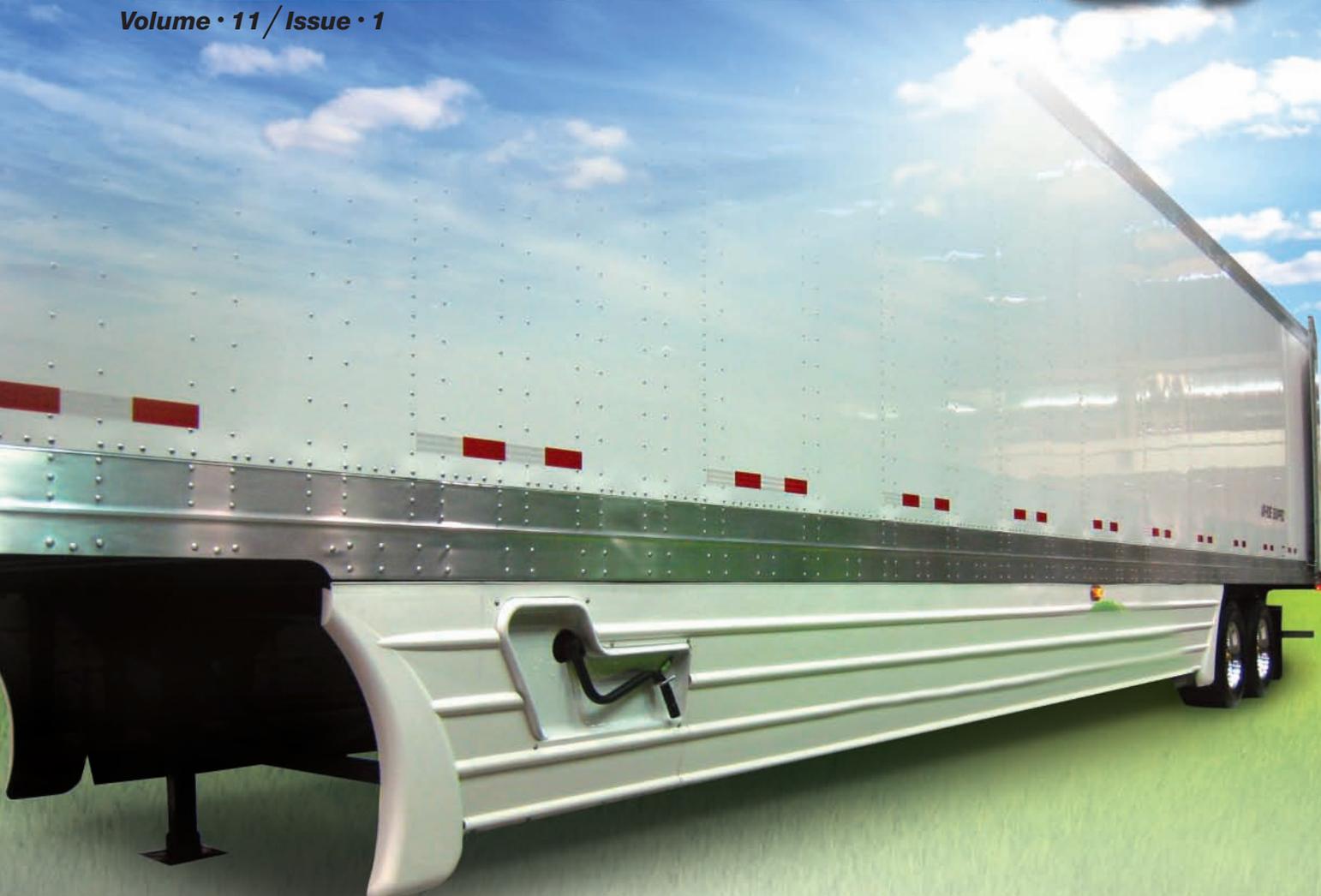


Evolving Trailer Technology

Volume • 11 / Issue • 1



No Fear of Commitment

Fleets Test, Deploy Fuel Saving Technologies

Highs and Lows

Lower Tire Rolling Resistance Raises Fuel Efficiency, Cuts Costs

Raising the Bar, Reducing Emissions

Landmark California Plan to Increase
Use of Fuel Saving, Aerodynamic Options



Great Dane Trailers

CALENDAR

April

April 16–18
ExpoCam
Place Bonaventure,
Montreal, Quebec
Canada

April 29 – May 3
Truck Trailer Manufacturers
Association (TTMA)
Marriott Star Pass Resort,
Tuscon, AZ

