BASIC FACTS ABOUT LP-GAS

Pounds Per Gallon	4.24
Specific Gravity of Gas	1.50
Specific Gravity of Liquid	0.504
Cu. Ft. Gas Per Gallon Liquid	36.38
Cu. Ft. Gas Per Pound	8.66
BTU Per Gallon	91,502
BTU Per Pound	21,548
Boiling Point in Degrees F	-44
Vapor Pressure at 0° F	31
Vapor Pressure at 70° F	127
Vapor Pressure at 100° F	196
Vapor Pressure at 110° F	230

In cold climates, in order to keep vaporization of LP gas at the highest level, keep the fuel level above 50%.

AVERAGE LP GAS CAPACITIES IN CYLNDERS

# Capacity	Gallon Capacity	BTU Capacity
5	1.18	107,903
10	2.36	215,807
11	2.59	237,387
20	4.72	431,613
30	7.08	647,420
40	9.43	863,226

The above capacities allow for the 20% vapor space on each cylinder.

CONVERSIONS

Gallons to Liters (1 Gallon = 3.785 Liters)

F° to C° (F° = 9/5 C° + 32°)

11" Water Column = 6 1/4 Ounces Per Square Inch Pressure

27.7" Water Column = 1 Pound Per Square Inch Pressure

Data from NFPA (National Fire Prevention Association) Pamphlet # 58-1998

NOTE: This pamphlet is not meant to be a complete guide to the use of propane cylinders and appliances.

SOME BASIC PRACTICES TO ENSURE SAFETY AND TROUBLE-FREE USE

Practice safety at all times. If you have questions about the operation of your appliance or LP-gas systems, contact your local LP-gas dealer.

1. *Never* allow your LP-gas container to be filled above the maximum safe level as indicated by a scale or the fixed liquid level gauge (outage). Do not use the visible gauge for filling.
2. Do not use a wrench or pliers to close the service valve or fixed liquid level gauge. These valves are designed to be closed leak-tight by hand or screw-driver as appropriate. If wrenches are necessary to stop a leak, the valve needs repair or replacement.
3. When tightening the POL Nut (left hand thread) on the service valve, draw it up snug with a proper wrench. This is a machined male brass fitting which seats securely against a female seat in the POL valve - no pipe dope is necessary.
4. Acme/Type 1 valves have right handed threads which are secure when hand tight, and on the Quick Disconnect/Type 2 Valves, the male connection is inserted into the female connection on the cylinder valve. (No wrenches required for the Acme or the Quick Disconnect.)
5. When using container, slowly open service valve all the way. Listen to the regulator. A continuous hiss or "clicking" sound may indicate a leak or an open valve on an appliance.
6. Check all tanks and the line connections periodically to be sure they are tight. When testing for leaks, use an approved ammonia-free leak detector solution, not matches.
7. Make certain your container is properly fastened in place.
8. Turn container with open part of container guard towards trailer (travel trailer installation). This protects valves and regulator against flying rocks and mud. Transport container in the proper position in which it is used, with the valves closed and POL plugs inserted for POL valves or dust caps for ACME valves. Secure the tank against falling or rolling.
9. Check for leaks after connecting. Apply approved leak detector solution to connection, turn off all burners and pilots, and open service valve. Leaks will be detected by the growth of the bubbles. If bubbles grow, tighten or repair the connection as needed. Repeat leak test until problem is corrected.
10. LP-gas is normally non-corrosive; you need not worry about the inside of your container. However, the outside should be kept free from rust by a periodic coat of paint in a light reflective color. It is very important to inspect and maintain the bottom and foot ring on the container.
11. Do not store LP-gas containers indoors or in enclosed areas. Do not expose LP-gas container to heat. Always store with service valve closed and plugged or capped as required.
12. Do not attempt to repair any containers, container valves, regulator or appliances by yourself. Use only trained certified LP-gas service personnel to perform repairs.

