

8. Anchoring, mooring & berthing

Approaching and leaving a mooring are important skills that will only come with experience – it's advisable to know the theory that makes for safe practice.

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Anchoring & mooring

Anchoring

- Don't anchor in a marked channel.
- Select an anchorage that offers protection.
- Use the appropriate anchor for the area of operation (refer chapter 4, **Safety equipment, Standards and features**).
- Make sure the anchor line is attached to your vessel.
- Untangle and lay the line out before deploying.
- Move into the wind forward of where you want to end up and stop.
- Gradually drop the anchor - don't just throw it overboard - and let it touch bottom. You will drift back to your selected location.
- Allow for a scope of 3:1 (anchor line to depth of water) in normal conditions, and 5:1 in rough conditions. The flatter the pull on the anchor, the better it will hold.
- Tie off the line to a forward bollard.
- Adjust the length of line to the conditions.
- Display the prescribed lighting if anchoring at night (refer chapter 7, **Buoys, marks, beacons, signals & signs, navigation lights**).
- Monitor your anchor's hold, as changing conditions can affect performance and vessel stability.
- When it's not in use, stow and lash the anchor securely.

Setting more than one anchor

Vessels which are likely to operate in adverse conditions should consider carrying a second anchor. Vessels over 8 metres are required to do so except in protected waters. A second forward anchor can be set spread apart from the first so the boat forms the bottom of a 'V'.

To hold the boat in one spot in calm conditions, such as when diving, use a stern anchor as well as the bow anchor.

It's not easy for one person to set more than one anchor. Ask your crew to help in letting out anchor lines so they are not picked up by the propeller as you locate the place for the second anchor. Once the anchors are down, adjust the lines so the vessel is riding safely.

Mooring

Before you put down a permanent mooring you need to complete an application form and lodge it with DIT (refer chapter 13, **Contact details & further information**).

You should also think about asking a professional to do the work for you and consider the following related issues:

- Depending on the location of the proposed mooring, you may need to consult with appropriate authorities eg DIT, DEW, Council etc.
- Is the location protected from wind and tide effects?
- Can it be easily accessed for use and maintenance?
- Will it interfere with any other mooring or property?
- Will my vessel and those nearby have full swing clearance?
- Is the mooring apparatus suitable for the vessel?

'Picking up' (attaching to) a mooring

- Travel slowly.
- Observe wind and/or tidal flow before approaching a mooring.
- Don't take other boat positions as a guarantee of wind and current; different types of boats may lie in the opposite direction to the wind and/or current, as surface effects of wind may differ from general tidal or current effects.
- The small pick-up buoy can also be an indicator of drift direction.

- Approach slowly into the wind or against the tide, using the stronger of the two as a 'brake'.
- Don't overrun the mooring buoy (this risks fouling the propeller on mooring lines).
- Use a boat hook to capture the pick-up buoy
- Secure the line or chain to a bow cleat.

Leaving a mooring

- Warm up the engine - or prepare the sails if sailing.
- Check for other boats nearby.
- Travel slowly, and make sure your passengers and crew stay within the boat itself - not on the side decking or the bow, where they could block your view or risk injuring themselves.
- If there is a heavy strain on the mooring, relieve this by using the motor or sails to come up to it.
- Release the chain or rope from the bow cleat, and drift back to clear the buoy before moving away. As you drift, check for trailing ropes that may get caught in your propeller.

Berthing at a wharf or jetty

This section outlines the steps to safely berth your vessel alongside a wharf or jetty, including the different actions required for various motor setups.



Berthing at a jetty

To avoid damaging your vessel, it's advisable to practise berthing against a soft buoy until you are confident.

Preparing to berth

- Make sure your passengers and crew are aware of your plans and identify where you intend to stop on the berth.
- Show your crew where to place the fenders and what you plan to tie up to.
- Check for obstacles, including other vessels at or near the berth.
- Assess the impact of the prevailing winds and current.
- If there is minimal or inconsistent wind along the berth, you can choose the side that best suits your vessel's steering.
- Your approach speed should be as slow as possible with your bow pointing in the same direction as other vessels at the wharf.
- Adjust your speed to the minimum without losing steering response, this allows more time to correct for errors.



Preparing to berth

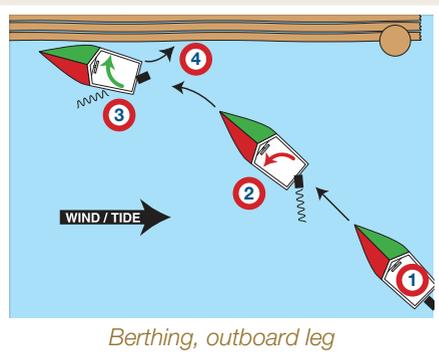
Berthing by motor setup

Outboard leg (outboard or sterndrive motor)

Outboard or sterndrive motors allow the boat to turn equally well in either direction, whether going ahead or astern.

