



## 2. Planning & preparation

<i>Choosing the right boat</i>	22
<i>Pre-season maintenance</i>	23
<b>General vessel check</b>	<b>23</b>
<b>Batteries</b>	<b>23</b>
<b>Bilges</b>	<b>24</b>
<b>Electrical system</b>	<b>24</b>
<b>Engine care</b>	<b>24</b>
Fuel system	24
LPG	24
Gearbox oil	24
Propellers	25
Spark plugs	25
Water pump	25
<b>Miscellaneous checks</b>	<b>25</b>
<b>Mooring/berthing equipment</b>	<b>25</b>
<b>Safety equipment</b>	<b>25</b>
<b>Spare parts and tools</b>	<b>27</b>
<i>Pre-trip checks</i>	27
<b>General vessel check</b>	<b>27</b>
<b>Clothing</b>	<b>28</b>
<b>Passengers and crew</b>	<b>28</b>
<b>Fuel</b>	<b>28</b>
<b>Navigation</b>	<b>28</b>
<b>Safety equipment</b>	<b>28</b>
<i>Towing and launching</i>	29
<b>Towing safety</b>	<b>29</b>
<b>Launching</b>	<b>29</b>
Preparation at the launch site	29
Backing the trailer on to the ramp	29
Unhooking the vessel	29
<i>Post-trip maintenance</i>	30
<i>Chapter 2. Self-check questions</i>	30

*The safety and success of any boating trip depends on the amount of planning and preparation before you leave, and it starts with choosing the right boat for your needs.*

*Marine and river conditions are harsh—salty water, vibration, sand, sun and rain combine to make life tough on the machinery. Regular maintenance by you and engine servicing by a qualified mechanic will help avoid an unsafe or disastrous experience, such as a breakdown at sea, or worse.*

*This chapter covers the minimum checks you should do before the season starts, and before and after each trip.*

## Choosing the right boat

**Boats are designed and built for various purposes to suit different water conditions and loads. Before you use or obtain a boat, do your research, including talking to manufacturers, retailers and other boat operators. The basic questions you should ask are:**

### What size boat do I need?

This depends on the number of people and the amount of equipment and provisions you intend to carry, as well as the water conditions you expect to experience (refer chapter 3, [Safety on the water](#), [Loading for stability](#)). Most boats built after 4 February 2008 must have an Australian Builders Plate (ABP) affixed, which gives maximum weight and other information (refer chapter 1 [Licensing & registration](#), [Motor vessel registration](#)).

### What will I use the boat for?

Fishing? Cruising? Waterskiing? Sailing? The design, construction, stability, flotation and maintenance of the vessel will all factor in the safety and performance of your vessel.

### Where do I plan to go boating?

Boats designed for use on inland or sheltered waters are not usually suited to open waters or along the coast, where waves are larger. Sea-going vessels however, may in many cases be just as suitable for use in the River Murray, for example.

### What engine power do I need?

Boats have both minimum power needs and maximum power limits. Be careful not to overpower a boat—a bigger engine may be unsafe by unbalancing the boat and reducing the freeboard. Conversely, an under-powered vessel may reduce your vessel's capacity for safe operation—as well as reducing the enjoyment of your trip.

## Pre-season maintenance

**A thorough pre-season check of both vessel and equipment is highly recommended for safer boating. The following steps are recommended as a minimum; however, it's also advisable to inspect many of these items before each trip (refer Pre-trip checks).**

For maintenance of personal watercraft (PWC), refer chapter 11, *Special activities*.

Regular inspection and maintenance will reduce the risk that the following parts will let you down.

### General vessel check

If possible, store your vessel under cover in a garage, carport or boat storage unit. At a minimum, keep your boat covered to protect it from sun and rain.