May

May 3 - 5
National Private Truck Council
Annual Conference and
Exhibition (NPTC)
Nashville Convention Center,
Nashville, TN
Booth #729

June

June 12 – 13
The Atlantic Truck Show
Moncton Coliseum,
Moncton, New Brunswick
Canada

June 21-24
Georgia Motor Trucking
Association Annual Convention
Hilton Head Marriott,
Hilton Head Island, SC

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- Trends in trucking technology



Going Green to Save Green Adds Up to Smart Choice

Dear Customer,

Improving your bottom line while improving the environment is becoming of increasing concern, and at Great Dane Trailers, we can help you go green and save green. Adding components that improve fuel efficiency is just one way to reduce your environmental impact while also reducing your expenses.

These aerodynamic improvements we offer come in addition to the proven quality of our products, which our knowledgeable Engineering and R&D departments continue to enhance. In this issue of *Evolving Trailer Technology*, our engineers share what to expect from Super LT design enhancements, as well as how new CARB laws will affect customers and the fuel performance that can be achieved with low rolling resistance tires.

Our customers rely on Great Dane's reputation to ensure their business can deliver. For instance, a full-service leasing company in the Midwest counts on our vans, reefers and flatbeds to get the job done, while also exploring new technologies and fuel-efficient options through EPA SmartWay compliance. A family-owned Canadian leasing company depends on the durability of Great Dane's patented SSL construction to meet its high standards in quality, reliability and service. With corrosion-resistant and energy-efficient options, Great Dane helps get the job done.

Whatever the operation or the need, Great Dane is committed to helping you get the greatest value for the money you invest with us. From environmentally-friendly components to low-maintenance products, choosing a Great Dane trailer adds up to the smart choice for driving your business forward.

Regards,

Jim Pines



freeze your green, STAY IN THE BLACK



THERMOGUARD
FROM GREAT DANE



Profit from less maintenance downtime and extended insulation performance with ThermoGuard, Great Dane's exclusive, revolutionary glass-reinforced thermoplastic reefer interior liner. It adds years to the useful life of the trailer by helping maintain thermal efficiency as it ages, and reduces cooling unit run time for greater fuel efficiency. Better for your bottom line and better for the environment, our innovative ThermoGuard boils down to the cool choice for sustaining a solid operation.



Great Dane

For more about how *freezing green* can *save you green*, visit us online at www.greatdanetrailers.com/freezegreen

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Award-Winning Canadian Company Seeks Fuel Savings by Going Green

New Level of Commitment

*Fleets Willing to Test,
Deploy New Fuel
Saving Technologies*



Diesel fuel prices continue to fall and remain below the record high levels of one year ago. By early February, according to the U.S. Department of Energy, on-highway fuel prices continued a 30-week downward trend, leaving them at the lowest level in nearly four years.

While that's good news for the trucking industry, the even better news for the environment is that the industry's manufacturers and suppliers have hardly stopped developing more fuel-efficient technologies. Now and in the future, these aerodynamic trailer designs and options for smoothing airflow will pay off regardless of the lows or highs of fuel prices. These aero components are becoming more readily available, including several items offered on Great Dane trailers.

Those technologies are included in specifications for U.S. EPA Certified SmartWay trailers. Based on performance goals developed by the agency and companies like Great Dane, SmartWay trailers are equipped with side skirts, weight-saving technologies, front gap reducers or trailer tails, and low-rolling resistance tires (wide-base single or duals) mounted on optional aluminum wheels.

On another front, industry suppliers are moving ahead with development and testing of fuel saving alternatives for heavy-duty trucks. In February, Great

Dane customer Wal-Mart Stores, Inc. announced it would begin testing new types of heavy-duty hybrids and alternative fuels.

The new trucks undergoing evaluation at Wal-Mart include a Meritor dual-mode diesel-electric hybrid drivetrain, developed in collaboration with Navistar and Cummins that will initially operate in the Detroit area. Believed to be the first vehicle of its type, the system combines mechanical and electrical propulsion. A key differentiator of this system is its ability for zero-emissions over a wide range of driving conditions, allowing operation in places where emissions are restricted, such as ports or urban areas.

