1 MONDAY 1

Automotive Engineering International Presents

# SHOW DAILY

SAE 2002 WORLD CONGRESS

## 7 Series is AEI's Best Engineered Vehicle for 2002

The **BMW** 7 Series was selected by the readers and editors of *AEI* as Best Engineered Vehicle for 2002 because it points the way for not only luxury/performance sedans but also other vehicle segments. Company product developers integrated many new technologies into the fourth-generation BMW flagship in an effort to set new standards in performance and efficiency, as well as luxury, design, and safety.

With help from its suppliers, BMW has produced a vehicle that blazes the engineering trail with innovations that will influence passenger vehicles for years to come. Engineering advances include a powertrain featuring a revolutionary throttle-less family of engines (January 2002 *AEI*) and the

***BMW's 7 Series.***

world's first six-speed automatic transmission (excluding CVTs). Other engineering firsts for the car include:

- Engine intake manifold with continuously variable intake-tube length
- Exhaust system that combines a Helmholtz resonator with an exhaust valve
- Aluminum brake calipers and brake booster
- Electromechanical parking brake
- MOST-based navigation and multimedia systems.

To enable improved ride comfort and handling, the 7 Series combines an all-aluminum suspension with Active Roll Stabilization to reduce body roll during cornering. One of the most significant advancements—though one that will require user training—is called iDrive, which enables a drastic reduction in and reorientation of controls with an innovative human/machine interface. Safety innovations include active head restraints, active knee protection, and inflatable head protection for rear- and front-seat passengers.

Kevin Jost

## Digital Car Conference this week

The inaugural Digital Car Conference (DCC), originally slated for this past fall and postponed after the events of 9/11, will be held this week in Cobo Center. While registrants to either conference may visit the other's exhibition, the same will be so for only certain technical sessions. DCC-only interactive technical sessions will be restricted to 400 people onsite (Cobo Center's Michigan Hall). Attendees will be provided with laptops wired to the speakers', enabling real-time exchanges between the presenters and the audience (Internet "attendees" will have the same capability). Under this arrangement, speakers will be able to poll the audience and display the results almost instantaneously. Similarly, those attending can compose questions for the speaker as they listen to the presentation.

## 2001 SAE President makes his mark

The SAE presidency can be a difficult job, but in 2001, SAE President Neil Schilke met each task with aplomb. His accomplishments varied, but at the core of each was the high level of commitment that defines **GM**'s General Director, Engineering, and the focus he promised to deliver this year on the so-called three "I"s that would shape his term: impact, involvement, and innovation.

***2001 SAE President Neil Schilke.***

Among his many major accomplishments to date as SAE President, Schilke has signed Memorandum of Understandings (MOUs) with such pivotal groups as the Guangzhou China-based automotive companies; CATARC (Chinese Automotive Technology & Research Center); ICAS (International Council of the Aeronautical Sciences); SAE-Australasia; and Autovaz in Russia.

In addition, Schilke has established a working agreement with the Consumer Electronics Association (CEA), which connects automotive and consumer electronics industries for technical meetings and standards development, and he formalized an intent of cooperation agreement with the Taiwan Industrial Development Bureau, which defines SAE's position to facilitate government/industry/academia interface and to collaborate on meetings, professional development programs, and general interaction with Taiwan and Taiwanese engineers. He also developed an action plan with SAE China that furthers the relationship between SAE and SAE China by identifying five specific areas (professional development, translation/exchange of technical articles for publication, international conference coordination, standards development, and membership) with actions and due dates for measurable progress.

Other activities that Schilke was directly involved with include:

- Reorganized SAE Board of Directors (BOD) and annual nominating process to ensure better connectivity of SAE to industry and create the opportunity for more senior level industry influence on SAE programs and priorities.
- Institutionalized top-tier measures, which drive SAE staff and all operating boards and committees to focus on and be measured against agreed-to priorities.
- Established the SAE Diversity Acceleration Council to aid the BOD in its diversity initiatives.

***Continued on page 21***

## Ford takes lead role in SAE 2002

Getting the thousands of parts in a typical vehicle to work in concert is no easy task for automotive engineers, and the job may not get easier anytime soon. That's the good news. The bad news is that engineers who don't raise their game to the next level may end up not having a job anytime soon.

In the words of Will Boddie, the **Ford** Motor Co. Vice President of Global Core Engineering who is serving as Chairman of the SAE 2002 World Congress, "Product development and engineering are absolutely critical success factors in this business. You cannot be successful without having an outstanding product development capability and organization, as well as technical excellence. That has been proven time and time again."

Moreover, he added, "The importance of engineering is increasing because the competition is increasing. People in the business are getting better and better, customer expectations are getting higher and higher, government requirements are getting tougher and tougher, and economic pressures are getting stronger and stronger. You add all that up, and most of those problems are solved in some way through product development. So, as all those pressures intensify, the value of high-quality product development becomes greater."

As does the importance of SAE's Congress, which offers a

***Continued on page 3***

## Today's Congress highlights

- OESA Panel "Supplier Best Practices in e-Business—Room W1-51, 9:00-11:00 a.m.
- Modeling of Diesel Engines—Room D3-22/23, 9:00 a.m.-5:00 p.m.
- Magnesium Technologies for the Automotive Industry—Room D3-24/25, 9:00 a.m.-5:00 p.m.
- Foresight Vehicle Technology—Room W2-64, 9:00 a.m.-5:00 p.m.
- STS Conference Within a Conference—Room D2-15, 9:00 a.m.-12:00 p.m. and 1:00-5:00 p.m.
- Hot New Body Styles for the Future and Why They're Catching On—Room O2-33, 1:00-3:00 p.m.
- Hybrid/Fuel Economy—Room D0-04AB, 1:00-5:00 p.m.
- Blue Ribbon Panel: Environment and Regulatory Policy—Room W1-51, 4:00-6:00 p.m.