- Wash down regularly, particularly after each use.
- Inspect vessel structure for corrosion, cracks, and general wear and tear.
- Check for water and fuel leaks.
- Test steering gear for stiffness and treat cables with correct lubricant.
- Ensure the bung is suitable and in good condition.
- Clear self-draining holes. Check drain flaps and grease if necessary.
- To protect the hull and decks:
  - keep them clean and properly waxed
  - clean fibreglass with fresh water and a non-abrasive soap
  - if necessary, use a soft brush to help remove debris caught in crevices
  - patch any minor cracks, as well as gouges or chips in fibreglass gel coat, that may occur due to normal wear and tear
  - more serious cracks caused by vessel stress, age or accidents should be repaired by a qualified boat repairer

- use a good metal wax to keep aluminium and stainless steel parts clean and polished; metals on boats can corrode quickly, especially near salt water
- check all screws, bolts and other fittings.

### Batteries

Flat batteries are a common cause of rescue call-outs. One recurring problem is that large boats require a lot of power to start and, if the battery is weak, a few starts will drain it.

Always use marine batteries, as they are designed for the environment; to reduce the risk of problems arising, keep your battery in the best possible condition.

- Check, charge and change your battery regularly.
- Charge the battery to the appropriate or recommended level; never overcharge.
- Secure the unit in brackets.
- Ensure its location is ventilated and vented before starting the engine.
- Keep terminals, cables and casing clean.
- Grease terminals regularly.
- Keep terminals and connections tightly secured.
- Top up battery cells with distilled water and check each cell with a hydrometer.
- To reduce the risk of explosion, turn off the power to the charger before disconnecting.



*Keep your battery in good condition and check regularly*

## Bilges

- Test bilge pumps for effective operation and service as required.
- Ensure bilges are clean and dry.

## Electrical system

Exposure to salt water can corrode electrical systems—another repeated cause of marine equipment failure.

- Ensure frequent inspection and cleaning of all electrical systems.
- Spray terminals and electrical connectors with a corrosion-retarding agent, such as CRC or WD-40.
- Keep all fittings dry.
- If lights are fitted or a torch is carried, check they are working—even if you only plan to be out in daylight.

## Engine care

At least once a year have your engine fully serviced by a specialised workshop; more frequently if it is used often or exposed to corrosion.

Before you use your motor, familiarise yourself with the manufacturer's manual—it should contain everything you need to know about your motor, as well as approved service agents, the availability of spares, and a troubleshooting section for minor faults. However, don't be tempted to tinker beyond what you can confidently do.

Periodically run and flush the motor, and also manually start it, if your engine allows this.

## Fuel system

The following maintenance routine will help to prevent fuel defects, a frequent cause of engine problems.

- Clean the fuel tank with a suitable cleaning solvent at least once a year.
- Drain fuel tanks if the vessel is not in use; always replace old fuel with new fuel if the boat has not been used for a while.

- Inspect fuel lines, the manual priming bulb, shut-off valves, pumps and connections for cracks, corrosion, wear, hardening and leaks.
- Check, clean and/or change filters frequently to prevent them clogging and ensure clean fuel is entering your engine.
- Refer to the engine manufacturer's specifications on ethanol blended fuel.

## LPG

If not handled correctly, LPG (liquefied petroleum gas) can be the most dangerous substance on boats. For safety, ensure that:

- installations and services are done by a licensed gas fitter
- cylinders are professionally and regularly inspected
- instructions for filling the tank are carefully followed.

For more information, contact the Office of the Technical Regulator ([refer chapter 13](#)).



*LPG can be the most dangerous substance on boats*

## Gearbox oil

Water in the gearbox will eventually cause it to fail. Water in oil will give the oil a milky appearance. To avoid gearbox failure:

- change oil regularly
- check and refill gear case oil regularly
- check and service transmissions and lower units according to the manufacturer's recommendations.

## Propellers

The bushing of a propeller can fail, especially if it has hit sand or rocks. Regular maintenance will help guard against this.

- Check steering.
- Keep shafts and propellers clean and in good working order.
- Check propeller nut and shear pin / split pin/s (some older models have shear pins).
- Check propeller shaft and remove caught fishing line or other materials that might affect the propeller's performance.
- Carry a suitable spanner to undo the propeller nut.
- Carry a spare propeller and shear pin / split pin/s if needed.

