



aerospace  
climate control  
electromechanical  
**filtration**  
**fluid & gas handling**  
hydraulics  
pneumatics  
process control  
sealing & shielding



Photo courtesy of U.S. Navy

# CNG Vehicle and Fueling System Solutions

Helping create a sustainable future



ENGINEERING YOUR SUCCESS.

# PARKER: A NATU

A leader in the design and manufacture of products and systems that convey and utilize compressed natural gas (CNG), Parker is a natural for natural gas. Our proven, multi-technology subsystems and components in fluid management, motion and fluid control, filtration, and temperature control provide CNG solutions that offer faster development, improved service life, reduced risk, and greater value.



## CNG Challenges

- Developing CNG refueling infrastructure
- Natural gas vehicles can cost up to 40% more than equivalent gas vehicles; natural gas conversion of a gas vehicle can cost up to \$18K
- Shorter driving range
- Longer refueling time
- Greater weight of fuel tank
- Currently only on a limited number of vehicles

## CNG Advantages

- Natural gas (NG) is plentiful in North America and relatively inexpensive, particularly in light of the fact that gasoline and diesel fuel have jumped in price by more than 30%
- NG produces 30% fewer greenhouse gas emissions than gas or diesel
- NG is safer, with a low chance of flammability
- Supply of NG is expected to exceed demand, keeping prices depressed
- Government push to alternative fuels through environmental regulations, tax credits, and incentives
- Refueling from existing natural gas lines makes home refueling easy
- NG engine availability is increasing
- NG vehicles offer longer vehicle life with less long-term expense for the consumer



# GLOBAL SOLUTIONS FOR NATURAL GAS

Our global footprint assures local availability, no matter where you develop, assemble, or manufacture.

Parker offers a complete product package for CNG including fittings, filters, couplings, valves, hoses, nozzles, and receptacles.

## Parker Solutions

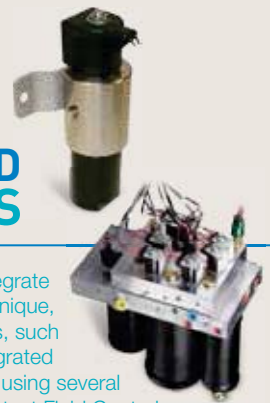
From fittings, filters, and couplings to valves, hoses, nozzles, and receptacles, our complete CNG product package is unmatched in the industry. Our customers also benefit from other value-added advantages:

- Years of extensive experience in design, prototyping, and manufacturing shortens design cycle, improving production efficiency and simplifying procurement procedures
- Early-on collaboration from concept through production creates competitive advantage
- Our global footprint assures local availability, no matter where you develop, assemble, or manufacture
- Compliant with national and international certification standards
- As a multiple technology provider, Parker saves you time and money by reducing the need for multiple suppliers
- Parker also supports LNG applications



## CUSTOMIZED SOLUTIONS

Parker has the ability to integrate multiple technologies into unique, customer-focused solutions, such as this CNG valve with integrated filter (top) and this manifold using several Parker products (right). Contact Fluid Control Division at (866) 827-2300 to find out more. Or follow this path online to chat live with an engineer: <http://parker.com/fcd> > Support > Live Help Ask An Engineer.



# ON VEHICLE

Collaborate with Parker for CNG solutions that fuel competitive advantage.

From the refueling receptacle to the engine compartment, Parker offers the CNG components that make a noticeable difference in performance, plus the expertise to put it all together for you. Our global experience in the design of fuel systems for medium- and heavy-duty vehicles is well respected in the industry. And customers have local access to Parker channels throughout North America.

## VALVES AND RECEPTACLES

- 1 High-pressure CNG valves
- 2 Low-pressure CNG valves
- 3 Check valves
- 4 Receptacles

## FUEL CONVEYANCE

- 5 Low-pressure CNG hose
- 6 High-pressure CNG hose
- 7 Seal-Lok™ O-Ring Face Seal fittings





## FILTRATION

- 8 High-pressure filters
- 9 Low-pressure filters

## CNG COMPLIANCE

Parker products meet the following standards. Reference product listings on the following pages for exact compliance.

- CSA
- ECE
- UL
- NFPA
- ISO 15500
- ANSI/IAS

Proven multi-technology subsystems and components.

## VALVES AND RECEPTACLES



### High-pressure CNG valves

Located between the pressure regulator and fuel injection system, our high-pressure, high-flow, two-way normally closed valves offer higher working pressure than competitors' models and all stainless steel construction for optimum performance.

- Bubble-tight maximum allowed leakage
- ISO 15500 / ECE R110 approval in process



### Low-pressure CNG valves

Two-way, normally closed valve line specifically designed for low-pressure CNG applications. Offers exceptionally high flow for a low-pressure valve. Located downstream of the pressure regulator.