Wal-Mart's plans also include testing Peterbilt Model 386 heavy-duty trucks with diesel-electric hybrid power systems developed by Eaton Corporation and PACCAR, that will be based in Dallas, Houston, Apple Valley, California, Atlanta and the Washington/Baltimore regions. Additionally, other Peterbilts and one yard truck will be operated on liquid natural gas in a Southern California distribution center as part of a partnership with the Mojave Air Quality Management District.

Other Wal-Mart initiatives will include 15 trucks in a distribution center near Phoenix that will be converted to run on Reclaimed Grease Fuel, made with the

waste cooking grease from its stores, and operating trucks on an 80/20 blend of biodiesel made of reclaimed yellow waste grease.

Wal-Mart, which operates nearly 7,200 heavy-duty trucks in North America, has committed to doubling its fleet efficiency by 2015. That type of effort will undoubtedly become even more important for many Great Dane customers in the U.S. Fuel cost decreases, while good news for an industry that includes more than 2.7 million Class 8 vehicles that travel roughly 130 billion miles and consume nearly 53 billion gallons of fuel annually, are most likely only temporary.

At the same time, new environmental legislation already enacted in places like California and quite likely in other regions of the country, will continue to impact operations. The need for ongoing development by manufacturers of all types of fuel-saving technologies for commercial trailers and trucks may be greater today than ever before.

While that's good news as well, even better news is that a growing number of fleets are willing to rise to a new level of commitment, and to work cooperatively with manufacturers to meet this ongoing industry challenge. 

Raising the Bar, Reducing Emissions

*California's Landmark Plan to Increase Use of
Fuel Saving, Aerodynamic Options*

Three years after it became law in California, a plan to reduce the state's greenhouse gas emissions to 1990 levels by the year 2020 was approved in early December 2008 by the Air Resources Board (ARB), a department of the California Environmental Protection Agency. The "Scoping Plan," a central requirement of AB 32, the Global Warming Solutions Act of 2006, includes regulations that could become law in the 3rd quarter of 2009 and will impact California-based fleets, as well as out-of-state registered vehicles that travel to and from the state.

For Great Dane customers, there are compliance requirements for new and existing 53-ft and longer dry freight vans and refrigerated trailers. Exempted from the regulations are drop frame and curtain-sided vans, as well as container chassis. Also not required to comply are short haul trailers, which ARB defines as vehicles that operate within 100 miles of a base or any trailer pulled by a short haul tractor (also a vehicle that operates within a 100 mile radius of its local haul base or travels no more than 50,000 annual miles).

Motor carriers, owners, drivers and California-based businesses that ship or receive freight in 53-ft or longer box-type trailers have responsibilities under the AB 32 plan. Much of the focus on compliance is on shippers and receivers based in the state, with plans to enforce the regulations centered on loading facilities. Roadside inspections are also planned, and in both

cases drivers will be required to ensure their vehicles comply with the new rules and must be prepared to present required documentation to enforcement personnel.

Compliance schedules for trailers have been set by ARB. Beginning January 1, 2010, new 2011 model year dry freight vans must be SmartWay certified or retrofitted to meet SmartWay specifications. Pre-2011 model year trailers must be retrofitted by January 1, 2013 or follow an optional phase-in compliance schedule. SmartWay approved technologies for trailers include aerodynamic devices and low-rolling resistance tires.

Dry freight trailer compliance follows a schedule based on fleet size. For operations with 20 or fewer trailers, 25 percent of the fleet must be in compliance by December 31, 2013; 50 percent by December 31, 2014; 75 percent by December 31, 2015; and 100 percent by December 31, 2016. Companies with 21 or more trailers must have 5 percent of their fleet in compliance on December 31, 2010; 15 percent on December 31, 2011; 30 percent on December 31, 2012; 50 percent on December 31, 2013; 75 percent on December 31, 2014; and 100 percent on December 31, 2015.

Refrigerated trailer compliance under AB 32 for existing 53 ft or longer units takes place over three years. By December 31, 2017, 2003 and 2004 model year trailers must comply with the regulations. For 2005 and 2006 models, the deadline is December 31,

2018, and for 2007 and 2008 units compliance is required by December 31, 2019.

