

# **Commitment**

**Green Diesel Technology vehicles meet customers' performance needs and society's demand for clean air.**

# **Leadership**

**International leads the field in high performance diesel technology at near-zero emission levels.**

# **Efficiency**

**Diesel engines use up to 60% less fuel per mile than comparable gasoline or alternatively fueled engines.**

# **Environment**

**Diesel vehicles produce about two thirds the amount of the CO<sub>2</sub> emissions associated with global warming that gasoline vehicles do.**

# **Solutions**

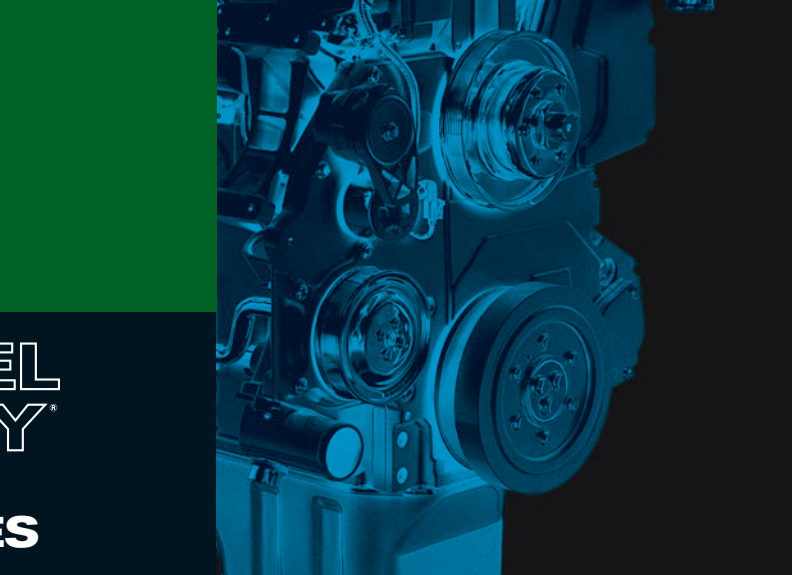
**International identifies emerging technologies that provide practical solutions for tough transportation issues.**

**For more information, see [internationaldelivers.com](http://internationaldelivers.com) and [greendieseltechnology.com](http://greendieseltechnology.com)**

