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2015

**Impala Bi-Fuel
(Gasoline/CNG) Supplement**



2015 Chevrolet Impala Bi-Fuel (Gasoline/CNG) Supplement

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This manual describes features that may or may not be on the vehicle because of optional equipment that was not purchased on the vehicle, model variants, country specifications, features/applications that may not be available in your region, or changes subsequent to the printing of this owner manual.

Refer to the purchase documentation relating to your specific vehicle to confirm the features.

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

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

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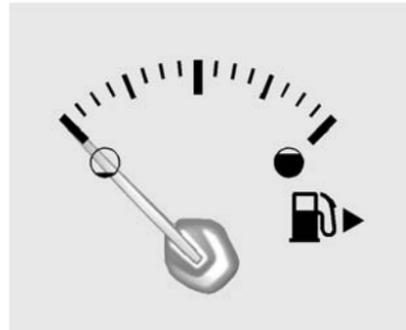
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Warning Lights, Gauges, and Indicators

Fuel Gauge

The vehicle has a fuel gauge that displays either gasoline or CNG fuel level.



Metric



English

With the ignition on, the gasoline/CNG fuel gauge indicates remaining fuel in the tank for the fuel that is being used. See “Fuel Selector Switch” under *Fuel on page 9-3*.

To check the level of the fuel not being used, see *Driver Information Center (DIC) on page 5-3*.

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

5-2 Instruments and Controls

CNG fuel gauge readings are affected by changes in fuel temperature and fuel pressure.

See “Fuel Gauge” in the owner manual.

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 CNG 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.

This light comes on during a malfunction in one of two ways:

Light Flashing

A misfire condition has been detected. A misfire increases vehicle emissions and could damage the emission control system on the vehicle. Diagnosis and service might be required.

To prevent more serious damage to the vehicle:

- Reduce vehicle speed.
- Avoid hard accelerations.
- Avoid steep uphill grades.

If the light continues to flash, find a safe place to stop and park the vehicle. Turn the vehicle off, wait at least 10 seconds, and restart the engine. If the light is still flashing, follow the previous steps and see your dealer for service as soon as possible.

Light On Steady

An emission control system malfunction has been detected on the vehicle. Diagnosis and service might be required.

See the owner manual for more information.

Low Fuel Warning Light



This light is near the fuel gauge and comes on briefly when the ignition is turned on as a check to show it is working.

It also comes on when the fuel tank is low on the fuel that is in operation (gasoline or CNG).

Information Displays

Driver Information Center (DIC)

The DIC displays are shown in the center of the instrument cluster in the Info app. A bi-fuel vehicle will have the following additional DIC info pages.

DIC Info Pages

Fuel Level: While operating on CNG, the gasoline fuel level can be viewed in the DIC.

CNG Fuel Level: While operating on gasoline, the CNG fuel level can be viewed in the DIC.

Fuel Range: Displays the approximate distances the vehicle can be driven with gasoline and CNG without refueling. A total distance with both gasoline and CNG distances combined is also displayed. LOW will be displayed when the vehicle is low on fuel. The

fuel range estimate is based on an average of the vehicle's current fuel economy.

Average Fuel Economy (AFE):

Located in the Trip A page of the DIC, the AFE is shown for the fuel that is in operation. The value shown is the average for the fuel used since the last Trip A reset while running on that fuel. If no reset occurs, the AFE value for each fuel will continually recalculate the average from the last reset.

Vehicle Messages

Fuel System Messages

FUEL MODE UNAVAILABLE

This message displays when the fuel selector switch is pressed and the fuel selected is empty or unavailable. See “Fuel Selector Switch” under *Fuel* on page 9-3. This is usually due to a low fuel condition of the fuel type selected or the engine is not warm enough after an initial engine start up.

This message will also appear if the vehicle has initiated a gasoline system maintenance routine. A switch to CNG will not be available until this routine is complete.

SERVICE FUEL SYSTEM PARK IN OPEN AREA

This vehicle is equipped with a CNG fuel system diagnostic to ensure proper function. This message displays when the CNG fuel system requires service.

