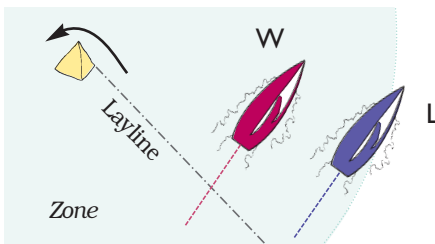


BRAIN TEASER

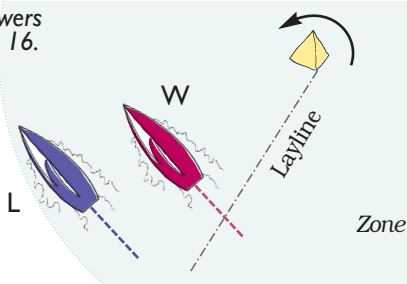
Can W do this?

Two boats overlapped on port tack enter the zone of a windward mark that they must round to port. Can the windward boat (W) keep sailing beyond the layline (and take L with her), or must she tack to round the mark?



In a similar situation, two boats overlapped on starboard tack approach the windward mark just below the starboard-tack layline. Does W have to tack when she reaches the port-tack layline, or can she keep going on starboard and force L past the layline?

See answers on page 16.



ISSUE # 116

A Case of 'the Slows'

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Attack your speed problem.

No sailor or boat is fast all the time. Because there are so many variables in sailboat racing and because wind conditions change constantly, having consistently good speed can be elusive, no matter how hard you work at it. Going slow occasionally is part of the game, but if this happens more than once in a while you may have a dreaded case of "the slows."

We all know how bad it feels to be slower than everyone else. It's impossible to hold a lane off the starting line, difficult to look smart tactically or strategically, tempting to bang the corners and generally frustrating whenever you are near other boats (which is most of the time until they all get ahead of you!).

The worst thing about "the slows" is not knowing why you are being passed. It would be one thing if you understood the problem because then you could take steps to fix it. But it's tough when the problem is mysterious and you're not sure what to do next.

Even the very best sailors in the world face speed bumps every now and then. However, they are usually able to solve their speed problems quickly and that's why they're successful. They may be slow for a windward leg, or even for a day or two, but they are good at figuring out what's wrong and then getting their groove back.

Many other sailors, however, catch "the slows" for a whole season (or even longer!). For these racers, going faster is the number one thing that will produce better race results and make racing more fun. To improve their speed, the first step is figuring out why they are slow. Then it should be relatively easy to find a cure. That process is what this issue is all about. •



Got a case of 'the slows'? Unfortunately, being slow creates a downward spiral. When you're off the pace, you can't get to the shifts or puffs first and you're often sailing in bad air, which means you get farther behind. When that happens, you need a plan to help you bust out of the loop.



Do I really have a speed problem?

As they say in therapy, the first step in solving any problem is acknowledging that you have that problem. Most sailors are not shy about admitting they are slow; in fact, many are quick to blame poor speed for a variety of mistakes. But if you want to improve your racing results, you need an honest assessment of your strengths and weaknesses – otherwise you will waste time working on the wrong thing.

For example, if you get a bad start in every race of a regatta, it's hard to blame your poor finishes on boatspeed. It may be easier to tell other sailors that you lost the races because you were slow (rather than admit you are a bad starter), but that won't help you improve for future events.

So, how do you know if you really have a speed problem? Try asking yourself a few questions:

- Have you been slow over and over in the same conditions?
- Have there always been boats nearby to give you good feedback?
- Can you rule out strategic and other reasons for poor performance?

If your answer to all of these questions is yes, you probably need to work on speed. But it is tough to draw too many conclusions about boatspeed based on your performance in regattas. That's because it is difficult to carry on a valid speed test while you are racing. Your attention is focused on other things, and it's too easy to interpret missed strategic opportunities (e.g. windshifts or puffs) as part of a speed problem.

However, there are a couple of things you could do during a regatta that will help you figure out if you've got the slows:

- Get a top sailor from your

class or your sailmaker to race with you, or even to steer your boat. If you are still slow with this talent, you probably have a problem.

- Steer someone else's boat for a race or regatta. If this boat feels good and you are suddenly getting better finishes than you got with

Don't mis-diagnose the problem you are having

In sailing, as in life, there are often several possible explanations for why a problem occurs. The secret to solving the problem is identifying the 'real' reason. For example, when it feels like you are going slower than other boats, do you really have a case of the slows? Or is there a more likely explanation such as:

- **The boats that are faster than you are sailing in different wind conditions.** If the other boats have very much lateral separation, they will gain on you in even the tiniest, almost imperceptible, windshifts. Don't interpret this as a case of the slows when it's really a strategic problem of missing the shifts. Of course, if other boats almost always gain on you, it's probably related to speed since they can't get the right shift every time!

- **Your speed problem is a random or unlucky occurrence.** Every boat has occasional periods of unusual slow speed. This could happen for many reasons from a momentary lapse of concentration to a plastic bag caught on the rudder without the crew's knowledge. If this kind of thing happens just once in a while, it may not be a 'speed problem' that needs fixing.

- **It's all in your head.** Sometimes a problem that seems very real does not really exist. Look inside first to see how much of your 'speed problem' might be imagined.



Is your speed problem psychological, or real? It could be a little of both. Sometimes a small issue with speed can create a downward slope that makes it feel like you have a bigger issue with speed. Even if much of this problem is in your mind, there is usually still an actual lack of speed. Often you just need to make some small changes (in the way you set up or sail your boat) so that you start to have a few small 'speed successes' (either in training or during races). This will slowly build your confidence and begin to remove the psychological component of your speed problem.

your own boat, you probably have an issue with speed (or psychology)!

In order to conclude that you have a speed problem, you need conclusive evidence – the kind that comes from seeing a problem happen over and over again in similar conditions with comparable boats sailing close together. In other words, you need to spend some time doing two-boat testing.

Test your speed with a buddy

There is only one way to know for sure if you have a speed problem, and that is to line up alongside a similar boat and sail upwind for a while. One-design sailors are lucky because it's easy to compare themselves to identical boats. Handicap racers, however, have a harder time because there may not be any other boats exactly like theirs.

So whenever you have a chance to go out on a training day with one other boat, don't hesitate! Line the boats up on closehauled courses (see pages 10-11) and sail until you are confident about your relative speeds. Switch positions, repeat, switch tacks and repeat more tests.

If one boat is usually slower, try exchanging helmspeople (i.e. switch them between boats) for a few tests. This is a definitive way to find out if the problem is with you or your boat! You could do the same thing with sail trimmers or even sails to isolate and identify the problem.

Don't settle for being slow

When you have a problem with your speed, early diagnosis is key. One thing that separates top sailors from all the rest is their ability to identify a disease early, determine the cause and quickly find a cure.

The longer you deny or ignore a speed problem, the more you grow accustomed to having other boats sail past you, and the more you change your tactics and strategies to compensate for having less speed. Neither of these is good.

Your basic assumption should always be that you have the potential to be as fast as any other boat on the race course. If you don't experience this during races or two-boat training sessions, assume you have a case of the slows and get to work finding a cure.

You know you have a speed problem when...

- **You find yourself banging the corners.** When you're going slow, it's painful to sail alongside other boats and tempting to head out to 'Cornersville.' It is tough to beat your competitors by staying close to them – but if you take a flier you may get a windshift that will put you far enough ahead of them that they can't catch you.

- **Your tactics and strategy are not as good as they used to be.** Most experienced tacticians know it's better to be fast than smart. When you're slow, it's tough to look and feel clever. Your tactics and strategies may actually be fine, but it's hard to make them work without speed.