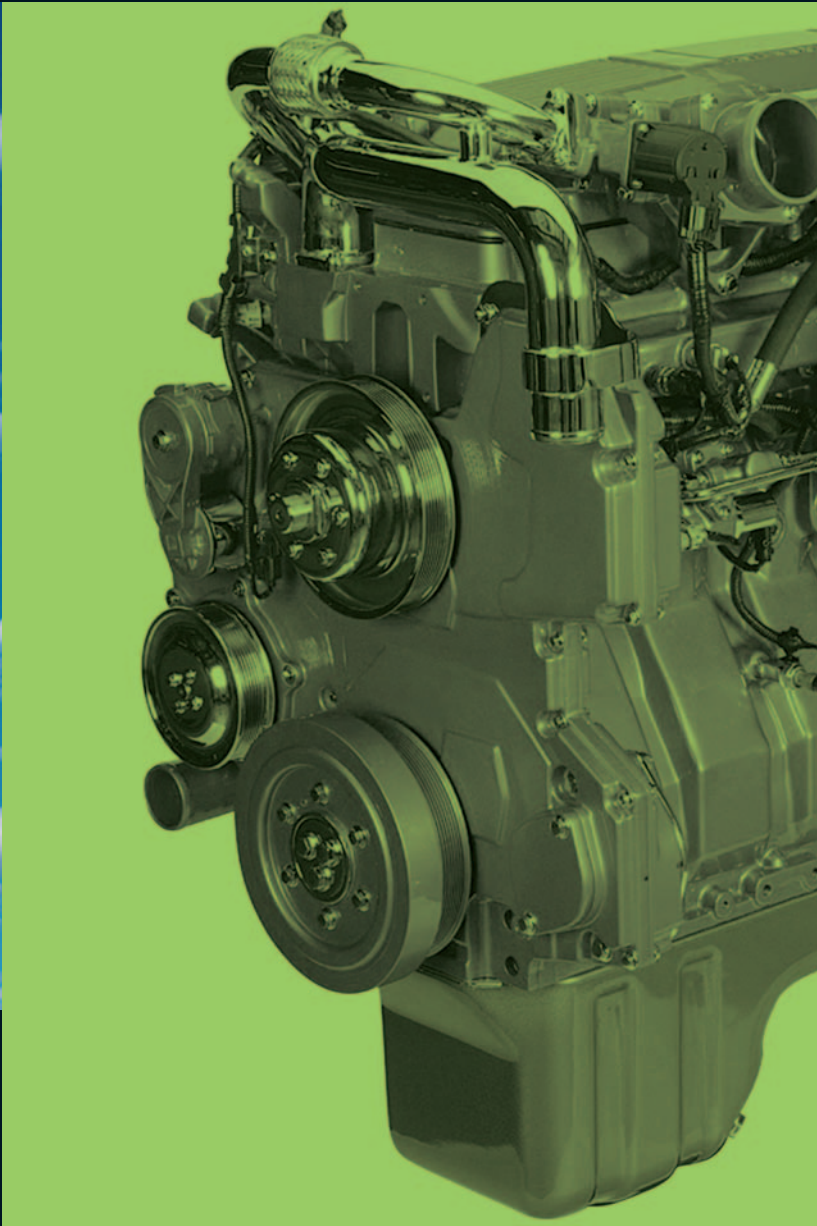


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**GREEN DIESEL  
TECHNOLOGY<sup>®</sup>**  
**ENGINES, TRUCKS,  
AND SCHOOL BUSES**



LEADING THE FIELD IN  
PERFORMANCE AT  
NEAR-ZERO EMISSIONS



# GREEN DIESEL TECHNOLOGY® ENGINES

## Why Diesel Power?

There are many reasons why diesel is used so widely. Diesel has some key advantages over other types of engines and fuels.

- **Power and Durability.**

Diesel engines offer many advantages. They are powerful and durable. Because they produce large amounts of torque at low engine speeds, they can be depended on to pull heavy loads from a standing start or uphill. By contrast, many alternative fuels such as natural gas that are used in buses and other vehicles require undesirable trade-offs regarding power, durability and vehicle range.

- **Energy-Efficiency.**

Diesel engines are also extremely energy-efficient: they use up to 60 percent less fuel per mile than comparable gasoline or natural gas engines. This means less dependence on foreign fuel supplies and reduced pressure to produce more oil and gas in the U.S.



- **Safety.**

Compared to alternative fuels, diesel fuel is stable, safe and easy to use, requiring no special handling or storage. Unlike diesel, natural gas is associated with a number of safety hazards. Because it is highly flammable, explosions and fires are always a possibility, and it must be stored extremely carefully in order to avoid dangerous leaks or fires.

## A Cost Effective Answer to Clean Air Concerns Now

### Breakthrough Green-Diesel Engineering

International Truck and Engine Corporation, a leading designer and manufacturer of diesel engines for medium-duty trucks, school buses and light trucks, leads in the search for better engines and cleaner air. International believes that with new advancements in diesel engine and after-treatment technology – and with the increasing availability of cleaner diesel fuel – the most powerful, efficient engines can also be the cleanest.

In 2001, the U.S. Environmental Protection Agency certified the clean-air performance of International's Green Diesel Technology® engine as able to meet standards established for 2007 for the reduction of particulate and hydrocarbon emissions. In 2001-2003, International delivered over 130 school buses with these engines to customers in California and Arizona.

International's Green Diesel Technology combines our advanced low-emitting, high performance truck and bus engines with a catalyzed diesel particulate filter and ultra-low-sulfur diesel fuel to yield impressive results: a 95 percent reduction in particulate and hydrocarbon emissions. Progress is also under way to further cut levels of nitrogen oxides – with levels expected to be reduced by 99 percent in 2010, from the levels 30 years earlier.

Enabling low-emitting diesel engineering and particulate filter technology is the new availability of diesel fuel with reduced sulfur content.

### State Officials Can Rely on Green Diesel Technology

Green Diesel Technology is a proven option for state officials as they plan future public and school transportation.

Under federal rules for heavy-duty diesel vehicles proposed for 2007, ultra-low-sulfur diesel fuel (below 15 parts per million sulfur content) will soon become widely available.

As the first entry of 2007-level technology in the marketplace, International is delivering low-emission Green Diesel Technology school buses.

International is working with customers and officials in various states to find clean-air solutions, including emissions-reduction retrofit of qualifying bus and truck engines.

