

# News & Updates

AUGUST 2003

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## Honda, Acura Transmissions Available From JASPER

Jasper Engines & Transmissions has expanded its import transmission offerings. JASPER offers Honda transmissions for these popular automatic applications:

- 1990-2002 Accord
- 1990-2003 Civic
- 1995-2002 Odyssey
- 1990-2001 Prelude
- 1997-2002 CRV
- 1990-1991 CRX

The Honda offerings follow JASPER's recent introduction of the Toyota Camry A541E and A140E and Corolla A131L and A245E automatic transmissions.

JASPER now has the capability of offering an entire drivetrain for many popular Honda applications.

"The two most popular vehicles today in the foreign market are



**JASPER offers Honda automatic transmissions for most popular applications like the Accord, Civic, CR-V, Odyssey and Prelude. Acura & Toyota transmissions are also available.**

Honda and Toyota," says Craig Leuck, JASPER Transmission Department Manager. "Since we had already started with the Toyota line, we took the natural step to go into the direction of Honda because of the volume."

JASPER's research and development discovered that the Honda automatic is a compact transmission. "The valve body is internal to the back side of the bell housing," says Leuck, "and the unit basically has no oil pan on the bottom. The gear setup is similar to that of a manual transmission. There are no planetary gears inside the transmission, so all of the gearing is activated through a set of clutches inside the unit."

A Honda transmission from JASPER includes external solenoids, cooler fitting washers, brackets and studs for installing external hardware, and an all-wheel drive box attached (CRV)

Meanwhile, JASPER now has Acura transmissions available for delivery. "The Acura transmissions available are for the CL, TL, and RL line of vehicles," says Leuck.

"This is the market we want to be in, because Hondas and Toyotas alike are both the most popular vehicles today, and we want to make sure we are providing for our customers in those markets."

## Link Automotive Service

“JASPER’s quality is second to none.” Those are the words of Nashville, Tennessee’s, Bobby Link, owner of Link Automotive Service. The company is celebrating its 20th year in business, and Bobby knows all about JASPER quality first hand. Prior to opening Link Automotive on June 1st, 1983, Bobby was a JASPER Associate in the Nashville area for 18 years, and was good friends with JASPER founder Alvin C. Ruxer. Link’s Service Manager Marc Humes and Parts Manager Dan Gallup were also JASPER Associates in the Nashville area.

Link Automotive has grown over time from its original 5,000 square foot building, to its present 15,000 square foot facility at 1229 Lebanon Road. A total of 14 employees keep up with the workload coming through 18 service bays. Link Automotive has the room to do repair work on the major fleets of the Nashville area, but Link Automotive can also handle the repair needs of the general motoring public.

Additional education for technicians at Link Automotive is very important to keep up with the latest advances in automotive technology. All of Link’s technicians are ASE-Certified, and two are



**Owner Bobby Link is flanked by Service Manager Marc Humes (left) and Parts Manager Dan Gallup (right).**

Master Technicians.

Link Automotive purchases approximately 40-50 gas engines, 25-50 transmissions, and a few diesel engines and differentials each year. “We specify JASPER products because of the exceptional quality, customer service, availability and warranty,” says Link. “With what you get, the price is good.”

“What I took from those years working with Alvin Ruxer, helped me grow my business and run it successfully. We try to ‘Think differently and work a little harder.’ And we believe in doing it right, or not at all.” It’s just one of the reasons why Link Automotive Service is recognized as the premier auto and truck repair facility in the Nashville area.



**With over 15,000 square feet of space, Link Automotive Service has the room to handle fleet repairs, and still take care of the general motoring public.**

# Engine Remanufacturing: Design and Analysis

by John Kluemper - JASPER Research & Development

## John Kluemper

is a graduate of ITT Auto & Diesel Technology school in St. Louis, Missouri.



John has been an associate of JASPER for 32 years, including 14 years with gas engine testing and 13 years in Research & Development and Quality Control Departments. John implemented JASPER's current gauge control program.

In 1950, the average mileage on a vehicle that needed a ring job or overhaul had only 38,000 miles on it. Although some went longer, it was an extreme rarity that an engine lasted for 100,000 miles. Over the years, improvements in materials and design have increased the life of the modern day engine. Life expectancy is well into the 150,000 to 200,000 mile range. However, premature engine failures do occur. And the necessity to do a root cause failure analysis is important to prevent future failures.