*Ford takes lead role...continued from page 1*

***Will Boddie of Ford Motor Co. is serving as Chairman of the SAE 2002 World Congress.***

motherload of automotive information detailing the industry's challenges and business strategies for overcoming them. Boddie did his best to get out the word about the value of Congress while making sure that prospective attendees from Ford are made aware that the company will cover costs associated with attending. He encouraged executives from other OEMs to make the same case to their employees.

Ford engineers will author more than 50 of the 1200+ technical papers to be presented at Congress—by far the most among OEMs. As host company for the event, Ford is demonstrating its commitment in other important ways. Nick Scheele, President and Chief Operating Officer, spoke to industry leaders in at the SAE Executive Breakfast, marking the official beginning of Congress season and will participate in this afternoon's Blue Ribbon Panel, which will be moderated by one of his top lieutenants, Susan Cischke, Vice President-Environmental & Safety Engineering. James Padilla, Group Vice President-Ford North America, will be the principal speaker at Thursday evening's banquet.

The basic blocking and tackling issues associated with hard-core engineering and product development will be covered, as always, in the technical sessions and on the show floor. Numerous panels will bring to light to a range of technical and non-technical issues; among the most important will be Executive Panels, a new Congress feature. They should be of great value not just for senior-level executives interested in hearing what their counterparts have to say, but also for engineers, Boddie said. One of the goals of Congress organizers was to increase attendance among executives, who will be able to gain valuable insight not just by observing the panels, but by interacting with their high-ranking colleagues.

"There are not a lot of forums where that tends to occur freely and easily like it does at Congress," said Boddie. "On that basis alone, it is appropriate that…senior-level executives should attend." Consisting of senior-level executives from OEMs and major suppliers (and, in some cases, government regulatory officials), the panels will address hybrid vehicles (Wednesday) and diesel engines (Thursday).

The executive panel topics were chosen by the Congress Organizing Committee, led by Boddie, and were organized by Ford executives.

Patrick Ponticel

## Foresight Vehicle Program: The UK's response to the global transportation crisis

Balancing increasing personal mobility needs with environmental, safety, and transportation infrastructure concerns is no easy task. To remain competitive, every global automaker is searching for vehicle technologies the meet modern expectations for mobility while also satisfying strict environmental, safety, and pricing concerns.

The UK has responded to the challenge with its **Foresight Vehicle**, a national automotive research and development program aimed at promoting technology that stimulates suppliers to develop market-driven components for future ground vehicles that meet safety, cost, performance, and desirability issues. Beginning today, 46 papers describing completed as well as ongoing Foresight Vehicle projects will be presented during sessions from 9:00 a.m.-5:00 p.m. Monday through Thursday in Room W2-64. Numerous technology topics will be addressed, including radio technologies for future telematic systems, driver assistance for the elderly, disabled and able-bodies, and the 3DayCar.

"There is a worldwide transportation crisis, and the Foresight Vehicle program is the UK's answer to helping solve it," said Michael Sporton, Foresight Vehicle Program Coordinator. "The team combination of government, industry, and academia has the key to the success of the project."

Foresight Vehicle, a joint venture between the UK government and automotive industry, was launched in 1997 and now comprises 108 projects worth more than £70 million. The program focuses on developing vehicles for mass-markets by 2020 that are clean, efficient, lightweight, telematic, and intelligent. For more information, visit www.foresightvehicle.org.uk.

Jenny R. Hessler

## Blue Ribbon Panel scheduled today

The theme of this afternoon's Blue Ribbon Panel is Environmental & Regulatory Policy: The Role of the Modern Diesel. **Ford** as host company selected the environmental Congress theme. Company Chairman and CEO William Clay Ford Jr. is an environmentalist who has expressed concern over his own company's production of certain vehicles with poor fuel economy. The company in 2000 launched a campaign called Cleaner Safer Sooner, with the pledge to, among other things:

- Improve the fuel economy of its SUV fleet by 25%
- Make its light trucks, SUVs, and Windstar minivans low-emissions vehicles
- Put a fuel-cell vehicle on the road by 2004
- Develop a hybrid version of the Ford Escape for road use by 2003.

While Cleaner Safer Sooner (part of a broader strategic vision called "sustainable mobility") is not listed as such in the Congress program, the technologies that will enable it to be achieved will be addressed thoroughly in technical paper presentations.

***Ford's PowerSmart transaxle case houses a traction motor and a generator. To be used on the Ford Escape HEV planned for launch in 2003, it is one of the technologies the company will deploy to meet its Cleaner Safer Sooner commitments.***

Balancing environmental objectives against those relating to cost and customer satisfaction is a tough nut to crack, according to Congress Chairman Will Boddie. "It's pretty clear that outside the U.S., the $CO_2$ requirements in Europe and Japan are large, and meeting those while at the same time maintaining economic viability and satisfying customers is an unbelievable challenge," he said. "Frankly, the requirements in the U.S. are not as stringent, but are likely to become as stringent, and our ability to deal with those as an industry without producing some severe economic dislocations...is really critical."

For the engineer, "You've got package issues, you've got quality issues, you've got cost issues, you've got styling issues, you've got functional issues," Boddie added. "The real job of the engineer is to balance all those things appropriately so you get the best package—the best system. You have to focus on the system and make the best tradeoffs so the system satisfies the customer in the particular vehicle segment or brand that you're talking about. Different segments have different requirements; different brands have different requirements. It's an extremely complicated equation, and there's no cookbook for it."

With increased competition and the evolution of technology "rewriting the book," Boddie said, companies that hope to succeed must answer with precision the question, "Where do you want to be?" More specifically, he said, companies must be able to answer with clarity questions such as "What do you want your particular brand to be known for? What does your company want to be known for?"

Boddie is not saying engineers and corporate leaders will find all the answers at the SAE Congress. On the other hand, "Considering the pace of change in the areas of environment, safety, powertrain, etc., it's very important that people get together to understand better where the industry is and to share best practices and build on each other's success," he said. "I think this particular Congress is a very good focal point for doing that—and it has been for a number of years."

