

Practicalities: LPG

Boom boom

Our intrepid correspondent **Stephen Peters** risks life and limb to get down to details so you don't have to.

More information:

BSS Guide to LPG installation
www.boat safetyscheme.org/media/.../bss%20guide%20chap7.pdf

Calor safety guides
www.calor.co.uk/customer-services/lpg-safety/

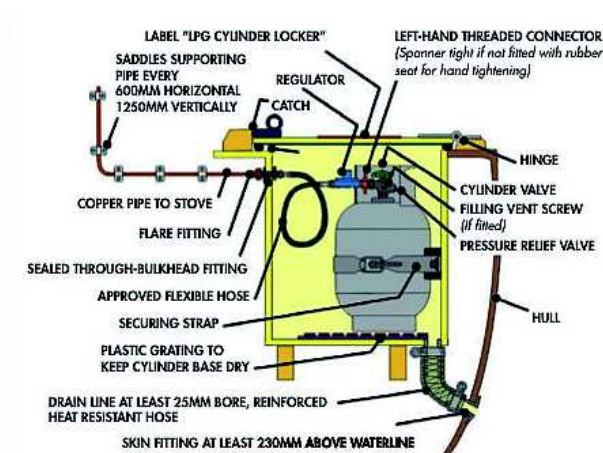
Typical gas locker installation—with the regulator on the bottle. If the regulator is remotely mounted it must be higher than the bottle outlet

The predominant fuel for cooking, water heating and refrigeration on the UK inland waterways is still LPG (Liquefied Petroleum Gas) although there is an increasing tendency for new craft to be all-electric to enable home comforts such as microwave ovens and washing machines to be operated via on-board inverters, generators, engine-driven alternators and shore supply. There is an inherent danger in using gas on a boat because of its high flammability and explosion risk coupled with its heavier-than-air density causing any leaks to settle in bilge areas. Sensible precautions and regular checking of gas installations for leaks will ensure that your boat remains safe; the Boat Safety Scheme website has a section on LPG that is well worth perusing. Pay particular attention to the requirement to use properly marked high pressure hoses and low pressure hoses (they are different) and note the need to

replace them by the marked expiry date.

In this country there are two forms of LPG in common use: butane, usually in blue cylinders, and propane in red. Calor Gas and other companies market both products in a variety of cylinder sizes (sold by weight) and it is best to choose a brand that can be easily obtained in the areas where you will cruise. CampingGaz is butane gas and obtainable only in smaller sized cylinders. Traditionally, butane was the preferred gas for boats but it has the drawback that it freezes in cold weather conditions. It has a boiling point of -2°C , compared with propane at -42°C . For this reason, propane is stored at a much higher pressure to keep it in its liquid state in the cylinder (7Bar or 100psi) whereas butane is stored at a mere 2Bar or 30psi. The higher storage pressure of propane is the reason why many suppliers do not recommend it for on-board use. Some boat owners prefer to use butane in the summer and change over to propane in the winter months to overcome the lack of gas pressure experienced when butane freezes.

LPG is stored as a liquid under pressure and when the shut-off valve is opened the gas vaporises and expands to many hundred times its volume. This, coupled with the higher calorific value of LPG, means that comparatively small cylinders are all that is required compared with the requirements for domestic natural gas. The high pressure in the cylinder is reduced to a very low pressure by means of the often



neglected regulator, which you will find in your gas locker between the cylinder(s) and the pipework serving your appliances. Butane is traditionally supplied at 28mBar (equivalent to 11inches or 28cm on a water gauge such as your BSS examiner will use). Propane regulators operate at 37mBar (equivalent to a 37cm water column—see the connection?). It is possible and safe to operate either gas using a butane regulator but the heat output from burning propane will not be so high.

Thanks to changes in industry standards LPG installations in boats and caravans now use a 30 mBar regulator, which is common to both types of gas, and when you replace your regulator (every 10 years is recommended) you can safely change to one of the new regulators, although the older types are still available. The one difference that applies only to sea-going craft is that the regulator should comply with EN 12864 Annex M, which means it is corrosion-resistant and incorporates an over-pressure relief valve for safety in the event that liquid gas enters the regulator. Inland waterway boats do not require this new type of more expensive regulator, but you may fit one if desired. But it is always the rule that your regulator must be mounted higher than the top of the upright cylinder to prevent catastrophic consequences caused by liquid gas expanding and rupturing your pipework.

You will find that different types of LPG cylinders have widely differing connections ranging from left-hand male threads on the small butane bottles, push-on connections on larger butane cylinders and left-hand female threads on all propane cylinders. As a result, if you want to change gas types or bottle sizes you will need adaptors, which are commercially available, to give complete

flexibility throughout the world.

All gas-consuming appliances such as cookers, water heaters, fridges, etc. must bear the CE mark to show they comply with an EC Directive and will have flame supervision devices to cut off the gas in the event of a blow-out. Other gas fittings such as regulators will not have a CE mark but must bear a label indicating the appropriate



standards.

All LPG installations must be carried out by a 'competent' person, which means a qualified gas fitter with LPG credentials, although it is not illegal for a DIY owner to carry out gas fitting work on a private boat. If you are confident and sensible you will be OK, but all work on commercial and hire boats must be done by an accredited GasSafe engineer.

One final hint, if you want to know how much gas is left in your cylinder you can weigh it. The net weight of the container is marked in lbs and oz on a plate around the neck of the cylinder. So subtract that from the total and you will know the weight of liquid gas remaining. The other information on the valve plates shows when the cylinder is next due for testing (every 15 years).

New style propane regulator to meet EN 12864 Annex M