## Spark plugs

- Clean spark plugs, check and adjust the gap or replace (replacement after 100 hours of use is recommended).
- Carry new spares—never keep old plugs as a standby for emergency use.

## Water pump

- Replace impeller regularly, especially if you have been operating in the shallows and stirring sand. Water pump impellers also deteriorate if not used for long periods.
- Make sure water is being discharged from the exhaust system—and from the tell-tale, where applicable—when the motor starts.
- Regularly check for water leaks. It's helpful to have a water pressure gauge on motors of 50 horsepower (hp) and over.

## Miscellaneous checks

- Make sure your tool kit is complete, including spare parts (refer following list) and odds and ends.
- Replenish your fresh water supply, and change it regularly.
- Keep ropes and lines in good condition and stored ready for use.
- Test engine kill switches.

- Test that hatches, windows and doors open easily.
- Check ventilation.
- Check hoses and carry spares.
- Check any engine belts.

## Mooring/berthing equipment

- Check the condition of lines for damage and wear.
- Check cleats and bitts attached to the boat.
- Check shackles, hard eyes and chain in the anchor cable.
- Test washers and pads on bolts securing the cleats.
- Check that shackles are 'moused' (wired) or otherwise prevented from undoing.
- Store all rope out of the sun—hardness and roughness in feel and fading colour (twist the rope to compare the interior colour) are signs of UV damage.

## Safety equipment

- Inspect all safety equipment for any deterioration or damage and expiry dates.
- Inflatable PFDs, EPIRBs etc should be regularly serviced by a qualified provider.
- Refresh your knowledge of the use of the equipment.
- Inspect anchor, shackles, chain and line for any sign of wear or corrosion, and replace if necessary.
- Test bilge pump diaphragm for wear and tear.
- If you have a marine radio, raise the antenna and aials, and check it's working by making a test transmission to a volunteer marine rescue group (refer chapter 13).
- Check the expiry date on the flares and EPIRB.
- Test your EPIRB battery and your waterproof torch.

(Refer also chapter 4, Safety equipment)

