Collins Bus Corporation
School, MFSAB, Activity Buses

www.collinsbuscorp.com
Collins Bus Corporation

- LARGEST TYPE A SCHOOL BUS MANUFACTURER IN NORTH AMERICA
- COLLINS BUS, MID-BUS, CORBEIL
  - MANUFACTURE On GM CUTAWAY CHASSIS
- SEATING FROM 9 to 35 PASSENGERS

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CleanFUEL USA
Total Fuel Solution

Fuel Procurement and Distribution
Service and Warranty
Propane Engine Systems
Fueling Infrastructure
CLEAN is green

NEXBUS™ PROPAINE

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CBC entered exclusive agreement with CleanFUEL USA Sept. 2009

GM Cutaway Chassis with 6.0L gasoline engine using Liquid Propane Injection System

Finished unit provides up to 32 seated passengers or 18 + 2 wheelchairs

Production initiated August 2010
GM Cutaway Chassis

- 6.0L V8 Gasoline engine
- 14,200# GVW
- 159” Wheelbase
- 6 Speed automatic transmission w/od
- 145 Amp alternator
- 40.5 Gallon propane tank
- Estimated fuel range over 300 miles
The LPI System

- GM 6.0L Gasoline Engine
- Liquid Injection System
- Clean-Low Emissions
- Simple Design
- Economical
- Superior Performance
- Safe
- Excellent Infrastructure
Propane System

<table>
<thead>
<tr>
<th>Callout</th>
<th>Description</th>
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<tbody>
<tr>
<td>A</td>
<td>Fuel Tank Twin 16&quot; x 34&quot;</td>
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<tr>
<td>B</td>
<td>Fuel Fill Port and Line</td>
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<tr>
<td>C</td>
<td>Multivalve</td>
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<tr>
<td>D</td>
<td>Fill Line Fuel Filter</td>
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<td>E</td>
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<td>F</td>
<td>Powertrain Control Module</td>
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<td>G</td>
<td>Fuel Injector Harness</td>
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<td>H</td>
<td>Fuel Rails</td>
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<td>I</td>
<td>Fuel Injectors</td>
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<td>J</td>
<td>Fuel Rail Supply/Return Lines</td>
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<tr>
<td>L</td>
<td>In Tank Liquid Fuel Pump</td>
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</tbody>
</table>
Propane System

Safe

- Fuel tank is made of ¼” thick carbon steel.
- Tanks are 20 times more puncture resistant than a gasoline or diesel tank.
- Fuel flow is automatically shut-off in the event of a fuel line rupture.
- Critical valves are positioned to provide superior protection from damage.
- Propane has the most narrow flammability range of any fossil fuel.
Benefit:

- Direct replacement of the OEM gasoline fuel system.
  - Sequential Port Injected
  - Utilizes the General Motors E-38 Engine Control Unit
- Proprietary programming optimizes fuel economy, performance, and low emissions.
- OEM developed diagnostics remain intact with the LPI system.
- Allows use of GM Tech II tool for diagnostics.
Benefit:

- Vaporization occurs at the intake port, cooling the air/fuel charge and increasing air/fuel density providing power better than the gasoline engine equivalent.
- Vaporization creates a cooling effect reducing valve and upper cylinder temperatures and prolonging engine life.
- Provides excellent cold weather start.

“LPI Delivers Propane to the Intake Port as a Liquid”
Currently the world’s most proven alternative fuel
Low operating cost when compared to gasoline or diesel
Non-toxic, burns cleanly & is not a ground contaminant
Propane is naturally a low emission fuel
Similar MPG and fuel fill rate as gasoline
Promotes a green fleet image
Energy Independence with over 90% produced domestically
Good fueling infrastructure
Extended engine life from low carbon and less oil contamination
#### Propane Advantages

**Clean – Low Emissions**

<table>
<thead>
<tr>
<th>2011</th>
<th>NOx Only</th>
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<tbody>
<tr>
<td>EPA &amp; CARB – Diesel Standard</td>
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<tr>
<td>EPA &amp; CARB - Gasoline Standard</td>
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<tr>
<td>6.0L Propane Certification Level</td>
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</table>

- Certified with EPA & CARB at Zero Particulate Matter
- No need for DEF, Cooled EGR or SCR Systems
**Economical**

6.0L Type A Bus – Fuel Cost
14,200 lbs. GVWR
30,000 Miles per Year
Fuel at Fleet Price
- Diesel $3.40 (13 mpg)
- Gasoline $3.10 (10 mpg)
- Propane $2.30 (9 mpg)
Est. Tax Credit - 0.50*
Net Price $1.80

**Annual Fuel Savings**
LPI-Propane vs Gasoline = $3,300
LPI-Propane vs Diesel = $1,846

**Fuel Savings Over 7 Years**
LPI-Propane vs Gasoline = $23,100
LPI-Propane vs Diesel = $12,922

*Propane fuel price reflects the Volumetric Excise Tax Credit (VETC)
Tax Credit Prices will vary based on local conditions
Propane Autogas vs. Compressed Natural Gas

A Comparison of Alternative Fuels

- Both CNG and propane are attractive, viable alternative fuels for the commercial fleet market, both fuels are greener and more cost effective than gasoline and diesel.

- **CNG storage tanks are required to be four times as large as propane tanks**, while the operating pressure of a CNG tank is 17 times the pressure of a propane tank.

- The CNG storage size combined with the extreme pressure *requires more space and fuel to transport than propane*. Heavier storage tanks also contribute to greater pressure and demands on vehicles, *which increases maintenance costs*.

- The pressure involved in CNG storage also *places a limit on how much fuel can be injected into a vehicle* during one given time, creating a time-intensive refueling process for the vehicle owner.

- The **cost of converting** a vehicle to run on **CNG is 50 percent more** than the cost of converting a vehicle to propane.

- **CNG is methane**, a greenhouse gas, as opposed to propane, which is not a greenhouse gas when released directly into the atmosphere.
Match GM engine warranty with a 3 year / 36,000 mile LPI system warranty

Technical training available

Technical manuals and CD provided

Technical service bulletins

Technical assistance hotline
Refueling & Storage Skid Systems

- Complete storage and pumping unit designed for autogas
- Portable systems ready for electrical and gas connection
- Available with or without storage tank
- Secured accessories and electrical control panel
- High flow rate valves and autogas pump/motor/piping
- Safe and tested system with over 16 years of field use
CLEAN FUELING TECHNOLOGIES DISPENSER OPTIONS

- Pro 2100 Series
- PRO 6100 Series
- PRO 7200 Series
- Self Serve Style
Refueling & Storage Skid Systems

PRO-2100

- Ideal solution for fleets, commercial refueling, cylinder fueling plants, RV centers, Camp Sites, etc

- A simple to use, reliable and attractive dispenser, with all the electronic functionality of bigger retail dispensers, in a compact and high durability stainless steel cabinet.

- Comes complete with as LiquaTech LPM102 flow meter with Trac-Bearing Chamber and CFT Electronic register, as well as standard 12’ over all delivery hose and MEC break-away.

*can be installed on a small footprint*
Refueling & Storage Skid Systems

PRO 2100 Integrated with Fuel Master
SMART FOR YOUR ROUTE. GOOD FOR THE WORLD.

NEXBUS™

HYBRID & PROPANE TECHNOLOGIES

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