

2013 Silverado/Sierra Bi-Fuel (Gasoline/CNG) Supplement

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The names, logos, emblems, slogans, vehicle model names, and vehicle body designs appearing in this supplement including, but not limited to, GM, the GM logo, CHEVROLET, the CHEVROLET Emblem, GMC, the GMC Truck Emblem, SILVERADO, and SIERRA are trademarks and/or service marks of General Motors LLC, its subsidiaries, affiliates, or licensors.

This manual describes features that may or may not be on your specific vehicle either because they are options that you did not purchase or due to changes subsequent to the printing of this owner manual. Please refer to the purchase documentation relating to your specific vehicle to confirm each of the features found on your vehicle. For vehicles first sold in Canada, substitute the name "General Motors of Canada Limited" for Chevrolet and GMC Motor Division wherever it appears in this manual.

This vehicle is designed to operate on gasoline or Compressed Natural Gas (CNG). It will not operate on 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 suivant:

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

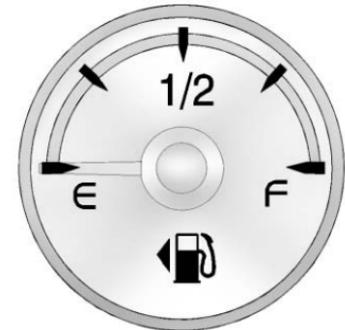
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Warning Lights, Gauges, and Indicators

Fuel Gauge

The vehicle has a gasoline fuel gauge and a CNG fuel level indicator.

Gasoline Fuel Gauge



When the ignition is on, the gasoline fuel gauge indicates about how much gasoline is left in the tank. See “Fuel Gauge” in the owner manual.

5-2 Instruments and Controls

CNG Fuel Gauge



While in the CNG mode, the four CNG fuel level indicator lamps show how much fuel is in the CNG fuel storage system. The gauge is only accurate while in CNG mode.

Four Lamps On: CNG fuel storage system is full.

Three Lamps On: CNG fuel storage system is three-quarters full.

Two Lamps On: CNG fuel storage system is half full.

One Lamp On: CNG fuel storage system is one-quarter full.

One Lamp Flashing: CNG fuel storage system has approximately 32 km (20 mi) of range remaining.

One Lamp Flashing and Beeps Sounding: CNG fuel storage system is empty and the system has switched to gasoline operation. To cancel the beep, press the fuel selector switch once. The sound will stop and the fuel operation indicator will be red.

CNG quantity is affected by changes in fuel temperature and fuel pressure.

Malfunction Indicator Lamp



The malfunction indicator lamp is in the instrument cluster.

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

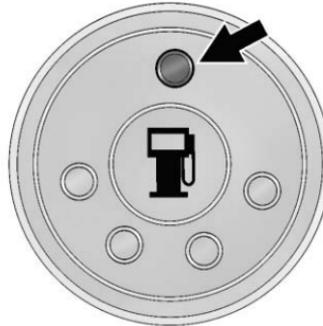
The malfunction indicator lamp comes on to indicate that there is a problem and service is required. Malfunctions often will be indicated by the system before any problem is apparent. This system is also designed to assist the service technician in correctly diagnosing any malfunction.

Notice: 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.

CNG Malfunction Indicator



The fuel operation indicator also functions as a malfunction indicator. If a malfunction occurs, the fuel operation indicator begins flashing red, and the vehicle switches over to gasoline operation. The fuel operation indicator will continue to flash red until the problem is corrected. See your dealer for service.

Driving and Operating

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Driving Information

Vehicle Load Limits

WARNING

Do not remove the Compressed Natural Gas (CNG) fuel tank shield. Things carried in the bed of the truck could shift forward during a sudden stop or a collision. The CNG fuel tank could be damaged and cause a natural gas leak. If the gas is, accidentally, ignited, you or others could be seriously injured. Make sure things in the bed of the truck are properly secured.

Notice: The CNG fuel tank and/or shield could be damaged if objects are stacked on or against the fuel tank shield or sit or stand on the shield. Never put anything on or against the CNG fuel tank shield.

See “Vehicle Load Limits” in the owner manual for cargo loading instructions.

Truck-Camper Loading Information

The vehicle was neither designed nor intended to carry a slide-in type camper.

Notice: Adding a slide-in camper or similar equipment to the vehicle can damage it, and the repairs would not be covered by the vehicle warranty. Do not install a slide-in camper or similar equipment on the vehicle.

Starting and Operating

Starting the Engine

Always maintain a minimum gasoline level of at least one-quarter tank. To protect engine components, a switch to gasoline may occur at any time. The vehicle will not start if the engine stalls due to lack of gasoline.

