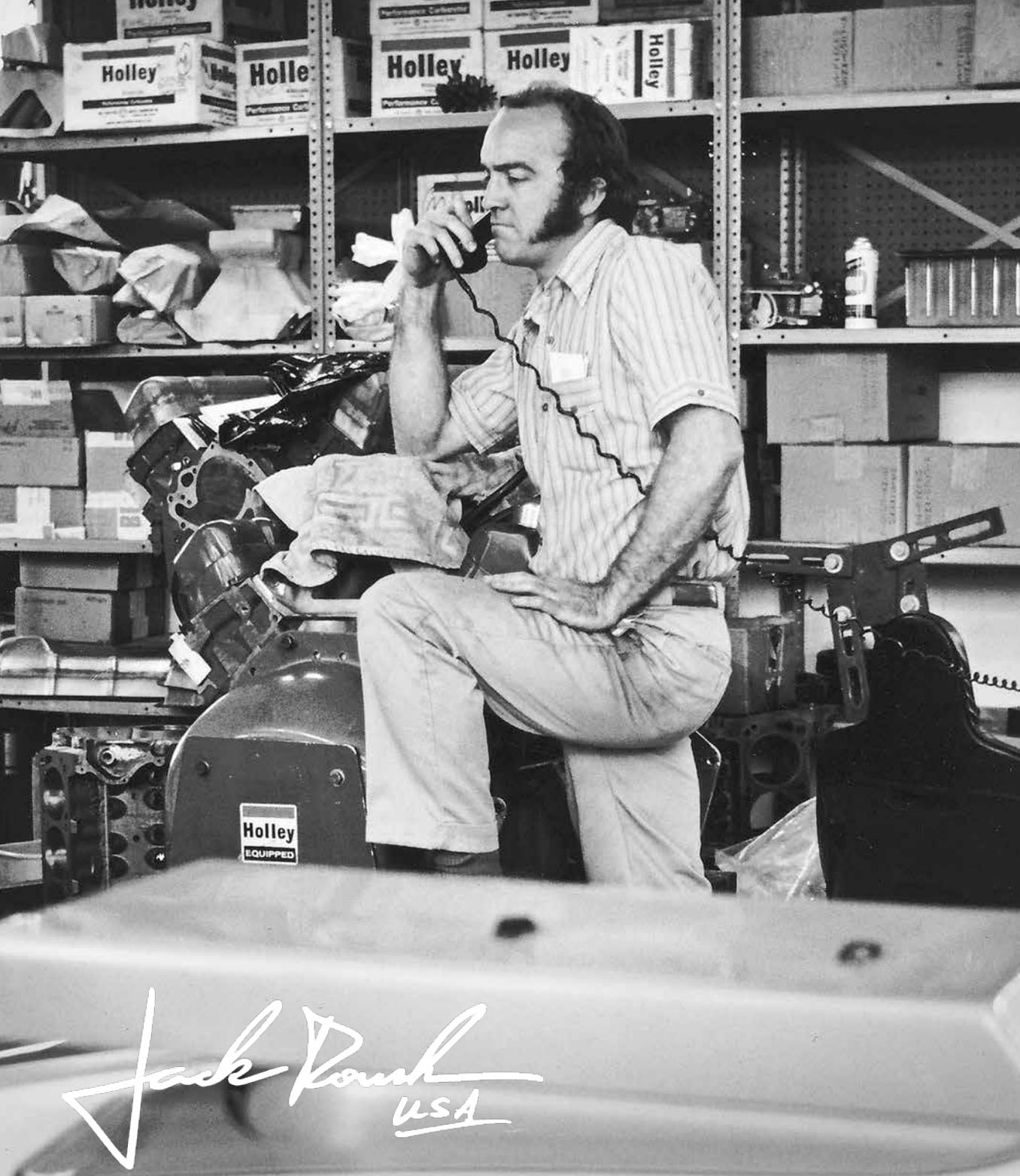


# 2023 PROGRAM OVERVIEW

Advanced Clean Transportation Solutions





For almost half a century, Roush has sustained growth in a constantly evolving mobility marketplace. The company is one of the fastest growing clean technology companies across the nation.

