

WAC 296-24-47511 Liquefied petroleum gas as a motor fuel. (1) Application.

(a) This section applies to internal combustion engines, fuel containers, and pertinent equipment for the use of liquefied petroleum gases as a motor fuel on easily movable, readily portable units including self-propelled vehicles.

(b) Fuel containers and pertinent equipment for internal combustion engines using liquefied petroleum gas where installation is of the stationary type are covered by WAC 296-24-47509. This section does not apply to containers for transportation of liquefied petroleum gases nor to marine fuel use. All requirements of WAC 296-24-47505 apply to this section, unless otherwise noted in WAC 296-24-47505.

(2) General.

(a) Fuel may be used from the cargo tank of a truck while in transit, but not from cargo tanks on trailers or semitrailers. The use of fuel from the cargo tanks to operate stationary engines is permitted providing wheels are securely blocked.

(b) You must not fuel passenger-carrying vehicles while passengers are on board.

(c) Reserved.

(d) LP-gas fueled industrial trucks must comply with the Standard for Type Designations, Areas of Use, Maintenance and Operation of Powered Industrial Trucks, NFPA 505-1969.

(e) You must shut down engines on vehicles while fueling if the fueling operation involves venting to the atmosphere.

(3) Design pressure and classification of fuel containers.

(a) Except as covered in (3)(b) and (c) of this section, containers must be in accordance with Table H-32.

(b) Reserved.

TABLE H-32

Container type	For gases with vapor press. Not to exceed lb. per sq. in. gage at 100°F. (37.8°C.)	Minimum design pressure of container lb. per sq. in. gage	
		1949 and earlier editions of ASME Code (Par. U-68, U-69)	1949 edition of ASME Code (Par. U-200, U-201); 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of ASME Code; All editions of API-ASME Code ²
200 ¹	215	200	250

¹ Container type may be increased by increments of 25. The minimum design pressure of containers must be 100% of the container type designation when constructed under 1949 or earlier editions of the ASME Code (Par. U-68 and U-69). The minimum design pressure of containers must be 125% of the container type designation when constructed under: (1) The 1949 ASME Code (Par. U-200 and U-201), (2) 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of the ASME Code, and (3) all editions of the API-ASME Code.

² Construction of containers under the API-ASME Code is not authorized after July 1, 1961.

(c) Containers manufactured and maintained under DOT specifications and regulations may be used as fuel containers. When so used they must conform to all requirements of this section.

(d) You must label all container inlets and outlets except safety relief valves and gaging devices to designate whether they communicate with vapor or liquid space. (Labels may be on valves.)

(4) Installation of fuel containers.

(a) You must locate containers in a place and in a manner to minimize the possibility of damage to the container. Containers located in the rear of trucks and buses, when protected by substantial bumpers, will be considered in conformance with this requirement. You must install fuel containers on passenger-carrying vehicles as far from the engine as is practicable, and you must seal the passenger space and any space containing radio equipment from the container space to prevent direct seepage of gas to these spaces. The container compartment must be vented to the outside. In case the fuel container is mounted near the engine or the exhaust system, the container must be shielded against direct heat radiation.

(b) You must install containers with as much clearance as practicable but never less than the minimum road clearance of the vehicle under maximum spring deflection. This minimum clearance must be to the bottom of the container or to the lowest fitting on the container or housing, whichever is lower.

(c) You must securely mount permanent and removable fuel containers to prevent jarring loose, slipping, or rotating, and the fastenings must be designed and constructed to withstand static loading in any direction equal to twice the weight of the tank and attachments when filled with fuel using a safety factor of not less than four based on the ultimate strength of the material to be used. Field welding, when necessary, must be made only on saddle plates, lugs or brackets, originally attached to the container by the tank manufacturer.

(d) You must permanently install fuel containers on buses.

(e) You must install and equip containers from which vapor only is to be withdrawn with suitable connections to minimize the accidental withdrawal of liquid.

(5) Valves and accessories.

(a) Container valves and accessories must have a rated working pressure of at least 250 p.s.i.g., and must be of a type suitable for liquefied petroleum gas service.