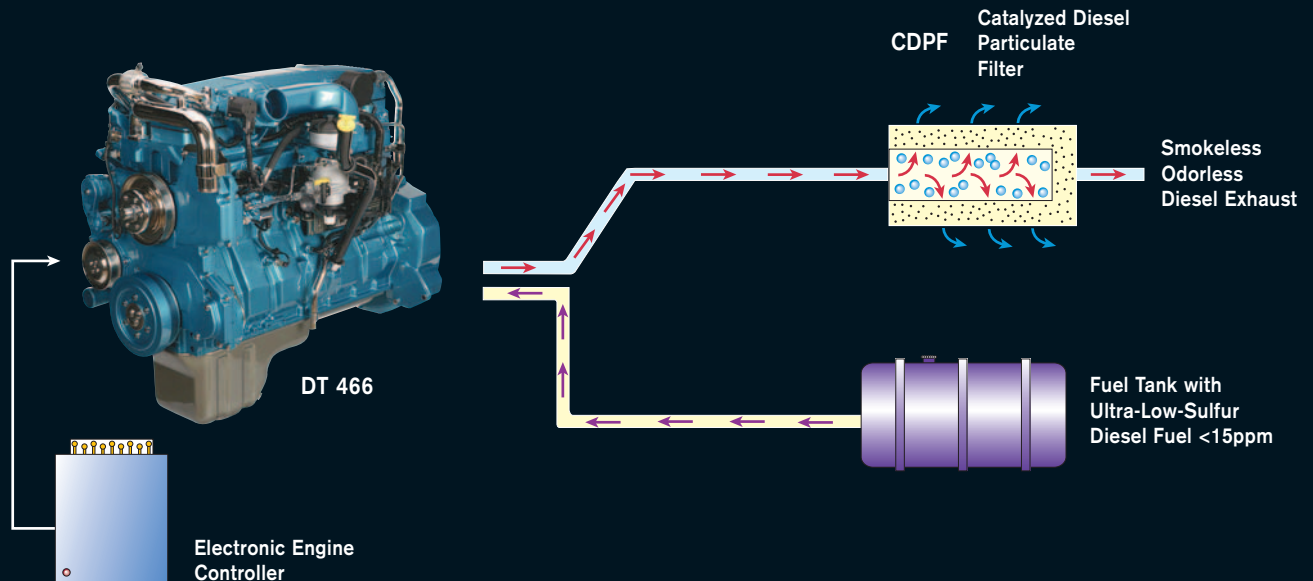
### What Happens Tomorrow?

International Truck and Engine Corporation will continue its commitment to lead in engine design and development, to meet customers' requirements and the public interest in a clean environment.

Starting today, Green Diesel Technology vehicles can help owners and operators of school buses and trucks enjoy reliable, fuel-efficient diesel performance – at near-zero emission levels.



# Low-Emitting Diesel Technology Using Ultra-Low-Sulfur Fuel



## Green Diesel Technology School Bus vs. Natural Gas Buses (certification levels in g/bhp-hr)

|                      | Green Diesel Technology Engine | Natural Gas School Bus Engine |
|----------------------|--------------------------------|-------------------------------|
| PM                   | 0.002                          | 0.011                         |
| NO <sub>x</sub>      | 2.2                            | 1.1                           |
| HC/NMHC              | 0                              | 0.1                           |
| NMHC+NO <sub>x</sub> | 2.2                            | 1.2                           |

### Alternatives at a Glance...

To help the environment, researchers are looking for alternatives to gasoline. Possible options include diesel fuel as well as fuels that are not used widely today. Each alternative fuel has pros (+) and cons (-) that are being researched.

The following chart shows how some alternative fuels compare, including how easy, inexpensive and safe they are to use.

|                                       | Diesel | Methanol | Ethanol | Compressed Natural Gas | Liquified Natural Gas |
|---------------------------------------|--------|----------|---------|------------------------|-----------------------|
| Supply                                | +      | -        | -       | +                      | +                     |
| Ease of distributing fuel             | +      | +        | +       | -                      | -                     |
| Cost to produce                       | +      | +        | -       | +                      | +                     |
| Safety                                | +      | -        | -       | -                      | -                     |
| Available locations & ease of fueling | +      | -        | -       | -                      | -                     |
| Storage of fuel                       | +      | -        | +       | -                      | -                     |
| Power per equivalent gallon           | +      | -        | -       | -                      | -                     |

As you can see from the chart, diesel fuel has many more positive points than other possible fuels.



# INTERNATIONAL<sup>®</sup> ...

## A Commitment and a Legacy of Leadership

This company's long-standing commitment to diesel technology that improves engine performance and helps the environment is a matter of record.

For more than 60 years, International has produced quality engines that meet customer demands, while demonstrating environmental responsibility in meeting – in fact, anticipating – rising public interest in cleaner air.

International has always been a leader in developing new diesel technology that improves engine performance while addressing environmental impact.

## 1985

Here are highlights of the International clean-air record so far:

## 1990

- In 1989, International demonstrated the first smokeless diesel engine – five years ahead of the U.S. Environmental Protection Agency's deadline.

## 1995

- In 1994, International introduced its low-pressure common-rail fuel system technology. This technology was developed to improve emission control, fuel economy and performance.

- In 1996, International became the first diesel engine manufacturer to demonstrate technological paths to meeting federal emission standards set for 2004.

## 2000

- In 1998, the EPA gave International 100 percent approval for its 1999 model engines in meeting emission standards. International was the only U.S. diesel engine manufacturer to receive such approval at the time.

- In 1999, International demonstrated its Green Diesel Technology vehicles to EPA, California regulators and the public: no smoke, no fumes, dramatically lowered emissions. This showed that diesel trucks could meet the 2007 PM emission requirements, almost 8 years ahead of time.

- In 2001, EPA and California regulators certified the clean-air performance of Green Diesel Technology vehicles; International delivered first buses to California schools.

- In 2004, In 2004, International and its engine business partners announced technology path for near-zero emissions in 2007.