

CHAPTER 1 BOAT SYSTEMS

Hulls

Two common types of boating hulls, displacement and planing, are shown in Figure 5.1.

- A displacement hull is a type of hull that ploughs through the water, displacing a weight of water equal to its own weight.
- A planing hull allows a boat to glide over the water rather than ploughing through it.

Hulls are designed for the type of propulsion required so the motor power and weight on as vessel should never exceed the manufacturers design.

If this occurs the hull may break and cause the vessel to sink rapidly and you most certainly will breach your general safety obligation.

Parts and places

The hull is the main structural body or shell of the boat and is joined at the front of the boat to create a strong stem. At the other end it forms the transom - a flat, vertical aft end of a boat, which is strengthened with a plate onto which an outboard motor can be attached.

- The front of the boat is called the bow and the back the stern. The left side is port and the right side starboard, when facing forward.
- The helm is the place where a vessel is steered. It includes the rudder, steering wheel and tiller and can be at the stern as in the case of a dinghy or in the cockpit of a run-about.
- If the boat goes forward it is said to go ahead and astern if backwards.
- The keel is the part of a boat extending along the bottom of the hull from stem to stern. Other parts include cleats and bollards as shown in Figure 5.3 and 5.4.
- The freeboard is the distance from the gunwale to the water. Most often this will vary along the length of the boat and can even be the lowest point of the transom.
- The gunwale is the upper edge of a boat's side; the part of a vessel where hull and deck meet. (Pronounced "gunnel")
- Draft - The depth of the boat below the waterline; the amount of vertical distance a boat draws from its water line to the bottom of its keel.
- Beam - The transverse measurement of a boat at its widest point.
- Chine - The line of intersection between the topsides and the bottom of a boat. Hard-chined boats have this angle pronounced.

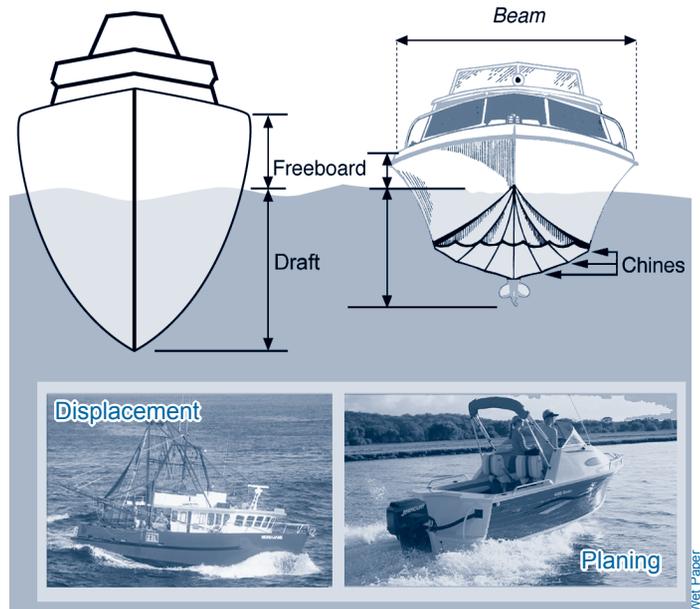


Figure 5.1 Displacement and planing hulls

<p>Punt</p> <p>Greater stability and carrying capacity. At planing speeds, hull pounds excessively.</p>	<p>Tri hull</p> <p>Tri-hull or Cathedral hull. Stable soft ride with good turning characteristics.</p>
<p>V hull</p> <p>Softer ride depending on the depth of the V. Require more power to move at same speed.</p>	<p>Catamaran</p> <p>Stable comfortable ride. Many sailboats and house boats use multi-hull design.</p>

Figure 5.2 Different types of hulls and features



Figure 5.3 Cleats and bollards are found on a boat

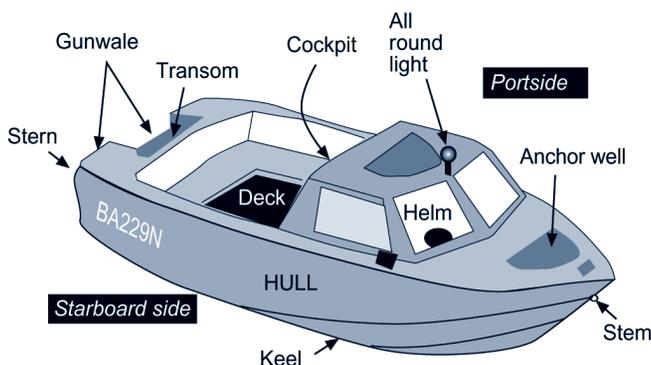
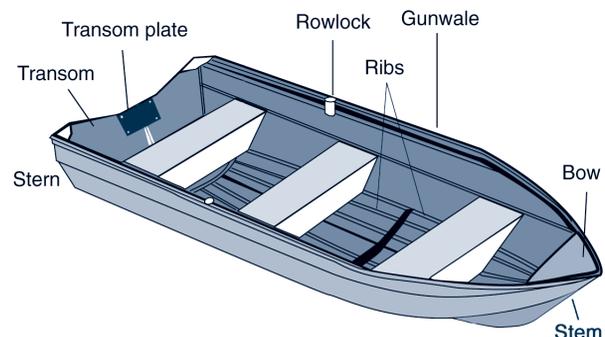


