Liquid Propane Autogas
Product Introduction & Overview
ABOUT US

Company Background & History
Roush at a Glance

<table>
<thead>
<tr>
<th>Michigan-based</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Privately held</td>
<td></td>
</tr>
<tr>
<td>Founded in 1976</td>
<td></td>
</tr>
<tr>
<td>Over 3,700 employees</td>
<td></td>
</tr>
<tr>
<td>Over 2.85 million sq. ft. office/development space</td>
<td></td>
</tr>
</tbody>
</table>

**Primary activities:**

- Engineering
- Testing
- Prototype Development
- Manufacturing
- Motorsports Management
Enterprise Brand Portfolio

ROUSH Industries
OEM manufacturing, engineering, prototyping and design

Roush Fenway Racing
Dominant NASCAR Sprint Cup racing team

ROUSH Performance
Industry leading high performance vehicles

ROUSH CleanTech
Propane autogas powered commercial vehicles.
Markets We Serve

**Transportation**
- Ford
- Chrysler
- GM
- Toyota
- Honda
- Hyundai
- Isuzu
- Volkswagen
- EcoMotors
- Nissan
- Navistar
- Bluebird

**Defense**
- Navistar Defense
- BAE Systems
- AM General
- General Dynamics
- SAIC
- Textron
- FAAC
- US Army/TARDEC
- Oskosh Defense
- Hardwire
- Astradyne

**Entertainment**
- Disney
- Universal Studios
- Disneyland Paris
- Universal Studios Orlando
- Hong Kong Disneyland
- Disney California Adventure
- Universal Studios Singapore
- The Henry Ford

**Aerospace**
- Bell Helicopter
- Boeing
- Pratt & Whitney
- United Launch Alliance
- Sikorsky

**Oil & Gas**
- Aramco
- Conoco Phillips
- Afton
- ProSource
- Weatherford

**Motorsports**
- Ford
- 3M
- Aflac
- Crown Royal
- UPS
- Scotts
- Kellogg
- Valvoline
- Coca-cola
- Fastenal

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Alt. Fuel Experience

- Compressed Natural Gas (CNG)
  - Design of fuel system.
  - Calibration.
  - EPA and CARB certification.
  - Vehicle integration.

- Electric
  - Over 16,000 recharging stations built.
  - Blink ECOtality contract with U.S. DOE.

- Hydrogen
  - 207.297 MPH (world land-speed record.)
  - Vehicle design.
  - Aerodynamics development.
  - Vehicle fabrication.
  - Propulsion system integration.
Liquid Propane Autogas

- Ford commercial trucks, vans, cutaways and strip chassis.
- Blue Bird Type A and Type C school bus.
- Ford QVM Partner:
  - Factory Ford warranty maintained.
  - No loss of HP / torque / towing capacity.
  - Serviceable with existing diagnostic equipment.
- EPA & CARB Certified.
What is Propane Autogas?

- **Clean:**
  - 24% reduction in Greenhouse Gas (GHG) emissions.
  - 20% reduction in Nitrogen Oxide (NOx) emissions.
  - 60% reduction in Carbon Monoxide (CO) emissions.

- **Domestic:**
  - 90% of propane used in U.S. comes from U.S.
  - 7% of propane used in U.S. comes from Canada.

- **Abundant:**
  - Most refueling infrastructure of any alternative fuel.
  - Major natural gas shale found in northeast U.S.
  - Powers over 21 million vehicles worldwide.

- **Safe:**
  - Low pressure (~ 200 psi).
  - Narrow flammability range.
  - Fuel tanks are 20 times more puncture resistant than gasoline.
Scorecard