Patrick Ponticel

## Young Engineers Lounge

SAE's f(c) program for young professionals will host a Young Engineers Lounge on the exhibit floor at the SAE 2002 World Congress. Young engineers can stop by Booth 3447 to take a break, check e-mail, and grab some refreshments. The lounge also will feature a mini-basketball free throw contest with a Palm Pilot for the week's best score. On Monday at 10 a.m., the lounge will host a breakfast with members of the VIP Tour, providing the opportunity for younger engineers to meet and network with SAE and industry executives. On Tuesday at 2:30 p.m., attendees are invited to form teams and compete against other engineers to build a winning vehicle with the parts from SAE's "A World In Motion: Challenge 2" kits. Finally, on Wednesday at 11:00 a.m., student design competition alum, Clean Snowmobile Challenge creator, and 2002 WEC/BREED Award for Women's Leadership award winner Dr. Lori Fussell will speak about "Entrepreneurial Spirit, Empowerment under 40, and SAE." The Young Engineers Lounge will be open daily during exhibition hours. For more information about SAE's f(c) program, call 1-724-772-7131 or e-mail fc@sae.org.

Jenny R. Hessler


## Editorial staff

*Automotive Engineering International* editorial staff for the Show Daily can be reached during show hours at Booth 801 or by calling (313) 393-4327.

Kevin Jost,
Editor
kevin@sae.org

Frank Bokulich,
Associate Editor
bokulich@sae.org

Jean L. Broge,
Associate Editor
jbroge@sae.org

Patrick Ponticel,
Assistant Editor
ponticel@sae.org

Jenny R. Hessler,
Assistant Editor
jhessler@sae.org

Ryan Gehm,
Assistant Editor
rgehm@sae.org

Kami Buchholz,
Detroit Editor

Linda Trego,
Correspondent

Wayne Silvonic,
Production Manager

Christian Bonicky,
Katie Korol,
Contributing Artists

## Diesel emissions control: 2001

Developments in diesel emissions control will be presented today at the Diesel Exhaust Emission Control (SCR) Technical Session in Room M3-32 at 9:00 a.m. One study conducted by researchers at **Corning** Inc. showed that the role of advanced diesel emissions control technology is increasing in importance.

*Nanoparticulate research*: High-dilution rate laboratory set-ups are getting close to simulating actual exhaust plume nanoparticle conditions. The first results show the large impact of fuel sulfur levels on very-fine nucleation-mode particles. Increased fuel-injection pressures decrease nanoparticle concentrations and average size, as does earlier injection. EGR and pilot injections increase nanoparticles. Homogeneous charge-compression-ignition (HCCI) engines still have nucleation mode nanoparticles on the same order or higher than conventional diesels, but with reduced soot or accumulation mode particles.

*Filters and PM control*: Filter regeneration methods are becoming simpler and more integrated. For example, catalyzed filters might replace the fuel-borne and oxidation catalysts on European passenger cars. Filter properties are becoming better understood, especially regarding durability and the effect of pore size distribution on back pressure. Some insights into the fuel penalty associated with back pressure are emerging. Quantification of filter and application engineering requirements and performance in retrofit applications is emerging, thus advancing the field.

*NOx control*: SCR is emerging as the leading NOx-reduction technology in Europe to achieve Euro IV (2005) and Euro V (2008) HDD standards. Tuning the engine for low particulate matter (PM), thus eliminating the need for filters, results in high NOx emissions and better fuel economy. The NOx can be treated with a nominally 65 and 80% efficient treatment to achieve the respective regulations. Even after considering the effective fuel penalty of the required urea reductant, the fuel savings can be as high as 7% relative to a Euro III baseline.

*Lean NOx traps*: Last year, reports of lean-NOx-traps (LNT) technology applied to diesel engines were emerging. Preliminary desulfation strategies were reported and the first results for HDD applications emerged. Engineers reported on how best to manage the regeneration strategies and driveability. More details emerged also on how to design a NOx trap system for heavy-duty applications, how to regenerate NOx traps more efficiently, and quantification of the sulfur problem and desulfating LNT systems.

*SCR*: Last year, the performance of SCR catalysts using NOx oxidation catalysts were emerging, resulting in improved performance and reduced system size. Urea-injection strategies were being perfected, and the first reports on long-term durability were emerging. Last year was characterized by further refinements in SCR catalysts and systems; more quantification of potential slip of ammonia, urea by-products, and $N_2O$; and descriptions of new systems for dispensing urea at the pump and into the exhaust system.

*Non-thermal plasma excitation*: Much work is being done to advance the technology of non-thermal plasma excitation of exhaust components to make them more reactive in downstream or entrained catalysts. The technology is attractive because it is sulfur tolerant and potentially offers NOx removal efficiencies in the range of 80%, in addition to soot oxidation at relatively low temperatures. Technology circa 2000 resulted generally in systems using model gases removing 70-80% of NOx with effective fuel penalties (electrical plus reductant) of 5-6%, with a projection for commercial LDD applications of about 60% efficiency at a 6% total fuel penalty.

*NOx emissions control*: Despite the differences in maturity, rapid progress is being realized for both LNT and SCR systems. Regarding LNTs, technology reports are surfacing involving regeneration frequencies, system sizes, and LNT design. As LNTs are very sensitive to sulfur poisoning, significant efforts are reported in this topic, with major advances in understanding emerging. On SCR, results on base metal and zeolite catalysts are reported, showing alternatives to the vanadia-based systems. Knowledge in non-thermal plasma is also advancing, with significant improvements in efficiency and fuel economy being reported.

*NOx/PM integrated solutions*: Ultimately, PM and NOx solutions are going to have to be integrated. The choice of the system will depend on total system performance and cost relative to the requirements. It is clear that the filter system affects the NOx system and visa versa. In filter/EGR systems, the EGR increases exhaust gas temperature but drops NOx, impacting filter regeneration. Conversely, one might expect filtered EGR gas to have different impacts on engine performance (wear) than unfiltered gas. Catalyzed filters ahead of the LNT can partially reform fuel to impart better LNT regeneration. When integrated into one unit, there are indications of reaction intermediaries from the LNT reactions impacting how soot is oxidized.