- **When there's a boat on your lee bow, you tack away before they even start affecting you.** A common occurrence when you have 'the slows' is being pinched off by a boat close to leeward. The slower you are, the sooner you will tack away, even when they aren't really hurting you yet.

- **No one wants to speed-test with you.** One rule of thumb about speed testing (before races or on training days) is that you should pair up with a boat that is equal or slightly faster than you. If you're slow you won't be so helpful for other boats.

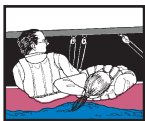
- **When you sail someone else's boat you feel really fast!** Try steering someone else's boat – if this makes you feel fast, then your own boat is probably slow.

- **The good guys all want to be near you on the starting line!** Fast boats like to set up near slower boats at the start because that makes it much easier for them to get off the line cleanly. It's nice to be in good company, but not on the starting line.



JH Peterson photo

Is your poor performance related to speed, or is there another explanation? There are many reasons why other boats may appear to be faster than you. If they have even slightly better wind pressure, for example, they will be able to sail faster and higher. It's critical to understand this so you can accurately identify your problem (and work on an appropriate solution). The more often you are slower, the more likely it is that this is a boatspeed problem (since the odds are small that other boats are always in better wind).



How to tackle a speed problem

In sailboat racing, speed is almost everything. It's important to be smart at tactics and strategy, of course, but if you're not pretty fast you will never be consistently at the top of your fleet. Therefore, good speed is worth a large investment of time and effort.

Every racing sailor has issues with speed from time to time, but these won't normally turn into big problems unless you don't make any concerted effort to fix them. The key for curing a case of the slows is to be logical, organized and persistent in your search for an answer. Attack the problem before it destroys your confidence.

Speed issues often cannot be solved in just an hour or a day. If you really want to be faster and win more races, you need to be ready for a long-term "speed improvement campaign," not just a quick fix.

Once you realize you are going slow, the key is to figure out why. Approach this as you would look for a solution to any other major problem – explore the situation from many different angles so you can understand everything possible about your boat, yourself, your class, the conditions in which you sail and your teammates.

Here are a bunch of ideas for tackling a speed problem. If you do a lot of these things, finding an actual solution should be easy.

Accept no limits.

The best thing you can bring to bear on a speed problem is an attitude that is inquisitive, hopeful and relentless. Assume from the beginning that you have the potential to be as fast as your fastest competitor

(but if you have a heavy old boat it may be tough, or costly). In other words, don't accept limits on what is possible. Realize that every speed problem can be fixed – you just have to figure out how – and treat every speed issue simply as a temporary bump in the road.

Make a conscious decision that you'll never use speed as an excuse. Sometimes there may be a bit of comfort in being slow because you can always blame poor performance on a lack of speed. If speed is really your problem, fix it.

Create a two-boat laboratory.

When a scientist is looking to find the cure for a disease or a solution to some other important problem, he or she goes into a laboratory and does research. For sailors, their lab is a wide open body of water with one other fast, identical boat. This provides a perfect environment for testing and learning about speed.

It's hard to overstate the value you can get from sailing alongside another boat. This immediate and direct comparison gives you the only true way to measure speed.

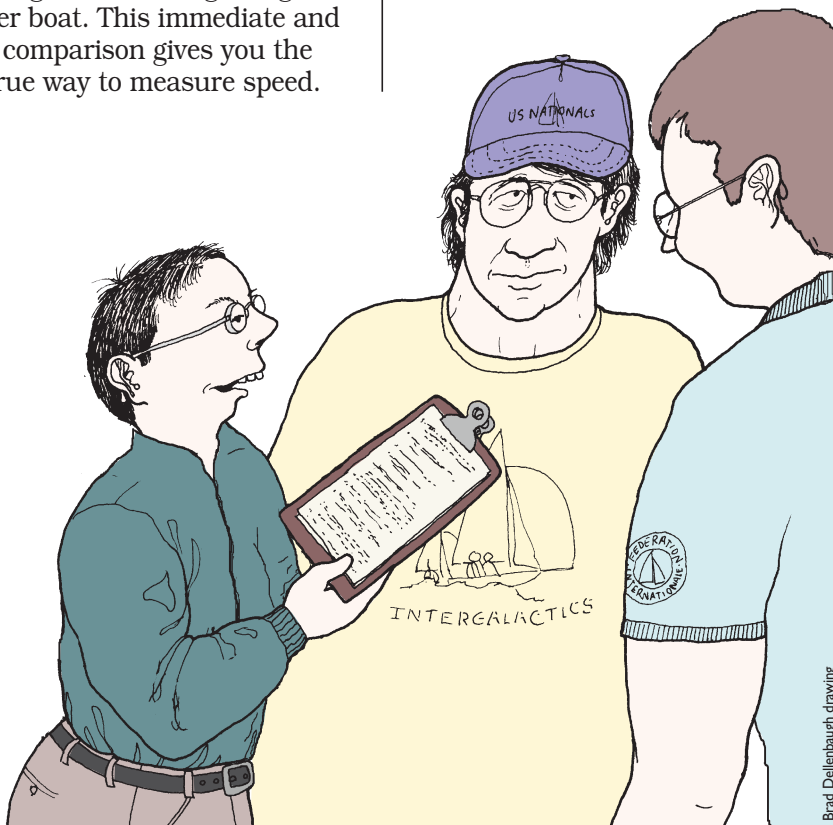
And since it's easy for just two teams to work together, you have control over how and what you test. This control over testing conditions is exactly what a scientist needs.

Prepare yourself for two-boat tuning by creating and maintaining a list of speed-related variables that you would like to test. For example, a post-race debrief might produce a discussion about whether it was better to keep the boom higher with less sheet tension (and more twist) or lower with more sheet and vang tension (and less twist). Add this to the list of things to test in your next lab session.

Ask lots of questions.

It may be possible to ask too many questions, but I don't know anyone who has done it. So don't be shy. Taking the initiative is often the only way to tap into the people around you who may well be your best source of speed information in
(Continued on page 6)

When you are trying to cure a case of the 'slows,' ask a lot of questions. Find out what other people think, especially those sailors who are always faster than you. Most racers are willing to share their knowledge, which is a good thing when the whole subject of speed seems a bit mysterious.



Define your problem with answers to these questions

When you realize that you have a speed problem, ask yourself some analytical questions like the ones below. Your answers may contain part of the solution or should at least lead you in the right direction.

Is your problem related primarily to speed through the water, or to pointing?

When you're sailing upwind, there are two basic components of performance: 1) Forward speed; and 2) Height, or pointing. A performance problem could affect only one of these areas, or it might impact both. Since pointing and speed are so inter-related, you often see a tradeoff situation where you can have decent pointing or speed, but not both. You will typically hear sailors say something like, "My speed was OK but I couldn't point with anyone." Or, "My height was good, but I wasn't going fast."

The way you answer this question could help solve your problem. If pointing is not good, for example, consider solutions such as trimming the mainsheet harder, adding more rake and having a flatter jib entry. But if pointing is OK and you're worried about straight-ahead speed, then give up some pointing to go faster. You might, for example, ease your mainsheet, drop the traveler or sail the boat a little lower. Often you need to find solutions that improve *both* pointing and speed such as a bottom job, new sails or a tuning makeover.

When did this problem start, and do you have any idea what caused it? It would be very helpful if you can remember when you first noticed being slow. Was there anything different between that day (or regatta) and races before then? For example, if the problem started the first day after you stepped a new mast or during the first regatta after you lost a long-time crew member, you have a huge clue about what might be wrong.