- Bubble-tight maximum allowed leakage
- Diaphragm option available for higher flow needs

### Receptacles

Parker's FMS-362 receptacles are available in 3,000 and 3,600 psi versions. NGV1 compliant, they offer a common profile for easy connectivity with other manufacturers' compliant products. Also with a common profile, our HNGVNG receptacles feature a high-flow design for fast filling.



### Check valves

Located on the fuel line between the fill receptacle and the fuel tank, Parker's CVS-363 check valve allows depressurization of the nozzle and receptacle, preventing return flow.

- Uni-directional flow control



## FUEL CONVEYANCE



### 5CNG high-pressure CNG hose

Flexible, lightweight hose serves as primary conveyance of CNG in all areas of the vehicle system up to the firewall. Rated to 180°F (82°C) at 5,000 psi.

- Conforms to and listed per: NFPA 52, ANSI / IAS NGV 4.2-1999, and CSA 12.52-M99
- Electrically conductive
- Dampens vibration and noise
- Up to 30% lighter than rigid tubing
- Very flexible; easy to install with faster routing and simple maintenance
- Robust hose design resists fatigue, corrosion, and environmental effects



### SS23CG low-pressure CNG hose

CNG compatible low-pressure, rubber-covered hose with nylon inner tube. High temperature rated to 250°F (121°C) at 425 psi. Flexible with a small bend radius for easy routing.

- CAN / CGA-8.1-M86 Type III
- Meets UL 21 588, 569 specifications
- Meets ECE R110 / R67 specifications

### Seal-Lok™ O-Ring Face Seal (ORFS) fittings for CNG applications

Leak-free, vibration-resistant, assembly line friendly ORFS threaded connection available in inch (1/4" to 3/4") and metric (6 mm to 20 mm) sizes for high- or low-pressure CNG applications using hard tube or hose.

- Utilizes captive o-ring groove for positive seal retention
- Zero clearance fitting system permits ease of plumbing, especially for tight installation
- Resistance to over-torque up to 200% of assembly torque, no assembly gauge required



- Unlimited reusability due to elastomeric seal, only seal replacement is needed
- ECE R110, ANSI NGV 3.1-2012 / CSA 12.3-2012, and ISO 15500 compliant

## FILTRATION

### FFC-110 / 110L filters

Positioned on the low-pressure side of the vehicle system between the pressure regulator and the fuel injectors. Protect fouling of fuel injectors. Multiple sizes, efficiency grades for application versatility.

- 800 psig maximum pressure is highest known
- Excellent corrosion resistance
- Easy drainage without bowl removal
- ECE R110 certified



### FFC-112 / 112L / 113 filters

Positioned on the high-pressure side of the vehicle system between the storage tank and the pressure regulator where pressures can typically reach 3,600 psig. Protects regulator from contaminant buildup. Multiple sizes for application versatility. FFC-113 offers large flow capacity and stainless steel housing for truck and bus engines.

- Anodized filter housing for long life and corrosion resistance in hostile environments
- Easy drainage without bowl removal
- ECE R110 certified



For consumer or fleet CNG refueling, connect with Parker.

Our complete line of CNG filtration, conveyance, dispensing, and valve solutions connect you to added efficiency and faster fill times. Have a unique application or the need to push the envelope of innovation? We can support that, too, with a team of CNG experts that will help to engineer your success.

## FILTRATION

- 1 High-pressure filters

## FUEL CONVEYANCE AND DISPENSING

- 2 CNG hose
- 3 Seal-Lok™ O-Ring Face Seal fittings
- 4 Fuel line breakaways
- 5 Nozzles / nozzle docks





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## VALVES

- 6 High-pressure CNG valves
- 7 Low-pressure CNG valves



### CNG COMPLIANCE

Parker products meet the following standards. Reference product listings on the following pages for exact compliance.

- CSA
- ECE
- UL
- NFPA
- ISO 15500
- ANSI/IAS

Added efficiency. Faster fill times.

## VALVES



### High-pressure, high-flow CNG valves

Located between the pressure regulator and fuel dispensing apparatus, our high-pressure, high-flow, two-way normally closed valves offer higher working pressure than competitors' models and all stainless steel construction for optimum performance.

- Bubble-tight maximum allowed leakage
- ISO 15500 / ECE R110 approval in process

### Low-pressure, high-flow CNG valves

Two-way, normally closed valve line specifically designed for low-pressure CNG applications. Offers exceptionally high flow for a low-pressure valve. Located downstream of the pressure regulator.

- Bubble-tight maximum allowed leakage
- Diaphragm option available for higher flow needs



## FILTRATION

### M-Series filters

Available in a variety of filter sizes and media, these 800 psig filters have multiple applications in a CNG system. Use them as contaminant protection in pre- and post-filters for a gas dryer, a compressor intake filter, and inter-stage compression filters. Excessive lubrication oil can create contamination problems in a compressor, especially at the higher pressures involved in the later stages of a multi-stage compressor.

