

HOW TO SAIL BETTER

Protect your boat in storm conditions

Øyvind Bordal and Magne Klann explain the steps you need to take to protect your rig and sails when the weather turns

There is every reason to have respect for really rough weather, be it a gale, strong gale or storm-force winds. However, with a well-prepared boat with an experienced crew, there is statistically very little risk. Sails and trim will also affect safety and comfort.

The single most important thing you can do for safety when it comes to storms at sea is not to be on the water at all when the weather gets really bad. Good weather forecasting is important, along with the will and ability to postpone or cut the trip short, even if it causes troublesome changes to your plans.

The risk of serious problems is also significantly reduced if the boat is robust and in proper condition on the essential

RIGHT Make sure not to ease the backstay too much for the conditions, especially on open wind angles

points: rudder, keel, through-hull fittings, rigging, sails and engine.

In other words: The most important safety feature is preparation: things you do or don't do while the boat is still in port.

Of course, in spite of good intentions you can find yourself at sea in weather you'd not have chosen to be out in. Here are some thoughts on how to handle that situation, with regard to sails and rigging.

Secured rig and sail plan

To handle a storm safely the rig has to be secure and correctly tuned. It really pays off to have a good base trim and



If the boat and crew are well prepared, then the risks of sailing in storm conditions are severely reduced

Colin Work

David Hannay

sufficient rig tension. The next point on the list is to adapt sails to the conditions. Sails used in really bad conditions should be designed and made for them, but once in the situation you will of course have to use whatever you have on board.

Reefing to adapt the size of the sail area is priority number one and this should be done in good time. Even simple and small tasks will become very difficult once the storm hits. All work on the foredeck will be hard and not entirely safe. If there are storm sails on the boat, rig and prepare them as early as possible.

Damage control

In these conditions trim is not so much about speed. Still, it is important that the boat is moving forward effectively, especially if conditions worsen and there is an opportunity to find shelter, reach port or get out of the weather system.

The main thing is to prevent injuries and technical problems. Take care not to overload or damage the equipment you will need to sail the boat. This goes for the whole boat and also when reefing, bending sails and working on the rig.

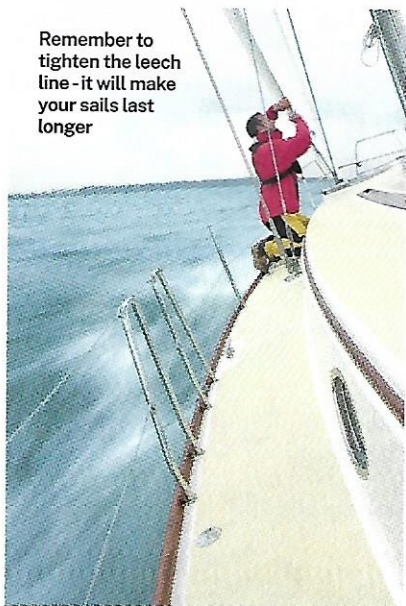
Stabilizing the mast

The base trim and a tight backstay should ensure rig tension in all directions. Do not ease the backstay much on open wind angles, it is more important to stabilise the rig than to optimise the sail profile.

Check regularly that the mast is straight sideways and has a proper longitudinal pre-bend. If you notice anything strange, ease the sheets immediately to depower the sails and examine the situation more closely.

If a shroud breaks on the weather side, the mast will come down very quickly, but if a fault is detected before it totally gives way, you can save the rig by coming about in a hurry, so the damage ends up on the leeward side. Now the mast can be stabilised with halyards attached to the chainplate or toe rail and tightened up as

Remember to tighten the leech line - it will make your sails last longer



hard as possible. A broken lower shroud can be 'imitated' with a halyard led under the spreaders and preferably also a turn around the mast. This will rule out the use of the mainsail but could save the rig.