Unfortunately, it's not usually this easy to cure a case of the slows. Speed problems often surface slowly without a clear line between 'before' and 'after.' However, this in itself could be a helpful clue. If the problem arose over a long period of time, perhaps it is related to a speed factor that changes at the same rate. This could be the aging of your sails, a deterioration of the condition of your boat's bottom finish, your rig going out of tune or even your crew gaining a lot of weight!

Is your speed problem the same on both tacks?

If you are slow on one tack but not the other, this is not the worst thing because there are only a few things that can cause a speed difference from tack to tack. In this case, the first things you would look

for are asymmetries in your rig or foils. For example, maybe the mast is falling off more on one tack than the other. Or perhaps your keel or centerboard is not exactly aligned with the boat's centerline. These could have serious effects on speed, but at least they are easier to identify when you have a performance difference between tacks.

Do your speed problems happen all the time, or only in specific wind or sea conditions?

The more you can narrow down the times when you feel slow, the easier it will be to tackle this problem. Often a speed issue will show up above or below a certain wind velocity, or when you have a particular wave state. If you are slow only in heavy air, for example, you can focus on things that will make you faster in breeze such as adding more mast rake, using extra backstay and vang or sailing with a heavier crew weight.

Any speed problem is much more manageable (and solvable) when you realize that it happens only at certain times such as in light air or choppy seas. If you are always slow, you have a bigger problem, but at least then you can start by looking at things (e.g. sails, hull, rig) that have the potential to make you slow across the board.

Is the problem a "straight-line" occurrence, or one associated with a maneuver? Most sailors think of the slows as a problem with speed or pointing when they have been sailing alongside another boat for a while. But there are other kinds of speed problems. For example, it could be that you lose ground every time you tack with another boat. In that case, the obvious solution is tacking practice. Or maybe you lose distance whenever the wind velocity drops. That means you need to figure out how to do a better job of 'downshifting.' The more you can identify the specific nature of your speed problem (and the sooner you do this), the easier it will be to find a quick solution.

Does your speed stay the same when you sail with different crew? The members of your team are very important factors in making your boat go fast. They trim sails, change gears, evaluate speed and perform many other functions that are critical for good boatspeed. Therefore, any examination of a speed problem must consider the human element. It is quite possible that any case of the slows is due entirely to the way the boat is being sailed. If a crew of professional sailors jumped into your boat, would they experience the same problem? If not, then going faster is just a matter of better trimming.

Tackle a speed problem

(Continued from page 4)

the world. Talk to anyone you think might have some nuggets of advice about going fast.

If you are hesitant, start with your sailmaker. It's his or her job to help you, so that is a no-brainer. Other sailmakers will be helpful too because they'd like your business in the future. You should also talk with your competitors, especially the ones who are going faster than you. They are usually willing to share info; if they seem reluctant, maybe you can find something to trade them in return for their help.

The great thing about asking questions is that you can zero in on exactly what's important to you. You don't have to sift through books or lectures to find the small amount of info that may be relevant to your situation. When asking questions, imagine that you are calling technical support for a computer problem. Try to describe your problem clearly and accurately so the other person

can best help you with a diagnosis and/or a solution.

Track your settings.

In grand prix auto racing, do you think the head mechanic for each team keeps a history of the engine settings for each car they race? Of course they do! They would be idiots to begin a race without an accurate record of what has worked for them and what didn't.

Now consider sailboat racing, another technical sport where speed is also ultra-important. How many sailors keep a written record of the tuning set-up and sail trim settings that they have found to be fastest in a wide range of wind conditions? I know a lot of the top competitors have this, but I'm guessing that many others do not.

If you want to improve your speed, one of the very first things you should do is put number scales on your controls and start recording all the settings you use while racing (see pages 12-13). Wait eagerly for

times when your boat feels especially fast (or slow), and make sure to record your settings at those moments. The idea is to gather a lot of data about how the boat is set up when you're going fast in various conditions – then use this info to reproduce those fast set-ups when you have similar conditions.

Be a copy cat.

There is no rule that says you can't copy what the fast sailors are doing. In fact, there's a rule of thumb that says you should.

If you had to start completely from scratch and figure out the speed thing all by yourself, it would be difficult. Save yourself a lot of time by finding out what other sailors already know.

A great place to start is your sailmaker's tuning guide. If you haven't read this (and checked to see how your boat compares) within the past year, do that as soon as possible. Unless you have a very good reason, I recommend setting up your boat exactly as your sailmaker suggests, especially when you are having a speed problem.

Another great source of intel is your competitors. During every race they are sailing around the course showing you how to go fast. This info is great and it's free – all you need is to be a good observer. Look for ways that fast boats are different from yours; copy those techniques and test them.

Get a broader perspective.

It's difficult to learn a lot about what other sailors are doing while you are steering your boat during races. So get out of your boat!

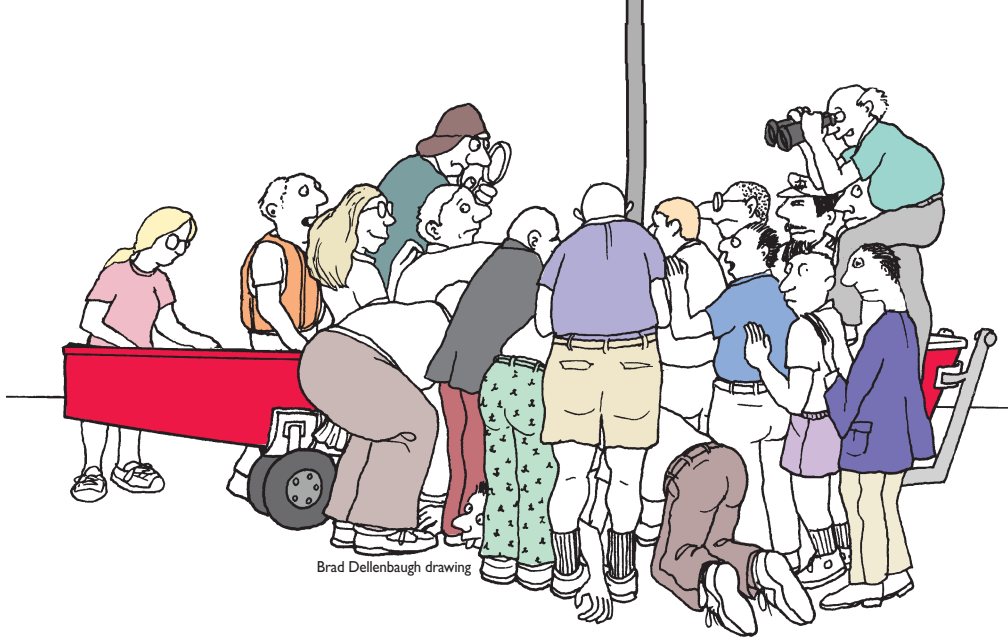
You can often gain a lot of insight by watching races from a powerboat. The ideal situation would be to find a non-important regatta that has top competitors. This way you can get fairly close to the boats while they are racing (especially if you are in a small boat), and you will be able to take close-up photos and videos.

Another great idea that will teach you a lot is to crew for one of your fastest competitors. This is



JH Peterson photo

The best way (by far) to work on improving your speed and height is by sailing upwind with another boat nearby on the same tack. With this 'stablemate' as your control (i.e. they don't make changes to speed variables), you can try different trim settings and get instant, accurate feedback about how these affect your speed. For much more on how to get the most from a two-boat testing program, see the article on pages 10 and 11.



