

# **FleetCare**

# First Responder Guide: CNG and LNG Vehicle Fuel Systems













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# **Proprietary Statement**

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# Warning Statements Used in this Guide

**WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.

## Introduction

This manual is a supplemental guide for public safety first responders to compressed natural gas (CNG) or liquefied natural gas (LNG) vehicle fuel system incidents.

It does not cover response tactics for liquefied petroleum gas (LPG or propane) or CNG vehicle fuel systems using Type 1 or Type 2 CNG cylinders.

This manual is not intended to replace any formal training on the proper response techniques, tactics, or procedures for responding to alternative fuel vehicle (AFV) accidents or incidents.

Hexagon Agility produces fuel systems for both CNG and LNG fuel vehicles for a variety of vocations and in several configurations. Please refer to the appropriate subsections for visual cues for vehicles of each fuel type.

#### **IMPORTANT:**

Always refer to most recent version of the United States Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) <u>Emergency Response Guide</u> (ERG).

Always consult the National Fire Protection Association (NFPA) "<u>Alternative Fuel Vehicles Training Program</u> for Emergency Responders" and your own training programs for the latest information and best practices for CNG and LNG emergency response.

# I. Compressed Natural Gas and Liquefied Natural Gas Facts

- 1. Natural gas (methane) is flammable; however, it only burns within a narrow range when mixed with air in a ratio of between 5 and 15 percent.
- 2. Natural gas is odorless, colorless, and tasteless.
- 3. Natural gas is lighter than air so it rises and diffuses into the atmosphere when released.
- 4. Natural gas has unique hazards not found in gasoline and diesel fuel: In order to be stored efficiently, natural gas must be either:
  - a. maintained under high pressure [3600 psi (250 bar)] in a compressed natural gas (CNG) system, OR
  - b. kept at an extremely low (cryogenic) temperature of -259°F (-161°C) or cooler in liquid form as liquefied natural gas (LNG).

## II. Compressed Natural Gas (CNG) Vehicles

#### 1. CNG Vehicle Identification

#### 1.1 CNG Vehicle Decals

The USDOT requires vehicles equipped with CNG fuel systems to have a diamond shaped decal affixed the rear of the vehicle identifying the vehicle fuel type. Additional CNG decals may be affixed to the front and sides of the vehicle—often directly to fuel storage system enclosures and fuel management modules (FMMs).

CNG fuel vehicles are identified by a blue and white decal (1) on the right rear of the vehicle (*left*). A CNG decal may also be affixed to the left front of the vehicle (*right*).



Additionally, many CNG vehicles display the CNG diamond decal (1) next to the USDOT number on the left and right sides of the vehicle as shown on a medium duty delivery van.



CNG diamond decals (1) are often applied to fuel storage system cabinets (box, left) and fuel management modules (FMMs) (box, right).



## 1.2 CNG Vehicle Configurations and Visual Cues

Hexagon Agility CNG fuel systems are installed on a wide range of vehicle vocations and configurations including the following types:

- 1. semi-tractors
- 2. straight trucks
- 3. refuse vehicles
- 4. terminal tractors
- 5. street sweepers
- 6. buses
- 7. medium duty delivery vans

## Truck ProCab® Behind the Cab (BTC) Configurations

Class 8 semis use ProCab behind the cab (BTC) fuel systems (boxes) which mount to the top of the vehicle chassis frame (top left). Multiple tractor configurations and views: top right: tandem axle day cab; bottom left: single axle day cab; bottom right: tandem axle sleeper cab.









CNG semi tractors equipped with ProCab fuel systems *(box)* with optional TruckWings™ (3) aerodynamic devices present a silhouette similar to a sleeper cab when TruckWings are deployed.



Straight truck ProCab BTC (boxes) applications: top left: stake body; top right: bare crew cab chassis; bottom left: utility body; bottom right: box van.



CNG street sweeper BTC fuel systems: *Left:* ProCab conventional (1); *right:* ProCab cab over engine (COE); *bottom:* sweeper OEM design BTC COE.







## **ProRail Side Mount (SM) Configurations**

Single axle beverage hauler semi with CNG ProRail side mount (box).



CNG ProRail side mount fuel systems (boxes) may be mounted on driver side, passenger side, or both sides.