AB 32 also follows on the heels of the 2004 Transport Refrigeration Unit (TRU) Airborne Toxic Control Measure (ATCM) adopted by ARB. That measure, aimed at reducing emissions from refrigeration units, forces operators of refrigerated trailers to adopt new technology at seven-year intervals. Beginning on July 17, 2009, model year 2001 and older transport refrigeration units must meet new performance standards. 2002 engines must comply by the end of 2009, and the pattern continues for subsequent model years, with mandatory compliance by the end of the seventh year after each engine model year.

Components on the EPA SmartWay trailer specifications list have been identified by the agency—with the help of leading manufacturers like Great Dane—as having the potential to help reduce fuel consumption and cut harmful emissions. ARB estimates that trailers in compliance with AB 32 will realize an improvement in fuel economy of 6.5 percent. Adding a SmartWay-certified tractor to the combination boosts estimated fuel savings to a range of 8 percent to 11 percent. Using benchmark figures of 1,100 gallons per year at 6 MPG and \$4 per gallon, 100,000 miles of operation and a total installed cost of \$7,000 to \$9,000, ARB estimates a return on investment for fleets of less than two years. 



Ups and Downs

How Lower Tire Rolling Resistance Raises Vehicle Fuel Efficiency, Cuts Costs

For most fleets, fuel represents the number one non-salary cost, followed in most cases by tires. Compounding the fuel cost equation as well is that tires also greatly impact vehicle fuel efficiency.

Today, most manufacturers offer tires with fuel-efficient tread compounds. How tires fit into the overall fuel economy picture has a lot to do with understanding rolling resistance.

Tire rolling resistance is the amount of drag created by tires as the vehicle runs down the highway. In other words, rolling resistance is the amount of force necessary to make a tire roll. Part of rolling resistance comes from the flexing and un-flexing of the tire as it rolls into and out of contact with the pavement.

The actual amount of tire rolling resistance is influenced by many factors, including tread pattern, and tread depth, and tire design and construction. About 35 to 50 percent of tire rolling resistance is the result of tread design and tread compounding.

In general, Bridgestone tests show, as a tread wears the fuel efficiency of a tire usually increases. Tires with less original tread depth tend to be more fuel efficient when new. As tread is worn, however, the efficiency of a tire improves because its rolling resistance and weight decreases.

Tread compounds, especially those incorporating silica, or using special formulas that combine natural and synthetic rubber, can reduce tire rolling resistance significantly. In some cases, a two-layer tread can be used. The cap compound, which is nearest the road, is chosen for high resistance to abrasion, long tread life and high traction. Since compounds with these characteristics tend to generate more heat, a base layer with a cooler-running compound is used, and lower overall tire temperature also means lower rolling resistance and better fuel economy.

Casings (including belts) contribute about 50 to 65 percent of tire rolling resistance. Bridgestone uses computer simulations to create new casing designs and shapes that minimize rolling resistance.

Tractor and trailer configuration also affects the contribution of tire rolling resistance to fuel economy. Bridgestone tests show trailer tires contribute more than drive tires to fuel economy. With a tandem drive axle tractor pulling a single trailer, for example, about 43 percent of tire fuel economy was attributable to trailer tires, and about 57 percent to tractor tires. When a tractor with a single drive axle was pulling two pups, the trailer tires accounted for 64 percent of the fuel economy effect, with the tractor tires contributing 36 percent.

Tire rolling resistance is just one of several factors in truck fuel consumption, and is often overshadowed by the combined effects of air resistance, frictional losses in the engine and drivetrain, and other factors.

Nevertheless, low rolling resistance, fuel-efficient tires are relatively easy to substitute for regular tires. For that reason, many Great Dane customers wisely use them to help improve fuel efficiency and lower their number one operating cost. 

Brown NationaLease

Great Dane Offers Full-Service Lease Customers Total Package in Products, Eco-Friendly Options

CASE STUDY



"In all of our trailer purchases we try to focus on having minimal maintenance exposure and the lowest possible costs to pass on to our customers."