Roush offers its global customers a level of thinking and passion they cannot find anywhere else.

**ROUSH**<sup>®</sup>

 **ROUSH**  
PERFORMANCE

**RFK**  
RACING

**ROUSH**<sup>®</sup>  
CLEANTECH

# ROUSH® Enterprises

INGENUITY ON DEMAND

Solving complex problems through ingenuity, curiosity and tenacity.

## INDUSTRIES



MOBILITY



DEFENSE



ENTERTAINMENT



AEROSPACE

## ABILITIES



DESIGN



ENGINEERING



PROTOTYPE



TESTING



MANUFACTURING

## SATISFIED CLIENTS

Aptiv  
Argo.ai  
BAE Systems  
Bell Helicopter

Blue Bird  
BMW  
Boeing  
Disney

FAAC  
Ford  
GAC  
GM

Google/Waymo  
Hardwire  
Honda  
Hyundai

Isuzu  
Navistar Defense  
Nissan  
Oskosh Defense

Pratt & Whitney  
Rivian  
SAIC  
Sikorsky

Toyota  
Universal Studios  
US Army/TARDEC  
Volkswagen

# PROPANE AUTOGAS REDUCES

## ✓ FUEL COSTS

Propane autogas costs about 40% less than gasoline and 50% less than diesel per gallon — year after year.

## ✓ EMISSIONS

Standard on the 7.3L, the 0.02 g/bhp-hr propane autogas engine is 90% cleaner than EPA's most stringent emission regulation.



## ✓ MAINTENANCE COSTS

Without the required 14+ diesel components, propane fleets report savings of 30 to 50% on filters and fluids, and even more on labor and shop space.

## ✓ TOTAL OPERATING COSTS

The benefit of lower fuel costs and less maintenance adds up to real savings.

## WHAT IS RENEWABLE PROPANE?



Renewable propane (also known as biopropane) is a non-fossil fuel that is produced from **100% renewable raw materials**. It's commonly produced from inexpensive and abundant feedstock like animal fat, algae and cooking oil. Renewable propane has the same chemical structure and physical properties as conventional propane. Because it's produced from renewable raw materials, it has an even lower carbon intensity than conventional propane and is far cleaner than other energy sources.

**Renewable propane is an important factor in the future of the transportation industry and is an integral part of our nation's energy strategy.**

ROUSH CleanTech's propane autogas engines can operate on renewable propane with no modifications.

# LIQUID PROPANE AUTOGAS FUEL SYSTEM TECHNOLOGY

The ROUSH CleanTech liquid propane autogas fuel system seamlessly integrates into the vehicle. Fuel lines follow the OEM routing, and the fuel tank generally replaces the standard tank location. The system delivers propane autogas to the engine in liquid form, ensuring zero compromise in vehicle performance.

## FUEL RAIL

Our signature anodized aluminum fuel rails operate under the varying temperatures of liquid propane autogas.

## FRPCM

The fuel rail pressure control module improves vehicle start-up times, lowers start-up emissions and provides consistent power.

## FUEL TANK

The fuel tank meets ASME certification standards. It's built 20 times more puncture-resistant than gasoline tanks and is made in the U.S.

## FUEL FILL

The design of the industry-standard valve allows for safe passage of liquid propane autogas into the vehicle. It also includes a check valve to prevent fuel leaks.

