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INTRODUCTION

Congratulations on your purchase of an IMPCO Automotive alternative fuel system. The IMPCO Automotive alternative fuel system is an advanced, state-of-the-art, gaseous fuel injection system designed to work in conjunction with the OEM engine management system and provide seamless performance on either Compressed Natural Gas (CNG) or Liquid Propane Gas (LPG). This Owner’s Manual covers both Bi-Fuel & Dedicated alternative fuel systems.

As the operator of this alternative fuel vehicle, you should familiarize yourself with the unique features and operation of this alternative fuel system.

Compressed Natural Gas (CNG) is a colorless and odorless vapor/gas as Liquid Propane Gas (LPG) is a colorless and odorless liquid. For safety reasons, a distinct odorant, with a sulfur-like or rotten egg smell, is added to alert the operator and passengers of a possible leak in the alternative fuel system.

Other than the IMPCO Automotive components that enable the vehicle to run on the alternative fuel system, your vehicle has the same features as the standard gasoline only vehicle. Read and understand all the safety information before operating the vehicle. This supplement contains information specific to the alternative fuel system. It does not explain everything you need to know about your vehicle. It is necessary to use this supplement in conjunction with the vehicle manufactures Owner’s manual.

Glossary

CNG
Whenever the abbreviation ‘CNG’ or ‘Natural Gas’ is referenced in this manual it is indicating Compressed Natural Gas.

LPG
Whenever the abbreviation ‘LPG’ or ‘Propane’ is referenced in this manual it is indicating Liquid Propane Gas.

Alternative Fuel Selector Switch
Whenever the words/abbreviations ‘Selector Switch’, ‘Alternative Fuel Selector Switch’, or ‘AFS Switch’ is referenced in this manual it is referring to the LED Switch located in the Passenger’s compartment which operates as the Fuel Selector, fuel gauge, and diagnostic indicator.
SAFETY INFORMATION:

Never take safety for granted. This IMPCO Automotive alternative fuel system conforms to all applicable safety standards and specifications in force at the time of manufacture. However it is up to you, the owner and operator, to understand and follow all precautions for safe handling and operation of your vehicle. The information provided in this Owner’s Manual is provided for your information and safety. Please familiarize yourself with each area of this Owner’s Manual before operating the alternative fuel vehicle.

CNG in its gaseous form is lighter than air. Leaking gases can collect in overhead ceilings or other confined areas. If the gases contact an ignition source, a fire or explosion could result. Exit the area immediately if CNG gases have leaked from the fuel system into a confined area. Failure to follow this warning could result in bodily injury or death.

The IMPCO Automotive CNG alternative fuel system is equipped with a manual shutoff valve. Turning this valve a ¼ turn (or 90 degrees) will shut off the flow of fuel from the alternative fuel tank. The valve is typically located on the driver's side, towards the middle of the vehicle, and should be labeled “Manual Shutoff Valve.” Be sure to familiarize yourself with its location and use before operating.

LPG in its gaseous form is heavier than air. Leaking gases can pool in low lying regions and depressions in buildings or other confined areas. If the gases contact an ignition source, a fire or explosion could result. Exit the area immediately if LPG gases have leaked from the fuel system into a confined area. Failure to follow this warning could result in bodily injury or death.
SAFETY INFORMATION:

GENERAL SAFETY PRECAUTIONS:

The following are some general safety precautions about alternative fuel systems and alternative fuel system servicing:

- Repair of the alternative fuel system should only be done by alternative fuel trained technicians (example ASE F1 Certification).
- All service work on the alternative fuel system should be done in a well-ventilated work area.
- Never perform repairs on an alternative fuel tank/cylinder that still has fuel in it.
- Never cut or weld any alternative fuel tank/cylinder.
- Leak check your alternative fuel tank/cylinder using only an approved leak detector. NEVER check for leaks with a flame or spark.
- Do not modify the valves/fittings on the alternative fuel system.
- Do not leave any alternative fuel tank/cylinder empty for an extended period of time since an empty tank/cylinder can develop condensation.
- If the alternative fuel tank/cylinder will be disconnected from service for an extended period of time, cap or plug all the fittings and keep the tank/cylinder shutoff valve closed.
- Know & recognize the odor of gaseous fuels. Gaseous fuels have a distinctive sulfur-like or rotten egg smell by design.
- Know how to open the tank/cylinder cover valve access door (when equipped).
- Never operate with the alternative fuel tank/cylinder cover removed. This cover is designed to protect the fuel tank/cylinder from damage.
- Know where the manual shutoff valve is located in case of an emergency.
- Never install a camper, camper shell or any type of cover on the pickup bed that may possibly trap flammable gaseous fuel vapors. Such an installation may prevent proper alternative fuel ventilation.
- Never over pressurize the alternative fuel tank/cylinder or use illegal adapters to exceed the rated fill pressure.
- Do not paint the alternative fuel tank/cylinder or the tank/cylinder cover.
- If the vehicle is repainted, the alternative fuel tank/cylinder must be removed by a qualified technician before the vehicle is placed in a paint oven (refer to Painting your vehicle on page 7).
- Make sure all tank/cylinder and vehicle markings and labels are clean and intact. If replacement labels are required, contact your original installer.
SAFETY INFORMATION:

GENERAL SAFETY PRECAUTIONS (CONTINUED):

Storing Your Vehicle:

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

- Turn the manual shutoff valve 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 leak detector (at the highest point for CNG and at the lowest point for LPG) of the storage facility.
- After storing the vehicle for an extended period, and before starting the engine for the first time, open the vehicle’s doors and leave them open for several minutes. This allows any gas vapors that may have collected in the cargo area to dissipate.

Failure to follow the above safety precautions could result in bodily injury or death.

On Bi-Fuel applications, in order to protect engine components, an automatic switch over to gasoline may occur under certain conditions. Maintain a recommended gasoline level of ¼ tank to prevent stalling in the event of fuel switch-over.

Painting Your Vehicle:

Failure to follow these warnings could result in bodily injury or death.

In the event your vehicle should require painting, the alternative fuel system must be fully depressurized and the tank must be removed from the vehicle by an alternative fuel trained service technician before placing the vehicle in any paint oven. Exposing the alternative fuel system and tank to the high temperatures that occur during the paint baking process could activate the pressure relief device on the alternative fuel tank, creating a hazardous condition. The pressure release device on the fuel tanks will open and release the gaseous fuel at 100°C (212°F).

