TEXAS LP-GAS EXAMINATION STUDY GUIDE

Category L
Mobile Fuel
Management Level

RAILROAD COMMISSION OF TEXAS

September 2012

NOTICE

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Exam administration

Taking an examination in Austin

You may take any Railroad Commission 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 Commission's Alternative Fuels Training Center. The training center is located at 6506 Bolm Road, on the northwest corner of the intersection of Bolm Road and U.S. Highway 183.

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

(See map to Training Center on page 18.)

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. 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. 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. 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.

Closed-book examinations

All Railroad Commission management-level qualifying examinations are closed book. This study guide may not be used during any management-level examination.

Examinees should prepare for the Category L Mobile Fuel management-level examination by studying the applicable sections of the Railroad Commission's LP-Gas Safety Rules (16 *Texas Administrative Code*, Chapter 9); and National Fire Protection Association 58, *Liquefied Petroleum Gas Code* (2008 edition).

Examination time limit

The management-level Category L Mobile Fuel qualifying examination must be completed within two 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 both the examination itself and your answer sheet to the proctor within the two-hour limit.

Grades, reports and retakes

The minimum passing grade is 75 percent on all Railroad Commission qualifying examinations.

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 outside of Austin 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.

Contacts

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LP-GAS EXAMINATION STUDY GUIDE MANAGEMENT-LEVEL CATEGORY L MOBILE FUEL

Who should use this guide?

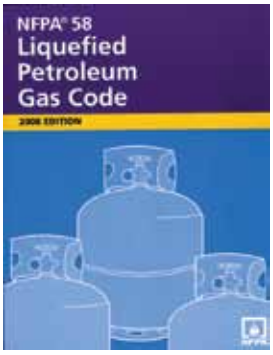
You should use this guide to prepare for the Railroad Commission's management-level qualifying examination to be a company representative or operations supervisor for an active Category L Mobile Fuel licensee. Activities covered by this certification are the installation of LP-gas mobile fuel containers, cylinders, and LP-gas mobile fuel systems, and the replacement of container valves on vehicles such as trailers, catering trucks, mobile kitchens, tar kettles, hot oil units, auxiliary engines and similar equipment. The Mobile Fuel examination does not authorize an individual to fill LP-gas mobile fuel containers or cylinders.

What books do I need?

This examination tests your knowledge of the laws and standards that apply are the installation of LP-gas mobile fuel containers, cylinders, and LP-gas mobile fuel systems, and the replacement of container valves on vehicles such as trailers, catering trucks, mobile kitchens, tar kettles, hot oil units, auxiliary engines and similar equipment. These laws and standards are found in two books:

LP-Gas Safety Rules (Texas Railroad Commission)
NFPA 58: *Liquefied Petroleum Gas Code* (National Fire Protection Association, 2008)

Where do I get the books?



You may download the current edition of the Railroad Commission's LP-Gas Safety Rules free online at 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) 463-7309.

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; click on "Codes and Standards."

Sections and topics

Before you take this examination you should know the definitions on page 6-7 of this study guide and the contents of the following sections of the codes and standards.

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

§9.6	Licenses and Fees
§9.7	Application for License and License Renewal Requirements
§9.8	Application for a New Certificate
§9.9	Requirements for Certificate Renewal
§9.10	Rules Examination
§9.11	Previously Certified Individuals
§9.12	Trainees
§9.17	Designation and Responsibilities of Company Representatives and Operations Supervisors
§9.36	Report of LP-Gas Incident/ Accident

NFPA 58 (2008)

§5.20	Appliances
§6.23	LP-Gas Systems on Vehicles (Other Than Engine Fuel Systems)

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, as well as the rules and standards highlighted in this guide.

NFPA 58 (2008)
NOTE: Informal terms that are sometimes used in the propane industry instead of formal technical terms are given in brackets.