Fuel

If a fuel leak is suspected, see *Fuel System Leak* on page 9-7.

- Whichever mode is selected, the vehicle always starts on gasoline. When CNG mode is selected, the vehicle will automatically transition from gas to CNG. Always keep the gasoline tank at least one-quarter full.
- It is very important not to run the gasoline tank out of fuel. The system will not switch over to CNG operation if the engine stalls while running on gasoline.
- If the vehicle runs out of CNG fuel, it will automatically switch over to gasoline operation. For normal CNG operation, fill the CNG fuel storage system until the fuel indicator lamps indicate at least one-quarter full.

- If it takes unusually long to fill the CNG cylinder, the fuel fill filter may be clogged. Contact your dealer for inspection and/or replacement.

This vehicle is designed to operate on gasoline or Compressed Natural Gas (CNG) and has a gasoline tank and a CNG fuel storage system. See “Recommended Fuel” under “Fuel” in the owner manual for gasoline information.

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, fuel is available at both private and public filling stations. We recommend use of natural gas fuel from fueling stations designed for providing fuel for vehicle use.

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.

Refueling Station Information

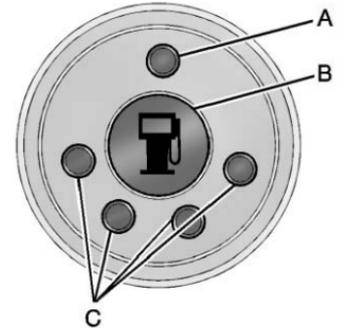
For up-to-date information on public-access CNG station locations and prices, and to view or add user comments, see:

www.cngprices.com and
www.cngchat.com

Public and private CNG stations may also be found at the following federal government website:

<http://www.afdc.energy.gov/afdc/locator/stations/>

Fuel Selector Switch



- A. Fuel Operation Indicator Lamp
- B. Fuel Selector Switch
- C. CNG Fuel Level Indicator Lamps

The fuel selector switch (B) is on the instrument panel below the climate controls. The center button is pressed to select gasoline or CNG with the key in ON/RUN with the engine running or off. The switch also includes the fuel operation indicator lamp (A) and the CNG fuel level indicator lamps (C).

9-4 Driving and Operating

The vehicle always starts on gasoline. If the fuel selector switch is in CNG mode when the vehicle is started, the vehicle will start on gasoline and switch to CNG when conditions for CNG operation have been met. While waiting to transition, the fuel operation indicator lamp will be red and the fuel level lamps will show the approximate CNG fuel level. The gauge will show the accurate fuel level when the vehicle has transitioned to CNG. If the vehicle is turned off in gasoline mode, when started it will remain in gasoline mode until the fuel selector switch is pressed. At temperatures below freezing, it may take 10 to 15 minutes for the vehicle to switch from gasoline to CNG. If the button is pressed to switch to gasoline from CNG while driving, the engine will change to gasoline operation. If the system transitions more than 20 times in a single key cycle, it will remain in the last mode selected.

Fuel Operation Indicator Lamp

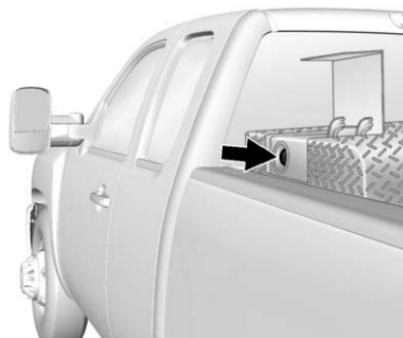
The fuel operation indicator lamp (A) changes color to indicate the current fuel mode or when in transition between fuels.

- Red: Vehicle is currently operating on gasoline.
- Green: Vehicle is currently operating on CNG.
- Amber: Vehicle is transitioning to the selected fuel.

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, have the vehicle immediately inspected and repaired by an authorized GM dealer.



Before filling either fuel tank, turn off the engine.

The gasoline tank is filled through the standard fill pipe. See “Filling the Tank” under “Fuel” in the owner manual.

The CNG fill valve is behind the fuel door on the driver side of the tank shield in the pickup bed.



There is an identifying blue diamond-shaped CNG label on the rear of the vehicle. Do not remove this label. This label is necessary for compliance with NFPA-52 regulations. 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 depending upon the refueling system used — consult with the refueling station attendant or system provider. 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).

