



Town of Islip
Department of Public Safety Enforcement
Fire Prevention Division

STUDY GUIDE FOR LP GAS CERTIFICATE OF FITNESS

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Overview

This study guide is provided to assist you in your preparation for the written and practical Certificate of Fitness examinations. Upon successful completion of both examinations, you will receive a Certificate of Fitness to dispense propane. This study guide is not intended to conflict with any Federal, State, or Local laws and regulations; nor is it intended to be the sole reference book for dispensing operations.

This guide may be used for quick reference and as a study aid for new and current dispenser operators. The New York State Fire Code, The Town of Islip Code (chapter 19), The National Fire Protection Association (NFPA) #58 The Liquefied Petroleum Gas Code and Propane Industry publications all contain rules, standards and best operating procedures. It shall be the responsibility of the Certificate holder to fully comply with all laws and regulations.

Remember, propane safety starts with you, the operator. Proper techniques and knowledge will ensure that a high level of safety is maintained. When handled properly, propane is a safe, clean energy source. However, when it is improperly handled, propane can lead to an accident causing serious personal injury or death. Let's work together to keep propane safe.



Section 1

Obtaining a Certificate of Fitness

A Certificate of Fitness is required to be obtained by any individual that is responsible for transferring liquefied petroleum gas (LPG) from one vessel or cylinder into another. Each facility that dispenses propane is required have a minimum of one (1) Certificate of Fitness holder. There shall be as many as required by management of each dispensing facility, and is there no maximum number of Certificate of Fitness permit holders per location.

Any individual interested in obtaining a Certificate of Fitness shall complete an application and submit the fee. The application is available for pick-up in the Fire Marshal's Office on Monday-Friday from 9am-4pm. It is also available on the Town of Islip website @ islipny.gov.

The fee for a Certificate of Fitness is \$150.00, and once issued, is valid for three (3) years. After three (3) years, the Certificate of Fitness can be renewed by submitting the \$150.00 renewal fee. If a Certificate of Fitness has expired for a period of more than one (1) year, it cannot be renewed, and the process must be started again to obtain a new Certificate of Fitness.

Once the completed application and fee has been submitted, the written examination can be scheduled. The written examination is given in the Fire Marshal's office, located at 24 Nassau Avenue in the Hamlet of Islip. The written test can be administered any day Monday-Friday, during the time frame of 10am-12pm, and 2pm-4pm.

The written examination shall consist of Twenty-five (25) questions, and the applicant shall have sixty (60) minutes to complete the examination. The applicant must bring a pen to the test. A calculator is permitted to be used, but **cell phones are prohibited**. The applicant shall show mastery of the subject matter by answering no less than twenty-one (21) test questions correctly, which will equate to a passing grade.

If the applicant fails to achieve a passing grade on the first attempt of the written examination, he/she will be required to return and take the test again, no less than



five (5) business days following the original test. If the applicant fails to achieve a passing grade on the second attempt of the written examination, he/she shall wait a minimum of thirty (30) days following the second failed attempt. Additionally, the applicant shall be required to re-apply and furnish all applicable fees prior to re-testing.

Once the applicant has obtained a successful passing grade on the written examination, the field practical examination can be scheduled at the applicant's place of employment. This test can be scheduled beginning 14 days after the written examination. The field practical examination can be administered Monday-Friday from 10am-3pm.

When the appointment is made for this portion of the examination, it will be explained that there should be an empty cylinder available to demonstrate the procedure on proper filling techniques. The candidate will successfully perform all the tasks needed to fill a LPG cylinder while the Fire Marshal observes in order to pass the field practical exam. This exam is graded as Pass/Fail.

If the applicant fails the initial field practical examination, another field exam shall be scheduled within 10 business days following the original test. If the second attempt is also failed, then the applicant shall be required to re-apply and furnish all applicable fees prior to re-testing, with the original written examination declared void.

Once the candidate successfully passes the field practical examination, a Certificate of Fitness is issued, and shall remain in effect for three (3) years. An Identification card will be supplied. This shall be used only by the individual whose name and picture appears on the card, and must be on hand at all times while dispensing LPG. No Certificate of fitness holder shall allow another individual to dispense LPG under their credentials. The Fire Marshal is authorized to ask an individual to produce a valid Certificate of Fitness card at any time while on the premises.