Failure to follow the above safety precautions could result in bodily injury or death.
SAFETY INFORMATION:

Warning!

Failure to follow these warnings could result in bodily injury or death.

IN CASE OF AN ALTERNATIVE FUEL LEAK:

1. If driving, pull off the road immediately and park the vehicle in an open, well-ventilated area.
2. Turn the engine off and exit the vehicle.
3. Close the manual shutoff valve.
4. Eliminate all potential sources of ignition such as burning cigarettes, sparks, etc.
5. Call emergency response personnel based on your personal discretion.

IN CASE OF FIRE:

1. Stop the flow of gas as soon as possible. Never attempt to put out the flame unless the gas source can be stopped. A spark of other source of ignition could cause an explosion.
2. Evacuate the immediate area of all people and animals and call the fire department.
SAFETY INFORMATION:

VEHICLE OPERATION:

Warning!

Failure to follow these warnings could result in bodily injury or death.

Natural Gas & Liquid Propane are both extremely flammable. If ignited, you could be badly burned. Keep sparks, flames, and smoking material away from all gaseous fuels. Do not smoke if you are near CNG/LPG vapors or when refueling your vehicle.

The Compressed Natural Gas (CNG) system is under high pressure. A sudden escape of CNG could cause injury. Never disconnect a CNG fuel line or remove a CNG fuel system component without properly relieving all pressure.

When Liquid Propane Gas (LPG) is exposed to the atmosphere it becomes extremely cold and could cause frost bite. A sudden escape of LPG could cause injury. Never disconnect a LPG fuel line or remove a LPG fuel system component without properly relieving pressure.

Service and repair of any IMPCO Automotive alternative fuel system should only be performed by an alternative fuel trained technician (example ASE F1 Certification) with the proper knowledge and tools.

Do not start and operate the vehicle in any enclosed area such as a garage without venting. Exhaust fumes contain deadly carbon monoxide. If you detect a strong smell of CNG or LPG before starting the engine or you hear a hissing sound then DO NOT start the engine. Close the manual shutoff valve and ventilate the area. Do not start the vehicle until the leak can be located and corrected by a qualified alternative fuel trained technician.
COMPONENT LOCATIONS:

IMPCO Automotive fuel system components include:
• Fuel tanks (which are usually located in the trunk, cargo area, and/or under the vehicle depending on application)
• Integrated fuel pressure regulator/vaporizer, in-tank fuel shutoff valves, high pressure fuel lines, electronically controlled multipoint fuel injectors, and various other lines, filters, and fittings.

Fuse Location:

• The IMPCO Automotive bi-fuel system has two fuses incorporated into the wiring harness (5 and 25 amp). Both fuses are in a plastic fuse holder that is mounted inside the engine compartment (usually near the battery). Location may vary by vehicle.

Alternative Fuel system components comply with the appropriate safety standards. Never modify or replace any original alternative fuel 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.

⚠️ 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 alternative fuel system, and always have alternative fuel system repairs and maintenance performed by an alternative fuel trained technician.
Fuel Selector Switch Location (typical for Bi-Fuel only):

(Example only – location will vary by vehicle)

(Equipment and locations may vary by vehicle)
Typical LPG Fuel Tank and Manual Shutoff Valve Locations (Example only):

(Equipment and locations may vary by vehicle)
Typical CNG Fuel Tank and Manual Shutoff Valve Locations (Example only):

(Equipment and locations may vary by vehicle)
Fuel System Controls & Operation:
Alternative Fuel “Selector Switch” (Bi-Fuel only):

The Alternative Fuel “Selector Switch” is always mounted in a location with easy access to the driver. The switch has two positions: Alternative Fuel and Gasoline. Fuel selection is performed with the key in the ON position and the engine running. Also, the switch housing incorporates the Alternative Fuel Operation “Indicator Lamp” and the Alternative Fuel Tank Level “Indicator Lamps”.

Gasoline Operation (Bi-Fuel only):

When the Alternative Fuel “Selector Switch” is in the gasoline position the Alternative Fuel Operation “Indicator Lamp” is illuminated red and the engine will start and run on gasoline. If the switch is moved to gasoline from the alternative fuel while driving, the engine will automatically switch over to gasoline operation.
Alternative Fuel Operation (Bi-Fuel only):

When the Alternative Fuel “Selector Switch” is in the alternative fuel position the indicator lamp is illuminated green and the engine will run on the alternative fuel (CNG or LPG). If the Alternative Fuel “Selector Switch” is moved to alternative fuel from gasoline while driving, the engine will automatically switch over to alternative fuel operation. If the alternative fuel tank runs low on the gaseous fuel (a predetermined value based on system pressure), the system will automatically switch to gasoline operation and the switch will continue to beep until pressed. This beep is intended to notify you that a fuel change has taken place.

*Note: On certain applications if the engine is attempting to start in the alternative fuel mode and the ambient temperature is below a predetermined level, the engine will then start on gasoline and will automatically switch back to the alternative fuel operation after certain conditions have been met.*

Alternative Fuel Operation “Indicator Lamp” (Bi-Fuel only):

The Alternative Fuel Operation “Indicator Lamp” changes color to indicate the current fuel mode & the fuel transition mode (the switch-over to the selected fuel). The colors are as follows:

- **RED**: Vehicle is currently operating on gasoline.
- **GREEN**: Vehicle is currently operating on the alternative fuel.
- **AMBER**: Fuel is transitioning to the selected alternative fuel.

System Malfunction “Indicator Lamp” (Bi-Fuel only):

The Alternative Fuel Operation “Indicator Lamp” also functions as a System Malfunction Indicator. If a malfunction in the IMPCO Automotive Bi-Fuel system occurs, the Alternative Fuel Operation “Indicator Lamp” will begin flashing & a beeper will sound 3 times every 20 seconds and the vehicle will switch over to gasoline operation. Depressing the Alternative Fuel “Selector Switch” will cancel the beeper. However, the Alternative Fuel Operation “Indicator Lamp” will continue flashing until the problem is corrected. If this occurs, drive your vehicle to the nearest IMPCO Automotive servicing dealer at your earliest convenience.

Fuel Tank Level “Indicator Lamps” (Bi-Fuel only):

The four alternative fuel “tank level indicator lamps” illuminate to indicate how much fuel is calculated to be left in the fuel tank.