Brad Dellenbaugh drawing

Don't reinvent the wheel! A large part of getting your boat up to speed should simply be copying what the fast sailors in your class are already doing. They have figured out what works, so go with it. It's easy for anyone to see their set-up while sailing, and you can also look at their boats on shore (but it's courteous to ask them first if this is OK).

even better than watching races from a powerboat – it's like having a personal speed tutorial, and it's free! Plus you can look around a lot more than when you are driving your own boat.

Bring in some help.

It's a lot easier to solve your speed problem when you aren't trying to figure it all out by yourself, so don't be afraid to ask (or pay!) for help.

There are many good coaches in sailing these days who can give you valuable feedback. If they observe while you are training and/or racing, they can show you video and give specific feedback about your speed set-up (and lots of other things). A coach can also watch other boats in your fleet and provide invaluable feedback about how you compare. It can also be very educational to observe a regatta with your coach.

Collect information.

To figure out how to go faster, you need to gather a lot of ideas and data, and then sort through it. For example, at each post-race debrief ask your teammates to brainstorm ideas about how to make the boat go faster. Record these in a notebook or computer so you have an ongoing list of things that might

help your speed. Go through the list and decide which ones are most likely to solve your speed problem. These are your priorities. Ideally you will test them one at a time in your next two-boat training session. This doesn't take as long as you might think. If you have good wind

conditions and a willing partner, you might be able to test several speed variables in an afternoon of sailing. This will make you a lot more confident the next time you race in those conditions.

Have the right attitude.

An unexplainable case of the slows can be frustrating, so be persistent and realize that it could take a long time to solve. Value the journey as much as the end goal. Even if you don't solve all your problems right away, you will learn a ton as you search for answers.

My philosophy has always been that you can't win every race, but you can always learn something from each race. I call this a "no-lose approach" and it works as well for improving speed as it does for other parts of sailboat racing.

Once you have cured a case of the slows, you will realize that you now have the tools and experience to do this over and over again. Since you will inevitably face new speed challenges throughout your future racing, this should help your results for years to come. •

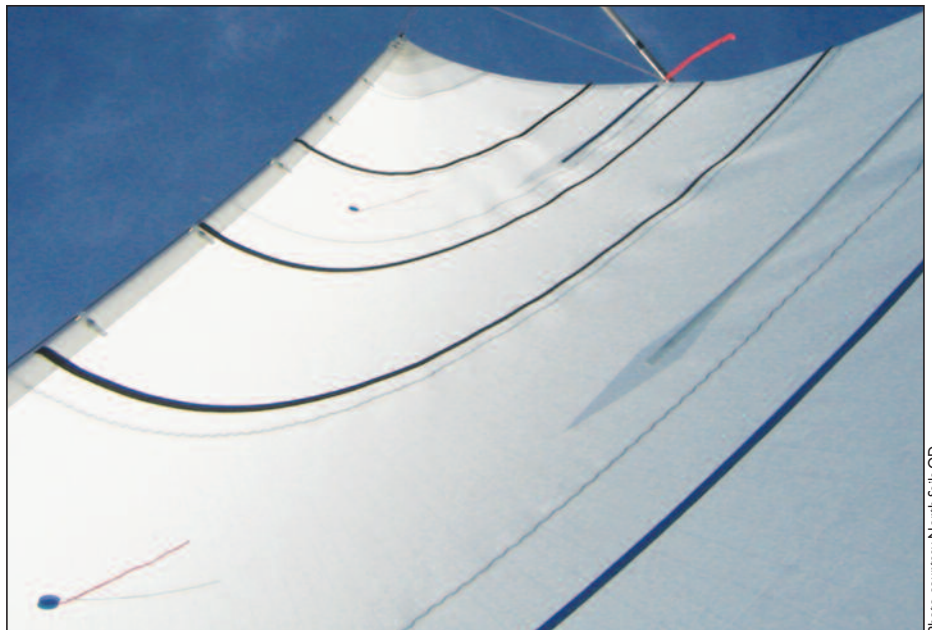


Photo courtesy North Sails OD

It's impossible to explore any speed problem without looking at sail shapes. Sails are a critical component of speed, so if they are old or trimmed incorrectly for the conditions you will be slow. Try to get your sailmaker to come out sailing or racing with you. He or she can comment on your trim settings and show you how the sails and rig should be set up. If you can't get a sailmaker, take photos of your sails (looking up from the middle of the foot) and email them to him or her for comments. Using draft stripes like the ones above will make it easier to gauge the sails' shapes while sailing.



Focus on the important stuff

One of the unique things about sailboat racing is that there are a lot of variables. And when you're looking for a little more boatspeed, there are many things you can try.

Sometimes it seems like there are too many choices, and it's hard to know where to start. Since it's impossible to test and evaluate all your options at the same time, you have to set priorities.

In my opinion, the items at the top of your priority list should meet two criteria: 1) There must be a very good chance they will make a significant improvement in your speed; and 2) They should be achievable within your budget and time frame.

When you're trying to go faster, you need a long-term perspective. Often there is no quick "fix" for a case of the slows. That's why you must commit yourself to a methodical program of learning and testing. If you do this right, you'll have a

much better chance of being faster in the long run than if you look for immediate rewards or try to solve the problem randomly.

On the other hand, going slow is frustrating. It's hard to be patient while other boats are sailing past, so you need to balance a long-term view with some short-term returns. This is why it's a good idea to start by testing things you think will have the biggest effect on your speed.

You could, for example, use a two-boat training session to test outhaul tension. However, it might be very difficult to see any speed differences at all when you adjust the outhaul. It would be much more valuable to test a variable, such as mainsheet tension, that can have a big impact on your speed.

When you make up your priority list, you must also choose things you can afford (in terms of money and time). It might help your speed

a lot to buy a new set of sails, but that may not be an option. So, you have to look for things that could have a relatively large impact on your speed and are, at the same time, affordable. On the next page is a graph that shows one approach to creating a priority list for working on the slows.




Setting priorities

Imagine a long list of things that might make your boat go a little faster (*if you don't already have a list like this, it's a great idea to make one!*). Now put those items in order based on which ones you might consider doing before your next regatta.

To prioritize your list, consider two factors: 1) how likely it is that each item will actually lead to a meaningful increase in speed; and 2) how easy it will be to accomplish each item.

Your top priorities should be things that are relatively easy to do and could have a significant effect on speed. These are 'no-brainers'! Lower priorities are items that cost a lot of money, take a long time to implement or have a small chance of actually affecting speed. These would be near the bottom of your list.

