IN THE MATTER OF:

Technical Standards and Safety Act 2000, S.O. 2000, c. 16,
Ontario Regulation 223/01 (Codes and Standards Adopted by Reference),
and
Ontario Regulation 211/01 (Propane Storage and Handling)

The Director for the purposes of Ontario Regulation 211/01 (Propane Storage and Handling), pursuant to section 9(1) of Ontario Regulation 223/01 (Codes and Standards Adopted by Reference), hereby provides notice that the PROPANE CODE ADOPTION DOCUMENT published by the Technical Standards and Safety Authority and dated June 1, 2001, as amended, is further amended as follows:

All sections of the Propane Code Adoption Document previously published are revoked and replaced with the following:

Background:

This amendment to the Propane Code Adoption Document (CAD) revokes and replaces the previous amendment (FS-211-14, dated August 1, 2014). A delta symbol (Δ) in the margin indicates a provision that is new or that has been changed by this CAD amendment. Background information is included for such new or changed provisions.

This CAD amendment adopts new requirements approved by the B149.2 and B149.5 Code Committees for the 2015 Code that are considered important to be implemented in Ontario now and addresses gaps in the current codes to enhance safety.

Major changes in this version include following:

- Adoption of B149.2-15, B149.5-15 and TSSA-FA-2016
- Adoption of B149.1-15 for RV appliances which have been moved from B149.2 to B149.1 in 2015
- Adoption of Field Approval Code and Mobile Food Unit Approval Code
- New requirements for labelling of tanks mounted on OEM and converted vehicles for motive power and for RV for supplying appliances

1. The CSA Standard B149.2-10 B149.2-15 “Propane Storage and Handling Code” published in August 2015 by the Canadian Standards Association is adopted with the following amendments:
1.1 Clause 1.2 is amended by adding the following subclause:

(l) propane used as refrigerant.

1.2 Clause 3 is amended by revoking the definitions of “Appliance”, “Approved”, and “Authority having jurisdiction”.

1.3 Clause 3 is amended by adding the following definitions:

**Authority having jurisdiction** — the Director designated for the purposes of O. Reg. 211/01 (Propane Storage and Handling).

**Construction site** — a temporary worksite involving construction activities such as the erection, alteration, and dismantling or demolition of a building or equipment, re-roofing of a building, or digging.

**Cylinder exchange** - a facility where propane in refillable *cylinders* is sold or otherwise distributed to an end user, with cylinders stored in no more than four (4) cabinets and each cabinet contains no more than 500 lb of propane.

1.4 Clause 4.1.4 is revoked and the following substituted:

4.1.4 Where a conflict exists between the manufacturer’s certified instructions and this Code, the requirements of this Code shall prevail unless otherwise approved by the authority having jurisdiction.

1.5 Clause 4.2.3 is revoked and the following substituted:

4.2.3 The approval of the assembly or construction of an appliance is subject to the authority having jurisdiction. (See TSSA Field Approval Code, TSSA-FA-2012 TSSA-FA-2015)

Δ 1.6 Clause 5.12 is amended by adding:

5.12.7 Vehicles which have permanently mounted propane tanks for fueling the appliances shall have two labels of approved design, to be affixed by a certificate holder on
(a) the inside of the rear window or rear side window of the vehicle in close proximity to the filling location, where it can be observed by the attendant prior to filling; and
(b) either a door latch or the inside of the glove compartment

See Figure 5.1

5.12.8
All propane fuel system shall be inspected at 5 year intervals, starting with the date of installation, and re-labelled in accordance with Clause 5.12.7(a).

5.12.9
Appliances shall be inspected every 5 years in accordance with the B149.1 and the inspection report shall be provided to the propane conversion centre. The copy of the inspection report must be no older than 90 days when received by the propane conversion centre.

5.12.10
A label applied in accordance with section 5.12.7 shall show an expiry date of 5 years after the date of inspection.

5.12.11
Where a label is missing or lost, a new label may be applied showing the remaining time until expiry without a vehicle inspection, provided that documentation is provided of the vehicle conversion or most recent vehicle inspection date.

5.12.12
The inspection of appliances shall be carried out by a valid G1, G2, RV1, RV2 certificate holder.

5.12.13
The inspection of the tank in shall be carried out by a holder of a valid Internal Combustion Alternate Fuel Technician, Propane (ICE-P) certificate. The inspection shall be carried out at a registered vehicle conversion centre.

5.12.14
Propane conversion centres shall keep records of the vehicles that have inspected. Records shall include
- VIN number of the vehicle,
- Licence plate number of the vehicle,
- make and model of vehicle,
- date of conversion/inspection,
- TSSA label numbers (TSSA issued door label and window label number),
- name and contact information for the vehicle owner,
- copy of appliance inspection report, and
- name of the certificate holder who did the conversion.

1.7 Clause 6.1.14 is revoked and the following substituted:

**6.1.14**

Cylinders requalified in accordance with Clause 6.1.5 and with a propane capacity of 40 lb (18 kg) or less shall be equipped with a cylinder valve that does not permit the flow of propane until a positive seal has been achieved. Industrial cylinders manufactured under specification DOT-4BW260/TC-4BWM18 are exempt from this requirement when used in cutting or welding applications. When requalifying DOT-4BW260/TC-4BWM18 cylinders, valve replacement may be made by using a valve outlet conforming to the CGA 510 standard, not requiring a positive seal and with a PRV set at 405 psi.

1.8 Clause 6.4.4 is revoked and the following substituted:

**Background:**

To enable a fuelling attendant at a propane refill station to confirm that the appliances on the RV have been checked so that he/she could fill the permanent tanks in compliance with S 16 for O Reg 211-01
6.4.4
(a) Before filling a container, it shall be inspected. If a cylinder has a sleeve, it shall be removed to facilitate the visual inspection prior to filling the cylinder.
(b) A cylinder that is damaged, leaking, or corroded beyond TC limits, or is due for a prescribed re-examination, shall not be filled but shall be removed from service.

1.9 Table 6.3 is amended by deleting “that have a maximum capacity of 20 lb (9 kg)” from the note.

1.10 Clause 6.5.1.14 is revoked and substituted with

6.5.1.14
A cylinder that contains propane liquid or vapour shall not be stored on the roof of a building, unless it is stored in accordance with clause 6.5.3.8 or connected for use in accordance with clause 6.8.

