is very windy runs, when it is undesirable to have the top of the sail more open than the bottom, or unstable, as both of these cause a heeling moment to windward and promote the death roll.

Teaching Tip: Have sailors pair up and help each other get the vang right downwind. One sailor sails to where she can see the leech well, and the other plays with the vang. The goal is a leech that opens when the sail is pumped, but "comes back". Have the sailor-coach describe the leech action to her partner as "dead, lively, or floppy" or something similar. Dead means ease vang, floppy means tighten it.

The board is set highest on windy, hiking, planing reaches, and light air runs. Having the board high on these reaches reduces helm and makes the goal of a constant angle of heel more obtainable. For best control and speed on the run, the board should be about half way down. The board is a feel thing: too high and the boat wants to "dish-out" instead of tracking. Too low and the boat trips and gets sticky. Inexperienced sailors tend to leave the board down for windy runs. This makes things much harder than pulling it up half way!!

Sailing Fast

All boats reward great technique. The Laser will help a sailor develop technique and feel that will make him better in any other boat he chooses to sail. This happens almost exclusively through focused time on the water. (review Bourdow ">From the experts")

- Article Adams/Sheidt "Kinetics Upwind"

- Article Hall "Let’s Go Surfing"

EXTRAS

A Few Tricks

When it’s windy and bailer will be left open: remove plug and tuck it under grab rail. This helps prevent kicking it closed

Bailing water out of cockpit: slide foot quickly along cockpit floor all the way to back, kicking water out

Righting a capsize with rig upwind of boat: the boat will want to blow back over. Either climb in and leap to high side, as soon as rig catches wind, or as boat comes up hang onto board and roll under boat as rig blows over, then right boat ("California Roll")

To get out of irons: pull boom way to windward and push tiller to leeward. This works great before the start if sculling the bow down isn’t working

Clearing weeds off the rudder sailing upwind: first do board, then heel way over and as rudder comes out of the water and vigorously shake it back and forth. This will sweep the weeds down the leading edge and off

A Couple Fun Things

Back flip: When there’s no wind, see who can stand on the stern and pull the boat directly backwards on top of themselves with the mainsheet. The winner is the one with the bow the straightest up in the air

Hang time: On a run, see who can sail on the edge of a deathroll the longest, touching the board under the boat by reaching over the rail

Stuff the bow: when there’s wind and some chop, see who can get the stern farthest in the air

Standing tacks: tack standing up, either running around the mast or stepping over the boom

Standing gybes: Gybe standing on the stern, the boom swinging in front of the sailor (careful!)

Climb the mast: A prize for anyone who can touch the mast tip before it reaches the water

All Sorts of Drills

1. Follow the leader: a great one for beginning and veteran Laser sailors alike. Even motor downwind really slowly and get them to stop. Also let each of them lead without a motorboat to follow. Follow the leader is a great way to do a gybing drill if you have a good coach boat.
2. Start/stop
3. Tack/gybe on the whistle
4. 720s
5. Cone drill
6. Sail backwards
7. Sail standing up
8. Sail with a piece of bungee holding tiller near centerline
9. Sail downwind with board all the way up
10. Sail downwind with feet off the floor (knees up)
11. Sail downwind with rudder up half way - be sure to tell them that the idea is NOT to use the loaded rudder to go straight. In fact, this is a drill for advanced sailors only, since pushing too hard on a kicked up rudder will stress the pintles and tiller. For solid sailors, it gives loud balance feedback to have the exaggerated helm, and will encourage better weight movement and sailtrim. Do this for a short time only, with 100% focus.
12. Sail with no tiller extension. This reduces the ability to move weight, and emphasizes sailtrim
13. Capsize and right boat as fast as possible, especially on runs
14. Round weather mark and continue turn right into a gybe
15. Vang off, bearaway
16. Sheet in/head up, vang on
17. Vang off, cunningham off, bear away
18. Cunningham on, sheet in/head up, vang on
19. Cunningham on while sailing upwind
20. Outhaul on/off while sailing upwind
21. Two gybes on a wave
22. Take mainsheet completely out of ratchet and sail as far by the lee as possible
23. Deathroll contest
24. Keep bow near a buoy for as long as possible

Gear

The two most important personal-gear items are a well fitting and comfy lifejacket, and

good hiking wetsuit-pants. Wearing lycra shorts over the top of hiking pants will greatly prolong their life by protecting the butt. There are a few brands of hiking pants, and they can fit a little differently, so it's worth trying different ones on. Boots are a matter of personal preference - many top sailors sail barefoot, others still swear by Aigles. A wetsuit which goes below the knee is a must for colder water, as it will keep the muscles and especially the joint, ligaments, etc. warm and help prevent injury. It also makes it easier to hike hard longer! These can be made with hiking pads on them, which is the best way to go if possible. A white long-sleeve rashguard really helps keep the sun off, and a short and longsleeve spraytop round out the wardrobe nicely.

Fitness

Racing a Laser when it is hiking conditions is very demanding physically, with the quadriceps and abdominal muscles used upwind, and the biceps and abdominals used downwind. The best way to get in shape (and the most fun) is to sail in breeze. However, only sailing will eventually present a problem: the quads and biceps will become over-developed compared to the hamstrings and triceps. And the quads themselves will be imbalanced. This imbalance is very hard on the knees and elbows, and can promote injury.

For someone serious about Laser fitness, three times a week at the gym will make a dramatic and important difference to their performance and injury prevention. Seek the help of a certified trainer in developing a program that addresses these areas:

- Improve hamstring and triceps strength
- Balance quadriceps muscles (outer quad usually needs some attention)
- Strengthen abdominals
- Strengthen lower back
- Flexibility - especially hamstrings, lower back, and neck/shoulders

While on the road, some basic wall sits, pushups, ab crunches, and lower back "superman" exercises will help keep up what has been gained at the gym

Other good training ideas include running, cycling, roller-blading (especially in a tuck with long strokes), and kicking in the pool (especially the butterfly kick)

Gaining Weight

Gaining weight through weight training is possible by age 16 or 17, but it takes dedication. Consult a certified trainer about exercises and proper diet for this.

Race Day

Fluids are very important - it’s hard to get enough during a long day of racing, especially when it’s cold and you don’t feel thirsty. Sports drinks with electrolytes are good, and the habit of drinking a water bottle for every hour on the water is great. Make sure to have enough fuel too. Brining a banana and an energy bar out on a long day helps prevent hitting a wall during that last windy race.

Legends

Currently two sailors have won the Laser World Championship three times: Glen Bourke of Australia and Robert Sheidt of Brazil. They have many things in common, but the most notable are incredible fitness, flawless boathandling, and good speed in all conditions but especially downwind in the breeze. These things come from one place - quality time on the water.

Your sailors’ goals may not be to win the Laser Worlds, but it’s important that they understand if they want to make a jump in ability, it can only come from working hard in the boat at the fundamentals.