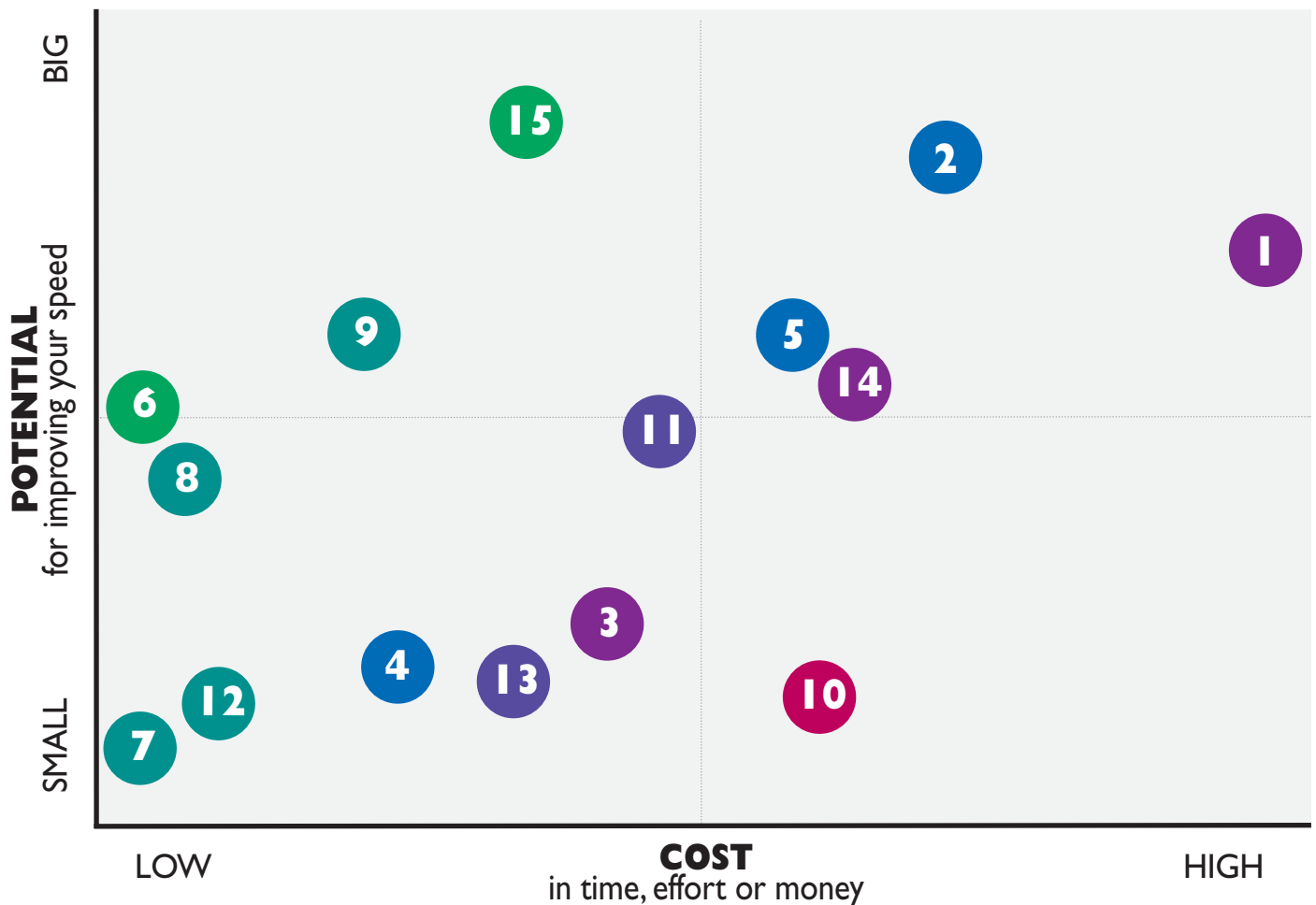
The next page contains a number of random speed-related ideas. The chart, which uses the color-coding below to indicate priority status, is one example of how you might determine which things should be your priorities.

-  Green = Go! High priority; likely to make a significant improvement in performance without a big investment in time or money.
-  Blue/Purple = Maybe Moderate priority; these options come with low impact and low cost, or higher impact but higher cost.
-  Red = Stop! Low priority; not likely to make a significant improvement in your performance and comes with a high cost.



JH Peterson photo

If you could change just one thing about your boat (or the way you sail it) to improve speed before your next regatta, what would you choose? This is a good question to ask yourself because it forces you to figure out which things are most important. You might, for example, buy a new jib or change how much pre-bend you have, but you probably wouldn't choose something (e.g. a new hiking stick) that is likely to have little effect on performance.



Evaluating various actions you might take to cure “the slows”

When you need more speed, there are many things you can try. Each of these actions has a certain potential for making you faster, and a certain cost. Since no one has time to test everything, each sailor or team must make choices based on their own evaluation of the rewards and costs of the various options. Top priorities

should be actions that have a high speed potential and a low cost (*the upper/left quadrants of the chart*).

Below are a few of the many things you might try to go faster, and above is a sample of how to evaluate their rewards and costs visually. Where would *you* put these in the chart, and which would be your priorities?

- 1 **Buy a brand new boat.** Could be a big improvement, but won't solve sailor-centered problems. Costly!
- 2 **Buy a new mainsail and jib.** Expensive but will almost certainly produce a noticeable speed upgrade.
- 3 **Wet-sand and/or polish your hull.** Unless your hull is pretty bad, this may be mostly psychological.
- 4 **Fair your blades.** Could make at least a slight difference on some boats.
- 5 **Fix asymmetries in your keel or centerboard.** A difficult project with a high potential return.
- 6 **Adjust your mainsheet tension.** Easy to do and can have a large impact on speed and pointing.
- 7 **Change the outhaul setting.** Usually will not make a significant difference in speed.
- 8 **Change the amount of mast rake.** Easy to do on some boats and could have a significant impact.
- 9 **Fix asymmetries in tuning from port to starboard tack.** Just takes time, but usually well worth it.
- 10 **Lose weight before sailing in a light-air venue.** Could help, but hard work and maybe it will be windy!
- 11 **Get a more experienced crew.** Big potential for speed improvement, but don't forget about chemistry.
- 12 **Hike harder when it's windy.** Won't make much difference unless you've been pretty lazy in the past.
- 13 **Remove all extra weight from your hull and rig.** Effort required might not be worth the small return.
- 14 **Hire a coach to help with speed.** Requires some investment but could make a big difference.
- 15 **Spend more time tuning with another boat.** A no-brainer!



TECHNIQUE

The value of two-boat testing

When it comes to curing a case of “the slows” and getting your boat up to speed, there may be no exercise more valuable than lining up near one other boat. There are several reasons why two-boat testing should be at the top of your priority list. First, it is the only way to evaluate your speed and height accurately. No matter how good your instruments or sense of feel, it’s impossible to measure exactly how fast (or slow) you are going without another boat alongside.

A second reason for two-boat testing (which may be even more important than the first) is that it gives you a chance to make trim changes and get instant feedback on whether you are going faster or slower. Without another boat nearby, the changes you make are essentially guesses in the dark. When you are sailing alone, there is no way to know whether trimming the mainsheet a little harder, for example, is good or bad.

On top of those reasons, two-boat testing gives you a great chance to work as a crew on changing gears (with instant feedback). And it doesn’t cost anything!

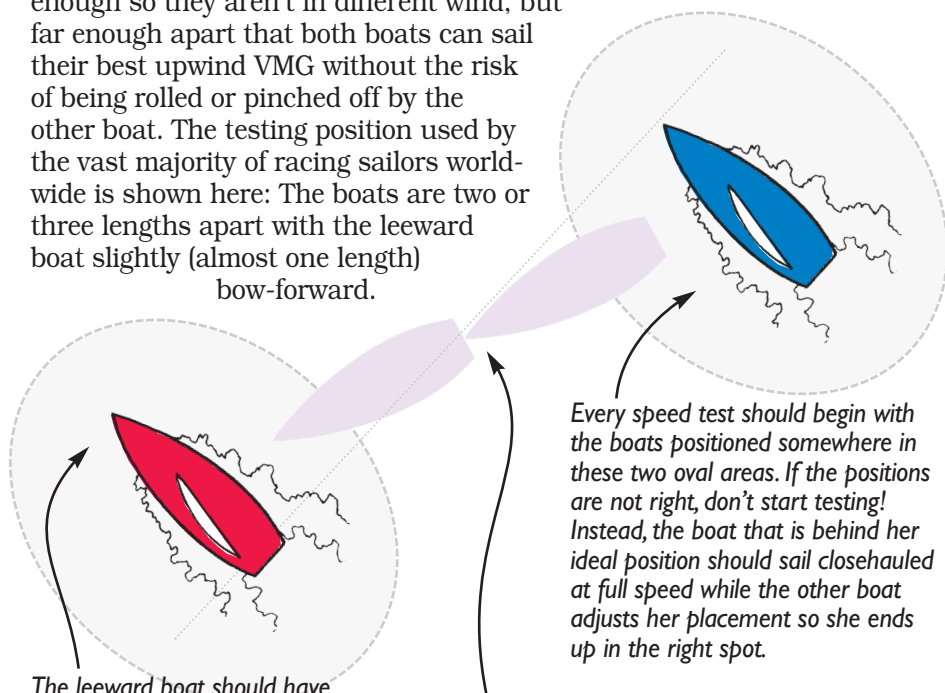
What should I test?

