



2015

**Express/Savana
CNG Compressed Natural
Gas Supplement**



2015 Express/Savana CNG Compressed Natural Gas Supplement

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This vehicle only operates on Compressed Natural Gas (CNG). It will not operate on gasoline, diesel, or Liquefied Petroleum Gas (LPG) fuel.

Keep this manual in the vehicle for quick reference.

Canadian Vehicle Owners

Propriétaires Canadiens

A French language manual can be obtained from your dealer, at www.helminc.com, or from:

On peut obtenir un exemplaire de ce guide en français auprès du concessionnaire ou à l'adresse savant:

Helm, Incorporated
Attention: Customer Service
47911 Halyard Drive
Plymouth, MI 48170

Using this Supplement

This supplement contains information specific to the unique components of the vehicle. It does not explain everything you need to know about the vehicle. Read this supplement along with the owner manual to learn about the vehicle's features and controls.

Index

A good place to look for what you need is the Index in back of this supplement. It is an alphabetical list of what is in the supplement, and the page number where you will find it.

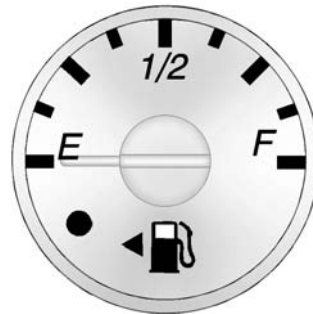
Instruments and Controls

Warning Lights, Gauges, and Indicators

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Warning Lights, Gauges, and Indicators

Fuel Gauge



When the ignition is on, the fuel gauge indicates about how much fuel is left in the vehicle fuel tank.

An arrow on the fuel gauge indicates the side of the vehicle the fuel door is on.

The fuel gauge has been calibrated to display full at approximately 24 800 kPa (3,600 psi) and empty at approximately 2 758 kPa (400 psi).

When the low fuel warning indicator flashes, fill the tank as soon as possible.

Compressed Natural Gas (CNG) fuel gauge readings are affected by changes in fuel temperature and fuel pressure.

See *Filling the Tank* on page 9-3.

Malfunction Indicator Lamp



This vehicle has been specifically designed to illuminate this indicator when emissions exceed acceptable levels while operating on natural gas fuel.

The malfunction indicator lamp comes on to indicate that there is a problem and service is required. Malfunctions often will be indicated by the system before any problem is apparent. This system is also designed to assist the service technician in correctly diagnosing any malfunction.

Caution

If the vehicle is continually driven with this light on, the emission controls might not work as well, the vehicle fuel economy might not be as good, and the engine might not run as smoothly. This could lead to costly repairs that might not be covered by the vehicle warranty.

This light should come on, as a check to show you it is working, when the ignition is on and the engine is not running.

See the owner manual for more information.

Driving and Operating

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Driving Information

Vehicle Load Limits



Caution

Loose items stored in the cargo area may damage the fuel tank and fuel system components. Secure all items in the cargo area to avoid shifting and any damage to the fuel tank and fuel tank components.

Starting and Operating

Starting the Engine

Starting the engine in a CNG vehicle is similar to starting a gasoline engine. See “Starting the Engine” in the owner manual.

Cold Weather Starting

If the outside temperature is below -20°C (-4°F), the engine may be harder to start, or may not start until the temperature increases.

Using the engine heater may make it easier to start. See “Engine Heater” in the owner manual.

High Altitude Cold Starting

An engine is harder to start in cold weather. The thinner air found above 1 600 m (5,000 ft) also makes the vehicle harder to start. The unique properties of CNG make it even more difficult or impossible to start at high altitudes if

9-2 Driving and Operating

temperatures drop below -16°C (4°F). When starting the vehicle in cold weather at high altitudes:

- Use the engine heater. See “Engine Heater” in the owner manual.
- Turn off all electrical accessories.
- Do not hold the ignition switch in START for more than 15 seconds.

Caution

If you add electrical parts or accessories, you could change the way the engine operates. Any resulting damage would not be covered by the vehicle warranty. See “Add-On Electrical Equipment” in the owner manual.

Fuel

This vehicle is designed to operate on Compressed Natural Gas (CNG).