There are several things that can affect the duty life of engines. In this article we will focus on the four major concerns of engine remanufacturing, which are the following:

- **Engine design**
- **Materials**
- **Machining and Assembly**
- **Installation/Maintenance**

### Engine Design

Engines have seen many design changes over the years.

Over Head Cam (OHC) and Dual Over Head Cam (DOHC) engines have led the way. Engineers have raised compression ratios and lowered emissions in an attempt to satisfy both the customer and the Environmental Protection Agency (EPA).

Demanding more power with smaller displacement engines can push the limits of any engine. Extremely lightweight oils such as 5W-20 are used because of very tight clearances, and to reduce friction (drag from oil weight). Improved oil filtration systems have increased the duty cycle of oil change service intervals. However, even with all the improvements in engine efficiency, all engines do have a weak link. In many cases, defective parts are replaced with an improved version of the same part. Therefore, analyzing a failed engine is very important. Finding an improved part or process can increase the life of a remanufactured engine, even longer than the original engine.

### Materials

Cast iron pistons, cast iron rings, babbit bearings & rope seals are just a few examples of materials first used in internal combustion engines. Over the years, many material improvements have occurred. Hypereutectic has become the piston material of choice. Higher silicon content has allowed for higher strength and lower heat expansion, to allow for tighter cylinder fit and less engine noise.

Graphite coating was added to piston skirts to reduce scuffing and allow for an even tighter piston fit. Next, smaller

rings to reduce friction were introduced. Ductile materials were used to prevent ring breakage and moly or chrome was inlaid in the compression ring to reduce wear.

Babbit materials were replaced with copper alloy, tin overlay (tri-metal) bearings. Many late model engines are now using aluminum bearings. The aluminum materials are more forgiving on rougher crank finishes. Multi-Layer Steel (MLS) and Graphite head gaskets replace asbestos. Teflon and Viton Materials are used on rear seals and valve seals.

Most timing components now require extreme hardness to prevent stretching and also require a tensioner due to the chain length required for OHC engines. Molded rubber gaskets have replaced the cork gaskets on oil pans and valve covers. During the remanufacturing process, it is important to understand the critical characteristics of all parts. Replacing parts is not as easy as making sure the holes line up any longer.

### Engine Machining

Improved engine designs have greatly complicated the remanufacturing process. With the introduction of MLS head gaskets, very smooth Rz finishes are now required. Plateau honing of cylinders is now the norm. Lightweight castings have demanded the need for torque plate honing. Crankshaft journals are being polished to Ra's of ten and below. Cracked cap rods must be machined to accept an over-size O.D., specially designed bearing insert. Improvements in machining processes have all

*(continued on page 7)*

# The Many Colors of Jasper Motorsports



*Dave Blaney's #77 Ford Taurus at Lowes Motor Speedway.*



*Dave's car one week later at Dover, Delaware.*

The Jasper Motorsports team sported a special edition paint scheme during the recent night time events at Lowes Motor Speedway Charlotte.

Driver Dave Blaney piloted a black panther #77 Ford Taurus with neon green accents, perfectly suited for racing under the lights. Blaney finished 2nd in the Winston Open, and finished 14th in the rain-shortened Coca Cola 600.

The following week at Dover International Speedway, the Jasper Engines & Transmissions Ford had a bright orange paint design, heralding the opening of the Universal Studios' *2 Fast 2 Furious* movie in theatres. Blaney finished 20th in the race.

Blaney and the #77 Ford will undergo another color change this summer, when First Tennessee, one of the South's leading financial institutions, signs on as an associate sponsor with Jasper Motorsports for the August 23rd night race at Bristol Motor Speedway. A special paint scheme (*see photo at right*) prominently featuring the red, white and blue First Tennessee logo will appear on the #77 car at the Sharpie 500.



## 2004 Calendar Contest Deadline September 1st

JASPER is once again seeking quality color photographs of vehicles and equipment in which a JASPER gas or diesel engine, transmission, differential, or stern drive has been installed for its 2004 Calendar Contest. Photo categories are unique vehicles and performance oriented cars and trucks.

Entrants must submit a color photograph, (35mm or larger) and a description of the vehicle or application along with the JASPER product that has been installed. Vehicles should be placed in a "show" type setting when photographed. Polaroid pictures and digital pictures transferred onto photo paper *will not* be accepted.