(b) You must fit the filling connection with an approved double back-pressure check valve, or a positive shutoff in conjunction with an internal back-pressure check valve. On a removable container the filler valve may be a hand operated shutoff valve with an internal excess flow valve. Main shutoff valves on the container on liquid and vapor must be readily accessible.

(c) With the exceptions of (5)(d)(iii) of this section, you must equip filling connections equipped with approved automatic back-pressure check valves, and safety relief valves, and all connections to the containers having openings for the flow of gas in excess of a No. 54 drill size with approved automatic excess flow valves to prevent discharge of content in case connections are broken.

(d) Liquid-level gaging devices:

(i) You must not use variable liquid-level gages which require the venting of fuel to the atmosphere on fuel containers of industrial trucks (including lift trucks).

(ii) On portable containers that may be filled in the vertical and/or horizontal position, the fixed liquid-level gage must indicate maximum permitted filling level for both vertical and horizontal filling with the container oriented to place the safety relief valve in communication with the vapor space.

(iii) In the case of containers used solely in farm tractor service and charged at a point at least 50 feet from any important building, the fixed liquid-level gaging device may be so constructed that

the outward flow of container content exceeds that passed by a No. 54 drill size opening, but in no case must the flow exceed that passed by a No. 31 drill-size opening. An excess flow valve is not required. You must mark fittings equipped with such restricted drill size opening and container on which they are used to indicate the size of the opening.

(iv) You must adequately protect all valves and connections on containers to prevent damage due to accidental contact with stationary objects or from loose objects thrown up from the road, and you must safeguard all valves against damage due to collision, overturning or other accident. For farm tractors where parts of the vehicle provide such protection to valves and fittings, the foregoing requirements must be considered fulfilled. However, on removable type containers you must permanently attach the protection for the fittings to the container.

(v) (Exchange of removable fuel containers preferably should be done outdoors but may be done indoors.) When removable fuel containers are used, you must provide means in the fuel system to minimize the escape of fuel when the containers are exchanged. This must be accomplished by one of the following methods:

(A) Using an approved automatic quick-closing coupling (a type closing in both directions when uncoupled) in the fuel line, or

(B) Closing the valve at the fuel container and allowing the engine to run until the fuel in the line is consumed.

(6) Piping—Including pipe, tubing, and fittings.

(a) Pipe from fuel container to first-stage regulator must be not less than schedule 80 wrought iron or steel (black or galvanized), brass or copper; or seamless copper, brass, or steel tubing. Steel tubing must have a minimum wall thickness of 0.049 inch. You must adequately protect steel pipe or tubing against exterior corrosion. Copper tubing must be types K or L or equivalent having a minimum wall thickness of 0.032 inch. Approved flexible connections may be used between container and regulator or between regulator and gas-air mixer within the limits of approval. The use of aluminum pipe or tubing is prohibited. In the case of removable containers you must use an approved flexible connection between the container and the fuel line.

(b) You must install all piping, braced, and supported so as to reduce to a minimum the possibility of vibration strains or wear.

(7) Safety devices.

(a) You must use spring-loaded internal type safety relief valves on all motor fuel containers.

(b) You must locate the discharge outlet from safety relief valves on the outside of enclosed spaces and as far as practicable from possible sources of ignition, and vented upward within 45 degrees of the vertical in such a manner as to prevent impingement of escaping gas upon containers, or parts of vehicles, or on vehicles in adjacent lines of traffic. You must use a rain cap or other protector to keep water and dirt from collecting in the valve.

(c) When a discharge line from the container safety relief valve is used, the line must be metallic, other than aluminum, and must be sized, located, and maintained so as not to restrict the required flow of gas from the safety relief valve. Such discharge line must be able to withstand the pressure resulting from the discharge of vapor when the safety relief valve is in the full open position. When flexibility is necessary, you must use flexible metal hose or tubing.

(d) Portable containers equipped for volumetric filling may be filled in either the vertical or horizontal position only when oriented to place the safety relief valve in communication with the vapor space.

(e) WAC 296-24-47505 (10)(1) for hydrostatic relief valves shall apply.