The general marketplace fuel quality of Compressed Natural Gas for motor vehicles in the state of California should be in compliance with Title 13 California Code of Regulations, Section 2292.5. The remaining regions of North America do not employ regulated fuel quality standards for general marketplace vehicle usage; however, CNG is available at both private and public filling stations. We recommend the use of CNG that meets or exceeds SAE J1616 specifications for fuel composition and cleanliness.

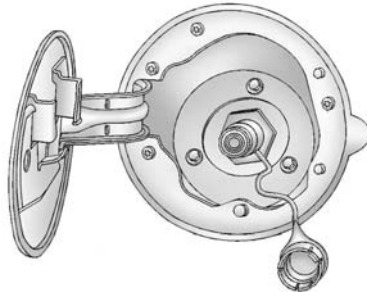
The main component of CNG is methane, a highly flammable, colorless gas. An odorant has been added for detection through smell. The smell is similar to that of rotten eggs. The CNG in the vehicle is stored under high pressure (maximum 24 800 kPa/3,600 psi). Gas should never be smelled and a

hissing sound should not be heard, unless refueling is being done. If gas is smelled or a hissing sound is heard at any other time, shut down the vehicle and have it serviced. It may be possible to hear the fuel flowing while the engine is running if standing close to the pipework or various fuel system components (regulator, filter). This is normal and should not be confused with a hissing sound at fittings that may indicate a fuel leak. Follow the instructions under *Fuel System Leak* on page 9-7.

Filling the Tank

Warning

CNG is flammable and highly explosive. You could be killed or seriously injured if leaking natural gas is ignited. If you suspect a leak, do not start the engine or drive the vehicle. Have the vehicle immediately towed, inspected, and repaired by an authorized GM dealer.



Before filling the fuel tanks, turn off the engine.

The fill valve is behind a hinged fuel door on the driver side.

There is an identifying blue diamond-shaped CNG label on the right rear cargo door. Do not remove this label — it is necessary for compliance with NFPA-52 regulations and insuring the vehicle. Driving without this label may violate the laws or regulations in some states. Replacement labels can be ordered from your dealer.

Refueling Procedure

There are two methods of refueling: fast filling or slow filling. Fast filling is normally used in fuel stations for natural gas vehicles. It takes about six to eight minutes to fill up the fuel tanks. Slow filling is done with a vehicle refueling appliance or a time-fill post provided by the fleet operator. Refueling time varies, based on the refueling system used. Consult with the refueling station attendant or system provider.

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Always observe all safety recommendations and operating instructions on the refueling equipment. When refueling, use a fuel fill nozzle that complies with ANSI/CSA-NGV 1-2006 standards. Nozzles are designed according to their maximum fill pressure: P30 (blue handle) for 20 684 kPa (3,000 psi) and P36 (yellow handle) for 24 800 kPa (3,600 psi).

A fuel nozzle less than 7.6 cm (3 in) long may be difficult to disengage after dispensing CNG.

During fueling, CNG needs to be delivered to the vehicle at the appropriate pressure in relationship to the ambient temperature. This can be done automatically by a temperature compensation system on the CNG fuel dispenser or manually by stopping the CNG fill at a recommended pressure. GM recommends that customers use CNG fueling stations that have a temperature compensation system whenever possible. Check with the fuel station. If one is not available,

see the temperature compensation chart that follows in this section to choose the appropriate fill pressure for the ambient temperature. In addition, fill only to the pressure level for the lowest ambient temperature anticipated during fueling.

Leaving a vehicle connected to a slow fill station can cause the tank to be filled to a higher pressure than recommended, especially when outside temperatures fluctuate. Disconnect the vehicle from the fill station as soon as it is full, unless an auto shutoff feature is used.

Warning

If CNG tanks are filled to a higher pressure than recommended and then exposed to a much higher ambient temperature environment, expansion of the gas caused by the temperature change may cause pressure relief

(Continued)

Warning (Continued)

devices on the vehicle CNG tank(s) to release gas, as designed. If an ignition source is present, this could create a risk of fire or explosion. If there is any possibility that the tank has been over pressurized, take steps to relieve the excess pressure, such as by driving or running the vehicle in an open area to remove some fuel.