1.11 Subclause 6.5.2.4 (d) is revoked and the following substituted:

(d) It shall be maintained in an upright position.

1.12 Clause 6.5.3.1 is revoked and substituted with the following:

6.5.3.1

6.5.3.1.1
Any cylinder that is not properly connected for use in an approved manner is deemed to be in storage.

6.5.3.1.2
(a) A stored cylinder shall be located in a storage area that is outdoors and that complies with the requirements of clause 6.5.3.2.
(b) Notwithstanding clause 6.5.3.1.2(a), a cylinder storage area in a structure with overhead protection, walls, or both shall be deemed to be outdoors if the following conditions are met:
   i. The structure is designed to be enclosed by no more than two solid walls on the level the cylinders are stored,
   ii. The cylinders are located within 25 ft (7.6 m) of an open area of the perimeter opening,
iii. When a wall of the structure is a part of a building, that building must be under construction, repair, improvement, and there must be no inhabited dwelling units or inhabited sections of that building,
iv. There are no openings through which gas may travel to a lower elevation, such as an open stairway on the floor on which the cylinders are located, and
v. There are no wall openings through which gasses could travel into another structure or building.

(c) Cylinders may be stored in a cabinet that meets clause 6.5.2.4, in the storage area.
(d) A storage area may be on a roof of a structure or building provided the conditions of clause 6.5.3.8 are met.

1.13 Clause 6.5.3.2 is revoked and replaced with the following:

6.5.3.2
Cylinders in storage shall
a) be stored in an area that:
   i. provides protection from tampering;
   ii. is free from vehicular or mobile equipment travel, or protected by barriers or equivalent protection;
   iii. has “NO SMOKING” signs that are prominently displayed. These signs shall be in accordance with Clause 7.12.3; and
   iv. meets the requirements of Table 6.3
b) be placed such that the relief valve on any cylinder is not less than 3 ft (1 m) horizontally from any building opening that is below the level of the relief valve discharge;
c) be placed such that the relief valve discharge is not less than 10 ft (3 m) on the horizontal plane from the air intake of any appliance or air-moving equipment;
d) be stored in an area that meets the requirements of Clause 6.5.1 and 6.5.3.8.

1.14 A new Clause 6.5.3.8 is added, as follows:

6.5.3.8 Cylinders on building rooftops

Cylinders on building rooftops shall comply with the following:
(1) A propane cylinder shall not be on the roof of a building unless the cylinder is to be connected for work undertaken on the roof during the current or the following work shift.

(2) Cylinders not in use shall be stored in accordance with provisions of clause 6.5.3.2 and the following shall additionally be met:
   a. the cylinder weight shall not exceed the capacity of the roofing structure;
   b. the storage area shall be at least 10 ft (3 m) from the building edge or a change in elevation of more than 3 feet (1 m);
   c. cylinders shall be secured to maintain the cylinder in its proper storage position during inclement weather; and
   d. all cylinders shall be removed upon completion of the work.

(3) Cylinders properly connected in an approved manner to the appliance it serves shall be adequately secured from inclement weather.

(4) No more than 1000 lb (450 kg) of propane in total capacity shall be on the roof.

1.15 A new Clause 6.5.11 is added:

6.5.11 Cylinder Exchange

6.5.11.1 General Requirements

In addition to other applicable cylinder storage requirements such as clause 6.5.1.9 and Table 6.3, facilities operating cylinder exchanges that are accessible to the public shall comply with the following requirements:

a) Cylinders shall be stored in a lockable, ventilated metal cabinet or other approved enclosure.

b) Cylinders shall be accessible only by authorized personnel or by use of an automated exchange system in accordance with Section 6.5.11.2.

c) A sign shall be posted on the entry door of the business operating the cylinder exchange stating “DO NOT BRING PROPANE CYLINDERS INTO THE BUILDING”.

d) An emergency contact information sign shall be posted within 10 ft (3 m) of the cylinder storage cabinet.

e) Electrical equipment within 5 ft (1.5 m) of cylinder exchange cabinets shall have a rating according to the Canadian Electrical Code, Part 1, Class 1, Group D, Division 2.

f) Protection of cylinders for resale shall be as per 6.5.4.2 (b).
6.5.11.2 Automated Cylinder Exchange Machine

_Cylinder exchange_ stations that include an automated vending system for exchanging _cylinders_ shall comply with the following additional requirements:

a) The Automated _Cylinder Exchange_ Machine shall only permit access to a single _cylinder_ per individual transaction.

b) Cabinets storing _cylinders_ shall be designed such that _cylinders_ can only be placed inside when they are oriented in the upright position.

c) Devices operating door releases for access to stored _cylinders_ shall be permitted to be pneumatic, mechanical or electrically powered.

d) A manual override control shall be permitted for use by authorized personnel. On Automated _Cylinder Exchange_ Machines, the vending system shall not be capable of returning to automatic operation after a manual override until the system has been inspected and reset by authorized personnel.

e) Inspections shall be conducted by authorized personnel to verify that all _cylinders_ are secured, access doors are closed and the Automated _Cylinder Exchange_ Machine has no visible damage or obvious defects which necessitate placing the station out of service.

f) There shall be a system, activated by a fusible link, designed to create a temporary inert atmosphere in the interior of the cabinet.

g) The system shall be equipped with a propane detector and if the system detects a propane leak the Automated _Cylinder Exchange_ Machine will put itself in an out-of-service condition and send an email notification to the supplier.

h) The area where the Automated _Cylinder Exchange_ Machine is located shall be illuminated.

i) All moving mechanisms in the Automated _Cylinder Exchange_ Machine shall be of non-sparking construction.

1.16 Clause 6.6 (Transportation of cylinders) is revoked

△ 1.9 Clause 6.1 is amended by adding the following

6.1.16

Where cylinders are stored in areas that are not free of vehicular or mobile equipment travel, they shall be protected as per Clause 7.19.4. These requirements apply to Clause 6.5.2.4, 6.5.3.2 and 6.5.4.2.

**Background:**

To provide clear guidelines for vehicular protection
1.10 Clause 6.5.2.6.1 (e) is revoked and the following substituted

   e) Electrical equipment within 5 ft (1.5 m) of cylinder exchange cabinets shall have a rating according to the Canadian Electrical Code, Part 1, Class 1, Group IIA, Zone 2.

