part five
outboard and portable engines

Fishermans Knot

Carrying portable petrol tanks and transferring petrol can be extremely hazardous if care isn't taken. Petrol and its vapour are highly flammable and can cause serious fires and explosions. Other fuels bring their own risks and should be handled with equal care. This Part complements Part Two (inboard engines) and reflects the additional risks of having portable fuel systems on boats.

By ensuring that fuel doesn't enter your boat, and that all components are suitable for the fuel used, you can minimise the risks associated with escaped fuels. Making sure portable fuel tanks and spare fuel containers are made of a suitable material, are kept in good condition and are securely stored will also reduce the risk of fuel spillage.

The following Standards apply to all boats fitted with, or carrying, outboard or portable engines, whether or not they are in use.

TAKE NOTE

It is essential, when handling fuel or filling your fuel tanks, that you make sure there are no naked flames around. If you have any appliances on board with a lit flame or automatic ignition systems, e.g. refrigerators, cookers, central heating boilers, etc. these must always be turned off before refuelling. Always fill portable fuel tanks on shore and well away from any sources of ignition.

fixed fuel systems for outboard/power boats

Outboard powered craft with permanently installed fuel filling, stowage and supply systems, must comply with the relevant sections of Standards 2.1 to 2.19. You must ensure that fuel systems and all associated pipework, fuel cocks and fittings are suitably protected from external impact. [5.1/5.2]

portable fuel tanks & supply lines

There's always the possibility of a fire starting and spreading if escaped fuel is present, while flammable vapour from petrol can cause an explosion if it's ignited. The portable or close-coupled fuel tank must be made of a suitable material for the fuel used and maintained in a sound condition to minimise this risk.

In this context a portable fuel tank is one that can be carried on and off the boat and is designed to be connected by flexible piping directly to the engine. A close-coupled fuel tank forms an integral part of the engine.

To control any accidental escape of fuel a shut-off valve must be fitted to the fuel supply line into the engine. A bayonet connection on a portable fuel tank/supply system can act as a shut-off valve.

To help prevent any of the components of the fuel supply system from failing and leaking fuel, the system must not be changed or modified in any way from that supplied or approved by the component manufacturer.

Examiners will check that the fuel line itself is still pliable and is not showing signs of deterioration, such as cracking, which can be caused through old-age or by being in contact with the wrong fuel. It's always worth checking the condition of the fuel line on a regular maintenance basis to prevent any nasty surprises. [5.1/5.2]

One boat owner had a nasty shock on a hot and sunny day. The petrol stored in containers on his deck was left in direct sunlight on one very hot and sunny day while the owner visited a local attraction. On his return, the boater decided to re-fuel his small outboard-engined boat, but forgot that vapours from the fuel would build up under pressure, because of the heat affecting the containers. When he opened the lid, petrol vapour escaped under high pressure and was ignited by what is believed to have been a discarded cigarette. The boater suffered significant burns to his arms as a result. [5.3]

To minimise the risk of putting the wrong fuel into the fuel tank, it's advisable to clearly mark your portable fuel tanks with the type of fuel they contain.

To avoid fuel and fuel vapour leaking into the boat from spare fuel tanks that are not directly connected to the engine, the tanks must be stored in accordance with Standards 7.2 through to 7.8, e.g. in a fire-resistant drained locker. This will help to ensure that any escaping fuel or fuel vapours drain overboard, rather than into the boat.

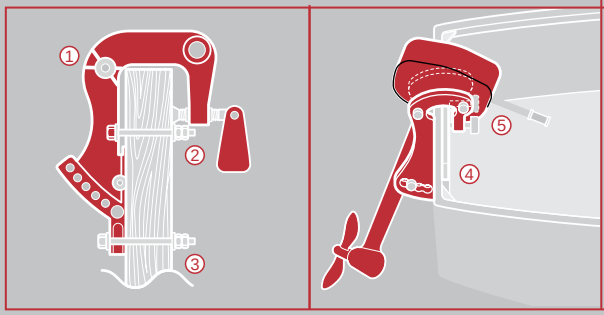
Small amounts of fuel can be diluted if they escape overboard. You should contact the Environment Agency Pollution Hotline on 0800 80 70 60 (24 hrs) or the Scottish Environment Protection Agency on 0345 73 72 71 to report instances where large quantities of fuel or other substances escape into a watercourse. [5.3]

petrol storage

Explosions can happen if flammable vapour from petrol is ignited, and the presence of escaped fuel will always cause a fire to escalate. Fuel containers must be made of appropriate materials to reduce the risk of leakage. The container construction must conform to the requirements of the Petroleum Spirit (Motor Vehicles, etc.) Regulations 1929 (S R & O 1929/952) or the Petroleum Spirit (Plastic Containers) Regulations S.I. 1982 No. 630.