When changing direction in a boat, the stern does nearly all the turning and it moves in the direction the propeller is pointing (while the bow barely moves).

- **Step 1:** Set a slow speed, aim for a spot at the berth where you intend ending up and hold that course. You should travel at an angle of 30 to 45 degrees to the berth.
- **Step 2:** When you are two to three boat lengths from it, turn away from the berth; this will start the stern swinging towards it. The steeper your angle of approach, the more you need to turn. This action will do most of the work in putting you alongside.
- **Step 3:** With the bow's shoulder nearing the berth, put the motor in neutral and turn to starboard (towards the berth).
- **Step 4:** Immediately after you have turned the wheel, put the motor in reverse. This will stop the boat moving ahead and, because the propeller is now pointing towards the berth, it will pull the stern into the berth. Once this is achieved, put the motor in neutral.



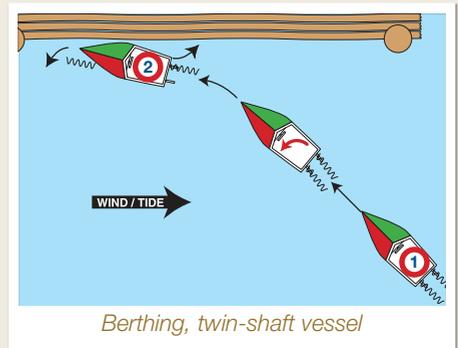
Twin shaft

Many vessels with twin shafts (twin-screw vessels) have outward-turning propellers. This means that whether moving ahead or astern, the vessel is set up to give the best engine assistance with turning.

Twin-shaft vessels give the operator greater manoeuvrability, however as with single-shaft vessels, their limitation is that the bow stays more or less motionless while the stern does all the turning.

Twin-shaft vessels have a smaller turning circle than a similar single-shaft vessel, and they are equally suited to putting either side of the vessel alongside a berth.

- **Step 1:** Make a slow approach, similar initially to a single-shaft vessel.
- **Step 2:** With the engine closest to the berth set to go ahead and the outer engine astern, use the short turning ability to pull the starboard stern alongside.

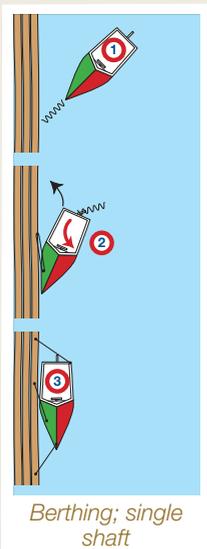


Single shaft (inboard or jet engine)

Most single-engine vessels have a right-handed (clockwise) propeller. For these boats it is easier to berth to the port side, because the stern tends to kick to port when the engine is going astern. The opposite applies to left-handed (anti-clockwise) propellers. This description assumes a right-handed propeller.

- **Step 1:** Make a shallow angle approach and operate astern propulsion (i.e. use reverse gear) to stop the vessel with the bow's shoulder almost touching the berth.
- **Step 2:** Attach a spring or flexible rope from the vessel's forward section to the berth.
- **Step 3:** Turn the wheel away from the berth and select forward gear and idle speed. The vessel will come alongside and the vessel can be secured with the appropriate mooring lines.

If wind, current or the boat's manoeuvrability are making your task more difficult, or you have put the non-preferred side along the berth, you can use a spring to help bring the vessel alongside. The diagram shows the steps to put the non-preferred side alongside the berth.

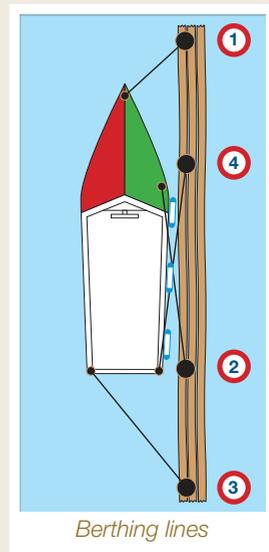


Berthing lines

The number of lines needed to adequately secure your vessel depends on the size of your vessel. Checking your mooring and berthing equipment should be part of your regular vessel maintenances.

The main types of berthing lines are:

- **Bow (forward) line (1)** - attaches from the bow to a secure point on the berth (such as a bollard, secured post or similar).
- **Bow spring (2)** - connects from the bow to a point on the berth that is aft (to the rear) of the centre of the vessel.
- **Stern (aft) line (3)** - attaches from the stern to a secure point on the berth.
- **Stern spring (4)** - connects from the stern to a point on the berth forward of the centre of the vessel. This reduces the amount of forward or backward movement, especially when combined with a bow spring.