Make sure that your CNG vehicle is properly maintained and repaired to avoid elevated temperatures surrounding the tank, since elevated temperatures in the area of the tank could also raise the CNG pressure in the tank.

Consult materials available from NGV America - <http://www.ngvc.org> and the Clean Vehicle Education Foundation -

<http://www.cleanvehicle.org> on CNG fueling stations for more information.

Ambient Temperature / Maximum CNG Fill Pressure Compensation Chart

To avoid the risk of fire or explosion if an ignition source were present, do not fill above the pressure level that corresponds to the lowest ambient temperature expected during fueling.

Service Pressure 24 800 kPa (3,600 psig) at 21 C (70 F).

Fahrenheit	
Temperature (°F)	Pressure (psig)
130	4500*
120	4399
110	4240
100	4080
90	3920
80	3760
70	3600
60	3415
50	3230
40	3045
30	2860
20	2675
10	2490
0	2306
-10	2123
-20	1940
-30	1759
-40	1578



Celsius	
Temperature (°C)	Pressure (psig)
55	4500*
50	4426
40	4142
30	3857
21	3600
10	3230
0	2894
-10	2558
-20	2222
-30	1886
-40	1578

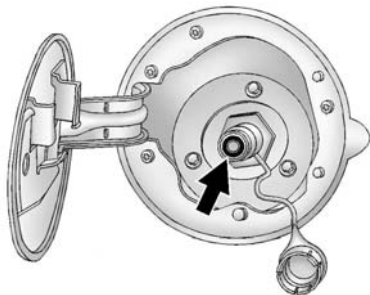
* Maximum allowable fill pressure regardless of ambient temperature

The refueling fill valve on the vehicle is in the same location as was provided originally for gasoline

refueling. Put the vehicle into P (Park) and turn off the engine prior to refueling. Remove the dust

9-6 Driving and Operating

cap from the receptacle, clean off any dirt or debris on the receptacle, and follow the refueling instructions on the pump or provided by the station operator.



Fill Valve O-Ring

If fuel or vapor is heard or seen leaking from the nozzle-fill valve connection, stop refueling immediately. Dirt or other debris may be preventing a positive connection. Turn off the refueling dispenser, disconnect the nozzle, reconnect it to the fill valve, and begin refueling again. If it continues

to leak, have an authorized dealer inspect the sealing O-ring in the fill valve. It may be missing, damaged, or worn. Spare O-rings designed for use with CNG are included with the vehicle. See an authorized GM dealer for additional O-rings.

Warning

Attempting to fill a CNG fuel system that has a missing or damaged O-ring is dangerous. Natural gas can leak. If the natural gas is ignited, you or others could be injured. Replace the O-ring before filling the tank.

To replace the fill valve O-ring:

1. Carefully remove the O-ring from the groove in the fill valve. A small flat-blade or pointed tool can be used.
2. Make sure the groove is clean and free of dirt and debris.

3. Install the new O-ring in the groove in the fill valve. Make sure the O-ring is properly seated in the groove.

Refueling will stop automatically when the tank is full. To disconnect the vehicle from the refueling station, remove the nozzle from the fill valve. A hissing sound may be heard as a small amount of natural gas escapes. This is normal.

If dirt or other debris is adhering to the inside of the fuel fill valve, gas may leak out after refueling. If more fuel is needed, repeat the refueling procedure.

Put the fill valve dust cap on securely and close the fuel filler door.

Pressure Relief Devices

The CNG tank has pressure relief devices that are designed to release pressure if the CNG tank is overheated or over pressurized.

 **Warning**

If the pressure relief devices release CNG while the vehicle is being operated, the CNG tanks will be emptied and it will run out of fuel. If a release of CNG is detected, move the vehicle to a safe stopping location. A loud rushing noise may be heard when the CNG is released.

If a pressure relief device releases CNG while the vehicle is not running, it is possible that not all tanks will be emptied. Do not start the vehicle.

Have the vehicle towed to an authorized GM dealer for service.