*The lamps illuminate as follows:*

- 4 lamps illuminated: Tank is full
- 3 lamps illuminated: Tank ¼ full
- 2 lamps illuminated: Tank ½ full
- 1 lamp illuminated: Tank ¼ full
- 1 lamp flashing: Tank is on reserve

1 lamp illuminated and beeper sounding: the alternative fuel tank is empty and the system has switched back to gasoline operation. To cancel the beeper, push on the fuel selector switch once. The sound will stop and the fuel operation LED will illuminate RED.

A few quick beeps: Indicates the system has switched over to gasoline operation due to high load conditions and will return to alternative fuel operation automatically when conditions allow.
Four lamps flashing, indicates the alternative fuel tank may be overfilled. Drive the vehicle to the nearest IMPCO Automotive trained alternative fuel repair center for inspection and repair.
Fuel System Controls & Operation:

Dedicated Fuel System:

The IMPCO Automotive “Dedicated” alternative fuel applications use the base vehicle’s fuel gauge to display the CNG or LPG fuel level. The dedicated systems use of 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).

The displayed fuel level will be affected by changes in the fuel temperature and fuel pressure. This may also affect the fuel gauge reading. After filling up, the fuel gauge may read past Full. After driving several miles, the gauge may now read a little less than Full. This “settling” of the alternative fuel in the tank is normal and does not indicate a problem with the fuel gauge. When the “low fuel warning” indicator flashes, fill the fuel tank as soon as possible.

Minimum Gasoline Tank Level: (Bi-Fuel only):

It is very important that you do not run the gasoline tank out of fuel and maintain a minimum tank level of a ¼ full. The gasoline fuel pump could be damaged if the vehicle is operated without fuel in the gasoline tank. In order to protect engine components, an automatic switch over to gasoline may occur under certain conditions.

The system will not switch over to the alternative fuel in the event of an engine stall while running on gasoline.

Tank/Cylinder Vaporizer/Regulator Inspection

Warning!

Failure to follow these warnings may result in bodily injury or death.

- Ensure the Fuel Tank/Cylinder mounted on your truck conforms to the safety standards applicable to motor vehicles. For additional questions or details, contact your original installer. The tank/cylinder should be inspected annually by a trained technician for any damage, wear or corrosion or whenever your truck is serviced. Other periodic inspection and testing may be required for the tank/cylinder, mounting brackets and hardware. If your vehicle is involved in a fire, accident or if the tank/cylinder is struck by an object, the system must be inspected immediately. Use the Tank/Cylinder Inspection Record to record inspections of the tank.
- The fuel pressure hoses, pressure regulator/vaporizer and pressure relief device should be inspected annually by a trained technician for signs of wear, damage or corrosion.
CNG/LPG Fuel Cylinder/Tank Level Indicator Lamps:

The four Fuel Cylinder Level Indicator Lamps illuminate to indicate how much fuel is in the fuel cylinder/tank. The lamps illuminate as follows:

1 GREEN lamp illuminated and beeper sounding: CNG cylinder empty and the system has reverted back to gasoline operation. To cancel the beeper, push on the fuel selector switch once. The sound will stop and the fuel operation LED will illuminate RED.

COLD WEATHER STARTING:

When the engine is started in CNG/LPG mode and the ambient temperature is below a predetermined level, the engine will start on gasoline and (after certain operating conditions have been met) will automatically switch over to CNG/LPG operation. Refer to the vehicle manufacturer’s base owner’s guide for gasoline cold starting information.
ROADSIDE EMERGENCIES:

If You Need to Have Your Vehicle Towed:

Refer to the section on towing your vehicle in your vehicle manufacturer owner’s guide for the proper procedures. During the addition of the CNG package to your vehicle, fuel lines and other components have been installed under the vehicle.

Use only those towing points indicated in the vehicle manufacturer owner’s guide. The use of unapproved lifts and towing points may damage the fuel lines and valves, creating a hazardous condition which may cause personal injury.

If Your Vehicle Needs a Jump-Start:

Before attempting to jump-start your vehicle, check carefully for the smell of CNG. A spark may cause an explosion and fire. If you smell the odor of CNG or hear a hissing sound, turn off the manual shutoff valve. Do not attempt to jump-start the vehicle. Contact an authorized repair facility and have a trained technician test or repair the possible leak. Failure to follow this warning may lead to bodily injury or death. Refer to the section on jump-starting in your vehicle manufacturer owner’s guide for the proper procedures.

If You Need to Jack Up the Vehicle:

Refer to the section on changing a tire in your vehicle manufacturer owner’s guide for proper procedures. During the addition of the CNG package to your vehicle, fuel lines and other components have been installed under the vehicle.

Use only those jacking points indicated in the vehicle manufacturer owner’s guide. Use of un-approved jacks and jacking points may damage the fuel lines and valves and create a hazardous condition that may lead to personal injury.

ADDING AFTERMARKET ACCESSORIES

Failure to follow these warnings may result in bodily injury or death.

During the addition of the CNG/LPG package to your vehicle, fuel lines and other components have been installed under the vehicle. Before installing an aftermarket accessory, verify that the accessory will not affect the operation of the CNG/LPG fuel system components. Never install an accessory that will restrict or prohibit access to the manual shutoff valve or the CNG/LPG fuel cylinder.
E85 Flex-Fuel Vehicles

Flex-fuel vehicles utilizing the IMPCO Automotive bi-fuel system MUST be operated on gasoline with a maximum 10% alcohol content. Failure to adhere to this criterion may cause the engine to run rough, have a lack of power during operation and/or increase exhaust emissions levels over the legal limit illuminating the vehicle manufacturer’s “Check Engine” lamp.

Refueling the LPG Fuel Tanks

Fuels and Fuel Quality:

Your vehicle is equipped with a standard gasoline fuel tank and an LPG fuel tank. The LPG is stored in a cylinder, usually located in the truck bed (the location may vary). LPG (or propane) is a hydrocarbon fuel that is a colorless, odorless liquid that boils at -44°F (-42°C) at atmospheric pressure. A distinctive, sulfur-like odorant is added to LPG for safety.

When filling your vehicle’s LPG fuel tank, use only grade HD-5 or HD-10 LPG.

Filling Your Fuel Tanks:

Before filling either of your fuel tanks, shut off the engine and set the parking brake. The gasoline tank is filled in the usual way through a standard filler pipe (refer to your vehicle manufacturer owner’s guide for information on refueling the gasoline tank).

The LPG tank may only be filled by individuals certified in handling LPG fuels.