## FUEL LINES

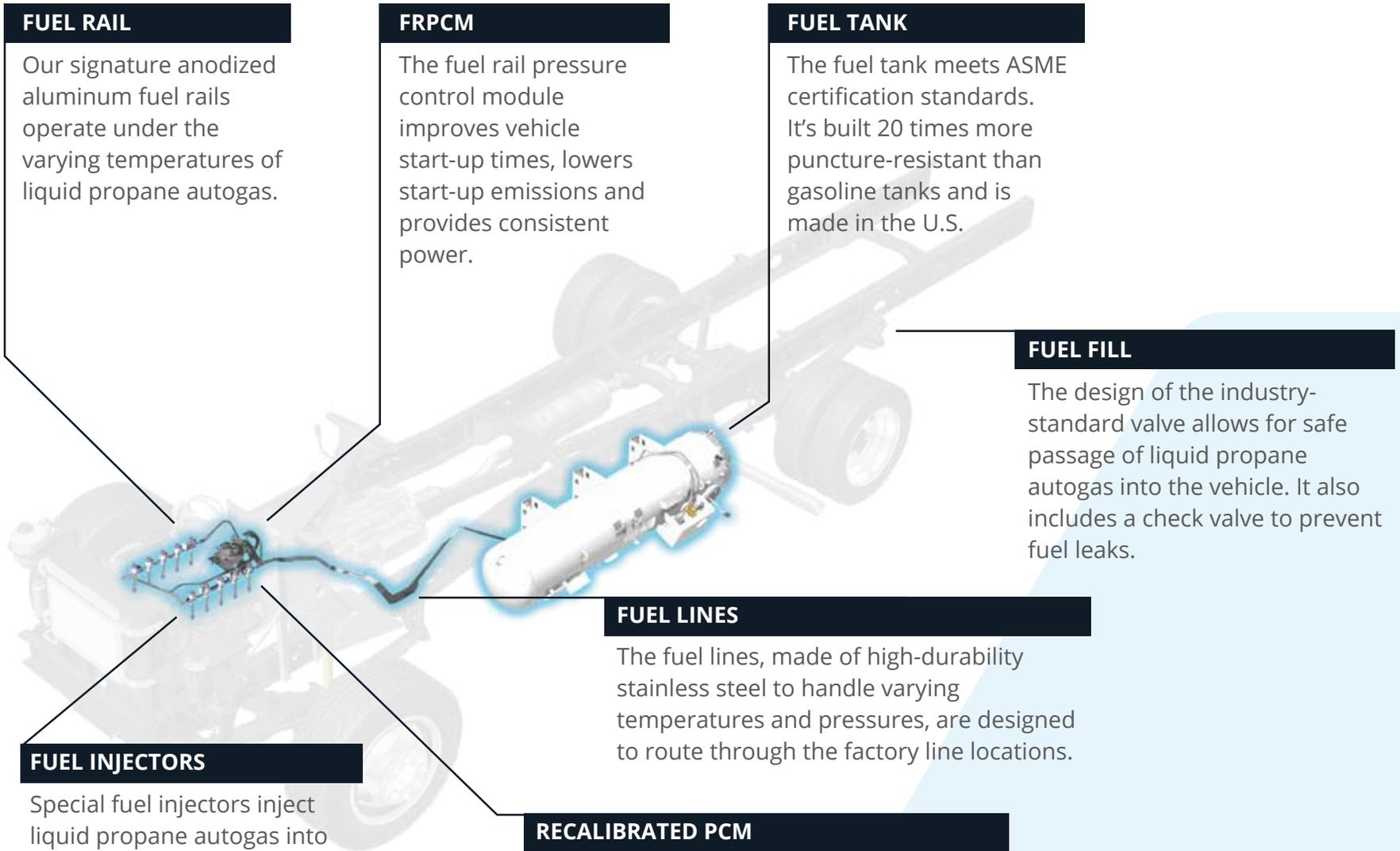
The fuel lines, made of high-durability stainless steel to handle varying temperatures and pressures, are designed to route through the factory line locations.

## FUEL INJECTORS

Special fuel injectors inject liquid propane autogas into the engine for ignition.

## RECALIBRATED PCM

We reprogram Ford's on-board computer that controls the engine to allow the vehicle to operate properly on propane autogas.



# COMMERCIAL VEHICLE OPTIONS



## Ford F-53 / F-59

Stripped Chassis  
7.3L V8



### Tech Specs

EPA & CARB approved  
F-53 GVWR: <26,000 lbs.  
F-59 GVWR: <22,000 lbs.

### Fuel Capacity

LH Saddle	45 gallons usable
Aft Axle	65 gallons usable

## Ford F-650 / F-750

Chassis Cab  
7.3L V8



### Tech Specs

EPA & CARB approved  
F-650 GVWR: <30,000 lbs.  
F-750 GVWR: <33,000 lbs.

### Fuel Capacity

Single 51" LH Saddle	30 gallons usable
Single 86" LH Saddle	50 gallons usable
Dual 51" Saddle	54 gallons usable*
Left Long, Right Short	74 gallons usable*

## Ford E-450

DRW Cutaway and Stripped Chassis  
7.3L V8



### Tech Specs

EPA & CARB approved  
GVWR: <14,500 lbs.