   **Background:**
   The same requirement of having 5' separation distance for cages from the source of ignition as agreed in the previous CAD is maintained.

1.11 Clause 6.5.2.6.1(f) is revoked and the following substituted

   f) Where the cylinders for resale are located in an area subject to vehicular or mobile equipment travel, they shall be protected by posts or barriers as per Clause 7.19.4. The criteria for determining whether protection is required are as per Annex P.

   **Background:**
   To provide clear guidelines for vehicular protection

1.12 Clause 6 is amended by adding the following:

**6.10 Requirements for Operation of Appliances and Cylinders at Shows, Exhibitions or other Similar Events**

   The operation of appliances and cylinders at shows, exhibitions, or other similar events shall comply with Annex J of CSA-B149.1-15 as adopted by Gaseous Fuel Code Adoption Document published by the Technical Standards & Safety Authority.

**6.11 Filling cylinders under 100 lbs from bulk trucks**
The filling of cylinders under 100 lbs from bulk trucks shall comply with Annex M-Q of this Code.

\[6.12\] Handling of Cylinders in Classrooms

The handling of cylinders in classrooms shall comply with Annex R of this Code

Background:

To provide clear requirements for use of cylinders in classrooms

\[\Delta1.13\] Clause 7.1 is amended by adding

7.1.16
All tanks shall be inspected and inspection recorded at a minimum interval of every three (3) years.

Background:

To be in line with pressure vessel requirements that all pressure vessels require inspection every three years

\[\Delta1.14\] Clause 7.2 is amended by adding

7.2.5
Relief valves shall be inspected and inspection recorded at a minimum interval of every five (5) years. The process as per “Pressure Relief valve (PRV) Replacement Intervals, Visual Inspections and Data Collection Requirements for Propane Tanks” published by Canadian Propane Association, January 2015, shall be followed.

7.2.6
Tanks of greater than 2,500 USWG shall have the relief valves rebuilt/certified or replaced every 10 years. All overdue relief valves shall be rebuilt/certified or replaced by January 1, 2023. Operating companies shall have a replacement program for replacing the overdue valves by January 1, 2017 that will have the following targets as a minimum:

- By January 1, 2018, completion for tanks of 25 years or older and no less than 10% of overdue valves;
- By January 1, 2020, completion for tanks of 20 years or older and 30% of overdue valves; and
- By January 1, 2021, completion for tanks of 15 years or older and 50% of overdue valves.

**7.2.7**
Tanks of 2,500 USWG or less shall have the relief valves rebuilt/certified or replaced every 25 years. All overdue relief valves shall be rebuilt/certified or replaced by January 1, 2026. Operating companies shall have a replacement program for replacing the overdue valves by January 1, 2017 that will have the following targets as a minimum:

- By January 1, 2018, completion for tanks of 40 years or older and no less than 10% of overdue valves;
- By January 1, 2021, completion for tanks of 35 years or older and no less than 30% of overdue valves;
- By January 2023, completion for tanks of 30 years or older and no less than 50% of overdue valves.

**Background:**
To adopt the requirements in B51 new edition and allow a grace period of seven (7) years for tanks greater than 2,500 USWG and ten (10) years for tanks of 2,500 USWG or less. Each operating company should have a plan and start acting as soon as these requirements come into effect.

**1.15** Clause 7.8.1 is revoked and the following substituted:

**7.8.1**
A tank shall only be installed underground in accordance with the manufacturer’s instructions and the requirements of this section.

**1.16** Clause 7.8.11 is revoked and the following substituted:

**7.8.11**
The minimum distance between the top of an underground tank and grade shall be in accordance with subclauses 7.8.12(c) and (d). Adequate protection in the form of fencing, guardrails, or bumper posts that comply with the requirements of clause 7.19.4 shall be provided for the above ground piping system and relief valve exhaust stacks to prevent abrasive action or physical damage from vehicular traffic. Tanks with a capacity below 2000 USWG are not required to have an exhaust stack.
1.17 Clause 7.8.12 is revoked and the following substituted:

**7.8.12**

An underground tank shall be located a minimum distance of
(a) 5 ft (1.5 m) from a line of adjoining property that cannot be built upon and from other underground services;
(b) 10 ft (3 m) from a line of adjoining property that may be built upon and from another underground tank;
(c) 6 in. (15 cm) below grade in areas where there is no vehicle traffic or where the tank is protected from damage by vehicles by fencing, guardrails or bumper posts that comply with the requirements of clause 7.19.4; and
(d) 18 in. (46 cm) below grade in areas where vehicular traffic can be expected.

1.18 Clause 7.8 is amended by adding following clause:

**7.8.1819**

Underground tanks shall be inspected in accordance with the manufacturer’s recommendations.

1.19 Clause 7.12.6 is revoked and the following is substituted:

**7.12.6**

In heavily populated or congested areas, the **authority having jurisdiction** may determine restrictions on individual tank capacity, total storage, parking of tank trailers and cargo liners, distance to line of adjoining property, and other requirements. The **filling plants** and **refill centres** shall comply with the requirements in Branch Standard No. 9 or a full risk and safety management plan prepared by a Professional Engineer acceptable to the **authority having jurisdiction**.

1.20 Subclause 7.19.4.2(b) is amended by appending the following sentence:

Alternatively, the Ontario Provincial Standard Drawing precast concrete barrier (OPSD-920.010 or 920.014, 911.140) may be used.

1.21 Clause 7.19.4 is amended by adding to it the following clauses:

**7.19.4.4 7.19.4.5**

Protection of tanks used to supply propane to **buildings** or sites under construction, repair or improvement may be accomplished by the installation of posts, guardrails or reinforced concrete
barriers as required in clauses 7.19.4.1, 7.19.4.2 and 7.19.4.3 or by using:
(a) concrete castings, weighting at least 900 lbs (410 kg) and not less than 30 inches (750 mm) in height. Any opening between barriers shall not exceed 54 inches (1350 mm); or
(b) a continuous berm pile having a minimum height of 36 inches (900 mm).
Distances between barriers and tanks shall be in compliance with the typical illustrations shown in Annex B.

7.19.4.5 7.19.4.6
In mine sites, logging facilities or asphalt plants, a continuous berm pile having a minimum height of 36 inches (900 mm) may be used to protect propane storage tanks and equipment.