Fuel System Leak

 **Warning**

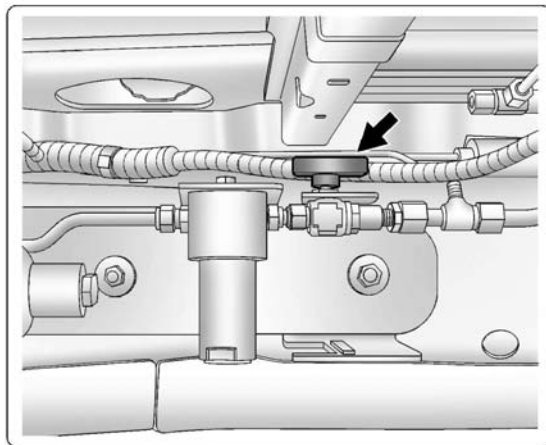
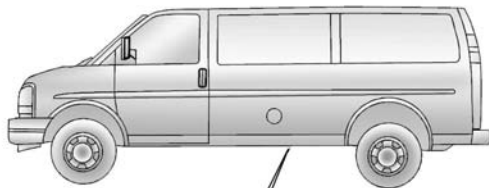
If you smell a persistent natural gas odor or hear a continual hissing sound, there could be a natural gas leak. If the natural gas is ignited, you or others could be injured. Do not start the engine or drive the vehicle. Have the vehicle towed to an authorized GM dealer for service.

A slight natural gas odor may be detected for a few moments after refueling. This is normal. You should not be able to smell natural gas at any other time. If you do, or if you hear a hissing sound, the fuel system may have a leak.

If natural gas is smelled or a hissing sound is heard:

1. Park the vehicle in a well-ventilated area and apply the parking brake. Keep heat, sparks, and flame away. Open all the vehicle doors for ventilation.
2. Turn the ignition to LOCK/OFF.

9-8 Driving and Operating



3. The manual shutoff valve is on the inner side of the driver side frame rail halfway between the front and rear tires.

A label is on the outside of the vehicle above the manual shutoff valve. Do not remove this label.

Turn the lever one-quarter turn clockwise to turn off.

Do not drive the vehicle. The vehicle should be towed to an authorized GM dealer.

Trailer Towing

Warning

The trailer hitch protects the CNG tank in a crash and from road hazards. Damage may result in a rupture or explosion of the CNG tank. You or others could be injured or even killed. If the trailer hitch must be removed for any reason, e.g., tank inspection or vehicle repair, always reinstall the trailer hitch before operating the vehicle.

The compressed natural gas system adds approximately 363 kg (800 lb) of weight to the vehicle. This must be included when determining the maximum load and trailer towing capacity for the vehicle as described in the owner manual.

Vehicle Care

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- Vehicle Storage 10-2

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Towing the Vehicle

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General Information

Accessories and Modifications

Adding accessories or making modifications to the vehicle, including to the CNG tank shields, could cause a malfunction or damage and would not be covered by the vehicle warranty. The CNG fuel tanks under the vehicle are protected by tank shields. If the vehicle has a CNG fuel tank in the cargo area, it is covered with a shield.

 **Warning**

To help avoid damage to the CNG tanks and to reduce the risk of explosion, tank shields must be present. Do not attach accessories, such as racks or bins, to the shield. Do not drill,

(Continued)

Warning (Continued)

modify, or use shields as a work surface. Do not use fire near shields or tanks.

If a CNG tank needs service or repair, have only a qualified technician perform the work. See “Accessories and Modifications” in the owner manual.

Vehicle Storage

In addition to vehicle storage procedures outlined in the owner manual, the following should be done with the vehicle in the event it will not be driven for extended periods of time:

- The manual shutoff valve is on the inner side of the driver side frame rail, halfway between the front and rear tires.

A label is on the outside of the vehicle above the manual shutoff valve. Do not remove this label.

Turn the lever one-quarter turn clockwise to turn off.

- If you store the vehicle indoors, it should be parked in a well-ventilated area. We recommend the installation of a natural gas leak detector at the highest point of the ceiling.
- After storing the vehicle for an extended period, and before starting the engine for the first time, open the doors and leave them open for several minutes. This allows any natural gas vapors that may have collected in the cargo area to dissipate.

Vehicle Checks

Doing Your Own Service Work



Never try to do your own service work on the Compressed Natural Gas (CNG) fuel system. The CNG fuel system operates under high pressure. You can be injured and the vehicle can be damaged if you try to do your own service work. Service and repair of this system should only be performed by a qualified dealer.

