

News & Updates

APRIL 2004

Inside . . .

- Customer Profile:*
Clayton Automotive pg. 2
- Calvin Thorn:*
The Alternate Fuel
Alphabet Soup - Part 2 pg. 3
- Jeri Cochran:*
PTFE Shaft Seals - Part 2 pg. 4
- JASPER Helps CARS
Drivers in NASCAR
Nextel Cup Test pg. 5



Be Car Care Aware™

Published by:
Jasper Engines & Transmissions
P.O. Box 650
Jasper, IN 47547-0650
Phone: 1-800-827-7455
Fax: 1-812-634-1820
www.jasperengines.com



JASPER Helps Motorists "Be Car Care Aware"

April is National Car Care Month. In an effort to further promote this program, Jasper Engines & Transmissions, and the Car Care Council, are educating motorists on the importance of vehicle maintenance, and enhancing the work of the *Be Car Care Aware* campaign.

Vehicle inspections held last year across the country during National Car Care Month showed that nine out of 10 vehicles inspected required some form of maintenance, whether it was engine oil, transmission fluid, belts, hoses, batteries, tires or lights. This is an opportunity for you to add to your customer base, provide your customers with a

much needed service in terms of routine vehicle maintenance, and in turn add profits to your business.

You too can help spread the word of proper vehicle maintenance to your customers with the *Be Car Care Aware* Point-of-Sale starter kit. This starter kit provides a wealth of marketing and promotional materials to help companies and organizations get involved with the ongoing *Be Car Care Aware* consumer education program. The kit includes a Service Schedule poster, a Service Schedule counter-mat, handouts, and mirror hangers.

The POS kits are available for a \$175 contribution to the *Be Car Care Aware* consumer education campaign. The kits can be ordered through the Car Care Council website at www.carcarecouncil.org. Go to *Ntl. Car Care Month*, and click on *Point-of-Sale Starter Kit*. In addition, JASPER offers the opportunity for you to use your co-op dollars toward the purchase of these start up kits. You will need to provide documentation of the \$175 contribution, and a receipt of the POS kit, to Abby in the Advertising Department, and JASPER will co-op the \$175 donation at 50%.

You can also find out more information on National Car Care Month and the *Be Car Care Aware* campaign by logging onto www.jasperengines.com and click on the "Be Car Care Aware" logo at the bottom of the page.



Service Interval Posters (above) are part of the *Be Car Care Aware* consumer education program. Ask your JASPER factory sales representative for details.

Clayton Automotive

Waco, Texas, is the home to Clayton Automotive, a full service automotive repair facility that strives to establish a trust-based relationship with their customers to last a lifetime.

Owner Dwight Clayton spent 20 years in the United States Army as a motor pool commander. After his military career, and a brief stint as an engineer for Mobil Chemical, Dwight decided to start his own auto repair business. He felt there was a need for a professional facility that would build a lifetime relationship with its customers. So in 1994, Clayton Automotive started in a leased facility in nearby Woodway, Texas. In 1997, the business moved to its present Waco location at 9515 China Spring Road. Dwight's son, Steve, is the shop's current manager and future owner.

In a short period of time, Clayton Automotive has doubled in size to include eight service bays on a 2.5 acre lot. Four of Clayton's eight employees are ASE Certified technicians, and one is a ASE Master technician. The company pays for all ASE testing, and sends its technicians to at least one seminar or clinic each month.

Clayton Automotive has purchased JASPER remanufactured

products since June of 2002. In their first full year with JASPER, Clayton sold seven gas engines, seven transmissions, one differential, six installation kits, and two radiators. Manager Steve Clayton says JASPER products are recommended on every replacement job, including an installation kit, and a radiator. "With JASPER products, we know additional updates and testing have been performed to give us confidence in recommending JASPER," says Steve. "Installation kits and radiator availability provide us one source that reduces our liability and saves us the hassle of making numerous calls and wasting time and money we can use to better serve our customers."