## Recommended Boat Maintenance Schedule

	Pre-season	Mid-season	Post-season
<b>Fuel Tank</b>	<ul style="list-style-type: none"> <li>Avoid using old fuel</li> <li>Keep clean and dry</li> </ul>	<ul style="list-style-type: none"> <li>Maintain proper fuel/oil mix</li> <li>Check for water in fuel</li> </ul>	<ul style="list-style-type: none"> <li>Store in dry place (vented)</li> <li>If metal, swish with 2-stroke oil</li> </ul>
<b>Fuel Line</b>	<ul style="list-style-type: none"> <li>Check for cracking and loose fittings</li> </ul>	<ul style="list-style-type: none"> <li>Watch for leaks</li> </ul>	<ul style="list-style-type: none"> <li>Drain</li> </ul>
<b>Fuel Filter</b>	<ul style="list-style-type: none"> <li>Check and replace as necessary</li> </ul>	<ul style="list-style-type: none"> <li>Check and clean</li> </ul>	<ul style="list-style-type: none"> <li>Check and clean</li> </ul>
<b>Fuel System</b> (if you suspect an ethanol fuel blend has been used)	<ul style="list-style-type: none"> <li>Drain and clean out tank</li> <li>Clean fuel lines</li> <li>Change fuel filters</li> <li>Have engine fuel system checked and serviced</li> </ul>	<ul style="list-style-type: none"> <li>Do not leave ethanol fuel standing in any tanks</li> <li>Check fuel filters</li> <li>Monitor engine operating temperature</li> </ul>	<ul style="list-style-type: none"> <li>Drain all ethanol-blended fuel from tanks, fuel lines and carburettors</li> </ul>
<b>Batteries</b>	<ul style="list-style-type: none"> <li>Check electrolyte, top up with distilled water</li> <li>Recharge, check mountings, clean terminals</li> </ul>	<ul style="list-style-type: none"> <li>Check electrolyte, top up with distilled water</li> <li>Recharge, check mountings, clean terminals</li> </ul>	<ul style="list-style-type: none"> <li>Check electrolyte, top up with distilled water</li> <li>Recharge regularly</li> </ul>
<b>Engine</b>			<ul style="list-style-type: none"> <li>Store upright (outboard)</li> </ul>
<b>Pull Cord</b> (if fitted)	<ul style="list-style-type: none"> <li>Replace if fraying</li> </ul>		
<b>Wiring</b>	<ul style="list-style-type: none"> <li>Check for cracking, loose wire and corrosion</li> </ul>		
<b>Spark Plugs</b>	<ul style="list-style-type: none"> <li>Clean and gap or replace</li> </ul>	<ul style="list-style-type: none"> <li>Watch for fouling, moisture</li> <li>Keep engine tuned</li> <li>Clean and gap as necessary</li> </ul>	
<b>Cylinders</b>	<ul style="list-style-type: none"> <li>Check for compression</li> </ul>		
<b>Moving Parts</b>	<ul style="list-style-type: none"> <li>Lubricate all moving parts</li> </ul>	<ul style="list-style-type: none"> <li>Lubricate every 60 days</li> </ul>	<ul style="list-style-type: none"> <li>Lubricate before storing</li> </ul>
<b>Power Unit</b>	<ul style="list-style-type: none"> <li>Drain and refill gear case oil</li> </ul>	<ul style="list-style-type: none"> <li>Drain and refill gear case oil every 100 hours of operation or once a season.</li> </ul>	
<b>Cooling System</b>	<ul style="list-style-type: none"> <li>Clean passages</li> </ul>	<ul style="list-style-type: none"> <li>Check ports for weeds</li> <li>Flush after use in salt water</li> </ul>	<ul style="list-style-type: none"> <li>Flush with fresh water</li> <li>Drain all water by pull-starting with plugs disconnected</li> </ul>
<b>Propeller</b>	<ul style="list-style-type: none"> <li>Sand or file small nicks</li> </ul>	<ul style="list-style-type: none"> <li>Check regularly</li> </ul>	<ul style="list-style-type: none"> <li>Check for repairs</li> </ul>
<b>Outer Surface</b>	<ul style="list-style-type: none"> <li>Clean</li> <li>Replace anodes as appropriate</li> </ul>	<ul style="list-style-type: none"> <li>Keep clean</li> </ul>	<ul style="list-style-type: none"> <li>Keep clean, touch up with paint</li> </ul>

## Spare parts and tools

An effective tool kit should include, at a minimum:

- an engine manual
- screwdrivers (Phillips and flathead)
- shifting spanner and pliers—long-nose pliers can be useful
- a set of open-end or ring spanners
- a suitable spanner or other tool to remove spark plugs
- de-watering spray, spare oil and a funnel or siphon hose for oil and fuel
- a roll of waterproof electrical tape
- starter cord
- a length of soft wire
- a wire brush
- a sharp knife
- spare
  - spark plugs and fuses (new)
  - batteries for torch and radio
  - ‘O’ rings for the fuel connector
  - bung
  - propeller nut and socket, washer and split pins
  - fuel line
  - ‘D’ shackle
  - key, on a lanyard or similar.

## Pre-trip checks

**It's recommended that you check off the following list each time you are planning a trip—and that you don't go out until any identified problem is fixed. If your boat is on a trailer, make sure that's in good working condition before you go as well.**

### General vessel check

- Before operating any switches or engines, check for and clear any petrol and/or LPG odours.
- Check that the engine is working properly.
- Test any electrics operating from the battery, such as radios, gauges and the power tilt.
- Make sure steering cables and connections are in good condition and working as they should.
- Charge your marine batteries regularly and change as required.
- Inspect the battery terminals and connections regularly.
- Check engine oil and coolant levels—top up if required.
- Inspect the bilges. If there is more bilge water than usual, find and rectify the fault. (If there is oil or fuel in the bilge water, clean it up with special absorbent pads—available at marine stores—and dispose of the pads appropriately. Polluting waterways is an offence.)
- Check the bung.
- Clear self-draining holes.
- Check that your anchor is appropriate to the area of use and that it's properly rigged, stowed and ready for use.
- If you have a radio, test it by reporting the details of your boat and voyage to a volunteer marine rescue (VMR) group ([refer chapter 13](#)).