MANCHESTER TANK SINCE 1946

HELPFUL HINTS

On LP-Gas and LP-Gas Containers

MANCHESTER TANK SINCE 1946

Millions enjoy using the world's most versatile fuel, but we should always remember to follow all the important safety warnings and product instructions. This pamphlet is designed by Manchester Tank to answer some questions you may have. If you need additional information or clarification, please contact us.

Customer safety is and will always remain our number one priority at Manchester Tank.

LP-Gas
(Liquid Petroleum Gas, or Propane)

LP-gas is a hydrocarbon stored in liquid form for easy transportation and storage. It is also known as propane or bottled gas. LP-gas is safe and economical, and because of its portability, provides modern living convenience no matter where you travel.

LP-gas is flammable, always contained under pressure and the liquid *can* freeze skin. Therefore, in the interest of safety, it is important to understand the basic facts about LP-gas and LP-gas containers.

Federal DOT (Department of Transportation) regulations require periodic inspections and re-qualifications of cylinders. DO NOT USE damaged or rusted containers.

Phone: 800-640-6327

www.mantank.com

CAUTION: USE LP-GAS CONTAINERS IN PROPER POSITION

Most LP-gas appliances for cooking, heating, lighting, water heating and refrigeration are designed to operate on LP-gas vapor only. Therefore, all LP-gas containers designed for vapor service must be transported, installed and used in the proper position. Do not transport, install or use a vertical cylinder in a horizontal or upside down position. Proper care must be taken to position a horizontal container in the correct position for vapor withdrawal. Liquid LP-gas could enter the system designed for vapor only, possibly creating a hazardous condition.

Always close the valve and install a POL plug on a POL valve or a dust cap on an ACME/Type 1 valve when transporting or storing disconnected containers (full or empty).

Manchester LP-gas containers are permanently marked with "top" stamped on the tab welded to the tank and stamped in the guard or brackets are arrows pointing upward indicating the proper position.

All LP-gas containers must be securely oriented in the proper position for intended use.

FILLING YOUR LP-GAS CONTAINER

Only qualified persons should fill your LP-Gas containers.

CAUTION: OVERFILLING IS HAZARDOUS! Do not allow your LP-gas container to be overfilled. Stop filling when liquid appears at the fixed level gauge. Bleed off excess propane in a safe area. Most LP-gas containers are equipped with a fixed liquid level gauge which contacts the liquid level at 80% of container capacity, allowing 20% for expansion. LP-gas containers not equipped with a fixed liquid level gauge can only be filled by weight.

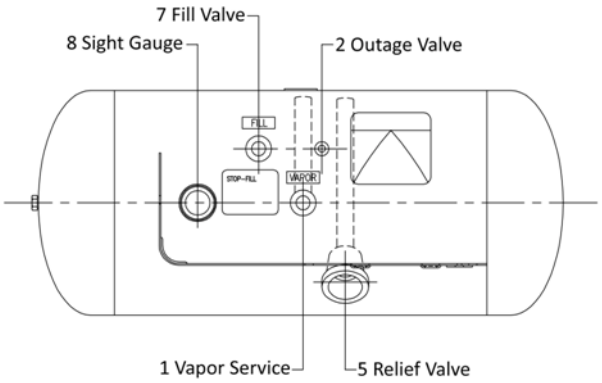
LP-gas containers must not be filled over 80% of total capacity. Propane expands approximately 1.5% for each 10° F temperature rise. Pumps do not stop filling "automatically." Pumps "by-pass" when containers are dangerously filled to total capacity. If overfilled, excessive pressure could develop within the container causing the relief valve to open and release flammable gas.