Figure 5.4 Parts and places on a boat



The trailer and boat ramp

Trailers have winches to pull the boat out of the water and back onto the trailer and can be electrical or mechanical. New winches have straps that are resistant to corrosion however older winches have galvanised cable which are prone to corrosion and need checking.

The winch cable has a shackle and eye bolt which connects to the boat, as well as a safety chain to hold the boat on the trailer while being towed. One hazard is the rapid unwinding of the winch if the boat is attached to the winch cable as the boat is launched.

Trailer fittings

Other fittings shown on a trailer in Figure 3.3 include a jockey wheel to help move the boat and trailer around; lights, registration plates, rollers and runners to allow the boat to slide off; brakes, grease seals, springs, axle and U bolts. Tie down straps keep the boat on the trailer while towing.

The towing vehicle

This has a tow bar and tow ball. The trailer has a towing coupling that connects with the tow ball to allow sideways and up and down movement of the trailer while it is being towed (Figure 3.3). A safety chain prevents the trailer coming loose if this mechanism fails accidentally. Figure 3.2 shows a support bracket that can be used to support the motor when towing and a clove hitch can be used to secure small items in a boat.

A brake and indicator system from the car connects to trailer lights by an electrical socket which must be checked every time it's connected.

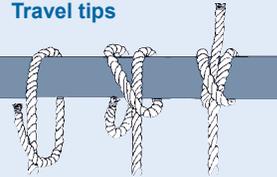
Wheel bearings need to be serviced at regular intervals according to the manufacturers handbook or just ask your dealer. It's a good idea to allow them to cool down before backing the trailer into the water.

Worksheet 1 is designed to summarise these points specific to launching the trailer and associated risks.



Figure 3.1 Check the lights and allow the bearings to cool.

Travel tips



A clove hitch can be used to secure small items in a boat.

Use a bracket to support the motor - it stops the motor from bouncing up and down while towing and protects the tilt mechanism.



Figure 3.2 Travel tips

Winch safety

- Check the condition of the winch cable and replace repair broken strands.
- Keep the winch cable and components greased.
- Unwind the winch cable so that it is ready upon return.
- Inspect the winch cable for damage to avoid breaking under strain.
- Never stand in line with the winch cable in case it breaks.

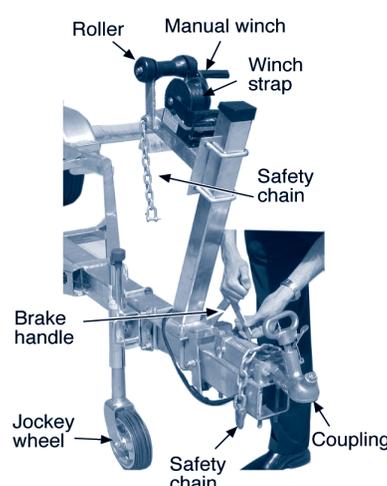
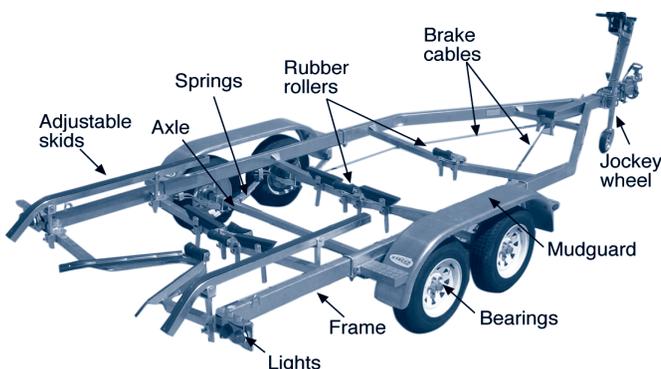
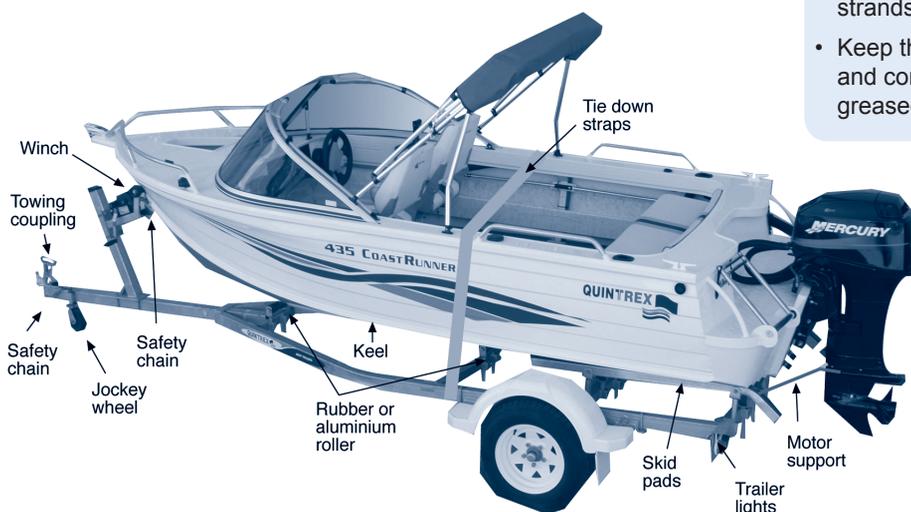
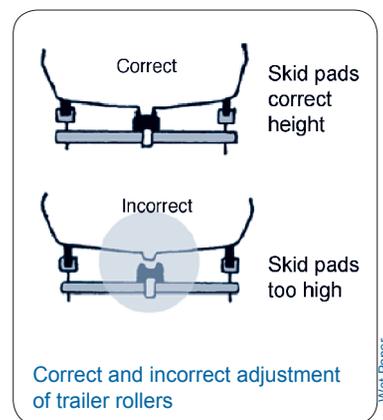