*Ralph Dove, Vice President,
Marketing at Brown NationaLease*

"Great Dane does everything very well," says Ralph Dove, Vice President, Marketing at Brown NationaLease. "The excellent relationship we've had with the company and our dealer for many years is why Great Dane is our predominant trailer supplier."

About half of the Great Danes in the Brown fleet are multi-temp Classic reefer models, specified to meet the needs of food service distributors. Included in the trailer specifications for flexibility in delivery operations, notes Dove, are two or three compartments, two side doors, and two rows of logistic track and walk ramps. For durability, he adds, the company specifies sidewall posts on 12-inch centers and heavy-duty flat floors. Hendrickson air suspensions are standard and while Thermo King continues to supply refrigeration units, the company is also buying new Carrier Vector models as well.

Brown's newest Great Dane Classic dry freight vans feature shallow logistic posts with Great Dane's patented SSL lining, and Great Dane's exclusive PunctureGuard .200" front wall lining. Standard specifications on the latest dry freight models include Meritor PSI Tire Inflation Systems and a Grote Long Life Light System. The fleet also includes a group of 30 P-Series dry vans with Havco composite floors that were purchased for a customer a few years ago.

"Last year," Dove relates, "we started buying some EPA SmartWay compliant dry vans for specific customers. The units have Laydon Composites trailer side fairings and Michelin X-One wide-base single tires on aluminum wheels. Those customers were very interested in saving fuel, and with Great Dane's vast number of offerings and capabilities we were able to help meet that need." Rounding out the roster of Great Danes in the Brown

NationaLease fleet are a group of 100 FREEDOM platform models, also purchased to meet the needs of a particular customer.

"In all of our trailer purchases we try to focus on having minimal maintenance exposure and the lowest possible costs to pass on to our customers," Dove states. "The integrity of Great Dane products and the company's competitive parts pricing helps us achieve that goal."

Great Dane – and especially the fleet's dealer for 20 years, Bruce Reis at Jim Hawk Truck Trailers in Des Moines – Dove concludes, has been the reason that Brown NationaLease has had such a long history with the manufacturer. "Great Dane has always been very responsive and supportive," he says. "We have no complaints because they always make it right."



Making a Responsible Choice

EPA SmartWay Spec Helps Boost Energy Efficiency



SmartWay Transport, an innovative collaboration between the U.S. Environmental Protection Agency and the freight transportation industry, is designed to improve energy efficiency, reduce greenhouse gas and air pollutant emissions, and improve energy security. Motor carrier customers of Great Dane that participate in SmartWay programs save money, reduce fuel consumption and are recognized for their social responsibility and leadership.

One way they accomplish that is by purchasing U.S. EPA Certified SmartWay trailers. Based on performance specifications developed by the agency and companies like Great Dane, the trailers are equipped with side skirts, weight-saving technologies, front gap reducers or trailer tails, and in many cases low-rolling resistance tires (wide-base single or duals) mounted on optional aluminum wheels. Tires approved by EPA as meeting SmartWay trailer specifications and offered by Great Dane include Bridgestone R-195F duals, as well as Bridgestone Greatec wide base singles, Continental HTL, Goodyear G316 LHT Fuel Max and Michelin XTA Energy, XT1 and X-One XTA models.




Laydon Composites Trailer Skirts™

LCL

*Trailer Fairings Help
Provide Smoother
Ride, Better
Fuel Economy*



All vehicles, and especially trailers, encounter air from different angles. These yaw angle winds hit the landing gear, crossmembers and rear axles, robbing the vehicle of horsepower. Designed to redirect the air down the side of a trailer and reduce the amount of energy required to move it down the road are Laydon Composites trailer fairings offered by Great Dane.

Laydon Composites trailer fairings reduce the fuel-robbing drag on trailers. In computer simulations by the company (at 62 MPH), fuel savings of 6.5 percent were indicated. Other data confirms these findings. Testing at the Automotive Research Center produced results reaching 6 percent, evaluations with the U.S. Environmental Protection Agency showed 4 percent to 5 percent fuel savings, tests at the National Research Council of Canada showed results reaching 6 percent, and road testing at Goodyear produced fuel savings of 6.89 percent.

Designed to improve aerodynamics, the modular Laydon Composites fairing system is designed to fit 28-, 40-, and 48- and 53-foot trailers. An EPA SmartWay compliant specification in a six-panel configuration, the coverage provided by the fairings can be expanded to seven, eight or nine panels. With the addition of a flexible, tough, five-inch rubber edge option fuel savings are even greater. The eight panel system,

with rubber bottom, qualifies as a stand alone device for the CARB AB32 requirement. A front of trailer device and rear of trailer are not required.

Laydon's multiple panel trailer side fairing design allows for easy replacement if a panel becomes damaged, and may minimize the number of components required. Installation using stainless steel fasteners does not require any drilling or welding of the trailer. A special crank handle insert covers the landing gear.

The panels in Laydon Composites' trailer fairing system are made of a maintenance-free lightweight, injection molded, impact resistant thermoplastic material that is resilient to freezing and hot temperatures ranging from -60 to 190 degrees F. Able to be painted or decaled, the fairings are offered in several available colors, which are consistent throughout the panel thickness. All components are also recyclable, and have a value at the end of life as scrap plastic.

Along with documented fuel savings, Laydon Composites trailer fairings can improve vehicle stability and handling, especially in cross winds, as well as enhance safety by reducing road spray. The fairings can be ordered through Great Dane for new vehicles and may be installed by dealers on existing units. 





Grote MicroNova LED Lamps

*Smaller, Brighter Clearance/Marker
Provides 40 Percent More Light Output*

A new standard on Great Dane Classic and Super LT reefers, the line of MicroNova LED clearance marker lamps from Grote Industries is meeting the highly specific design requirements for restricted trailer top rail mounting areas. Producing as much as 40 percent more light than single lamps, the MicroNova LEDs are also helping improve conspicuity on the road.

Designed to fit in the narrow top rail of Great Dane trailers while maintaining a low half-inch profile, the Grote MicroNova lamps require only a three-quarter inch mounting hole. The low profile, highly aerodynamic design also makes the lamps less susceptible to damage.

Featuring low amperage draw LED technology—so voltage drop is no longer an issue — Grote MicroNova lamps are designed with field hardened, fully potted circuit boards, polycarbonate bases and lens, and a hermetic lens-to-housing seal for exceptional protection against vibration and corrosion. The lamps are also hard-wired with cable seals, and have .180 bullet connections to assure moisture tight installation.

Grote's complete line of miniature MicroNova LED clearance/marker lamps are available with snap in grommet or screw mount options. Grommet mount versions have no exposed fasteners.

MicroNova lamps are offered in P2, PC and Bar Lamps, and with optional chrome bezels as well as in red, amber and clear lenses. Bar Lamps feature replaceable sealed lights set in a rugged, reinforced polycarbonate bar.

Grote Industries, a major supplier to Great Dane, offers a complete line of LED and incandescent lamps, mirrors, obstacle detection systems and reflective accessories to the trucking industry. The company is headquartered in Madison, Indiana and has other manufacturing plants in Toronto and Waterloo, Ontario, Canada, as well as in Monterrey, Mexico. 

Grote
The first name in
vehicle safety systems®

CASE STUDY

riska Transportation

Leading Canadian Truckload Carrier Looks to Great Dane for Durability, Fuel-Efficient Options



also feature a Grote Long Life Light System with LED exterior lamps and MicroNova rear header lights. The fleet's specs also call for Hendrickson unitized wheel hubs.

Prior to being placed in service at Kriska, the newest SSL dry freight vans were fitted by Glasvan Great Dane with side skirts supplied by Transtex Composite, a Montreal-based company. "We wanted to adopt technology that could help improve our fuel efficiency and enhance environmental protection," Seymour relates. "We researched side skirts that have been tested in the market over the last few years and in the Transtex MFS side skirts we found a product that produced documented fuel savings."

Fuel economy, along with improving vehicle utilization, was also on Kriska's agenda when the company opted to specify pintle hooks on its latest SSL dry freight vans. "We want to be prepared to field Long Combination Vehicles if the law is passed in Ontario allowing the operation of double 53-ft van trailers," Seymour explains. "The government is planning a pilot project this spring so it made sense to add pintle hooks on our latest SSL dry vans."

All of the Great Dane trailers in the Kriska fleet are kept in top operating condition by the company's full-service maintenance department, which employs more than 20 mechanics and shop personnel. Glasvan Great Dane also handles some repairs for the carrier and supplies parts to the operation.

"Glasvan provides us with more than just new trailers, repair services and parts," Seymour adds. "The dealership is also an active participant in our program to dispose of used trailers. While we are growing consistently and adding to our fleet, we still need to remove older trailers from service with every new purchase."

Kriska Transportation is highly rated by its customers for its quality, dependable temperature controlled dry van and

refrigerated truckload services, as well as its logistics and warehousing offerings. The company has also been recognized as one of "Canada's 50 Best Managed Companies" for the past eight years, is a three-time winner of the Truckload Carrier Association's Fleet Safety award, and a five-time winner of the "Shippers Choice Award."

"It's all about relationships," Seymour concludes. "We like to say, 'The Difference Is In Our People,' when it comes to meeting our customers' transportation needs. At the same time, we count on our relationships with suppliers and dealers like Great Dane and Glasvan and continue to do business with them because at the end of the day we know we can trust them to do what's best for us."



"We've been operating Great Dane trailers for 20 years," says Mark Seymour, president and CEO of Kriska Transportation. "That experience has taught us how a strong product matched with excellent manufacturer and dealer relationships is important to our continued success."

"The SSL dry freight van has all the attributes we're looking for in a trailer for our operation," Seymour states. "It provides the carrying capacity and inside width we need, as well as logistics capabilities. We also specified these trailers with a HAVCO Composite Floor for weight savings. Perhaps most importantly, because food hauling is a big part of our business, the SSL's steel interior lining helps maintain cargo integrity and eliminate forklift damage."

The single-sided laminate in the SSL, a Great Dane exclusive, consists of a layer of .019-inch steel over a rigid core. The steel layer wraps the edges of the core to create an anti-sag surface while the rigid core bonded to the steel ply assures the interior will not wrinkle or easily crumple from forklift impact. The puncture strength of the SSL lining is nearly six times greater than .25-inch domestic plywood and over four times greater than MDPE plastic.

The new SSL dry freight vans in the Kriska fleet are also specified for long term durability. Included are galvanized steel rear door frames and impact guards, roof bows and scuff bands. The trailers

A privately held, second generation corporation, Kriska Transportation began operating in 1978. From its base in Prescott, Ontario – within minutes of two bridges linking Canada and the U.S. – and from terminals in Mississauga and Ottawa, Ontario and Montreal, Quebec, the company specializes in truckload dry and refrigerated freight hauling. Kriska also recently purchased the van division of BMD Transportation, a carrier in Lansdowne, Ontario, and also owns and operates a wholly owned subsidiary, Lavigne Trucks Lines.

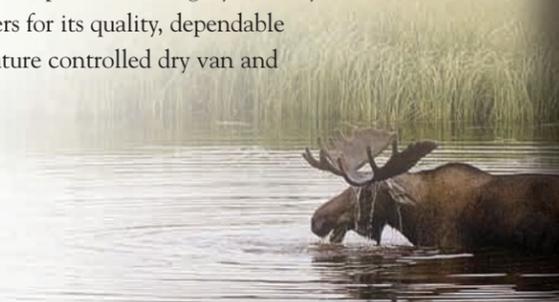
Kriska fields about 350 SSL dry freight vans and Super Seal reefers. Its exclusive dealer is Glasvan Great Dane, which has supplied the carrier with 50 to 60 new trailers annually for the last three years, including 40 SSL models and 20 Super Seals this year.

Composite Floors



The HAVCO Composite Floor, an alternative to traditional hardwood that is available on Great Dane trailers, is based on conventional laminated oak flooring. Each floorboard in a HAVCO Composite Floor is reinforced on the underside by adhesively bonding a continuous panel of Glass/Fiber-Reinforced Epoxy. The continuous panel protects the wood and blocks moisture intrusion by preventing water from road spray from entering the trailer through the floorboards.

HAVCO Composite Floor panels, which are several times stronger and stiffer than wood, save weight by allowing for use of a thinner layer of wood. The floor is available in 1-1/16-inch, 1-1/8-inch, and 1-3/16-inch up to 1-3/8-inch thicknesses. A 1-1/16-inch floor saves about 228 lbs in a trailer compared to 1-5/16-inch conventional laminated hardwood flooring. A 1-3/16-inch floor can save about 323 lbs compared to 1-1/2-inch conventional laminated oak flooring.