- 800 psig maximum pressure ensures reliability
- Excellent corrosion resistance
- Easy drainage without bowl removal
- Multiple sizes and media choices



### J-Series filters

5,000 psig filters remove solid and liquid contaminants from natural gas. Available in a variety of filter sizes and media, these versatile filters can be used as a compressor post-filter or as a pre-filter to storage cascades and fuel dispensing equipment.

- More filter choices than any other competitor
- Easy drainage without bowl removal
- Optional high-pressure drain kits allow drainage while system is pressurized





## FUEL CONVEYANCE AND DISPENSING



### Nozzle and nozzle dock

Located on the fill line, the NGV C2 Type II nozzle acts as a fuel dispenser for CNG vehicles.

Situated on the fueling station, our NGVND nozzle dock (not shown) holds the nozzle when not in use, keeping it clean and readily accessible.



### Vent line breakaway

Placed on the fuel return line, our B887 breakaway ensures the venting of the CNG hose in the event of a "drive off."

- Reliable performance
- NGV4.4 compliance pending



### Seal-Lok™ O-Ring Face Seal (ORFS) fittings for CNG applications

Leak-free, vibration-resistant, ORFS threaded connection available in inch (1/4" to 3/4") and metric (6 mm to 20 mm) sizes for high- or low-pressure CNG applications using hard tube or hose.

- Utilizes captive o-ring groove for positive seal retention
- Zero clearance fitting system permits ease of plumbing, especially for tight installation.
- Resistance to over-torque (if under 200% of assembly torque), no assembly gauge required
- Unlimited reusability due to elastomeric seal, no component damage can occur
- ECE R110, ANSI NGV 3.1-2012 / CSA 12.3-2012, and ISO 15500 compliant

### Fill line breakaway

NGVBCN2 breakaway in 3/8" size provides an important safety feature. It allows the hose to safely disconnect in the event of a "drive off," sealing the CNG in the line to effectively prevent leaking.

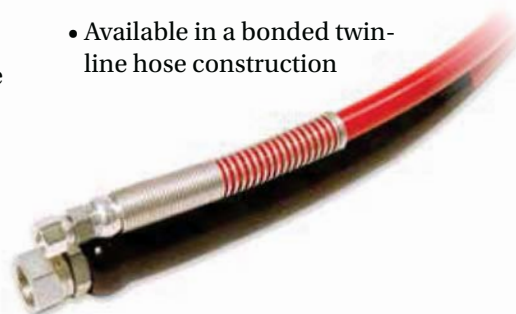


- Pressure balanced
- Reliable performance

### 5CNG high-pressure CNG hose

Conveys CNG from the storage tank to the dispenser and into the vehicle. Specially developed for this application, Parker's CNG hose is constructed of an electrically conductive nylon core designed to dissipate static buildup. Rated to 180°F (82°C) at 5,000 psi.

- Conforms to and listed per: NFPA 52, ANSI / IAS NGV 4.2-1999, CSA 12.52-M99
- Electrically conductive
- Dampens vibration and noise
- Up to 30% lighter than rigid tubing
- Very flexible. Easy to install with faster routing and simple maintenance
- Robust hose design resists fatigue, corrosion, and environmental effects
- Available in a bonded twin-line hose construction



## Parker Divisions for these CNG products

### **FILTRATION**

Parker Hannifin Corporation  
**Filtration Division**  
Finite Airtek  
500 S. Glaspie Street  
Oxford, Michigan 48371  
phone 248 628 6400  
fax 248 628 1850

### **CNG VALVES**

Parker Hannifin Corporation  
**Fluid Control Division**  
95 Edgewood Avenue  
New Britain, Connecticut 06051  
phone 860 827 2300  
fax 860 827 2384

### **CNG SUPPLY AND RETURN LINE HOSE**

Parker Hannifin Corporation  
**Hose Products Division**  
30240 Lakeland Blvd.  
Wickliffe, Ohio 44092  
phone 440 943 5700  
fax 440 943 3129

### **CNG HOSE**

Parker Hannifin Corporation  
**Parflex Division**  
1300 N. Freedom Street  
Ravenna, Ohio 44266  
phone 330 296 2871  
fax 330 296 8433

### **SEAL-LOK™ O-RING FACE SEAL FITTINGS**

Parker Hannifin Corporation  
**Tube Fittings Division**  
3885 Gateway Blvd.  
Columbus, Ohio 43228  
phone 614 279 7070  
fax 614 279 7685

### **CHECK VALVES, BREAKAWAY VALVES, RECEPTACLES, AND NOZZLES**

Parker Hannifin Corporation  
**Quick Coupling Division**  
8145 Lewis Road  
Minneapolis, Minnesota 55427  
phone 763 544 7781  
fax 763 544 3418