Linda Trego

***Diesel particulate filters are a key technology to allowing diesel engines to meet emissions regulations through 2010.***

# AEI Tech 2002 Awards

***Each day, AEI Show Daily editors highlight some of the top products and technologies on display at the SAE 2002 World Congress.***

## Support software

**e-GIP Software** AG has developed an intranet- and Internet-supported innovation process called the electronic-Generic Innovation Process (e-GIP). The software is a knowledge and process platform for the support of innovation and workflow management. It is an assistant for project management, a platform for idea management, and an information center for all project activities. The specific connection to mailing systems enables automatic control of all project-relevant activities, which enables e-GIP to increase the performance of processes and the efficiency of employees by a noticeable margin.
Booth 2460

## Release coatings

**DuPont** TraSys water-based release coatings are environmentally safe, enabling molders to meet even the most stringent existing and anticipated environmental regulations. TraSys is free of volatile organic compounds and ozone-depleting chemicals. DuPont also has eliminated chlorinated solvents from its release products rather than replace them with carcinogenic solvents or flammable alcohols. The releases are manufactured using highly effective, stable raw materials and are mixed in a unique blending process to yield the desired durability. Product consistency and reliability keep production running smoothly, while competitive pricing, combined with the high levels of performance and longevity, provides the most cost-effective release available for elastomer molders.
Booth 2632

## Cam phaser

**Hydraulik-Ring**'s camshaft adjustment systems offer increased power and torque, reduced fuel

consumption, and improved capability to meet emissions requirements. Whether a chain- or belt-driven system, the company offers a solution for all types of cylinder heads and for any number of cylinders. Hydraulik-Ring also is developing new lightweight designs to meet future requirements for reduced weight and inertia.
Booth 3138

## Plastic welding

**Leister Lasersystems**' Novolas OEM is an integrated system that can be used for plastic welding and soldering with lasers. It is available as an -S version with a fiber-coupled spot laser and an -L version with a line laser. Optics, clamping devices, positioning, and process control can be selected to match each application. The graphical user interface uses Windows NT-based software and provides for simple and quick programming of all machine parameters.
Booth 3350

## Real-time controller

The COM20070A EC-NET Real-Time Communication Controller from **Toyo Microsystems** Corp. is an optimized network controller for embedded real-time control applications. Co-developed with **Subaru**, EC-NET was originally designed for use in automotive control networks, but its enhanced feature set and deterministic protocol make it suitable for embedded applications requiring real-time control. Subaru's first application of the system is in a control network for the various environmental and operational functions of buses. The system's features include high throughput, deterministic performance, mirroring RAM data, real-time clock adjustment, and improved token-passing protocol.
Booth 2630

## PDA integration

**Pi Technology** has developed applications for **Palm** Corp.'s Bluetooth radio for the Palm Vx that allow the user to control the vehicle radio and CD player without using the audio system controls. From the PDA, users can perform functions such as selecting tracks on the CD and adjusting the volume. Bluetooth is suitable for in-vehicle use because of its electrical noise tolerance. Applications include PDAs that instruct the vehicle's navigation system based on the day's diary, phones that integrate with the vehicle's audio system for hands-free operation, trip computers that automatically download information to the driver's PDA for trip reports and expense claims, and wireless audio systems.

Booth 1781

## Software development

TTP-Tools from **TTTech Computertechnik** AG support embedded software engineers with a powerful production development environment for building a fault-tolerant, real-time, time-triggered communication architecture. The TTP-Tools software addresses the needs of the systems engineer in the automotive, aerospace, and industrial control application domain. TTP-Tools provide rapid, harmonized, and systematic development while smoothly integrating into the existing development process. The 5th generation of TTP-Tools includes enhanced functionality and algorithms for fault-tolerance, new user interfaces, as well as support for the TTP/C chip generation. With TTP-Matlink and TTP-Tools, the user can design a model, generate application code and fault-tolerant communication drivers with specialized code generators, download the resulting application right down into the target, then calibrate and test the distributed application.

Booth 2413

## SSA presents driver distraction report

Through the auspices of the **SAE Strategic Alliance** (SSA), the State of the Industry for Driver Focus Research is scheduled for Tuesday, March 5, from 2-5 p.m. in Room D3-16/17/18. This panel session will highlight the current state of research into areas involving distracted driving and the proposals made and discussed at the Motorola Research Summit held on August 13, 2001. The panel will discuss how the proposals should be used for maximum impact on both policy and technology and how the research should be funded.

Jenny R. Hessler

# Exhibitors List

***Companies are listed alphabetically and include booth number.***

# Exhibitors List



## D



## E



## F

# Exhibitors List



## G



## H



## I



## J

# Exhibitors List

# Exhibitors List

# Exhibitors List



## U



## V



## W



## X



## Y



## Z

# What's New from the exhibitors

***The SAE 2002 World Congress provides industry suppliers the opportunity to showcase their products, services, and technologies to the global automotive community. Show Daily previews what some exhibiting companies plan to display this year.***

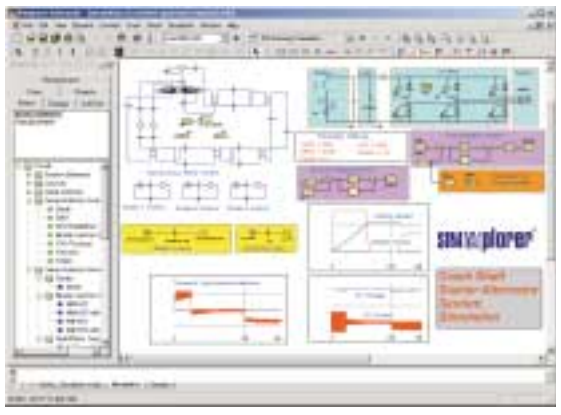
## Height sensors

Rollover propensity testing demands dependable, highly accurate, vehicle-height measurement sensitivity in dynamic conditions whether in sub-arctic cold or on desert tracks at high temperatures. **A-DAT**'s OPTIMA FM height sensor operates

in IR 24 hours a day regardless of weather, providing no light sensitivity. Using laser-based triangulation and position-sensitive device technology, the tool weighs less than 0.5 kg (1 lb), mounts 317 mm (12.5 in) above ground level, and permits a ±178 mm (7 in) measurement range. Small and compact, the device connects with virtually any data-acquisition system or dashboard display.