△ 1.22 Clause 8.1.2 is revoked and the following substituted

8.1.2
Propane equipment on a tank and its related piping shall be in accordance with Annex T and shall be maintained in good working order and kept free of leaks at all times

Background:
S28(1) of O Reg 211-01 requires a tank truck to be licensed. Annex T provides the technical requirements for the tank trucks to be licensed.

1.23 Clause 8.12.3 8.4.3 is revoked and the following substituted:

8.4.3
The contents of a tank on a tank truck or a cargo liner shall not be transferred to the cargo tank on another tank truck or cargo liner unless the operation is carried out at a filling plant.

Except for an emergency such as a loss of power due to unexpected natural weather, the transfer of propane from a cargo tank to another tank truck or cargo liner at the filling plant shall be approved.

Note: TSSA will consider the following before granting an approval to transfer propane from a cargo tank to another tank truck or cargo liner at a filling plant:
- The filling plant shall be hold a valid licence
• The filling plant shall have a permanent licenced storage capacity of at least the largest tank truck, or the amount of the truck to truck transfer shall be specifically approved by TSSA.
• The transfer shall be performed by a Propane Truck Operator (PTO) certificate holder.
• The risks associated with the operation, including mitigation measures and emergency procedures in place.
• Sufficient space to accommodate both tank trucks without blocking any emergency exits shall be maintained; and
• All requirements and minimum clearances of CSA B149.2-10, including emergency shutoff valves shall be complied with.

1.24 Clause 8.14.3 8.6.3 is amended by adding to it the following:

(c) Notwithstanding (a) and (b), a tank truck, tank trailer or cargo liner carrying propane shall not be parked and used for storage in a congested or heavily populated area or within 50 ft of a building used for assembly, care or detention or multiple residential occupancy.

1.27 A new Clause 12 is added, as follows:

12—— Operation, Maintenance, and Personnel Training

12.1—— General
Each holder of a licence to operate a filling plant or a container refill centre, or any company acting as a distributor as defined in O. Reg, 211/01, shall develop documented operation, maintenance, and training procedures based on its experience, knowledge of its propane plants, and the conditions under which the procedures will be used. Clause 12.2 contains basic requirements and minimum standards for the safe operation and maintenance of propane operations and for personnel training. Note: Because there are many variables, it is not possible to prescribe a set of operation and maintenance procedures that will be adequate from the standpoint of safety in all cases without being burdensome and, in some cases, impractical.

12.2—— Operations and Maintenance Procedures
Procedures shall be established appropriate to tank systems, filling plants, container refill centres and other facilities as follows:
(a) Operating procedures sufficient to ensure safety and reliability in the day-to-day operation of the facility.
(b) Maintenance procedures covering testing, inspection, monitoring and documentation, equipment repair and general upkeep.

12.2.1 Documentation of procedures
The procedures in clause 12.2 shall be documented in a form appropriate to the particular facility in notices, manuals, guidelines, or other recorded instructions on display or readily available at the facility.

12.2.2 Review and revision of procedures
The procedures shall be reviewed as necessary to ensure they are promptly modified upon any equipment or organizational changes.

12.2.3 Operating procedures
The operating procedures shall be appropriate to the particular facility and shall take into account, amongst other things, the following:
(a) Emergency procedures.
(b) Emergency evacuation procedures and designated safe location.
(c) Product transfer and handling procedures.
(d) Monitoring of essential functions and equipment.
(e) Housekeeping and site maintenance.
(f) Any manufacturer’s operating instructions for equipment.
(g) Equipment not in use (i.e., isolation, deactivation, identification).
(h) Maintaining clear spaces for access.
(i) Maintaining clearances for setbacks.
(j) Personnel safety.
(k) Personal protective equipment.
(l) Control of ignition sources.
(m) Grounding and bonding.
(n) Control of access, security and lock-up.
(o) Vehicle movement and parking.
(p) Operator experience.

12.2.4 Maintenance Procedures
12.2.4.1 Maintenance procedures shall be appropriate to the particular facility and shall take into account, amongst other things, the following:
(a) Inspection of protective devices and alarms.
(b) Regular inspection and testing of hoses.
(c) Regular review of emergency procedures.
(d) Regular review of emergency evacuation procedures and designated safe location.
(e) Propane purging procedures.
(f) Isolation and tagging.
(g) Fire extinguishers and firefighting equipment.
(h) Piping, pumps, valves and other propane equipment.
(i) Storage tanks.
(j) Electrical equipment.
(k) Fencing and security measures, signage and notices.
(l) Lighting.
(m) Regular inspection and testing of vaporizers in a grid-type distribution systems.
(n) Any manufacturer’s maintenance instructions for equipment.

12.2.4.2
Persons who perform maintenance on propane systems shall be a certificate or record of training holder and trained in the hazards of the system and in the maintenance and testing procedures applicable to the facility.

△ 1.25 The annexes are amended by adding Annex P as follows:

Annex P
Criteria for Determining the Need for Vehicular Protection for Cages
Cylinder Exchange Cabinet (CEC) install site, (no curb)

Cylinder Exchange Cabinet (CEC) install (no curb, perpendicular orientation)
Cylinder Exchange Cabinet (CEC) install site. CEC < 3ft from raised curb.

Cylinder Exchange Cabinet (CEC) install site. CEC ≥ 3ft from raised curb.

Background:
See 1.10 (Revised Clause 6.5.2.6.1(f) of CSA-B149.2-15)
The annexes are amended by adding Annex Q as follows:

Annex M  Q

Conditions for Filling Cylinders under 100 lbs from Bulk Trucks

Q.1
Section 27 of O. Reg. 211/01 establishes the conditions for cylinder handling facilities. In summary, the following is required:

Q.1.1
- Subsection 27(1) requires that each facility is licensed;
- Subsection 27(3)(c) requires a letter from the local municipality stating that the proposed site does not contravene the zoning by-laws; and
- Subsection 27(3) (d) requires drawings for each site.

Q.1.2
Each application shall be approved in accordance with the requirements of O. Reg. 211/01 under the Technical Standards and Safety Act, 2000, and the conditions outlined below. Non-conformity with any of the conditions specified shall thereby cause the approval to lapse.

Q.1.3
Each proposed site shall be approved. Drawings shall be submitted in accordance with O. Reg. 211/01, s. 27(3) (d).

