

WATCHKEEPING DUTIES & NAUTICAL EMERGENCIES

WATCHKEEPING

The law requires every vessel to maintain an efficient and competent watch, adequate to the prevailing circumstances and conditions. The watchkeeper should be sufficiently rested and not under the influence of alcohol or narcotics. If the watchkeeper being relieved is doubtful of the fitness of the relieving watchkeeper, the watch should not be handed over and alternative arrangements should be made. Watchkeepers need to fully understand the operation as well as the limitations of the navigational equipment on board. Prior to taking over a watch, the watchkeeper must become fully aware of the vessel's position, courses, speed as well as any dangers likely to be met during the watch. The watchkeeper must not hesitate to use the helm, engines, sails or sound signalling appliances on board.

Commercial vessels have learnt from experience that the Master's presence in the wheelhouse does not mean the watchkeeper has been relieved from his or her watchkeeping duties or from taking action to avoid collisions. Should the master wish to take over the watch, he or she would do so by expressly stating words such as "I now have the watch". Whether by day or night, the watchkeepers are required to notify the Master if in any doubt of the safety of the vessel. Masters leave written Standing Orders as well as Night Orders on ship's bridge to ensure that misunderstandings do not creep in.

WATCHKEEPING WHEN UNDERWAY:

- Do not at any time leave the bridge or cockpit unattended.
- Keep a close watch on weather and visibility - by satellite, radio, radar and visual.
- Be aware of other vessels and navigational hazards in the vicinity.
- Make effective use of the navigational aids on board.
- Do not use the automatic pilot in poor visibility, in confined waters or in heavy traffic density. Do not make large course alterations on automatic pilot.
- Frequently check the vessel's position by various methods, and cross-reference them.
- Be aware of compass, GPS and all other instruments errors.
- Be aware of tides, currents and depths in the area.
- Be aware of the state of vessel's machinery and auxiliaries.
- Keep an eye on any cargo on board. Maintain a fire and bilge watch.
- Maintain an appropriate radio watch.

WATCHKEEPING AT ANCHOR:

Ensure that the vessel maintains her position. Except when she is swinging due to change in the direction of tide or wind, a changing beam bearing is the best early warning of a dragging anchor. A minimum of two bearings noted down and rechecked from time to time is the best all round method to ensure that the vessel is holding her anchor.

A good lookout at anchor includes a safety watch on the passing traffic, positions of other vessels at anchor, knowledge of weather forecast and the state of the current weather and tides, display of the appropriate anchor signal, complying with pollution regulations, bilge and fire watch, engine and auxiliary machinery in readiness as per the circumstances. A radio watch must also be maintained. Masters of commercial vessels leave written Standing Orders and Night Orders on the ship's bridge, especially when anchored at a precarious location. In any case, the watchkeeper is always required to notify the Master if in any doubt of the safety of the vessel.

WATCHKEEPING IN PORT

In the interest of occupational health and safety and to minimise third party liability claims as well as in the interest of your own safety and the safety of your vessel, your vessel must be berthed or moored securely at all times in all tidal, wind and weather conditions. In places where there is a large range of tides the berthing lines must be long enough for the vessel to be able to rise and fall with the tide (as discussed in Chapter 8). The access to the vessel must be adequate and safe at all times. Appropriate signals and safety signs must be displayed when vessel is refuelling, there is a diver below or when carrying out other specific functions. You must be aware of who is on board at any given time.

WATCHKEEPING FATIGUE

The STCW recommended procedure for rest periods are as follows:

Watch keepers must have at least 10 hours rest in a 24-hour period, consisting of not more than two rest periods, one of which must be not less than 6 hours. However the rest period of 10 hours may be reduced to not less than six consecutive hours provided that any such reduction does not extend over two days, and at least 70 hours rest is provided during a 7-day period.

REFUELLING PRECAUTIONS & POLLUTION PREVENTION: See Chapter 12.

MASTER'S INSTRUCTIONS TO WATCHKEEPERS

(STANDING ORDERS, NIGHT ORDERS, ETC.)

- Call me if you encounter restricted visibility, heavy weather or a navigation hazard or if you feel unable to deal with the traffic conditions.
- Call me if you fail to make the expected landfall or sight the navigational mark or obtain the expected sounding.
- Call me if experience difficult in the steerage or navigation or manoeuvring of the vessel, or if any of the equipment malfunctions.
- Call me if in doubt at any time.