The LPG fuel tank installed in your vehicle meets all U.S. and Canadian safety standards in effect at the time of production. The LPG fuel tank is equipped with an automatic stop fill device that will prevent the tank from being overfilled. The automatic stop fill will close when the fuel level in the LPG fuel tank reaches 80%. If an LPG fueling station requires the use of a bleeder valve during filling, a bleeder valve is located on the tank under the tank cover access door.
Filling Your LPG Fuel Tanks (continued):

Filling the LPG fuel tank requires extra caution. Follow the warnings and procedures shown below.

**Failure to follow these warnings may result in bodily injury or death:**

- **DO NOT SMOKE.**
- Always wear approved safety attire and eye protection during the LPG transfer.
- Never fill an LPG fuel tank that is damaged and/or shows signs of leakage and/or corrosion.
- Never overfill an LPG fuel tank. Refill fuel tanks to recommended capacity only.
- Never fill your LPG fuel tank from another LPG bottle. Always fill from an approved refueling station.
- Never transfer LPG within 50 feet (15 m) of a potential source of ignition. Extinguish or turn off all sources or potential sources of ignition.

**Follow these steps when refueling the LPG fuel tank:**

1. Turn off the engine, set the parking brake and make sure all passengers are out of the vehicle.
2. Inspect the fill port O-ring. Replace the O-ring if missing or damaged. Consult your authorized vehicle manufacturer dealer for the O-ring.
3. Make the filling connection to the fill port.
4. Stand by the filling control during the transfer.
5. Open the liquid valve at the storage tank and turn on the pump.
6. Close the filling connection valve immediately when the tank stops filling.
7. Turn off the pump and close the filling valve.
8. Back off the filling connection no more than one turn. Do not disconnect until the bleed-off through the connection vent hole has stopped.
9. Disconnect the filling hose.
10. Replace the cap on the fill connection of the tank.
11. Make sure all fill supply hoses are disconnected and secured.
12. Turn off the valve at the storage tank.

**If You Run Out of LPG Fuel:**

If your vehicle runs out of LPG fuel, it will automatically switch over to gasoline operation. For normal LPG operation, fill the LPG fuel tank until the fuel indicator lamps indicate at least ¼ full.

**If You Run Out of Gasoline:**

It is very important not to run the gasoline tank out of fuel. The system does not switch over to LPG operation in the event of an engine stall while running on gasoline. Also, the gasoline fuel pump could be damaged if the vehicle is operated without fuel in the gasoline tank.
REFUELING THE CNG FUEL CYLINDERS

Fuels and Fuel Quality:
Your vehicle is equipped with a standard gasoline fuel tank and a CNG fuel cylinder. The CNG is stored in a cylinder, usually located in the truck bed (the location may vary). A distinctive, sulfur-like or rotten egg odorant is added to CNG for safety.

Filling Your Fuel Cylinders:
Before filling either fuel, shut off the engine and set the parking brake. The gasoline tank is filled in the usual way through a standard filler pipe (refer to your vehicle manufacturer owner’s guide for information on refueling the gasoline tank).

The CNG fuel cylinder installed in your vehicle meets all U.S. and Canadian safety standards in effect at the time of production.

Note: Failure to service your system in accordance to the maintenance schedule may result in voiding the warranty.
REFUELING THE CNG FUEL CYLINDER (continued):

Filling the CNG fuel cylinder requires extra caution. Follow the warnings and procedures shown below.

**Warning!**

Failure to follow these warnings may result in bodily injury or death.

- **DO NOT SMOKE.**
- Always wear approved safety attire and eye protection during the CNG transfer.
- Never fill a CNG fuel cylinder that is damaged and/or shows signs of leakage and/or corrosion.
- Never overfill a CNG fuel cylinder. Refill fuel cylinders to recommended capacity only.
- Never fill your CNG fuel cylinder from another CNG bottle. Always fill from an approved refueling station.
- Never transfer CNG within 50 feet (15 m) of a potential source of ignition. Extinguish or turn off all sources or potential sources of ignition.

1. Turn off the engine, set the parking brake and make sure all passengers are out of the vehicle.
2. Visually inspect the fill port O-ring. If the O-ring is missing or damaged, consult your authorized vehicle manufacturer or CNG certified technician for replacement prior to filling CNG.
3. Always observe and follow the safety guidelines and filling instructions of the fill station.

**REFUELING THE CNG FUEL CYLINDER**

**If You Experience Very Slow Fill Rates:**

If it takes much longer than usual to fill the CNG cylinder, your Fuel Fill Filter may be clogged. Contact your CNG certified service technician for inspection and/or replacement.

**If You Run Out of CNG Fuel:**

If your vehicle runs out of CNG fuel, it will automatically switch over to gasoline operation. For normal CNG operation, fill the CNG fuel cylinder until the fuel indicator lamps indicate at least ¼ full.

**If You Run Out of Gasoline:**

It is very important not to run the gasoline tank out of fuel. The system does not switch over to CNG operation in the event of an engine stall while running on gasoline. Also, the gasoline fuel pump could be damaged if the vehicle is operated without fuel in the gasoline tank.
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. 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. IMPCO 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 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. The refueling fill valve on the vehicle may be in a different location than the manufacturer’s normal location. 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. 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 IMPCO Service Center for additional O-rings.

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.
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.

**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 IMPCO dealer for service.
## Ambient Temperature/ Maximum CNG Fill Pressure Compensation Chart

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>Pressure (Psig)</th>
</tr>
</thead>
<tbody>
<tr>
<td>130</td>
<td>4500¹</td>
</tr>
<tr>
<td>120</td>
<td>4399</td>
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</table>

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Pressure (kPa)</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>49</td>
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<td>-34</td>
<td>12100</td>
</tr>
<tr>
<td>-40</td>
<td>10900</td>
</tr>
</tbody>
</table>

¹ Maximum allowable fill pressure regardless of ambient temperature.
² Service pressure 3600 psig (24,800 kPa) at 70° F (21° C).
**WARRANTY STATEMENT**

**EMISSION CONTROL SYSTEM WARRANTY**

All vehicles are eligible for Federal Emissions Control System Warranty Coverage. If the emissions control label contains language stating the vehicle conforms to California regulations, the vehicle is also eligible for the California Emissions Control System Warranty Coverage. For all maintenance or other work not covered by warranty, within and outside of the warranty period of the vehicle, IMPCO strongly recommends that all maintenance be performed by an IMPCO-authorized technician certified to work on alternative fuel vehicles.