Figure 3.3 Parts of the trailer system

Wet Paper



Correct and incorrect adjustment of trailer rollers

New innovation - Retriever-mate



Reference Whitfords Online catalogue

WORKSHEET 1 AT THE BOAT RAMP

Launching

Q1. Explain the following terms:

Hazard

Risk

Safety precautions (*Control measures*)



Q2. Identify any three hazards that could be found on the boat ramp in the photograph above and the likelihood they could occur.

Q3. Describe any five safety control measures you could use to reduce risks while using the boat ramp shown above.

Q4. Justify four winch safety tips.

Q5. Explain how to protect an outboard motor while towing on a trailer behind a car.

Q6. Identify the following safety features on the trailer using the list of terms below.

Roller, manual winch, winch strap, safety chain, coupling, brake handle, jockey wheel, safety chain to towing vehicle.

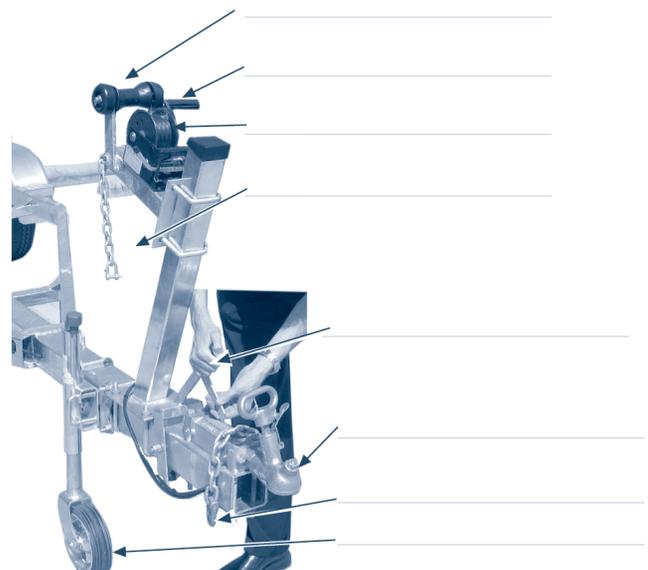
Q7. Suggest a care and maintenance procedure for the following parts of a trailer.

Winch

Lights

Bearings

Jockey wheel



CHAPTER 4 SAFETY EQUIPMENT

The general safety obligation (GSO) requires all boat owners and operators to make sure the boat is safe, appropriately equipped and crewed, and operated in a safe manner. Here are some legal issues for consideration.

- Equipment **MUST** be able to be found in a timely manner (Qld).
- Boats requiring registration must carry the regulated safety equipment.
- Additional safety equipment recommended in the State regulations should also be carried to satisfy the GSO.
- This allows boat owners and operators to choose the equipment best suited for the type of boat and intended voyage.
- When deciding what to take on board, remember your obligation – if you fail to carry a piece of equipment that could have helped to prevent an accident, you could be prosecuted.

