

*B149.5S1-07*

***Supplement No. 1 to  
CAN/CSA-B149.5-05, Installation  
code for propane fuel systems and  
tanks on highway vehicles***

*January 2007*

**Note:** *General Instructions for CSA Standards are now called Updates. Please contact CSA Information Products Sales or visit [www.ShopCSA.ca](http://www.ShopCSA.ca) for information about the **CSA Standards Update Service**.*

**Title:** *Installation code for propane fuel systems and tanks on highway vehicles — originally published January 2005*

The following revisions have been formally approved and are marked by the symbol double delta ( $\Delta\Delta$ ) in the margin on the attached replacement pages:

<b>Revised</b>	Contents and Clauses 2 and 4.2.4
<b>New</b>	Annex E
<b>Deleted</b>	None

CAN/CSA-B149.5-05 originally consisted of **39 pages** (xi preliminary and 28 text), each dated **January 2005**. It now consists of the following pages:

<b>January 2005</b>	v–xi, 1, 2, and 7–28
<b>January 2007</b>	iii, iv, 3–6A, and 29

- Update your copy by inserting these revised pages.
- Keep the pages you remove for reference.

**IMPORTANT NOTICE**

Please consult with the appropriate authority having jurisdiction regarding the applicability of this Supplement.



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**SAE (Society of Automotive Engineers)**

J527-00

*Brazed Double Wall Low-Carbon Steel Tubing*△△ **UL (Underwriters Laboratories Inc.)**

UL 125

*Standard for Safety Valves for Anhydrous Ammonia and LP-Gas (Other Than Safety Relief)*

UL 132

*Standard for Safety Relief Valves for Anhydrous Ammonia and LP-Gas*

UL 429

*Standard for Safety Electrically Operated Valves*

UL 565

*Standard for Safety Liquid-Level Gauges and Indicators for Anhydrous Ammonia and LP-Gas***ULC (Underwriters' Laboratories of Canada)**

CAN/ULC-S642-1987 (R2000)

*Compounds and Tapes for Threaded Pipe Joints*△△ **United Nations**

Economic and Social Council

Economic Commission for Europe. Regulation No. 67: Equipment for liquefied petroleum gas.

TRANS/WP.29/656, 12 January 1999.

### 3 Definitions

**Note:** Throughout this Code, certain terms appear in bold italic type. These terms have been defined in this Clause to ensure understanding of their intended meaning in this Code. Defined terms have been highlighted in bold italic type only in certain key contexts. It is the responsibility of the user to ensure that the defined terms are understood in accordance with this Clause, whether or not they appear in bold italic type.

The following definitions apply in this Code:

**Accessory** — a part capable of performing an independent function and contributing to the operation of the fuel system that it serves.

**Approved** — acceptable to the authority having jurisdiction.

**Authority having jurisdiction** — the governmental body responsible for the enforcement of any part of this Code, or the official or agency designated by that body to exercise such a function.

- △ **Certified** (with respect to any appliance, accessory, component, equipment, or manufacturer's installation instructions) — investigated and identified by a designated testing organization as conforming to recognized standards, requirements, or accepted test reports.

**Component** — an essential part of a fuel system, accessory, or equipment.

**Connector** — tubing or hose with a fitting at each end for connecting an accessory, component, or equipment with piping or tubing.

**Converter** — see **Vaporizer**.

**Equipment** — a device, other than an accessory or component, that is connected to a piping or tubing system.

- △ **Fitting** — an item in a piping or tubing system that is used as a means of connection, such as an elbow, return bend, tee, union, bushing, coupling, cross, or nipple, but does not include such functioning items as a valve, pressure regulator, heat exchanger, float gauge, or level sensor.

**Flexible metallic hose** — an all-metallic flexible propane conduit.

- △ **Fuel rails hose (injector hose)** — a device used to convey fuel to and from the injector.

**Gauge** (when referring to the liquid level in containers) —

- △ **Electronic liquid-level sensor** — an electronic device inserted in the tank to provide an electric signal indicative of the level of the fluid in the tank.