Every qualified entrant will receive a JASPER Dave Blaney autographed race hat. All entries will be judged based on adherence

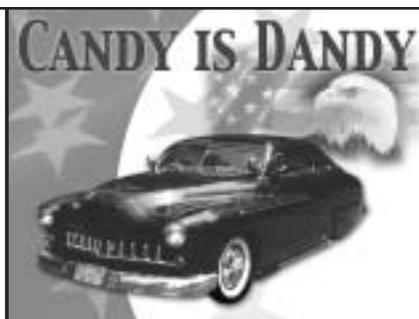
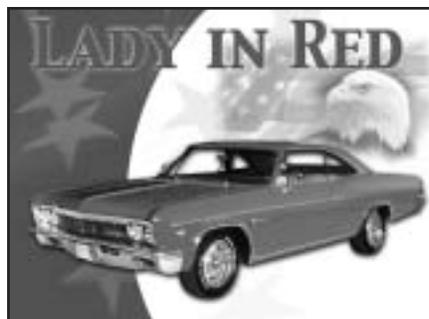
to the category, equipment appearance and the quality of the photograph. Winners will be required to sign a release consent form for photograph and name publication.

All entrants whose work appears in the calendar will receive a \$100 gift certificate which can be used to purchase JASPER remanufactured products or wearable items, 24 com-

plimentary calendars and a special JASPER Sports Gift Package.

The entry deadline is September 1st, 2003. The contest is open to all JASPER customers, distributors and associates. Entries should be mailed to:

**Jasper Engines & Transmissions  
P.O. Box 650  
Jasper, Indiana 47547-0650  
Attn: Abby Brelage**



*Here's a pair of our 2003 contest winners. Send in your photo for a chance to be in the 2004 Jasper Engines & Transmissions calendar.*

# Business Management 101: How to Close the Sale

by Dave Deegan, president of Engine Lab of Tampa, Inc., Tampa, Florida

How do we close the sale on a remanufactured engine, get the work in the door and turn shoppers into customers?

These are the basic operations business owners have asked themselves since the first shingle was hung, and the open sign was placed in the window. The automotive industry isn't really that much different; the foundation of every business is sales and profit. For right now, let's focus on the sales aspect.

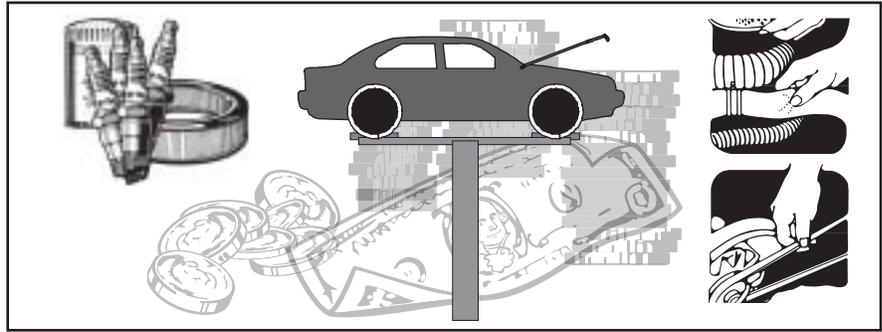
First, let's establish the fact that a certain percentage of customers are price shoppers. They are only interested in finding the lowest price. Your opportunities are limited with this customer, but I recommend you try anyway.

What about the average car owner who has a problem and is simply trying to find out what the repair or engine replacement will cost? Often times, this customer has limited knowledge of their vehicle and even less understanding of how the engine support systems work. Many times, they assume that the quality, warranty and overall product at all repair facilities is a constant. As we all know, this is not the case. So how do we turn this price shopper into a buyer?

By sticking to sales basics, more often than not, you will find an increase in the number of telephone inquiries that will be turned into long lasting customers.

It has been our experience that the customer has usually had someone tell them what the problem is: a blown head gasket, a lower end noise, a bad lifter, a valve ticking, etc. Sound familiar? During this initial telephone call, there are several basic guidelines we follow that will open the door for the sale.

