



Creative Bus Sales

Elkhart • Chino • Hayward • Sacramento • Las Vegas • Florida

The Creative Bus Sales Difference

Engine System

- CARB and EPA Certified
- ISO Certified Engine System Manufacturer
- Manufacturer Ford certified as a QCM – Qualified Calibration Modifier.
Insures manufacturer is utilizing Ford OEM calibration standards for CNG and not “hacking into” or performing an “unauthorized reflash” of the original calibration.
- Engine System Manufacturer Ford QVM -Insures manufacturer’s operations have been audited by Ford to demonstrate that engine calibration stays within original engine operating parameters (cylinder pressure and temperature, engine speed, etc.), that the manufacturer has demonstrated conformance to FMVSS standards, that the manufacturer has committed to perform conversions only on new vehicles with the gaseous prep engine and the original Ford warranty is not voided as a result of the conversion process.

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CNG Cylinder Specifications

- CNG Cylinders meet federal government’s FMVSS 304 (49 CFR 571.304), *Compress Natural Gas Fuel Container Integrity*. All CNG Cylinders shall meet ANSI/CSA NGV2.
- CNG Cylinders either 15 or 20 year Type 3 or Type 4 cylinders with electric valve.
 - All cylinders equipped with electric shut-off valves interfaced to vehicle fuel module allowing full integration of manufacturers original equipment safety features pertaining to rollover and inertia protection.
 - Cylinder valves have a manual shut off valves, requiring no tools.
 - Cylinder valves have an excess flow device.
 - All cylinders are equipped with a pressure relief device (PRD) to automatically relieve pressure from cylinder in the event of emergency situation, and vent to the top/rear of the vehicle.
 - Cylinder valves are accessible through the gravel shields.

High & Low Pressure Tubing, Fittings, and Hoses

- All stainless steel tubing installed per NFPA 52 guidelines with proper clearances from obstructions.

- The PRD system uses min. ½ , .049 wall thickness stainless steel vent tubing so not to have melt down in case of vehicle fire.
- All 1/2” tubing - minimum specification .049” wall thicknesses rated for working pressure of 3700 psi. Material certification from the supplier supplied with the bus.
- All 3/8” tubing - minimum specification .049 wall thicknesses rated for working pressure of 4800 psi. Material certification from the supplier supplied with the bus.
- All High pressure hoses are conductive core hoses constructed of a polyurethane cover with fiber reinforced insulation along with a 302 SS spring guard to alleviate crimping of the hose and stainless steel end connections for maximum durability. High pressure hoses have minimum working pressure of 5,000 psi, and 20,000 psi burst pressure. Material certification from the supplier supplied with the bus.
- All fuel hoses in engine compartment are wrap heat shielded by aluminum foil-faced fiberglass fabric with a high-temperature acrylic pressure-sensitive adhesive backing for proper installation. Protection to high heat exposure and retains residual strength after exposure to flame.
- All fittings are ANSI approved for CNG application and shall be capable of withstanding a hydrostatic test of at least four times the rated service pressure without structural failure (NFPA 52)

Mounting Brackets, Cylinder Brackets, and Mounting Hardware

- All mounting hardware - American Made grade 8 material or higher.
- Grade 8 self-locking nuts and bolts used to insure proper installation.
- Cylinder brackets designed for the cylinder’s diameter and equipped with protective rubber material to allow for cylinder expansion.
- Cylinder Brackets independently tested by PE firm to document strength and load bearing capacity.
- Mounting structures cold bent to eliminate the possibility of structures failing from a poor weld.

Vehicle Safety Features

- All vehicles equipped with a minimum of two pressure external gauges for driver safety.
 - One mounted externally at the fuel fill receptacle so the driver can distinguish the fuel pressures at every inspection.
 - A second pressure gauge shall be mounted at the undercarriage by the manual fuel shut-off valve.
- A pressure regulator inlet and each chamber designed for its service pressure with a pressure safety factor of at least four times service pressure without structural failure.
- Low-pressure chambers provide for overpressure relief in addition to the cylinder high pressure relief.
- System utilizes protective heat shield material to protect high and low pressure hoses and tubing from excessive heat exposure.
- One way check valve, quarter turn valve, and purge valve installed for added safety.

Cylinder Gravel Shields

- All shielding made of 16 Gauge steel.
- Shields have anti-corrosion protection in the form of powder coating at minimum or Stainless steel.

- Shielding constructed in a way to provide proper drainage of water that may cause structural damage.
- Shields bolted to brackets for ease of removal and proper re-installation.
- Shields cover bottom, front, back, and sides of exposed areas of cylinders for maximum protection from elements.
- Gravel shields also equipped with this material in order to protect the cylinders from excessive heat.

Fuel Capacity

- CNG Fuel capacity requirements stated in SCF @ 3600 PSI. Gasoline Gallon Equivalent capacity shall be calculated @ 122 SCF per 1 GGE.

Fuel System Integrity

- CNG Fuel System Altoona Tested per the following FTA guidelines:

“Buses manufactured on a gasoline-fueled third-party chassis and then converted to a compressed natural gas (CNG) fuel system by a fourth-party converter, upfitter, and/or dealer prior to final acceptance of the vehicle(s) by an FTA grantee. A change in a previously-tested bus model's fuel system from gasoline to CNG is a major change and triggers Partial Testing<http://www.fta.dot.gov/research_8867.html> requirements; tests in which FTA might reasonably expect to obtain different data (compared to the baseline gasoline-fueled version of the bus) would need to be repeated. Accordingly, each newly-offered fourth-party conversion to a CNG fueling system (consisting of a particular design, specific major components [whether produced in-house or by outside suppliers], installation techniques, and calibration) must have completed testing at the Bus Testing Center that includes at least the Maintainability, Safety, Performance, Structural Durability (test 5.7), Fuel Economy, dynamic Noise (i.e., noise tests involving engine operation), and (if the conversion was contracted for testing on or after January 1, 2010) Emissions tests, since these are the tests in which we would expect to obtain significantly different data due to the conversion. Once a particular fourth-party CNG conversion of a particular chassis has completed the testing specified above, it may be substituted for the corresponding gasoline chassis in bus models that have satisfied FTA Bus Testing requirements on that corresponding gasoline chassis. Versions with fewer CNG tanks could also be substituted, but versions with more tanks would require an individual determination of testing requirements. In this context, "corresponding chassis" means the same make and model chassis powered by the same make and model engine. In order for a proposed CNG bus model to meet the requirements of the Bus Testing Regulation, the Partial Bus Testing Report resulting from the test of the corresponding converted CNG chassis must be provided to the grantee along with the full Bus Testing Report for the baseline gasoline-powered version of that bus model. (posted January 5, 2011)”