Park the vehicle in an outdoor open area, do not start the engine, refuel, or drive the vehicle. Have the vehicle towed to an authorized GM dealer for service.

See *Fuel System Leak* on page 9-8.

Driving and Operating

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Driving Information Vehicle Load Limits

 **Caution**

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

Fuel Selection

A switch allows the selection of fuel. See *Fuel on page 9-3*. The vehicle typically defaults to the fuel used on the last key cycle.

If a tank refill has occurred after an automatic low fuel level transition from one fuel to another, CNG to gasoline for example, the vehicle recognizes the refill and if conditions are met, will start on the fuel last selected on the switch.

To protect engine and gasoline fuel system components, an automatic switch to gasoline may occur at any time. The vehicle will transition back

9-2 Driving and Operating

to CNG automatically once the gasoline system has run for a pre-set time.

Cold Weather Starting

If the outside temperature is below 2 °C (35 °F), the engine may start on gasoline when CNG is selected. After starting on gasoline, the vehicle will automatically transition to CNG operation after a set amount of warm-up time.

Using the engine heater may make it easier to start. 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.

Ride Control Systems

Traction Control/ Electronic Stability Control

This vehicle has Traction Control System (TCS) and StabiliTrak[®] electronic stability control systems. These systems are enabled automatically and StabiliTrak cannot be turned off. To turn off TCS, see “Traction Control/Electronic Stability Control” in the owner manual.

Fuel

If a fuel leak is suspected, see *Fuel System Leak* on page 9-8.

- If the vehicle runs out of CNG or gasoline, it will automatically switch to the other fuel system, if there is fuel.
- If it takes unusually long to fill the CNG cylinder, the fuel fill receptacle may be clogged. Contact your dealer for inspection and/or replacement. See “Fuel Filling Problems” in *Filling the Tank (CNG)* on page 9-4.

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

The general marketplace fuel quality of CNG (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 CNG fuel quality standards for general marketplace vehicle usage; however, CNG is available at both private and public filling stations. We recommend use of CNG that meets or exceeds SAE J1616 specifications for fuel composition and cleanliness. See *Filling the Tank (CNG)* on page 9-4.

Caution

Using below standard CNG fuel quality may cause damage to the CNG fuel system. Below standard CNG fuel may also cause a whistle noise. Use only CNG fuel meeting recommended CNG fuel standards.

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 800kPa at 21 °C/ 3,600 psig at 70 °F). Gas should never be smelled unless it occurs briefly during refueling. If gas is smelled or a hissing sound is heard at any other time, park in a well ventilated outdoor open area, 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. If you suspect a fuel leak, follow the instructions under *Fuel System Leak* on page 9-8.

9-4 Driving and Operating

Fuel Selector Switch



The fuel selector switch is on the instrument panel left of the steering wheel. When the ignition is in ON/RUN, press  to select between gasoline and CNG. The indicator light in the fuel selector switch comes on when the vehicle is running on CNG.

Certain conditions must be met in order to switch between gasoline and CNG. The vehicle will start up on the last fuel that was selected.

When the fuel selector switch is pressed, the indicator light will flash during a fuel transition. If the fuel transition is unsuccessful, the DIC will display FUEL MODE UNAVAILABLE. See *Fuel System Messages* on page 5-4.

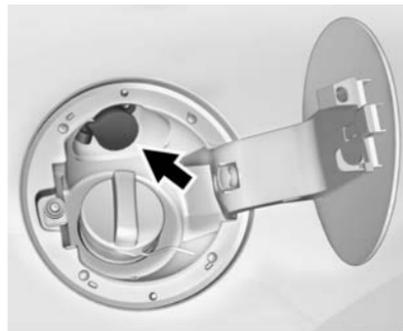
Filling the Tank (CNG)

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 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 receptacle is behind the fuel door on the passenger side above the gasoline cap.

Refueling Procedure

There are two methods of refueling: fast fill or time fill. Fast fill is normally used in fuel stations for natural gas vehicles. It takes about two to five minutes to fill up the fuel tank. Time fill is done with a

refueling appliance, including residential appliances, 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. If a 24 800 kPa (3,600 psig) nozzle is not available, a 20 684 kPa (3,000 psig) nozzle may be connected to the vehicle.

