



Have your Vehicle Converted to Compressed Natural Gas - SAFELY

Once you decide to convert your existing vehicle to compressed natural gas (CNG) or buy a vehicle that has already been converted to run on CNG, you should take steps to assure that it meets or will meet federal regulations that apply in every state and conform to the safety Code for natural gas vehicles, *NFPA 52 Vehicular Gaseous Fuel Systems Code*. Most state and local governments have not yet implemented rules for conversions, so you must shop and buy wisely in order to obtain a safe and durable CNG vehicle or conversion system that meets your expectations. The checklist provided below includes some things that you should consider doing:

CHECK LIST:

- 1. Are you buying a new vehicle? If so, check out the factory OEM CNG offerings before buying a gasoline vehicle to convert.**
- 2. To purchase a new vehicle that you plan to have converted, ask to purchase the option for a gaseous-fuel-prepared engine to be assured of normal engine durability.**
- 3. Do you have highly regarded conversion shops in your area? If so, go to these first. Ask for a list of references you can speak with.**
- 4. Ask if the engine conversion system is EPA or CARB certified or approved. If not, find another shop that will abide by federal law.**
- 5. Ask the shop to provide proof of EPA or CARB certification or approval for the specific vehicle that you own or are purchasing (e.g., Model Year 2010 Ford F-150). Providing a copy of the EPA certificate or CARB Executive Order should not be difficult for conversion shops as these documents are only 1 or 2 pages in length and are readily available online.**

- 6. Request to see proof that the person who will perform the conversion is a licensed mechanic and has received certification or training to perform conversions.**
- 7. When receiving a vehicle that has been converted, check to make sure the vehicle upfitter has installed the proper EPA label under the hood and the label at the fuel door indicating the expiration date of the cylinder and the date of inspection if it is an older cylinder.**
- 8. Converted vehicles that have been altered in accordance with National Highway Traffic Safety Administration regulations must have an alterer's label at the driver's door. Selling a new CNG vehicle to be titled for the first time that does not bear either an alterer's label or an OEM window label identifying it as an OEM CNG vehicle is a violation of federal law.**
- 9. Find out what will be the remaining useful life of the CNG cylinders to be installed. New CNG cylinders typically have a useful life of 15–20 years. See below for more information about used cylinders.**
- 10. Make sure that the conversion contract provides that:**
 - a. The conversion kit will be EPA or CARB certified or approved for the vehicle model and engine.**
 - b. The vehicle will comply with all applicable federal and state regulations as certified by the dealer doing the conversion.**
 - c. The vehicle system will comply fully with the current edition of NFPA 52 (2010 or later).**
 - d. The CNG cylinders will be labeled, tested and certified in accordance with FMVSS 304.**
 - e. If used cylinders will be installed, make sure that the cylinders have been recently inspected by a certified cylinder inspector and be good for the life of the vehicle. Decide how many years you need.**

DETAILED INFORMATION AND ADDITIONAL LINKS:

Consider a new CNG vehicle that is fully certified in accordance with all safety and emissions regulations. If you do not already own the vehicle in question, you should investigate whether the vehicle you need is already available as a new CNG vehicle. U.S. automakers have recently announced plans to begin selling additional NGV offerings, so check with a local dealer to see if the vehicle you want is or soon will be available as a factory offering. Also, several OEMs are now working with aftermarket companies to make available NGVs that can be ordered directly from the dealership and upfitted at the dealership or by arrangement before delivery to the customer. Vehicle OEMs sometimes work with approved vehicle modifiers to install and test the CNG system, and the vehicle would be certified in accordance with FMVSS 303 Fuel system integrity for full confidence. In some cases, the vehicle OEM works with an approved vehicle modifier who will add the CNG fuel system before it is offered for first sale. In this situation, The National Highway Safety Administration (NHTSA) requires an additional alterer's label at the driver's door that certifies that the alterations do not take the vehicle out of compliance with Federal Motor Vehicle Safety Standards. This label assures you that the original crashworthiness of the gasoline system is matched by the added CNG system.

If a new CNG vehicle will not serve your needs, there are necessary steps to make sure that YOU buy a safe and legal conversion. There are well-developed safety standards for the fuel system on vehicles converted to CNG **but in most states there is no effective regulation of conversion shops to assure compliance with these standards.** There is also no voluntary industry certification agency for conversions. *The quality, safety and durability of your converted vehicle will depend on your choice of converter and the requirements of your purchase agreement.*

Pick a conversion shop with lots of experience and satisfied customers. Think of this as if you were picking a contractor to do major work on your house. With the rapid growth of the CNG market, you may not have a local converter with long experience but these recommendations will help.

Purchase only an EPA and/or CARB-certified conversion system for your vehicle. While a variety of non-certified systems are sold on the Internet and/or offered by some automotive shops, EPA's position is that installation of these systems is "tampering with a federally approved emission control system," and a federal violation punishable by a substantial financial penalty. Installation of non-certified systems can also cause a vehicle to fail emissions inspection, or lead to performance problems if the systems has not been specifically designed and tested to work on your vehicle. You can be more confident in a shop that offers only legally certified conversions. The EPA certification does not include the high-pressure storage system (i.e. the CNG cylinders).