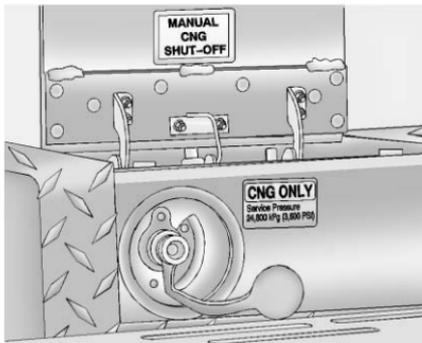
The maximum fill pressure is 24 800 kPa (3,600 psi). Refuel with a yellow P36 nozzle where available. Using a blue P30 nozzle will provide a partial fill only.

Depending on CNG fill station equipment/performance and environmental conditions, CNG fill volume will vary. This will affect overall vehicle range.

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.

9-6 Driving and Operating

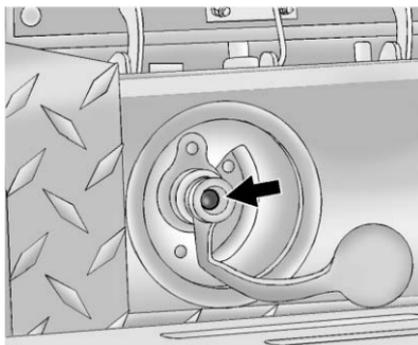


Put the vehicle into P (Park) and turn off the engine prior to refueling. Remove the dust cap from the receptacle, clean off any dirt or debris on the receptacle, and follow the refueling instructions on the pump or provided by the station operator.

Refueling will stop automatically when the tank is full. Wait for the high pressure fuel to be purged from the hose before disconnecting. See the station operator for information on how the line is purged. 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.

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



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, and inspect the fill valve for a missing, damaged, dirty, or worn

O-ring. Reconnect the refueling dispenser to the fill valve and begin refueling again. If it continues to leak, replace the fill valve O-ring.

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.

If it continues to leak after you have replaced the O-ring, have an authorized dealer inspect the sealing O-ring in the fill valve.

If dirt or other debris is adhering to the inside of the fuel fill valve, gas may leak out after refueling. If you need to add more fuel, do the refueling procedure again.

See an authorized GM dealer for replacement O-rings.

Fuel System Leak

WARNING

Fuel vapors and fuel fires burn violently and can cause injury or death.

- Keep all smoking materials and sources of ignition away from the fuel system components.
- CNG is non-toxic but the vapors are lighter than air and can cause oxygen depletion if they are enclosed in a confined space. Make sure there is adequate ventilation and use extreme caution if a leak is suspected.

WARNING

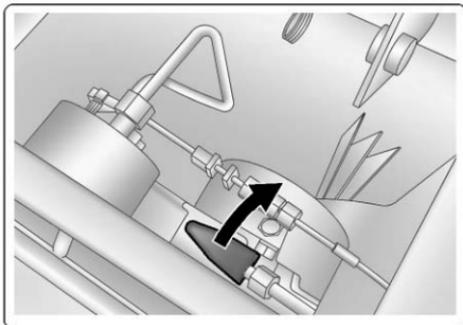
If you smell a persistent natural gas odor or hear a continual hissing sound, there could be a natural gas leak. If the natural gas is ignited, you or others could be injured. Do not start the engine or drive the vehicle. Have the vehicle towed to an authorized GM dealer for service.

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 is near the fuel fill valve on the driver side of the tank shield in the pickup bed.

A label is on the outside of the vehicle near 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.

Do not add anything to the vehicle that will cover the CNG fuel storage system or restrict access to the manual shutoff valve. See *Accessories and Modifications on page 10-1*.

Towing

Trailer Towing

For more information, see “Trailer Towing” in the owner manual.

Weight of the Trailer

How heavy can a trailer safely be?

It depends on how the rig is used. For example, speed, altitude, road grades, outside temperature, and how much the vehicle is used to pull a trailer are all important. It can depend on any special equipment on the vehicle, and the amount of tongue weight the vehicle can carry.

Maximum trailer weight is calculated assuming only the driver is in the tow vehicle and it has all the required trailering equipment. The weight of additional optional equipment, passengers, and cargo in the tow vehicle must be subtracted from the maximum trailer weight.

Use the following charts to determine how much the vehicle can weigh, based upon the vehicle model and options.

9-10 Driving and Operating

Vehicle	Axle Ratio	Maximum Trailer Weight	GCWR*
2WD Standard Box	3.73	4 218 kg (9,300 lb)	7 258 kg (16,000 lb)
2WD Standard Box	4.10	5 897 kg (13,000 lb)	9 299 kg (20,500 lb)
2WD Long Box	3.73	4 173 kg (9,200 lb)	7 258 kg (16,000 lb)
2WD Long Box	4.10	5 897 kg (13,000 lb)	9 299 kg (20,500 lb)
4WD Standard Box	3.73	4 082 kg (9,000 lb)	7 258 kg (16,000 lb)
4WD Standard Box	4.10	5 897 kg (13,000 lb)	9 299 kg (20,500 lb)
4WD Long Box	3.73	4 037 kg (8,900 lb)	7 258 kg (16,000 lb)
4WD Long Box	4.10	5 897 kg (13,000 lb)	9 299 kg (20,500 lb)

*The Gross Combination Weight Rating (GCWR) is the total allowable weight of the completely loaded vehicle and trailer including any passengers, cargo, equipment, and conversions. The GCWR for the vehicle should not be exceeded.