### Fuel Capacity

Aft Axle	41 gallons usable
Extended Aft Axle	64 gallons usable

\*Total gallons usable for dual tanks combined. Contact ROUSH CleanTech for pricing.

## FOR TRANSIT AGENCIES



“With a propane fueling infrastructure, propane is the most cost-effective alt fuel system. Our total net cost by switching to propane away from gasoline is about \$8.2 million over the last five years, and that doesn’t include additional Florida incentives we received.”

— Paul Strobis, Director of Paratransit, Broward County Transit



“Our first five propane-fueled buses collectively traveled 450,000 miles with no fuel system-related failures, and saved \$15,000 in fuel costs alone. That, combined with the reduction in greenhouse gas emissions, made it an easy decision to expand the propane program with our new private fuel stations and propane fleet.”

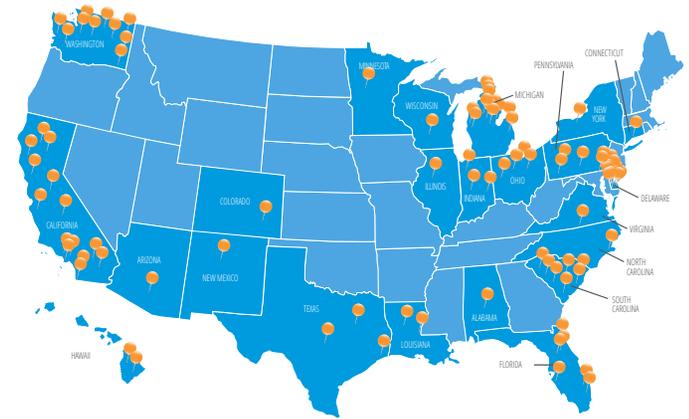
— John T. Sisson, CEO, Delaware Area Regional Transit

## AVAILABLE MODELS



E-450

F-650 / F-750



Transit agencies across the U.S. rely on ROUSH CleanTech for savings, service and reduced emissions.

[REQUEST A DEMO](#)

[CALCULATE YOUR SAVINGS](#)

[Visit.ROUSHcleantech.com](http://Visit.ROUSHcleantech.com)



# SCHOOL BUS PRODUCT OVERVIEW

## Blue Bird Vision



### CONFIGURATION OPTIONS

BODY MODEL	WHEELBASE	PROPANE*	GASOLINE*
BBCV1910	169"	47	45
BBCV2311	189"	69	60
BBCV2508	217"	69	60
BBCV2610	217"	69	60
BBCV2807	238"	69	60
BBCV3011	252"	69	60
BBCV3201	273"	69	60
BBCV3303	273"	69 / 98	60 / 100
BBCV3310	273"	69 / 98	60 / 100
BBCV3507	280"	69 / 98	60 / 100



#### Tech Specs

EPA & CARB approved  
GVWR: 33,000 lbs.  
Up to 77 passengers

#### Fuel Capacity

Short Tank	47 gallons usable
Standard	67 gallons usable
Extended	93 gallons usable



#### Tech Specs

EPA & CARB approved  
GVWR: 33,000 lbs.  
Up to 77 passengers

#### Fuel Capacity

Standard	60 gallons usable
Extended	100 gallons usable

\*Tank capacity in gallons. Contact your local Blue Bird dealer at [www.blue-bird.com/find-a-dealer](http://www.blue-bird.com/find-a-dealer) for pricing.



ROUSH CleanTech has partnered with Blue Bird since 2012 to bring customers the best-selling propane school buses on the market. The Blue Bird Vision and Micro Bird G5, equipped with our propane fuel system, offer school districts many non-diesel options for school bus transportation.