# **Truck Combination Fuel System Configurations**

If greater fuel capacity is required, ProRail® (2) side mount (SM) cylinder(s) may also be fitted in combination with ProCab® (1) systems.



## **Refuse Fuel System Configurations**

ProCab BTCs (boxes) on refuse truck applications: rear load body (left); automated side loader (ASL) (right).





Refuse roof mount (RM) CNG fuel system location (boxes) and views on automated side loaders (ASLs).





Refuse front of body (FOB) CNG fuel system locations (boxes) and views on rear end loaders.







Refuse tailgate (TG) CNG fuel system (boxes) applications: front end loader (FEL) (left) and automated side loader (ASL) (right).





Refuse ProRail side mount (boxes) configurations: top left: conventional rear end loader; top right: dumpster roll-back chassis; bottom right: automated side loader; bottom left: conventional rear end loader.



## **Refuse Combination Fuel System Configurations**

Typical combinations of roof mount (1) and ProRail (2) refuse CNG fuel systems (boxes): left: REL; right: FEL.



## Terminal Tractor ProRail® Fuel System Configurations

ProRail yard tractor side mount CNG fuel systems (boxes).



### **Transit Bus Fuel System Configurations**

Transit roof mount (RM) CNG fuel systems (boxes).





Articulated CNG bus roof mount fuel storage systems (boxes).



## **Medium Duty Fuel System Configurations**

Medium duty delivery vehicle CNG ProRail side mount fuel system. **NOTE**: CNG fuel cylinders *(not visible)* bolt to driver side and passenger side chassis frame rails and are protected by vehicle body and shielding.





## **Other CNG Fuel System Configurations**

Unique OEM three-wheel CNG street sweeper design with cylinders (boxes) mounted below the chassis.



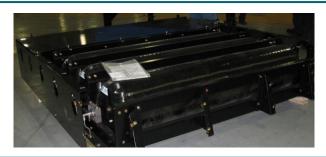
Please visit the Hexagon Agility Fleetcare Helpdesk Knowledge base for more <u>fuel system identification</u> details.

## 1.3 CNG Vehicle Cylinders and Mounting

- 1. There are four types of CNG cylinders:
  - Type 1: All metal construction
  - Type 2: Metal liner with hoop-wrap around cylinder
  - Type 3: Thin metal liner with continuous carbon-fiber over-wrap
  - Type 4: Plastic liner with continuous carbon-fiber over-wrap

Of the four cylinder types, Type 3 and Type 4 cylinders are most prevalent in commercial vehicles. Hexagon Agility uses Type 3 and Type 4 cylinders.

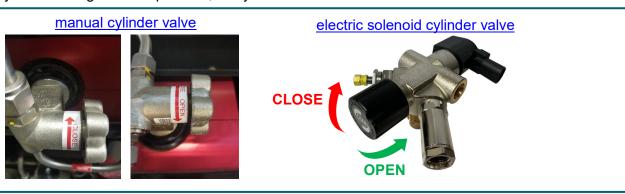
2. CNG fuel cylinder(s) are housed in steel or aluminum structures secured to the vehicle body or frame. These structures are engineered to protect the cylinders in a collision.



3. The fuel storage structure is covered with a composite or metal cover to protect the cylinders from UV exposure and enhance vehicle appearance and aerodynamics.

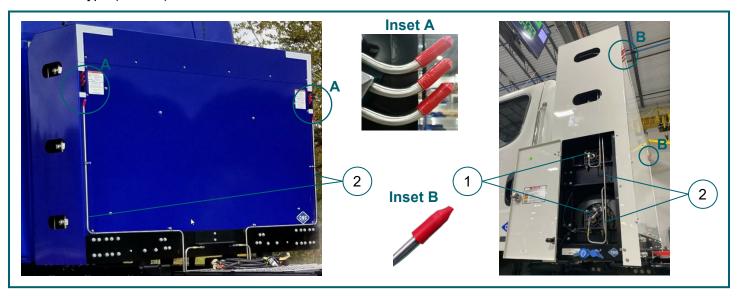


- 4. CNG cylinders may be mounted to vehicle chassis on side rails or behind the cab, or attached to the vehicle body at the front, the rear, or the roof.
- 5. Fuel storage capacity may be increased by combining systems. ProCab BTC trucks and roof mount, FOB, and tailgate refuse vehicles may be equipped with 1 or 2 additional ProRail fuel storage systems
- 6. Each cylinder in a CNG system is equipped with a valve (1) at one end to allow fuel to be isolated from the rest of the system. During normal operation, all cylinder valves should be OPEN.