HANDING OVER OR TAKING OVER A WATCH

Pay attention to:

- master's standing orders
- vessel's position, course speed and draft
- weather and tide conditions
- working of the navigational equipment, and compass errors
- presence and movement of other vessels
- the state of machinery and sails
- the state of any cargo, and any operational activities.

REPORTING MARINE CASUALTIES & INCIDENTS

Under the marine safety acts in all States as well as in Commonwealth, a marine casualty or a marine incident is deemed to have occurred when a vessel is in danger of serious damage or is lost, abandoned, stranded, grounded or materially damaged (whether by fire or otherwise) or has been in a collision with another vessel or with any other thing; or there is a serious danger of or an actual loss of life or injury to a person due to an accident on board.

The incidents involving danger, without actual injury or damage, should be reported in the same way as other incidents so that relevant data can be recorded and analysed.

Rules concerning responsibilities and care among those involved in marine casualties and incidents may vary slightly among States. You should consult your State's boating literature or Sailing Directions. In general, transmit a distress, urgency or safety message as appropriate, make an entry in the vessel's log book and make a full report to the appropriate authority within 48 hours. If the initial report is not made in the approved form the master must make a further report in the approved form as soon as possible. In addition, when involved in a collision with another vessel, follow the rules similar to those after a motorcar accident:

- Stop the vessel.
- Ensure the safety of own vessel.
- Give necessary assistance to the other vessel.
- Produce your certificate of competency if requested on reasonable grounds.
- Exchange names and addresses and registration details, if any.

CLAIMING SALVAGE *(See IMO website for more information – address on the last page of this book)*

Your legal duty to provide rescue at sea is limited only to the saving of lives. Saving of property is salvage unless the vessel needs to be salvaged in order to save lives.

No salvage claim in respect of a distressed vessel is valid unless the salvage is specifically requested by the master or the owner. The parties are free to enter a fixed price salvage agreement. However, the request for salvage is usually recorded on what is known as a "LLOYDS OPEN FORM OF SALVAGE (LOF) AGREEMENT". There is no provision to enter a monetary value on this form. It provides for the salvor to be rewarded a percentage of the property salvaged (vessel and cargo) if the salvage is successful. If unsuccessful, the salvor is not entitled to a salvage claim. Therefore, the form is also referred to as a "No Cure No Pay" agreement. (However, a reward may be payable for an unsuccessful salvage if it has averted or minimised pollution.) An independent arbitrator is appointed through a Lloyds Agent or the Law Society to assess the reward, based on the value of the property saved and the risk and cost borne by the salvor.

Most commercial vessels and salvage tugs carry this one page agreement on board. Agreement to comply

with the LOF terms can also be signed on a plain sheet of paper. Even in the absence of this document, if the salvor is asked to salvage the property in distress and the salvage is successful, the salvage award is usually automatic.

Where it is necessary to tow a vessel in distress in order to save lives it is your statutory duty to do so without risking the safety of your own vessel, regardless of the owner's agreement or a clause in the insurance policy. An award for salvage of property may still apply. However, as soon as the distressed vessel is in a safe position, the towing vessel has no right to continue towing for the purpose of earning additional salvage award.

Ownership of a property found adrift or sunken at sea is not automatic, unless abandonment can be shown or the owner can not be found. However, a salvage award for rescuing such property may be successful, especially if it is found outside the territorial limit of 12 nautical miles. Such claims are dealt with through the Receiver of Wrecks (in the Australian Maritime Safety Authority (AMSA)).

Before undertaking a voluntary salvage, the salvor should take the following actions:

- In the absence of a printed form, enter an agreement headed "Lloyds Open Form of Salvage Agreement" written on a sheet of paper together with the names of the vessels and the date and signatures of the two masters.
- Obtain both owners' as well as your insurer's agreements.
- Ensure there is sufficient fuel remaining on board to complete the task.
- Obtain a weather forecast for the estimated period of salvage.
- Check to see that there is sufficient engine power for the task in rough weather.
- Assess your possible expenses (perishable cargo, etc.) in comparison with the value of the property being salvaged.
- Assess your prospects of success.

EMERGENCIES

(All emergencies should be regularly practiced and drilled as discussed in Chapter 19.3. For example, in case of loss of steering, the crew must know how to deploy the emergency tiller as well as a steering drogue. The flush deck mounted "bung" that allows access to the top of the rudder post should be serviced annually to prevent it seizing up, and the tool for opening it should be secured nearby. The tiller or rudder should have lugs attached for pulleys and ropes to aid its emergency use, as should the bulkhead to attach them. The pulleys and ropes should be regularly inspected and stored at the appointed location.)