Fuel System Components

Warning

Tampering with, or improperly maintaining the high-pressure fuel system can cause a dangerous condition in which serious injury or death may result. Never attempt to modify the fuel system, and always have the fuel system repaired and maintained by a qualified dealer.

CNG fuel system components include fuel tanks located in the cargo area and under the vehicle, an integrated fuel pressure regulator, in-tank fuel shutoff valves, high pressure fuel lines, electronically controlled multipoint fuel injectors, and other equipment. Fuel system components comply with appropriate safety standards. These components have been designed and approved for use in a CNG vehicle. Never modify or

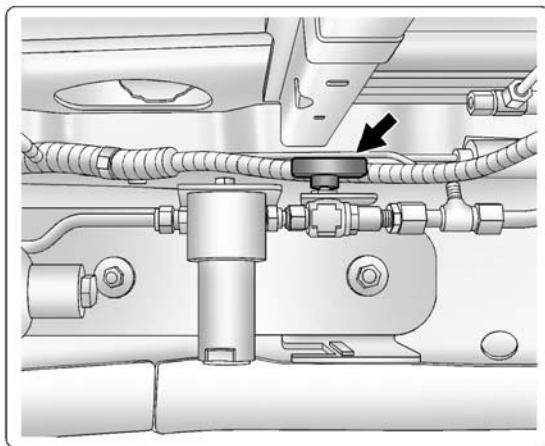
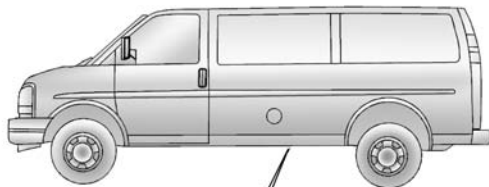
replace any original CNG components or parts with those specified for a gasoline-powered vehicle. Improper parts or components can damage the vehicle fuel system and affect the vehicle safety and performance.

Do not modify, tamper with, or perforate the cargo area tank shield. Damage to the fuel system can result.

The in-tank fuel shutoff valve is controlled by the ignition switch and a solenoid on the high pressure regulator under the vehicle. When the ignition is in LOCK/OFF or ACC/ACCESSORY, the solenoid is off and the valve is closed, shutting off fuel flow to the engine. When the ignition is turned to ON/RUN, the solenoid is on (for three seconds) and the fuel shutoff valve is open.

10-4 Vehicle Care

Manual Shutoff Valve



Locate the manual shutoff valve so that it can be found quickly if it is needed.

The manual shutoff valve is on the inner side of the driver side frame rail halfway between the front and rear tires.

A label is on the outside of the vehicle above the manual shutoff valve. Do not remove this label.

To turn off the valve, turn the lever one-quarter turn clockwise. Turn it counterclockwise to turn the valve back on.

Turn off the valve if a fuel leak is suspected or the vehicle is involved in an accident. This valve, when turned, will stop CNG flow to the engine. If the vehicle has just been in storage and it will not start, verify that the valve is turned to the on position.

Wheels and Tires

Tire Changing

This vehicle does not have a spare tire. See *Towing the Vehicle* on page 10-5.

Jump Starting

Warning

If the CNG fuel system has a leak, a spark from the jumper cables could ignite the natural gas, causing injury or death. Do not jump start the vehicle if you smell a persistent natural gas odor or hear a continual hissing sound. Close the manual shutoff valve, and have the vehicle towed to an authorized GM dealer for service. See *Fuel System Components* on page 10-3.

See “Jump Starting” in the owner manual.

Towing the Vehicle

Warning

Improperly positioned tow straps, hooks, or chains can damage the CNG fuel system and cause a leak. If leaking gas catches fire, it could cause injury or death. To avoid damage, always flatbed on a car carrier.

See the owner manual for more information on towing the disabled vehicle.

Appearance Care

Exterior Care

Finish Damage

 **Warning**

Heating the vehicle to above 82°C (180°F) may damage the Compressed Natural Gas (CNG) tanks and may cause the fuel pressure relief device to open and release CNG. If an ignition source is present, this could create a risk of fire or explosion.