Clayton Automotive takes care of their customers when they bring their vehicle in for service, including free pick up and delivery, maintenance service reminders, a 300 point vehicle inspection, and each vehicle is washed and vacuumed regardless of its size and work performed.

As the company recently doubled in size, Clayton Automotive plans to be in business for generations to come, and always looks for ways to better serve their customers and the community.



Clayton Automotive, located in Waco, Texas, is a company building trust-based relationships with their customers, and a dedicated JASPER installer.

The Alternate Fuel Alphabet Soup - Part 2

by Calvin Thorn - Manager, JASPER Alternate Fuels

Calvin Thorn

is a graduate of Centennial Technical College 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 the past six years in the role of Manager of the Alternate Fuels Division.



Jasper Engines & Transmissions has built alternate fuel engines for many years. Words like LPG, CNG, FFV, E85, M85 and Bio-Diesel are commonplace when talking about these engines. But what does this mean, and what are these different fuels?

In our last article, we discussed Liquefied Petroleum Gas (LPG), Compressed Natural Gas (CNG), and Liquefied Natural Gas (LNG). In this issue, we will deal with BioDiesel, PuriNOx diesel fuel, and the alcohol-based fuels.

BioDiesel - a lot like diesel fuel, but made from vegetable oil or animal fat.

BioDiesel is not regular vegetable oil. BioDiesel is biodegradable though, so it is much less harmful to the environment if spilled. BioDiesel is made through a process called *transesterification*. This process makes vegetable oil and animal fat into esterified oil, which can be used as diesel fuel, or mixed with regular diesel fuel.

Ordinary diesel engines can run on BioDiesel. Practically any type of vegetable oil or animal fat can be used to make BioDiesel. But the most popular types of vegetable oils

are soybean and rapeseed oil. Soybeans are used to make tofu and soy sauce. Soybean and rapeseed oil have been tried as BioDiesel because they are less expensive than most types of vegetable oil. Although soybean and rapeseed oil are more expensive than regular diesel fuel, most other types of vegetable oils are too expensive to even be considered for use as diesel fuel. Animal fat also is too expensive for this use, but used oil from restaurants have been tried for BioDiesel.

BioDiesel has been shown to produce lower tailpipe emissions than regular diesel fuel. The best thing about BioDiesel is that it's made from plants and animals, which are renewable resources.

Some interesting information regarding the origins of BioDiesel. One of the first uses of BioDiesel was powering heavy-duty vehicles in South Africa before World War II. The name "BioDiesel" has been given to transesterified vegetable oil to describe its use as a diesel fuel. It was patented in the United States in the 1940s by Colgate (and other) scientists. The researchers at that time were looking for a method to produce glycerine more readily, in order to produce explosives for the war effort. Many of the methods used today by producers and have their origin in the original 1940's research.

PuriNOx Diesel Fuel

This fuel is being tested in California. PuriNOx is diesel fuel that is emulsified with water. This emulsion process is a suspension of small globules of one liquid in a second liquid with which the first will not mix. The main benefit of PuriNOx is it's a simple, instant and economical solution to improving air quality. PuriNOx reduces Nox* emissions from compression ignition engines - new and old - up to 30% and particulate matter (PM) emissions up to 65% when com-

pared to conventional No. 2 diesel fuel. PuriNOx helps meet national and local emissions requirements mandated by regulatory agencies. This fuel enhances the environmental image, and qualifies for tax or emissions credits in certain regions.

***Oxides of Nitrogen: Chemical compounds of nitrogen bonded to various amounts of oxygen (Nox).**

A major pollution emission of the internal combustion engine. Formed under pressure and temperatures above 2,500 degrees Fahrenheit.

The Alcohols - Ethanol and Methanol

Alcohols have been popular alternative fuels for many years. In fact, Henry Ford's first car was fueled with alcohol. Both ethanol and methanol are now used as transportation fuels and will likely play an increasingly important role in the future.

