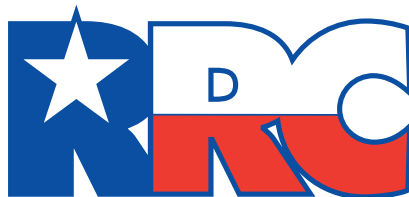


# **TEXAS LP-GAS EXAMINATION STUDY GUIDE**

**Bobtail Driver  
Employee Level**



**RAILROAD COMMISSION OF TEXAS**

September 2012

## **NOTICE**

This publication is intended for use in its entirety as a guide for persons preparing to take Railroad Commission LP-gas qualifying examinations. Any other use or distribution of this publication or use or distribution of any portion of this publication for any purpose whatsoever is considered by the Railroad Commission of Texas to be misuse of this publication.

This publication is not intended to be an exhaustive treatment of the subjects covered and should not be interpreted as precluding the use of other safety programs or procedures that comply with (1) applicable federal, state, and/or local code provisions, statutes, ordinances, and/or other regulations, including, but not limited to, the Railroad Commission of Texas *LP-Gas Safety Rules* and codes adopted by the Railroad Commission of Texas, and/or (2) other industry standards and/or practices.

Every effort was made to ensure that this publication was accurate and up-to-date as of the date of publication. The reader is cautioned, however, about reliance on this publication or any portion thereof at any time thereafter, particularly because changes in technology are likely to occur that might make portions of this publication inaccurate and out-of-date. The Railroad Commission of Texas assumes no liability, under any circumstances, for any actions taken or omissions made in reliance of the contents of this publication, from whatever source, or any other consequences of any such reliance.

All rights reserved. No part of this publication may be reproduced or transmitted in any form without written permission from the Railroad Commission of Texas.

---

## Exam administration

---

### Taking an examination in Austin

You may take any LP-gas qualifying examination in Austin without pre-registering (“walk-in”) on any business day, excluding holidays, from 8:00 a.m. to 12:00 noon at the AFRED Training Center. The Training Center is located at 6506 Bolm Road, at the intersection of U.S. Highway 183.

Tuesdays and Thursdays are the preferred days for walk-in examinations.

(See map to Training Center on page 23)

### Taking an examination outside of Austin

You may also take any Railroad Commission qualifying examination at more than two dozen other locations statewide. Exam dates, times and locations are listed three months in advance on the Commission’s web site. To view a complete schedule, go to [www.rrc.state.tx.us](http://www.rrc.state.tx.us). From the drop-down menu under “Education and Training,” choose “Training Classes & Qualifying Exams” and click on “Class/Exam Schedule.” The online schedule has links to maps showing each class and exam location.

You must register at least two business days in advance to take an examination outside of Austin. To register online, go to [www.rrc.state.tx.us](http://www.rrc.state.tx.us). From the drop-down menu under “Education and Training,” choose “Training Classes & Qualifying Exams” and click on “Register Now.” The web site allows you to register up to four people for an examination.

When you register online, you will receive a return e-mail confirming the registration and the dates and locations of the exams. Registering online also ensures that you will receive advance notification of any changes in the examination date, time or location.

### Payment for exams; LPG Form 16; ID required

The fee is \$40.00 for each employee-level exam and \$70.00 for each management-level exam. Fees are non-refundable by state law, and cash cannot be accepted.

You may pay the required examination fee at any exam location by check or money order payable to the Railroad Commission of Texas. LPG Form 16, “Application for Examination,” may also be completed at the examination site. Examinees must also present an official state-issued driver’s license or photo ID at the exam site.

You may also pay your examination fee by credit card in advance online. To pay by credit card, go to [www.rrc.state.tx.us](http://www.rrc.state.tx.us). From the drop-down menu under “Education and Training,” choose “Training Classes & Qualifying Exams” and click on “Pay Online.” Be sure to print out the confirmation page in Step 6. Make a copy of the confirmation page for your records and bring a copy with you to the examination site.

### Open-book examinations

All Railroad Commission LP-gas employee-level qualifying examinations are open book.

Examinees may use a copy of NFPA 54, 2006 edition; NFPA 58, 2008 edition; the Railroad Commission’s *LP-Gas Safety Rules*, the 49 CFR Supplement for Bobtail Drivers, or a Railroad Commission Texas Propane Training 2.3 course manual to take their bobtail driver examination. The course manual does not cover every topic included on the bobtail driver examination. The questions on the employee-level bobtail driver examination are not organized by topic as they are in this study guide.

### **Examination time limit**

The employee-level bobtail driver examination must be completed within three hours after the examination is given to you, including any breaks you elect to take. The examination proctor is the official timekeeper. You must submit your examination and your answer sheet to the proctor within the three-hour limit.

### **Grades, reports and retakes**

The minimum passing grade is 75 percent on all LP-gas examinations.

All examinations administered at the Training Center in Austin are graded on-site, and examinees are immediately informed of the results. If you fail an examination that you took in Austin, you may retake that same examination only one additional time during a business day. Any subsequent examination must be taken on another business day, unless approved by the Commission.

Exams taken at a remote site are graded as soon as possible and the results of the examination are reported within 10 working days.

If you pass an examination, the Railroad Commission will issue you a blue certification card within 10 working days. You will be notified by letter if you fail an examination.

### **Required first-year training class**

Certified bobtail drivers are subject to Railroad Commission training and continuing-education requirements. To maintain your certification, you must complete one of the following Railroad Commission eight-hour courses by the next May 31 after you pass your initial examination. (NOTE: If you pass the examination between March 1 and May 31, you have until May 31 the next year to complete the required class.)

- 1.1 Introduction to Propane
- 2.3 Bobtail Operations [preferred]
- 3.11 Residential System Inspection

### **Contacts**

---

#### **Alternative Fuels Research and Education (AFRED)**

Rayfield Hearne, Certification Manager	(512) 463-6845	<a href="mailto:rayfield.hearne@rrc.state.tx.us">rayfield.hearne@rrc.state.tx.us</a>
Amber Flaherty, Examination Coordinator	(512) 463-6933	<a href="mailto:amber.flaherty@rrc.state.tx.us">amber.flaherty@rrc.state.tx.us</a>
Carol Goodman, Training Coordinator	(512) 463-2682	<a href="mailto:carol.goodman@rrc.state.tx.us">carol.goodman@rrc.state.tx.us</a>

#### **LP-Gas Operations**

April Dawn Richardson, LP-Gas Safety	(512) 463-6935	<a href="mailto:april.richardson@rrc.state.tx.us">april.richardson@rrc.state.tx.us</a>
--------------------------------------	----------------	--

# 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?

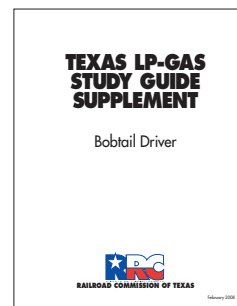
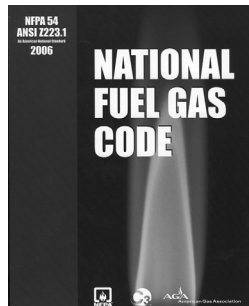
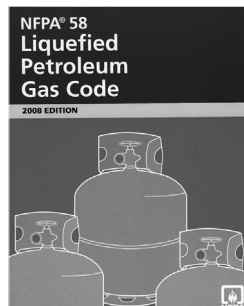
This examination tests your knowledge of the laws and standards that apply to bobtail operations in Texas. These laws and standards are found in four books:

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

NFPA 58: *Liquefied Petroleum Gas Code* (National Fire Protection Association, 2008)

NFPA 54: *National Fuel Gas Code* (National Fire Protection Association, 2006)

Title 49, *Code of Federal Regulations* (CFR) Supplement



## Where do I get these books?

---

You may download the current edition of the Railroad Commission's *LP-Gas Safety Rules* free online at [www.propane.tx.gov](http://www.propane.tx.gov). Click on "Training and Examinations," select "Examinations and Certification" from the drop-down menu, and scroll down to "LPG Safety Rules (PDF)." You may also buy a printed copy of the book for \$10.00, tax included, by calling the Railroad Commission's publications office at (512) 463-6747.

Printed copies of NFPA 58 are available for purchase from the Texas Propane Gas Association by calling (800) 392-0023. You may also order NFPA manuals online at [www.nfpa.org](http://www.nfpa.org); click on "Codes and Standards."

Key parts of 49 CFR are available free online from the Railroad Commission in *Texas LP-Gas Study Guide Supplement: LP-Gas Transport Driver*. Go to [www.propane.tx.gov](http://www.propane.tx.gov), click on "Training and Examinations," select "Study Guides (LPG, CNG and LNG)," and scroll down to "CFR Supplement (PDF)." The full current text of 49 CFR can also be viewed online. Go to <http://ecfr.gpoaccess.gov> and select "Title 49—Transportation."

## Sections and topics

---

Before you take this examination you should know the definitions on pages 8 and 9 of this study guide and the contents of the sections of the codes and standards listed below.

NOTE: Section (§) 9.402(c) of the LP-Gas Safety Rules states, "Container capacity, piping system, and appliance exceptions. 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, or to any LP-gas piping system or appliance attached or connected to such a container."

The actual examination may not cover all of the listed sections and topics.

### Railroad Commission LP-Gas Safety Rules

Unless otherwise stated, a transport is defined in §9.2(52) as "Any bobtail or semitrailer equipped with one or more containers."

§9.129	Manufacturer's Nameplate and Markings on ASME Containers
§9.134	Connecting Container to Piping
§9.135	Unsafe or Unapproved Containers, Cylinders, or Piping
§9.136	Filling of DOT Containers
§9.137	Inspection of Containers at Each Filling
§9.140	Uniform Protection Standards
§9.141	Uniform Safety Requirements
§9.201	Applicability
§9.211	Markings

- §9.402 Clarification of Certain Terms Used in NFPA 58
- §9.403 Sections in NFPA 58 Not Adopted by Reference, and Adopted with Changes or Additional Requirements: 5.2.8.4, 5.7.3.1, 5.7.4.1, 6.6.21, 6.8.2, and 6.6.3.1

**NFPA 54 (2006)**

- §3.3 General Definitions
- §5.6 Acceptable Piping Materials and Joining Methods
- §8.1 Pressure Testing and Inspection
- §8.2 Piping System, Appliance, and Equipment Leakage Check

**NFPA 58 (2008)**

- §3.3 General Definitions
- §5.2 Containers
- §5.7 Container Appurtenances and Regulations
- §5.8 Regulators and Regulator Vents
- §5.9 Piping (Including Hose), Fittings, and Valves
- §6.3 Container Separation Distance
- §6.4 Other Container Location Requirements
- §6.6 Installation of Containers
- §6.7 Installation of Container Appurtenances
- §6.8 Regulators
- §6.9 Piping Systems
- §6.23 LP-Gas Systems on Vehicles (Other Than Engine Fuel Systems)
- §6.25 Fire Protection
- §7.2 Operational Safety
- §9.2 Electrical Requirements
- §9.3 Transportation in Portable Containers
- §9.4 Transportation in Cargo Tank Vehicles
- §9.7 Parking and Garaging Vehicles Used To Carry LP-Gas Cargo
- §11.3 Containers
- §11.7 Installation of Containers and Container Appurtenances
- §11.11 Marking

**Title 49, Code of Federal Regulations (CFR)**

- 49 CFR §171.8
- 49 CFR §172.504(c)

49 CFR §172.504(c)  
49 CFR §173.315(n)(3)  
49 CFR §177.834  
49 CFR §177.840(g), (l)-(r)  
49 CFR §178.337-1  
49 CFR §180.407(c)  
49 CFR §180.416(a)-(g)  
49 CFR §396.7  
49 CFR §396.11

## Terms and definitions

---

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.

### **NFPA 58 (2008)**

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

**Container.** Any vessel, including cylinders, tanks, portable tanks, and cargo tanks, used for the transporting or storage of LP-gases. §3.3.13

**Container Appurtenances.** Devices installed in container openings for safety, control, or operating purposes. §3.3.14

**Cylinder.** A container designed, constructed, tested, and marked in accordance with the U. S. Department of Transportation specifications, Title 49, Code of Federal Regulations, or in accordance with a valid DOT exemption. §3.3.16

**DOT.** U.S. Department of Transportation. §3.3.21

**Fixed Liquid Level Gauge.** A liquid level indicator that uses a positive shutoff vent valve to indicate that the liquid level in a container being filled has reached the point at which the indicator communicates with the liquid level in the container. §3.3.29.1

**Fixed Maximum Liquid Level Gauge** [“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. §3.3.29.2

**Flexible Connector.** A short [60 in. maximum length] component of a piping system that is made of flexible material (such as hose) and equipped with suitable connections on both ends. §3.3.25

**Liquefied Petroleum Gas** [“LP-gas,” “LPG”]. Any material having a vapor pressure not exceeding that allowed for commercial propane that is composed predominantly of the following hydrocarbons, either by themselves or as mixtures: propane, propylene, butane (normal butane or isobutane), and butylenes. §3.3.36



**Mobile container.** A container that is permanently mounted on a vehicle and connected for uses other than supplying engine fuel. §3.3.41

**NFPA.** National Fire Protection Association. §3.3.47

**Overfilling Prevention Device** [“OPD,” “stop valve”]. A safety device that is designed to provide an automatically means to prevent the filling of a container in excess of the maximum permitted filling limit. §3.3.49

**Point of Transfer.** The location where connections and disconnections are made or where LP-gas is vented to the atmosphere during transfer operations. §3.3.54

**Pressure Relief Device** [“popoff valve”]. A device designed to open to prevent a rise of internal pressure in excess of a specified value due to emergency or abnormal conditions. §3.3.58

**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. §3.3.67

**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 withdrawal appurtenances function properly in either position. §3.3.73

**Water Capacity.** The amount of water at 60°F required to fill a container. §3.3.79

### **NFPA 54 (2006)**

**Leak Check.** An operation performed on a complete gas piping system, the connections, appliances, and equipment to verify that the system does not leak. §3.3.62

**Pressure Test.** An operation performed to verify the gastight integrity of gas piping following its installation or modification. §3.3.81

#### **SAMPLE QUESTION**

A cylinder that can be used in either the vertical or horizontal position, and whose fixed maximum liquid level gauge, pressure relief valve and withdrawal appurtenances will work properly in either position, is called a \_\_\_\_\_ cylinder.

- A. Combination
- B. Dual-purpose
- C. Universal
- D. VP or HP

**Answer: C**

## Key topics

---

NOTE: The list below is not exhaustive. You are responsible for knowing all the fact, 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. Then, when you take the examination, read each question very carefully.

### 1. Cargo Tank Motor Vehicles (CTMV)

#### Arrangement and Operation of Transfer Systems

Cargo tank vehicles unloading into storage containers must be at least 10 feet 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***

#### Electrical Requirements

Electrical wiring on cargo tank motor vehicles must be insulated and protected from physical damage.

***NFPA 58, §9.2***

#### Fire Extinguishers

Each cargo tank vehicle or tractor must be provided with at least one approved portable fire extinguisher having a minimum capacity of 18 lb dry chemical with a B:C rating.

***NFPA 58, §9.4.7***

#### Chock Blocks

Each cargo tank vehicle and trailer must carry chock blocks, which must be used to prevent rolling of the vehicle whenever it is being loaded or unloaded or is parked.

***NFPA 58, §9.4.8***

#### Parking

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

***NFPA 58, §9.7.2.1***

Vehicles must not be parked in congested areas.

***NFPA 58, §9.7.2.2***

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

***NFPA 58, §9.7.2.3***

Where cargo tank vehicles of 3,500 gal. water capacity or less are parked on streets adjacent to the driver's residence in uncongested residential areas, the parking locations must be at least 50 feet from a building used for assembly, institutional, or multiple residential occupancy.

***NFPA 58, §9.7.2.4***

### **Markings**

In addition to NFPA 58 §9.4.6.2, each LP-gas transport and container delivery unit in LP-gas service must be marked with lettering at least two inches in height, in sharp contrast to the background, on each side and the rear with the name of the licensee or the ultimate consumer operating the unit.

***LP-Gas Safety Rules, §9.211***

#### **SAMPLE QUESTION**

Each cargo tank motor vehicle must be provided with at least one approved portable fire extinguisher having a minimum of \_\_\_\_\_ lb. dry chemical with a B:C rating.

- A. 25
- B. 20
- C. 18
- D. 15

***Answer: C***

## **2. Loading and Unloading**

### **Attendance During Transfer Operations**

At least one qualified person must 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***

### **Filling and Evacuating of Containers**

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

***NFPA 58, §7.2.2.1***

### Sources of Ignition

Sources of ignition must 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***

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

***NFPA 58, § 7.2.3.2(B)***

### Smoking Prohibition

No person may smoke or carry lighted smoking materials:

- 1) On or within 25 feet of a vehicle containing LP-gas liquid or vapor,
- 2) At points of liquid transfer, or
- 3) When delivering or connecting to containers.

***NFPA 58, § 9.4.10***

### Applicability

A person may not drive a cargo tank motor vehicle containing a hazardous material, regardless of quantity, unless all manhole closures are closed and secured and all valves and other closures in liquid discharge systems are closed and free of leaks.

***LP-Gas Safety Rules, § 9.201(c) (1)***

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

***LP-Gas Safety Rules, § 9.201(c) (2); 49 CFR 177.840(g)***

### SAMPLE QUESTION

Open flames capable of igniting LP-gas must not be permitted within \_\_\_\_\_ feet of a point of transfer while filling operations are in progress.

- A. 50
- B. 25
- C. 15
- D. 10

***Answer: B***

### 3. Piping, Hoses, Fittings and Valves

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

***NFPA 58, §§9.4.3.5 and 5.9.6.1***

An LP-gas hose, hose connection, or flexible connector used for conveying liquid or vapor in excess of 5 psig must have a minimum working pressure of 350 psig with a safety factor of 5 to 1, continuously marked with LP-Gas or Propane and the manufacturer's name or trademark.

***NFPA 58, §§9.4.3.5 and 5.9.6.4***

(1) A flexible connector assembled from rubber hose and couplings on a DOT cargo tank motor vehicle must be permanently marked to indicate the date of installation.

(2) The flexible hose portion of the connector must be replaced with an unused connector within 10 years of the indicated date of installation.

***NFPA 58, §9.4.3.7(2)***

(3) A flexible connector on a DOT cargo tank vehicle must be visually inspected before the first delivery of each day.

***NFPA 58, §9.4.3.7(2)***

#### **Protection of Cargo Tank Appurtenances, Piping System, and Equipment**

Container appurtenances, piping, and equipment comprising the complete LP-gas system on a cargo tank vehicle must be mounted in position, must be protected against damage, and must be in accordance with DOT regulations.

***NFPA 58, §9.4.5***

### 4. Bulk Plant, Stationary Storage, Inspection and Safety Requirements

#### **Container Separation Distances**

The minimum separation distance between an aboveground 500-gallon water capacity container, important buildings, and the boundary line of adjoining property that can be built upon is 10 feet.

***NFPA 58 §6.3.1***

Cylinders installed alongside of buildings must be positioned so the discharge from the pressure relief device is located at least 3 feet horizontally away from any building opening that is below the level of discharge and at least 5 feet in any direction away from any exterior source of ignition, openings into direct-vent appliances, or mechanical ventilation air intakes.

***NFPA 58 §6.3.7***

ASME container filled on site. The minimum distance in any direction from the point of discharge of a container pressure relief valve, vent of a fixed maximum liquid level gauge on a container, and the container filling connection to exterior sources of ignition, openings into direct-vent (sealed combustion system) appliances, and mechanical ventilation air intakes is 10 feet.

***NFPA 58, §6.3.10***

Loose or piled combustible material and weeds and long dry grass must be separated from containers by a minimum of 10 feet.

***NFPA 58, §6.4.5.2***

LP-gas containers must be located at least 10 feet from the centerline of the wall of diked areas containing flammable or combustible liquids.

***NFPA 58, §6.4.5.4***

The minimum horizontal separation between aboveground LP-gas containers and aboveground tanks containing liquids having flash points below 200°F must be 20 feet.

***NFPA 58, §6.4.5.5***

An aboveground container and any of its parts must not be located within 6 feet of a vertical plane beneath overhead electric power lines that are over 600 volts, nominal.

***NFPA 58, §6.4.5.12***

### **Installation of Cylinders**

Cylinders must be installed only aboveground, and must be set upon a firm foundation of concrete, masonry, or metal and be firmly secured against displacement. The cylinder must not be in contact with the soil.

***LP-Gas Safety Rules, §9.403(a); NFPA 58, §6.6.2.1***

### **Installation of Underground and Mounded Containers**

(B) In areas where vehicle traffic is expected, a non-interchangeable underground container must be either installed at least 18 inches below grade or otherwise protected from damage from vehicles.

(G) The discharge of the regulator vent on an underground container must be above the highest probable water level.

***NFPA 58, §6.6.6.1***

### **Installation of Pressure Relief Devices**

(1) 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, §6.7.2.3***

The discharge of the regulator vent on an underground container must be above the highest probable water level.

***NFPA 58, §6.6.6.1(G)***

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

***NFPA 58, §6.8.1.6***

### **Regulator Installation**

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

***NFPA 58, §6.8.1.7***

### **Extinguishing LP-Gas Fires**

LP-gas fires must not be extinguished until the source of the burning gas has been shut off.

***NFPA 58, §6.25.4.3***

### **Manufacturer's Nameplate and Markings on ASME Containers**

LP-gas must not be introduced into an ASME container unless the container is equipped with an original nameplate or at least one of the following nameplates: Commission Identification Nameplate, Duplicate, Modification (or alteration), and Replacement, permanently attached to the container.

***LP-Gas Safety Rules, §9.129(a)***

Nameplates on containers built prior to September 1, 1984, must include at least:

- (1) the name of container manufacturer,
- (2) the manufacturer's serial number,
- (3) the container's working pressure and
- (4) the container's water capacity.

***LP-Gas Safety Rules, §9.129(d)***

Nameplates on containers built on or after September 1, 1984, must be stainless steel and permanently attached to the container by continuous fusion welding around the perimeter of the nameplate.

***LP-Gas Safety Rules, §9.129(e)***

### **Fencing**

(b) (6) Fencing located more than 25 feet from any point of an LP-gas transfer system or container must be designated as perimeter fencing. If an LP-gas transfer system or container is located inside perimeter fencing and is subject to vehicular traffic, it must be protected against damage according to the guardrail requirements.

***LP-Gas Safety Rules, §9.140***

### Painting of ASME Containers

(a) In addition to NFPA 58, §6.6.1.4, ASME containers, except vaporizers, must be painted white or aluminum, or any other heat-reflective color (such as light green, light blue, etc.) Darker, heat-absorbing colors (such as black, navy blue, etc.) are not permitted.

***LP-Gas Safety Rules, §9.141***

### Installation of Horizontal Aboveground ASME Containers

Horizontal ASME containers designed for permanent installation in stationary service above ground must be placed on masonry or other noncombustible structural supports installed on concrete or masonry foundations. Containers must not be in contact with the soil.

***LP-Gas Safety Rules, §9.403(a); §6.6.3.1***

#### SAMPLE QUESTION

Which of the following is not required information on the ASME nameplate of a stationary storage container constructed prior to September 1, 1984?

- A. The name of the manufacturer
- B. The ASME code symbol
- C. The manufacturer's serial number
- D. The container's water capacity

***Answer: B***

## 5. Piping System, Regulators, Inspection and Testing

### Cast Iron Pipe Prohibited

Cast-iron pipe must not be used.

***NFPA 54, §5.6.2.1***

### Steel and Wrought Iron

Steel and wrought-iron pipe must be at least of standard weight (Schedule 40) and comply with one of the following standards:

- 1) ANSI/ASME B36.10, *Standard for Welded and Seamless Wrought-Steel Pipe*
- 2) ASTM A 53, *Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.*
- 3) ASTM A 106, *Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service.*  
***NFPA 54, §5.6.2.2(1)-(3)***



**Plastic Pipe, Tubing, and Fittings**

Plastic pipe, tubing, and fittings used to supply fuel gas must be used outdoors underground only and must conform with ASTM D 2513, *Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings*. Pipe to be used must be marked “gas” and “ASTM D 2513.”

***NFPA 54, §5.6.4.1***

**Pressure Testing and Inspection**

A piping system must be tested as a complete unit or in sections.

***NFPA 54 §8.1.1.5***

**Test Medium**

The pressure test medium may be Air, Nitrogen or Inert gas

***NFPA 54, §8.1.2***

**Test Pressure**

The test pressure to be used must be no less than 1½ times the proposed maximum working pressure, but not less than 3 psi, irrespective of design pressure.

***NFPA 54, §8.1.4.2***

**Detection of Leaks and Defects**

For leak detection in an LP-gas system, the following items must not be used: matches, candles, camping-type gas lantern or electric torch.

***NFPA 54 §8.1.5.2***

**System Inspection**

Before gas is introduced into a system of new gas piping, the entire system must 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***

**Leak Check**

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 must be checked for leakage. Where leakage is indicated, the gas supply must be shut off until the necessary repairs have been made.

***NFPA 54, §8.2.3***

**Placing Appliances and Equipment in Operation**

Appliances and equipment must not be placed in operation until after the piping system has been tested in accordance with §8.2.3 and purged in accordance with §8.3.2.

***NFPA 54, §8.2.4***

### **Regulators**

Second-stage regulators and integral two-stage regulators must have a maximum outlet pressure setting of 14 inches water column.

***NFPA 58 §5.8.1.2***

### **Selection of Pressure Regulators**

A two-stage regulator system, an integral two-stage regulator, or a two-psi regulator system must be required on all fixed piping systems that serve ½ psig appliance systems [normally operated at 11 inches water column pressure].

***NFPA 58, §6.8.2***

### **Polyethylene Piping Systems**

(3) Polyethylene piping systems must be limited to the following:

- (a) Vapor service not exceeding 30 psig
- (b) Installation outdoors and underground

***NFPA 58, §6.9.1.1***

### **Installation of Metallic Pipe, Tubing, and Fittings**

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

***NFPA 58, §6.9.3.10***

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

***NFPA 58, §6.9.3.11***

Buried metallic pipe and tubing must be installed underground with a minimum 12 inches of cover. The cover must be increased to 18 inches if external damage to the pipe or tubing from external sources is likely to result. If a minimum 12 inches of cover cannot be maintained, the piping must be installed in conduit or must be bridged (shielded).

***NFPA 58, §6.9.3.12***

Where underground piping is beneath driveways, roads, or streets, possible damage by vehicles must be taken into account.

***NFPA 58, §6.9.3.13***

### **Installation of Polyethylene and Polyamide Pipe, Tubing, and Fittings**

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

***NFPA 58, §6.9.4.1***

### **Connecting Container to Piping**

LP-gas piping must be installed only by a licensee authorized to perform such installation, a registrant authorized by §9.13 (General Installers and Repairman Exemption), or an individual exempted from licensing as authorized by Texas Natural Resources Code, §113.081. A licensee may not connect an LP-gas container or cylinder to a piping installation made by a person who is not licensed to make such installation, except that connection may be made to piping installed by an individual on that individual's single family residential home. A licensee may connect to

piping installed by an unlicensed person provided the licensee has performed a pressure test, verified that the piping has been installed according to the LP-Gas Safety Rules and filed a properly-completed LPG Form 22 with the Safety Division, identifying the unlicensed person who installed the LP-gas piping.

***LP-Gas Safety Rules, §9.134***

**SAMPLE QUESTION**

Immediately after the gas is turned on into a system that has been initially restored after an interruption of service, the piping system must be \_\_\_\_\_.

- A. Pressure tested
- B. Inspected
- C. Checked for leakage
- D. Both A and B

***Answer: C***

## 6. Containers

Containers must be designed, fabricated, tested, and marked (or stamped) in accordance with the regulations of the U.S. Department of Transportation (DOT); the ASME *Boiler and Pressure Vessel Code*, Section VIII; or the API-ASME *Code for Unfired Pressure Vessels for Petroleum Liquids and Gases*.

***NFPA 58, §5.2.1.1***

Containers that have been involved in a fire and show no distortion must be requalified for continued service before being used or reinstalled.

- A. Cylinders must be requalified by a manufacturer of the type of cylinder to be requalified or by a repair facility approved by DOT.
- B. ASME or API-ASME containers must be retested using the hydrostatic test procedure applicable at the time of the original fabrication.
- C. All container appurtenances must be replaced.
- (D) DOT 4E specification (aluminum) cylinders and composite cylinders involved in a fire must be permanently removed from service.

***NFPA 58, §5.2.1.2***

A cylinder with an expired qualification date must not be refilled until requalified by methods prescribed in DOT regulations.

***NFPA 58, §5.2.2.2***

### **Cylinder Service Pressure**

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

***NFPA 58 (2008), §5.2.4.5***

### **Warning Labels**

Warning labels must be applied to all cylinders of 4.2 lb to 100 lb propane capacity and not filled on site. Warning labels must include information on the potential hazards of LP-gas.

***LP-Gas Safety Rules, §9.403(a), §5.2.8.4***

### **Pressure Relief Devices**

All cylinders used in industrial truck service (including forklift truck cylinders) must have the cylinder's pressure relief valve replaced by a new or unused valve within 12 years of the date of manufacture of the cylinders and every 10 years thereafter.

***NFPA 58, §5.7.2.13***

### **Overfilling Prevention Devices**

Cylinders with 4.2 lb through 40-lb propane capacity for vapor service must be equipped or fitted with a listed overfilling prevention device and a fixed maximum liquid level gauge.

***LP-Gas Safety Rules, §9.403(a), §5.7.3.1***

Exceptions:

All cylinders used in industrial truck service and cylinders identified and used for industrial welding and cutting gases.

***NFPA 58, §5.7.3.5(1)***

Cylinders manufactured prior to October 1, 1998, and designed for use in the horizontal orientation for which an overfilling prevention device is not available.

***NFPA 58, §5.7.3.5(2)***

Exempted horizontal cylinders must be marked with a label to indicate that they are not equipped with an overfilling prevention device.

***NFPA 58, §5.7.3.6***

### **Transportation of Cylinders**

A cylinder with a propane capacity of 45 lbs or less being transported in an open vehicle may be in either position. A cylinder with a propane capacity greater than 45 lbs being transported in an open vehicle must be positioned so the relief valve communicates with the vapor space of the cylinder.

***NFPA 58, §9.3.2.9***

### **Unsafe or Unapproved Containers, Cylinders, or Piping**

A licensee or the licensee's employees shall not introduce LP-gas into any container or cylinder if the licensee or employee has 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 LP-Gas Safety Rules.

***LP-Gas Safety Rules, §9.135***

### **Inspection of Container at Each Filling**

In addition to NFPA 58, §§5.2.1.1, 7.2.2.11, and 5.2.2, before filling a container or cylinder, the individual filling

the container or cylinder must examine it for any obvious defects. Where the container or cylinder is found to be dented or bulged, where the metal is gouged, or where there is evidence of corrosion which substantially reduces the integrity of the container or cylinder, the container or cylinder must not be filled.

***LP-Gas Safety Rules, §9.137***

**Filling of DOT Containers**

(a) In addition to NFPA 58, §7.4.2.1, DOT containers of less than 101 pounds LP-gas capacity, other than containers designed to be used on forklift or industrial trucks, must be filled by weight only. The weight of the containers must be determined by scales that meet the specifications of the National Institute of Standards and Technology's Handbook 44. Scales at licensees' facilities must be currently registered with the Texas Department of Agriculture. The scales must have a rated weighing capacity which exceeds the total weight of the cylinders being filled. The scales must be accurate during the filling of the cylinder. The formula for filling LP-gas containers by weight under this section is as follows:

(1) The propane capacity in pounds is determined by multiplying the total water capacity in pounds by 0.42.

(2) Add the tare weight [weight of empty cylinder, plus weight of all permanently attached valves and other fittings] of the cylinder to the liquid weight of the product plus the weight of the hose and nozzle. The total weight of these three is the proper scale setting.

***LP-Gas Safety Rules, §9.136***

**SAMPLE QUESTION**

Cylinders with an LP-gas capacity of \_\_\_\_\_ lb through 40 lb, fabricated after September 30, 1998, must be equipped with a listed overfilling prevention device [OPD] and a \_\_\_\_\_.

- A. 20 / fixed maximum liquid level gauge
- B. 33 / float gauge
- C. 12 / dip tube
- D. 4.2 / fixed maximum liquid level

***Answer: D***

**7. ASME Engine Fuel/Mobile Fuel Containers and Vehicles**

**Container Capacity**

LP-gas fuel containers used on passenger-carrying vehicles must not exceed 200 gallons aggregate water capacity.

***NFPA 58, §6.23.3.1(D)***

**Container Maximum Allowable Working Pressure**

ASME engine fuel and mobile containers must have a minimum design pressure of 250 psig or 312.5 psig where required if constructed prior to April 1, 2001, and 312.5 psig if constructed on or after April 1, 2001.

***NFPA 58, §11.3.2.1***

### **Labeling of Openings**

Container openings on ASME engine fuel or mobile tanks, except pressure relief devices and gauging devices, must be labeled on the container or valve to show whether they communicate with the vapor space or the liquid space.

***NFPA 58, §11.3.6.3, §11.3.6.4***

### **Shutoff Valves**

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

***NFPA 58, §11.7.4.3***

### **Label Requirements**

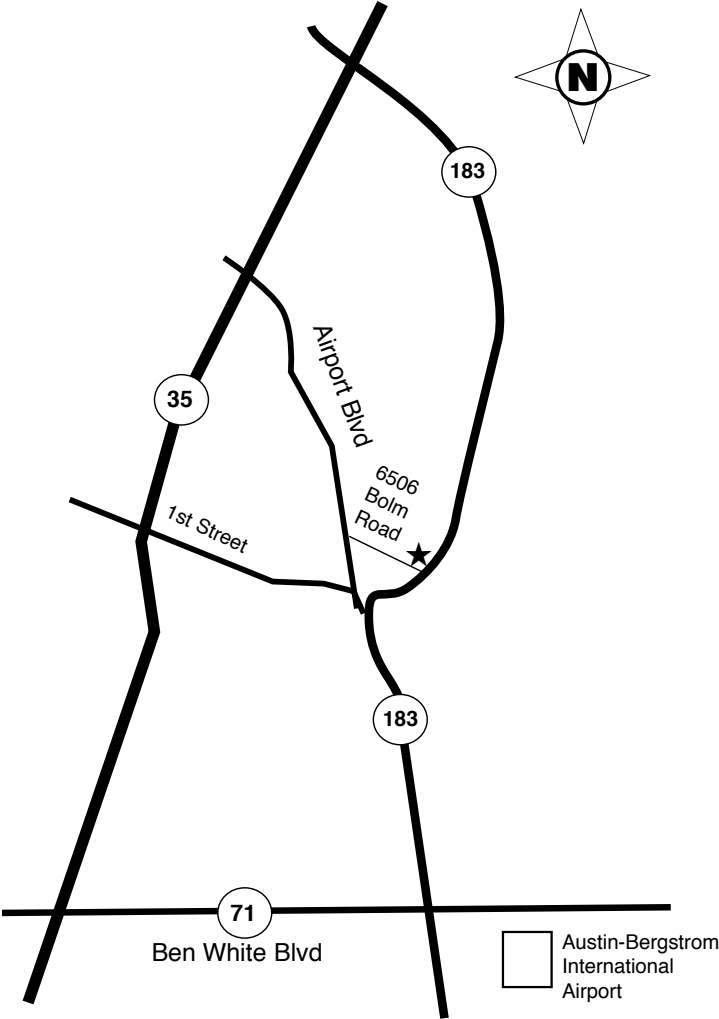
Each over-the-road general-purpose vehicle powered by LP-gas must be identified with a weather-resistant diamond-shaped label located on an exterior vertical or near vertical surface on the lower right rear of the vehicle (on the trunk lid of a vehicle so equipped, but not on the bumper of any vehicle) inboard from any other markings.

***NFPA 58, §11.11.1***

The marking must consist of a border and the word PROPANE [1 in. minimum height centered in the diamond] in silver or white reflective luminous material on a black or Pantone 2945C Royal Blue or equivalent background.

***LP-Gas Safety Rules §9.403(a), §11.11.2.2***

# RRC/AFRED TRAINING CENTER 6506 BOLM RD., AUSTIN



### DIRECTIONS TO RRC ALTERNATIVE FUELS TRAINING CENTER, AUSTIN

#### Entering Austin on I-35 going south:

Take exit 239/240 for Hwy 183 South/ Austin-Bergstrom International Airport. Stay on 183 past Cameron Road, U.S. 290, Manor Road, Loyola Lane, and Techni-Center Drive. Proceed down the hill on 183 and take the exit just before the overpass (DO NOT GO OVER THE OVERPASS, there is no exit sign for Bolm Road). At the light, turn right onto Bolm Road. The Training Center is on the northwest corner of 183 and Bolm Road. Enter through the double glass doors on the south side of the building.

#### Entering Austin on I-35 going north:

Take exit 230 for Texas Hwy. 71/Ben White Blvd. Turn right toward Bastrop. Stay on 71 for approximately 4.3 miles. Exit onto U.S. 183 North. Stay on 183 past the Colorado River bridge. Stay in the right lane and take the first exit, which is just before an overpass (DO NOT GO OVER THE OVERPASS, there is no exit sign for Bolm Road). Turn left at the light onto Bolm Road and go under the overpass. The Training Center is on the northwest corner of 183 and Bolm Road. Enter through the double glass doors on the south side of the building.