A ***container*** is any vessel, including cylinders, tanks, portable tanks, and cargo tanks, used for the transporting or storage of LP-gases.
NFPA 58, §3.3.13

Container appurtenances are devices installed in container openings for safety, control, or operating purposes.
NFPA 58, §3.3.14

DOT means the U.S. Department of Transportation.
NFPA 58, §3.3.21

A ***fixed liquid level gauge*** is 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.
NFPA 58, §3.3.29.1

A ***flexible connector*** is 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.
NFPA 58, §3.3.25

A ***fixed maximum liquid level gauge ["outage gauge," "spitter valve," "spew gauge"***] is a fixed gauge that indicates the liquid level at which the container is filled to its maximum permitted filling limit.
NFPA 58, §3.3.29.2

Liquefied petroleum gas ["LP-Gas, LPG"] is 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.
NFPA 58, §3.3.36

A ***mobile container*** is defined as a container that is permanently mounted on a vehicle and connected for uses other than supplying fuel to the vehicle's engine.
NFPA 58, §3.3.41

The ***point of transfer*** is the location where connections and disconnections are made or where LP-gas is vented to the atmosphere during transfer operations.
NFPA 58, §3.3.54

A universal cylinder is 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 gauge, pressure relief device, and withdrawal appurtenances function properly in either position.
NFPA 58, §3.3.73

Water capacity is the amount of water at 60°F required to fill a container.
NFPA 58, §3.3.79

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 topics. Then when you take the examination, read each question very carefully.

GENERAL REQUIREMENTS ADMINISTRATIVE

LP-GAS SAFETY RULES

Application for License and License Renewal Requirements

(a) No person, except a trainee as defined in the LP-Gas Safety Rules, may perform work, directly supervise LP-gas activities, or be employed in any capacity requiring contact until he or she has passed an applicable rules examination.

(e) LP-gas licenses expire one year after issuance at midnight on the last day of the month prior to the month in which they are issued.

(h) If a person's license expires, that person must immediately cease performance of any LP-gas activities authorized by the license.
LP-Gas Safety Rules, §9.7

Application for a New Certificate

(a) An applicant for a new certificate must:

(1) file a properly completed LPG Form 16 and the applicable nonrefundable rules examination fee;

(2) pass the applicable rules examination with a score of at least 75%

(b) An individual who holds an employee-level certificate who wishes to obtain a management-level certificate must comply with the requirements of the LP-Gas Safety Rules.
LP-Gas Safety Rules, §9.8

Requirements for Certificate Renewal

(c) Certificate holders must remit the nonrefundable $35 annual certificate renewal fee to AFRED on or before May 31 of each year. Individuals who hold more than one certificate must pay only one annual renewal fee.

(1) Failure to pay the nonrefundable annual renewal fee by the deadline will result in a lapsed certification.

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

If a person's certification expires, that person must immediately cease performance of any LP-gas activities authorized by the certification.

If an individual's certificate has been expired for more than two years from May 31 of the year in which certification lapsed, that individual must comply with the requirements for a new certificate.
LP-Gas Safety Rules, §9.9

Rules Examination

(d) Failure of any LP-gas qualifying examination immediately disqualifies the examinee from performing any LP-gas related activities covered by the failed examination, except activities that are covered by a separate examination the individual has passed.
LP-Gas Safety Rules, §9.10

Trainees

(a) 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.

A trainee must 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

Designation and Responsibilities of Company Representatives and Operations Supervisors

(a) Each licensee must have at least one company representative for the license.

(2) A licensee may have more than one company representative.

(3) An individual may be operations supervisor at more than one outlet provided that:

(A) each outlet has a designated LP-gas certified employee responsible for the LP-gas activities at that outlet;

(B) the certified employee's and/or operations supervisor's telephone number is posted at the outlet on a sign with lettering at least 3/4-inch high, visible and legible at all times; and

(C) the certified employee and/or the operations supervisor monitors the telephone number and responds to calls during normal business hours.

(a)(5)(A) A licensee must cease all LP-gas activities if, at the termination of its company representative, there is no other qualified company representative of the licensee who has complied with the Commission's requirements.
LP-Gas Safety Rules, §9.17

Report of LP-Gas Incident/Accident

(a) At the earliest practical moment or within two hours following discovery, a licensee owning, operating, or servicing the equipment of an installation must notify the Railroad Commission by telephone of any accident involving an LP-gas installation.
LP-Gas Safety Rules, §9.36

SAMPLE QUESTION

If a person's LP-gas license is not renewed by the annual renewal deadline, the license _____ and the person must _____ performance of any LP-gas activities authorized by the license.