The mid-section of the mast must never bend backwards, which can happen when the mainsail is deeply reefed and there is not enough tension in the backstay. If possible, the midsection of the mast should bend slightly forward. Any kind of pumping or jerks in the mast must be avoided, if at all possible. Tighten check stay and baby stay if the boat is rigged with these.

Reef at all angles to the wind

Reefed sails should also be trimmed. A simple yet essential check is that the halyard and reefing line are tensioned properly. This provides a flat open sail with the deepest point well forward, which is what you need. The sheeting point for the headsail must be adjusted until the sail twists properly - too little will increase side force; too much could ruin the sail (flogging top/leech).

Also, remember to tighten the leech line. If the sail is allowed to vibrate in the leech, the life of the sail will be greatly shortened. The noise from vibrating leeches is also a stress factor for the crew.

It is equally important (but not as obvious) to reef on open wind angles. Lateral forces are less and boat speed greater, so it feels much quieter. This is however a false impression. As conditions worsen, it may become difficult to reef or reduce sail and you could lose control over the boat. Please feel free to take the mainsail down on open angles - and if not, use a preventer.

Balancing with the mainsail

In rough weather, it's important to keep balance in mind. It's usually a good idea to have relatively low pressure in the mainsail compared to the headsail. Upwind, the boat heels a lot, especially in gusts and when hit by waves. You'll be

ABOVE If the boat heels over too much, and the mainsail has been released, steer into the wind to balance the boat

RIGHT Storm jib alone is a good sail plan for open wind angles

able to steer the boat better with the centre of effort well forward. The jib sheet should be tight, but allow the sail to twist. Still, the headsail should not be too flat.

The optimal sail in storm-force conditions is a very small sail, but with some profile. This provides a wider track and smoother progress. The waves will throw the bow around a lot and precise steering will be difficult. The mainsheet should be set rather loosely but keep a

very tight backstay. The mainsail is usually reduced to a tool for balance, not speed.

If a gust heels the boat too much, even with a released mainsheet, steer into

the wind. Ultimately, if needed, ease the jib sheet too. If this happens a lot, it's a signal the boat is overpowered for the conditions. Releasing the jib sheet should be a 'last resort'. If the waves are more on the nose on one tack than the other, point high on the tack where waves are more from the side and lower on the tack where waves are more on the bow.

Pressure point in the sails

Downwind it is even more important to move the centre of effort forward. This will keep the bow down with the wind and reduce the chances of a broach and ultimately an involuntary gybe.

If the boat is heavy on the helm, do something about it. Sheets are the first place to look. Weather helm is often a signal that the mainsail should be eased out, reefed or taken down.



TOP TIPS

Safety in rough weather

- 1 Stay on board.** In other words: Hold on! Be aware and take care when you move about on deck. Use a harness when conditions demand it.
- 2 Use a lifejacket,** preferably one with a personal emergency beacon, so that you can easily be found if you should fall in the water.
- 3 Be aware of the boom** when the boat sails downwind, especially in high seas. Use a preventer, make sure the helmsman is focused and that the crew knows what an involuntary gybe is. Avoid a dead downwind run, especially with any kind of mainsail up.
- 4 Check if the boat is taking on water,** either through leaky or defective through-hull fittings, piping systems, deck hatches or elsewhere. Don't forget to concentrate on navigation!



ABOVE Make sure the trysail is rigged before the heavy weather hits

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Storm sails

Trysail. A trysail is a storm sail that can be used as an alternative to a fully reefed mainsail – but it is actually very rarely used in practice.

If it is going to be of any use, it requires two things: firstly, that it has been tried out beforehand, so you know the procedures, sheeting point etc, and secondly that it is rigged and prepared before the storm sets in.

Storm jib. If the boat is rigged with a furling headsail, as most boats are, it could be a challenge to set a storm jib. If you sail on the open sea or want to be prepared for foul weather, it's a good idea to have an inner forestay or cutter stay, where you could hank on a storm jib.