Require the converter to show that they are certified by the manufacturer of the EPA or CARB-certified system. Anyone can open a shop and say they are a converter. So beware. EPA and CARB require that conversion system suppliers provide appropriate documentation and instructions to installers of their systems. Normally EPA- or CARB-certified engine conversion systems are sold to trained/approved installers but **CVEF has received reports that some systems are re-sold through unauthorized channels to unapproved shops.** CNG conversions **SHOULD NOT** be performed by unqualified technicians! A vehicle that has been upfitted with an EPA-certified or approved conversion system will include an EPA-approved label under the hood identifier specific information about the system.

Require that the converter certify that the vehicle conversion complies with the most recent version of NFPA 52. Properly installed CNG systems are safe and economical, with the vehicle operating almost exactly like a gasoline vehicle. However, CNG systems rely on high-pressure compressed natural gas for fuel, and high-pressure gases require specialized components and technical skills for installation. Conversions should be done according to the National Fire Protection Association's *Vehicular Fuel Systems Code* (NFPA 52).

Use a licensed conversion shop where there are such regulations. Some states such as Texas and Oklahoma have licensing requirements and the California Highway Patrol (CHP) in California has regulations for CNG vehicles. Just like a building permit for construction, make sure your conversion will meet local and state codes.

Buy a vehicle with the durability you expect. Engine designs that are durable when operated on gasoline may experience rapid valve wear when operated on natural gas. OEM certified CNG vehicles have special components (such as hardened valve seats and valves) but most converted vehicle engines do not. Generally speaking, OEM engine manufacturers may not honor the engine warranty against wear of valves in gasoline engines that are converted to CNG. If you expect to operate the vehicle under heavy load or accumulate high mileage, an engine that is designed to operate on natural gas is the smarter choice. An OEM dealer should be able to look up the VIN for your vehicle and determine whether it has a "hardened" engine. Understand the warranty for the conversion since the conversion equipment will not be covered under the vehicle's original warranty, and any damage to other engine components that are caused by the conversion systems installation or use likely may not be covered by the OEM warranty.

Verify that the CNG cylinders are labeled in accordance with Federal Motor Vehicle Safety Standard 304. Be sure your cylinders are safe and legal. CNG cylinders must carry labels showing they meet the applicable US Department of Transportation standard (FMVSS 304) by the symbol "DOT" on the label. The label will show an expiration date, after which the cylinder may not be safely used. Some very old converted cylinders use so-called "DOT" cylinders that are intended for shipping oxygen and other gases. **These DOT are not FMVSS-legal CNG cylinders.**

Your cylinders must be labeled in accordance with FMVSS 304 as follows:

(a) CNG fuel container manufacturer's name, address, and telephone number.

- (b) The month and year of manufacture of the CNG fuel container.
- (c) Service pressure **3600 psig**
- (d) The symbol **DOT**, constituting a certification by the CNG container manufacturer that the container complies with all requirements of this standard.
- (e) The container designation (e.g., **Type 1, 2, 3, 4**).
- (f) **“CNG Only.”**
- (g) “This container should be visually inspected after a motor vehicle accident or fire and at least every 36 months or 36,000 miles, whichever comes first, for damage and deterioration.
- (h) “Do Not Use After _____ inserting the month and year that mark the end of the manufacturer's recommended service life for the container.

Be very careful buying CNG conversion equipment or cylinders through the Internet. Some web merchants offer imported CNG cylinders that are not labeled as certified to FMVSS 304 and some even offer expired cylinders that are illegal to refuel and must be removed and properly destroyed. Many of the illegal cylinders are also rated with a service pressure of 3,000 psi and should not be refilled at U.S. stations which have been designed to provide fuel for vehicles equipped with cylinders that are rated at 3,600 psi.

Know the inspection status and remaining life of your cylinders. CNG cylinders should be inspected for safety every three years or 36,000 miles, whichever comes first (see <https://www.ngvamerica.org/wp-content/uploads/2019/11/CNG-Vehicle-Fuel-System-Inspection-Guidance-1.pdf>). The cylinders should also be inspected if they are removed from one vehicle and moved to another. If your converter intends to install used cylinders, require that they be inspected before installation and make sure that their remaining life is at least as long as you intend to use the vehicle (replacement cylinders are not inexpensive). Converters and vehicle owners should have documentation that this safety inspection has been done and both the cylinders and vehicle must be labeled with the next inspection due date.

Educate yourself about your converted CNG vehicle. OEM CNG vehicles are delivered with an owner's manual covers the CNG system just as it covers all the rest of the vehicle. Your converter should provide a manual supplement for the converted parts of the vehicle. Study the manual when you take delivery and be sure to ask questions about anything that is unclear.

If you have more questions about CNG conversions, contact the following organizations for assistance.

NGVAmerica is the national trade association dedicated to the development of a growing and sustainable American market for vehicles powered by natural gas.

About the Clean Vehicle Education Foundation - CVEF coordinates and implements a variety of public awareness, education, market research, codes and standards and technology programs for natural gas vehicles.