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 related to the ambient temperature compensation chart. 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 time 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 time 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 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 outdoor 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

9-6 Driving and Operating

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

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

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 receptacle.

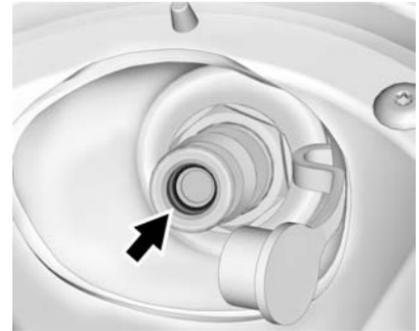
A momentary release of CNG will occur when the nozzle is released. This is normal.

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 receptacle 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 receptacle for a missing, damaged, dirty, or worn O-ring. Reconnect the refueling dispenser to the fill valve and begin refueling again. If a leak is still present, replace the fill valve O-ring.

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.



Fill Valve O-Ring

To replace the fill valve O-ring:

1. Carefully remove the O-ring from the groove in the fill receptacle. 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 receptacle. Make sure the O-ring is properly seated in the groove.

9-8 Driving and Operating

If a leak is still present after you have replaced the O-ring, have an authorized dealer inspect the sealing O-ring in the fill receptacle.

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

See an authorized GM dealer for replacement O-rings.

Fuel Filling Problems

If you experience very slow fill rates, the CNG fuel filter in the fill valve may require service. Slow fill rates may also be caused by ice formation on the fuel receptacle. Use only CNG fuel meeting recommended CNG fuel standards.

If you experience reduced range during CNG operation and none of the conditions described earlier in this section apply, the CNG fuel tank may require service. This may be caused by the buildup of water, oil, or debris inside the tank or an

inoperative tank valve. In either case, take the vehicle to an authorized GM dealer for service.

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.

If a pressure relief device releases CNG, the CNG tank will be emptied and will switch to gasoline, if gasoline is available. A loud rushing noise may be heard when CNG is released.

In Case of a CNG Leak

If a CNG fuel leak is suspected, see *Fuel System Leak on page 9-8*.

Fuel System Leak



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 CNG leak. If the gas is accidentally ignited, you or others could be seriously injured or killed. 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 an outdoor open 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. Do not start the engine, refuel, or drive the vehicle.
3. The manual shutoff is on the driver side of the vehicle in front of the rear tire. See *Fuel System Components on page 10-2*.

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

Trailer Towing

The vehicle is neither designed nor intended to tow a trailer.

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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 damage and would not be covered by the vehicle warranty.

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 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.

10-2 Vehicle Care

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 the fuel tank in the trunk of the vehicle, a fuel pressure regulator, an in-tank fuel shutoff valve, high pressure fuel lines, electronically controlled multipoint fuel injectors, and other equipment.

CNG fuel system components comply with appropriate safety standards. 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.

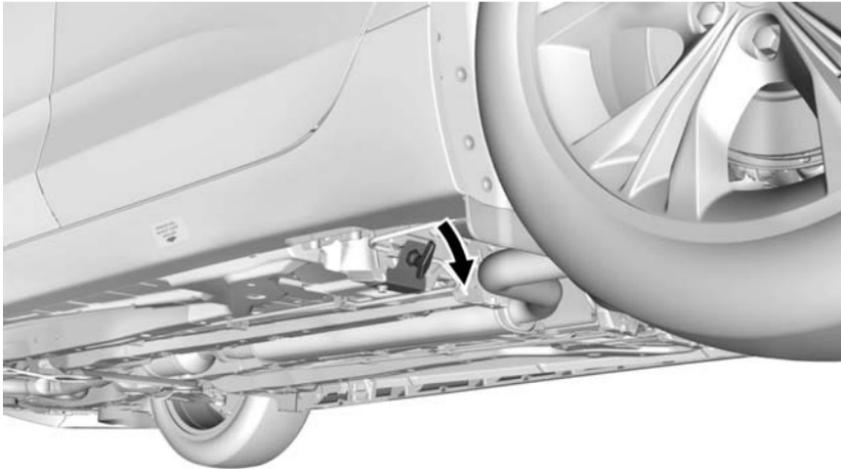
Do not modify, tamper with, or perforate the CNG tank shield. Damage to the CNG fuel system can result.