Hanks are the most reliable system. There are also storm jibs that can be set 'flying', ie with the stay integrated with the sail, often with a Spectra line. They require

a solid mounting point on the foredeck.

Other storm jibs are designed to wrap around the rolled-up furler, with a kind of pouch in the luff.

Feedback from people who have a lot of experience sailing in rough weather suggests that these storm jibs do not necessarily work that well in practice.

The simplest yet most risky option is to sail with a small piece of furling headsail out. It will work well on open angles and not so well close hauled, but the risk is that the furling line could break, or that the system becomes overloaded and the whole sail gets torn out of the roll. There are major forces at play. To find yourself with a fully unfurled genoa in a storm is a difficult and dangerous situation.

If you sail with a reefed furling headsail instead of a storm jib, it's a good idea to secure the furler with a strap to prevent it from rotating.

Boats rigged for ocean passages sometimes (if they intend to use a trysail) have a separate track on the mast for that purpose. If setting a trysail requires that the mainsail slides are taken out of the mast track, or if the trysail has to be rigged above the lashed mainsail, then it will be very difficult to rig it in a storm.

Storm strategy

Running with the weather. A lot of seasoned sailors would argue that the best survival strategy for extreme weather is to go with the wind and wave. Sailing with just a small storm jib can be a sensible setup. You could also drop all sails and sail only on the rig. To run with the weather assumes that there is

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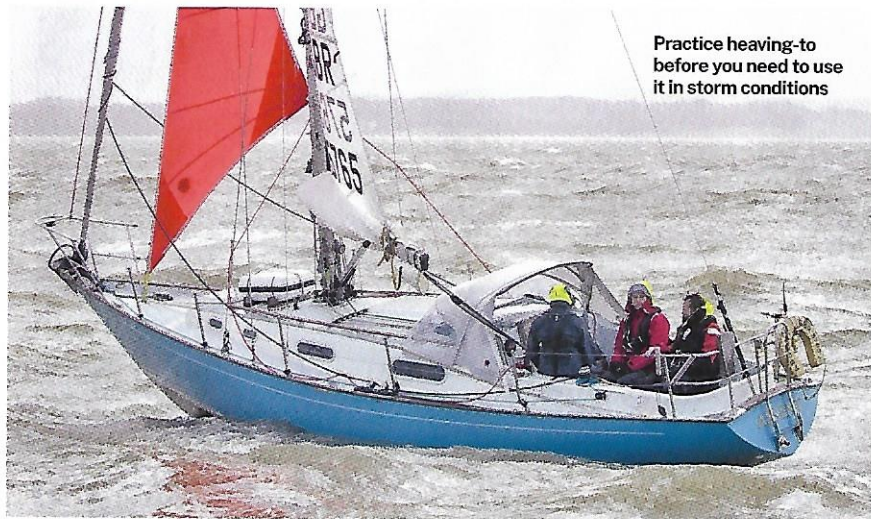
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Richard Langdon/Ocean Images



ABOVE Using a sea anchor or drogue will keep the boat's bow towards the waves, reducing the risk of a knockdown



Practice heaving-to before you need to use it in storm conditions

room enough downwind, however.

Experienced sailors are always careful not to sail too close to a weather (lee) shore if there is a risk of extreme weather. They will either seek shelter before the weather gets bad or head far out to sea, with plenty of space to sail with the weather – for several days if necessary.

Avoid placing the boat square to the wind and waves. Breaking waves can turn a boat over if it is beam to. In very high seas you should try to limit your speed down the waves. Long, heavy ropes streaming astern can help and can also curb breaking waves to a certain extent.

A risk when running with the wind and waves is that the helmsman eventually will get exhausted and that sooner or later you'll experience a violent broach or knockdown. Moreover, you are sailing many miles in a direction that's not necessarily a good one.

Still, to sail with the weather will be the

easiest choice and could also be the right decision in less dramatic circumstances. Even if the situation may not be dangerous, it will often be a good idea to turn around and sail back with the wind, or change the destination to somewhere downwind.