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General Information

Accessories and Modifications

 WARNING
Installing an aftermarket accessory may damage the vehicle. Never install an accessory that will restrict or prohibit access to the manual shutoff valve or the CNG fuel storage system. Never install any type of cover over the CNG fuel storage system that may trap CNG fumes.

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.

 WARNING
To avoid damage to any fuel tanks and reduce the risk of explosion, tank shields must be present. Do not drill, modify, attach accessories, 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 is near the fuel fill valve on the driver side of the tank shield in the pickup bed.

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

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

- If the vehicle is stored indoors, it should be parked in a well-ventilated area. Installation of a natural gas leak detector at the highest point of the ceiling is recommended.

Vehicle Checks

Doing Your Own Service Work

 **WARNING**

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

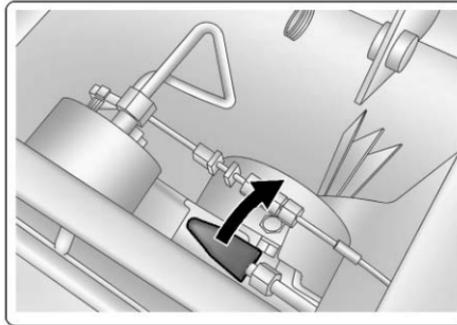
 **WARNING**

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 comply with appropriate safety standards. These component parts 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 tank shield. Damage to the fuel system can result.

Manual Shutoff Valve



10-4 Vehicle Care

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

The manual shutoff valve is near the fuel fill valve on the driver side of the tank shield in the pickup bed.

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

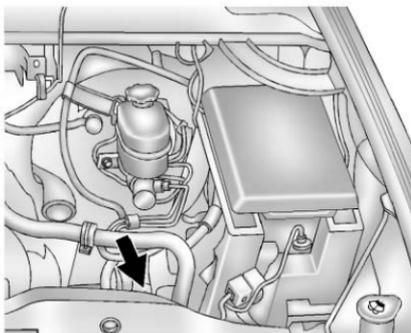
To turn off the valve, turn the lever one-quarter turn clockwise. Turn it counterclockwise to turn the valve back on.

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 switch over to CNG operation, verify that the valve is turned to the on position.

Electrical System

Fuses

Fuse Location



The bi-fuel system has two fuses that are part of the engine compartment wiring harness. Both fuses are in a plastic holder that is mounted inside the engine compartment, near the accessory battery tray.

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 10-2.

See “Jump Starting” in the owner manual.

Appearance Care

Exterior Care

Finish Damage

 **WARNING**

Heating the vehicle to above 82°C (180°F) may cause the fuel pressure relief device to open and release CNG gas. You could be injured or the vehicle could be damaged. Never cure a painted body repair by heating.

Service and Maintenance

Maintenance Schedule

Maintenance Schedule 11-1

Maintenance Records

Natural Gas Vehicle (CNG)
Service Records 11-3

Maintenance Schedule

 **WARNING**

The tank shield protects the fuel tank in a crash and from road hazards. Operation with the shield removed 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 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.

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.

11-2 Service and Maintenance

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.

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 visit:
<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 high pressure CNG filter. See your dealer.

Maintenance Records

Natural Gas Vehicle (CNG) Service Records

Vehicle Identification Number (VIN)

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CNG Tank Information

Size	Capacity*	Serial #	Exp. Date
533 mm x 1 327 mm (21 in x 52 in)	210 L (55.5 gal)		
* Total Container Water Volume			

CNG Fuel Tank Inspection Record

Tank Serial Number:			Tank Expiration Date:	
Inspection Interval (Mileage or Years)	Inspection Date	Inspector	Inspector Initials	Type of Repair

11-4 Service and Maintenance

CNG Fuel Tank Inspection Record (cont'd)

15 Years	N/A	N/A	N/A	Tank Exchanged

Technical Data

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Vehicle Data

Capacities and Specifications

Application	Capacities	
	Metric	English
CNG Fuel Tank Capacity ^{1 2}	66.6L	17.6 GGE
¹ At 24.8 MPa (3,600 psi) and 21°C (70°F). ² GGE (Gasoline Gallon Equivalent)		

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