Booth 535

## Electromechanical/electrohydraulic simulation



SIMPLORER from **Ansoft** is a design suite for electromechanical and electrohydraulic systems used in the automotive industry. It covers a range of applications including onboard power networks, 42-V systems design, and electric and electric-hybrid vehicles. The product combines advanced, non-Spice circuit simulation with a powerful block diagram and a sophisticated state machine simulator. The kernels run simultaneously in a simulator-coupling environment, providing high numerical stability. The coupling technology also provides an open programming interface to include other industry tools. The company's latest release, SIMPLORER 4.2.1, has an extended model generation capability that allows the use of the latest power semiconductor technology. The parameterization process uses SIMPLORER's optimization tool to adapt the model parameters to the required behavior.

Booth 2351

## Exhaust gas aftertreatment

**AVL List** GmbH has developed heavy-duty diesel engines complying with Euro 4 emissions legislation without the use of particulate traps or DeNOx catalysts. The technology builds on advanced fuel-injection equipment combined with AVL's combustion knowledge and holistic development approach. A dynamically controlled EGR system is applied. An Oxicat is added to compensate for production tolerances affecting the lube-oil control. Test results show a 20% margin to the legislated emissions limits. On-road fuel consumption is similar to current Euro 3 compliant engines. The technology is also applicable to off-road engines to meet Tier 3 requirements.

Booth 1001

## Sound and vibration measurement

With Version 6.1 of PULSE, **Brüel & Kjær**'s sound and vibration measurement platform offers spatial transformation of sound fields such as near-field acoustical holography on data generated by the Acoustic Test

Consultant for near-field analysis and source location. It also features steady-state response analysis and arbitrary waveforms on PULSE; multiple-input, multiple-output analysis (supported by Modal Test Consultant) and a new version of operational modal analysis; envelope analysis using amplitude demodulation (*e.g.*, for the diagnosis of roller bearing elements and the identification of gearbox faults); and all-in-one input/output module up to 102.4 kHz.

Booth 838

## Interior impact

A turnkey solution for interior impact testing from **BIA** is capable of FMVSS201 interior impacts at 42 km/h (26 mph), 10 kN (2250 lbf), and 1% accuracy. Impact test parameters are configurable by entering the required test conditions into a Windows-based control system and leading the

robotic-type impactor to the desired impact point. The test system comes complete with PC-based controls, a laser positioning system, photography equipment interface, and an integral hydraulic system. The only facility requirement is electrical power. By adding an optional high-speed impactor, the system can simulate pedestrian impacts.
Booth 751

## Air-fuel ratio meter

**ECM**'s AFRecorder Model 1200B air-fuel ratio (AFR) meter is a compact, handheld meter that measures AFR using an exhaust-mounted, wide-

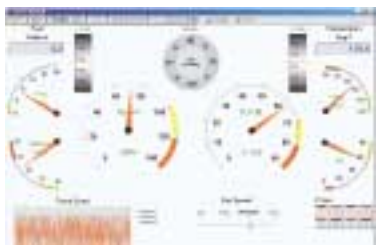

range UEGO sensor. Programmable for all fuel types and compositions, it can display AFR in Lambda and $\%O_2$ units. Other features include an analog output, a programmable EGO simulator, and large, built-in nonvolatile recording memory. With the supplied PC software, the meter will record and plot in real time. The model is one of six AFR meters offered by the company.
Booth 1025

## Plastic mount

A saddle mount from **HellermannTyton** provides abrasion protection between bundles and frame rails. Designed for use with the firm's button-head ties, the saddle mount provides clearance for the bundle from bolts and other protrusions, which can cause abrasion. It also helps keep dirt and grease from the bundles and hoses. The saddle mount can secure three separate bundles, providing parallel spacing between the frame rail and adjacent bundles. Manufactured from high-impact, heat-stabilized, black nylon 6/6, the mount is suitable for continuous high-temperature applications. The mount is manufactured with a pilot bushing that prevents the cable tie from chafing against the burr edge of the mounting hole.
Booth 538

## Data acquisition

ViewDAQ is real-time display software for use with **Campbell Scientific**'s CR5000 and CR9000 data-acquisition systems. With drag-and-drop functionality and other



easy-to-use design features, it is suitable for creating scenes that provide real-time display of data during vehicle testing. Screens can be configured with any combination of dials, gauges, compasses, thermometers, LEDs, strip charts, and other display elements. Control features such as flags, switches, potentiometers, and variable settings can also be incorporated into the screens to provide real-time control. Operation of the units with or without ac power or a PC makes the systems effective in either portable or stationary applications. The CR9000 features a maximum throughput of 100 kHz. The CR5000 is a self-contained, stand-alone unit with 40 single-ended (20 differential) analog inputs, two pulse counters, two continuous analog outputs, four switched voltage excitations, four current excitations, and eight digital I/Os.
Booth 804

## GPS sensor

The MicroSAT GPS sensor from **Corrsys-Datron Sensorsystems** performs dynamic, noncontact vehicle speed and distance measurement. It uses military-

grade global-positioning data to provide slip-free speed measurement at 0.1% accuracy. The unit is also suited to off-road testing, as well as testing and measurement of watercraft and aircraft. It is designed to enable a single person to conduct performance tests quickly and easily. It can switch automatically between acceleration and brake test screens for data viewing. Through an acceleration run, the system analyzes speed gain and stores the data as a separate test. It also logs braking tests. The acquired data can be viewed as a series of individual tests or as an overall plot of the entire test run. The sensor is available in three configurations, with the capacity to accommodate up to 16 additional external sensors.
Booth 942