**FEDERAL ALTERNATIVE FUEL SYSTEM WARRANTY COVERAGE**

The FEDERAL warranty period for alternative fuel components is 3 years or 36,000 miles (58,000 km) from the day it is first put in service, whichever occurs first. For vehicles within the warranty period, an IMPCO-authorized technician will repair or replace, at IMPCO’s discretion, any parts that are determined by IMPCO to be defective in material or workmanship. All warranty work on the alternative fuel system must be performed by an IMPCO-authorized technician.

**KNOW WHEN YOUR WARRANTY BEGINS**

Your Warranty Start Date is the day you take delivery of your new vehicle or the day it is first put into service (for example, as a dealer demonstrator), whichever occurs first. The mileage at the date of delivery of your new vehicle put into service is the warranty mileage start.
Performance Warranty

The Performance Warranty covers repairs which are required during the first 2 years or 24,000 miles of vehicle use (whichever occurs first) due to the vehicle failing an emission test. Specified major emission control components are covered for the first 8 years or 80,000 miles (whichever occurs first). If you are a resident of an area with an Inspection and Maintenance (I/M) program that meets federal guidelines, you are eligible for this warranty protection provided that:

- Your car or light-duty truck fails an approved emissions test; and
- Your vehicle is less than 2 years old and has less than 24,000 miles (up to 8 years/80,000 miles for certain components); and
- Your state or local government requires that you repair the vehicle; and
- The test failure does not result from misuse of the vehicle or a failure to follow the manufacturers’ written maintenance instructions; and
- You present the vehicle to an IMPCO Automotive warranty-authorized service center, along with evidence of the emission test failure, during the warranty period.

During the first 2 years/24,000 miles (whichever occurs first), the Performance Warranty covers any repair or adjustment which is necessary to make your vehicle pass an approved, locally-required emission test and as long as your vehicle has not exceeded the warranty time or mileage limitations and has been properly maintained according to the manufacturer’s specifications.
Specified Major Emission Control Components

There are specified major emission control components, covered for the first 8 years or 80,000 miles of vehicle use (whichever occurs first) on 1995 and newer vehicles:

- Catalytic converters – (Determined that an IMPCO Parts caused the Catalytic Converter to fail)
- The electronic emissions control unit or computer (ECU)

Emission Control Parts

- Exhaust Gas Conversion Systems: catalytic converter
- Evaporative Emission Control System: purge valve, fuel filler cap, purge solenoid, vapor storage canister and filter
- Positive Crankcase Ventilation (PCV) System: PCV valve, PCV solenoid
- Air Injection System: Air pump, diverter, bypass, or gulp valve, reed valve, anti-backfire or deceleration valve
- Early Fuel Evaporative (EFE) System: EFE valve, thermal vacuum switch, heat riser valve
- Fuel Metering System: electronic control module (unit) or EFI air flow meter, computer command module or mixture control unit, deceleration controls, electronic choke, fuel injectors, fuel injection units and fuel altitude compensator sensor, bars or rails for EFI or TBI systems, mixture settings on sealed fuel mixture control solenoid, diaphragm or other systems, fuel metering components that achieve closed, other feedback control sensors, loop operation switches and valves
- Air Induction System: thermostatically controlled air cleaner, air box
- Ignition Systems: electronic spark advance timing advance, retard systems, high energy electronic ignition
- Miscellaneous Parts: hoses, gaskets, brackets, clamps and other accessories used in the above systems

If your vehicle is within the age and mileage limits for the applicable emissions warranty, the manufacturer can only deny coverage if evidence shows that you have failed to properly maintain and use your vehicle, causing the part or emission test failure. Some examples of misuse and improper maintenance include the following:

- Vehicle abuse such as off-road driving or overloading; or
- Tampering with emission control parts or systems, including removal or intentional damage of such parts or systems; or
- Improper maintenance, including failure to follow maintenance schedules and instructions specified by manufacturer, or use of replacement parts which are not equivalent to the originally installed parts.
EMISSIONS DEFECT WARRANTY COVERAGE

During the warranty coverage period, IMPCO Automotive warrants that:

- Your vehicle or engine is designed, built, and equipped to meet – at the time it is sold - the emissions regulations of the U.S. Environmental Protection Agency (EPA).
- Your vehicle or engine is free from emission-related defects in factory-supplied materials or workmanship, which are defects that could prevent the vehicle or engine from conforming to applicable EPA regulations.
- You will not be charged for diagnosis, repair, replacement, or adjustment of parts containing an emissions-related defect.

The warranty coverage period for:

- Passenger cars, light duty trucks (applies to vehicles up to 8,500 pounds GVWR)
  * The emission warranty coverage period is 8 years or 80,000 miles (whichever occurs first) for catalytic converters, electronic emission control units, and onboard emissions diagnostic devices.
  * All other parts covered under your emissions warranty are warranted for 3 years or 36,000 miles whichever comes first.
- Heavy duty vehicles (applies to trucks over 8,500 pounds GVWR up to 19,500 pounds GVWR)
  * The emissions warranty coverage period for heavy duty vehicles (HDVs) is 5 years or 50,000 miles (whichever comes first) for all parts covered by your emissions warranty.
The CALIFORNIA Emission Control System Warranty coverage applies if your vehicle meets both of the following requirements:

1. Your vehicle is certified for sale in California as indicated on the vehicles under hood emission control information label.
2. Your vehicle is registered in California or other states adopting California Emission and Warranty regulations.

Subject to change, the following states have adopted and are enforcing the California Emissions Warranty regulations:

- **Passenger Car & Light-duty Trucks** (up to 8,500 pounds GVWR)
  * California, Connecticut, Maine, Maryland, Massachusetts, New Jersey, Oregon, Pennsylvania, Rhode Island, Vermont and Washington (Note: New York adopted California emissions standards, but not the California Emissions Warranty; the Federal Emission Control Warranty applies to all non-PZEV vehicles in New York)

- **Medium-Duty Passenger Vehicles** (up to 10,000 pounds GVWR designed primarily for the transportation of persons. Excludes incomplete trucks, trucks with a seating capacity either over twelve persons total or over nine persons rearward of the driver’s seat, or trucks with an open cargo area of at least six feet of interior length)
  * California, Connecticut, Maine, Maryland, Massachusetts, Oregon, Rhode Island, Vermont and Washington

- **Medium-Duty Vehicles** (over 8,500 pounds GVWR up to 14,000 pounds GVWR)
  * California, Connecticut, Maine, Maryland, Massachusetts, Oregon, Rhode Island, and Vermont.