A. Is revoked / immediately cease
B. Expires / immediately cease
C. Is suspended / substantially cease
D. Expires / substantially cease

Answer: B

CONTAINER: DESIGN, CAPACITY, CONSTRUCTION, REPAIR AND NAME PLATE

NFPA 58

Container Installation Requirements

Containers must comply with the following:

(A) ASME mobile containers must have a maximum allowable working pressure of 250 psig if constructed prior to April 1, 2001, or 312 psig if constructed on or after April 1, 2001.

(B) Cylinders installed on recreational vehicles or on other vehicles must be constructed for at least a 240 psig service pressure.

(C) ASME mobile containers installed on recreational vehicles or on other vehicles must be constructed for at least a 312 psig maximum allowable working pressure.

(D) LP-gas fuel containers used on passenger-carrying vehicles must not exceed 200 gallons total water capacity.

(E) The capacity of individual LP-gas containers on highway vehicles must be in accordance with Table 6.23.3.1(E).

(E) The maximum capacity of an individual LP-gas container installed on a highway, non-passenger vehicle is 300 gallons water capacity.
NFPA 58, Table 6.23.3.1

(F) Containers designed for stationary service only and not in compliance with the container appurtenance protection requirements of 5.2.6 must not be used.
NFPA 58, §6.23.3.1

Containers must be mounted securely on the vehicle or within the enclosing recess or cabinet.

(A) Containers must be installed with road clearance in accordance with 11.7.3

(B) Fuel containers must be mounted to prevent jarring loose and slipping or rotating, and the fastenings must be designed and constructed to withstand, without permanent visible deformation, static loading in any direction equal to four times the weight of the container filled with fuel.

(C) Where containers are mounted within a vehicle housing, the securing of the housing to the vehicle must comply with this code. Any removable portions of the housing or cabinet must be secured while in transit.

(D) Field welding on containers must be limited to attachments to non-pressure parts such as saddle plates, wear plates, or brackets applied by the container manufacturer.

(E) All container valves, appurtenances, and connections must be protected to prevent damage from accidental contacts with stationary objects, from loose objects, stones, mud, or ice thrown up from the ground or floor, and from damage due to overturn or similar vehicular accident.

(F) Permanently mounted ASME containers must be located on the vehicle to provide this protection.

(G) Cylinders must have permanent protection for cylinder valves and connections.

(H) Where cylinders are located on the outside of a vehicle, weather protection must be provided.

(I) Containers mounted on the interior of passenger-carrying vehicles must be installed in compliance with Section 11.8. Pressure relief valve installations for such containers must comply with 11.7.5.
NFPA 58, §6.23.3.4

Cylinders installed on portable tar kettles alongside the kettle, on the vehicle frame, or on road-surface heating equipment must be protected from radiant or convected heat from open flame or other burners by the use of a heat shield or by the location of the cylinder(s) on the vehicle. In addition:

(1) Cylinder valves must be closed when burners are not in use.

(2) Cylinders must not be refilled while burners are in use as provided in 7.2.3.2(B).
NFPA 58, §6.23.3.5

SAMPLE QUESTION

ASME mobile containers installed on recreational vehicles or on other vehicles must be constructed for at least a 275 psig maximum allowable working pressure.

A. True
B. False

Answer: B

INSTALLATION OF CONTAINER APPURTENANCES (VALVES AND FITTINGS)

Container appurtenances must be installed in accordance with the following:

(1) Pressure relief valves installed on ASME containers that are installed in the interior of vehicles complying with §11.8 must comply with §11.7.5.

(2) Pressure relief valve installations on ASME containers installed on the outside of vehicles must comply with §11.7.5 and §6.23.3.3.

(3) Main shutoff valves on containers for liquid and vapor must be readily accessible.

(4) Cylinders must be designed to be filled in either the vertical or horizontal position. Universal-type cylinders may be filled in either position.