Q.1.4
Applications must include a letter from the local municipality stating that the refueling of propane cylinders does not contravene any applicable zoning bylaws.

Q.1.5
Calculations shall be submitted confirming that Branch Standard No. 9 has been met.

Q.1.6
Cylinders must be secured when being filled.

Q.1.7
Hoses used for refueling the cylinders shall be of the type used in container refill centres.
Q.1.8
The refilling of cylinders shall be performed in accordance with written procedures for refilling cylinders from a bulk truck.

△ 1.27
The annexes are amended by adding Annex R as follows:

Annex R
Use of Non-Refillable Propane Cylinders in Laboratories/Classrooms in Schools, Colleges and Universities

R1 Scope/General Requirements

R1.1 These requirements apply to the Use of Non-Refillable Propane Cylinders in laboratories/Classrooms in Schools, Colleges and Universities

R1.2 Instead of permanently installed gas systems feeding gas outlets for small appliances such as portable bunsen burners, the appliances may be connected to non-refillable cylinders in accordance with the conditions described below.

R1.3 The appliances and cylinders shall be used for educational and instructional purposes only.

R1.4 Propane cylinders shall be of the approved non-refillable type (TC-39, TC-2P and TC-2Q), commonly referred to as “single-trip” – with the maximum capacity of 16 oz.

R2 Classroom Quantities

R2.1 No more than the quantity of cylinders required to fuel the appliance shall be brought into the laboratory/classroom.

R2.2 Not more than 20 cylinders may be connected for use in a laboratory/classroom at one time or one (1) cylinder to every two (2) students, whichever number is lower.

R3 Classroom/ Laboratory Use

R3.1 Cylinders shall be directly connected to the appliance without the use
of hose.

**R3.2**
Only one cylinder per appliance shall be used.

**R3.3**
An appliance shall not be located so as to obstruct an entrance or exit of a laboratory or the pathway to such an exit or entrance or a stairway.

**R3.4**
The appliances/cylinders shall be secured so as to prevent accidental tip over. Bunsen burners should be secured to retort stands.

**R3.5**
A leak test, using a leak detection solution or a gas detector, shall be carried out on all connections each time the cylinder is connected to the appliance for use. A source of ignition shall not be used to check for leaks.

**R3.6**
Acceptable leak test methods are:
- Use of a leak detection solution.
- Any other leak detection method.

**R3.7**
A source of ignition shall not be used to check for leaks.

**R3.8**
At no time can appliances and cylinders be moved from the work station while operating.

**R3.9**
Appliances shall be disconnected at the end of class by the teacher or instructor in charge of the class or by students who have been properly trained for the operation.

**R3.9**
Cylinders shall be leak tested immediately after disconnection by the teacher or instructor in charge.

**R3.9**
A portable fire extinguisher classified not less than 10 B:C shall be located in each laboratory/classroom where the appliances and cylinders are used.

**R4 Training and Responsibilities**
R4.1
The instructor/teacher shall be in control of the operation of all appliances and cylinders to ensure safe operation and handling.

R4.2
All instructors and teachers supervising the use of these cylinders shall be trained and knowledgeable in the safe use of both the appliances and cylinders.

R4.3
Students shall not be allowed to connect or disconnect cylinders until they have been properly trained on the connecting/disconnecting procedure of a cylinder to an appliance.

R5 Cylinder Storage and Removal

R5.1
No cylinders shall be stored overnight in the laboratory/classroom that is not designed for cylinder storage.

R5.2
All cylinders, used and spares, shall be stored overnight in accordance with the Ontario Propane Code either outdoors or indoors in a special cylinder storage room or as per Clause 6.5.9.3.

R5.3
All cylinders that have been depleted of their product shall be treated the same as full or partly full and disposed of in an environmental-friendly manner according to the manufacturers’ instructions, ie, recycled at a hazardous waste site.

Background:
See 1.11 (New added Clause 6.12 for CSA-B149.2-15)

△ 1.28
The annexes are amended by adding Annex S as follows

Requirements for Tank Trucks, Tank Trailers, and Cargo Liners

S1 General

S1.1
All tank trucks, tank trailers, and cargo liners shall be designed, fabricated, and marked in accordance with the requirements of CSA Standard B620.
S1.2
Each tank shall be kept painted.

S1.3
The frame or chassis of a tank truck or tank trailer shall be designed and maintained in a manner that will prevent cracking or distortion of frame members resulting from concentration of stress, load, and vibration.

S1.4
Propane equipment on a tank and its related piping shall be maintained in good working order and kept free of leaks at all times.

S1.5
Propane offered for transport, and transported, shall comply with the Transportation of Dangerous Goods Regulations of Transport Canada.

S2  Tank Equipment on Tank Trucks, Tank Trailers, and Cargo Liners

S2.1
The discharge outlet from a relief valve shall be provided with a rain cap or other protector to keep water and dirt from collecting in the relief valve. The protector shall not reduce the flow through the valve. When a relief valve is installed in a well in the top of the tank, the well shall be kept painted or otherwise protected to reduce corrosion and kept free of water and dirt.

S2.2
Except for relief valve and liquid level gauge openings in a tank, the filling and vapour equalizing connections shall be equipped with at least one of the following:
(a) a combination of a single back check valve and an excess flow valve;
(b) a double back check valve, one seat of which shall be of the metal-to-composition type;
(c) an internal excess flow valve and a shut-off valve;
(d) an internal back check valve and a shut-off valve; or
(e) an internal valve.

S2.3
All internal threaded primary valves and fittings used in liquid filling or vapour equalization connections shall be of steel, malleable iron, or ductile iron construction.
S2.4
Each liquid discharge opening in a tank on a tank truck or cargo liner shall be equipped with an internal valve
(a) operated by mechanical or hydraulic means, or by air or gas pressure;
(b) with the operating system provided with a fusible link or plug that has a melting point not more than 220°F (105°C) that shall cause the internal valve to close if involved with fire;
(c) with at least one remote means of closure on a tank truck or cargo liner having an aggregate tank capacity of 3500 USWG (13 500 L) or less; and
(d) with at least two remote means of closure on a tank truck or cargo liner having an aggregate tank capacity over 3500 USWG (13 500 L). These remote control stations shall be located at each end of the tank or vehicle and diagonally opposed to each other.

S2.5
Relief valves shall be inspected and replaced in accordance with CSA Standard B620.