7,078 vehicles sold since 2007

297,271,440 gallons of propane autogas used

240,837,565 gallons of gasoline displaced
<table>
<thead>
<tr>
<th>Customer Adoptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sears</td>
</tr>
<tr>
<td>CenturyLink™</td>
</tr>
<tr>
<td>ARS Rescue Rooter</td>
</tr>
<tr>
<td>Airco Express</td>
</tr>
<tr>
<td>Prime Time Shuttle</td>
</tr>
<tr>
<td>Mesa Public Schools</td>
</tr>
<tr>
<td>BIGVALLEY</td>
</tr>
<tr>
<td>ThyssenKrupp</td>
</tr>
<tr>
<td>Knapheide</td>
</tr>
<tr>
<td>Creative Bus Sales</td>
</tr>
<tr>
<td>FritoLay</td>
</tr>
<tr>
<td>Blue Bird</td>
</tr>
<tr>
<td>DHL Worldwide Express</td>
</tr>
<tr>
<td>MV</td>
</tr>
<tr>
<td>Transfer Flow, Inc.</td>
</tr>
<tr>
<td>Asplundh Tree Expert Co.</td>
</tr>
<tr>
<td>Trugreen</td>
</tr>
<tr>
<td>Knight's</td>
</tr>
<tr>
<td>Indiana DOT</td>
</tr>
<tr>
<td>Ferrellgas</td>
</tr>
<tr>
<td>MTA</td>
</tr>
<tr>
<td>SuperShuttle</td>
</tr>
<tr>
<td>Safelite AutoGlass</td>
</tr>
<tr>
<td>Fort Worth</td>
</tr>
<tr>
<td>San Antonio</td>
</tr>
</tbody>
</table>

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Customer Adoptions

- Comet
- UPS
- TruGreen
- FedEx Ground
- Admiral Linen and Uniform Service
- WIS International
- Dish Network
- AmeriPride
- MasterPark
- EMCOR
- RTA
- H&S Bakery, Inc.
- Nestlé Waters
- ValleyCrest
- Carts
- Parking Spot
Customer Adoptions

- SMART
- AutoZone
- King County METRO
- DIRECTV Satellite Television
- Microsoft
- FedEx Ground
- ARAMARK
- Broward County FLORIDA
- AmeriGas America's Propane Company
- Palm Tran
- Alpha Baking Co., Inc.
PRODUCT OVERVIEW

Pickups  |  Vans & Wagons  |  Cutaway Vans
Chassis Cab  |  School Bus
Liquid Propane Autogas

- Light & medium duty Ford trucks & vans, school bus.
- Factory Ford warranty maintained.
- No loss of HP / torque / towing capacity.
- Serviceable with existing diagnostic equipment.
- EPA & CARB Certified.
Why Dedicated?

- Much stronger ROI (more autogas used).
- Easier to install and service.
- Less components to maintain.
- Single fuel can be optimized in ECM/PCM.
- Single system requires less space.
Model Years
2012 - 2015

Engine Size
6.2L V8 (3V)

Applications
4x2 or 4x4.
6.75 ft., 8 ft., bed delete.

Fuel Tank Capacity
Under-bed: 21 gallons (usable).
*Not available on 6.75’ bed.
In-bed: 38 gallons (usable)

Technical Specifications
EPA and CARB approved.
Requires “98F” gaseous fuels prep. package.

Pricing
Under-bed: $11,450
In-bed: $10,495
## Tank Specifications: F-250 / F-350

<table>
<thead>
<tr>
<th>Under-Bed</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Usable gallons</td>
<td>21</td>
</tr>
<tr>
<td>Length</td>
<td>60.9”</td>
</tr>
<tr>
<td>Width</td>
<td>17.3”</td>
</tr>
<tr>
<td>Height</td>
<td>14.6”</td>
</tr>
<tr>
<td>Fuel system weight (dry)</td>
<td>255 pounds</td>
</tr>
</tbody>
</table>

### Special Considerations
- Not available on chassis cab.
- 8 ft. bed only.
- Available on pickup and bed delete.
# Tank Specifications: F-250 / F-350

<table>
<thead>
<tr>
<th>In-Bed</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Usable gallons</td>
<td>38</td>
</tr>
<tr>
<td>Length</td>
<td>46.9”</td>
</tr>
<tr>
<td>Width</td>
<td>25.5”</td>
</tr>
<tr>
<td>Height</td>
<td>22.4”</td>
</tr>
<tr>
<td>Fuel system weight (dry)</td>
<td>285 pounds</td>
</tr>
<tr>
<td>Special Considerations</td>
<td></td>
</tr>
<tr>
<td>Available on pickup, bed delete and chassis cab.</td>
<td></td>
</tr>
<tr>
<td>Knapheide service body only.</td>
<td></td>
</tr>
</tbody>
</table>
## Product Overview