(5) All container inlets, outlets, or valves that are installed in container inlets or outlets, except pressure relief devices and gauging devices, must be labeled to designate whether they communicate with the vapor or liquid space of the container.

(6) Containers from which only vapor is to be withdrawn must be installed and equipped with connections to minimize the possibility of the accidental withdrawal of liquid.
NFPA 58, §6.23.4.1

Regulators must be installed in accordance with NFPA 58 requirements.

(A) Regulators must be installed with the pressure relief vent opening pointing vertically downward to allow for drainage of moisture collected on the diaphragm of the regulator.

(B) Regulators not installed in compartments must be equipped with a durable cover designed to protect the regulator vent opening from sleet, snow, freezing rain, ice, mud, and wheel spray.

(C) If vehicle-mounted regulators are installed at or below the floor level, they must be installed in a compartment that provides protection against the weather and wheel spray.

(D) Regulator compartments must comply with the following:

(1) The compartment must be of sufficient size to allow tool operation for connection to and replacement of the regulators(s).

(2) The compartment must be vapor-tight to the interior of the vehicle.

(3) The compartment must have a 1 square inch minimum vent opening to the exterior located within 1 inch of the bottom of the compartment.

(4) The compartment must not contain flame or spark producing equipment.

(E) A regulator vent outlet must be at least 2 inches above the compartment vent opening.
NFPA 58, §6.23.4.2

SAMPLE QUESTION

If a vehicle-mounted regulator is installed _____, it must be installed in a compartment that provides protection against the weather and wheel spray.

A. Below floor level
B. At floor level
C. At or below floor level
D. None of the above

Answer: C

PIPING

General Requirements for Appurtenances

Piping must be installed in accordance with NFPA-58 requirements.

(A) Steel tubing must have a minimum wall thickness of 0.049 in.

(B) A flexible connector must be installed between the regulator outlet and the piping system to protect against expansion, contraction, jarring, and vibration strains.

(C) Flexibility must be provided in the piping between a cylinder and the gas piping system or regulator.

(D) Flexible connectors must be installed in accordance with §6.9.6.

(E) Flexible connectors longer than the length allowed in the code, or fuel lines that incorporate hose, must be used only where approved.

(F) The piping system must be designed, installed, supported, and secured to minimize the possibility of damage due to vibration, strains, or wear and to preclude any loosening while in transit.

(G) Piping must be installed in a protected location.

(H) Where piping is installed outside the vehicle, it must be installed as follows:

(1) Piping must be under the vehicle and below any insulation or false bottom.

(2) Fastening or other protection must be installed to prevent damage due to vibration or abrasion.

(3) At each point where piping passes through sheet metal or a structural member, a rubber grommet or equivalent protection must be installed to prevent chafing.

(I) Gas piping must be installed to enter the vehicle through the floor directly beneath or adjacent to the appliance served.

(J) If a branch line is installed, the tee connection must be located in the main gas line under the floor and outside the vehicle.

(K) Exposed parts of the piping system either must be of corrosion-resistant material or must be coated or protected to minimize exterior corrosion.

(L) Hydrostatic relief valves must be installed in isolated sections of liquid piping as provided in §6.13.

(M) Piping systems, including hose, must be pressure tested and proven free of leaks in accordance with §6.14.
NFPA 58, §6.23.5.1

There must be no fuel connection between a tractor and trailer or other vehicle units.
NFPA 58, §6.23.5.2

SAMPLE QUESTION

Piping systems, including hose, must be pressure tested and proven free of leaks.

A. True
B. False

Answer: A

EQUIPMENT INSTALLATION

Installation must be made in accordance with the manufacturer's recommendations and, in the case of approved equipment, as provided in the approval.
NFPA 58, §6.23.6.1

Equipment installed on vehicles must be protected against vehicular damage as provided for container appurtenances and connections in §6.23.3.4(C).
NFPA 58, §6.23.6.2

APPLIANCE INSTALLATION ON VEHICLES

LP-Gas appliances used on commercial vehicles must be approved for the service.

(A) Gas-fired heating appliances and water heaters must be equipped with automatic devices designed to shut off the flow of gas to the main burner and the pilot in the event the pilot flame is extinguished.