Where the Rubber Meets the Road

Bridgestone Firestone North American Tire, LLC Explains the Major Components of Today's Trailer Tires



What goes into the tires on Great Dane trailers? How is a modern day tire made? While they may seem simple, trailer tires are one of the most complex engineered products in the world.

Not surprisingly, first among the materials that make up a tire is rubber. By weight, roughly 40 percent of a tire is constructed of rubber, about three-quarters of which is natural and one-quarter synthetic.

Natural rubber is used because it lasts a long time and tends to run cool, an important component in treads and other parts of the tire that must flex. Synthetic rubber is used because it can be engineered with particular performance characteristics, such as cut resistance that is a valuable attribute in treads and sidewalls. Synthetic rubber can also be specially formulated for irregular wear resistance and for excellent wet traction.

Another major tire ingredient is carbon black. This very finely powdered pure carbon makes up about 30 percent of a tire's weight. Used as filler, carbon black adds enormous strength to rubber, and makes it much more abrasion-resistant and slower-to-wear process. Carbon black

also helps protect rubber against ultraviolet (UV) light from the sun, which causes rubber molecules to break down and become brittle, a process that can make tires wear faster.

Used in the beads, belts and body, about 20 percent of a tire by weight is steel. The steel cord acts like the frame of a building with different types and diameters of steel wire and different cable engineered for specific purposes. Some steel cords consist of a large number of strands wound together, like the cables that support suspension bridges. There is also a special coating on each individual strand to help it bond to the rubber tightly during processing.

Most of the other 10 percent of a tire's weight comes from a number of ingredients, including:

- Sulfur, used during curing to connect different rubber molecules together, adds strength and gives the rubber resistance to both heat and cold.
- Zinc stearate and waxes are used in small amounts to help control cure

rates, prevent oxidation and make rubber easier to process.

- Accelerators are used to control the cure rate, so different types of rubber can cure fully in the same amount of time.
- Antioxidants and antiozonants are added to rubber to fight degradation by oxygen and ozone, which can shorten the life of tires. Oxygen, like UV light, can break down rubber molecules, making rubber brittle, causing cracks and rapid wear. Ozone, a special type of oxygen molecule, is especially hard on tires.

Are there other things in a tire recipe? Lots of them, according to Bridgestone Firestone, including some that are top secret. All are there for special reasons, however, making the modern trailer tire a long way from just being a mixture of rubber that meets the road. 🚛

BRIDGESTONE



Less is More



Experience fuel savings that's better for your bottom line and the environment with the help of Great Dane, a key member of the EPA's SmartWay Transport Partnership. Now customers committed to measuring and improving the efficiency of their freight operations can adopt a range of trailer systems and components with the EPA SmartWay spec that can help significantly reduce fuel consumption.



Advantages of the EPA SmartWay Spec (Options below available on 53-foot or longer dry freight vans)

- **Aerodynamic Trailer Side Skirts:** Smooth air flow and reduce cross-flow along and below the side edges of the trailer. Side skirts provide a fuel savings of at least 4 percent, for applications based upon testing.
- **Front and/or Rear Mount Gap Fairing:** Smooths air flow around exposed top and side edges of the trailer and reduces tractor-trailer gap. For applications based upon testing, these provide at least a 1 percent fuel savings.
- **Aluminum Wheels:** Add to weight savings and contribute to fuel economy.
- **Lightweight Materials:** New trailers can achieve greater weight savings by using aluminum, composite, and/or other lightweight components.
- **Low-Rolling Resistance Tires:** Duals or singles mounted on aluminum wheels provide a 3 percent fuel economy benefit, relative to mid-range rolling resistance tires as defined by EPA. Certain manufacturers and tire models qualify.

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going green IS BLACK AND WHITE



Choosing to equip trailers with aerodynamic and lightweight options to achieve greater fuel efficiency is clear. It's better for your bottom line and better for the environment. But the benefits go beyond the numbers. A Great Dane trailer engineered by years of expertise and backed by service after the sale adds up to the smart choice for driving your business forward.



Great Dane

For more about how **going green** can **save you green**, visit us online at www.greatdanetrailers.com/goinggreen

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