## Electrical design analysis

A new version of the AutoSteve electrical design analysis toolkit from **FirstEarth** Ltd. integrates with eSys Design, a wiring harness design tool from DB Soft UK that is built on top of AutoCAD. The new port provides a complete drawing, design, and analysis tool for electrical engineers. AutoSteve is an integrated toolkit that enables engineers to simulate quickly the behavior of electrical schematics and to see the results displayed on the schematic. Based

on simulation, AutoSteve automatically performs failure-mode and -effects analysis (FMEA) and sneak-circuit analysis (SCA) on electrical wiring systems. The result of the FMEA is a natural-language report that describes the effects of applying all possible failures to the circuit. The result of the SCA is a complete set of switch combinations that can cause sneak paths in a design. AutoSteve uses advanced techniques from the field of artificial intelligence to determine the circuit activity based on the behavior of the components.
Booth 1379

## Real-time controller

The COM20070A EC-NET Real-Time Communication Controller from **Toyo Microsystems** Corp. is an optimized network controller for embedded real-time control applications. Co-developed with **Subaru**, EC-NET was originally designed for use in automotive control networks, but its enhanced feature set and deterministic protocol make it suitable for embedded applications requiring real-time control. Subaru's first application of the system is in a control network for the various environmental and operational functions of buses. The system's features include high throughput, deterministic performance, mirroring RAM data, real-time clock adjustment, and improved token-passing protocol. A stand-alone mode allows the device to send and receive data without CPU intervention, thus eliminating the need for CPU, RAM, and Flash-ROM and resulting in lower per-node cost.
Booth 2630

## Intake manifold

**Keihin** Corp. is producing a composite intake manifold for the Honda Civic to accompany the one already being produced for the Honda Accord. Both plastic manifolds are part of complete intake-manifold assemblies supplied by Keihin. By using a composite material, the company was able to work with Honda in achieving a higher level of

shape complexity and part integration, thus gaining easier assembly and reduced cost. Keihin also offered engineering support and worked with other suppliers to meet the high level of quality and refinement required by the customer for the new material.
Booth 2525

## Pyrotechnic activator

To help prevent serious neck injuries during a typical rear impact, **Hirtenberger Automotive Safety** has developed a pyrotechnic activator for crash-active headrests. In the case of a rear impact, the device moves the headrest toward the occupant's head in less than 20 ms. Due to the quick and reliable reaction achieved by using pyrotechnics and sensors, the system presents a significant improvement in comparison to conventional systems. The system also is easily reloadable and, therefore, cost competitive. By launching the system in the new BMW 7 Series, the company is the first supplier of a pyrotechnic anti-whiplash system.
Booth 2413

## Condensation weathering instrument

**Atlas Electric Devices** Co.'s UV2000 is an easy-to-use fluorescent UV condensation weathering instrument. It tests the effects of the sun's ultraviolet light on coatings, plastics, pigments, textiles, adhesives, sealants, and other materials. The device operates with a break-

through power supply system designed to increase bulb life, eliminating the need for bulb rotation while generating steadier output. The unit comes with a Siemens controller that features an intuitive touch-screen display to set up test parameters. The instrument offers a microprocessor-based control with test parameter storage. It provides complete irradiance control as well as enhanced air and temperature distribution. The UV2000 meets the requirements of SAE J2020, ASTM G53, JIS D0205, BS 2782, Part 5, and other industry standards.
Booth 1049

## X-by-wire

**Intensa** offers a toolbox of mechatronics solutions for the next X-by-wire generation. The steering, throttle, brake, shift, and suspension control systems will replace traditional mechanical hardware with highly reliable networks of actuators, control units, sensors, wiring, and communication protocols such as Time-Triggered Protocol or FlexRay. The company also features programs covering control unit housings for accommodation of the PCB with precision insert-molded, multi-pin connectors and provides bondable, insert-molded solutions for miniature noncontacting sensors (*e.g.*, pedal and throttle position sensors). In addition, Intensa and its manufacturing partners offer gold-plated contact pins for improved conductivity as well as completely sealed housing and wire harness designs.
Booth 2413

## Plastic welding

**Leister Lasersystems**' Novolas OEM is an integrated system that can be used for plastic welding and soldering with lasers. It is available as an -S version with a fiber-coupled spot laser and an -L version with a line laser. Optics, clamping devices, positioning, and process control can be selected to match each application. The graphical user interface uses Windows NT-based software and provides for simple and quick programming of all machine parameters.

Booth 3350

## Linear displacement sensor

The LD-50 noncontact, linear Hall sensor from **Power Components of Midwest**, Inc. is a hermetically sealed unit that is available in either single or dual programmable outputs in any combination of 0 to 5 V dc, PWM, or specific switch points. The unit can sense from 12.7 to 762 mm (0.5 to 30 in) of travel with resolution to ±0.025 mm (0.001 in) and linearity of 1% over the temperature range of -40 to +150°C (-40 to +300°F). Mechanical life expectancy is in excess of 30 million operations. Custom termination and mounting configurations are available, as well as complete custom packaging with integral connectors.
Booth 2456

## Check valves

The **Lee** Co.'s CCPI Series Press-In Chek is a miniature cartridge-style check valve designed for installation into plastics. Available in 5.5- and 8-mm (0.22- and 0.31-in)

diameters, the valve features a robust barbed design, which allows easy installation, provides retention, and prevents any bypass leakage around the valve. Each valve is tested for flow, leakage, and cracking pressure to ensure consistent long-term performance. The device is offered in cracking pressures from 0 to 500 kPa (0-72.5 psi) and is compatible with most fluids.
Booth 624

## Occupant safety testing

**Microsys Technologies** Inc. will display and demonstrate Version 5.0 of its SureFire occupant safety test-system control software. The new release includes upgrades in database functionality and enhanced camera control. Database functionality eases the handling of large image and sensor data files created during a test and handles system configuration and calibration issues. Customers can choose either Oracle or Microsoft Access as the database engine. The software also features camera control options for high-speed digital cameras; camera parameter management with information such as parameter settings, serial number, current lens, and current assignment; and Auto-AVI creation based on predefined frame ranges and corrections. In addition, it has the ability to save and recall "test profiles" to simplify and speed setups, and can be completely integrated with high-*g* sled crash simulation facilities.