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 or CSA

B109 regulations. Driving without this label may violate the laws or regulations in some jurisdictions. Replacement labels can be ordered from your dealer.

Manual Shutoff Valve



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

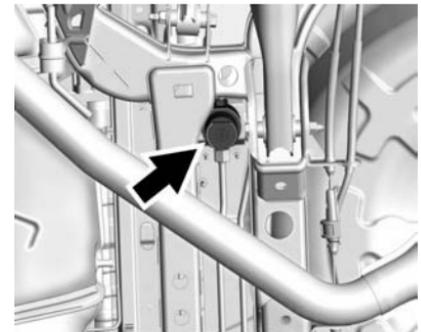
The manual shutoff valve is on the driver side of the vehicle in front of the rear tire.

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.

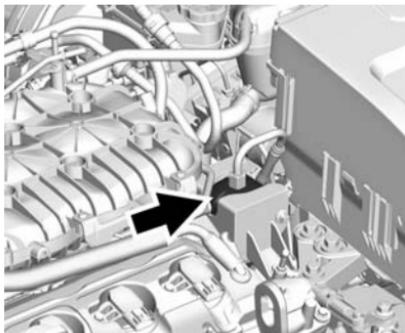
High Pressure CNG Fuel Filter



The high pressure CNG fuel filter is under the rear of the vehicle. This filter must have the water drained and the filter element must also be replaced at specific service intervals. See *Maintenance Schedule* on page 11-1.

10-4 Vehicle Care

Low Pressure CNG Oil Separator



The low pressure CNG oil separator is under the hood on the driver side of the vehicle. This filter must have the oil drained periodically. See *Maintenance Schedule* on page 11-1.

Wheels and Tires

Tire Changing

Storing a Flat Tire

Warning

Storing a jack, a tire, or other equipment in the passenger compartment of the vehicle could cause injury. In a sudden stop or collision, loose equipment could strike someone. Store all these in the proper place.

1. Replace the foam, jack, and tools as instructed in the owner manual.
2. Replace the floor cover.
3. Place the tire, lying flat, in the trunk.

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 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

Maintenance Schedule

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Natural Gas Vehicle (CNG)
Service Records 11-3

Maintenance Schedule

Warning

Do not operate the vehicle without CNG tank shields in place. Operation with a CNG tank 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.

See instructions on fuel container for inspection and service life.

Inspect the fuel tank every three years and replace it after 15 years. The fuel tank expiration date is on the labels near the fuel tank and fuel fill areas. Refer to the maintenance intervals following.

11-2 Service and Maintenance

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.

Every 17 500 km/11,000 Miles

- Replacement of the high pressure CNG filter. See your dealer.

Every 48 000 km/30,000 Miles

- Spark plug replacement and spark plug wire inspection. *See Emission Control Service.*

Every 60 000 km/37,500 Miles

- Visual inspection of the CNG fuel tank by a qualified technician or authorized GM dealer (or 36 months, whichever occurs first). For more information, see your dealer or visit: <http://www.csa-international.org/>

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

- Service of the low pressure oil separator (or 36 months, whichever occurs first). See your dealer.

Maintenance Records

Natural Gas Vehicle (CNG) Service Records

Vehicle Identification Number (VIN)

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

CNG Tank Information

Size	Capacity*	Serial #	Exp. Date
* 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

Vehicle Data

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12-2 Technical Data

Vehicle Data

Capacities and Specifications

Application	Total Capacities	
	Canada 200 Bar @ 15°C	U.S. 3,600 psig @ 70°F
CNG Fuel Tank Capacity ¹	7.0 GGE	7.8 GGE
¹ GGE (Gasoline Gallon Equivalent)		

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