GROUNDING

Grounding can be intentional or accidental. Intentional grounding, more often called beaching, means that you want to ground the vessel for reasons such as repairs or hull cleaning. More correctly, the following terms may be used:

- STRANDING: Unintentional running ashore (Strand means ocean shore).
- GROUNDING: Unintentional contact with the bottom but not on the shore line.
- BEACHING: Intentionally running up a beach to save the vessel, to undertake repairs or to save the crew

STRANDING (ACCIDENTAL GROUNDING)

While some grounding or stranding incidents are nothing more than embarrassment; others have resulted in disastrous consequences. Therefore, grounding or stranding, small or large, should be treated as potentially serious until the situation has been assessed.

The situations that may involve running aground are many, from running onto a mud bank in a quiet harbour, to being driven by heavy weather onto a rocky shore. In the latter case the principal concern will be the saving of life. If you run aground on a falling tide, the vessel may become damaged through hull fracture or holed by sitting on rocks or reefs.

INITIAL ACTIONS

- Stop engines and auxiliaries.
- Sound bilges and inspect voids. Take bearings and plot position.
- Examine chart details, survey the area and check soundings around the vessel.
- Check whether tide rising or falling. Check tidal stream. Obtain weather forecast.
- Don't go astern for too long or too fast. In fact avoid it. If the bottom is sand or mud, going astern may wash a quantity of this material from astern and throw it directly under the keel. This will bed the vessel down more firmly. The sand or mud will also be pumped into the engine through the water intake.
- If the bottom is rocky, going astern may cause hull damage.
- When grounded forward, a right-handed single screw vessel going astern may swing the stern to port. This may cause the hull to go broadside on shore.
- If grounded on a falling tide, work quickly to stop the hull from swinging due to the action of wind or waves. Also brace the vessel so that it will stay upright and easier to refloat.

- Move crew and passengers to lighten the grounded end of vessel.
- Jettison any weights you can. Control panic, check for personnel injuries.
- Check for hull damage. If the hull damage is evident, it may be better not to pull her off.
- Lay out an anchor to prevent her going up any further.
- Request Water Police, the State Marine Authority or the Volunteer Coastal Patrol/Coast Guard for a tow, if appropriate.
- Consider taking tow from a passer-by or ordering a commercial tug.
- Lay out anchors to prepare to pull off at the next high water, if decided. This is known as kedging. Two anchors laid with a 30° spread between them can be used to wiggle a vessel's stern, by heaving on them turn by turn.
- Hoist 'vessel aground' day shapes or lights.
- Send Pan Pan or Mayday and plan abandon ship, if necessary.

POLLUTION PREVENTION

See Chapter 12

SALVAGE CLAIM

Discussed earlier in this chapter

PREPARING TO REFLOAT

- Lay out anchors to pull her off.
- Lighten her or move weights or people as necessary.
- Pump out or flood compartments as appropriate.
- Have lifesaving appliances ready in case of a sudden need.
- Start refloating just before HW.

AFTER REFLOATING

- Check if she is taking any water and whether or not you can cope with it.
- Check propeller, rudder and engine damage, if any.
- Make for the nearest safe port and make a report to the licensing authority and owner.
- The licensing authority will decide if she needs to be slipped and checked.

IF HARD AGROUND ON A REEF: Running hard aground on a reef means the hull is likely to be holed. If the weather is calm, it may be advisable to stay there and request help by, say, a Pan Pan message on radio. Accidental refloating by rising tide should be guarded against. You could either shift or load some weight on board. Take an anchor ashore to hold her until temporary repairs can be made or help arrives. Take environmental precautions against oil or fuel leaks.

IF AGROUND ON AN UNCERTAIN SANDY LOCATION AT NIGHT: Since your position is uncertain, it is night time and it is a safe place to stay, you should seriously consider staying there until daylight.