First, the customer needs to feel that you know what you are doing. After getting the primary



information about the car, ask some specific questions, like, "Tell me exactly what happened when you were driving the car," and emphasize *exactly*. Now, listen carefully to what the customer is telling you. Ask more questions about the problem and be sure to use the customer's name. Get more information about the overall situation such as: Who usually drives the car? How many miles are on the vehicle? Have you had other problems with the car? Is it in good condition? Had you planned on keeping the car? If you are asking these questions, then you are in control. More importantly, you are establishing a rapport with the customer. Customers want to know that their situation will be handled correctly and that they will be satisfied with the results. Let the customer know that your business is professional, experienced and warranty's its work. Be friendly and enthusiastic in a professional manner. Take a genuine interest in their situation while being positive and upbeat. Use empathy not sympathy!

Offer the customer a solution that will get them into your shop. If the problem they are describing seems multifaceted, give them confidence, such as "Maybe the thing to do right now is to confirm what repair is actually needed and to do some thorough diagnostic work!"

This approach instills customer confidence in that you know what you are doing, you have the exper-

tise, and they are in capable hands. Remember, most people have a limited understanding of what is under the hood!

Do not diagnose the problem on the telephone! What you don't know is that the customer has an inner ear condition and does not hear well. What sounds like a slight ticking noise to our "hearing impaired" customer is actually a rod knock that is on the verge of creating a window in the side of the block!

Now close the sale. This portion of the sale is by far the most uncomfortable for shop owners. We as shop owners must remember that "profit" is not a bad word, and dropping the price will only cause more headaches. When you are giving the estimate to the customer, establish with them that your price may not be the lowest in town, but the work is of the highest quality. Let them know that the objective of your business is for you to win. If they win, you win. We do not ascribe to the philosophy of matching the lowest price. We are not non-profit organizations, but entrepreneurs in capitalism.

To sum it up, remember to be G.R.E.A.T. with the customer - Sound **Genuine**, be **Responsive**, have **Enthusiasm**, Ask questions and take **Time** to listen to what the customer has to say.

*Article reprinted with permission of Dave Deegan & Engine Builder magazine*

# Bi-Metal Aluminum Bearings

by Jeff Richardson, Product Manager - Engine Bearings, Federal-Mogul Corporation

## Jeff Richardson

is the Product Manager for Engine Bearings, Timing Components and Oil

Pumps for the North American aftermarket. Jeff has worked for Federal-Mogul for the past seven years. Prior to that, he worked as an auto technician for ten years. Richardson also teaches Auto Shop in an adult continuing education program.



The dominant engine bearing material in the automotive industry over the past 25 years is dominant no more.

Overplated copper-lead (or “tri-metal”) bearing alloys have been virtually eliminated in new passenger-vehicle engines from major domestic and overseas engine manufacturers. Moreover, this trend can now be seen in the aftermarket, where production engine remanufacturers, in particular, have embraced the benefits of a new breakthrough in engine bearing technology. That technology? Bi-metal aluminum alloys containing small percentages of silicon.

Tri-metal bearing alloys were the predominant OE and aftermarket technology from the late 1970s to the mid-'90s, due largely to their unique combination of performance characteristics: high fatigue strength, seizure resistance and embedability.

Tri-metal bearings are not, however, highly resistant to wear and are especially susceptible to damage when paired with an inadequate crankshaft finish.

Crankshaft finish is a critical issue at both the OEM and aftermarket levels. In spite of the fact that OEMs utilize computer-controlled grinding and polishing techniques, OE crankshaft finish characteristics can range from excellent to poor.

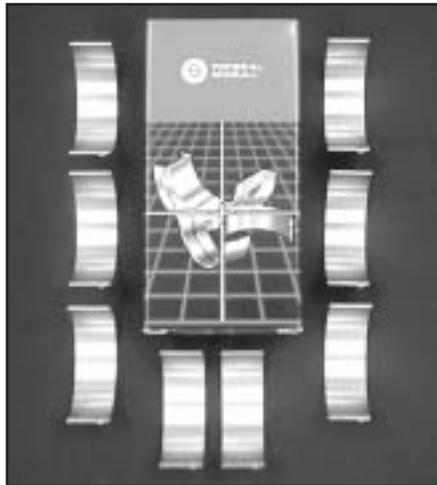
Until the mid-1990s, there were few tri-metal bearing alternatives for OEMs and remanufacturers. All of that changed with the development of bearing materials featuring aluminum alloys and small percentages of silicon.

Federal-Mogul technologies including new bi-metal alloys for engine bearings are sold in the replacement products market under the Sealed Power brand name. Sealed Power “A Series” engine bearings featuring the bi-metal alloy deliver greater seizure resistance than tri-metal materials while dramatically reducing or eliminating bearing

wear in a wide range of automotive and truck engines. These attributes are particularly appealing to vehicle OEMs, many of which have established durability thresholds exceeding 150,000 miles for their latest engines.