The first, and most important, thing is simply to test your best set-up against the other boat. Sail your boat as you normally do in races, focusing on good steering, sail trim and communication about shifting gears. Before you start changing things, it’s very valuable to measure how well you are going when your boat is trimmed as you have been racing it.

Once you have established a good ‘baseline’ with the other boat (i.e. you’ve done enough lineups that you are confident about which boat is faster or slower and by how much), you’re ready to change something. It is probably best to change only one thing at a time so you can isolate the effect of that variable on speed. Since it takes a while to test each variable thoroughly, I would start with the things (e.g. mainsheet, backstay, rake) that may have the biggest impact on speed. It would be great to test subtle things like cunningham tension, but you might go all day without seeing any differences in performance.

Basic testing position

When you are testing upwind boatspeed, it’s important to start off with the boats in the right position. You want them to be close enough so they aren’t in different wind, but far enough apart that both boats can sail their best upwind VMG without the risk of being rolled or pinched off by the other boat. The testing position used by the vast majority of racing sailors worldwide is shown here: The boats are two or three lengths apart with the leeward boat slightly (almost one length) bow-forward.



The leeward boat should have their bow between one half and one boatlength ahead of the windward boat. If they are too far back, they won’t be comfortable pointing. If they are much farther ahead, it may be too easy to pinch off the windward boat.

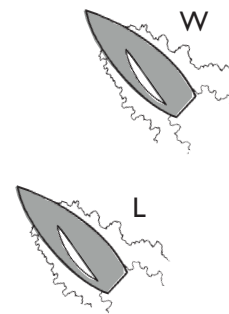
There should be 2 or 3 boatlengths between boats. If you get much closer than this, you increase the risk that one boat will interfere with the other. If you are much farther away, you’ll increase the chance that the boats will be sailing in different wind.

Every speed test should begin with the boats positioned somewhere in these two oval areas. If the positions are not right, don’t start testing! Instead, the boat that is behind her ideal position should sail closehauled at full speed while the other boat adjusts her placement so she ends up in the right spot.

Don’t waste your time

The quality of the information you get from two-boat testing is closely related to the quality of your speed lineups. So begin all your tests in the basic testing position (and learn how to get into that position without wasting a lot of time). If you spend most of your tests with one boat ahead of or behind their ideal spot (see below), you will not get nearly as much useful information.

NO – W is too far advanced on L. It will be hard for L to point as high as normal, and W will be tempted to foot off and roll L.



NO – L is too far advanced on W. It will be hard for W to put her bow down as needed in waves, and L will be tempted to squeeze up to pinch off W.



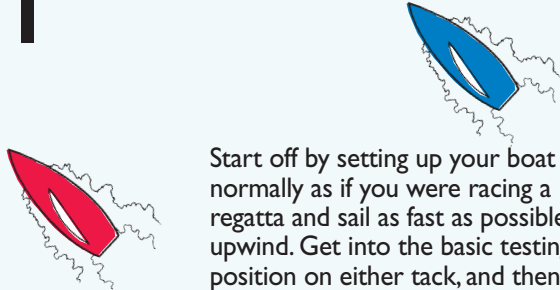
Case of the ‘Slows’

How to carry out a two-boat test

Here is a four-step process for conducting a rigorous test of upwind speed. There are actually many stages in this process, but four basic steps are required each time you want to establish a baseline or test a different speed variable. Here are some key points:

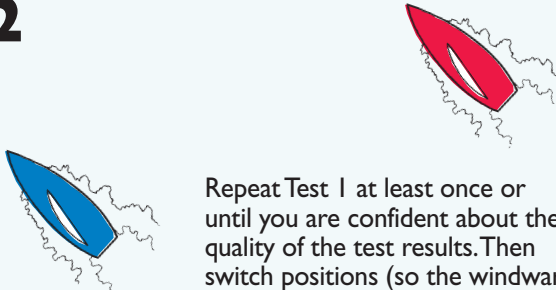
- Save time and improve results by starting a test only when the boats are in the proper testing position.
- Begin your two-boat testing session by creating a “baseline” of relative performance. In other words, which boat is faster and by how much? This is key for evaluating future tests (the boats don’t have to be exactly equal – you just need to know their difference).
- Repeat each step until you have confidence in the result. One two-minute lineup is hardly conclusive.
- The key to learning is sharing, so the discussions that happen downwind (and later ashore) are critical.

1

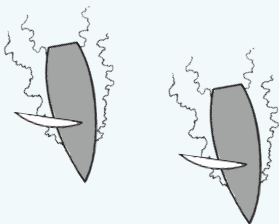


Start off by setting up your boat normally as if you were racing a regatta and sail as fast as possible upwind. Get into the basic testing position on either tack, and then sail for a few minutes or until one boat gains enough that the boats are no longer in a good testing position.

2

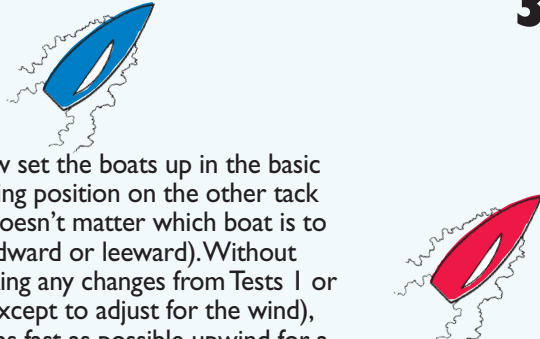


Repeat Test 1 at least once or until you are confident about the quality of the test results. Then switch positions (so the windward boat goes to leeward) and begin Test 2 on the same tack. Carry out this test exactly as Test 1.



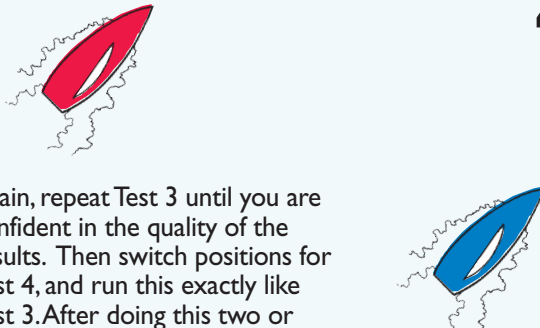
Once you have completed at least two high-quality lineups in Tests 1 and 2, turn downwind and sail back toward your starting point. Keep the boats close and discuss the tests until you agree about which boat (if either) was faster and by how much.

3



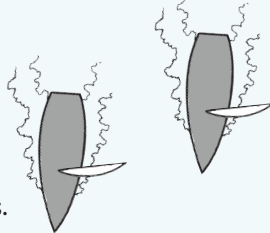
Now set the boats up in the basic testing position on the other tack (it doesn’t matter which boat is to windward or leeward). Without making any changes from Tests 1 or 2 (except to adjust for the wind), sail as fast as possible upwind for a few minutes or until one boat gains.