To avoid petrol leaking into the boat from fuel containers, they must be stowed in accordance with Standards 7.2 through to 7.8, e.g. in a fire resistant drained locker. This will allow fuel or fuel vapours to drain overboard, rather than into the boat. [5.4]

Outboard engine mounting systems



1 THROUGH-BOLTING ARRANGEMENT FOR LARGER HP ENGINES
2 CAPS OR WASHERS TO SPREAD LOAD
3 NUTS WITH LOCKING ARRANGEMENT
4 PACKING REINFORCEMENT COULD BE EITHER SIDE OF TRANSOM OR BOTH
5 CLAMPS

LPG outboard engines

To minimise the potential for fire or explosion, all boats with engines fuelled by Liquefied Petroleum Gas (LPG) must comply with the Liquefied Petroleum Gas Association (LPGA) Code of Practice No. 18, and must not be a dual fuel system. [5.5]

securing outboard engines

If part of your fuel supply system becomes detached it could cause fuel or fuel vapours to leak, which could spread a fire or cause an explosion. To reduce the risk of this happening outboard engines must be securely fitted. It's also worth remembering that you are in danger of losing control of your boat if the engine is not properly secured. [5.6]

exhaust noise levels

It's recommended that your boat's exhaust noise is effectively suppressed to prevent noise nuisance to others. [5.7]

Petrol must be treated with the utmost care at all times, and that includes ensuring that it's properly stored in a container designed for holding petrol. When an examiner came to inspect the petrol tank on one boat he was visiting, he was horrified to find just a piece of electrical insulation tape covering a hole in a rusty and old outboard storage tank. Apart from leaking petrol each time the tank was moved, the hole also allowed dangerous vapours to escape, giving further opportunities for an explosion to occur. Don't wait for your rusty outboard tank to leak petrol before you consider replacing it, replace it now, it could prevent a fire. [5.4]

When the portable tank is disconnected from the engine, it must either be stored in a fire-resistant container, stored on open deck where leakage can go straight overboard, vented near the bottom and piped overboard (similar to a steel gas compartment) or removed from the boat completely. The same applies to petrol generators when they are disconnected from the electrical installation. You just can't take risks with petrol when an appliance is not in use. **[5.8]**

storage of portable internal combustion engines/generators

If fuel or gas escape into your boat from your portable engine or generator there could be a serious risk of a fire or explosion. To reduce this risk all portable LPG/petrol internal combustion engines/generators with integral fuel tanks must be stored in accordance with the requirements of Standards 7.2 through to 7.8 when they are not in use, e.g. in a fire-resistant drained locker. This will help ensure that any escaping fuel or fuel vapours drain overboard, rather than into the boat.

It's also a good idea for you to store portable diesel engines or generators securely when you're are not using them. [5.8]

Need more help or advice? Refer to Standards 5.1-5.8 in the appendix page 10.

For more technical information refer to:

- SRO 1929 No. 952 "The Petroleum Spirit (Motor Vehicles etc.) Regulations 1929".
- SI 1982 No. 630 "The Petroleum Spirit (Plastic Containers) Regulations 1982"

part five checklist

5.1	*deck connections minimise risk of cross contamination*	☐
	deck connections clearly marked ‘PETROL’	☐
	deck connections clearly marked ’PETROIL’	☐
	deck connections clearly marked ‘PARAFFIN’	☐
	deck connections clearly marked ‘DIESEL’	☐
	deck connections clearly marked ‘LPG BUTANE/PROPANE’ as appropriate	☐
	deck connections clearly marked ‘WATER’	☐
	deck connections clearly marked ‘PUMP OUT’	☐
	deck connections clearly marked ‘RINSE OUT’	☐
	deck connection markings on deck fitting or immediately beside deck connections	☐
5.2	permanent fuel systems fixed/constructed to Standards 2.1-2.19	☐
	permanent fuel systems suitably protected against external impact	☐
	fuel systems – permanent pipework suitably protected against external impact	☐
	fuel systems – permanent fuel cocks suitably protected against external impact	☐
5.3	portable/close coupled fuel tank in sound condition	☐
	fuel tank – portable/close coupled – fuel supply not capable of being readily shut off	☐
	fuel tank – portable/close coupled – unauthorised modifications made	☐
	fuel tank – portable/close coupled – not clearly marked with type of fuel used	☐
	portable fuel tank – not in use – Not stowed in accordance with Standards 7.2 and 7.3 of these Standards	☐
5.4	spare petrol carried in approved containers conforming to petroleum spirit regulations	☐
	spare petrol containers stowed in accordance with Standards 7.2 and 7.3 of these Standards	☐
5.5	LPG engines comply with LPGA code of practice No. 18	☐
	LPG Engines not dual fuel system	☐

5.6	outboard engine securely fitted	☐
5.7	*exhaust noise effectively suppressed*	☐
5.8	portable LPG/petrol engines generators with integral tanks stowed in accordance with standards 7.2 and 7.3 of these standards	☐
	portable diesel generators with integral tanks stowed in accordance with Standards 7.2 and 7.3 of these Standards	☐
	portable diesel generators stored securely	☐
	portable diesel engines stored securely	☐

Check List items in bold are Mandatory
Check List items in italic are Advisory

*EXEMPTION AVAILABLE