S3 Pumps and Compressors on Tank Trucks and Cargo Liners
S3.1
Pumps and compressors shall be protected from damage and may be
(a) mounted upon a tank truck or cargo liner; and
(b) operated by using the truck power take-off unit, an internal combustion engine with a shielded ignition system, or devices operated by hand, mechanical, hydraulic, or electrical means.

S3.2
A pump installed on a tank truck or cargo liner shall be equipped with an automatic by-pass valve or an internal pump relief valve that limits the differential pressure between the inlet and outlet.

S4 Piping, Tubing, Hose, and Fittings on Tank Trucks, Tank Trailers, and Cargo Liners
S4.1
Except as provided in Clause T4.2, piping and fittings shall comply with the requirements of Clause 5 of CSA Standard B149.1.

S4.2
Pipe shall be at least Schedule 80, and fittings shall be forged steel with a working pressure of not less than 2000 psig (14 000 kPa).
S4.3
Piping, tubing, and fittings shall be securely mounted and protected against damage and breakage.

S4.4
A flexible connector may be used to compensate for stresses and vibrations but shall not exceed 3 ft (1 m) in length.

S4.5
Where compensation for stress and vibration is required, it shall be achieved by the use of flexible metallic hose complying with ULC Standard C536, or a hose connector with stainless steel reinforcement complying with CGA Standard CAN/CGA-8.1.

S4.6
A hydrostatic relief valve with a start-to-discharge setting of not less than 375 psig (2500 kPa) and not more than 500 psig (3500 kPa) shall be installed between each pair of shut-off valves on liquid propane piping or hose and located so that it relieves in a safe manner.

S4.7
A piping or hose fitting used for loading or unloading propane shall be provided with a manual valve for relieving pressure before the hose is disconnected unless the valve is designed to limit the escape of propane released when disconnecting to 1/500 gal (10 mL).

S4.8
The owner of a tank truck, tank trailer, or cargo liner shall be responsible for ensuring that where signs of wear or deterioration or other damage are apparent in the reinforcement material of the hose or the hose connectors, they shall be immediately replaced.

S5 Electrical Equipment and Lighting on Tank Trucks, Tank Trailers, and Cargo Liners

S5.1
A tank truck, tank trailer, or cargo liner shall not be equipped with illumination other than from an electric source. Lighting circuits shall have over-current protection, and the wiring shall have sufficient current-carrying capacity to accommodate the electrical load. It shall be secured, grommeted, and protected against damage.

S5.2
Electric motors, wiring, equipment, and fixtures enclosed in the cabinet shall conform with the provincial or territorial electrical
code or the *Canadian Electrical Code, Part I*, for Class I, Division II, Group D hazardous locations.

**S6  Braking Systems and Chock Blocks**

**S6.1**
A *tank truck* or a *cargo liner* shall be equipped with either
(a) a fail-safe braking system that is interlocked with the pump power take-off; or
(b) chock blocks that shall be chained permanently to the vehicle for use at the rear wheels.

**S6.2**
At least one of the methods of braking detailed in Clause T6.1 shall be used when the vehicle is parked during loading or unloading.

**S6.3**
Every *tank trailer* shall be equipped with a reliable system of brakes, and provisions shall be made for its efficient operation from the driver's seat of the vehicle towing the trailer.

**S7  Exhaust Systems**
The truck engine exhaust shall be directed to the outside of the frame and skirting, away from the fuel system and *combustible* materials and from any *tank, valve*, pump, or piping.

**S8  Engine Fuel**
When propane is used in a truck engine, the fuel system shall be installed in accordance with CSA Standard B149.5.

**S9  Collision Protection**
Every *tank truck, tank trailer*, or *cargo liner* shall be provided with attached steel bumpers or chassis extensions attached so as to protect the *tank, piping, valves, and fittings* in the event of collision. All *valves* shall be safeguarded against damage resulting from collision, overturning, or other accident.

**S10  Fire Extinguishers**
Every *tank truck* and *cargo liner* shall be provided with at least one portable dry chemical fire extinguisher of not less than 20-B,C rating, and where more than one fire extinguisher is provided, each additional extinguisher shall have not less than a 5-B,C rating.

**S11  Tank Truck and Cargo Liner Lettering**

**S11.1**
Every *tank truck* and *cargo liner* shall be marked legibly and conspicuously on both sides and on the rear in letters not less than 4
in
(100 mm) high, and of a colour that contrasts sharply with the
background, with at least one of the following:
(a) the words COMPRESSED LP GAS;
(b) the word FLAMMABLE;
(c) the word PROPANE; or
(d) the name of the carrier if the name includes the word
PROPANE.

S11.2
Every tank truck or cargo liner shall bear the tank serial number
either
(a) on a permanent metal plate; or
(b) painted in legible letters not less than 1 in (25 mm) high on a
background of a contrasting colour.

S12 Towing Tank Trailers

S12.1
Every tank trailer shall be firmly secured by means of draw bars
supplemented by safety chains attached to the vehicle towing the
tank trailer.

S12.2
A 4-wheeled tank trailer shall be of a type that will follow directly
in the path of the towing vehicle.

Background:
See 1.20 (revised Clause 8.1.2 of CSA-B149.2-15)

2. The CSA Standard B149.5-4015 “Installation code for propane fuel
systems and containers on motor vehicles” published in August 2015 by the
Canadian Standards Association is adopted with the following
amendments:

2.1 Clause 3 is amended by revoking the definitions of “Approved” and
“Authority having jurisdiction”.

2.2 Clause 3 is amended by adding to it the following definition:

Authority having jurisdiction — the Director designated for the
purposes of O. Reg. 211/01 (Propane Storage and Handling).

2.3 Clause 4.1.5 is revoked and the following substituted:
4.1.5
Where a conflict exists between the manufacturer’s certified instructions and this code, the requirements of this code shall prevail unless otherwise approved by the authority having jurisdiction.

2.4 Clause 4.2.4 is revoked and the following substituted:

4.2.4.1
_valves, components, and accessories_ shall be approved to the relevant standards as per Annex F1 and in accordance with the process as described in Annex F2.

4.2.4.2
For _valves, components, and accessories_ manufactured before October 1, 2015, they shall either be approved as per Section 4.2.4.1 or approved to the relevant standards as per Annex E and also meets the IGAC Protocol No 09-17, issued on June 26, 2009.