**Fixed liquid level** — a type of liquid-level gauge that uses a small bleed valve and that is designed to indicate when the liquid level in a tank being filled reaches the point at which the gauge or its connecting tube communicates with the liquid within the tank.

**Float** — a variable-liquid-level gauge constructed with a float inside the container resting on the liquid surface that transmits its position to a pointer and dial outside the container.

- △ **Heat exchanger** — a device used to heat or cool liquid or vapour propane.

**Hose** — a flexible conduit.

- △ **Injector hose** — see **Fuel rails hose**.

- △ **Power supply bushing** — a device used to supply power to such items as fuel pumps, actuators, and electronic level sensors.

- △ **Propane injector device** — a device to inject propane, in either liquid or vapour state, into the manifold or cylinder of an engine.

**Regulator** — see **Vaporizer**.

**Tank** (with respect to propane storage) — the class of container for the storage and transportation of propane, designed and fabricated in accordance with CSA B51.

**Manifold tank** — a tank that consists of two or more tanks, as fabricated by the original manufacturer, interconnected by rigid, integral, nonremovable liquid and vapour passages and braced to form a single rigid unit.

**Valve** — a device by which the flow of a fluid can be started, stopped, or regulated by a movable part that opens or obstructs passage.

**Back check valve** — a valve that is normally closed and allows flow in only one direction.

**Excess-flow valve** — a valve designed to close when the liquid or vapour passing through it exceeds a prescribed flow rate as determined by a pressure drop across the valve.

**Hydrostatic relief valve** — a pressure relief valve installed in a liquid propane line.

**Internal excess-flow valve** — an excess-flow valve that remains functional within the tank when any portion of the valve external to the tank's perimeter is sheared off or otherwise damaged. An internal excess-flow valve can be integral to another valve.

**Note:** *The perimeter of the tank is taken to mean not only the surface of the tank's shell and ends but also the outline of any boss, spigot, or nozzle welded to the tank so as to project outwards from it. The outline of welded brackets, mountings, guards, subcompartments, and the like are not considered part of the perimeter for the purpose of this definition.*

Δ **Internal valve** — a valve designed and installed so that its seat is within a tank and the arrangement of the parts of the valve is such that damage to the parts outside the tank will not prevent effective seating of the valve.

**Shut-off valve** — a valve that is part of a system and that is designed to limit and shut down the flow of propane.

**Stop-fill valve** — a device in a tank that is intended to automatically shut off the flow of liquid into the tank when a predetermined fixed level is achieved.

**Vaporizer (converter or regulator)** — an appliance for converting liquid propane to vapour by means other than atmospheric heat transfer through the surface of the tank.

## 4 General

### 4.1 Application

#### 4.1.1

For the purpose of this Code, the requirements contained in CAN/CGSB-3.14 for propane or CAN/CGSB-3.13 for butane shall apply.

#### 4.1.2

When a specification or document referenced in Clause 2 contains a requirement that conflicts with a requirement in the Code, the requirement in this Code shall govern.

#### 4.1.3

Propane distributed for fuel purposes shall be odorized in accordance with CAN/CGSB-3.14.

#### 4.1.4

An **accessory, component, equipment**, or any other item shall be installed in accordance with the manufacturer's **certified** installation instructions and this Code.

Δ **4.1.5**

Where a conflict exists between the manufacturer's **certified** installation instructions and this Code, the requirements of this Code shall prevail unless otherwise **approved**.

Δ **4.1.6**

When a fuel **tank** is being repaired, requalified, or scrapped, its liquid contents shall only be removed by flaring or by transfer to another container.

Δ **4.1.7**

The material of the **equipment** that is in contact with the propane shall be compatible with propane and the intended service.

### 4.2 Approval of accessories, components, equipment, and material

#### 4.2.1

A **valve, accessory, component, equipment**, or material used in an installation shall be of a type and rating **approved** for the specific purpose for which it is employed.