Stowage

- The owner or master must give each person on board information about where the safety equipment is kept.
 - The **CREW** must know where the jackets and safety equipment is located.
 - The **SKIPPER** can receive an infringement notice if the crew cannot locate safety equipment in a timely manner.
- Items such as flares, torches or first aid kits, that can be affected by water must be kept in water tight containers like the one shown in the photograph below where the hatch is closed when the boat is underway.
- Other safety items such as anchors and lines should be stowed so as not to cause potential hazards while the boat is in motion.
- Life jackets must be stored where they are clearly visible or kept in a place readily accessible and indicated by a clearly visible sign with a white background marked with the word 'life jackets' in red letters or a red background with white letters.
- Wearing life jackets is strongly recommended in any emergency situation:
 - At the first sign of bad weather, at night, when visibility is restricted, when boating in unfamiliar waters or alone; or
 - When operating in a following sea, by persons who are poor swimmers or when boating alone.

Serviceability

- Safety equipment needs to be serviceable. So check for wear and tear and repair or replace so that it will work.
 - If life jackets are ripped torn or faded they are no longer serviceable and should be discarded.
 - One way to look after life jackets is to **NOT** use them as seat cushions.

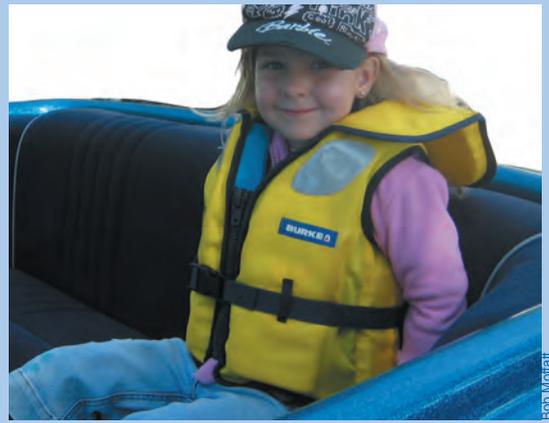
Life jackets State requirements

These are different and are determined by the State water limits. For example in Victoria, all occupants of certain vessels are required to wear a specified life jacket (see table for life jacket types) at times of heightened risk when under way and when in an open area of the vessel (see State web sites).

In Queensland it is compulsory to wear a life jacket when crossing the designated coastal bars in open boats less than 4.8 metres.

New laws in New South Wales has meant that there are many options for boating activities, vessel types and situations that require different life jackets. In some cases kayaks and canoes are involved. See www.lifejacketwearit.com.au

Chapter 7 discusses National and State regulations in greater detail.



UNDER 4.8 m - UNDER 12 - UNDERWAY LIFE JACKET COMPULSORY



SAFETY EQUIPMENT LOCATION BECOMES OBSCURED WHEN HATCH IS CLOSED



Life jackets

Here are some important general points to remember about life jackets to fulfil your general safety obligation.

- Life jackets should be accessible at all times; if they aren't visible to passengers you must clearly sign where life jackets are stowed. The sign must have the words 'life jacket' in red text on a white background or white text on a red background.
 - They must be kept in good condition.
 - They must fit the wearer – ill-fitting life jackets won't meet the safety equipment requirement.
 - Do not use life jackets as a cushion.
 - Make sure you know how to put them on quickly.
 - Life jackets should be marked correctly to ensure they comply with standards.

Life jackets must comply with standards

For a life jacket to comply with a particular standard, certain information required under that standard must be displayed.

- The current standard for life jackets is Australian Standard 4758 (AS 4758). This standard has replaced Australian Standard 1512–1996, Australian Standard 1499–1996 and Australian Standard 2260–1996.
- You do not have to upgrade your current life jacket under the old standards – they will still be acceptable for use as long as they are in good condition. AS 4758 has a different rating system than the previous standards.

For use in smooth, partially smooth and open waters

- To comply with Australian Standard 4758 it must be marked 'Level 100', 'Level 150' or 'Level 275'.
- To comply with Australian Standard 1512–1996 it must be marked 'Life jacket type 1'.
- These are not to be used by skiers or people being towed.



Level 275, 150 or 100



Example of 2008 AS 4758 labels

PERSONAL FLOTATION DEVICE		Australian Standard AS4758.1
AS4758		LICENCE NUMBER SMKH22006
APPLICATION		Performance level
Offshore, extreme conditions, special protective clothing, heavy equipment		275
Offshore, foul weather clothing		150
Sheltered waters, light clothing		100
Swimmers only, sheltered waters, help at hand, limited protection against drowning		50
Special purpose device		All performance levels

The level stands for **Newton's Buoyancy (N)** and is the amount of force or upthrust provided by a life jacket in water



- ← Life jacket type, model identification
- ← Intended weight and chest size
- ← Illustrated donning instructions
- ← Standards symbol
- ← Instructions for care and storage
- ← Manufacturer's name, date of manufacture, batch number

CONSIDERATIONS WHEN SELECTING A LIFE JACKET