## 1.4. CNG Pressure Relief Devices (PRDs) and Vent Lines

- 1. CNG fuel cylinders are protected with one or more thermally-activated pressure relief devices (PRDs).
- 2. PRDs (1) activate between 212°F to 220°F (100°C to 104°C).
- 3. PRD vent lines (2) may be identified by the presence of protective caps (circled) which are typically red for inspection purposes. Old PRD vent caps were a heat shrink design (Inset A); new and replacement caps pushon duckbill type (Inset B).

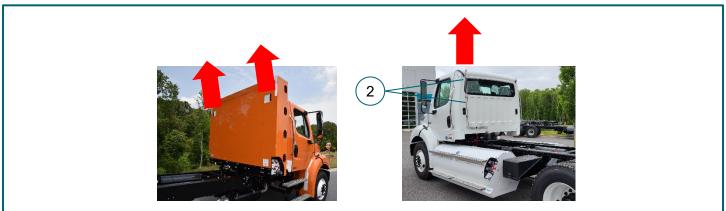


#### WARNING

- A. CNG PRDs vent system pressure of 3600 psi (250 bar) and higher.
- B. Venting gas may ignite, become a jet fire, extinguish itself and reignite several times.
- C. Vehicle damage and position may modify venting gas direction.

#### 1.4.1 PRD Vent Locations and Venting Direction

Right: ProCab® behind the cab (BTC) fuel system PRD vent tubes exit from the rear of the cabinet to vent upward and rearward (arrows). Left: ProRail® side mount (SM) PRD vent tubes (2) behind the cab on dual cylinder system.



Combination ProCab and ProRail fuel system PRD vent locations and venting directions (arrows).



Some older CNG PRD vent system designs vent downward (arrow) as indicated on a side mount roll-back.



Roof mount (RM) refuse vehicle PRD vent tubes at fuel storage cabinet rear vent upward and rearward (arrow).



Front of body (FOB) refuse vehicle fuel system PRD venting direction (arrow).



Roof mount (RM) transit bus fuel system PRD vent tubes (*inset*) positioned within fuel storage cabinets typically vent upward (*arrows*) or rearward.







Medium duty ProRail side mount system PRD vent tube is located just below the roof on the right rear; vent direction (arrows) is rearward and away from curbside (the passenger side of the vehicle).





**IMPORTANT**: PRD function is crucial to CNG vehicle safety by allowing fuel pressure to escape.

**WARNING** Allow gas to vent and watch for secondary exposures and hazards.

- DO NOT apply water to PRDs during a thermal event.
- Establish a safe perimeter to keep people away.
- Proactively protect vehicles, structures, etc. in potential PRD flame jet path.

## 1.5 CNG Fuel Management Module (FMM)

The fuel management module (FMM) is equipped with a <u>1/4-turn manual shutoff valve</u> which isolates the fuel storage system from the engine for maintenance or emergency situations. The FMM may be a <u>box FMM</u> separate from the cylinders or integrated into the cylinder storage cabinet. Although the location and arrangement of valves and gauges may vary, all FMMs are functionally the same.

#### **High-Pressure Gauge**

Indicates fuel storage cylinder pressure, nominal 3600 psi (25 bar).

# 1/4-Turn Manual Shutoff Valve

Stops fuel flow to the engine. Normally OPEN. Turn OFF and depressurize before servicing.

#### **Defuel Receptacle**

Used when removing fuel from the cylinder.

### Low-Pressure Gauge

Indicates pressure exiting the regulator, nominal 125 psi (8.62 bar).

### Fill Receptacle

Standard fill shown.

#### Install Data Label

Water volume, liters, install location and date, cylinder expiration date.



#### 1.5.1 1/4-turn Manual Shutoff Valve Locations

<u>1/4-turn manual shutoff valves</u> (*circles*) is located on the fuel management module faceplate on box FMMs (*top*), ProCab FMMs (*bottom left*) and ProRail FMMs (*bottom left*).