- **Heavy-Duty Vehicles/Engines** (over 14,000 pounds GVWR) – California.
The California Air Resources Board and IMPCO Automotive are pleased to explain the emission control system warranty on your vehicle. In California, new motor vehicles must be designated, built and equipped to meet the State’s stringent anti-smog standards. IMPCO Automotive must warrant the emission control system on your vehicle for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your vehicle.

Your emission control system may include parts such as the carburetor or fuel-injection system, the ignition system, catalytic converter, and engine computer. Also included may be hoses, belts, connectors and other emissions-related assemblies. Where a warrantable condition exists, IMPCO Automotive will repair your vehicle at no cost to you including diagnosis, parts and delivery.

**CALIFORNIA VEHICLE EMISSIONS INSPECTION PROGRAM (SMOG CHECK)**

- Should a vehicle installed with the IMPCO Automotive alternative fuel system fail an inspection during its warranty period, the vehicle owner may choose to have it repaired at a designated Warranty & Repair Station.
- Should the failure be determined to have been caused by a warranted part in the IMPCO Automotive alternative fuel system, then IMPCO Automotive will be liable for expenses associated with the detection and correction of the part failure or malfunction; unless it is determined that part failure or malfunction was caused by abuse, neglect, or improper maintenance.
  * Should it be determined that the failure was caused by abuse, neglect, or improper maintenance, the vehicle owner shall be liable for all diagnostic and repair expenses.
  * Should it be determined that the failure was caused by defects covered under warranty, then the vehicle owner will not be charged for the diagnostic and repair costs of the warrantable defect.
IMPCO AUTOMOTIVE ALTERNATIVE FUEL SYSTEM CARB EMISSION
CONTROL SYSTEM WARRANTED PARTS

IMPCO Automotive covers the applicable emissions parts as listed in the OEM Owner’s Manual and Warranty book for a period of five (5) years/50,000 miles. The following gaseous fuel (LPG or CNG) specific emissions parts are also covered during this time period.

**5 Years / 50,000 miles**
- Injectors
- Fuel rails
- Low pressure hoses

The long-term emissions DEFECT WARRANTY provided by IMPCO Automotive covers the parts listed below for a period of seven (7) years/70,000 miles.

**7 Years / 70,000 miles**
- PCM
- CNG High Pressure Regulator/LPG Vaporizer
- Catalytic converter

**What Is Covered:**
An authorized IMPCO Warranty & Repair Service Centers will repair, replace or adjust, at IMPCO’s discretion, all parts necessary to correct any defects in materials or workmanship of the IMPCO Alternative Fuel System.
What Is Not Covered:

- Part(s) not supplied or authorized by IMPCO Automotive
- Part(s) that failed due to non-authorized modifications or alternations
- Part(s) that failed due to improper or negligent installation
- Part(s) that failed due to installation on a non-approved application
- Part(s) that failed due to use of an improper fuel or refueling procedure
- Part(s) that failed due to improper operation, abuse or collision damage
- Part(s) that failed due to the application of corrosion protection
- Vehicle pick-up and delivery charges (including towing charges)
- Standard shop supplies, including but not limited to, antifreeze and grease

Proof of Installation: Documentation of the installation date and vehicle mileage is required for the IMPCO Automotive warranty to be honored.

Repair of Replacement Parts: Authorized IMPCO Warranty & Repair Service Centers will use new or remanufactured parts as authorized by IMPCO Automotive when making warranty repairs.

Return of Failed Parts: All failed parts will be returned to IMPCO Automotive by the authorized IMPCO Warranty & Repair Service Centers for diagnosis.
IMPCO (MANUFACTURER) WARRANTY COVERAGE

The warranty period shall begin on the date that the vehicle was installed with the IMPCO Alternative Fuel System & is delivered to its intended user. Should the vehicle be placed into service as a “demonstrator” or “company” car prior to delivery, the date it is first placed into service becomes the start date of the system warranty.

- IMPCO Automotive warrants that the vehicle or engine is:
  * Designed, built & equipped so as to conform, at the time of sale, with all applicable regulations adopted by the California Air Resources Board pursuant to its authority in Chapters 1 and 2, Part 5, Division 26 of the Health and Safety Code; and
  * Free from defects in materials & workmanship that would cause the vehicle’s on-board diagnostic malfunction indicator light to illuminate, for a period of 3 years or 50,000 miles, whichever first occurs:
  * Free from defects in materials & workmanship which cause the failure of a specifically warranted long-term emission control part for 7 years or 70,000 miles, whichever first occurs.
- The warranty period shall be:
  * Per the terms outlined by the California Air Resources Board, light-duty, medium-duty, heavy-duty vehicles and motor vehicle engines used in such vehicles shall be warranted for a period of use of five years or 50,000 miles, whichever first occurs.
  * A warranty claim may be submitted by bringing a vehicle to any repair facility authorized by IMPCO Automotive to service that vehicle. The Warranty & Repair Service Center will contact IMPCO Automotive to determine the validity of any warranty claims.

Warranty services and/or repairs shall be provided at all authorized IMPCO Automotive Warranty & Repair Service Centers, a listing of authorized IMPCO Automotive Warranty & Repair Service Centers has been provided on a separate sheet. Please check our website: http://impco-asap.com/cms/home/ for updated information.
- Provided that diagnostic analysis is performed at one of the listed Warranty & Repair Service Centers, the vehicle owner will not be charged for diagnostic labor that leads to the determination that a warranted part is defective. IMPCO Automotive is liable for any damages incurred by other vehicle components triggered by a failure of any warranted part still under warranty. Warranty Repairs will be made within a reasonable time period, not to exceed 30 days from the date when the vehicle is initially diagnosed as presenting a warrantable condition.
- The inability of the Warranty & Repair Service Center to complete warranty repairs within the 30 day time frame shall constitute an emergency under the terms outlined by the California Air Resources Board.
- In the event of an emergency condition, any replacement part designated by a manufacturer may be used in the performance of any maintenance or repairs. Use of these parts will not reduce the warranty obligations of IMPCO Automotive, except the conditions that the repair or replacement is for a non-warranted part.
- Each manufacturer shall furnish with each new vehicle or engine, written instructions for the maintenance and use of the vehicle or engine by the owner.
- Each manufacturer shall furnish with each new vehicle or engine, a list of the warranted parts installed on the vehicle or engine.
OEM Maintenance and Warranty Coverage