If anyone is observed dispensing LPG without a valid certificate of Fitness, they can face fines of a maximum of \$2000.00 or a term of imprisonment not to exceed fifteen (15) days on the first offense. Additionally, the place of business can have their Hazardous Materials Storage Permit revoked, and be faced with further legal action.



Section 2

PROPERTIES OF PROPANE

Propane is a clean-burning, portable fuel used in a variety of applications by both consumers and businesses. Propane is a hydrocarbon (C_3H_8), and is commonly referred to as liquefied petroleum gas, LP-gas, or LPG. It is produced from both natural gas processing and crude oil refining. Nearly all of the propane consumed in the United States is produced in North America.

Propane is non-toxic, colorless and virtually odorless. To increase the likelihood that a propane leak can be detected, ethyl mercaptan, a sulfur-based compound is added to the gas at the time of production. Always be sensitive to the slightest gas smell and learn to recognize the odor of propane. Many factors may diminish your ability to detect the odorant in propane including prolonged exposure, colds, allergies, age, certain medications, and the use of alcohol or drugs. Although propane is non-toxic, if released in a confined space, it can displace oxygen and act as a simple asphyxiant.

Propane can be either a liquid or a gas, however under ambient conditions, propane will be a gas. In order to store propane as a liquid above its normal boiling point of negative 44 (-44) degrees Fahrenheit, it must be stored and transported in pressure tight containers. Liquid propane stored in containers at ambient temperatures will boil off and become a vapor that occupies the empty space in the container. This vapor is what is used in the consumer's equipment and appliances. Like water, liquid propane will expand when heated. Propane however, will expand considerably more than water over the same change in temperature. Liquid propane will increase in volume nearly 17 times greater than water over the same temperature increase. To allow for this expansion, propane cylinders are typically filled to only 80% of their capacity.





Under normal outdoor temperatures, liquid LP-gases expand rapidly into gas. One cubic foot of liquid propane will boil off and produce 270 cubic feet of propane vapor. Therefore, liquid propane leaks are more hazardous than vapor leaks. Liquid propane will rapidly vaporize in air, causing a refrigerating effect that makes everything it comes in contact with extremely cold. If liquid propane comes in contact with skin, it can cause 3rd degree or deep freeze burns. It is important to wear gloves or other personal protective equipment resistant to propane at all times when filling containers.

Vapor density is the comparison of the weight of a given volume of a gas at a certain temperature vs. the same volume of air at the same temperature. Propane has a vapor density of 1.52 at 60 degrees Fahrenheit. It is important to remember that since propane's vapor density is 1.52, it is roughly 1½ times heavier than air. If a leak develops in a gas line or container outdoors, propane readily dissipates. However, under the right conditions, propane gas may settle in low unventilated areas and can become concentrated if there is little or no air movement. This information is critical when trying to find the source of a leak, or working in an area where a leak has occurred.

Even with an abundant supply of both air and propane, combustion cannot occur unless they are mixed together in the proper proportions. The most common way of expressing the proper mixtures needed for combustion is in terms of flammability limits (also known as explosive limits or explosive range). A flammable limit is simply the percentage of gas needed in an air/gas mixture to support combustion. Normally this value is given in both upper and lower limits of flammability. The lower limit is the percentage of gas in the leanest (less gas) mixture that will support combustion, and the upper limit is the percentage of gas that is the richest (most gas). The lower flammable limit (LFL or LEL) for commercial propane is 2.15%, while the upper flammable limit (UFL or UEL) is 9.6%.

Every time propane is released, there is a potential for hazard. Three ingredients are needed to start and sustain combustion during a propane release: propane, oxygen and an ignition source. All three ingredients must be present for combustion to occur. An ignition source shall also be present, and must provide enough heat to the propane-oxygen mixture to raise the temperature of the propane to its ignition point. In order to minimize possible ignition sources that could lead to combustion, it is important to restrict customers from the immediate area around liquid propane transfer areas.



Section 3

PROPANE CONTAINERS

Propane storage containers are made in many sizes and shapes for both stationary and mobile use. Both types are designed to hold propane in its liquid form, which means that the container is pressurized. There are two common types of propane tanks:

- Department of Transportation (DOT) cylinders: Most propane cylinders in service today are manufactured according to DOT specifications and are commonly referred to as “DOT cylinders”. DOT regulations are covered by 49 CFR. Small portable DOT cylinders are filled at various locations and are commonly used with hand torches, gas lanterns, camp stoves, barbeque grills and recreational vehicles. Large cylinders are typically filled at a propane facility or plant and delivered to industrial, commercial or residential customers. DOT cylinders are measured in pounds of water, and can be various sizes. They are constructed of materials like steel or aluminum, or newer technologies like composite materials.
 - Additionally, Disposable cylinders are small cylinders, typically containing one pound of propane that can be used for camping or soldering. These types of cylinders generally are disposable, but some approved cylinders can be refilled.
- American Society of Mechanical Engineers (ASME) tanks: These tanks are manufactured to ASME standards. These tanks are designed for a stationary installation, and not designed to be transported containing propane. These tanks are typically installed horizontally and are measured in gallons. They range in size from 120 to more than 2,000 gallons. ASME tanks have thicker steel and are not exposed to the hazards that the mobile DOT cylinders are, therefore recertification is not required.

NOTE: *We will be focusing on DOT cylinders only in this document. Once a Certificate of Fitness is obtained, you may only fill DOT cylinders.*



Components of a DOT Cylinder

Cylinder Body: Commonly made from either aluminum or some type of alloy steel, and consists of either two or three pieces.



Cylinder Body

Cylinder foot ring: Every aluminum or steel cylinder has a foot ring. The foot ring is a wide metal band that is welded or brazed to the bottom (non-service end) of the cylinder. It is used to protect the bottom of the cylinder body from corrosion or other damage and also functions as a support stand or base.



Cylinder Foot Ring

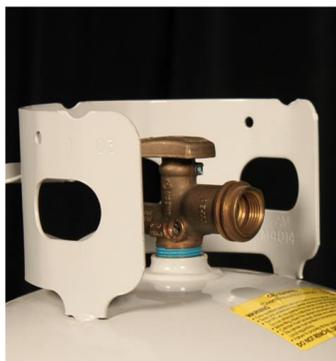
Service End: This is the top of the cylinder and is where the openings for valves and fittings are located. The threaded fittings are welded to the opening. The number of openings depends on how the cylinder will be used.



Service End of Cylinder

Portable and exchange cylinders will rarely have more than one fitting that is threaded to a 3/4" female National Pipe Thread (NPT) fitting and raised above the surface. As a result, the fitting is often called the neck of the cylinder. A combination service valve and pressure relief valve is installed in the fitting.

Cylinder Collar: To protect the cylinder valve(s), a wide metal band called a "collar" is welded to the cylinder body and partially surrounds the neck of the service end. Collars often incorporate a handle for lifting and moving. Cylinder valves should never be used to lift or move a cylinder.



Cylinder Collar



Handle for Lifting

Overfilling Prevention Device (OPD): As of April 1, 2002, cylinders without an OPD cannot be refilled. Beginning October 1, 1998, all newly manufactured small propane cylinders (capacity of 4- to 40-lbs. propane) were required to be equipped with an OPD. OPD equipped cylinders can be identified by either warning labels or the unique valve hand wheel, a modified triangular shape. The OPD marking is stamped into the wheel and valve body itself.

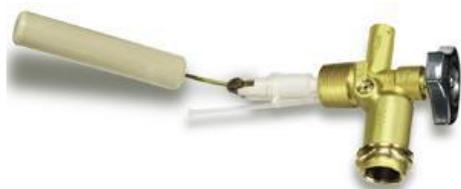


Old Style handle (No OPD)

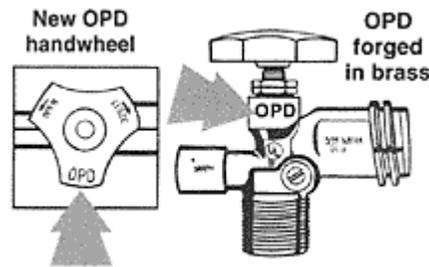


New Style Handle (With OPD)

An OPD is a secondary means of assuring that cylinders are not overfilled, but must not be used as a method for determining the proper amount of propane in the cylinder. It is a very reliable when used as a backup device to correct filling procedures.



Valve assembly with an OPD



OPD Marking Example

NOTE:

Cylinders used in industrial truck service, including forklift truck cylinders and cylinders used for industrial welding and cutting gases are exempt from the requirements of an OPD.

Cylinder Markings

Markings are required by DOT and are the ID card for the cylinder. Markings must be legible and clearly and permanently marked on the collar or cylinder body.

The markings include information for selecting cylinder valves, the **specification design code**, cylinder **tare weight (TW)**, **water capacity (WC)** in pounds, and the manufacturer name and test or requalification date.



Cylinder specification markings consist of two basic parts: the design code and the service pressure. DOT-4BA240 is one of several specifications for cylinders. The term "4BA" indicates that the cylinder is a welded (series 4) alloy steel (series BA) cylinder. The number "240" indicates the service pressure is 240 pounds per square inch gauge (psig).



Specification Design Code

The cylinder size is marked by the amount of water it can hold in pounds. Water capacity (WC) is the weight of water needed to completely fill a cylinder. The WC for cylinders is calculated in pounds. The propane capacity is not marked on a cylinder. Instead, the WC is used to establish the cylinder capacity. Never confuse the WC of the cylinder with the propane capacity. The maximum propane capacity is 42% of the WC. When cylinders are filled by weight, they must NEVER be filled beyond the maximum propane capacity.



Water Capacity

Tare Weight (TW) is the weight of the cylinder when empty and includes the weight of the cylinder valves, but not the filling hose and nozzle. Cylinders with the same WC can have different TWs, so each cylinder should be treated individually. The TW is used when a cylinder is filled by weight and should always be checked before it is filled.



Tare Weight

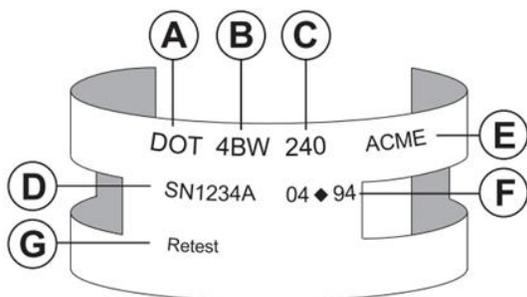
Cylinder Requalification

All refillable cylinders must be requalified at regular intervals. Requalification is not normally handled at dispenser locations, and should be performed only by trained individuals whose facility is registered with the DOT.

When reading requalification markings:

- A date without a letter indicates the next requalification must be within 12 years.
- The letter “S” following the date indicates the cylinder must be requalified 7 seven years of the marked date.
- The letter “E” following the date indicates that requalification is required again within 5 years of the marked date.
- The most recent requalification date is marked on the cylinder. Cylinders that are out of qualification must NOT be refilled; rather, they should be marked and set aside in a designated safe area.

Knowing about cylinder construction, components, and markings will assist you in safely refilling your customers’ cylinders.



- (A) Manufactured to U.S. DOT specifications
- (B) Cylinder specification type (e.g. 4B, 4BA, 4BW, and 4E)
- (C) Cylinder service pressure (psig)
- (D) Cylinder serial number
- (E) Manufacturer’s name (or registered symbol)
- (F) Original manufacture/test date, month and year, and inspector’s mark, as required (i.e., this diagram indicates April 1994 and inspector’s mark ♦)
- (G) Area for date requalified/retested (no date is shown indicating that the 10-year requalification is *overdue*)

* Additional markings may be present as authorized by HMR under the specification

Tank Markings Legend



CYLINDER REQUALIFICATION METHODS	
EXTERNAL HYDROSTATIC EXPANSION	
LETTER STAMP	NEXT REQUALIFICATION
NONE	12 YRS
DATE 10/05	DATE 10/17
INTERNAL HYDROSTATIC	
LETTER STAMP	NEXT REQUALIFICATION
S	7 YRS
DATE 10/05 S	DATE 10/12 S
EXTERNAL VISUAL INSPECTION	
LETTER STAMP	NEXT REQUALIFICATION
E	5 YRS
DATE 10/05 E	DATE 10/10 E

Example of Date Markings & Their Meanings



Section 4

Inspection & Filling of Cylinders

Cylinder Inspection

Visual Inspection:

Prior to filling any cylinder, an in-depth inspection must be performed. This visual inspection is performed on all cylinders regardless of size or type. Prior to inspecting a cylinder, remove any plastic or paper sleeve on the cylinder so you are easily able to spot any problems. After inspection, if any defects are found, the cylinder must not be refilled and should be marked and set aside in a designated safe area. Items that prevent refilling of a cylinder include:

- The container has excessive denting, bulging, gouging, or other damage.
- Evidence of excessive rusting or corrosion. (especially on the bottom of the cylinder)
- The container has been exposed to fire.
- Identifying marks are missing or not legible.
- Leaking or defective valve.
- No OPD (**Remember** there are exceptions-Forklift cylinders, etc.)
- Damaged cylinder collar
- Discoloration of the valve (ammonia contamination)
 - If you find a blue-green stain on the brass portion of the cylinder valve, the cylinder may have come in contact with anhydrous ammonia, which is often used to manufacture illegal drugs. If found, place the cylinder in a safe location and contact your supervisor.

Requalification:

In addition to items the visual inspection looks for as described above, the cylinder also needs to be checked to ensure that it is being requalified at the required intervals. The most recent date is marked on the cylinder. A date without a letter following it is good for twelve (12) years from the date of manufacture. The letter "S" following the date indicates the cylinder was hydrostatically inspected and is good for an additional seven (7) years from the date of manufacture. The letter "E" following the date indicates that the cylinder was visually inspected and is good for an additional five (5) years from the date of manufacture.



****Remember:** Cylinders that fail a pre-fill inspection (visual including the requalification date) should not be filled. The customer shall be informed, and the tank placed in a designated safe area to be returned to the manufacturer.

BEFORE YOU CONNECT-INSPECT!

Examples of damaged cylinders:



Anhydrous Ammonia Stain



Section 5

Dispensing Equipment & Safety

In order to dispense propane safely, you should be familiar with the equipment you are working with and how to use it. Dispensing equipment will vary by facility. Typically, you will find the following components:

- A lockable fenced enclosure and cabinet to secure the dispenser
 - This shall remain closed and locked to prevent the public from entering when not in use
- An ASME horizontally mounted tank
- Valves to control the flow of propane
- A propane pump driven by an explosion proof electric motor
- A metering system to measure the amount of liquid propane dispensed
- Transfer hose assembly
- Platform scale
 - These shall be inspected periodically and calibrated for accuracy
- Portable fire extinguisher
 - Shall comply with NFPA 10 (Standard for Portable Fire Extinguishers), and have a minimum capacity of 18lbs. of dry chemical
- Signage
 - “No Smoking” signs shall be posted

Again, propane is a fuel that is inherently safe as long as it is in a safe container and properly handled when transferring from one cylinder to another. The equipment used for this transfer are built and equipped for a safe operation. The New York State Fire Code, The Town of Islip Code, The National Fire Protection Association (NFPA) and Propane Industry publications all contain rules, standards and best operating procedures, that when followed, will greatly diminish the chance of an accident.



Good Housekeeping Practices

Good housekeeping is an important part of safety everywhere, especially when dealing with the dispensing of propane. NFPA 58, the Liquefied Petroleum Gas Code, establishes safeguards for all filling locations. Poor housekeeping can cause injuries and hide defects in dispensing equipment. A few of the important items an individual that dispenses propane should be mindful of include:

- Combustible materials shall not be allowed to accumulate within ten (10) feet of the dispensing cylinder and equipment.
- Keeping the dispensing area clear with the exception of objects necessary for operations.
- Any leaks shall be reported immediately.
- Proper storage of cylinders.
- Visual check of the of the portable fire extinguisher to make sure it is fully charged and readily accessible.

Report or correct any items discovered before operating any dispensing equipment.

Personal Protective Equipment

For your safety, personal protective equipment shall be used when transferring liquid propane. Freeze burns from contact with vaporizing propane can cause physical harm and be extremely painful. Propane-resistant gloves must be used when dispensing propane. Additionally, eye protection is also required. Propane should never be dispensed by any individual without the afforded protection of gloves and safety eyewear.



Section 6

Filling Operations

Once you are ready to fill a customer's cylinder, always make sure you are aware of the following items:

- Be sure you know what to do in case of an emergency.
- Do not allow unauthorized individuals inside the filling area.
- All sources of ignition shall be turned off while all operations are underway.
 - Internal combustion engines within fifteen (15) feet shall be turned off during dispensing operations.
 - Smoking, open flame, portable electric tools, and extension lights capable of igniting LP-gas shall not be permitted within twenty-five (25) feet of a point of transfer while filling operations are in progress.
 - Metal cutting, grinding, oxygen-fuel gas cutting, brazing, soldering or welding shall not be permitted within thirty-five (35) feet of a point of transfer while filling operations are in progress.
- You must be present for the entire filling procedure.
- Ensure that the customer will be transporting the filled container per the regulations stated in Section 7.

Filling Cylinders by Weight:

After ensuring that the area is safe to commence operations, don your required personal protective equipment (PPE). Complete your visual inspection of the cylinder, looking at the items described in Section 4. Verify that the cylinder is within the correct requalification date range also as described in Section 4.

When you fill by weight, start by making sure that the scale platform is clean. Be sure to check that the scale reads zero before beginning. If the scale does not balance and read zero, contact your supervisor.

Find the tare weight and the water capacity of the cylinder to be filled. These numbers are stamped on the cylinder collar or body. Use these numbers to determine the correct fill weight of the cylinder. This is the number that the scale shall be set to. The formula is:



Fill Weight=Tare Weight (TW)+42%Water Capacity (WC)+ hose/nozzle weight

For example, the cylinder that you have inspected and are ready to fill has a tare weight of 18, and a water capacity of 48. Using the formula above, take the water capacity and multiply by .42, and you will get 20.16, rounded to 20. Now you will add that number, 20, to the tare weight, which is 18, to get a total of 38. Typically, one (1) pound is added for the hose/nozzle weight. This will give you a total of 39. This is the number that the scale shall be set at. You can utilize charts and/or tables to help determine these figures, and they can be posted at the filling location.

Once you have determined the filling weight, the scale should be set to that weight. Place the cylinder on the scale and connect the filling hose end to the cylinder. Next, open the valve on the cylinder, start the pump and then open filling hose nozzle.

NEVER LEAVE A FILLING PROCESS UNATTENDED!

While the filling operation is ongoing, be sure to look for leaks using a commercial leak detection solution. If a leak is detected, stop the filling process immediately, and notify your supervisor.

Watch the scale closely, and when the scale balances, it has reached the desired weight. Immediately shut off the filling hose nozzle, the pump, and close the cylinder valve. Be sure to bleed off the filling hose/nozzle before disconnecting. Remove the filling hose end and check the cylinder weight, making sure that the cylinder has not been overfilled.

If the cylinder has been overfilled, the excess propane must be removed before the cylinder is returned to the customer. Follow your company's policies to safely remove the excess propane. **NEVER GIVE AND OVERFILLED OR LEAKING CYLINDER BACK TO A CUSTOMER!**

Re-install the cylinder valve cap or install a new one if it is missing or damaged. Affix the required labels if they are missing or no longer legible. The cylinder shall also be checked again for leaks before giving back to the customer.



AFTER CONTAINER FILLING OPERATION IS COMPLETED, OR ANY TIME THE FILLING STATION IS UNATTENDED, REMEMBER TO:

1. Ensure pump is off.
2. Close valves at storage tank.
3. Coil hose on rack inside fence or protected area.
4. Lock fence to protected area to secure against tampering.

Filling Cylinders by Volume:

Before filling cylinders by volume, first confirm that the cylinder is appropriate for filling by volume. Then, open and close the vent valve on the fixed maximum liquid level gauge to be sure vapor vents. If no vapor escapes, the valve may be blocked and must be reopened before the gauge will operate properly. Do not attempt to fill a cylinder by volume if the fixed maximum liquid level gauge is damaged or inoperable.

1. Make sure all cylinder valves are closed.
2. Select the proper hose end adapter to fit the filler valve or service valve.
3. Remove the protective cap or plug from the valve.
4. Connect to the cylinder.
5. Open the vent valve on the fixed maximum liquid level gauge. If mist appears when the gauge is open, stop! The cylinder is already full.
6. Start the pump.
7. If filling through a filler valve, slowly open the hose end valve. If filling through a service valve, open the hose end valve and then slowly open the cylinder service valve.
8. When a white mist begins to escape from the fixed maximum liquid level gauge, immediately close the hose end valve.
9. Close the vent valve on the fixed maximum liquid level gauge. Failure to shut off the propane promptly will result in an overfilled cylinder. An overfilled cylinder may discharge propane if the temperature rises, posing a risk of fire or personal injury to anyone nearby.



LPG Certificate of Fitness Study Guide

10. Shut off the pump if no other cylinders are to be filled.
11. Make sure the cylinder service valve is closed.
12. Loosen the connection and wait for any trapped liquid to bleed off.
13. When trapped liquid is vented, disconnect the hose end fitting.
14. Use an approved method to check for leaks.
15. Reinstall appropriate valve caps and plugs.
 - a. If the cylinder has a filler valve, reinstall the cap.
 - b. If the cylinder has a POL service valve, reinstall the valve plug.
 - c. Replace any caps and plugs that are missing.

AFTER CONTAINER FILLING OPERATION IS COMPLETED, OR ANY TIME THE FILLING STATION IS UNATTENDED, REMEMBER TO:

1. Ensure pump is off.
2. Close valves at storage tank.
3. Coil hose on rack inside fence or protected area.
4. Lock fence to protected area to secure against tampering.



Section 7

TRANSPORTATION OF CONTAINERS

Cylinders under 45 lbs. propane capacity may be transported in enclosed vehicles. The cylinder and its valves must be protected and determined to be leak free and securely fastened, with consumer warning and shipping labels attached.

If your customer is transporting a propane container in an enclosed vehicle (*Sedans, station wagons, SUV's, mis-size vehicles, etc.*), you should recommend that the vehicle be kept cool and ventilated, and that the cylinder be removed as soon as possible once returning home. If a hissing noise or odor of propane is noticed, the cylinder must be removed at once, taking special precautions to avoid all possible sources of ignition. The use of a milk crate or tank stabilizer is recommended to prevent the tank from tipping over during transportation. The tank can also be wedged between the front and rear seats to keep it stable. A propane cylinder can be transported in a vehicle's trunk area, but only in the upright position and only if it is secured to prevent tipping during transport.

By law, the largest amount (total pounds) of propane that may be transported at one time in an **enclosed vehicle** is 90 pounds aggregate; however, no single container can exceed 45 lbs. propane capacity. Additionally, no more than four (4) propane tanks are allowed in an enclosed vehicle.

Customers can also transport propane tanks in pick-up trucks or open trailer bed truck. Since the tanks that are being transported in these vehicles are in the open air, more propane is allowed per trip. The total amount of propane that can be transported in a pick-up trucks or open trailer bed trucks is 1,000 pounds. This includes the use of 100lb. propane tanks. The tanks shall be kept in the upright position at all times, and securely strapped to the truck.

Cylinders must be transported in a position where the pressure relief valve is in direct contact with the vapor space. With most cylinders, this is an upright (vertical) position, standing on the container foot ring. Some cylinders, however, are designed to "lie down" or be positioned horizontally.

If the pressure relief valve comes in contact with the liquid stored in the cylinder, a rise in tank pressure would cause the escape of propane liquid. The expansion of this



liquid released to the atmosphere (at a 270:1 ratio) could create an immediate safety hazard due to the large amount of propane present and the possibility of ignition.

During transport, those not in commerce (homeowners) are not subject to the Department of Transportation (DOT) regulations.

Small businesses can transport propane under the “Materials of Trade” exception, and not follow the DOT regulations when the total amount transported equals 440lbs. or less. Once that amount has been exceeded, the load becomes fully DOT regulated. This exception would only apply to businesses that use propane as an accessory use to the main business, and not to a propane filling/transportation business.

REMEMBER:

1. Containers shall not be transported inside vehicles where ignition sources (pilot lights, burners, etc.) are present.
2. Smoking should be prohibited when containers are transported in the space opened to the passenger area.
3. Containers shall be secured and transported only with the pressure relief valve in contact with the vapor space of the container; usually this is in an upright position.
4. A leaking container should never be placed inside a vehicle.
5. Cylinders shall not be transported without valve protection by use of cap, collar or other acceptable method.