Integrated FMM (*left*) mounted on an older CNG ProRail<sup>®</sup> side mount system (*right*); 1/4-turn manual shutoff valve (*circle*) is in the OPEN position.

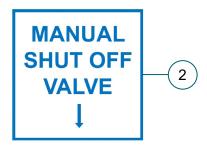




Hexagon Agility medium duty CNG fuel systems use an abbreviated fuel fill interface in which 1/4-turn manual shutoff valve is mounted to the driver side of the vehicle on the chassis frame rail but is not readily visible. An exterior "Manual Shut Off Valve" decal (2) indicates the location of the red handle inside the bodywork.







## 2. CNG Vehicle Emergency Response

**IMPORTANT**: A CNG vehicle has a limited amount of fuel on board. Allow gas to vent and watch for secondary hazards to people, other vehicles or structures.

## 2.1. If a CNG Vehicle is Damaged or a Gas Leak Is Discovered

Always refer to latest version of USDOT *Emergency Response Guide* (ERG) Section 115.

### WARNING Do not cut fuel supply tubing.

- 1. Keep people and traffic away from the area.
- 2. Eliminate all sources of ignition such as fire, sparks, electronics, lights, or electrostatic charges.

### WARNING Do not smoke or vape near the vehicle and do not light road flares.

- 3. If the vehicle driver/other personnel have not done so: Turn ignition switch OFF to close the <u>supply solenoid</u> <u>valve (SSV)</u>, set parking brake, chock vehicle wheels, and turn OFF battery at main battery disconnect.
- 4. If it is safe to do so, CLOSE the <u>1/4-turn manual shutoff valve</u>, CLOSE individual <u>cylinder valves</u>, and check the fuel system near the damaged area for leaks using smell, sight, and sound. CNG is odorized and can be detected by smell.

# **WARNING** Residual gas may still leak from the storage system even after the ignition switch is off and manual shutoff valves are closed.

- 5. Use a combustible gas meter to monitor for potential fuel leaks.
- 6. Open vehicle doors to introduce fresh air to prevent natural gas accumulation.
- 7. If the vehicle is indoors, open building windows and doors to allow ventilation.

# **WARNING** Avoid turning on any lights or electronics which may create a spark. Pay attention to overhead ignition sources because natural gas will rise to the ceiling.

- 8. Advise towing and wreckage storage operators the vehicle is fueled with CNG; refer to <a href="CNG">CNG</a> vehicle towing procedure.
- 9. Have a qualified natural gas vehicle service technician make necessary repairs or defuel the vehicle.

#### 2.2. In Case of a CNG Vehicle Fire

Always refer to latest version of USDOT *Emergency Response Guide* (ERG) Section 115.

WARNING DO NOT apply water to CNG cylinders because this will prevent the PRDs from activating and can result in a catastrophic cylinder failure (high-pressure gas rupture).

- 1. Keep people and traffic away from the area.
- 2. Eliminate all sources of ignition such as fire, sparks, electronics, lights, or electrostatic charges.

**WARNING** Do not smoke or vape near the vehicle and do not light road flares.

- 3. Always assume a CNG cylinder is under pressure.
- 4. Establish a minimum safe perimeter of 330-ft (100 m) around the vehicle per USDOT recommendation.
- 5. If fire is impinging on the CNG cylinders, if cylinders are on fire, or if the fire is fueled by an active leak, DO NOT APPROACH THE VEHICLE. Allow the fire to burn while watching for secondary hazards, such as other vehicles or structures, and protecting exposures.
- 6. When a PRD activates, the result is often a jet fire which may go out and re-ignite several times.
- 7. **If the CNG cylinders are <u>not</u> involved in the fire,** the fire on the vehicle may be extinguished with normal response tactics. For example, small blazes such as brake fires and electrical fires.

#### WARNING

- A. Full extent of fire exposure may not always be apparent.
- B. When fighting a CNG fire, keep in mind CNG properties and storage methods. Monitor the situation closely as changing conditions may require a change in tactics.
- 8. If it is safe to approach the vehicle, always approach at a 45 degree angle.
- 9. If safe to do so, chock vehicle wheels to prevent accidental movement.
- 10. Advise towing and wreckage storage operators the vehicle is fueled with CNG.