The vehicle manufacturer’s original equipment warranty applies to parts, systems and subsystems of the OEM’s engine, emission system and vehicle. Refer to the vehicle manufacturer’s Owner’s Manual. All OEM-specified vehicle, engine, and fuel system maintenance does not change. Service and warranty of the gasoline fuel system is to be performed through normal vehicle manufacturer’s dealer channels.
Warranty Exclusions

- Warranty coverage shall be excluded should it be determined that the vehicle or engine has been abused, neglected, or improperly maintained, and that such abuse, neglect, or improper maintenance was the direct cause of the need for the repair or replacement of the warranted part.
- IMPCO Automotive may deny any emission performance warranty claim on the basis of noncompliance with the written instructions if:
  * IMPCO Automotive is able to prove that the vehicle failed an inspection because the vehicle was abused, neglected, improperly maintained, or that the required maintenance was performed in such a manner that resulted in a component being improperly installed or a component or related parameter being adjusted substantially outside of IMPCO Automotive designated specifications, or maintenance was performed on the vehicle which resulted in the removal or rendering inoperable of any of the components that affect the vehicle’s emissions.
- To determine whether an owner has complied with the written instructions, IMPCO Automotive may require that an owner submit evidence of compliance with the written instructions which are believed to:
  - Not to have been performed; and
  - If they were not performed, could be the cause of the failed inspection.
- Evidence of compliance with a maintenance instruction may consist of:
  - A maintenance log book endorsed at the approximate time or mileage intervals specified in the written instructions by a designated service technician; or
  - A repair order, sales receipt, or similar, demonstrating that the vehicle received scheduled maintenance at the approximate time or mileage intervals specified in the written instructions; or
  - A written statement by the vehicle owner that maintenance was performed at the approximate time or mileage interval specified in the written instructions using proper replacement parts. Failure of the vehicle or engine owner to ensure the performance of such scheduled maintenance or to keep maintenance records shall not, per se, be grounds for disallowing a warranty claim.
- In no case may IMPCO Automotive deny an emission performance warranty claim on the basis of: Work performed to rectify an unsafe condition, including an unsafe driveability condition, attributable to IMPCO Automotive, provided that the vehicle owner had taken action to put the vehicle in a condition that conforms with IMPCO Automotive and California Air Resources Board’s emission standards in a timely manner; or Any cause attributable to IMPCO Automotive.
- Within the 30 days, the manufacturer shall provide the owner, in writing, with an explanation as to why any claim is being denied.
  * Failure to notify a vehicle owner that a warrantable condition does not exist within 30 days shall result in IMPCO Automotive being responsible for repairing the vehicle free of charge to the vehicle owner.
- IMPCO Automotive shall incur all costs associated with a determination that an emission performance warranty claim is valid.
- Alternative Fuel Systems provided by IMPCO Automotive are low pressure emissions components, and do not include fuel storage tanks. Approved IMPCO installation facilities will convert the entire gasoline vehicle to an alternative fuel vehicle using only approved compatible components covered under our manufacturer’s warranty. The installer can provide this warranty to you with the delivery of your completed vehicle. You may also request this warranty prior to, or any time during, the conversion process. Tank storage and high pressure components will be included in the installer’s warranty – separate from the IMPCO Alternative Fuel System Warranty. The installer may supply this warranty as a supplemental warranty included with additional warranty coverage.
OWNER’S WARRANTY RESPONSIBILITIES

The vehicle owner is responsible for the performance of the required maintenance as listed in the owner’s manual and as developed and provided in the OEM service manual. IMPCO Automotive recommends that all receipts covering maintenance on the car are retained; however, warranty cannot be denied based solely because of a lack of receipts or failure to conduct all scheduled maintenance.

It is the responsibility of the vehicle owner/operator to present any problem to an IMPCO Automotive Warranty & Repair Service Center as soon as it is observed. Warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

IMPCO Automotive reserves the right to deny warranty coverage if the subject vehicle(s) or part(s) have failed due to abuse, neglect, improper maintenance, and/or unapproved modifications.
IMPCO Warranty Summary

2011 and Older Vehicles - 24 months or 24,000 miles whichever comes first. (PARTS ONLY)

2012 and Newer Vehicles - 36 months or 36,000 miles whichever comes first. (PARTS & LABOR ONLY) NO EXCEPTIONS TO THE LABOR TIME GUIDE.

Vehicles that exceed 25,000 miles are not authorized for LPG/CNG conversion unless prior approval is provided in writing by IMPCO Automotive. Any vehicle converted that exceeds this mileage will not be covered under any warranty by IMPCO Automotive & IMPCO Technologies, Inc. Warranty coverage is transferable; however, a copy of the Purchase agreement between the seller and the owner must be provided to IMPCO Automotive Warranty Administration.

IMPCO Warranty Registration

Once the vehicle has been converted to LPG/CNG by an IMPCO Automotive Certified Installer (CI’s) (Definition of IMPCO Automotive Certified Installer is an installer who has a written agreement document number CS F151 & CS F152 with IMPCO Automotive) or when the vehicle is sold to the end user the vehicle must be registered for Warranty. The following IMPCO Automotive Website: http://impco-asap.com/ is the only source for Certified Installers (CI’s) to input Warranty Registration for each vehicle. All vehicles converted by CI’s with IMPCO Automotive Kits must be registered in the IMPCO Automotive Warranty system within 30 days of the installation. The warranty will not be valid and all claims will be delayed until warranty registration is complete.

ALL fields must be populated to accurately reflect the vehicle being registered. The system will point out any deficiencies before accepting the registration.

NOTE: Print the registration page for your records BEFORE submitting. Place the Owner’s and Warranty Manual Supplements in a prominent location in the dash or center console where the customer can easily locate them. It is strongly recommended to review the highlights of the Owner’s Manual Supplement with the Customer.