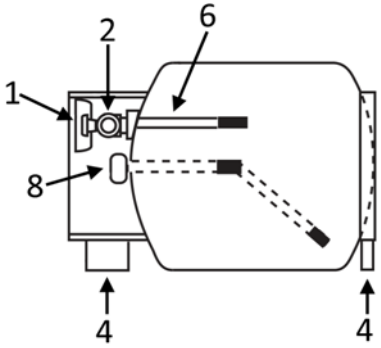
The fixed liquid level gauge is used only to determine safe fill levels and does not indicate lower levels. LP-gas containers are available with visible gauges that monitor the amount of gas in the container at all times, reading from full to empty. Do not use visible gauges for filling.

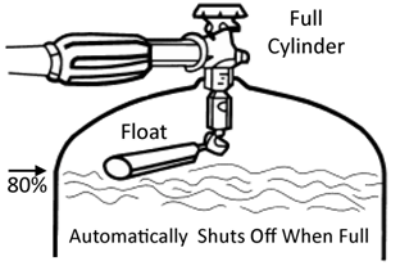
PURGING OF AIR FROM LP-GAS CONTAINERS

Air in LP-gas containers is a contaminant. Purging is done prior to initial filling to remove the air. If the container is not properly purged, air in the container dilutes the LP-gas vapor. Failure to purge may cause excessive tank pressure, slow filling and poor appliance operation. Appliances then require constant adjustment and pilot lights won't stay lit. This condition would exist until all air is depleted, leaving pure LP-gas vapor.

Have your LP-gas container properly purged. It only takes a few minutes and your LP-gas dealer is equipped to perform this service (see NPGA bulletin 133-89A).







Typical Regulator for RV Use

Regulator Covers

COMMON TERMS OF LP-GAS TANKS

1. **POL, ACME and Quick Disconnect Valves -** Types of vapor withdrawal service valves.
2. **Fixed Liquid Level Gauge -** Clear vapor less than 80%; white mist 80% or above. Used to indicate maximum safe fill level of container.
3. **Vapor Withdrawal Tube -** Used on tanks for vapor service where service valve is not located on top of tank.
4. **Base ring, stand legs or mounting brackets**.
5. **Relief Valve -** Discharges LP-gas if the pressure in the container is too high. If LP-gas is discharging, call the Fire Dept. and get away from the container. The container should always be used and stored in the correct position to ensure the relief valve is in direct communication with the vapor space of the container.
6. **OPD -** Or Overfill Protection Device is a valve, designed to reduce the potential overfilling of LP gas cylinders.
7. **Automatic Stop Fill Valve -** Similar to OPD but used with 1 3/4" ACME.
8. **Visible Sight Gauge -** Available with remote sender. Indicates approximate level of LP gas liquid in container.

DOT AND ASME CONTAINERS

Generally speaking, LP-gas tanks are built to the specifications of either the ASME Boiler and Pressure Vessel Code or DOT Hazardous Materials Regulations.

Basically, the difference between the two is permanent installation (ASME) and transportable use (DOT). DOT capacity is expressed in pounds of water. ASME capacity is expressed in U.S. gallons. Manchester production and testing methods are the most modern available to assure top quality. All valves provided in Manchester containers are UL Listed.

LP GAS REGULATORS

LP-gas regulators reduce the pressure of LP-gas vapor from tank pressure to desired appliance pressure. The regulator is the heart of the LP-gas system. Care should be taken to protect it from the elements which could cause it to malfunction. Your LP-gas system should be kept free of moisture which could cause regulator freeze-up. A good regulator enclosure will protect your regulator.

CAUTION - ALWAYS BE SURE THAT THE REGULATOR VENT IS POINTING DOWN WITHIN 45 DEGREES OF VERTICAL.

ADVANTAGES OF TWO-STAGE REGULATION

Reduced Freeze-Up Problems - According to national code, a two-stage regulator must be used on RV's. A two stage regulator greatly reduces the possibility of freeze-ups.

Improved Regulation - The second stage regulator receives a relatively uniform pressure from the first stage regulator. This helps the second stage regulator to maintain appliance pressure at a nearly constant 11" W.C.

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