# III. Liquified Natural Gas (LNG) Vehicles

- 1. LNG is stored at cryogenic temperatures [-259°F (-161°C) or cooler] and is odorless.
- 2. LNG cannot be odorized because of its very cold temperature; therefore, methane detection systems are mandatory. One sensor is located in the engine compartment and one is located inside the cab.
- 3. LNG is extremely cold, and if spilled, will vaporize and dissipate into the air.
- 4. Compared to CNG which is stored at pressures of 3600 psi (250 bar) and greater, typical LNG fuel system pressures range from 115 psi (8 bar) to 230 psi (16 bar).

#### WARNING

- A. LNG PPE should include gloves and face shields to prevent frostbite, a methane/flammable gas detector, and self-contained breathing apparatus (SCBA).
- B. Because LNG fuel is a multi-phase mixture of liquid and gas at cryogenic temperatures, the fuel pressure inside the LNG tank is <u>not</u> indicative of fuel level. A full tank could read zero pressure, and an empty tank could read 230 psi (16 bar).

#### 1. LNG Vehicle Identification

#### 1.1 LNG Vehicle Decals

The USDOT requires vehicles equipped with LNG fuel systems to have a diamond shaped decal affixed the rear of the vehicle identifying the vehicle fuel type. Additional LNG decals may be affixed to the front and sides of the vehicle—often on distinctive large cylindrical stainless steel fuel tanks.

LNG fuel vehicles are identified by a dark blue and white diamond decal (2) one of which must be placed on the right rear of the vehicle (*left*) or on lower right rear of cab on vehicles without bodies (*right*).



LNG decal (2) on a side mount fuel tank.



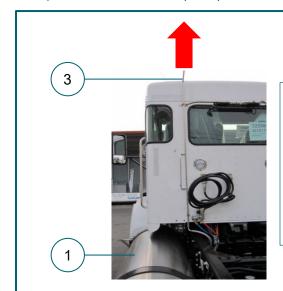
#### 1.2 LNG Vehicle Visual Cues and Configurations

Key LNG vehicle identifiers include the following system equipment and signage:

1. Large, cylindrical, double-insulated stainless-steel tanks (1) affixed to one or both vehicle chassis side rails. LNG fuel tanks are considerably larger in length and diameter than typical cylindrical diesel tanks.



3. A pressure relief valve (PRV) vent tube (3) for normal venting (arrow) of pressure upward.



LNG PRV vent tube (3) runs from LNG fuel tank (1) to above the vehicle roof\* to vent gaseous fuel (arrow).

LNG vent tubes resemble CNG PRD vent tubes, but LNG vent tubes are not capped.

Also, be aware that LNG vehicles may vent in normal operation.

\*Some LNG fuel systems vent gas below the vehicle.

4. Refuse trucks (*left*) and Class 8 semi-tractors (*right*) are the most common LNG vehicles with tanks (1) mounted to one or both vehicle chassis side rails. Note also: LNG vehicle diamond decal locations (2).



5. LNG fuel transit vehicles such as municipal buses are less common than their CNG counterparts. The fuel tanks are hidden from external view by body panels or fuel system cabinets (4), making the LNG decal (2) critical for accurate identification.



#### 1.3 LNG Fuel Control Components and Functions

LNG fuel system control and function are both similar to and different from CNG fuel management modules (FMMs) and associated flow components.

# Primary Pressure Relief Valve (PRV)

Vents excess pressure at 230 psi (16 bar) from the tank due to normal operation.

# Secondary Pressure Relief Valve (PRV)

Normally covered by red **vent cap**.

Cap releases to vent pressure at 350 psi (24 bar).



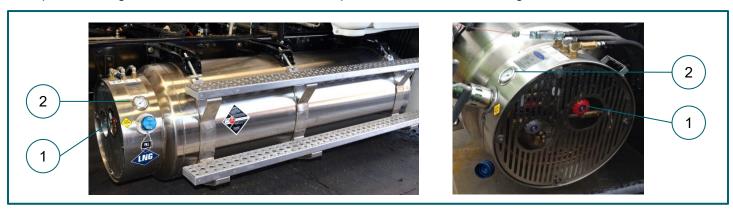
Red MANUAL FUEL SHUTOFF VALVE aka "Liquid Valve"

Normally OPEN to allow fuel to flow to the engine.

