Introduction to Calor Cylinders, Valves, Regulators, Hoses & Safety Devices

This is the first of three modules which will aid you on how to connect and disconnect a range of Calor Cylinders.

The regulators shown in the presentation are only an example of those available on the market.

The Legal Side

Gas Safety Installation and Use Regulations 1998

- The safe installation, maintenance and use of gas fittings

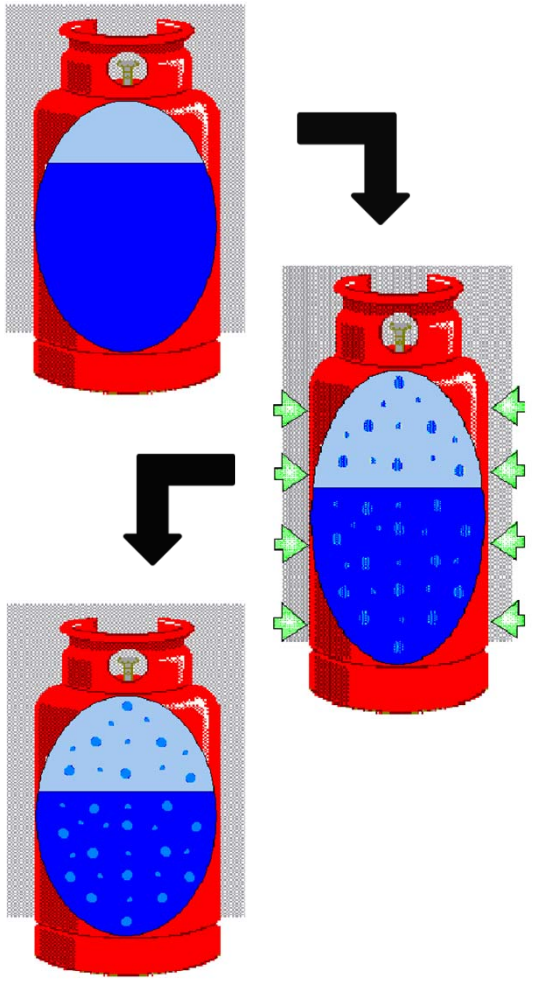
- Regulation 3 enables you to replace *"certain like for like hose/regulator, such as where used/worn items are replaced"* without being Gas Safe registered but you must be deemed competent by Calor before attempting any of these activities this also includes
  - The replacement of a hose or regulator on a portable or mobile space heater or
  - The replacement of a hose connecting a re-fillable cylinder to installations pipework

Anatomy of a Cylinder

- An LPG cylinder is a pressure vessel made from 2 to 3mm mild steel plate and of welded construction
- The surface of a cylinder in direct contact with the Liquefied Petroleum Gas is known as the wetted area

How a Cylinder Works

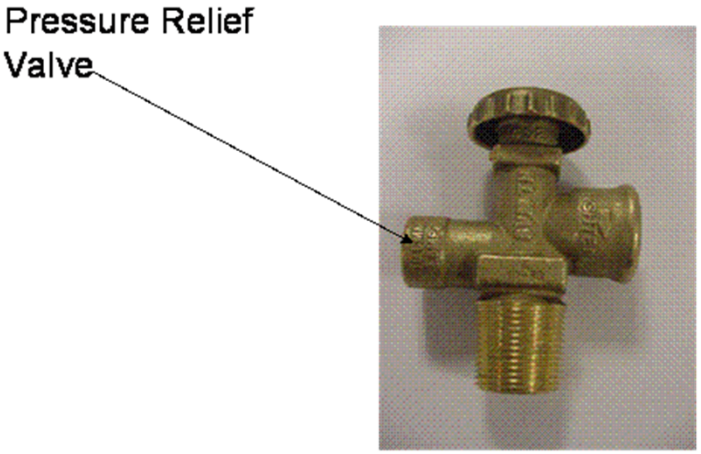
- A 'full' cylinder is not full of liquid, space is left for expansion of the liquid and a supply of compressed vapour in the space above the liquid level
- The percentage fill varies with the size of the cylinder but normally has a maximum fill of 80 to 87%
- When the valve is opened, gas is pushed out of the vessel by the pressure and as a result the pressure above the liquid is reduced
- The liquid takes in heat from the cylinder and the outside atmosphere and begins to boil, giving off vapour
- As the conversion of liquid to gas continues, the liquid level slowly falls
- When the valve is closed again the pressure inside will rebuild up to the vapour pressure of the liquid, irrespective of how much liquid is left in the container



Valves

- Valves prevent the gas escaping from the cylinder

- They contain a pressure relief device which activates if the pressure builds up in the cylinder due to **excessive** heat
  - Butane 21 bar
  - Propane 26 bar



Butane Valves

- 4.5kg Butane cylinders have a hand wheel connection with a male left hand thread valve

- 7kg, 12kg and 15kg cylinders are fitted with a 21mm clip on self sealing valve

Propane Valves

- 3.9kg, 6kg, 13kg, 19kg and 47Kg Propane Cylinder are fitted with a hand wheel which has a POL connection valve