**Ford F-450 / F-550 Chassis Cab**

<table>
<thead>
<tr>
<th><strong>Model Years</strong></th>
<th>2012-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engine Size</strong></td>
<td>6.8L V10 (3V)</td>
</tr>
<tr>
<td><strong>Applications</strong></td>
<td>All cab configurations.</td>
</tr>
<tr>
<td></td>
<td>All wheelbase configurations.</td>
</tr>
<tr>
<td></td>
<td>5-speed automatic transmission.</td>
</tr>
<tr>
<td><strong>Fuel Tank Capacity</strong></td>
<td>Aft-Cab*: 52 gallons (usable)</td>
</tr>
<tr>
<td></td>
<td>Bus: 65 gallons (usable)</td>
</tr>
<tr>
<td><strong>Technical Specifications</strong></td>
<td>EPA and CARB approved.</td>
</tr>
<tr>
<td></td>
<td>GVWR: &lt; 16,500 – 19,500 lbs.</td>
</tr>
<tr>
<td></td>
<td>Requires “98G” gaseous fuels prep. package.</td>
</tr>
<tr>
<td><strong>Order Availability</strong></td>
<td>Shuttle: Q1, 2013 (distributed through GAS only).</td>
</tr>
</tbody>
</table>

*Note: Aft-Cab* indicates the configuration behind the driver's cab.
### Tank Specifications: F-450 / F-550

#### Aft-Cab

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Usable gallons</td>
<td>52</td>
</tr>
<tr>
<td>Length</td>
<td>73.0”</td>
</tr>
<tr>
<td>Width</td>
<td>23.4”</td>
</tr>
<tr>
<td>Height</td>
<td>25.5”</td>
</tr>
<tr>
<td>Fuel system weight</td>
<td>303 pounds</td>
</tr>
<tr>
<td>(dry)</td>
<td></td>
</tr>
</tbody>
</table>

**Special Considerations**

At least 25.5” of clearance required between the cab and body for the tank.
F-450 / F-550 Applications

Industries: Airport, Food & Beverage, Government, Transit, Schools, Energy
## Tank Specifications: F-450 / F-550

<table>
<thead>
<tr>
<th>Single Saddle Mount</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Usable gallons</td>
<td>50</td>
</tr>
<tr>
<td>Length</td>
<td>86.0”</td>
</tr>
<tr>
<td>Width</td>
<td>22.5”</td>
</tr>
<tr>
<td>Height</td>
<td>18.5”</td>
</tr>
<tr>
<td>Fuel system weight</td>
<td>272 pounds</td>
</tr>
<tr>
<td>(dry)</td>
<td></td>
</tr>
<tr>
<td>Special Considerations</td>
<td>Available on 120” CA only.</td>
</tr>
</tbody>
</table>
## Savings Calculation

