

# News & Updates

FEBRUARY 2004

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SPECIAL FULL COLOR ISSUE !

## Gaughan, JASPER & Kodak Team Up for Penske-Jasper Racing in 2004

Officials from Eastman Kodak Company and Penske-Jasper Racing announced an agreement that will put rising racing star Brendan Gaughan behind the wheel of the #77 Dodge for the 2004 NASCAR Nextel Cup Series.

The multi-year agreement calls for



*The #77 JASPER Dodge will show this paint scheme for four races this season.*

Penske-Jasper Racing to field a team in 2004 for Gaughan, 28, from Las Vegas, Nevada who made his mark in NASCAR's Winston West and Craftsman Truck Series in recent years. Kodak will be the primary sponsor of the #77 Dodge with Jasper Engines & Transmissions (the primary sponsor for the past 13 seasons) participating as a major associate sponsor. The team's investors are Penske Racing South, the owner of the #12 Alltel Dodge of young charger Ryan Newman and the #2 Miller Lite Dodge of veteran and 1989 Series Champion Rusty Wallace, and long time Penske business associate,



*Kodak will be the primary sponsor of the #77 Dodge.*

Jasper Engine and Transmission Exchange, Inc. The new team will compete under the Penske-Jasper Racing banner, with company president Doug Bawel of Jasper Engine and Transmission Exchange, Inc. serving as principal.

Penske Racing South General Manager, John Erickson, will oversee the day to day operations of the team.

Jasper Engines & Transmissions will be identified as the primary sponsor in four races each year. In addition to its sponsorship, JASPER will provide engineering support and power train development to the #77 Dodge.

The #77 Dodge will be co-owned by Jasper Engine and Transmission Exchange, a long time Penske business partner, and will have the benefits of its relationship with Penske's other Nextel Cup teams, the #2 Miller Lite Dodge, driven by Rusty Wallace, and the #12 Alltel Dodge, driven by Ryan Newman.

"Having the opportunity to partner with Kodak brings a tremendous amount of credibility to our

*(continued on page 5)*

## Martinsburg Service Center

Martinsburg Service Center, located in West Virginia's eastern region, opened for business in March of 1994 by Rick and Susan Cole. Their dream was to create a complete car and truck center that would provide consistent, high-quality work.

Rick says the business started literally on a prayer and \$5,000 when they took over a three-bay garage from a previous owner. "He wanted to retire and I always wanted my own business, just never made the leap of faith. I was finally forced to and it was the best thing that ever happened to me."

Rick's brother Robert Cole, and their mother, Dee Vaughn, joined the business in 1997. And soon the family made plans to buy land and build a new facility to keep up with their growing business. The new Martinsburg Service Center opened in March of 1999 at its present location at 123 Reliance Road. This facility measures 6,240 square feet and features six service bays to take care of engine, transmission and differential replacement, custom exhaust, alignment and general automotive repair.

Experience and training are key at Martinsburg Service Center. There are eight total technicians, four of them have achieved ASE Master Certification. The other four are ASE Certified in three or more

areas. "First and foremost, we make sure all technicians understand the need for them to continue their education in the automotive industry is a must for their employment at Martinsburg Service Center," explained Cole. "We'll pay for the training and ASE testing as long as it's passed. And we explain to our employees the more they know and can do, the more valuable they become."

Over the past five years, Martinsburg Service Center has installed JASPER remanufactured engines, transmissions, differentials and installation kits. Cole says, "I have used a lot of different remanufactured products since I have been in business, and none of them have given me the service, warranty and quality that JASPER has. JASPER has taken very good care of Martinsburg Service Center and my customers."

As for the future, Martinsburg Service Center is in the final stages of planning for an expansion which would add 5,500 square feet to its existing building. This expansion would include a performance shop, a truck shop, and a parts room.

All of this success is based around Martinsburg Service Center's business philosophy of providing vehicle repair in a clean, professional atmosphere that is friendly and honest to the customer.



*Martinsburg Service Center has provided customers with professional work in a clean, friendly atmosphere since March of 1994.*

# The Alternate Fuel Alphabet Soup - Part 1

## Calvin Thorn

is a graduate of Centennial Technical Collage in Toronto, Canada. Calvin has



been in the automotive industry 29 years, 23 of those working with automotive alternative fuels. Calvin has worked at JASPER for the past six years in the role of General Manager of the Alternate Fuels Division.

