

Inboard petrol engines

Inboard petrol engines pose particular hazards for boat users, especially if not properly maintained or designed for purpose. Petrol has a much lower flashpoint than diesel, and its vapours ignite far more easily. Petrol fumes are denser than air and tend to accumulate in a vessel's bilge if not properly ventilated.

Petrol fumes can easily explode if there are any ignition sources present. The main risk is during or just after refuelling. However, fire or explosions can occur at other times if sufficient vapour is present, for example from a fuel leak.



Maintenance and operation of inboard petrol engines

- Make sure your engine's components are designed for the marine environment. Unsuitable parts or materials increase the risk of leaks and fumes. It is especially important that converted auto engines and older installations are checked and upgraded as necessary
- Ensure your engine and electrical and fuel systems are serviced regularly by a suitably qualified person
- Inspect the fuel system regularly, looking for any possible leaks. Pay particular attention to hoses, joints and clamps. Double clamping is a good idea
- If you find any leaks, fix them before starting the engine. If you find a leak when the engine is running, shut the engine down as soon as possible
- Keep your engine, fuel lines and bilges clean. This will make it much easier to locate and fix any fuel leaks
- Try to avoid having any sources of ignition located low in the vessel. If possible, move batteries and other electrical items out of enclosed spaces containing any part of the engine or fuel system

- If you cannot avoid having electrical systems in these spaces, make sure they are suitable for use in hazardous areas and designed to avoid introducing sparks. Pay extra attention to any wiring and wiring connections, remembering that inappropriate or poorly wired bilge pumps and starter motors can cause sparks, leading to possible ignition
- Do not smoke near a run text on along first line of this dot point
- Carry an appropriate torch for the inspection of engine spaces, suitable for use in hazardous areas and designed to avoid introducing sparks
- Know the capacity of your fuel tank/s and have a means of gauging how much fuel you have at any time
- Avoid tying up alongside another vessel that is refuelling
- Consider installing fuel/LPG sensors and alarms

Be aware that petrol degrades over time, leading to difficulty starting the engine, rough idling, reduced fuel economy and higher emissions

Consider installing a fuel/water separating system. Fuel floats on water, so if water is present in the fuel, it will be picked up first and make its way through the vessel fuel system, causing damage and breakdowns.



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Onboard fuel handle with care



Onboard fire and explosion risks

Whether using petrol or diesel fuel, LP gas or kerosene, there are risks of onboard fire and explosion that can be prevented with careful handling and thorough boat maintenance.

Refuelling is one of the most potentially hazardous parts of boating. To minimise the risk of fire or explosion take care, follow the correct procedures and avoid being rushed or distracted by others. This is especially important with inboard petrol engines.

Before refuelling

- Switch off your engine/s
- Ensure your vessel is securely moored against the jetty, wharf or shore, and do not let another vessel tie up alongside you
- Turn off or put out all potential sources of flame or sparks, such as cigarettes, pilot lights, gas refrigerators, electrical equipment, batteries and mobile phones
- Close all hatches and doors to prevent fumes from entering enclosed spaces
- Read any instructions provided at the refuelling facility, such as using anti-static earth wires
- Don't be afraid to ask for assistance
- Always have the correct fire-fighting equipment on board. Make sure it is easy to reach, in good working order and you know how to use it
- Be aware of any other fire-fighting equipment nearby
- Look for the nearest spill kit and consider carrying a small kit with you so you can quickly clean up any small spills
- Instruct all your crew and passengers to leave the boat
- Check the location of your fire extinguishers and know how to use them.



During refuelling

- Check again that no-one else is onboard
- Ensure the hose nozzle is in the tank before starting the dispenser, and make sure you have selected the correct fuel for your engine/s
- Always operate the fuel dispenser by hand. Never lock or jam it in the open position
- Maintain firm contact between the hose nozzle and the filler neck to avoid static sparks. Keep your feet firmly on the deck, wharf or pontoon at all times
- Be careful not to overfill your tank/s. Fuel expands in high temperatures
- Try not to spill any fuel
- Ensure the dispenser is off before removing the hose nozzle from the tank
- Have fuel absorbant material or a rag to immediately clean up any drips after removing the hose nozzle.



After refuelling

- Remember to replace the fuel cap.
- Open all hatches and doors and ensure the engine bay and bilges have adequate ventilation
- Use a 'bilge blower' after refuelling to help remove fumes. Run the blower for enough time to clear fumes, depending on the capacity of the blower and the size of the engine space
- Take the time to make sure all areas are clear of fumes and remember that fumes will tend to accumulate in the lowest part of the vessel, which may vary depending on how the vessel is loaded
- Check to see if any fuel has spilled into the bilges. If it has, clean up the spill using fuel

absorbant material, or pump the bilges out into a container or onshore tank (depending on the volume) and then ventilate the bilges.

- Start the engine only when you are satisfied that the boat is free of fumes – use your sense of smell in conjunction with an appropriate gas detector to 'sniff out' any pockets of petrol vapour. If you suspect any vapours, fully vent the space and check for leaks in the fuel system
- Allow passengers to board the vessel only after you have started the engine and allowed it to run for several minutes
- Don't stay alongside a refuelling facility longer than necessary. If you wish to load supplies and boating gear, move your boat to another location.

Portable tanks

In addition to the refuelling precautions mentioned above, always remember to:

- Regularly check the breather on portable tank/s for any defects
- Fill your portable tank/s away from the boat to keep fumes from building up around it
- Take special care when carrying or lifting portable fuel tanks onto your boat. Get assistance if necessary
- Always secure your tank/s so they can't move around while the boat is underway
- If using portable petrol tanks to supplement onboard fuel tanks, keep them in a position where they can be removed quickly
- Always use fuel lines to transfer fuel from portable tanks to inboard tanks or direct to the engine, in preference to pouring fuel through a funnel or spout.