Gray **VENT MANUAL SHUTOFF VALVE** aka "Gas Valve"

Normally CLOSED, opened when fueling to relieve pressure.

1. Red manual fuel shutoff valves (1) are located on each LNG tank in a multiple tank fuel system. As the name implies, closing the manual fuel shutoff valve stops the flow of fuel to the engine.



2. Pressure gauges (2) are mounted on or near each LNG tank.

**WARNING** Fuel pressure inside the LNG tank is <u>not</u> indicative of fuel level. A full tank could read zero pressure, and an empty tank could read 230 psi (1.6 bar).

- 3. Unlike CNG pressure relief devices (PRDs), LNG pressure relief valves are <u>not</u> thermally activated, so there is no danger of compromising pressure relief valve function with the application of water.
- 4. An LNG fuel system may <u>normally</u> vent via the primary relief valve when the pressure inside the tank rises above 230 psi (16 bar) due to normal reaction (expansion) to ambient temperatures.
  - a. The primary PRV will automatically reset when the pressure decreases to 230 psi (16 bar).
  - b. LNG venting is considered normal, but excessive venting may indicate a problem.

Please visit the Hexagon Agility Fleetcare Helpdesk Knowledge base for more fuel system identification details.

## 2. LNG Vehicle Emergency Response

**IMPORTANT**: An LNG vehicle has a limited amount of fuel on board. Allow gas to vent and watch for secondary hazards to people, other vehicles, or structures.

#### WARNING

- A. PPE should include gloves and face shields to prevent frostbite, a methane/flammable gas detector and self-contained breathing apparatus (SCBA).
- B. Fuel pressure inside the LNG tank is <u>not</u> indicative of fuel level. A full tank could read zero pressure, and an empty tank could read 230 psi (1.6 bar).

#### 2.1. If an LNG Vehicle is Damaged or a Gas Leak is Found

Always refer to latest version of USDOT *Emergency Response Guide* (ERG) Section 115.

Use caution when handling an LNG leak. LNG is stored at temperatures below -260°F (-162°C) and can cause first degree burns and frostbite if it contacts skin. It is best to remove sources of ignition and allow leaking LNG fuel to vaporize and disperse into the atmosphere.

- 1. Establish a minimum safe perimeter of 330-ft (100 m) around the vehicle per USDOT recommendation.
- 2. Always assume an LNG tank is under pressure.
- 3. Use a combustible gas meter to monitor for potential fuel leaks.
- 4. Small LNG leaks may be observed as vapor escaping from the leak, usually at fittings.
- 5. Large liquid leaks may spill, but will vaporize and rise almost immediately. Be aware of the extreme cold and make sure PPE is in place for any exposed skin.

**WARNING** DO NOT apply water, regular or alcohol-resistant foam directly on spill. Use a high-expansion foam if available to reduce vapors.

- 6. Turn the ignition switch OFF (this closes the supply solenoid valve).
  - a. Set parking brake.
  - b. If it is safe to do so, turn OFF the main battery switch.
- 7. If it is safe to do so, close the red manual shutoff valve and check the fuel system near the damaged area for frost, ice, or condensation which is an indicator of an LNG leak.
- 8. If the tank is damaged or there is frost on the tank or the sound of fuel escaping can be heard, the gas will vaporize and rise into the air.
- 9. Be aware the pressure gauges may indicate zero, but some residual liquid may remain in the tank.
- 10. Open vehicle doors to introduce fresh air and prevent gas accumulation.
- 11. If the vehicle is indoors, open building windows and doors to allow ventilation and avoid turning on any lights or electronics which may create a spark. Pay particular attention to any sources of ignition overhead because natural gas will rise to the ceiling.
- 12 Beware that residual gas may still leak from the storage system even after the ignition switch is off and all manual shutoff valves are closed.
- Advise towing and wreckage storage operators the vehicle is fueled with LNG; follow OEM towing procedure.
- 14. Have a qualified natural gas vehicle service technician make necessary repairs or defuel the vehicle.

#### 2.2. In Case of an LNG Vehicle Fire

Always refer to latest version of USDOT Emergency Response Guide (ERG) Section 115.