Booth 819

## Magneto-rheological fluid

**Lord** Corp. and **Delphi Automotive Systems** co-developed the magneto-rheological (MR) fluid used in Delphi's MagneRide semi-active suspension system, which features a

monotube design with no electromechanical valves or small moving parts. The peak power is 20 W at each of the system's four dampers. The specially formulated MR fluid has a low viscosity that is forced through a magnetized opening in the MagneRide damper. The material changes from a fluid state to a semi-solid state that is directly proportional to the magnetic field applied to it. Magnetic particles in the fluid form a dense network of chains when a magnetic force is applied to them. When it is removed, particles revert to their free, unchained form and allow movement of the dampers. MagneRide provides a 5-ms response time, which is three to five times faster than the hydraulic system in the CVRSS damper.
Booth 1711

## Multi-protocol analyzer


**Dearborn Group**'s Python is a multi-protocol analyzer that is designed to interface with all OBD networks including CAN, J1850 PWM, J1850 VPW, ISO 9141-2, and KWP 2000. The versatile networking tool communicates with a PC by the use of a USB port or RS-232 cable. It is intended for a variety of applications including end-of-line testing, diagnostics, and development. The Python's hardware includes an API, which makes it suitable for users to write their own software applications.
Booth 959

## Triaxial ICP accelerometer

The Model 356A32 triaxial ICP accelerometer from the Vibration Div. of **PCB Piezotronics**, Inc. features a 100 mV/*g* output signal, 300 µ*g* resolution, and a small, lightweight, titanium housing. Additionally, a four-pin electrical connector with positive keyway achieves the convenience of a removable cable without risk of bent pins. The unit is suited for modal and structural vibration analysis on automotive and aerospace structures as well as automotive NVH and general-purpose applications. Shear mode, piezoceramic sensing elements account for the high sensitivity and accuracy through a frequency range of 0.7 to 5000 Hz (±10%).
Booth 1115

## PDA integration

**Pi Technology** has developed applications for **Palm** Corp.'s Bluetooth radio for the Palm Vx that allow the user to control the vehicle radio and CD player without using the audio system controls. From the PDA, users can perform functions such as selecting tracks on the CD and adjusting the volume. Bluetooth is suitable for in-vehicle use because of its electrical noise tolerance. Applications include PDAs that instruct the vehicle's navigation system based on the day's diary, phones that integrate with the vehicle's audio system for hands-free operation, trip computers that automatically download information to the driver's PDA for trip reports and expense claims, and wireless audio systems.
Booth 1716

## In-mold decorating


Gemini in-mold decorating from **Serigraph** Inc. is a multi-layered, in-mold decorating process targeted at supplanting the spray-painting process for plastic automotive parts and components. The construction combines in-register screen or offset printed graphics with the firm's proprietary adhesive, coating, forming, and in-mold technology. The resulting technology eliminates environmental concerns raised by spray painting, speeds up production, and lowers costs. Instead of shipping parts from molder to painter to assembler, the product enables simultaneous decoration and molding of the entire part and logos or graphics. Logos, colors, and other decorative or identification needs are screen or offset printed on a sheet of clear material, which is then laminated to another sheet or sheets of material. The resulting decorative surface provides almost bulletproof durability. The application is suitable for metallic looks and colors for telematics, GPS displays, lenses, and onboard entertainment systems.
Booth 517

## Tin coating

**Olin Brass**'s extensive research into the understanding of tin coatings and their resultant performance related to contact physics has lead to the development of Advance Tin and Super Thin Advance Tin coating technology. Pin counts for multiple termination connectors continue to go up, and any decrease in robustness to lower the insertion efforts could impact contact stability. STAR (Super Thin Advance Reflow) and Advance Tin Reflow offers a solution to this problem. Instead of reducing the normal force of the connector to improve/lower the efforts, a thinner coating with lower coefficient of friction values could be used.
Booth 2950

## Oil-pan filtration

The all-plastic oil-pan-filtration system from **SPX Filtran** integrates different processes and components into one product. It is designed to provide a "fill for life" concept for transmission filtration. The modularized system provides almost 50% system weight reduction over replaced components, cost reduction due to reduced number of components and assembly steps, synchronization of components (six into one system), and improved quality control due to one supplier rather than six. The suction inlet position allows the customer to reduce ATF consumption substantially while reducing cavitation.

Booth 2765

## Simulation table

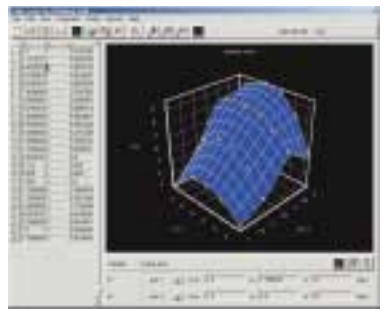
A high-frequency multi-axial simulation table from **MTS Systems** Corp. features a hexapod with six extensible servo-hydraulic

struts. It provides repeatable, high-frequency, six-degree-of-freedom simulation of the operating environment of automotive systems and components. Engineered to be stiff, the system delivers frequency content in excess of 250 Hz, giving it unique potential in both durability and noise and vibration testing. It offers sinusoidal testing, including sine sweep and sine dwell, and time history reproduction using MTS' Remote Parameter Control software. To ensure accuracy, controllability, and repeatability over a broad frequency range, the system uses displacement, velocity, and acceleration feedback in conjunction with a three variable control algorithm.