The valve has a female left hand thread

Regulators

- A regulator must be included in the connection between the cylinder and the appliance except for appliances designed to be supplied at cylinder or vapour pressure

- The regulator is precisely set by the manufacturer to control the pressure of supply and **must not be adjusted**

- Regulators must be certified and marked with BS3016 (now withdrawn) or BSEN12864 for cylinder mounted regulators or BSEN13786 for Automatic Changeover Devices (ACDs)

Clip on Regulators

- Patio Cylinder Regulator
  - Propane regulator
  - Operating pressure: 37mbar
  - Reinforced diaphragm
  - Inlet: 27mm
  - Outlet: 8mm nozzle

- 27mm Propane Regulator
  - Operating pressure : 37mbar
  - Reinforced diaphragm
  - Inlet: 27mm
  - Outlet: 8mm nozzle

- 21mm Butane Regulator
  - Operating pressure: 28mbar
  - Reinforced diaphragm
  - Inlet: 21mm
  - Outlet: 8mm nozzle

Screw on Regulators

- Low Pressure Butane Regulator
  - Operating pressure : 28mbar
  - Reinforced diaphragm
  - Inlet: union 109
  - Outlet : 8mm nozzle

- Low Pressure Propane Regulator
  - Operating pressure : 37mbar
  - Reinforced diaphragm
  - Inlet: POL 105
  - Outlet: 8mm nozzle

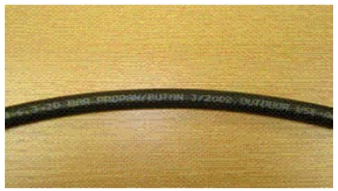
Automatic Changeover Devices (ACDs)

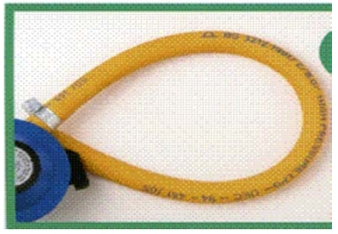
- Low Pressure Automatic Changeover Device
  - Operating pressure : 37mbar
  - Reinforced diaphragm
  - Limited relief : 55mbar
  - Over Pressure Shut Off (OPSO): 75mbar
  - Inlet: union 105
  - Outlet : 1/2 inch BSP Ball Valve

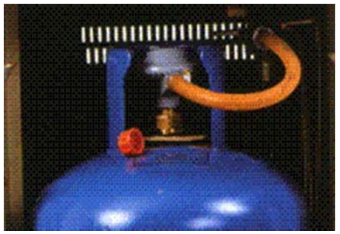
- All regulators that are not connected directly to a cylinder i.e. those connected by a hose, should be positioned above the top of the cylinder

Hoses

- Hoses must be certified and marked either BS3212 or BSEN1763 and bear the year of manufacture and name of manufacturer
- Hose length should be as short as possible but should not be stretched
- All hoses should be secured with proper hose clips
- Ensure the hose is kept clear of hot spots
- Hoses fitted to cabinet heaters must be marked BS3212 type 2 be BSEN1763 class 3 and be of 8mm inside diameter
- Hoses for ACDs must be marked BS3212 type 2 be BSEN1763 class 3 and be of 8mm inside diameter. These must be supplied as a complete assembly with end fittings, crimped to the hose







General Cylinder Information

- Treat cylinders with care to ensure that the valve is not damaged
- Always use cylinders in the upright position unless specifically designed for liquid offtake. Liquid offtake cylinders that are used on their side are only found on Fork Lift Trucks.
- Be careful when manual handling cylinders. They weigh approximately twice the net weight shown
  - Use mechanical aids or trolleys where appropriate
- Don't subject a cylinder to heat as the pressure inside could build up to exceed the safe limit of the pressure relief valve
- Don't attempt to disconnect or unscrew a regulator from any cylinder if the flame does not go out when the regulator is turned off
- Don't deliver cylinders to
  - cellars
  - areas below ground
  - within 2 meters of untrapped drains, unsealed gullies or opening to cellars
- Propane cylinders must not be supplied for use indoors at domestic premises.
- Propane and Butane cylinders must not be supplied to blocks of flats where a piped gas supply is prohibited

Before Exchanging a Cylinder

- Carry out a visual inspection of the installation and its associated equipment
- Ensure you have the correct equipment and Personal Protective Equipment
  - Gloves
  - Safety boots
  - Full body protection (i.e. no t-shirts and shorts)
- **Don't Connect a Cylinder if**

The hose is

- Not marked to a British Standard
- Does not have a date of manufacture
- Damaged or worn
- Has cuts or splits
- Or is the wrong type

The regulator

- Is out of date, it is recommended that regulators should be replaced if over 10 years old
- Shows signs of damage or wear

For further information on exchanging cylinders please refer to Modules 2 and 3

Thank you for taking the time to view this training advice.

For more information, contact your Manager or Supervisor.

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