4



Again, repeat Test 3 until you are confident in the quality of the results. Then switch positions for Test 4, and run this exactly like Test 3. After doing this two or more times, turn back downwind.

As you sail back toward your starting point, discuss Tests 3 and 4. How did the boats compare in speed and height? Combine these results with Tests 1 and 2 to establish a ‘baseline’ between the two boats.



Now you are ready to discuss the next step. One boat (usually the slower one) should change one thing to test (usually the top item on her priority list) while the other boat stays constant; then repeat Tests 1 through 4.

Each of the four tests described here should actually include several repetitions of the lineup that is shown. These repetitions are needed to confirm performance differences (or similarities) at each stage of the process. What’s shown above is just one stage of a thorough two-boat testing program. The overall plan might be:

- Stage 1: Establish baseline between boats
- Stage 2: Test Variable 1 (e.g. more mast rake)
- Stage 3: Test Variable 2 (e.g. less twist in mainsail)
- Stage 4: Test Variable 3 (e.g. sheeting jib harder)
- ... and so on.

In Stage 1, both crews should sail their boats fast upwind as if they were in a race. Don’t make changes during the Stage 1 tests (save these for later stages), but do continually adjust the trim of your boat and sails to go fast in changing wind conditions.



Record your ‘going fast’ moments

Curing a case of the slows does not happen all at once – most of the time it’s an incremental process where you have to collect a bunch of information and build on what you already know.

The first key to making progress is knowing when your boat is going fast and feels “in the groove.” This may seem easy, but we don’t always recognize this while racing. When you are working on boatspeed, say something out loud to everyone on your boat when you think you are going fast. This could be a simple statement like “Going fast!”

It’s important to acknowledge good boatspeed because this will help you reproduce that speed in the future. As soon as someone in your crew says “Going fast,” make a (mental or written) note about the wind and wave conditions and how your boat and sails are set up.

If you are on a high-tech big boat, you could push a button on the computer and take an electronic “snapshot” of the readings on all your instruments, load cells, etc. But since you probably don’t have that technology, you need to look

around at your sail controls. How tight is the mainsheet trimmed? Where is the traveler, and the jib lead? How much rig tension and rake do you have? And so on.

This is critical because when you have the same wind and wave conditions in the future, you must be able to reproduce the set-up that was so fast before. If you don’t remember your settings, you’ll have to start all over again from scratch (and you won’t be making very much progress on speed).

What you need is an easy and organized system for keeping track of all your speed settings when you have a “going fast” moment. On the next page is one way to do this – a chart for recording all your control settings. If you take a lot of these ‘snapshots’ when you are going fast, you should have enough data to be confident speed-wise over a range of wind conditions.

Remember one important thing! In order to record your settings, you must calibrate all your sail controls. Unless you have clear, objective markings on each control, it will be difficult to replicate fast trim.

Coding speed controls

Here are suggestions on how to code the speed controls that are included in the chart on the next page.

Mast rake – Measured as either the length of the forestay or the distance from mast tip to transom.

Backstay tension – Measured by a load cell on bigger boats or a mark on the wire or control line at the stern on smaller boats.

Rig tension – Typically measured before sailing with a tension gauge on the forestay or shrouds.

Mainsheet tension – The best way to track this is with a mark on the sheet near the mid-boom block.

Traveler position – Use a number scale along the traveler that is symmetrical on each side of center.

Outhaul – Use a number scale near the clew at the end of the boom, or at the forward end of the boom with a mark on the line.

Cunningham – The best idea is usually a vertical number scale on the mast with a mark on the line.

Vang – Try colored marks on the strut or fixed end of the line, with a mark on an adjacent moving part.

Jib lead position – Number the track holes or put a number scale along the jib track (see photo).

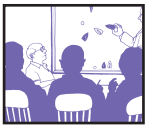
Jib halyard tension – Put a mark on the halyard and a number scale on the mast or deck near the cleat.

Jib sheet – Difficult to measure this. Try a mark on the sheet (the same on both sides) near the turning block, or marks on the spreaders to gauge leech position.

In order to reproduce fast settings, you need measurement marks on every sail control. Set up your scales so a higher number means a) more tension, or b) farther toward the side or stern of the boat. For example, on your jib track each hole gets a number and the higher numbers are aft. Then start recording fast settings!



JH Peterson photo



Which rules apply to my race?

Whenever you are racing, it's kind of important to know which rules apply to your regatta. There's a wide range of rules that could apply to any race, and a number of rules that can be changed for your particular event. Here is a series of questions and answers to help you figure it all out.

Question 1: Does every regatta have to use the racing rules that are found in my rulebook?

Answer: Yes. Every race must be "governed by the rules as defined in *The Racing Rules of Sailing*." This statement is required to be in both the Notice of Race (NOR) and the Sailing Instructions (SIs) for your regatta (see *Appendix J – Notice of Race and Sailing Instructions*).

The definition of "Rule" in the front of the rulebook provides a list of rules that apply at every regatta. These include the rules in the rulebook (including definitions), the notice of race, sailing instructions, the prescriptions of your national authority and your class rules.

Question 2: Can any of the rules be changed for my specific regatta?

Answer: Yes. Rule 86 (Changes to the Racing Rules) explains which rules can and cannot be changed for specific events. There are a number of rules that, for the most part, can never be changed; these include the Definitions, the Fundamental Rules, all the right-of-way rules in Part 2 (When Boats Meet) and some other rules that are not used nearly as often.

Note that a 'change' to a rule includes an addition to it or the deletion of all or part of it.

Question 3: How will I know if any rules are being changed?

Answer: Look in your NOR and SIs (usually near the beginning) to see if any rules will be changed. In the rulebook, Appendix J specifies all the things that must be included in your NOR and SIs. If any rules

are going to be changed, your SIs must refer specifically to each rule and state the change (rule J2.2(3)).

In addition, the NOR must identify any racing rules that will be changed, summarize the changes and include a statement that the changes will appear in full in the SIs. However, the NOR does not have to include this information unless it "...would help competitors decide whether to attend the event or...conveys other information they will need before the sailing instructions become available."

Question 4: So, can the basic right-of-way rules like port-and-starboard ever be changed?

Answer: That's a good question. The answer is essentially no since rules in Part 2 (When Boats Meet) cannot be changed by prescriptions, SIs or class rules. Rule 86 used to allow the SIs to change the definition of 'Zone' to two or four hull lengths (instead of three), but that is no longer the case.

Rules 86.2 describes certain rare situations when ISAF can authorize rule changes for a 'specific international event' (like the America's Cup). And rule 86.3 says your national authority can prescribe that rule changes are allowed to "develop or test proposed rules." In the US, for example, the prescription to rule 86 says that proposed rules may be tested, but only a) in local races, or b) 'if, for each event, the organizing authority first obtains written permission from US Sailing and the proposed rules are included' in the NOR and SIs. But this is not very common,

Question 5: Can the racing rules be changed by my class rules?

Answer: According to rule 86.1(c), there are only seven rules that can be changed by class rules:

- 42 *Propulsion*
- 49 *Crew Position; Lifelines*
- 50 *Setting and Sheeting Sails*

- 51 *Movable Ballast*
- 52 *Manual Power*
- 53 *Skin Friction*; and
- 54 *Forestays and Headsail Tacks*.

When a class wishes to change one of these rules, it must "refer specifically to the rule and state the change." Common changes include modifying rule 49 to permit other methods of hiking (e.g. trapezes) or rule 42 to allow more kinetics (e.g. unlimited pumping when the wind is over a certain velocity).