2.4 Clause 5.3.4.6 5.3.5.6 is revoked and the following substituted:

5.3.5.6
A shut-off valve on a tank shall be accessible; the removal of any cover shall not require the use of tools.

\(\Delta\) 2.5 Clause 5.4.7 is revoked and the following substituted:

5.4.7
All tank attachment bolts shall have self-locking nuts or equivalent, protruding through any nut with a minimum of three (3) threads exposed. No bolts shall be cut to size and shall be a minimum of grade 5 type. Where a bolt passes through a sheet metal portion of the vehicle, a backup steel reinforcing plate shall be provided. This plate shall be a minimum 0.1 in (2.5 mm) thick with an area of at least 6 in² (3870 mm²). Sheet metal screws shall not be used as an attaching component, and where attachment is to a chassis of a unibody vehicle, existing frame holes shall be used where possible. Support to prevent the weakening of the frame members shall be provided. Material used for reinforcement shall be of steel and have a minimum thickness of 0.125 in (3.8 mm) and a diameter four times the diameter of the hole. Corrosion protection shall be applied to drilled and metal-reinforced areas. See Annex B and figure B1.

**Background:**

To clarify what is an acceptable practice for self-locking nuts.
2.6 Clause 5.5.3 is revoked and the following substituted:

5.5.3 **Tanks** and any other **components** of the fuel system shall be installed much road clearance as practicable. This clearance shall be measured from the bottom of the tank or the lowest fitting, support or attachment on the tank or fuel system or its housing (if any), whichever is lowest, as follows:

1. **Tanks** and any **component** of the fuel system installed between axles shall be no lower than the lowest point forward of the tank or fuel system on:
   (a) the lowest structural component of the body;
   (b) the lowest structural component of the frame or subframe, if any;
   (c) the lowest point of the engine;
   (d) the lowest point of the transmission (including the clutch housing or torque converter housing, as applicable).

2. **Tanks** and fuel system **components** installed behind the rear axle and extending below frame shall be no lower than the lowest point of the following points and surfaces:
   a. Not lower than the lowest point of the structural component of the body, engine, transmission (including clutch housing or torque converter housing, as applicable), forward of the tank or fuel system. Also no lower than the lines extending rearward from each wheel at the point where the wheels contact the ground directly below the centre of the axle to the lowest and most rearward structural interference (i.e. bumper, bumper frame, etc.).
   b. Where there are two or more rear axles, the projections shall be made from the rearmost axle.

2.7 Subclause 5.7.6 is amended by adding the following:

5.7.6.4 5.7.6.6

A supply line of a vehicle or a return line from the engine to the **tank** shall be installed to maintain a clearance of at least 2 inches (50 mm) from any positive unfused terminal.

2.8 Subclause 5.7.7 is amended by adding the following:
5.7.7.8
A supply line that pierces a panel of a vehicle shall be protected from damage by a grommet, bulkhead fitting or a similar device.

\[2.9\] Subclause 5.7.8 is amended by adding the following:

5.7.8.8
Gear clamps shall not be used.

**Background:**
Gear clamps were found to be used for propane vehicle conversion that leaked.

2.9 Subclause 5.13 5.12 is amended by adding the following:

5.13.5 5.12.6
*Tanks* shall be inspected every five years in accordance with the “Province of Ontario 5 Year Periodical Visual Inspection Procedure and Criteria for Propane Fuel Systems and Tanks on Highway Vehicles.” Where the Inspection Procedure contains a requirement that conflicts with a requirement in this code, the requirements in this code shall prevail.

5.13.6 5.12.7
A label applied in accordance with 5.13.1 shall show an expiry date of 5 years after the date of conversion or inspection.

5.13.7 5.12.8
Where a label described in 5.13.1 is missing or lost, a new label may be applied showing the remaining time until expiry without a vehicle inspection, provided that documentation is provided of the vehicle conversion or most recent vehicle inspection date.

5.13.8 5.12.9
The inspection required in 5.13.6 shall be carried out by a holder of a valid Internal Combustion Alternate Fuel Technician, Propane (ICE-P) certificate. The inspection shall be carried out at a registered vehicle conversion centre.

\[5.12.10\] Propane conversion centres shall keep records of the vehicles that have been converted or inspected. Records shall include - date of conversion/inspection,
- VIN number, licence plate number and the make and model of vehicle,
- TSSA label numbers (TSSA issued door label and window label number), and
- certificate holder name who did the conversion.

**Background:**

To ensure the propane conversion centres are operating in accordance with the regulations and facilitate audit by TSSA for compliance

**Δ 5.12.11**

Labels of approved design may be affixed on OEM (Original Equipment Manufacturer) propane vehicles.

**Δ 5.12.12**

A label of *approved* design shall be affixed by the certificate holder on the inside of the rear window or rear side window of the vehicle in close proximity to the filling location, where it can be observed by the attendant prior to filling. See Figure C.1. The label will be affixed once the certificate holder confirmed the vehicle is an OEM vehicle is approved under Canadian Federal Government Standard MVSS301.

**Background:**

Labels for OEM vehicles so that they could get fuel from operators who will only fuel propane vehicles with labels that were originally meant for converted vehicles.
2.10 A new Annex F is added:

**Annex F (normative)**

*Relevant Standards for valves, components, and accessories*

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

F1. Components shall be in compliance with the appropriate reference Standard shown below:

<table>
<thead>
<tr>
<th>Component</th>
<th>Reference Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic liquid level control (stop-fill) valves</td>
<td>UL-125 or Annex 3 of Standard R67*</td>
</tr>
<tr>
<td>Back check valves</td>
<td>UL-125 or Annex 7 of Standard R67*</td>
</tr>
<tr>
<td>Carburetor, mixers, and adapters</td>
<td>Annex 11 of Standard R67</td>
</tr>
<tr>
<td>Electronic liquid level sensor</td>
<td>Annex 3 of Standard R67*</td>
</tr>
<tr>
<td>Filler valves (remote fuelling)</td>
<td>UL-125 or Annex 9 of Standard R67*</td>
</tr>
<tr>
<td>Fixed liquid level vent valves</td>
<td>UL-125 or Annex 3 of Standard R67*</td>
</tr>
<tr>
<td>Float type liquid level gauges</td>
<td>UL-665 or Annex 3 of Standard R67*</td>
</tr>
<tr>
<td>Fuel rail</td>
<td>Annex 11 of Standard R67*</td>
</tr>
<tr>
<td>Fuel tanks</td>
<td>See Clause 5.2 of this Code</td>
</tr>
<tr>
<td>Gas dosage unit</td>
<td>Annex 12 of Standard R67*</td>
</tr>
<tr>
<td>Gas pressure regulator</td>
<td>Annex 6 of Standard R67*</td>
</tr>
<tr>
<td>Hydrostatic relief valves</td>
<td>UL-132</td>
</tr>
<tr>
<td>Liquid excess flow valves</td>
<td>UL-125 or Annex 3 of Standard R67*</td>
</tr>
<tr>
<td>Power supply bushing</td>
<td>Annex 3 of Standard R67*</td>
</tr>
<tr>
<td>Component</td>
<td>Reference</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Pressure and temperature</td>
<td>Annex 13 of Standard R67*</td>
</tr>
<tr>
<td>sensors and switches</td>
<td></td>
</tr>
<tr>
<td>Propane fuel pumps</td>
<td>Annex 4 of Standard R67*</td>
</tr>
<tr>
<td>Propane heat exchanger</td>
<td>CSA B51</td>
</tr>
<tr>
<td>Propane injection devices</td>
<td>Annex 11 of Standard R67*</td>
</tr>
<tr>
<td>Solenoid valves</td>
<td>UL 429 and UL 125; or Annex 3 of Standard R67*</td>
</tr>
<tr>
<td>Supply/return lines</td>
<td>See Clauses 5.7.2 and 5.7.3 of this Code</td>
</tr>
<tr>
<td>Vaporizers</td>
<td>Annex 6 of Standard R67*</td>
</tr>
<tr>
<td>Withdrawal (service) valves</td>
<td>UL 125 or Annex 7 of Standard R67*</td>
</tr>
<tr>
<td>other than solenoid type</td>
<td></td>
</tr>
</tbody>
</table>

*Components shall be suitable for temperatures of –40 °C and relief pressures based on service.

F2. Canadian Recognition of Propane Components tested by ILAC Signatory to accepted Canadian Requirements

Note:
The purpose of this Annex is to facilitate the acceptance of R67 components in Canada, as currently recognized by reference in the CSA B149.5 Installation Code for Propane Fuel Systems and Tanks on Highway Vehicles.

This protocol is approved by the Interprovincial Gas Advisory Council (IGAC), and is intended as guidance to Provincial authorities having jurisdiction, to serve as a reference document on which to base Provincial acceptance of R67 components, as revised in the CSA B149.5 Code.

It is noted that Standards Council of Canada recognizes accredited product certifications, including product testing performed at laboratories that are accredited by an ILAC signatory. However, in this case, the test has to be performed to the standard recognized by the provincial regulator and it has to be verified that the test is within the scope of accreditation granted to the laboratory by the signatory. CSA B149.5 Installation Code for Propane Fuel Systems and Tanks on Highway Vehicles recognizes the suitability of propane components that meet the requirements of various sections of R67 "UNIFORM PROVISIONS CONCERNING: I. APPROVAL OF SPECIFIC EQUIPMENT OF MOTOR VEHICLES USING LIQUEFIED PETROLEUM GASES IN THEIR PROPULSION SYSTEM".
Due to current market conditions, there is a lack of component certification conducted by agencies accredited by Standards Council of Canada (SCC), thereby necessitating a protocol to facilitate acceptance of these components that have been tested by an ILAC Signatory.

### F2.1 Use of propane components tested by an ILAC Signatory Accredited Laboratory

#### F2.1.1 Components

Components in compliance with R67 as determined by an ILAC signatory accredited laboratory may be acceptable for use in Canada in accordance with the limitations of Annex F of CSA B149.5, subject to the approval of the Authority Having Jurisdiction.

#### F2.1.2 Components

Components shall bear a marking of a circle surrounding the letter “E” followed by the distinguishing number of the country which has granted approval, as stated in section 5 of R67 e.g. Germany = E1, Czech Republic = E8, etc.

#### F2.1.3 Homologation and test reports

Homologation and test reports shall be reviewed by a certification body accredited by Standards Council of Canada on behalf of Canadian distributor to verify compliance with R67 as revised by CSA B149.5.

**Note:** The Canadian distributor includes those who import the product direct for their own use.

#### F2.1.4 The Canadian distributor shall have a documented quality program

The Canadian distributor shall have a documented quality program, acceptable to the certification body, which ensures that they order, receive and supply compliant components. Prior to distribution to the market, the distributor shall ensure that the markings meet the requirements of the B149.5 code. All transactions shall be traceable to facilitate recalls if required.

Measures shall be established within the quality control program to provide for a systematic review and correction of nonconformities. The distributor shall keep the approved quality control system in use and enforce conformity with its provisions with respect to any components made and distributed under this Annex.

#### F2.1.5 Components

Components shall bear a marking identifying the name of the manufacturer or Canadian distributor and the words “CSA B149.5”.
Δ 3. The CSA Standard B149.1-15 “Natural gas and propane installation code”
published in August 2015 by the Canadian Standards Association is
adopted for the installation requirements for mobile homes and recreational
vehicles.

**Background:**

S 2(1)(b) of O Reg 211-01 states that the Reg applies to the installation of appliances,
equipment, components, accessories and containers on highway vehicles, recreational
vehicles, mobile housing, outdoor food service units, and wash-mobile when propane
is to be used for fuel purposes.

In 2015, CSA moved all these requirements from B149.2 to B149.1.

4. The TSSA **Field Approval Code**, TSSA-FA-20122015, is adopted for the
approval of assembly or construction of an appliance.

Δ 5. The TSSA Mobile Food Service Equipment Code, TSSA-MFSE-2014, is
adopted for the approval of mobile food service equipment.

**Background:**

The new code has been developed for the specific requirements of mobile food service
equipment

This amendment is effective January 1, 2016.

DATED at Toronto this 1st day of November, 2015

_________________________________________
John Marshall
Director, O. Reg. 211/01 (Propane Storage and Handling)

Any person involved in an activity, process or procedure to which this document applies shall comply with this
document.

This document was developed in consultation with the TSSA Propane Council and the TSSA Propane Risk
Reduction Group

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