**Note: if you do 'log on' with a VMR group, remember to 'log off' when you return.**

- Make sure your navigation lights and torch are working, even if you plan to return in daylight; you could be delayed.
- Ropes and lines should be in good condition and stored ready for use.
- Ensure your first aid kit is complete.
- Ensure essential tools and spare parts are in good condition.
- Carry up-to-date charts showing ports of refuge along your route.
- Ensure there is sufficient fresh water and food for the voyage, including extra in case of emergency.
- Check all gear is properly stowed and secure.
- Keep a sharp knife in a handy place.

### Clothing

- It's colder out on the water, so take extra jumpers and waterproofs.
- The sun reflecting off the water makes its effects stronger, so apply sunscreen regularly.
- Carry adequate wet weather gear for your planned trip.
- Wear clothing that will protect you from the elements (wind, water and sunlight).
- Wear clothing that will not restrict your movements.
- Avoid clothing that will reduce buoyancy.
- In shallow water and if possible before you go boating, test your ability to swim or float in your clothes—but make sure you have a spare set with you.

### Passengers and crew

- Ensure every person is correctly fitted with a personal flotation device (PFD) ([refer chapter 4, Safety equipment, Standards and features](#)).
- Children, weak or non-swimmers and people who are on prescription medication should wear a PFD at all times.

- Ensure everyone knows what safety equipment is on board, where it is stored, how it works and what to do in an emergency.
- Show others how to operate the boat and radio.
- Ensure that people who require medication have it with them and that others know how to administer it if necessary.

### Fuel

- Ensure there is enough fuel for your trip—a good measure is to allow one third each to go out, to return and in reserve. You'll use more fuel in rough conditions, so it's safest to base your calculation on the worst conditions you might face.
- Carry spare fuel in a container approved for that purpose—don't just use any old drink bottles or similar—and make sure you have a funnel or similar to avoid spills.
- Make sure fuel is fresh.

### Navigation

- Know exactly where you are going, how to get there and how long it should take to return.
- Check the weather, tides, tidal flow and bar conditions.
- Find out about any local dangers—such as reefs, rock outcrops or bars—and special rules or regulations in the area of your trip.
- Seek information from local or official charts, signage at boat ramps, and the South Australian Government website, [www.sa.gov.au/boatingmarine](http://www.sa.gov.au/boatingmarine)

### Safety equipment

- Check that you have all of the compulsory safety equipment, and any extra that you may need for the area you are boating in; be aware of what gear you may need to handle local conditions.
- Ensure it is properly stowed, easily accessible and in good working order.
- Know how to use all safety equipment.

- Check expiry dates, especially on flares and EPIRB.
- Know how to use—and recognise—distress signals (refer chapter 7, **Buoys, marks, beacons, signals & signs**).
- Carry a radio and test it regularly. If you are not required to carry a marine radio (refer chapter 4, **Safety equipment, Checklists**), a pocket transistor radio can be used for up-to-date weather forecasts. VHF, HF and Marine 27 MHz radios are more expensive, but can bring help quickly.
- Mobile phones are no substitute for a marine radio, but they may help in some situations, so make sure your phone battery is fully charged.
- For vessels with an engine and/or cooking facilities, an appropriate fire extinguisher and suitable fire bucket must be carried and stored in an accessible place, away from the stove. A fire blanket can also be useful.

Refer also chapter 4, **Safety equipment**.

## Towing and launching

**This section covers the basic steps in getting your boat from home to the water, via a boat ramp.**

The brochure *You and your boat trailer*, published by DTEI, has comprehensive information on trailers and towing (refer chapter 13).