(B) Catalytic heating appliances must be equipped with an approved automatic device to shut off the flow of gas in the event of combustion failure.

(C) Gas-fired heating appliances and water heaters to be used in vehicles intended for human occupancy must be designed for complete separation of the combustion system and the living space.

(D) If the separation between the combustion system and the living space is not integral with the appliance, it must be provided in accordance with NFPA 58 installation requirements.
NFPA 58, §***5.20.7***

All appliances installed on vehicles must be approved.
NFPA 58, §6.23.7.2

Where the device or appliance is designed to be in operation while the vehicle is in transit, such as a cargo heater or cooler, means to stop the flow of gas in the event of a line break, such as an excess-flow valve, must be installed.
NFPA 58, §6.23.7.3

(A) Gas-fired heating appliances and water heaters must be equipped with automatic devices designed to shut off the flow of gas to the main burner and the pilot in the event the pilot flame is extinguished.
NFPA 58, §5.20.7(A)

All gas-fired heating appliances must be equipped with safety shutoffs in accordance with §5.20.7(A) except those covered in §6.19.2.8(2).
NFPA 58, §6.23.7.4

Gas-fired heating appliances, other than ranges and illuminating appliances installed on vehicles intended for human occupancy, must be designed or installed to provide for a complete separation of the combustion system from the atmosphere inside the vehicle.
NFPA 58, §6.23.7.5

Where unvented-type heaters that are designed to protect cargo are used on vehicles not intended for human occupancy, provisions must be made to provide air from the outside for combustion and dispose of the products of combustion to the outside.
NFPA 58, §6.23.7.6

Appliances installed in the cargo space of a vehicle must be readily accessible whether the vehicle is loaded or empty.
NFPA 58, §6.23.7.7

Appliances must be constructed or otherwise protected to minimize possible damage or impaired operation due to cargo shifting or handling.
NFPA 58, §6.23.7.8

Appliances must be located so that a fire at any appliance will not block persons from exiting the vehicle.
NFPA 58, §6.23.7.9

A permanent caution plate must be provided, affixed to either the appliance or the vehicle outside of any enclosure and adjacent to the container(s), and must include the following items:

CAUTION:

(1) Be sure all appliance valves are closed before opening container valve.

(2) Connections at the appliances, regulators, and containers must be checked periodically for leaks with soapy water or its equivalent.

(3) Never use a match or flame to check for leaks.

(4) Container valves must be closed when equipment is not in use.
NFPA 58, §6.23.7.10

SAMPLE QUESTION

Which of the following statements is not required to be included on the caution plate affixed to either the appliance or to the vehicle outside of any enclosure and adjacent to the container(s)?

A. Be sure all appliance valves are closed before opening container valve
B. Never use a match or flame to check for leaks
C. Container valves shall be closed when equipment is not in use
D. Leak-check appliances, regulators and containers every three years

Answer: D

GENERAL PRECAUTIONS

Mobile units containing hot plates and other cooking equipment, including mobile kitchens and catering vehicles, must have at least one approved portable fire extinguisher rated at not less than 10-B:C in accordance with NFPA 10, *Standard for Portable Fire Extinguishers*.
NFPA 58, §6.23.8

PARKING, SERVICING, AND REPAIR

Vehicles with LP-Gas fuel systems mounted on them for purposes other than propulsion must be permitted to be parked, serviced, or repaired inside buildings in accordance with the following:

(1) The fuel system must be leak-free, and the container(s) must not be filled beyond the limits specified in Chapter 7.

(2) The container shutoff valve must be closed, except that the container shutoff valve must not be required to be closed when fuel is required for test or repair.

(3) The vehicle must not be parked near sources of heat, open flames, or similar sources of ignition, or near unventilated pits.
NFPA 58, §6.23.9.1

Vehicles having containers with water capacities larger than 300 gallon must comply with the requirements of §9.7.
NFPA 58, §6.23.9.2

RRC ALTERNATIVE FUELS TRAINING CENTER 4044 PROMONTORY POINT DR., AUSTIN