IF AGROUND ON A MUD BANK

1. **ROUND BILGE (FLAT BOTTOM) BOAT:** Lay out the anchor with the longest available warp (line from a winch) and attempt to winch her off. Plan for rising tide (if any) and a favourable wind direction. Don't run engine. Close all openings in case she heels over and lighten the vessel as much as possible before attempting to haul off.
Or, heel her (towards the shallower side if possible), either by manual force or with help from another vessel. This can be done by crewmembers sitting on the boom swung at right angles to the hull or the other vessel heaving on a halyard from the top of a mast. Take care not to damage the keel. Push or tow to slide the vessel off the mud bank in this position.
2. **KEEL BOAT:** Reduce the boat's draft by heeling her. Make fast a rope to the mast as high as possible, get out of the boat and pull on the rope. Or pass the line from a kedge anchor through a block at the masthead or at a high point and take it to a winch. Swing weights out on the boom. If the boat is dimasted then list her by moving weights (people) on board to one side.

PLANNED GROUNDING (BEACHING)

This may be necessary to save a vessel from fire or foundering in deep water or to carry out an underwater inspection. Consider the following when beaching:

- Selection of the site: nature of bottom, obstructions, bottom slope, exposure to wind, etc. A gently shelving, sandy, sheltered beach is the best option. Beaching on a rocky shore can be a disaster in bad weather. Both

the vessel and survivors may smash against rocks. Under such circumstances, abandoning vessel into a liferaft may be a better alternative.

- Weights and trim. Keep half ballasted if possible. Load additional weight after grounding to hold her down. On refloating, increase buoyancy by discharging all ballast.
- Tidal conditions: range, tidal stream, times of high and low water. How long is the intended period of beaching. Beach just after HW so that you can get maximum time for repairs and she will be easy to float at next HW.
- How to make the approach (90° to the beach). In order to prevent mud or sand being sucked into the cooling water intake stop engine prior to making contact and close all underwater openings.
- Assess securing arrangement for the vessel.
- Assess when and how to use anchors. Usually it is better to lay out anchors after grounding in readiness to pull her off at next HW. (See Kedging with anchors under Accidental Grounding.)
- Has the vessel a flat bottom or deep keel. A deep keel vessel might need shoring up. Refloating while lying on her side might be difficult. (See Careening and Hard Stand in Chapter 5.)
- Work out refloating procedure and the possibility of bleeding the cooling system.

COLLISIONS

If collision is imminent, take action to reduce damage to sensitive areas of both vessels. For example, go full astern on engines and turn the vessel to avoid a direct hit (a glancing blow would cause less damage). A bow to bow or bow to quarter hit would also cause less damage than one vessel cutting into the hull of the other, particularly into the engine compartment. If one vessel becomes wedged into the hull of the other, it may be safer for them not to separate until the situation has been assessed. Transferring people from one vessel into the other might also be safer while wedged.

Read procedures under Safety Drills, Hull Damage, Beaching and Reporting Marine Incidents in this Chapter and Chapter 19.3.

HULL DAMAGE/ FOUNDERING

A vessel may FOUNDER (sink) as a result of water ingress. Heeling her to the undamaged side may keep her afloat. Cushions, bedding, sails, boat hooks and dinghy paddles may be used to patch and shore up the hole. Sails and bedding can also be wrapped on the outside to stem the water flow. A water-cooled engine can be used as an additional bilge pump by connecting the water inlet to the bilges. It is wise to fit a filter over the intake. Shut off the normal intake seacock.

DAMAGE BELOW THE WATERLINE: If a vessel is holed below the waterline, one way to reduce the inflow of water in order to carry out repairs from inside is to rig a collision mat over the damaged hull section.

A COLLISION MAT, in its simplest form, is a sheet of strong canvas, with spars and rigging lines lashed to two opposite sides. After rolling it on deck and holding it with strong ropes, pass it under the hull from over the bow or stern. Move it over the hole, unroll and lash it in place. The hole can also be stuffed with a pillow or covered with a mattress, but DO NOT USE THE LIFE SAVING EQUIPMENT for this purpose.

One type of commercially available collision mat for small vessels is like an umbrella (shown here). It is inserted through the hole and opened.

A CEMENT BOX is used to repair the hole from inside the hull. Use quick setting underwater ready mix cement or mix 1-part cement with 3 parts sand. Make two wooden boxes: one larger than the other, both large enough to cover the hole. In each box make a hole on one side for a drainpipe to pass through.

Fix the smaller box over the hole with a drainpipe for any water to run out. Now fix the larger box over the smaller box and fill it with cement. Plug the drainpipe when the cement has set.

SHORING BULKHEADS IN A DAMAGED BOAT: If the vessel is holed in the bow, the forward bulkhead may need shoring from behind to support the weight of the sea flooding forward of it. The forward bulkhead is likely to be triangular in shape. It will be best supported if you shored it roughly half way up from the base of the bulkhead to the flooding waterline.