### Towing safety

When towing your boat on a trailer, keep in mind that:

- your vehicle's steering and acceleration will be affected by the added weight
- you need a lot more room for overtaking and returning to your lane
- you need to be far more aware of smaller vehicles, such as motorbikes and bicycles.

## Launching

### Preparation at the launch site

- Inspect the ramp, checking its:
  - general condition, including mooring cleats
  - gradient (slope) and width suits your vessel
  - depth of water.
- Consider weather and tidal conditions.
- Prepare your boat away from the ramp, ensuring:
  - the boat was not damaged on the trip
  - the straps and ties are undone
  - everything you need is on board
  - the bung is in and drain plugs are in place and tight
  - a handling line is attached to the bow of the boat
  - the trailer winch is secure
  - the motor is tilted up, if it is stern drive or an outboard
  - the battery switch and, if fitted, the blower are on
  - the trailer wiring is disconnected.
- Don't pull straight into the ramp.
- Wait your turn—boats coming out of the water take priority over those being launched.
- Give other boaties a hand, if required.
- When you are ready, move towards the ramp at a gentle pace.

### Backing the trailer on to the ramp

- Ask someone to stand to one side of the ramp and direct you.
- Grasp the steering wheel with one hand at its lowest point (the 6 o'clock position).
- If you want the trailer to turn right, move your hand slowly to the right (anti-clockwise); and the opposite (clockwise) for left.

### Unhooking the vessel

- Back the trailer into the water. Set the handbrake and lock the transmission.
- Slacken the trailer winch and, with the winch line still connected, push the boat slowly but firmly into the water.

- Make sure nobody stands behind the boat and trailer when winching your boat off or on to the trailer, in case the line breaks (use a line attached to the winch switch).
- Maintain a firm hold on the bow line, but remember it's dangerous to wrap it around your hand.
- Detach the trailer winch hook and line from the boat and wind the line back on to the winch.
- Don't step inside or on the trailer frame.
- Using the bow line, move the boat to one side, away from the launch position.
- Secure the boat to this holding position with the bow line and, if possible a stern line.
- Once you've launched, move your trailer out of the way so you don't hold other boaties up.

To load, reverse the launching procedures.

## Post-trip maintenance

**It pays to spend a few minutes on basic preventative maintenance each time your motor is used. You should take the following steps as a minimum after a trip.**

- Flush your engine with fresh water as soon as possible after it has been in salty, silty or polluted water. This will minimise deposits that can clog cooling passages. Ask your dealer for a suitable flushing device and anti-corrosion flushing liquid, and follow the engine manufacturer's instructions.
- Remove the engine cover, check the connections and spray them with water dispersant.
- Wash down the engine with fresh water and dry off the exterior.
- Secure anchor shackles and pins with wire or cable ties.
- Stow synthetic ropes out of direct sunlight.
- Check the trailer's towing hitch and lights.
- Most importantly, make sure the trailer's wheel bearings are clean and well greased.

## Chapter 2. Self-check questions

### 1) When is it advisable to check your boat, its fittings and the engine?

- A. Before each trip.
- B. Before each boating season.
- C. Both A and B.

### 2) When should children and poor swimmers wear a PFD?

- A. In Unprotected waters (waters offshore of a line 2 nautical miles seaward of the low water mark of the coast of the mainland and Kangaroo Island, or of the banks of Lakes Alexandrina and Albert).
- B. It's recommended they wear a PFD at all times.
- C. After sunset.

### 3) If you have the room, what items apart from the required safety equipment is it recommended to carry on board your vessel?

- A. A tool kit, including spare parts.
- B. An ice box for the fish.
- C. Extra warm clothing.
- D. Both A and C.

### 4) When launching your boat at a boat ramp, which of the following statements apply?

- A. You should prepare your boat away from the ramp so you don't hold other boaties up.
- B. General ramp conditions, tide and weather must be considered when launching.
- C. Boats going out (launching) should give way to vessels coming in (retrieving).
- D. All of the above.