- 1. Establish a minimum safe perimeter of 330-ft (100 m) around the vehicle.
- 2. **If the LNG tanks are <u>not</u> involved in the fire**, the fire on the vehicle can be extinguished with normal response tactics.

### **WARNING** Fire exposure may not always be apparent.

- a. Apply copious amounts of water to the LNG tanks.
- b. If LNG tanks are not kept cool with water, there is potential for a boiling liquid expansion vapor explosion (BLEVE). Therefore, if a sufficient water supply is not available, suspend water application and evacuate to a safe distance.
- 3. <u>If fire is impinging on the LNG tanks</u>, or <u>if the fire is fueled by an active leak</u>, allow the fire to burn while watching for secondary hazards, such as other vehicles or structures, and protecting exposures.
- 4. If it is safe to approach the vehicle, always approach at a 45 degree angle.
- 5. If it is safe to do so, immediately chock vehicle wheels to prevent accidental movement.
- 6. Water can be used to extinguish the fire because LNG tanks are well insulated.
  - a. LNG tanks are well insulated so temperature and pressure rise should be small.
  - b. The LNG pressure relief valve (PRV) will open causing CNG to vent.
  - c. LNG PRVs are self-resetting; resets when pressure is below about 230 psi (16 bar).
- 7. If it is safe to do so, turn off the main battery switch.
- 8. Advise towing and wreckage storage operators the vehicle is fueled with LNG; follow OEM towing procedure.

# III. Hexagon Agility FleetCare First Responder Training

The Hexagon Agility Technical Training Academy offers a range of courses for first responders to learn more about CNG and LNG vehicles:

https://hexagonagility.com/fleetcare/customer-care-training

## IV. References and Additional Information

The following resources and publications will help increase understanding of CNG and LNG fuel systems:

United States Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration. (PHMSA) *Emergency Response Guide* (ERG):

https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2024-04/ERG2024-Eng-Web-a.pdf

A mobile ERG app is also available: https://www.phmsa.dot.gov/training/hazmat/erg/erg-mobile-app

National Fire Protection Association. *Emergency Field Guide: Hybrid, Electric, Fuel Cell, and Gaseous Fuel Vehicles, 2018.* (Free PDF download).

National Fire Protection Association. NFPA 52, Vehicular Natural Gas Fuel Systems Code (2023).

NFPA also offers an online "Alternative Fuel Vehicles Training Program for Emergency Responders": http://www.nfpa.org/training-and-events/by-topic/alternative-fuel-vehicle-safety-training

CNG training video:

CNG Characteristics and Fuel System Overview https://youtu.be/lq1brqn20VM?si=yZo\_9qfjXAKOTYEE LNG training videos:

US DOT Pipeline and Hazardous Materials Safety Administration. "Liquified Natural Gas Safety and Emergency Response." https://www.youtube.com/watch?v=vnoU k8ClUQ

LNG Fuel System Introduction https://youtu.be/B3lLsMAVzdw?si=VOtBOayyzsYTLQBG

LNG Safety Procedures and PPE https://youtu.be/4whSbNlyw7U?si=Q1fONOW9m5Rm0Jlb

LNG Fuel System Overview (full-length) https://www.youtube.com/watch?v=2uZzmcfE59M

The Hexagon Agility FleetCare Helpdesk Knowledge Base: https://agilityfs.freshdesk.com/support/home hosts a variety of CNG and LNG fuel system publications:

- Agility Fuel Solutions, "Truck and Tractor CNG Fuel System Operation, Maintenance & Inspection Manual," ENP-516
- Agility Fuel Solutions, "CNG System Users' Manual," ENP-314
- Agility Fuel Solutions, "Safely Working on CNG Fuel Systems," ENP-391
- Agility Fuel Solutions, "Dual Tank LNG System Operation Manual," ENP-064
- Agility Fuel Solutions, "LNG System Users' Manual," ENP-334

## **Contact Information**

Fuel system product support may be obtained by calling or emailing Hexagon<sup>®</sup> Agility<sup>®</sup> FleetCare:

+1 833 443-9227 support@hexagonagility.com

Please visit the Hexagon® Agility® website for more information: www.hexagonagility.com
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