## Micro Bird G5



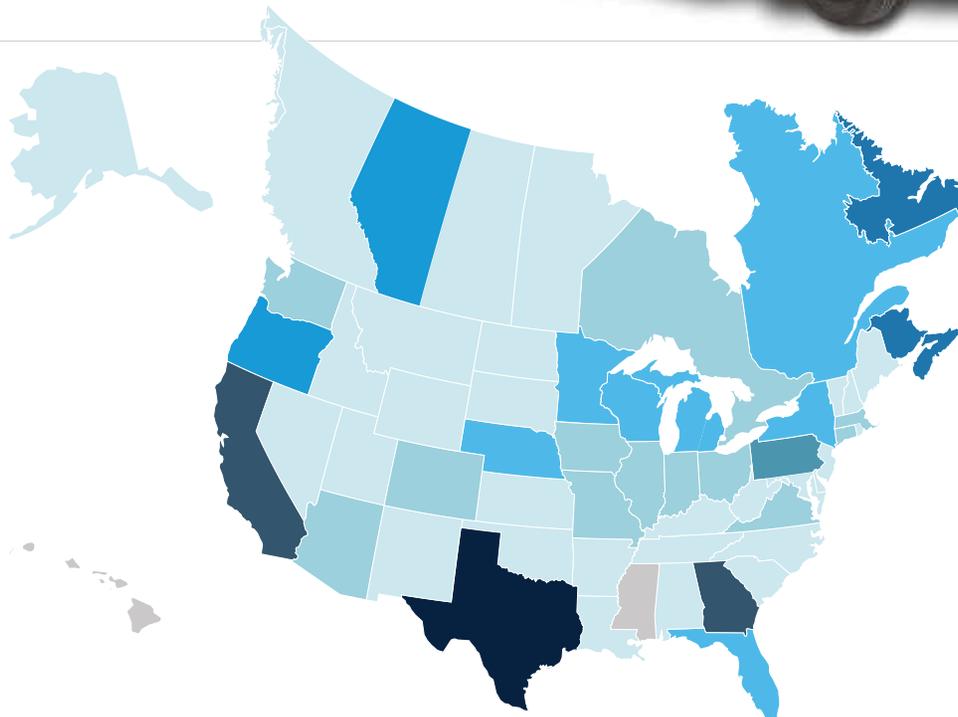
### Tech Specs

EPA & CARB approved  
GVWR: 14,500 lbs.  
Up to 30 passengers

### Fuel Capacity

Aft Axle

41 gallons usable



## PROPANE SCHOOL BUSES ACROSS NORTH AMERICA

- Over 18,500 Blue Bird propane school buses in North America.
- More than 1,000 school districts operating Blue Bird propane buses.

[REQUEST A DEMO](#)

[CALCULATE YOUR SAVINGS](#)

Visit [ROUSHcleantech.com](http://ROUSHcleantech.com)

# AFTER SALES SUPPORT



## Training and Technical Publications

ROUSH CleanTech offers a variety of propane autogas system training options instructed by one of our expert trainers, a field service engineer or online. Our training library gives customers the flexibility to complete the program at their own pace. If additional training is needed after going through our online training program, we can send a ROUSH CleanTech training expert to complete on-site training.

Technical publications are available on our website at no charge. You can find regularly updated service and diagnostic manuals, wiring schematics and more on our Service web page at [ROUSHcleantech.com/service](http://ROUSHcleantech.com/service).

**FACTORY TECHNICIAN WORKSHOPS** provide hands-on training to service centers and customers at our Livonia, Michigan, location. To register for one of our Factory Technician Workshops, please visit the Service tab on the ROUSH CleanTech website.

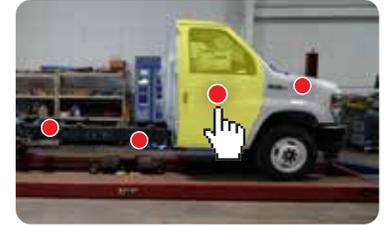


**ON-SITE TRAINING** depends on a customer's needs and experience with ROUSH CleanTech vehicles. On-site training ranges from a two-hour Vehicle Overview to a full-day Advanced Diagnostics Training.



## INTERACTIVE SCENARIOS

- Utilizing new technology, we are creating scenario-based training, allowing you to perform service tasks, run diagnostic tests and troubleshoot vehicle issues.
- We release new interactive training modules throughout the year.