The increased wear resistance of bi-metal aluminum alloys is due in large part to the use of silicon, which produces significantly greater surface hardness. The silicon particles also help polish the crank surface during engine operation, further reducing friction and related wear.

An additional benefit of Sealed Power’s A-Series and similar bi-metal materials is their increased bearing wall size control; because the bearings are unplated, manufactured wall variances can be reduced by as much as 40 percent. This improves oil clearance tolerances – and, in fact, makes it possible to maintain OEM clearances over the life of the engine — thereby reducing operating noise, vibration and harshness.



*Sealed Power A-Series bi-metal engine bearings from Federal-Mogul deliver greater wear resistance over traditional tri-metal bearing alloys.*

*Editor's Note: JASPER currently uses Federal-Mogul A-Series bearings on late model Ford and General Motors products. The use of these bi-metal bearings will be expanded to other engine lines as soon as Federal-Mogul makes them available.*

**FEDERAL MOGUL**

**SEALED POWER™**

(continued from page 3)

but eliminated the need for engine break-in periods. Lower friction and increased power have been the results.

### Assembly

Along with improvements in machining, the need for correct assembly has become critical. Torque to yield bolts and elaborate torquing procedures are needed on most late model engines. Timing components require special tooling for correct installation. Non-adjustable valve trains require valve stem heights and cam base circles be held to very tight tolerances. Milling of heads and blocks often require specially designed pistons to assure the correct compression ratio is maintained.

### Installation/Maintenance

In 1930 (from an owner's manual for a new Model A Ford), oil changes were recommended every five-hundred miles. On most engines, the oil filter was optional. With improvements in filtering systems and detergent oils, engines are running much cleaner with change intervals of six thousand miles and more. Unleaded fuels have all but eliminated spark plug changes and improvements in firing systems have made periodic trips for tune-ups almost obsolete.

Nonetheless, remember what we talked about before. If you are replacing your engines with a remanufactured engine, you cannot be sure that one or more external components have failed. Your job is to avoid another problem with your new engine. There are many external components that may be the culprit.

Examples include:

- **Coolant Flow** - Overheated engines can cause a large variety of problems. Scored pistons, burnt valves, blown head gaskets are just a few. Make sure to check your radiator, thermostat, and hoses closely.

- **Bearing Failure** - Dirt is an engine's number one enemy. Be sure to clean external adapters and replace oil coolers to prevent contamination from entering our new engine. With today's tight tolerances, cleanliness is even more important.

- **Sensors** - Map sensors, O<sup>2</sup> sensors, and EGR valves are just a few of your computer system controls. They control the fuel and timing of your engine. Any malfunctioning sensor can lead to a poor running engine and even detonation. Remember, it is not as simple as making sure the bolt holes line up anymore!

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## Year II of Valvoline Cup Holds More Money, Merchandise for Grassroots Racers

The Valvoline Cup will continue its commitment to American grassroots racing with Year II of the Valvoline Cup National Driver Points Championship.

The top driver from across the country in each of 31 Valvoline Cup classes were crowned national champions in 2003, while over 700 drivers received awards for their season-long accomplishments with the awards going as far as 30th place in each class.

Once again, The Valvoline Cup will be contested by virtually all drivers in all types and classes of wheel to wheel competition in all sanctioned racing or track sponsored weekly racing programs throughout the U.S. Every driver will be awarded points for finishing positions in his or her own racing series,

according to Valvoline and program administrator, RaceFan, Inc.

There are no Valvoline Cup rules with respect to the cars, tracks and racing. The rules of the tracks and sanctioning organizations under which each driver competes will govern that driver and car. The Valvoline Cup will be a measure of the success of a driver within his or her racing program relative to the success of other drivers in similar cars within their program.

The program calls for every

driver being awarded points for finishing positions in their own racing series. In this way, a superstock driver can compete with a NASCAR Winston West driver, and a NAMARS driver can compete against a USAC driver all on equal footing and all for the same trophies, merchandise awards and cash prizes. There will be 30 divisions for the 2003 program.

Weekly updates for Valvoline Cup competition will be posted on a special website, [www.valvolinecup.com](http://www.valvolinecup.com).





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