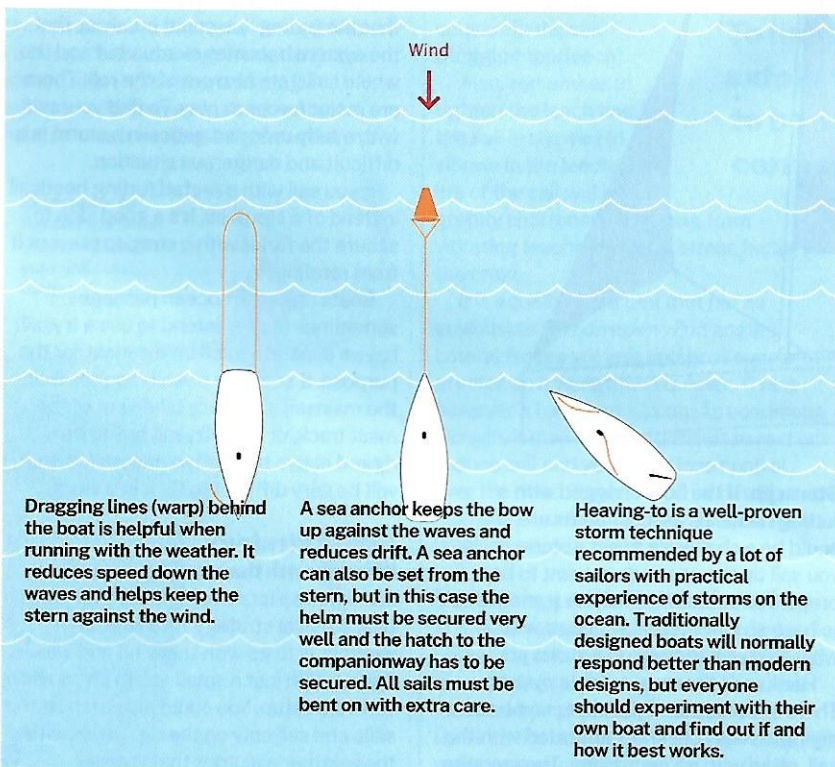
Heaving-to. Heaving-to is an old, traditional way to survive harsh weather. Modern boats are not always designed and balanced in a way that makes the technique suitable and the method is rarely used these days. But with a traditional, long-keeled boat, it may be relevant to heave-to and wait for better weather. You should try it out in controlled conditions, to know how your boat reacts. This is how it is done: when the boat is sailing close-hauled (upwind) you initiate a normal tack, but leave the jib sheet attached so that the jib is backed. The mainsheet is loosened and adjusted so the boat balances, but without the

mainsail contributing much to forward progress. The rudder is hard over, steering the boat into the wind. The backed jib now forces the boat to leeward, while the helm pushes the boat to windward.

The idea is that these two forces will counteract each other and keep the boat in balance. When this works as intended, the bow will be pointing at a 45° angle towards the waves and wind, with hardly any speed ahead, but also without drifting much. The boat will now deal with the waves relatively well. The rudder may be locked in this position, so the whole crew can theoretically remain below deck until the weather improves, maintaining a proper lookout. In extreme weather, the boat might be knocked down by the forces in the backed headsail, but nonetheless; many have safely weathered a storm this way.

Sea anchor

A drogue or sea anchor helps to keep the bow towards the waves. The rope should be long and with stretch and the sea anchor should preferably be in step with the waves, so the boat and drogue are on top of a wave at the same time.



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ADDITIONAL READING

Øyvind Bordal and Magne Klann have written extensively about sail trim and rig care in their book *Sail and Rig: The Tuning Guide*, which is



published by Fernhurst Books (£18) and available at fernhurstbooks.com

The book provides a clear understanding of the dynamics of rig and sail and how to get them working together in harmony. Professional riggers, sailmakers and elite sailors were consulted for the book, which is suitable for both beginner and experienced sailors.