<table>
<thead>
<tr>
<th>Capital Costs</th>
<th>Gasoline (6.8L V10)</th>
<th>Propane (6.8L V10)</th>
<th>Savings (Costs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Ford Vehicle Purchase Price</td>
<td>$32,945.00</td>
<td>$33,260.00</td>
<td></td>
</tr>
<tr>
<td>ROUSH CleanTech Propene Conversion</td>
<td>$0.00</td>
<td>$21,900.00</td>
<td></td>
</tr>
<tr>
<td>State or Federal Incentive (if applicable)</td>
<td>$0.00</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td><strong>Total Capital Savings (or Investment)</strong></td>
<td>$32,945.00</td>
<td>$55,160.00</td>
<td>($22,215.00)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating Costs</th>
<th>Gasoline (6.8L V10)</th>
<th>Propane (6.8L V10)</th>
<th>Savings (Costs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Vehicle Life (miles)</td>
<td>200,000</td>
<td>200,000</td>
<td></td>
</tr>
<tr>
<td>Average Miles Per Gallon</td>
<td>7.00</td>
<td>5.95</td>
<td></td>
</tr>
<tr>
<td>Gallons of Fuel Over Lifetime</td>
<td>28,571.43</td>
<td>33,613.45</td>
<td></td>
</tr>
<tr>
<td>Fuel Price (per gallon)**</td>
<td>$3.63</td>
<td>$1.87</td>
<td></td>
</tr>
<tr>
<td>Fuel Tax Credit / Gallon</td>
<td>$0.00</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>Adjusted Fuel Price / Gallon</td>
<td>$3.63</td>
<td>$1.87</td>
<td></td>
</tr>
<tr>
<td><strong>Total Fuel Savings (or Costs)</strong></td>
<td>$103,714.29</td>
<td>$62,857.14</td>
<td>$40,857.14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Miscellaneous Costs</th>
<th>Gasoline (6.8L V10)</th>
<th>Propane (6.8L V10)</th>
<th>Savings (Costs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance Rate (per mile)***</td>
<td>$0.030</td>
<td>$0.015</td>
<td></td>
</tr>
<tr>
<td>Maintenance Costs</td>
<td>$6,000.00</td>
<td>$5,000.00</td>
<td></td>
</tr>
<tr>
<td>Fuel Loss From Pilferage / Theft</td>
<td>$0.00</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td><strong>Total Misc. Savings (or Costs)</strong></td>
<td>$6,000.00</td>
<td>$3,000.00</td>
<td>$3,000.00</td>
</tr>
</tbody>
</table>

**Gross Vehicle Lifetime Savings (Loss)**           | $43,857.14          |

**Net Vehicle Lifetime Savings (Loss)**             | $21,642.14          |
Model Years
2013 - 2016

Engine Size
6.8L V10 (3V)

Applications
All cab configurations.
All wheelbase configurations.
6-speed automatic transmission.

Fuel Tank Capacity
Short Tanks (Clean CA): 45 gallons (usable)
Long Tanks (Non-Clean CA): 83 gallons (usable)
Single Saddle Tank: 50 gallons (usable)

Technical Specifications
EPA and CARB approved.
GVWR: < 30,000 lbs.
Requires “98G” gaseous fuels prep. package.

Product Overview
Ford F-650 Chassis Cab
F-650 Applications

Industries:
- Energy
- Food & Beverage
- Government
- Transit
- Utility

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Tank configurations:
- Short tanks: 45 usable gallons
- Long tanks: 83 usable gallons
- Single saddle tank: 50 usable gallons

GVWR: up to 33,000 lbs.

Available: Fall 2015
E-450 Applications

Industries: Airport, Food & Beverage, Logistics, Para-Transit, Schools
F-53 / F-59 Applications

Industries: Food & Beverage, Government, Logistics
SERVICE & WARRANTY

Training, Basic Coverage and Special Tools
Services

Product Training

Installation Support

Technical Hotline

Field Support

Warranty Support

Field Data Analysis

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Service Network

- **National footprint:**
  - Over 380 locations ROUSH CleanTech approved service locations (both United States and Canada).
  - Ford dealers, Independent service centers and Blue Bird dealers

- **Coverage improvements:**
  - Improved coverage
    - 60.4% - 12/2013
    - 94.0% - 08/2014

- **New Deployments:**
  - Defined process for new deployments.
Web-Based Training

Service Technician Course:
A. Propane as an Autogas.
B. Propane Autogas Fuel System Overview.
C. System Diagnostics.
D. Basic Warranty Information.

Service Manager/Advisor Course:
A. Propane as an Autogas.
B. Propane Autogas Fuel System Overview.
C. Detailed Warranty Process.
Tools Available to You

- Savings calculators.
- Demo vehicles.
- Testimonials.
- Product brochures.
- iPad app.
- Website.
- Marketing support.
CONTACT US:

800.59.ROUSH
ROUSHcleantech.com

Steve Ford
Business Development Director

734.377.1375
Steve.ford@roush.com