



"Fuel economy is everything. For example, the latest Ford Super Duty has a 24 percent fuel efficiency improvement over the previous model. There's no silver bullet. A multitude of factors such as engine, transmission, fuels, tires, aerodynamics (even on tow trucks) and driver education combine to produce fuel efficiency. Future technologies will improve truck chassis materials, making them stronger and lighter for significant vehicle weight reductions. But you must achieve a balance with quality, durability and reliability."

**Todd Kaufman
F-Series Chassis Cab Marketing Manager
Ford Trucks**

FUEL-SAVING TECHNIQUES

How Truck Makers Are Saving You Money

BY BENJAMIN HUNTING

Over the past several years, major truck manufacturers ranging from Ford and UD Trucks to Western Star and Kenworth have been investing significant resources into the research and development of fuel saving technologies. While fuel economy has always been important in the heavy truck industry, rising diesel and gasoline prices and the lingering specter of potential federal regulations concerning commercial truck efficiency requirements have accelerated interest in a wider range of alternative energy sources, truck designs and engine management systems.

For decades now, truck manufacturers have concentrated on making aerodynamic improvements to a vehicle's cab and body as their primary tool for reducing fuel consumption. Given that

manufacturers such as Kenworth have stated that half of the energy of a truck traveling at highway speeds is used simply to move air, this focus comes as no surprise. In recent years, however, a host of additional fuel saving technologies have begun to come to the forefront in the form of engine systems and truck designs that are intended to both help improve fuel economy during around-town driving as well as reduce the need to idle.

Green Technologies

One of the most prominent names to push forward with fuel efficiency enhancement has been Peterbilt through its Green Technologies program. In addition to testing fuel cell systems in partnership with Delphi, Peterbilt has already deployed liquefied

natural gas engines (LNG) across five different models featuring both Westport and Cummins drivetrains. The brand has also moved aggressively into the hybrid truck space with the Eaton Hybrid Electric System, a design that combines battery assistance with a diesel engine in order to provide 320 horsepower and 860 lb-ft of torque. On top of its "traditional" hybrid offering, Peterbilt has developed what it terms "Hydraulic Launch Assist Technology", which is designed to recover braking energy in pressurized hydraulic fluid and then release it on demand in order to improve acceleration, allowing a fuel mileage increase of just under a 30 percent in certain models.

Hybrid Drivetrains

30 percent is a lofty claim in an industry used to fuel economy gains of one to three percent averaged out over an entire fleet, but the diesel/electric hybrid drivetrains now being offered by a range of manufacturers are certainly capable of delivering this impressive level of fuel savings. In fact, Peterbilt is far from the only truck company to have gotten involved in the hybrid medium and heavy-duty truck market. Kenworth, Hino and International Navistar are all prominent names

"We know fleet managers are looking very closely at fuel costs these days. Fuel efficiency is important for our environment, our economy and gives our customers an advantage to their bottom line. In a recent independent SAE-type test, Hino Trucks produced a 19.8 percent advantage in fuel efficiency. The 2011MY Hino Truck model 268 (25,950 lbs. GVW) significantly outperformed a key competitor. Fuel efficiency and reliability are important contributors to the Hino Advantage."

**Glenn Ellis
Vice President of Marketing and Dealer Operations
Hino Trucks**

"Fleet managers are requesting environmentally friendly trucks and because of this manufacturers of truck chassis are searching for ways to be more green, and in doing so, more fuel efficient. Our concern has always been focused on being fuel efficient and environmentally conscious. The UD Trucks' carbon footprint is 7,000 lbs. less than the 2007 EPA emissions standards and after adapting to rigorous US10 emissions standards, our engines are more efficient, offering a fuel cost savings of 3 to 5 percent over previous models. With the rising cost of fuel, fuel efficiency equals savings, which is important along with the safety and reliability of the vehicle."