CNG tank(s) must be drained by a qualified technician prior to heat curing a painted body repair.

Service and Maintenance

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Maintenance Schedule

 **Warning**

The tank shields protect the CNG tank in a crash and from road hazards. Removal of the shields may result in tank damage that could result in a rupture or possible explosion of the tank. You or others could be injured or even killed. If you must remove a tank shield for any reason, e.g., tank inspection or vehicle repair, always reinstall the shield before operating the vehicle.

 **Warning**

Keeping a CNG fuel tank in service after the tank service expiration date is dangerous and
(Continued)

Warning (Continued)

is prohibited by federal law. The tank may no longer withstand the CNG fuel system operating pressure. You could be severely injured or killed. Take the vehicle to an authorized GM dealer to have the tank replaced.

See instructions on fuel container for inspection and service life.

This CNG vehicle is designed for routine maintenance (fluids, filters, etc.) according to the original specifications as provided in the owner manual for gasoline fuel vehicles. See the owner manual for maintenance service intervals and fluid specifications.

See your dealer or other qualified repair facility for required service and maintenance. Your dealer has the necessary training and parts to repair the vehicle.

11-2 Service and Maintenance

In addition, the CNG system requires the following every 60 000 km (36,000 mi) or 36 months, whichever occurs first:

- Visual inspection of the CNG fuel tanks by a CSA International-certified inspector or authorized GM dealer. For more information, see your dealer or see:

<http://www.csa-international.org>

Have the CNG fuel system and tanks inspected if the vehicle has been involved in a collision or fire. The fuel tanks must be replaced 15 years after manufacture. The expiration date of the fuel tanks is on a label on the fuel tanks. Have an authorized GM dealer replace the fuel tanks. Do not reuse old fuel tanks.

- Replacement of the coalescent filter. See your dealer.

Maintenance Records

Natural Gas Vehicle (CNG) Service Records

Vehicle Identification Number (VIN)

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CNG Tank Information

Location	Size	Capacity*	Serial #	Exp. Date
In Front of Rear Axle	254 mm x 1 854 mm (10 in x 73 in)	79.5 L (21.0 gal)		
Behind Rear Axle (Front)	335 mm x 787 mm (13 in x 31 in)	51.0 L (13.5 gal)		
Behind Rear Axle (Rear)	335 mm x 813 mm (13 in x 32 in)	54.0 L (14.3 gal)		
Interior (If Equipped)	391 mm x 991 mm (15 in x 39 in)	90.0 L (23.8 gal)		
* Total Container Water Volume				

11-4 Service and Maintenance

CNG Fuel Tank Inspection Record

Tank Location:				
Tank Serial Number:			Tank Expiration Date:	
Inspection Interval (Mileage or Years)	Inspection Date	Inspector	Inspector Initials	Type of Repair
15 Years	N/A	N/A	N/A	Tank Exchanged

CNG Fuel Tank Inspection Record

Tank Location:				
Tank Serial Number:			Tank Expiration Date:	
Inspection Interval (Mileage or Years)	Inspection Date	Inspector	Inspector Initials	Type of Repair
15 Years	N/A	N/A	N/A	Tank Exchanged

11-6 Service and Maintenance

CNG Fuel Tank Inspection Record

Tank Location:				
Tank Serial Number:			Tank Expiration Date:	
Inspection Interval (Mileage or Years)	Inspection Date	Inspector	Inspector Initials	Type of Repair
15 Years	N/A	N/A	N/A	Tank Exchanged

CNG Fuel Tank Inspection Record

Tank Location:				
Tank Serial Number:			Tank Expiration Date:	
Inspection Interval (Mileage or Years)	Inspection Date	Inspector	Inspector Initials	Type of Repair
15 Years	N/A	N/A	N/A	Tank Exchanged

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Vehicle Data

Capacities and Specifications

Application	Total Capacities	
	Canada 200 Bar @ 15°C	U.S. 3,600 psi @ 70°F
CNG Fuel Tank Capacity – 4 Tank Cargo Van ¹	20.7 GGE	23.1 GGE
CNG Fuel Tank Capacity – 3 Tank Cargo and Passenger Van ¹	13.8 GGE	15.4 GGE
¹ GGE (Gasoline Gallon Equivalent)		

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