## ONLINE TRAINING

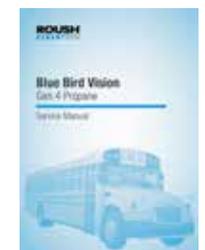
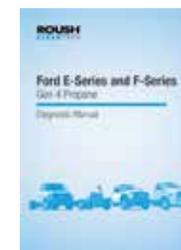
- Propane Properties and Safety
- Propane Fuel System Overview
- Diagnostics
- Interactive Scenarios

## VIDEOS



- Repair and Diagnostic Videos
- News Updates
- "How to" Videos
- Fuel and Driving Demonstrations

## TECHNICAL PUBLICATIONS



- Service Manuals
- Diagnostic Manuals
- Repair and Service Procedures
- Special Service Messages



## Contact and Support

You can rely on ROUSH CleanTech's in-house Customer Success department after your new vehicles are in operation. Our extensive after-sale customer support includes field service, a call center, warranty assistance, technical publications and training. Our team members are with you every step of the way.



**800.59.ROUSH**



**support@ROUSHcleantech.com**



**ROUSHcleantech.com/service**



## Partners

ROUSH CleanTech partners with Ford, Blue Bird and independent service centers to create a nationwide network of qualified experts.



## Service Network

We support our partners by providing technical support and contact center assistance. We make sure that each of our partners are properly equipped with the tooling, training and service diagnostic information to effectively service and maintain the ROUSH CleanTech fuel system with our expanding service network. Our team's mission is to help you diagnose any issues that may arise and get your vehicle back on the road as quickly as possible.

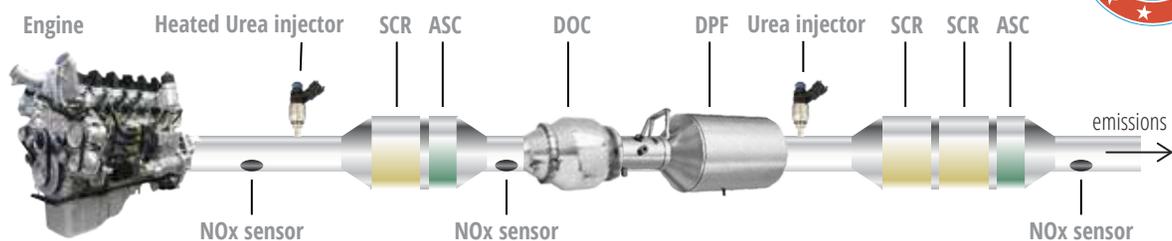


**ROUSH CleanTech offers an expanding service network with more than 700 locations across the country.**

# THE FUTURE OF DIESEL EMISSIONS

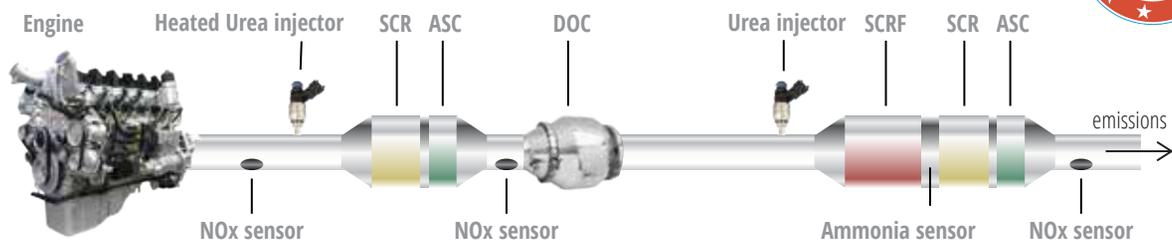
California Air Resources Board passed the Heavy Duty Engine and Vehicle Omnibus Regulations into law last year. Fleets operating diesel need to achieve certain levels of NOx through various engine calibrations strategies and more aggressive aftertreatment. These added components will result in increased downtime and added labor costs.

**2024** → 0.02 NOx



✓ ROUSH CleanTech's propane autogas vehicles meet CARB's 2024 standard.

**2027** → 0.02 NOx



✓ ROUSH CleanTech's propane autogas vehicles meet CARB's 2027 standard.

## ROUSH IS READY FOR YOUR FUTURE...

Renewable propane combined 0.02 NOx meets CARB's 2027 standard.

