

## **DAMAGE CONTROL**

### **Basic guidance for dealing with major technical emergencies: Dismasting, Steering Failure, Hull Rupture.**

#### **Dismasting**

##### **Immediate actions**

The boat and the crew may seriously be endangered after a dismasting. It is vital that the crew is coordinated by the skipper or a more experienced member. The following is a proposed action plan for such a case:

Do not panic and do not start the engine - there will be rigging and sheets/halyards in the water around the boat.

Assemble the crew immediately, check for injuries and assess their physical condition and morale.

Assess the rigging damage and confirm the exact position of the mast (or parts thereof) and the rigging.

If the mast (or part of it) is in the water and the sea is rough, there is an immediate risk of the hull being punctured. Furthermore, it will be very dangerous for the crew to try to salvage and secure the broken mast, rigging and sails on deck. It is better to cut the rigging and let everything sink.

An alternative solution is to selectively cut off rigging and halyards/ sheets and let the mast/rigging/sails operate as a drogue (sea anchor) if conditions oblige you to do so.

In mild weather, anything that can be saved will help set up a jury-rig if the situation calls for it. Use loops to pull the mast and rigging out of the water. This will be easier if you can manage to remove the sails first. You will probably be able to retrieve the foresail, but it is unlikely that the main will be saved.

If the mast falls on deck, secure it immediately. Then deal with the sails that have fallen overboard. It is better to sacrifice them rather than risk crew injury or loss to save them.

Carefully check twice that there is no rigging, sheets/halyards or sails that could get tangled in the propeller/shafting. Then you can start the machine.

Depending on how far away you are from a safe harbour, consider whether to continue with the engine or set up a jury rig.

Always have a waterproof handheld VHF and a spare, pre-wired VHF antenna with you - the main antenna will be lost along with the mast.

Do not leave the boat unless it has been badly damaged and sinking. Remember the British saying 'Always step up, NOT down, a liferaft'.

## **Saving the rigging**

On most modern sailboats, in almost every case of rigging failure, the mast is doomed. Sometimes, however, quick reactions can temporarily save the situation, until some repair action is attempted.

As soon as you notice any damage to the rigging, normally on the windward side, immediately tack or gybe to reverse the rigging loads. If you are sailing to windward, simply heave-to: the boat will stop, rig loads will be reversed, wave impact loads will be reduced and rig oscillations will be minimised.

If conditions are mild and permit so, continue sailing. Sailing will reduce rolling and transfer of loads to the side of the rigging that has been compromised.

If the backstay fails, do not release the mainsheet under any circumstances. The leach tension of the main will keep the mast in place indefinitely. Further support will be ensured by careful tightening of the boomvang. A spare halyard can easily serve as a temporary backstay. A spare halyard or the topping lift can also be used as an internal forestay.

If you continue sailing, alter course as required in order to reduce wave impact forces.

It is needless to point out that all crew will have to be positioned as far as possible out of harm's way.

If, finally, the rigging starts collapsing, try to steer so that the mast falls into the sea.

## **Causes of dismasting**

Most cases are due to terminal failures. Standard stainless steel wires or rods rarely break. Their sensitive point is the hardened tightening and crevasse corrosion-prone area of the terminal.

Many terminals also fail due to poor alignment. Make sure you have links that allow free alignment on all axes.

If the mast itself fails first, then this will be due to material fatigue that originates from the so-called 'panting', i.e. the oscillation of its central part due to insufficient support and/or poor rigging adjustment. If you notice this on your boat after rigging adjustments have been fully optimised, consider installing check stays.

## **Necessary tools and equipment for longer voyages**

Any skipper sailing offshore should ensure that suitable equipment is onboard should such a critical situation need to be dealt with:

Complete toolbox covering all types of fasteners (bolts) and fittings

Sailor's knives

Special type stainless steel cable cutter

Hacksaws with spare blades suitable for stainless steel

Large adjustable wrench and piece of pipe that can serve as a lever around the handle

Hammer

Marlinspike

Collection of shackles

Long ropes (preferably made of modern, low stretch fibers)

At least one rope 1.5 times as long as the longest stay and of suitable diameter/ tensile strength.

Long bolts with nuts and washers of suitable sizes for rigging fittings

Sheet metal screws

Clamps

Wire

Fabric adhesive tape (e.g. Silvertape)

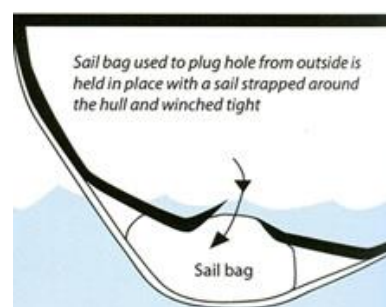
Rivetter / rivets

Additional blocks

Terminal screws with jaws & jaw type terminal fittings (e.g. NORSEMAN)

## Hull Rupture

In case of a large hull puncture, it is proposed to attempt plugging of the opening from the outside by using a sail bag held in place with a sail strapped around the hull and winched tight (see sketch), subject obviously to weather conditions and crew capacity. This is an efficient method as access and ways to reduce/control serious water ingress from the inside of the boat are usually limited.



## Steering Failure

A spare tiller must be available on racing boats in all categories unless they use an unbreakable metal tiller as the main steering system.

The crew must be trained to quickly react, set-up and steer the vessel in any sea state using at least one alternative steering method (e.g. by makeshift rudder made from a spinnaker pole and floorboards, controlled by ropes) should the rudder/steering fail.