Question 6: What if my class rules change a racing rule that is not one of the seven listed in rule 86.1c?

Answer: According to ISAF Case 85, "If a racing rule is not one of the rules listed in rule 86.1(c), class rules are not permitted to change it. If a class rule attempts to change such a rule, that class rule is not valid and does not apply."

For example, if your class rules change all Two-Turns Penalties to One-Turn Penalties, that rule is not valid because rule 44 (Penalties at the Time of an Incident) is not one of the seven racing rules that can be changed by classes. The only way a class could make such a change is by including it in the SIs for all their regattas, since it's OK for the SIs to change rule 44.

Question 7: Can the sailing instructions change my class rules?

Answer: Generally, no. According to rule 87 (Changes to Class Rules), the sailing instructions can change a class rule only if: 1) that change is specifically permitted by the class rules, or 2) written permission from the class for that change is posted on the official notice board.

Question 8: When a one-design boat (e.g. a J/24) races in a handicap fleet, does she have to comply with her class rules?

Answer: That will depend on the handicap rule. According to ISAF Case 98, "If her handicap was ex-



JH Peterson photo

Explicitly based on the assumption that she race in compliance with some, or all, of the J/24 class rules, then those J/24 class rules, or all the J/24 class rules, apply to her.” But if her handicap is not based on this assumption, then the J/24 class rules do not apply to her.

Question 9: Once the NOR for a regatta has been published and publicized, can it be changed?

Answer: In most cases, yes. Rule 89.2(a) requires every organizing authority to publish a notice of race and says that NOR must comply with rule J1 (Notice of Race Contents). Rule 89.2(a) also says, “The notice of race may be changed provided adequate notice is given.”

Question 10: What if there’s a conflict between the NOR and the SIs for a regatta?

Answer: In that case, ISAF Case 98 explains that neither takes precedence. If the conflict must be resolved in order to settle a protest or a request for redress, rule 63.7 requires the protest committee to “apply the rule that it believes will provide the fairest result for all boats affected.”

If the conflict is found before it affects a protest, the NOR and/or the SIs can (and should) be amended to get rid of the conflict.

Question 11: Do I have to comply with the right-of-way rules in the rulebook before and after racing?

Answer: The right-of-way rules in Part 2 (When Boats Meet) “apply between boats that are sailing in or near the racing area and intend to race, are racing or have been racing” (see the Part 2 preamble). So if two boats are near the racing area and they are planning to race or they have been racing, they must abide by the right-of-way rules in the rulebook. However, they generally can’t be penalized for breaking a right-of-way rule unless they are racing (i.e. it’s after the prep signal and before they finish).

Some parts of the rulebook (e.g. most of Part 4) apply only while you

are racing, while certain rules (e.g. rule 55 – Trash Disposal) apply all the time boats are on the water.

Question 12: What happens when I’m in the middle of a race and I meet a boat that is not racing?

Answer: In that case, the Part 2 preamble says you must “comply with the International Regulations for Preventing Collisions at Sea (IRPCAS)...” These rules apply to your interaction with any vessel that is not racing, including boats under power or sail. If you break an IRPCAS rule with respect to a non-racing boat, you can be protested by any of your competitors or the race or protest committee.

Question 13: Can the SIs change a national prescription?

Answer: In general, the answer is yes, but it varies by country. Rule 88.2 says, “The sailing instructions may change a prescription.” However, rule 88.2 also allows national authorities to restrict changes to their prescriptions. To do that, they must write a prescription to rule 88.2 listing any prescriptions that can’t be changed or deleted.

In the US, for example, the prescription to rule 88.2 says that SIs cannot change several prescriptions including rule 61.4. That rule is a US prescription that says “no fees shall be charged for protests or requests for redress.” In other words, regattas in the US cannot require money for filing protests, and this cannot be changed by their SIs. •

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TACTICAL TIPS

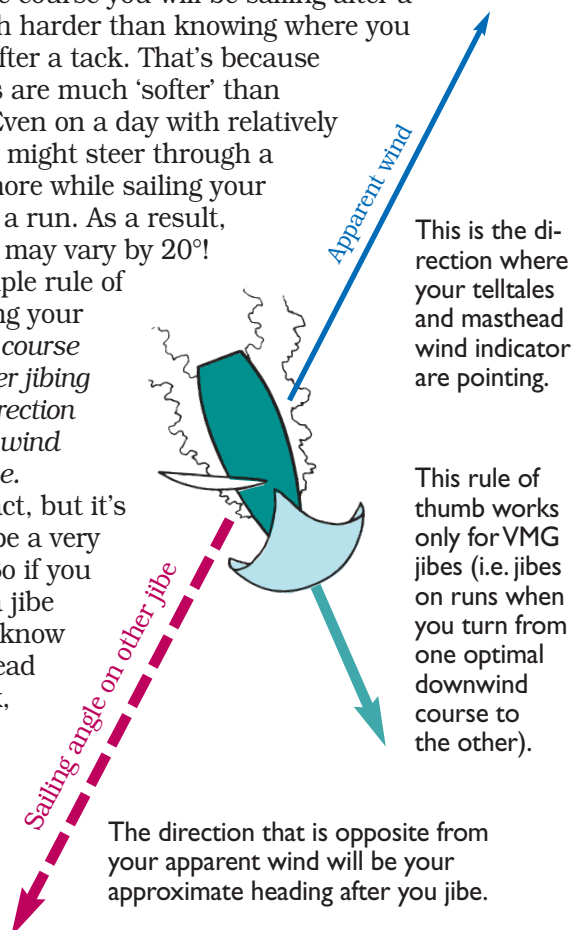
Easy jibing angle

A lot of sailors have trouble knowing how far they will turn their boat in jibes. This makes it difficult to call laylines to leeward marks, keep the boat going fast through jibes, and position themselves tactically relative to the competition.

Predicting the course you will be sailing after a jibe is often much harder than knowing where you will be heading after a tack. That's because downwind angles are much 'softer' than upwind angles. Even on a day with relatively steady wind, you might steer through a range of 10° or more while sailing your optimal angle on a run. As a result, your jibing angle may vary by 20°!

Here is a simple rule of thumb for gauging your jibing angle: *The course you will steer after jibing is opposite the direction of your apparent wind just before the jibe.*

This isn't exact, but it's close enough to be a very good reference. So if you are considering a jibe and you want to know where you will head on the other tack, look up at your masthead wind pennant – you will be sailing in the opposite direction.



TEASER ANSWER (From page 1)

Yes, W can keep sailing past the layline in both situations. There is no rule that requires W to tack to round the mark. Therefore, W can keep going as far as she wants and force L beyond the layline.

Of course, W is a windward boat in each of these situations. Therefore, according to rule 11 (On The Same Tack, Overlapped), W must keep clear of L. While W is taking mark-room to which she is entitled (as is the case at least briefly on port tack), W will be exonerated if she breaks rule 11. However, once W is no longer at the mark or sailing to it (e.g. she has gone past the layline) she will not be exonerated if she breaks rule 11.

L is a leeward boat with the right of way. While W is in the zone and has an inside overlap (as is the case on port tack), L must give her mark-room. But once W is no longer at the mark or sailing to it, L no longer has to give mark-room.

L could, in fact, 'luff' above close-hauled in both situations shown since W is not (or no longer) entitled to mark-room in either. L, of course, must give W room to keep clear (see rule 16) when she changes course. Even if L established her leeward overlap from clear astern, she can luff head to wind once the boats are clearly past the layline because tacking is then her proper course.

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