Booths 1011 and 1211

## System design environment

iQBus from **Avant!** Corp. is a complete design process solution offering specification entry, system tradeoffs, component development, and links to manufacturing. It is a database-centric development environment with a single point of data entry. The product supports the design of entire vehicles, system archi-



tectures, mechatronic systems, X-by-wire systems, hybrid systems, bus systems, power systems, cabling, and other vehicle design applications. It includes a mixed-technology simulator, Saber, for automated design verification and testing. It provides concurrency for using schematics contributed from different engineering departments and also offers several tools to capture and create models from any kind of data available. The model library contains 30,000 parts—ranging from various high-level control blocks to physical component implementations—from different engineering domains. Software and hardware can be designed in a virtual design environment with software-in-the-loop, including instruction set processor models, down to real hardware-in-the-loop.

Booth 859

## Road wheel material

The first prototype road wheel using **Thixomat**, Inc.'s Thixo-molded component was developed in Japan in a joint effort between **Japan Steel Works** and an automotive OEM. The hub of the wheel is a

Thixomolded magnesium alloy preform that is warm-forged to improve its structural integrity before it is fastened to the aluminum wheel body using chromium-plated steel bolts. The use of Thixomolding (>30% solids) was necessary to produce high-quality preforms with low porosity levels.

Booth 1454

## Digital oscilloscope

**Yokogawa**'s Model DL7200 four-channel, 2-Gs/s, 500-MHz bandwidth digital oscilloscope can trigger on and analyze CAN bus signals. The device's memory length—up to 16

Mword/channel—offers the ability to acquire many frames from a CAN bus. It can accommodate CAN bus rates from 33 kbps to 1 Mbps, as well as standard (11 bits) and extended (29 bits) data formats. It can trigger on start of frame, specified identifiers, RTR, specified data, and error frames. Once captured, the unit will analyze and display detailed CAN signal information in a binary or hex format.

Booth 1132

## Communication controller

The TTP/C protocol is finding more applications in safety-critical systems such as those used in the automotive industry. **TTTech Computertechnik** AG's new TTP/C controller models

are designed to meet the TTP/C specification and can be transferred to silicon as a stand-alone device or as part of an SOC solution. The C2 and C2S models allow communication at speeds up to 5 Mbit/s in asynchronous mode and 25 Mbit/s in synchronous mode. The configurable bus interface module affords 8-, 16-, or 32-bit width and either Intel or Motorola type accesses. The first TTP/C-C2 silicon implementation, a stand-alone controller, is available from **Austriamicrosystems** AG and has AS8202 as its device number. The firm will bring the C2S version, called AS8202S, on the market shortly after the AS8202. **NEC** is also implementing a stand-alone controller based on the TTP/C-C2S and supporting the full 32-bit host CPU bus interface.

Booth 2413

## Fan-cooled black light

When magnetic particle inspection is needed to check for cracks in long parts, the fan-cooled ZB-100F MB black light from **Illinois**

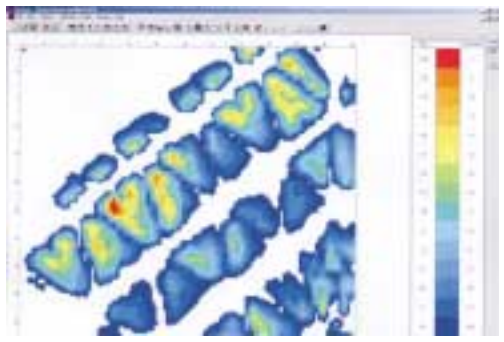
**Tool Works**' Magnaflux division can energize power packs or wet benches remotely. The black light has a remote button intergraded into its handle to eliminate the need to return continuously to the MPI Unit for another shot. The light can be retrofitted easily into existing equipment by obtaining the specific kit designed for the particular MPI Unit. A schematic and instruction sheet is provided with each new light.
Booth 3160

## High-speed video imaging

**NAC**'s Memrecam fx high-speed digital camcorders are suitable for airbag deployment and automotive test image acquisition. The

self-contained, digital, Hi-G system is capable of monochrome or full color image capture of up to 10,000 pps with resolutions of up to 1280 x 1024 pixels. The camcorders consist of the Memrecam 4,000 and K3. The 4,000 is a CCD sensor with full-frame resolution of up to 4000 pps and split-frame resolution up to 10,000 pps. The K3 is based on a CMOS sensor that provides up to 1280 x 1024 pixel resolution at 1000 pps. The 4,000 offers up to 4 s of record time at 4000 pps, and the K3 will provide 2-4 s record time at 1000 pps. The systems are easy to set up and operate either locally, at the camera, or remotely, via PC.
Booth 711

## Force and pressure sensor



**Sensor Products** Inc.'s Xsensor is a reusable electronic tactile force and pressure-indicating sensor system that allows engineers to monitor in real time how force is disbursed between any two contacting or mating surfaces. The Windows-based technology can be used in manufacturing process control as well as machine/component inspection and calibration where pressure is between 1.7 to 82,740 kPa (0.25 to 12,000 psi). It can aid the design and production of components with gasketed and flanged interfaces and also is suitable for analyzing pressure distribution in lamination, injection molding, impact testing, clutches, and brakes, as well as tire-tread-footprint analysis. The system, which consists of a sensor "skin," an interface controller, and software, indicates how surfaces deform and engage under stress and is useful as a confirmation of FE analysis.
Booth 1459

## Emissions control


Emissions legislation calls for a dramatic decrease of the emissions of heavy-duty diesel engines, especially NOx. The SINOx system from **Siemens Ceramics** and **Hydraulik-Ring** GmbH (a Siemens company) represents the technology to reduce NOx and HC emissions by approximately 80%, and PM emissions by 20-40%, thereby fulfilling the expected European NOx emissions requirements of 2008 even with today's engine technology and calibration. The companies combine their expertise to provide the major components of the SINOx system: the SCR catalyst, catalyst housing, urea dosing control unit, and SCR system electronic unit with control logic software.
Booth 2929

## