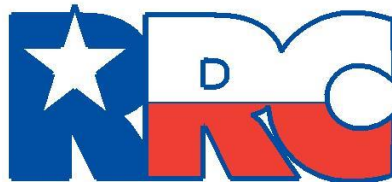


# **TEXAS LP-GAS EXAMINATION STUDY GUIDE**

**Bobtail Driver  
Employee Level**



**RAILROAD COMMISSION OF TEXAS**

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# LP-GAS EXAMINATION STUDY GUIDE

## EMPLOYEE-LEVEL

### Bobtail Driver

#### Who should use this guide?

You should use this guide if you plan to take the Railroad Commission's employee-level qualifying examination to operate a propane bobtail.

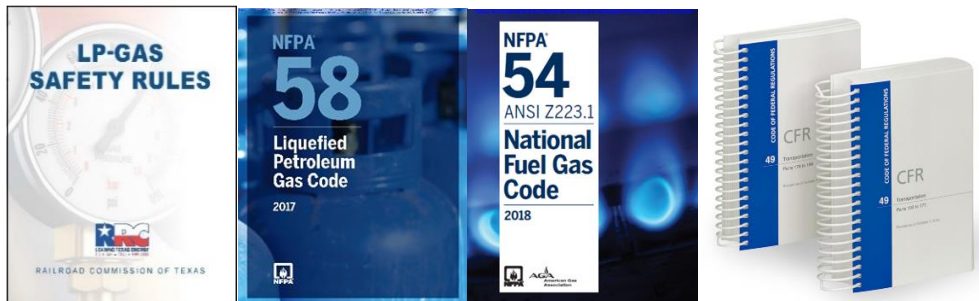
The guide may not be used during the examination.

The bobtail certification qualifies you to perform the following LP-gas activities:

- operate a bobtail;
- operate a transport unit;
- perform leak checks and pressure tests;
- light appliances;
- adjust regulators and thermocouples;
- inspect, requalify, fill, disconnect and connect DOT cylinders, including forklift cylinders;
- replace cylinder valves; and
- fill ASME motor fuel tanks or mobile fuel containers.

The bobtail certification does not qualify you to connect or disconnect containers, except when performing a pressure test or removing a container from service. To requalify cylinders, your employer must have a Requalifiers Identification Number (RIN) issued by the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration

#### What books do I need?



This examination tests your knowledge of the laws and standards that apply to bobtail operations in Texas. These laws and standards are found in four books:

*LP-Gas Safety Rules* (Texas Railroad Commission)

*NFPA 58 Liquefied Petroleum Gas Code* (National Fire Protection Association, 2017)

*NFPA 54 National Fuel Gas Code* (National Fire Protection Association 2018)

Title 49, Code of Federal Regulations (CFR) Supplement

## Where do I get these books?

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You may download the current edition of the Railroad Commission's *LP-Gas Safety Rules* in PDF format free online at [www.rrc.texas.gov](http://www.rrc.texas.gov). If you need printed copies, they may be purchased for \$10.00, tax included, by calling the Railroad Commission's publications office at (512) 463-7309.

You may also order NFPA manuals online at [www.nfpa.org](http://www.nfpa.org); click on "Codes and Standards."

The full current text of 49 CFR can also be viewed online. Go to <http://ecfr.gov> and select "Title 49—Transportation."

## Sections and Topics

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Before you take this examination, you should know the definitions found in this study guide and the contents of the sections of the codes and standards listed below. The actual examination questions may not cover all of the listed sections and topics.

## Terms and Definitions

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NOTE: The list below is not exhaustive. You are responsible for knowing all the terms and definitions that apply to the LP-gas activities you will perform, as well as the rules and standards highlighted in this guide.

NOTE: Informal terms that are sometimes used in the propane industry instead of formal technical terms are given in brackets.

### **Railroad Commission *LP-Gas Safety Rules***

NOTE: Section (§) 9.402(c) of the *LP-Gas Safety Rules* states, "The Commission does not adopt language in any NFPA rule, chart, figure, or table pertaining to any LP-gas container having a water capacity of one gallon (4.2 pounds LP-gas capacity) or less."

***Alternative Fuel Safety (AFS)***. The RRC department responsible for LP-Gas training and inspection.  
***LP-Gas Safety Rules, §9.2(1)***

***LP Gas Safety Rules***. The rules adopted by the Railroad Commission in the Texas Administrative Code, Title 16, Part 1, Chapter 9, including any NFPA or other documents adopted by reference. The official text of the Commission's rules is that which is on file with the Secretary of State's office and available at [www.sos.state.tx.us](http://www.sos.state.tx.us) or through the Commission's web site

***LP-Gas Safety Rules, §9.2(22)***

***Mobile fuel container***. An LP-gas container mounted on a vehicle to store LP-gas as the fuel supply to an auxiliary engine other than the engine to propel the vehicle or for other uses on the vehicle.

***LP-Gas Safety Rules, §9.2(25)***

**Motor fuel container.** An LP-gas container mounted on a vehicle to store LP-gas as the fuel supply to an engine used to propel the vehicle.

**LP-Gas Safety Rules, §9.2(27)**

**Rules examination.** The Commission’s written examination that measures an examinee’s working knowledge of Chapter 113 of the Texas Natural Resources Code and/or the current LP-Gas Safety Rules.

**LP-Gas Safety Rules, §9.2(41)**

## **NFPA 58 (2017)**

**ASME.** American Society of Mechanical Engineers.

**NFPA 58, §3.3.6**

**Container.** Any vessel, including cylinders, tanks, portable tanks, and cargo tanks, used for the transporting or storing of LP-Gases.

**NFPA 58, §3.3.14**

**Container Appurtenances.** Devices installed in container openings for safety, control, or operating purposes. [Examples include pressure-relief devices; shutoff valves, backflow check valves, excess-flow valves and internal valves; liquid level gauges; pressure gauges; and plugs].

**NFPA 58, §3.3.15**

**Fixed Maximum Liquid Level Gauge** [“bleeder valve,” “outage gauge,” “spitter valve,” “spew gauge”]. A fixed liquid level gauge that indicates the liquid level at which the container is filled to its maximum permitted filling limit.

**NFPA 58, §3.3.34.2**

**Flexible Connector.** A short [not exceeding 60 inches overall length] fixed piping system component that is fabricated from a flexible material and equipped with connections at both ends.

**Flexible Hose Connector.** A component fabricated from LP-Gas hose that is made from a material that is compatible with LP-Gas

**Flexible Metallic Connector.** A component fabricated from metallic material that provides liquid and vapor LP-Gas confinement and is provided with connections on both ends

**Maximum Allowable Working Pressure (MAWP).** The maximum pressure at which a pressure vessel is to operate as described by the ASME Boiler and Pressure Vessel Code

**NFPA 58, § 3.3.47**

**Leak Check.** An operation performed on a gas piping system to verify that the system does not leak.

**NFPA 58, § 3.3.42**

**Liquefied Petroleum Gas (LP-Gas).** Any material having a vapor pressure not exceeding that allowed for commercial propane that is composed predominantly of the following hydrocarbons, either by themselves (except propylene) or as mixtures: propane, propylene, butane (normal butane or isobutane), and butylenes.

**NFPA 58, §3.3.43**

**NFPA.** National Fire Protection Association.

**NFPA 58, §3.3.53**

**Overfilling Prevention Device** [“OPD,” “stop valve”]. A device that is designed to provide an automatic means to prevent the filling of a container beyond a predetermined level.

**NFPA 58, §3.3.55**

**Point of Transfer.** The location where connections and disconnections are made or where LP-Gas is vented to the atmosphere in the course of transfer operations.

**NFPA 58, §3.3.60**

**Portable Container.** A container designed to transport LP-Gas.

**NFPA 58, §3.3.61**

**Pressure Relief Device** [“popoff valve”]. A device designed to open to prevent a rise of internal pressure in excess of a specified value.

**NFPA 58, §3.3.65**

An operation performed to verify the gastight integrity of gas piping following its installation or modification.

**NFPA 58, §3.3.66**

**Sources of Ignition.** Devices or equipment that, because of their modes of use or operation, are capable of providing sufficient thermal energy to ignite flammable LP-Gas vapor–air mixtures when introduced into such a mixture or when such a mixture comes into contact with them, and that will permit propagation of flame away from them.

**NFPA 58, §3.3.78**

**Universal Cylinder.** A cylinder that can be connected for service in either the vertical or the horizontal position so that the fixed maximum liquid level gauge, pressure relief device, and filling and withdrawal appurtenances function properly in either position

**NFPA 58, §3.3.17.1**

**Volumetric Method Filling.** Filling a container to not more than the maximum permitted liquid volume.

**NFPA 58, §3.3.26.1**

**Water Capacity** [“WC”]. The amount of water at 60°F (16°C) required to fill a container.

**NFPA 58, §3.3.90**

## **Title 49, Code of Federal Regulations**

**Emergency Discharge Control:** means the ability to stop a cargo tank unloading operation in the event of an unintentional release.

**49 CFR §178.337-1(g)**

**Sample Question 1**

ASME is the acronym for

- A. The American Society of Mechanical Equipment
- B. The American Society of Mechanical Engineers
- C. The American Standards of Mechanical Engineering
- D. The Approved Standards of Mobile Equipment

*Answer on last page.*

**Key Topics**

NOTE: The list below is not exhaustive. You are responsible for knowing all the facts, rules, standards and procedures that apply to the LP-gas activities you will perform, as well as the rules and standards highlighted in this guide.

As you study the applicable codes and standards, pay special attention to the facts, rules and procedures related to the following key topics. When you take the examination, read each question very carefully.

**ADMINISTRATIVE RULES - GENERAL REQUIREMENTS****Company License**

No person may engage in any LP-gas activity until that person has obtained a license from the Commission authorizing the LP-gas activities.

*LP-Gas Safety Rules, §9.7(a)*

Licensees, registered manufacturers, company representatives, and operations supervisors at each outlet shall have copies of all current licenses and/or manufacturer registrations and certificates for employees at that location available for inspection during regular business hours.

*LP-Gas Safety Rules, §9.7(c)*

**Application for a New Certificate**

An applicant for a new certificate shall:

- (1) file with AFS a properly completed LPG Form 16 and the applicable nonrefundable rules examination fee specified in §9.10 of this title (relating to Rules Examination); pass the applicable rules examination with a score of at least 75%
- (2) pass the applicable rules examination with a score of at least 75%; and
- (3) complete any required training and/or AFT in §9.51 and §9.52 of this title.

*LP-Gas Safety Rules, §9.8(c)*

## **Certificate Renewal**

Certificate holders shall remit the nonrefundable \$35 annual certificate renewal fee to AFS on or before May 31 of each year. Individuals who hold more than one certificate shall pay only one annual renewal fee.

(1) Failure to pay the nonrefundable annual renewal fee by the deadline shall result in a lapsed certificate

(A) To renew a lapsed certification, the individual must pay the nonrefundable \$35 annual renewal fee plus a nonrefundable \$20 late-filing fee.

(B) If an individual's certificate lapses or expires, that individual shall immediately cease performance of any LP-gas activities authorized by the certificate.

(C) If an individual's certificate has been expired for more than two years from May 31 of the year in which the certificate lapsed, that individual shall comply with the requirements in §9.8 of this title (relating to Requirements and Application for a New Certificate) or §9.13 of this title.

***LP-Gas Safety Rules, §9.9(c)***

Continuing education. A certificate holder shall complete at least eight hours of continuing education every four years as specified in this subsection.

(1) Upon fulfillment of this requirement, the certificate holder's next continuing education deadline shall be four years after the May 31 following the date of the most recent class the certificate holder has completed, unless the course was completed on May 31, in which case the deadline shall be four years from that date.

***LP-Gas Safety Rules, §9.52(b)***

## **Rules Examination**

Failure of any exam shall immediately disqualify the individual from performing any LP-gas related activities covered by the exam which is failed, except for activities covered by a separate exam which the individual has passed.

***LP-Gas Safety Rules, §9.10(f)***

## **Trainees**

A licensee or ultimate consumer may employ an individual as a trainee for a period not to exceed 45 calendar days without that individual having successfully completed the rules examination

(1) The trainee shall be directly and individually supervised at all times by an individual who has successfully completed the Commission's rules examination for the areas of work being performed by the trainee.

***LP-Gas Safety Rules, §9.12***



## Qualified Personnel

Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes proper handling and emergency response procedures.

*NFPA 58, §4.4.1*

Refresher training shall be provided at least every 3 years.

*NFPA 58, §4.4.3*

Initial and subsequent refresher training shall be documented.

*NFPA 58, §4.4.4*

Transfer of LP-Gas to and from a container shall be accomplished only by qualified individuals trained in proper handling and operating procedures.

*NFPA 58, §7.2.2.1*

At least one qualified person shall remain in attendance at the transfer operation from the time connections are made until the transfer is completed, shutoff valves are closed, and lines are disconnected.

*NFPA 58, §7.2.1.2*

Public access to areas where LP-Gas is stored and transferred shall be prohibited except where necessary for the conduct of normal business activities.

*NFPA 58, §7.2.3.1*

## Vehicle Requirements

To register a unit previously unregistered in Texas, the operator of the unit shall:

- (A) pay to AFS the \$270 registration fee for each bobtail truck, semitrailer, container delivery unit, or other motor vehicle equipped with LP-gas cargo tanks;
- (B) file a properly completed LPG Form 7

*LP-Gas Safety Rules, §9.202(a)(1)*

When all registration or transfer requirements have been met, AFS shall issue LPG Form 4 which shall be properly affixed in accordance with the placement instructions on the form.

- (1) A person shall not operate an LP-gas transport unit or container delivery unit in Texas unless the LPG Form 4 has been properly affixed or unless its operation has been specifically approved by AFS.
- (2) A person shall not introduce LP-gas into a transport container unless that unit bears an LPG Form 4 or unless specifically approved by AFS.
- (6) If an LPG Form 4 decal on a unit currently registered with AFS is destroyed, lost, or damaged, the operator of that vehicle shall obtain a replacement decal by filing LPG Form 18B and a \$50 replacement fee with AFS.

*LP-Gas Safety Rules, §9.202(c)*

**Sample Question 2**

To pass a rules examination the applicant must score at least a \_\_\_\_\_%.

- A. 60
- B. 70
- C. 75
- D. 80

*Answer on last Page*

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**Regulations For Operating a Bobtail**

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**Driver Vehicle Inspection**

A motor vehicle shall not be operated in such a condition as to likely cause an accident or a breakdown of the vehicle.

**49-§396.7 (a)**

Report required. Every motor carrier shall require its drivers to report, and every driver shall prepare a report in writing at the completion of each day's work on each vehicle operated. The report shall cover at least the following parts and accessories:

- (i) Service brakes including trailer brake connections;
- (ii) Parking brake;
- (iii) Steering mechanism;
- (iv) Lighting devices and reflectors;
- (v) Tires;
- (vi) Horn;
- (vii) Windshield wipers;
- (viii) Rear vision mirrors;
- (ix) Coupling devices;
- (x) Wheels and rims;
- (xi) Emergency equipment.

**49-§396.11 (a)(1)**

No motor vehicle shall be operated on any tire that—

- (1) Has body ply or belt material exposed through the tread or sidewall,
- (2) Has any tread or sidewall separation,
- (3) Is flat or has an audible leak, or
- (4) Has a cut to the extent that the ply or belt material is exposed.

**49-§393.75 (a)**

Any tire on the front wheels of a bus, truck, or truck tractor shall have a tread groove pattern depth of at least 4/32 of an inch when measured at any point on a major tread groove. The measurements shall not be made where tie bars, humps, or fillets are located.

**49-§393.75 (b)**

Except as provided in paragraph (b) of this section, tires shall have a tread groove pattern depth of at least  $\frac{2}{32}$  of an inch when measured in a major tread groove. The measurement shall not be made where tie bars, humps or fillets are located

**49-§393.75 (c)**

Each cargo tank vehicle or tractor shall be provided with at least one portable fire extinguisher in accordance with Section 4.7 having a minimum capacity of 18 lb dry chemical.

**NFPA 58, §9.4.7.1**

Only electrical lighting shall be used with the vehicles covered by this chapter.

**NFPA 58, §9.2.1**

### **Vehicle Markings**

In addition to NFPA 58 §9.4.6.2, each LP-gas transport and container delivery unit in LP-gas service shall be marked on each side and the rear with the name of the licensee or the ultimate consumer operating the unit. Such lettering shall be legible and at least two inches in height and in sharp color contrast to the background. AFS shall determine whether the name marked on the unit is sufficient to properly identify the licensee or ultimate consumer operating the unit.

**LP-Gas Safety Rules, §9.211**

Every uninsulated cargo tank permanently attached to a cargo tank motor vehicle shall, unless covered with a jacket made of aluminum, stainless steel, or other bright nontarnishing metal, be painted a white, aluminum or similar reflecting color on the upper two-thirds of area of the cargo tank.

**49-§178.337-1(d)**

Each transport vehicle must be placarded on each side and each end of container.

**49-§172.504(a)**

Each cargo tank transporting a Class 2 material must be marked, in lettering no less than 2.0 inches, on each side and each end with an appropriate common name for the material (e.g., “LP-Gas Gas or Propane”).

**49-§172.328(b)**

### **Sample Question 3**

No motor vehicle shall be operated on any tire that \_\_\_\_\_.

- A. Isn't run flat
- B. Has white walls
- C. Is used
- D. Has tread separation
- E. All of the above

*Answer on last page*

### **Hoses and Flexible connectors**

Hose, hose connections, and flexible connectors must be fabricated of materials that are resistant to the action of LP-Gas both as liquid and vapor.

**NFPA 58, §5.11.6.1**

Flexible connectors used in the piping system to compensate for stresses and vibration shall be limited to 3 ft. in overall length and, when replaced, shall comply with 5.11.6.

***NFPA 58, §9.4.3.6***

Flexible hose connectors shall be permanently marked to indicate the date of installation of the flexible hose connector.

***NFPA 58, §9.4.3.7(1)***

The flexible hose portion of the connector shall be replaced within 10 years of the installation of the connector and visually inspected before the first delivery of each day.

***NFPA 58, §9.4.3.7(2)***

By July 1, 2000, the operator must assure that each delivery hose assembly is permanently marked with a unique identification number and maximum working pressure.

***49-§180.416(b)***

After each unloading, the operator must visually check that portion of the delivery hose assembly deployed during the unloading.

***49-§180.416(c)***

### **Discharge System Inspection**

(1) The operator must visually inspect each delivery hose assembly at least once each calendar month the delivery hose assembly is in service.

(2) The operator must visually inspect the piping system at least once each calendar month the cargo tank is in service. The inspection must include fusible elements and all components of the piping system, including bolts, connections, and seals.

(3) At least once each calendar month a cargo tank is in service, the operator must actuate all emergency discharge control devices designed to close the internal self-closing stop valve to assure that all linkages operate as designed.

(4) The operator of a cargo tank must check the internal self-closing stop valve in the liquid discharge opening for leakage through the valve at least once each calendar month the cargo tank is in service. On cargo tanks equipped with a meter, the meter creep test as outlined in appendix B to this part or a test providing equivalent accuracy is acceptable.

(5) The operator must note each inspection in a record. That record must include the inspection date, the name of the person performing the inspection, the hose assembly identification number, the manufacturer of the hose assembly, the date the hose was assembled and tested, and an indication that the delivery hose assembly and piping system passed or failed the tests and inspections. The operator must retain a copy of each test and inspection record at its principal place of business or where the vehicle is housed or maintained until the next test of the same type is successfully completed.

***49-§180.416(d)***

No operator may use a delivery hose assembly determined to have any condition identified below for unloading liquefied compressed gases. An operator may remove and replace damaged sections or correct defects discovered. Repaired hose assemblies may be placed back in service if retested successfully in accordance with paragraph (f) of this section.

- (i) Damage to the hose cover that exposes the reinforcement.
  - (ii) Wire braid reinforcement that has been kinked or flattened so as to permanently deform the wire braid.
  - (iii) Soft spots when not under pressure, bulging under pressure, or loose outer covering.
  - (iv) Damaged, slipping, or excessively worn hose couplings.
  - (v) Loose or missing bolts or fastenings on bolted hose coupling assemblies.
- 49-§180.416(g)(1)**

No operator may use a cargo tank with a piping system found to have any condition identified in this paragraph (g)(2) for unloading liquefied compressed gases.

- (i) Any external leak identifiable without the use of instruments.
  - (ii) Bolts that are loose, missing, or severely corroded.
  - (iii) Manual stop valves that will not actuate.
  - (iv) Rubber hose flexible connectors with any condition outlined in paragraph (g)(1) of this section.
  - (v) Stainless steel flexible connectors with damaged reinforcement braid.
  - (vi) Internal self-closing stop valves that fail to close or that permit leakage through the valve detectable without the use of instruments.
  - (vii) Pipes or joints that are severely corroded.
- 49-§180.416(g)(2)**

All LP-gas vehicles and vehicle containers, valves, dispensers, accessories, piping, transfer equipment, gas container, gas utilization equipment, and appliances shall be maintained in safe working order and in accordance with the manufacturer's instructions and the rules in this chapter.

**LP-Gas Safety Rules, §9.204**

### **Testing and Inspection**

Each transport container unit required to be registered with AFS shall be tested in accordance with 49 CFR 180.407, relating to requirements for test and inspection of specification cargo tanks. The tests shall be conducted by any individual authorized by the United States Department of Transportation.

**LP-Gas Safety Rules, §9.208**

Each cargo tank must have an external (V) visual inspection and leakage (K) test on a one-year interval.

**49-§180.407(c)**

The external visual inspection and testing must include as a minimum the following:

- (i) The tank shell and heads
  - (ii) The piping, valves, and gaskets
  - (iii) All devices for tightening manhole covers
  - (iv) All emergency devices and valves including self-closing stop valves, excess flow valves and remote closure devices. Must be functioned to demonstrate proper operation.
  - (v) Missing bolts, nuts and fusible links
  - (vi) All markings on the cargo tank required by parts 172, 178 and 180 must be legible;
  - (viii) All major appurtenances and structural attachments on the cargo tank
- 49-§180.407(d)(2)**

Each cargo tank successfully completing the test and inspection requirements contained in §180.407 must be marked as specified in this section.

**49-§180.415(a)**

Each cargo tank must be durably and legibly marked, in English, with the date (month and year) and the type of test or inspection performed, subject to the following provisions:

- (1) The date must be readily identifiable with the applicable test or inspection.
- (2) The markings must be in letters and numbers at least 1.25 inches high, near the specification plate or anywhere on the front head.

**49-§180.415(b)**

The type of test or inspection may be abbreviated as follows:

- (i) V for external visual inspection and test;
- (ii) I for internal visual inspection;
- (iii) P for pressure test;
- (iv) L for lining inspection;
- (v) T for thickness test; and
- (vi) K for leakage test

**49-§180.415(b)(3)**

### **Discharge System Control**

Each operator of a cargo tank motor vehicle that is subject to the emergency discharge control requirements must carry on or within the cargo tank motor vehicle written emergency discharge control procedures for all delivery operations.

The procedures must describe the cargo tank motor vehicle's emergency discharge control features and, for a passive shut-down capability, the parameters within which they are designed to function.

**49-§177.840(I)**

If there is an unintentional release of product to the environment during unloading of a liquefied compressed gas, the qualified person unloading the cargo tank motor vehicle must promptly shut the internal self-closing stop valve or other primary means of closure and shut down all motive and auxiliary power equipment.

**49-§177.840(n)**

An operator must successfully test the activation device within 18 hours prior to the first delivery of each day. For a wireless transmitter/receiver, the person conducting the test must be at least 150 feet from the cargo tank and may have the cargo tank in his line of sight.

**49-§177.840(o)**

For a cargo tank motor vehicle with an off-truck remote control shut-off capability, the qualified person attending the unloading operation must be in possession of the activation device at all times during the unloading process.

**49-§177.840(s)**

A cargo tank motor vehicle must have an off-truck remote means to close the internal self-closing stop valve and shut off all motive and auxiliary power equipment upon activation by a qualified person attending the unloading of the cargo tank motor vehicle (off-truck remote shut-off). It must function reliably at a distance of 150 feet.

**49-§173.315(n)(3)**

#### Sample Question 4

Each cargo tank with successful inspection must be marked with the \_\_\_\_.

- A. Date (Month and Year)
- B. Date (Month, Day, and Year)
- C. Date (Year only)
- D. Name of the Inspector

*Answer on last page.*

### Shipping Papers

A driver of a motor vehicle containing hazardous material, and each carrier using such a vehicle, shall ensure that the shipping paper required by this section is readily available to, and recognizable by, authorities in the event of accident or inspection. Specifically, the driver and the carrier shall:

- (1) Clearly distinguish the shipping paper, if it is carried with other shipping papers or other papers of any kind, by either distinctively tabbing it or by having it appear first; and
- (2) Store the shipping paper as follows:

When the driver is at the vehicle's controls, the shipping paper shall be:

- (A) Within his immediate reach while he is restrained by the lap belt; and
- (B) either readily visible to a person entering the driver's compartment or in a holder which is mounted to the inside of the door on the driver's side of the vehicle.

**49-§177.817(e)**

When the driver is not at the vehicle's controls, the shipping paper shall be:

- (A) In a holder which is mounted to the inside of the door on the driver's side of the vehicle; or
- (B) on the driver's seat in the vehicle.

**49-§177.817(e)(2)(ii)**

### Operation of Transfer Systems

Sources of ignition shall be turned off during transfer operations, while connections or disconnections are made, or while LP-Gas is being vented to the atmosphere.

**NFPA 58, §7.2.3.2**

Internal combustion engines within 15 ft of a point of transfer shall be shut down while such transfer operations are in progress,

**NFPA 58, §7.2.3.2(A)**

Smoking, open flame, portable electrical tools, and extension lights capable of igniting LP-Gas shall not be permitted within 25 ft of a point of transfer while filling operations are in progress.

**NFPA 58, §7.2.3.2(B)**

Cargo tank vehicles unloading into storage containers shall be at least 10 ft. from the container and so positioned that the shutoff valves on both the truck and the container are readily accessible.

*NFPA 58, §7.2.3.3*

### **Odorization**

All LP-Gases shall be odorized prior to being loaded into a railcar or cargo tank motor vehicle by the addition of a warning agent of such character that the gases are detectable by a distinct odor to a concentration in air of not over one-fifth the lower limit of flammability.

*NFPA 58, §4.2.1*

The addition of the odorant shall be documented at the point of odorization.

*NFPA 58, §4.2.2*

The presence of the odorant shall be verified by sniff-testing or other means and the results documented prior to final delivery to the end-use customer.

*NFPA 58, §4.2.3*

### **Loading the Cargo Tank**

loading of a liquefied gas into a cargo tank or portable tank shall be determined by weight or by a suitable liquid level gauging device.

*49-§173.315(c)*

If a cargo tank is to be loaded using a fixed maximum liquid indicator. It shall be arranged to function at a level not to exceed the maximum permitted volume. Loading shall be stopped when the device functions.

*49-§173.315(f)*

Additional gauging devices may be installed but may not be used as primary controls for filling of cargo tanks.

*49-§173.315(h)*

### **Unloading the Cargo Tank**

For a cargo tank with a capacity of 3,500 water gallons or less, the qualified person attending the unloading operation must remain within 150 ft. of the cargo tank and within 25 ft. of the delivery hose and must observe both the cargo tank and receiving container at least once every 5 minutes the internal self-closing stop valve is open during unloading operations that take more than five minutes to complete.

*49-§177.840(p)(1)*



**Bulk Plant**

all new stationary LP-gas installations with individual or aggregate water capacities of 4,001 gallons or more shall:

- (1) install a vertical bulkhead
- (2) install one of the following in all container openings 1 1/4 inches or greater
  - (A) pneumatically-operated emergency shutoff valves (ESV);
  - (B) pneumatically-operated internal valves;
  - (C) pneumatically-operated API 607 ball valves; or
  - (D) a backflow check valve may be installed where the flow is in one direction into the container

***LP-Gas Safety Rules, §9.143(a)***

**Transportation in Cargo Tank Vehicles**

A person may not drive a cargo tank motor vehicle containing a hazardous material regardless of quantity unless:

- (1) All manhole closures are closed and secured; and
- (2) All valves and other closures in liquid discharge systems are closed and free of leaks, except external emergency self-closing valves on MC 338 cargo tanks containing the residue of cryogenic liquids may remain either open or closed during transit.

***49-§177.834(j)***

Main shutoff valves on a container for liquid and vapor shall be readily accessible without the use of tools, or other equipment shall be provided to shut off the container valves.

***NFPA 58, §11.8.4.3***

Each liquid discharge valve on a cargo tank motor vehicle, other than an engine fuel line valve, must be closed during transportation except during loading and unloading.

***49-§177.840(g)***

Any unit registered with the Commission shall utilize a wheel stop, in addition to the parking or hand brake, whenever the unit is loading, unloading, or parked, to prevent the unit from unintended movement.

***NFPA 58, §9.4.8;(with changes per LP-Gas Safety Rules 9.403)***

**Parking Vehicles**

Vehicles shall not be left unattended on any street, highway, avenue, or alley, except for necessary absences from the vehicle associated with drivers' normal duties, including stops for meals and rest stops during the day or night, except as follows:

- (1) This requirement shall not apply in an emergency.
- (2) This requirement shall not apply to vehicles parked in accordance with 9.7.2.3 and 9.7.2.4.

***NFPA 58, §9.7.2.1***

Vehicles shall not be parked in congested areas.

***NFPA 58, §9.7.2.2***

Where vehicles are parked off the street in uncongested areas, they shall be at least 50 ft from any building used for assembly, institutional, or multiple residential occupancy.

***NFPA 58, §9.7.2.3***

Where vehicles carrying portable containers or cargo tank vehicles of 3500 gal water capacity or less are parked on streets adjacent to the driver's residence in uncongested residential areas, the parking locations shall be at least 50 ft from a building used for assembly, institutional, or multiple residential occupancy.

Where vehicles carrying portable containers or cargo tank vehicles of 3500 gal water capacity or less are parked on streets adjacent to the driver's residence in uncongested residential areas, the parking locations shall be at least 50 ft from a building used for assembly, institutional, or multiple residential occupancy.

*NFPA 58, §9.7.2.4*

**Sample Question 5**

Loading of a liquefied gas into a cargo tank or portable tank shall be determined by \_\_\_\_\_.

- A. Weight
- B. Float Gauge
- C. Fixed maximum liquid Indicator
- D. All of the above
- E. Both A and C

*Answer on last page*

## **LP-Gas System Installation**

### **Container Installation**

Table 6.4.1.1 Separation Distances Between Containers, Important Buildings, and Line of Adjoining Property That Can Be Built Upon

Water Capacity per Container		Minimum Distances					
		Mounded or Underground Containers <sup>a</sup>		Aboveground Containers		Between Containers <sup>b</sup>	
		ft	m	ft	m	ft	m
gal	m <sup>3</sup>						
<125 <sup>c</sup>	<0.5 <sup>c</sup>	10	3	0 <sup>d</sup>	0 <sup>d</sup>	0	0
125–250	0.5–1.0	10	3	10	3	0	0
251–500	>1.0–1.9	10	3	10	3	3	1
501–2,000	>1.9–7.6	10	3	25 <sup>c</sup>	7.6	3	1
2,001–30,000	>7.6–114	50	15	50	15	5	1.5
30,001–70,000	>114–265	50	15	75	23		
70,001–90,000	>265–341	50	15	100	30		
90,001–120,000	>341–454	50	15	125	38		
120,001–200,000	>454–757	50	15	200	61		
200,001–1,000,000	>757–3,785	50	15	300	91		
>1,000,000	>3,785	50	15	400	122		

A pressure relief device installed on an ASME container with a water capacity of 125 gallons or more used in stationary service must be vented upward away from the container and to the open air.

**NFPA 58, §6.9.2.3(1)**

The distance measured horizontally from the point of discharge of a container pressure relief valve to any building opening below the level of such discharge shall be in accordance with Table 6.4.4.3.

**NFPA 58, §6.4.4.3**

**Table 6.4.4.3 Separation Distance Between Container Pressure Relief Valve and Building Openings**

Container Type	Exchange or Filled on Site at Point of Use	Distance Horizontally from Relief Valve Discharge to Opening Below Discharge		Discharge from Relief Valve, Vent Discharge, and Filling Connection to Exterior Source of Ignition, Openings into Direct-Vent Appliances, and Mechanical Ventilation Air Intakes	
		ft	m	ft	m
Cylinder	Exchange	3	0.9	5	1.5
Cylinder	Filled on site at the point of use	3	0.9	10	3.0
ASME	Filled on site at the point of use	5	1.5	10	3.0

ASME containers for underground installation including interchangeable aboveground–underground container assemblies, shall be installed:

- (A) 6 inches below grade where no vehicle traffic is expected
- (B) 18 inches below grade where vehicle traffic is expected.

**NFPA 58, §6.8.6.1**

Combustible materials shall not accumulate or be stored within 10 ft. of a container.

**NFPA 58, §6.5.3.3**

The minimum horizontal separation between aboveground LP-Gas containers and aboveground tanks containing liquids having flash points below 200°F shall be 20 ft

**NFPA 58, §6.5.3.6**

An aboveground LP-Gas container shall not be located within 6 ft. of a vertical plane beneath overhead electric power lines that are over 600 volts.

**NFPA 58, §6.5.3.13**

**Container Name Plate**

LP-gas shall not be introduced into an ASME container unless the container is equipped with an original nameplate or at least one of the nameplates defined in this subsection permanently attached to the container.

**LP-Gas Safety Rules, §9.129(a)**

Nameplates on stationary ASME containers built prior to September 1, 1984, shall include at least the following legible information:

- (1) the name of container manufacturer;
- (2) the manufacturer's serial number;
- (3) the container's working pressure;
- (4) the container's water capacity; and
- (5) the ASME Code symbol

***LP-Gas Safety Rules, §9.129(d)***

### **Corrosion Protection System**

In addition to requirements in NFPA 58 steel containers and steel piping systems installed underground, partially underground, or as mounded installations on or after March 1, 2014, shall include a corrosion protection system.

***LP-Gas Safety Rules, §9.116(a)***

### **Piping System**

Polyethylene and polyamide pipe, tubing, and fittings shall be installed outdoors underground only.

***NFPA 58, §6.9.4.1***

Polyethylene piping systems shall be limited to the following:

- (1) Vapor service not exceeding 30 psig
- (2) Installation outdoors and underground.

***NFPA 58, §6.11.1.1(C)***

Aboveground piping shall be supported and protected against physical damage by vehicles.

***NFPA 58, §6.11.3.10***

The portion of aboveground piping in contact with a support or a corrosion-causing substance shall be protected against corrosion.

***NFPA 58, §6.11.3.11***

Buried metallic pipe and tubing shall be installed underground with a minimum 12 in. of cover.

(A) The minimum cover shall be increased to 18 in. If external damage to the pipe or tubing from external forces is likely to result.

(B) If a minimum 12 in. of cover cannot be maintained, the piping shall be installed in conduit or shall be bridged (shielded).

***NFPA 58, §6.11.3.12***

Assembled anodeless risers shall be used to terminate underground polyamide and polyethylene piping systems above ground

***NFPA 58, §6.11.4.3***

Flexible metallic connectors shall not exceed 5 ft in overall length when used with liquid or vapor piping on stationary containers of 2000 gal water capacity or less.

***NFPA 58, §6.11.6.3***

**Sample Question 6**

Which of the following is not required on an ASME nameplate for a container built prior to September 1, 1984?

- A. Propane Capacity
- B. Serial number
- C. Working pressure
- D. Water Capacity

*Answer on last page*

**Pressure Regulators**

A two-stage regulator system, an integral two-stage regulator, or a 2 psi regulator system shall be required on all fixed piping systems that serve 1/2 psig appliance systems [normally operated at 11 in. water column].

***NFPA 58, §6.10.2.1***

Single-stage regulators shall not be installed in fixed piping systems on or after February 1, 2001

***NFPA 58, §6.10.2.3;(with changes per LP-Gas Safety Rules 9.403)***

The point of discharge from the required pressure relief device on regulated equipment installed outside of buildings or occupiable structures in fixed piping systems shall be located not less than 3 ft horizontally away from any building or occupiable structure opening below the level of discharge, and not beneath or inside any building or occupiable structure unless this space is not enclosed for more than 50 percent of its perimeter.

***NFPA 58, §6.10.1.5***

The point of discharge shall also be located not less than 5 ft in any direction from any source of ignition, openings into direct-vent (sealed combustion system) appliances, or mechanical ventilation air intakes.

***NFPA 58, §6.10.1.6***

The discharge of the regulator vent shall be above the highest probable water level.

***NFPA 58, §6.8.6.1(H)***

**Pressure Test**

The test medium shall be air, nitrogen, carbon dioxide, or an inert gas. Oxygen shall not be used as a test medium.

***NFPA 54, §8.1.2***

Test pressure shall be measured with a manometer or with a pressure measuring device designed and calibrated to read, record, or indicate a pressure loss due to leakage during the pressure test period. The source of pressure shall be isolated before the pressure tests are made. Mechanical gauges used to measure test pressures shall have a range such that the highest end of the scale is not greater than 5 times the test pressure.

***NFPA 54, §8.1.4.1***

**Leak Check**

The leakage shall be located by means of an approved gas detector, a noncorrosive leak detection fluid, or other approved leak detection methods.

***NFPA 54, §8.1.5.2***

During the process of turning gas on into a system of new gas piping, the entire system shall be inspected to determine that there are no open fittings or ends and that all valves at unused outlets are closed and plugged or capped.

***NFPA 54, §8.2.2***

Immediately after the gas is turned on into a new system or into a system that has been initially restored after an interruption of service, the piping system shall be checked for leakage. Where leakage is indicated, the gas supply shall be shut off until the necessary repairs have been made.

***NFPA 54, §8.2.3***

Appliances and equipment shall not be placed in operation until after the piping system has been checked for leakage in accordance with 8.2.3, the piping system is purged in accordance with Section 8.3, and connections to the appliance are checked for leakage.

***NFPA 54, §8.2.4***

Each school district must provide the supplier with a copy of the most current LPG Form 30 as proof the system has been tested.

***LP-Gas Safety Rules, §9.41(b)(2)***

School Leakage test requirements.

(1) The results of the leakage test for each building or structure shall be immediately documented on LPG Form 30.

(2) LP-gas shall be used as the test medium.

(3) Leakage test pressure shall not exceed normal operating pressure.

Leakage test duration shall not be less than 30 minutes.

***LP-Gas Safety Rules, §9.41(c)***

**Placing Appliances in Operation**

Where a safety shutoff device is provided, it shall be checked for proper operation and adjustment in accordance with the appliance manufacturer's instructions. Where the device does not function properly to turn off the gas supply in the event of pilot outage or other improper operation, it shall be properly serviced or replaced with a new device.

***NFPA 54, §11.3***

Draft hood-equipped appliances shall be checked to verify that there is no draft hood spillage after 5 minutes of main burner operation

***NFPA 54, §11.6***

Operating instructions shall be furnished and shall be left in a prominent position near the appliance for the use of the consumer.

***NFPA 54, §11.7***

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## **DOT CYLINDER - GENERAL REQUIREMENTS**

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### **Cylinder Inspection**

Containers shall be designed, fabricated, tested, and marked (or stamped) in accordance with the regulations of the U.S. Department of Transportation (DOT 49 CFR); Federal Aviation Administration (FAA 14 CFR); the ASME Code, Section VIII, "Rules for the Construction of Unfired Pressure Vessels".  
*NFPA 58, §5.2.1.1*

#### **Sample Question 7**

Test pressure shall be measured with a \_\_\_\_\_ or with a pressure measuring device designed and calibrated to read, record, or indicate a pressure loss.

- A. Relief valve
- B. Regulator
- C. Manometer
- D. Fixed liquid level gauge

*Answer on last page*

Containers that show excessive denting, bulging, gouging, or corrosion shall be removed from service.

*NFPA 58, §5.2.1.4*

A cylinder with an expired requalification date shall not be refilled until it is requalified by the methods prescribed in DOT regulations.

*NFPA 58, §5.2.2.3*

Cylinders shall be designed and constructed for at least a 240 psig service pressure.

*NFPA 58, §5.2.4.6*

### **Universal Cylinders**

Cylinders shall be designed, constructed, or fitted for installation and filling in either the vertical or horizontal position or, if the cylinder is a universal cylinder, in either position.

*NFPA 58, §11.13.2.1*

Universal cylinders intended for use in the horizontal position shall be installed with the positioning slot correctly positioned prior to use or filling.

*NFPA 58, §11.13.2.2*

The fixed maximum liquid level gauge shall indicate the maximum permitted filling level in either position.

*NFPA 58, §11.13.2.3*

The cylinder pressure relief valve discharge shall be directed upward within 45 degrees of vertical and shall not impinge on the cylinder, the exhaust system, or any other part of the industrial truck.

***NFPA 58, §11.12.2.6***

### **Filling Cylinders**

Before filling a cylinder, the individual shall conduct a visual inspection of the exposed, readily accessible areas of the cylinder for any obvious defects. Where the cylinder is dented, bulged, gouged or corroded such that the integrity of the cylinder is substantially reduced, it shall not be filled.

***LP-Gas Safety Rules, §9.137***

A cylinder with an expired requalification date shall not be refilled until it is requalified by the methods prescribed in DOT regulations.

***NFPA 58, §5.2.2.3***

Single-opening DOT containers of less than 101 pounds LP-gas capacity, shall be filled by weight only. The weight of such containers shall be determined by scales that meet the specifications of NIST Handbook 44. Scales at licensees' facilities shall be currently registered with the Texas Department of Agriculture. The scales shall have a rated weighing capacity which exceeds the total weight of the cylinders being filled. The scales shall be accurate during the filling of the cylinder.

***LP-Gas Safety Rules, §9.136(a)***

The propane capacity in pounds is determined by multiplying the total water capacity in pounds by .42.

***LP-Gas Safety Rules, §9.136(a)(1)***

The formula for filling LP-gas containers by weight under this section is as follows:

The proper scale setting is the total of

1. The Tare weight of the Cylinder
2. The propane capacity in pounds
3. The weight of the hose and nozzle

***LP-Gas Safety Rules, §9.136(a)(2)***

Containers designed to be used on forklifts or industrial trucks shall be filled as specified in NFPA 58, §11.13.

***LP-Gas Safety Rules, §9.136(b)***

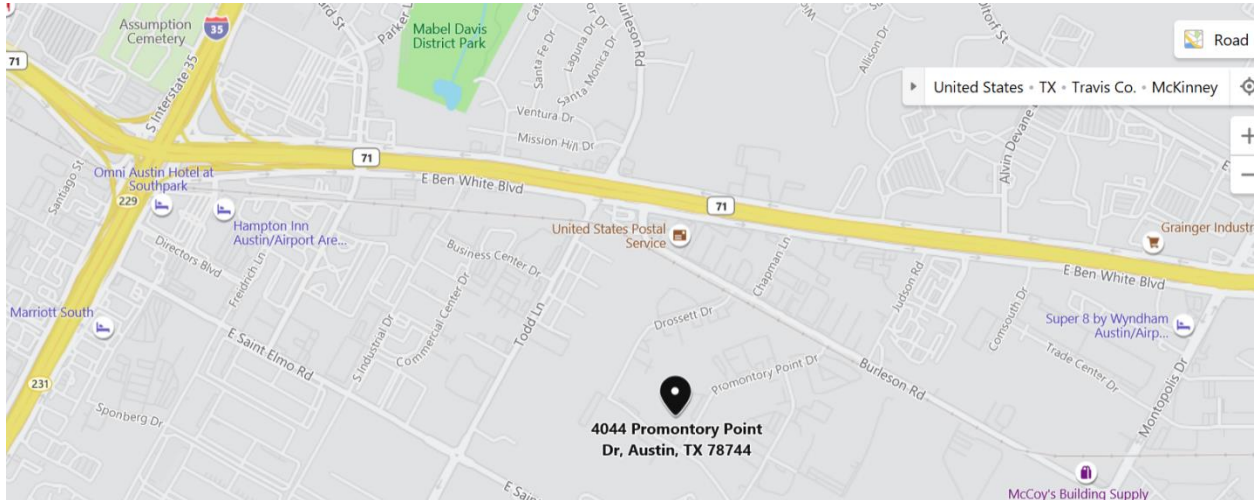
A licensee or the licensee's employees shall not introduce LP-Gas into any container or cylinder if the licensee or employee have knowledge or reason to believe that such container, cylinder, piping or the system or the appliance to which it is attached is unsafe or is not installed in accordance with the statutes or the rules in this chapter

***LP-Gas Safety Rules, §9.135***



# ALTERNATIVE FUELS TRAINING CENTER

## 4044 Promontory Point Austin Texas 78744



Sample Question Answers

1. B
2. C
3. D
4. A
5. E
6. A
7. C