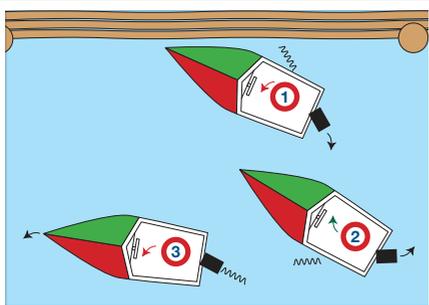
Leaving a berth

It's normal to reverse from a berth because vessels steer from the stern. If you try to leave by going forward, using rudder or engine movements for steering, the swing of the stern will make it difficult to get the bow off the jetty.

Before departing the berth, check for other vessels.

Outboard leg

- **Step 1:** With the motor in neutral, turn the wheel fully away from the berth; this points the propeller in the direction the stern will go when the motor is in reverse. Put the motor in reverse and apply very little throttle. Unless the wind or current is pushing the vessel on to the berth, the stern will move out and the bow will not scrape on the berth. Otherwise, you may need to straighten the wheel a little as the vessel moves astern to protect the bow from hitting the berth.



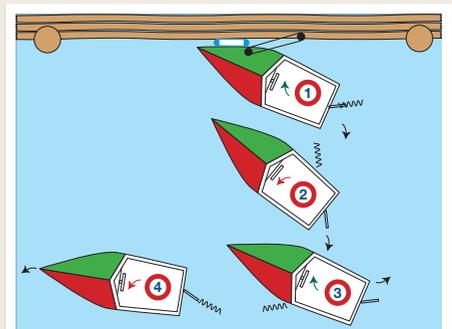
Leaving a berth, outboard leg

- **Step 2:** Once the bow of the vessel is clear of the berth and while still in reverse, turn the wheel fully towards the berth. This will straighten the vessel by swinging the stern towards the berth and the bow away from the berth.
- **Step 3:** When the vessel is parallel to the berth turn the wheel in the direction you want to go and select a forward gear.

Single shaft

The single shaft's rudder needs a flow of water over it before it will turn the boat, releasing the lines and going astern will not usually work - particularly if the wind or current is pushing the vessel on to the berth. The most effective way to get off is to use a spring.

- **Step 1:** Remove all berthing lines except a bow spring. Protect the vessel by putting a fender between the berth and the shoulder of the bow. Turn the wheel fully towards the berth. Put the motor into forward gear and apply a small amount of throttle. The vessel will try to move forward but the spring will stop this, while allowing a good flow of water past the rudder so that the stern will swing away from the berth. The vessel also tends to pivot around the bow's shoulder.
- **Step 2:** When the stern is pointing well away from the berth, put the motor in neutral, release the spring, turn the wheel away from the berth and reverse out.
- **Step 3:** Once the bow is clear of the berth and while still in reverse, turn the wheel fully towards the berth; the stern will swing towards the berth and the bow away from it, straightening the vessel.
- **Step 4:** When the vessel is parallel to the berth, turn in the direction you want to go and move forward.

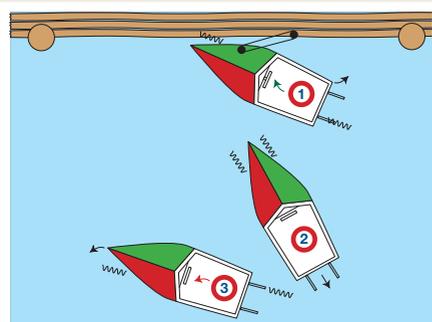


Leaving a berth, single shaft

Twin shaft

A similar manoeuvre can be made with twin-shaft vessels. Most close-quarter manoeuvring with twin-shaft vessels can be done entirely with the engines.

- **Step 1:** When swinging the stern out, use a forward gear on the engine furthest from the berth and reverse (astern) on the engine closest to the berth.
- **Step 2:** Once the stern has swung out far enough to clear any obstacles, release the spring and go astern on both engines.
- **Step 3:** Once the bow of the vessel is well clear of the jetty, go forward on the engine closer to the berth. When the vessel is pointing in the correct direction, go forward on both engines.



Leaving a berth, twin-shaft vessel

Chapter 8. Self-check questions

1) When approaching a mooring or preparing to berth, which of the following behaviours is most suitable?

- A. Approach as quickly as safely possible to secure your spot.
- B. Get a crew member or passenger onto the bow to grab hold of the mooring as you reach it.
- C. Approach at the slowest possible speed that maintains steering.

2) When departing a berth or mooring, which of the following statements is correct?

- A. You may sometimes use forward gear to help move away.
- B. You will usually use astern propulsion (reverse gear) because boats steer from the rear.
- C. How you depart a berth or mooring will be affected by the wind conditions at the time.
- D. All of the above.

3) Before you approach a wharf or jetty to berth, which of the following steps should be taken?

- A. Make sure your passengers and crew are aware of your plans.
- B. Identify where you intend to stop on the berth.
- C. Check for obstacles, including other vessels at or near the berth.
- D. All of the above.