**Annalee Addesso
Manager, Marketing
UD Trucks**

attached to commercial hybrid trucks, with some boasting years of development time and real-world testing to back up their designs. Mitsubishi Fuso also offers the Canter Eco Hybrid outside of North America, a truck which could make its way into the hands of United States operators within a few years time.

PTO Function

Fuel savings from operating a diesel hybrid rig are generally within the 20 to 30 percent range for wrecker applications, with no loss of power or utility when compared to a traditional diesel drivetrain. Most of these systems are only in effect at speeds of 30 miles per hour or less, and some incorporate the ability to charge their electric batteries via regenerative braking. Truck makers have also begun to branch out and extend the fuel saving advantages of a hybrid battery pack to PTO use – allowing for idle reduction – with the emphasis being on the number of hours a truck's auxiliary equipment can be operated with the diesel engine shut down. Kenworth's PACCAR PX-6 engines in Class 6 and Class 7 trucks, for example, can be paired with a battery-powered motor developed with Eaton that features an electric PTO. International Navistar, which offers a

unique four-wheel drive hybrid system suitable for more challenging tow situations, claims up to 60 percent fuel savings when the truck's hybrid battery is used to power its auxiliary equipment.

"Fuel costs are important in any business which utilizes even one vehicle. As fuel prices hover near record levels, efficiency is paramount to the competitiveness and profit of a business. Our new models feature the new 4P10 three-liter, in-line, four cylinder diesel engine with compound turbocharging. The engine utilizes our BlueTec R emissions reduction system and is mated to our all-new DUONIC TM automated manual transmission. Each system contributes to enhanced fuel economy for MFTA's 2012 Canter commercial trucks."

**Leighton Good
Manager, Product and Applications
Mitsubishi Fuso Truck of America Inc.**

Less Expensive, Still Effective

While hybrid drivetrains are among the most advanced fuel saving measures currently being adopted by commercial truck builders, they do not represent the sum total of the push for greater economy out on the road. Less expensive but still effective technological advancements such as improvements to low rolling resistance tires, and in some cases, the replacement of double tires with wide-base single units, can provide fuel mileage increases of as much as 3.5 percent.

"We recognize that fuel costs have a huge impact on the bottom line. Engine efficiency and operator driving habits are the two major factors for recovery vehicles, since they offer very little in aerodynamics. Our models feature efficient SCR technology from Cummins and Detroit Diesel resulting in better fuel economy, reduced cooling system loads and extended oil drain intervals. Detroit Diesel's BlueTec system delivers up to five percent better fuel economy over similar EPA 2007 engines."

**Guy Lemieux
Marketing Segment Manager
Western Star Trucks**

More extensive use of lightweight materials in truck construction, as well as transmission advances like the ECO mode offered by the Duonic dual clutch gearbox found in the Mitsubishi Fuso and diesel engine redesigns from Ford for the current model year also count fuel savings as their primary advantage.

Even environmental regulations have had an effect on fuel economy. UD Trucks Annalee Addesso says that the challenge of meeting the US10 emissions standard brought with it a between four and a half and five percent fuel mileage improvement through the implementation of SCR urea technology. Hino, Detroit Diesel and Mitsubishi also claim that their SCR technology offers between three and five percent fuel savings.

Consumer Demand

Fuel-saving technologies have moved aggressively to the forefront in the medium- and heavy-truck industry, with manufacturers increasingly touting the efficiency of their vehicles as a primary selling point. The trend to develop ever more frugal, fuel-sipping engine designs, as well as those that use alternative power sources will continue to expand as this type of tech becomes less expensive. Perhaps more importantly, commercial truck companies have now turned their eye towards ensuring that every vehicle they produce offers an ultra-efficient system of components that provides maximum fuel savings in all operating conditions and modes. By approaching each truck design as a whole, major brands are able to squeeze as much use out of a gallon of fuel as possible, regardless of whether the vehicle is rolling down the highway, crawling through city traffic or parked while recovering an automobile from a wreck.