(8) **Vaporizers.**

(a) Vaporizers and any part thereof and other devices that may be subjected to container pressure must have a design pressure of at least 250 p.s.i.g.

(b) Each vaporizer must have a valve or suitable plug which will permit substantially complete draining of the vaporizer. You must locate it at or near the lowest portion of the section occupied by the water or other heating medium.

(c) You must securely fasten vaporizers so as to minimize the possibility of becoming loosened.

(d) You must permanently mark each vaporizer at a visible point as follows:

(i) With the design pressure of the fuel-containing portion in p.s.i.g.

(ii) With the water capacity of the fuel-containing portion of the vaporizer in pounds.

(e) You must equip devices to supply heat directly to a fuel container with an automatic device to cut off the supply of heat before the pressure inside the fuel container reaches 80% of the start to discharge pressure setting of the safety relief device on the fuel container.

(f) Engine exhaust gases may be used as a direct source of heat supply for the vaporization of fuel if the materials of construction of those parts of the vaporizer in contact with exhaust gases are resistant to the corrosive action of exhaust gases and the vaporizer system is designed to prevent excessive pressures.

(g) You must not equip vaporizers with fusible plugs.

(9) **Gas regulating and mixing equipment.**

(a) You must install approved automatic pressure reducing equipment in a secure manner between the fuel supply container and gas-air mixer for the purpose of reducing the pressure of the fuel delivered to the gas-air mixer.

(b) You must provide an approved automatic shutoff valve in the fuel system at some point ahead of the inlet of the gas-air mixer, designed to prevent flow of fuel to the mixer when the ignition is off and the engine is not running. In the case of industrial trucks and engines operating in buildings other than those used exclusively to house engines, the automatic shutoff valve must be designed to operate if the engine should stop. Atmospheric type regulators (zero governors) will be considered adequate as an automatic shutoff valve only in cases of outdoor operation such as farm tractors, construction equipment, irrigation pump engines, and other outdoor stationary engine installations.

(c) You must completely isolate the source of the air for combustion from the passenger compartment, ventilating system, or air-conditioning system.

(10) **Stationary engines in buildings.** Stationary engines and gas turbines installed in buildings, including portable engines used instead of or to supplement stationary engines, must comply with the Standard for the Installation and Use of Stationary Combustion Engines

and Gas Turbines, NFPA 37-1970, and the appropriate provisions of WAC 296-24-47505 through 296-24-47509.

(11) **Portable engines in buildings.**

(a) Portable engines may be used in buildings only for emergency use, except as provided by (11) of this section.

(b) You must discharge exhaust gases to outside the building or to an area where they will not constitute a hazard.

(c) You must make provisions to supply sufficient air for combustion and cooling.

(d) You must provide an approved automatic shutoff valve in the fuel system ahead of the engine, designed to prevent flow of fuel to the engine when the ignition is off or if the engine should stop.

(e) The capacity of LP-gas containers used with such engines must comply with the applicable occupancy provision of WAC 296-24-47507(5).

(12) **Industrial trucks inside buildings.**

(a) Reserved.

(b) Reserved.

(c) Reserved.

(d) You must not leave trucks unattended in areas occupied by the public.

(e) Reserved.

(13) **Garaging LP-gas-fueled vehicles.**

(a) LP-gas-fueled vehicles may be stored or serviced inside garages provided there are no leaks in the fuel system and the fuel tanks are not filled beyond the maximum filling capacity specified in WAC 296-24-47505 (12) (a).

(b) You must close the container shutoff valve on LP-gas-fueled vehicles being repaired in garages except when fuel is required for engine operation.

(c) You must not park such vehicles near sources of heat, open flames, or similar sources of ignition or near open pits unless such pits are adequately ventilated.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. WSR 15-24-100, § 296-24-47511, filed 12/1/15, effective 1/5/16; WSR 04-19-051, § 296-24-47511, filed 9/14/04, effective 2/1/05. Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. WSR 99-17-094, § 296-24-47511, filed 8/17/99, effective 12/1/99; Order 73-5, § 296-24-47511, filed 5/9/73 and Order 73-4, § 296-24-47511, filed 5/7/73.]