Ethanol

Ethanol (sometimes called grain alcohol) is generally made in the United States from corn (a grain). It can also be made from biomass, or organic materials, which includes agricultural crops and waste (like rice straw), plant material left from logging, and trash including cellulose (paper). Brazil, by far the largest producer in the world, makes ethanol from sugar cane. Projects are now underway in California to convert some of the state's agricultural waste, like rice straw that is now burned in fields, into ethanol.

The alcohol found in alcoholic beverages is ethanol. However, the ethanol used in motor fuel is denatured, which means poison has been added so people can't drink it.

Methanol

Methanol (sometimes called wood alcohol) can be made from

(continued on page 5)

PTFE Shaft Seals - Part 2

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

Jeri 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, Jeri 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 & mechanical engineering.

Material Differences

One of the biggest advantages of using PTFE seals is that polytetrafluoroethylene is a plastic material that is chemically inert to any fluid encountered in a vehicle. Thus, it will not be chemically attacked or degraded by the media it is sealing, or by contamination in the media. By contrast, the material selected for elastomeric seals must be carefully matched to the various fluids they will be sealing, because they are susceptible to chemical attack. For example, silicones cannot be used in the presence of gasoline or diesel fuel because they swell up to several times their original volume. Even the best elastomer possible for an application will, over time, change in volume and hardness because of exposure to the sealing media. A further complication is that, within a specific media, for example, engine oil, there is a wide variation in the chemistry of the available oils, which may differently attack the elastomer originally selected for the vehicle manufacturer's factory fill.

PTFE has another advantage over elastomers in that it does not harden

over the operating temperature range of a vehicle. Elastomeric materials are sensitive at both low temperatures and high temperatures to hardening. They, therefore, must be selected for the operating temperatures that are expected, and are vulnerable to premature failure if these aren't totally understood. PTFE remains flexible from -70°C to $+250^{\circ}\text{C}$.

A disadvantage of PTFE over elastomeric seals is its sensitivity to abrasion. The material is scored very easily, which could potentially lead to leakage. Because of this, in environments where the seal is exposed to outside contamination, PTFE seals must be designed with auxiliary lips to keep the contamination from the PTFE material.

Design

PTFE seal design relies on contact of the sealing element over a wide area of the shaft (typically 3.5 - 7.5mm). The wide contact pattern replaces the spring used in elastomeric shaft seals to guarantee that the sealing element always remains in contact with the shaft, regardless of runout, relaxation of the material or wear of the shaft or sealing element. This wide contact band, compared to the very narrow contact band of an elastomeric seal, can tolerate shaft imperfections such as scratches and porosity much better. Parameters such as element thickness, laydown length, thread or groove geometry and PTFE filler material can be tailored to specific application requirements.

PTFE seals also generate lower temperatures under the contact surface. This is related to both the material and the design. Because of the wide contact zone, the contact pressure is evenly distributed across the surface. The pumping action also ensures that the oil is constantly circulating.

PTFE seals are sensitive to handling and installation procedures for several reasons. The material can be easily scratched, so it must be protected in shipping and handling from



Though sensitive to abrasion, PTFE shaft seals cannot be chemically attacked by the media it is sealing.

potential damage. A shipping sleeve is generally used to protect the PTFE lip. In many cases, particularly for rear crankshaft seal applications, the seal must be installed in the direction the sealing element is formed, thus making it possible to fold the lip during assembly. To prevent this, and to ensure that the lip isn't damaged as it is pushed over the shaft, an installation tool is required. This may be the same part as the shipping sleeve, or it may be a separate permanent tool.

Summary

PTFE seals have definite advantages over elastomeric seals in many areas. They have been used for over 30 years in heavy-duty truck applications and ten years for passenger car applications. They are chemically inert, have wide design flexibility, and operate under known screw pump theory. However, each application should be carefully considered to arrive at the most effective seal for the application.

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

**FEDERAL
MOGUL**

(Alternate Fuels continued)

various biomass resources like wood, as well as coal. However, nearly all methanol produced today comes from natural gas because it's cheaper.

Methanol must not be confused with ethanol. But is also very poisonous if swallowed. It is also wise to avoid skin contact with methanol, as it can pass through the skin.