Jasper Engines and Transmissions has been building alternate fuel engines for many years. We use words like LPG, CNG, FFV, E85, M85 and Biodiesel when talking about these engines. But what does all this mean, what are these different fuels and what changes does JASPER make to these engines over a regular gasoline and diesel engine?

### **Liquefied Petroleum Gas (LPG) - hydrocarbon gases under low pressure**

Propane, also known as LPG (liquefied petroleum gas), is the leading alternative fuel in the country. It is also the nation's third most common vehicular fuel used today, after gasoline and diesel. There are over 270,000 on-road vehicles in the United States and 8 million worldwide that operate on propane. A large number of these are used in fleets that include light- to heavy-duty trucks, buses, taxicabs, police cars, airport shuttles, and national parks tour buses. LPG is also used to power industrial forklifts, irrigation and petroleum pump engines.

54% of the LPG produced in the

by Calvin Thorn - General Manager, JASPER Alternate Fuels

U.S. comes from natural gas well-head processing. The other 46% come from petroleum refining. Propane is stored as a liquid in low pressure fuel tanks mounted on the vehicle, the propane is changed to a gas vapor before it enters the engine. Because propane enters the engine as a dry gas vapor there is no cooling taking place in the combustion chamber as there would be with vaporized gasoline. To handle the added heat in the combustion chamber we install hardened valves and seats in all LPG and CNG engines.

### **Compressed Natural Gas (CNG)**

Natural gas is made up of about 95% methane. The other five percent is made up of various gases along with small amounts of water vapor. Because of its clean burning nature and the fact that it is not made from petroleum, as gasoline and diesel are, many auto makers around the world are developing vehicles to run on natural gas. CNG is stored as a high-pressure gas (3600 psi) in fuel tanks mounted to the vehicle.

CNG engines have the same seat and valve modification as the LPG engines. JASPER has recently started building CNG 5.9 liter Cummins engines. This engine is used mostly in transit applications.

### **Liquefied Natural Gas (LNG) - natural gas that is very, very cold**

Natural gas can be made into three forms. One kind is the low-pressure form you use to cook or heat your home. Another form is compressed natural gas (CNG). This form is compressed into high-pressure fuel cylinders to power a car or truck. The third form is liquefied natural gas (LNG). LNG is made by

refrigerating natural gas to condense it into a liquid. The liquid form is much more dense than natural gas or CNG. It has much more energy for the amount of space it takes up. So, much more energy can be stored in the same amount of space on a car or truck. That means LNG is good for large trucks that need to go a long distance before they stop for more fuel.

Liquefied natural gas is made by refrigerating natural gas to minus 260 degrees Fahrenheit (260 degrees below zero!) to condense it into a liquid. This is called liquefaction. The liquefaction process removes



***The JASPER Optimized Alternate Fuel Engine delivers the performance and reliability expected from a conventional gasoline engine.***

most of the water vapor, butane, propane, and other trace gases, that are usually included in ordinary natural gas. The resulting LNG is usually more than 98% pure methane. Caterpillar, Cummins, Detroit Diesel, Mack and Navistar sell heavy-duty natural gas engines that can operate on LNG.

*In the next issue of News & Updates, we'll discuss BioDiesel, PuriNOx Diesel Fuel, and the Alcohol-based fuels - Ethanol & Methanol.*

# PTFE Shaft Seals - Part 1

by Jeri Cochran, Product Engineering Manager - Engine Seals, Federal-Mogul Corporation

## Jerri Cochran

is the Product Engineering Manager on Engine Seals for Federal-Mogul Corporation. She

has worked in that position for 12 years. Prior to that, Jerri managed the Seal Technical Center for three years. She worked at Detroit Diesel for 12 years as a materials development manager. She holds degrees in biology, chemistry and mechanical engineering.



PTFE shaft seals have been used since the 1970's in heavy duty diesel engine rear crankshaft seal applications, and quickly became the overwhelming choice because of the extended seal life achieved. They have been used in passenger cars and light trucks since the early 1990's in the US and are becoming more popular in Europe in these applications as well.

PTFE seals are different from conventional elastomeric shaft seals in both the seal design and the sealing material. Figure 1 shows a cross section of the two different sealing technologies.

### Theory of PTFE Sealing

A PTFE sealing element acts as a mechanical screw pump (see Figure 2). The element is coined or cut with a screw thread or groove to pump oil from under the lip back into the sump. The element is dependent upon the same factors for pump rate as a screw pump: the speed the shaft turns, the viscosity and temperature of the fluid being pumped, the angle and pitch of the screw thread, the groove profile and

the clearance gap.