A midships bulkhead needing support, on the other hand, is likely to be rectangular in shape. Shore it from behind, roughly one third of the way up from the base of the bulkhead to the flooding waterline.

In the case of a vessel in survey, any damage and the repairs thereof must be reported to and inspected by a licensed surveyor.

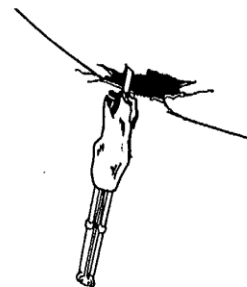
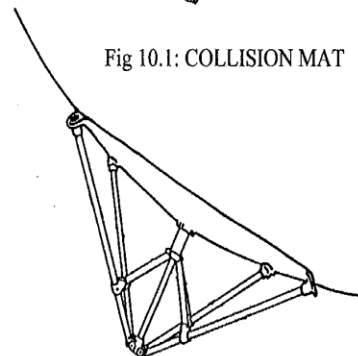


Fig 10.1: COLLISION MAT



STEERING ROD PARTED WITH RUDDER JAMMED HARD OVER TO ONE SIDE

Try to pull back the rudder amidships or as near amidships as possible. Then rig a jury rudder as discussed below in "loss of steering at sea".

If you have to leave the rudder jammed hard over, the vessel will tend to go in circles. You should slow down to reduce the rudder effect.

In case of a twin-screw vessel, you may be able to keep her on course by using the one engine more than the other. In a single screw vessel, you will need to tow a drogue on the opposite quarter to counteract the rudder effect. By hauling it in or out, you may also be able to steer the vessel. You will need to adjust the size of the drogue and the length of the line by trial and error.

LOSS OF STEERING AT SEA

First check whether the rudder is lost or it is just the steering gear that is not working. In a non-hydraulic system, a rod (or wire) may have broken, or the chain may have slipped off the gipsy in the steering wheel assembly or off the rudder quadrant. In the hydraulic steering system, the pump may have stopped working, there could be a break in the oil line or at the tiller head, or the bearings in the steering wheel assembly may have become seized.

If the rudder is intact, and you do not have the mechanical knowledge to repair the steering gear, you should be able to steer by the emergency steering (manual tiller). It is usually required to be carried by vessels operating in open waters. If the rudder has been lost, look out for any ingress of water from the rudderpost area.

Irrespective of the cause, make sure that the vessel is safe from running aground, collisions or being swamped or capsized by the waves.

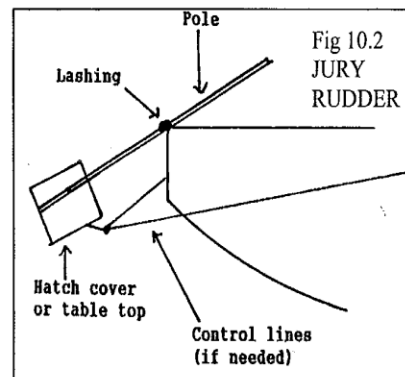
ACTION TO BE TAKEN: Drop an anchor, if water is shallow enough. If not, use a sea anchor to hold her head into the sea to avoid capsizing. Hoist the Not Under Command day shapes or lights. Seek assistance or rig a jury rudder.

The easiest jury rudder is a drogue towed behind the vessel from a bridle secured to her quarters. (A drogue is any object offering sufficient drag.) The vessel can then be steered by hauling in the bridle line from the required quarter. Hauling on the starboard line will turn the vessel to starboard, and visa versa. She will steer straight ahead when the drogue is centred.

A cabin table or a hatch cover secured to a pole and fastened with U-bolts can also provide a substitute rudder.

A twin-screw vessel can be steered in emergency by running both engines at half speed, and then increasing or decreasing the speed on one of them to turn the vessel in the desired direction.

Record the event in vessel's logbook.



LOSS OF PROPELLER AT SEA

As discussed with loss of steering, first make sure that the vessel is safe from running aground, collisions or being swamped or capsized by the waves.

ACTION TO BE TAKEN: Drop an anchor, if water is shallow enough. If not, use a sea anchor to hold her head into the sea to avoid capsizing. Hoist the Not Under Command day shapes or lights. Seek assistance or rig a sail or row if close to the shore.

PROPELLER FOULED OR DAMAGED AT SEA

If you feel a thump & engine starts to slow down or stop without apparent reason, the propeller may have become fouled with a net or a rope and it has started to wind around the propeller shaft.