Alcohol-fueled vehicles

Flexible fuel vehicles (FFVs) are specifically designed to operate on alcohol, gasoline, or any combination of the two. FFVs have become quite popular with many fleets. Although some vehicles run on pure alcohol, FFVs operate on alcohol blends for two main reasons.

Adding a small amount of gasoline improves the engine starting in cold weather and improves flame visibility in daylight. Pure alcohol burns with a nearly invisible flame in daylight. By adding gasoline, the flame is easier to see and therefore safer.

The blended fuels used in FFVs are either E85 (85% ethanol with 15% gasoline) or M85 (85% methanol with 15% gasoline). The FFV engines that JASPER provides are built no different than a regular gas engine. The difference with the FFVs is in the fuel system components that are specifically designed to tolerate the corrosive nature of alcohol. Because the number of ethanol and methanol stations in the United States is very limited at the present time, FFVs can run on gasoline when needed.

17th Annual Preferred Partner Awards

Jasper Engines & Transmissions recognized seven "Partners in Success" at the annual Preferred Partner Luncheon held March 9th in Jasper, Indiana.

The seven Preferred Partners for the year 2003 are Federal-Mogul, Mahle, Inc., Elgin Industries, Dana Corporation, Cloyes Gear & Products, Inc., Transtar, and Grant Iron & Motors.

Recipients of the Preferred Partner Award are nominated by a purchaser within our JASPER organization and are judged on quality, service, fill-rate, response time to a problem, billing/credit procedures, and other criteria.

JASPER Help CARS Drivers in NASCAR Nextel Cup Test

The Championship Auto Racing Series (CARS) has announced their 2004 Stock Car and Super Truck points Champions, plus a "wildcard driver" in each division, will be awarded the opportunity to test and be evaluated in a Penske-Jasper Racing #77 NASCAR Nextel Cup Dodge at season's end.

The program is in conjunction with Jasper Engines & Transmissions, Indianapolis Raceway Park and CARS. JASPER has been a primary CARS Series sponsor for the past two years. The CARS Series will use JASPER engine heads in 2004 prior to going to JASPER Spec Racing Engines exclusively for the 2005 racing season.

JASPER launched its Panther Spec Engine Program nationally last fall at the Performance Racing Industry Show in Indianapolis. The Panther Spec Engine is geared to racetracks that want to level the horsepower playing field and increase car counts by controlling costs.



"The Championship Auto Racing Series has played an important research and development role for our spec racing engines," says JASPER Vice-President of Marketing Tom Schrader. "The CARS Series JASPER engines have proven performance and reliability race after race."

"We are pleased to furnish a Penske-Jasper NASCAR Nextel Cup Series Dodge for the CARS test," says Schrader. "We are always looking for new driver talent. Indianapolis Raceway Park is the perfect place to conduct the test since two of the three top NASCAR divisions compete there."

IRP's .686 mile oval has been the

home track for the CARS Series since its inception in 1997. "The CARS Series has given us an opportunity to utilize our oval track several times a season," says IRP General Manager Ron Anderson. "We are excited to be a part of the JASPER NASCAR Nextel Cup test for the CARS Series. It would be great to have one of our CARS guys move up in the ranks. We have had some drivers that cut their teeth at IRP then went on to bigger things like Jeff Gordon, Tony Stewart, and Ryan Newman have."

"We are very fortunate to be working with a great American company like JASPER," says Championship Auto Racing Series President Jim Mills. "JASPER backs their products and our series. This is a tremendous opportunity for one of our CARS racers to actually drive a NASCAR Nextel Cup Series car. I know this is really going to intensify the points chase for all the drivers."



JASPER ENGINE AND TRANSMISSION EXCHANGE
815 Wernsing Road · P.O. Box 650 · Jasper, IN 47547-0650
e-mail: sales@jasperengines.com

Prst. Std.
U.S. Postage Paid
Permit 49
Jasper, IN 47546



1-800-827-7455