In order to effect a dynamic seal, the pump rate of the sealing element must exceed the combination of fluid pressure and surface forces working to force oil past the lip.

The pumping rate changes over time and under different operating conditions as various factors change: the clearance gap may increase with seal wear, the viscosity of the oil changes over time, and PTFE relaxation over time causes the groove profile to change, and the contact pressure that is exerted on the shaft to diminish.

The effective groove profile will also change over time due to wear, and contaminants (either oil degradation products or external contaminants) filling the groove volume. When a PTFE seal can no longer pump effectively, it can no longer function as a dynamic seal.

Since PTFE elements require a screw thread to effect a dynamic seal, static sealing is a challenge because a leak path is inherent in the design. Static sealing is effected by the contact pressure distribution across the sealing element.

### Different Groove Designs and Manufacture

There are two main approaches to creating the pumping grooves of the

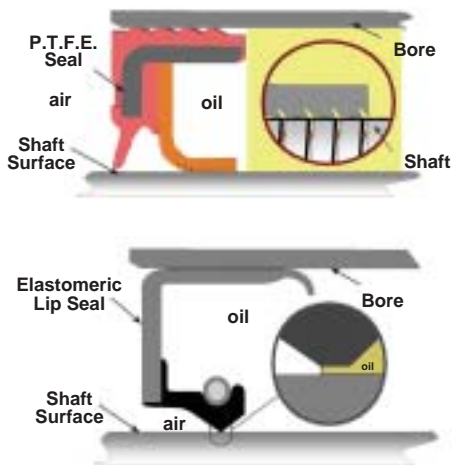


Figure 1 - Comparison of PTFE and elastomeric shaft seal design



Figure 2 - The PTFE sealing element acts like a pump.

PTFE element. Figure 3 shows the most popular designs.

Each design has advantages and limitations which affect where it can be effectively used, and what other design features are used to compensate for limitations.

The top groove shown is not a groove. It is a slit thread – cut with a knife on a lathe with no material removal. The groove volume is achieved by the element stretching to fit the shaft – and effectively the volume varies across the contact zone. This design has the advantages of being more effective as a static seal, since there is much less volume to allow fluid transfer. It is also effective in sealing air pressure as in an on-line engine assembly aircheck. The contact pressure differential across the sealing zone is effective in creating an oil cooling mechanism and thus reducing underlip temperature and the chance for oil carbonization. The machining operation allows for flexibility in PTFE filler materials and in groove profile details, but it is a more expensive operation than coining. Because of the smaller groove volume, slit threads are more susceptible to contamination issues and oil carbonization and may require more complex dirt exclusion devices.

The lower two designs shown in Figure 3 are coined threads. The groove volume is much larger, and thus the initial pumping rate is greater. Because of the large groove volume, these designs are less susceptible to the negative effects on

(continued on page 6)

(Continued from page 1)

race team and I look forward to the business-to-business opportunities that will develop from this new relationship," said Roger Penske.

Jasper Engines & Transmissions president Doug Bawel commented, "We are excited to be associated with such a great company as Kodak and we're excited about further developing and strengthening our relationship with the Penske organization. We are also very pleased about our new relationship with Dodge and to have such an up and coming driver in Brendan Gaughan behind the wheel of the #77 car and as part of this great new team of Penske-Jasper Racing."

Gaughan, a graduate of Georgetown University, joins the top level of NASCAR racing after winning two championships in NASCAR



**2002 NASCAR Craftsman Truck Series "Rookie of the Year" Brendan Gaughan replaces Dave Blaney behind the wheel of the #77 Kodak Dodge in the 2004 NASCAR Nextel Cup Series.**

Winston West competition and claiming "Rookie of the Year" honors and scoring eight wins in two seasons on the NASCAR Craftsman

Truck Series Circuit. Gaughan posted a series-leading six wins, along with 14 top-five finishes and 18 top-10s in 2003 truck racing competition. He challenged for the series championship until a crash in the last race of the year dropped him to fourth in the final standings.

"I'm thrilled to get this opportunity and thankful to so many people," said Gaughan, a former collegiate basketball player and champion off-road racer. I appreciate the confidence that Kodak, JASPER and the Penske-Jasper Racing organization have shown in my abilities and I'm very excited about the opportunity to represent one of the most respected global brand names in sports. To drive the Kodak Dodge for an organization the caliber of Penske-Jasper Racing is a dream come true. I can't wait for the 2004 season to begin."

## JASPER's NASCAR Getaway Package

**One Race Day Ticket • One Race Day Hospitality Pass  
Special Gift • One Race Day Behind-the-Scenes Experience  
for any one of the race dates listed below!**

*Event names determined from the best available information at the time of printing. Dates are subject to change.*

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Pontiac Performance 400 - Richmond, VA .....	May 15, 2004
MBNA America 400 - Dover, DE .....	June 6, 2004
Michigan 400 - Brooklyn, MI .....	June 20, 2004
Brickyard 400 - Indianapolis, IN .....	August 8, 2004
Sharpie 500 - Bristol, TN .....	August 28, 2004
Bass Pro Shops MBNA 500 - Atlanta, GA .....	October 31, 2004

Each package is valued at \$350.00 and is available to you for only \$125.00 and the proof of purchase of 5 engines, transmissions, differentials and/or stern drives. Purchases must be made between October 1, 2003, and October 20, 2004. Package(s) do not include transportation or lodging and must be redeemed 30 days prior to the race you plan to attend. JASPER is not responsible for rain dates or cancellations. All reservations will be confirmed in writing. To redeem package(s), submit copies of your invoices along with a check for \$125.00 to:

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Hurry while supplies last! Packages are subject to ticket availability.

(continued from page 4)



**Figure 3 - Alternative PTFE element designs.**

pumping from carbonization or external dirt contamination, although they may allow outside contamination to be transferred into the oil system. These designs generally require PTFE compounds with higher glass content to reduce PTFE relaxation and maintain groove profile geometry. Higher glass content materials are stiffer and more abrasive, so these designs may cause significant shaft wear or high underlip temperatures. These designs have more difficulty sealing statically, and may not seal air pressure at all without additional features, such as a static dam across the groove in the contact zone or a contacting barrier.

In the next issue, we will discuss the material differences between PTFE and elastomeric seals, and their design.

*Writer's Note: PTFE is polytetrafluoroethylene, commonly known as Teflon®, which is Dupont's name for this material.*

## Atlanta Branch Facility Voted "Best Industrial Site"



Each year, the Building Department of the City of Peachtree City, Georgia, recognizes local builders for outstanding achievement during the preceding year. The 2003 awards of recognition were presented by Peachtree City Building Official Tom Carty and Peachtree City Mayor Steve Brown to Jasper Engines & Transmissions and Leslie Construction for Best Industrial Site in 2003. This was one of four awards presented by the council at their January 15, 2004 meeting.

"We think that outstanding achievement should receive recognition," Peachtree City Building Official Tom Carty said, "and these building professionals have actively worked to excel in construction quality and job site safety. Each of these firms has been excellent to work with over the past year."

The Builder of the Year Awards is an annual event, and awardees are selected by the members of Peachtree City's Developmental Services Division who deals with the various stages of development and construction.

## Support "Right to Repair" Legislation

Jasper Engines & Transmissions believes car owners and independent repair shops must have full access to information, parts and tools to accurately diagnose, repair or re-program these modern systems. By restricting access to such information, car manufacturers force motorists to bypass independent repair shops and patronize only new car dealerships. Restricting customer choice would inevitably lead to higher prices and under-maintained vehicles. Moreover, the lack of competition will lead to the failure of independent garages and

the companies that supply them.

The Motor Vehicle Owners Right to Repair Act (H.R. 2735 & S. 2617) prevents vehicle makers and others from unfairly restricting access to the information, parts and tools necessary to properly diagnose, repair, re-program or install automotive replacement parts. The Act ensures that motorists retain the right to choose how and by whom their vehicles are maintained and repaired. Most importantly, the Right to Repair Act includes an enforcement mechanism under the auspices of the Federal Trade Commission, to

ensure all parties fulfill their obligations to the motoring public.

You can show support for the Motor Vehicle Owner's Right to Repair Act by sending a letter to your United States Representative or Senator, informing them of the legislation. Let them know how this legislation will help you and other constituents who use their vehicles in their everyday lives. ***A model letter to send to your lawmaker can be found at [www.aftermarket.org/government](http://www.aftermarket.org/government).***

# Kodak Puts Digital Users in the Driver's Seat

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