Stop the engine instantly. Make sure that the vessel is safe from running aground, collision or being swamped or capsized by the waves. Drop an anchor, if water is shallow enough. If not, use a sea anchor to hold her head into the sea to avoid capsizing. Hoist the Not Under Command day shapes or lights.

If possible, carry out a visual inspection of the propeller and shaft. You must shut down the engine without any possibility of accidentally being started before carrying out this operation. Go over the side and remove the net or rope by unwinding it from around the shaft or cutting it with a hacksaw blade or bread knife. (The synthetic ropes usually become tight and fuse around the shaft).

Check for any visible damage to the propeller blades, rudder post, propeller shaft, cutlass bearings and the spectacle frame. Also check for any damage to the gearbox.

Vibrations in the vessel indicate propeller damage as a result of striking an object. A noise from vessel's after end indicates loose or fouled propeller. It could also be rudder damage interfering with the propeller.

Once the obstruction has been removed, get the vessel slowly underway and listen for any abnormal sounds:

- A bent blade or a blade touching a bent rudderpost will go "clunk clunk".
- A bent shaft or a chipped or bent blade will cause the engine (and vessel) to vibrate.
- Leaky stern gland or chattering noise may mean that the cutlass bearing is damaged.
- Slip the vessel on returning to port for a thorough check.

CAPSIZE

Possible consequences:

- It may fill up with water and sink.
- It may continue to float upside down.
- It may right itself.
- You may be able to climb on the upturned vessel and right her.

Abandon the vessel only as a last resort. Stay close to her to improve the prospect of sighting by the rescue craft. Stay in the liferaft and don't remove your lifejackets. If you are in the water, stay together in a HUDDLE or H.E.L.P. position (see Chapter 19.3).

Don't try to swim ashore unless it is very close and suitable landing place exists. Distances can be deceptive. You may become exhausted and drown. Hypothermia is a real danger even if you are wearing a lifejacket. Keep up your spirits and maintain group morale.

Try to get the EPIRB and distress signals out of the capsized vessel and raise an alarm. Try putting up a make-up signal on the upturned vessel. Make yourselves as visible as you can to both ships and aircraft. Put on more clothes if you are able to find any or get them out of the upturned vessel.

TRANSFERRING SURVIVORS FROM STRICKEN VESSEL

Survivors and those assisting them on deck should wear lifejackets. In calm weather you may be able to go alongside the stricken vessel. Make sure all booms and other movable gear are swung inboard on both vessels. Use heavy fenders. Do not tie up to the stricken vessel in case you quickly need to get away. Maintain your position alongside using engines.

In rough weather, both vessels when unattended would lie beam to wind and sea. You should position your vessel upwind. You may be able to throw a heaving line to the stricken vessel, and then set up a heavier line between the two vessels. A raft or a dinghy travelling along the rope can then be used to transfer survivors.

Another way to send a line and an inflatable rubber raft to the stricken vessel is to secure the raft to one end of the line and let it blow downwind towards the stricken vessel. The survivors when boarded in the raft can then be hauled back with the line.

FAILURE OF MAST SUPPORTS

If a shroud or wire support has parted or slipped out of its spreader end, ease the pressure off the gear by bringing the damaged part to leeward. As an immediate measure, replace the shroud with a spare halyard while considering a better repair. A spare length of wire with hard eye in one end is always handy on a yacht.

FAILURE OF A SAIL

A sail may give way at a chafed stitching or a sharp edge may tear the cloth. An adhesive patch should provide a temporary relief, but a sewn patch is a better repair. Re-sewing the stitching with palm, needle and twine is another option. Use a double-sided tape or a single-sided tape folded in half lengthwise to hold the seams together. Pass tacking stitches at intervals along the tear or failed seam before stitching the full length of the damaged sail.

WINCH FAILURE

Rig a handy billy to take the weight of the halyard, while you decide to leave it there or move it to another winch. In the case of sheet winches, use the windward winch if the one too leeward is malfunctioning.

WINDLASS FAILURE

Haul the anchor chain with a line from another winch or with a block and tackle. Rig a stopper (see Chapter 4) on the chain while you transfer it to another winch. You may be able to bring it (in) in one haul or in short lengths by transferring the hauling line forward one haul after another. Alternatively, buoy and slip the anchor, note its position, advise the authorities and return later to retrieve it.