Coverage outlined above includes the following parts that are included in the IMPCO Automotive LOW PRESSURE KITS:

- ECM Bracket
- ECM
- Regulator Bracket
- Regulator
- Harnesses
- Injectors
- Hoses
- Fuel Rails
- Map Sensor Assembly
- Fuel Pressure Sensor
- Fuel Selector Switch
- Modules
Above mentioned warranty includes the following parts that are included in the IMPCO Automotive HIGH PRESSURE KITS:

- Tank Brackets
- Tanks
- Fuel Lines
- Fittings
- Tank Shields/Covers – Corrosion ONLY
- High Pressure Filter Assembly
- Pressure Relief Device
- Fuel Gauges
- Shut Off Valves

Federal Emissions Warranty (ARB)

**Passenger cars, light duty trucks 36 Months/36,000 Miles**
(Applies to vehicles up to 8,500 pounds GVWR)

**Heavy duty vehicles 60 Months/50,000 Miles**
(Applies to trucks over 8,500 pounds GVWR up to 19,500 pounds GVWR)

**Performance Warranty 24 Months/24,000 Miles**
Fuel Injectors, Hoses, brackets, clamps

**Major Emission Control Components 96 Months/80,000 Miles**
ECU and Catalytic Converters
California Emissions Warranty (CARB)

Vehicles of 14,000 lbs and Under Short Term 36 Months/50,000 Miles

Long Term 84 Months/70,000 Miles

Vehicles of 14,000 lbs and Over 60 Months/50,000 Miles

Performance Warranty

36 Months/50,000 Miles
(Vehicles of 14,000 lbs and Under)

IMPCO Automotive Warranty

2011 and Older Vehicles 24 Months/24,000 Miles whichever comes first. (PARTS ONLY)
2012 and Newer Vehicles 36 Months/36,000 Miles whichever comes first. (PARTS & LABOR ONLY)

AUTHORIZED WARRANTY & REPAIR SERVICE CENTERS

Do not contact IMPCO Automotive directly. A complete listing of authorized IMPCO Automotive Warranty & Repair Service Centers can be found at http://impco-asap.com/

STANDARD CONSUMABLES

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<tr>
<td>PPM01890</td>
<td>O-RING KIT, FUEL FILL</td>
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</table>

Replacement fill port O-rings; 3 per bag

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<th>Part Number</th>
<th>Part Description</th>
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<tbody>
<tr>
<td>PPM01859</td>
<td>KIT-CNG FILTER ELEMENT</td>
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Fuel filter replacement; 1 filter with O-rings
### LPG fuel filter cartridge

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<tr>
<th>Part Number</th>
<th>Part Description</th>
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### LPG Fuel filter assembly

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<th>Part Description</th>
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<tr>
<td>09SQ99010006</td>
<td>BRC FILTER &amp; O RING KIT</td>
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### LPG Lock-Off Filter kit

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<tr>
<td>04RE00100005</td>
<td>REPAIR KIT, ET98 WITH FILTER</td>
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MAINTENANCE SCHEDULE

The maintenance items listed below are specific to the LPG or CNG system. These are required in addition to the regular maintenance items listed in your vehicle manufacturer owner’s guide. Regular maintenance is essential for the proper operation, safety and performance of your vehicle.

Along with the information recorded in the vehicle manufacturer’s maintenance booklet, the material in this section will form a record of the services performed on this vehicle. Please keep it with the vehicle.

There are two maintenance schedules. One is for NORMAL driving conditions, which covers most everyday driving situations. The SEVERE DUTY schedule should be followed if one or more of the following conditions occur frequently:

- Operating in severe dust conditions.
- Extensive idling, as in door-to-door deliveries.
- Off-road operation.
- Short trips of less than 10 miles (16 km) when outside temperatures remain below 0°F (-18°C).

NOTE: Extensive idling will accumulate more hours of use on your vehicle than is indicated on the odometer. Change the oil and filter at an interval equivalent to 200 engine hours of operation. You may have to approximate this time since most engines are not equipped with hour meters.

LPG

Normal and Severe Driving Conditions:
In addition to the maintenance listed in your vehicle manufacturer owner’s guide maintenance schedule, perform the following:

Every 7,500 MILES (10,000 KILOMETERS)*
- Visually inspect all vacuum lines and fittings.
- Visually inspect LPG fuel hoses and fittings.
- Visually inspect fuel receptacle O-ring.
- Visually inspect Fuel Fill Filter.
- Visually inspect the entire air intake assembly for vacuum leaks.

Every 15,000 MILES (24,000 KILOMETERS)*
- Replace the LPG In-line fuel filter.
- Replace the LPG Lockoff fuel filter.

Every 30,000 MILES (48,000 KILOMETERS)*
- Check the condition of all wiring.

Severe Duty Conditions:
Follow the SEVERE DUTY schedule in your vehicle manufacturer’s maintenance schedule booklet.
CNG

Normal and Severe Driving Conditions:
In addition to the maintenance listed in your vehicle manufacturer owner’s guide maintenance schedule, perform the following:

Every 3,000 Miles (5,000 KILOMETERS)*
- Drain the CNG Fuel filter; Replace if more than 1 oz of water escapes.

Every 7,500 MILES (10,000 KILOMETERS)*
- Visually inspect all vacuum lines and fittings.
- Visually inspect CNG fuel hoses and fittings.
- Visually inspect fuel receptacle O-ring.
- Replace Fuel Filter.
- Visually inspect the entire air intake assembly for vacuum leaks.

Every 15,000 MILES (24,000 KILOMETERS)*
- Replace the LPG In-line fuel filter.
- Replace the LPG Lockoff fuel filter.

Every 30,000 MILES (48,000 KILOMETERS)*
- Check the condition of all wiring.

Severe Duty Conditions:
Follow the SEVERE DUTY schedule in your vehicle manufacturer’s maintenance schedule booklet.
### MAINTENANCE RECORDS

<table>
<thead>
<tr>
<th>Date</th>
<th>Service Interval*</th>
<th>Odometer Reading</th>
<th>Serviced By:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7,500 Miles (12,000 km)</td>
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<td></td>
<td>15,000 Miles (24,000 km)</td>
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<tr>
<td></td>
<td>22,500 Miles (36,000 km)</td>
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<td>30,000 Miles (48,000 km)</td>
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<td>37,500 Miles (60,000 km)</td>
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<td></td>
<td>45,000 Miles (72,000 km)</td>
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<td></td>
<td>52,500 Miles (84,000 km)</td>
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<td></td>
<td>60,000 Miles (96,000 km)</td>
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<td>67,500 Miles (108,000 km)</td>
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<td>75,000 Miles (120,000 km)</td>
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<td>82,500 Miles (132,000 km)</td>
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<td>90,000 Miles (144,000 km)</td>
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<td>97,500 Miles (156,000 km)</td>
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<td>105,000 Miles (168,000 km)</td>
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<td></td>
<td>112,500 Miles (180,000 km)</td>
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</tr>
<tr>
<td></td>
<td>120,000 Miles (192,000 km)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Vehicle miles/kilometers accrued after the installation of the IMPCO Automotive Bi-fuel fuel system.