### 4.2.2

When deviation from or postponement of these requirements is necessary, permission in writing shall be obtained from the **authority having jurisdiction** before the work proceeds, and this permission shall apply only to the particular installation for which it is given.

### 4.2.3

Used **accessories**, **components**, and **equipment** shall be inspected and determined by the installer to be safe for use.

### △△ 4.2.4

**Valves**, **components**, and **accessories** shall be **approved** to the relevant Standards. See Annex E.

## 4.3 Responsibilities of the installer

### 4.3.1

Before leaving an installation, the installer shall ensure that any **accessory**, **component**, or **equipment** installed is in accordance with the Code requirements, and the person initially activating the propane fuel system shall ensure that the system is in safe working order.

### 4.3.2

The installer shall instruct the user in the safe and correct operation of the fuel system.

### 4.3.3

The installer shall ensure that the manufacturer's instructions supplied with the **component**, **accessory**, or **equipment** are left with the user.

### 4.3.4

Before installing any replacement part of a propane fuel system, the installer shall ensure that the replacement part provides operational characteristics at least equivalent to those of the original part.

### 4.3.5

It shall be the responsibility of the installer of a piping or tubing system to perform pressure tests in accordance with [Clause 5.7.10](#) and to ensure that the piping or tubing system is gas-tight at the completion of the tests.

## 4.4 Training and quality of labour

### 4.4.1

All work shall be done in a skillful, thorough manner. Careful attention shall be paid not only to the mechanical execution of the work but also to the arrangement of the installation.

### 4.4.2

Personnel performing installation, operation, and maintenance work shall be properly trained in such functions.

### 4.4.3

Propane shall be transferred from one container to another only by a person who is the holder of a certificate recognized by the **authority having jurisdiction**.

## **4.5 Smoking**

Smoking or providing any other source of ignition shall not be permitted in the area where work is being done on piping, tubing, or **equipment** that contains or has contained propane unless the piping, tubing, or **equipment** has been purged of all propane.

## **4.6 Isolation of safety devices**

Isolating or rendering inoperative a relief **valve** or a safety **component, accessory, or equipment** shall be prohibited.

## **4.7 Leak detection**

### **4.7.1**

A match, candle, flame, or other source of ignition shall not be used to check for a propane leak.



## △△ *Annex E (normative)*

# ***Relevant Standards for valves, components, and accessories***

**Note:** *This Annex is a mandatory part of this Standard.*

Component	Reference Standard
Automatic liquid level control (stop-fill) valves	UL 125 or Annex 3 of Standard EN67*
Carburetor, mixers, and adapters	Annex 11 of Standard EN67
Electronic liquid level sensor	Annex 3 of Standard EN67*
Filler valves (remote fueling)	UL 125 or Annex 9 of Standard EN67*
Fixed liquid level vent valves	UL 125 or Annex 3 of Standard EN67*
Float type liquid level gauges	UL 565 or Annex 3 of Standard EN67*
Fuel rail	Annex 11 of Standard EN67*
Fuel tanks	See Clause 5.2 of this Standard
Gas dosage unit	Annex 12 of Standard EN67*
Gas pressure regulator	Annex 6 of Standard EN67*
Hydrostatic relief valves	UL 132
Liquid excess flow valves	UL 125
Power supply bushing	Annex 3 of Standard EN67*
Pressure and temperature sensors and switches	Annex 13 of Standard EN67*
Propane fuel pumps	Annex 4 of Standard EN67*
Propane heat exchanger	CSA B51
Propane injection devices	Annex 11 of Standard EN67*
Solenoid valves	UL 429 and UL 125; or Annex 3 of Standard EN67*
Supply/return lines	See Clauses 5.7.2 and 5.7.3 of this Standard
Vaporizers	Annex 6 of Standard EN67
Withdrawal (service) valves other than solenoid type valves	UL 125 or Annex 7 of Standard EN67*

\*Components shall be suitable for temperatures of  $-40\text{ }^{\circ}\text{C}$  and relief pressures based on service.

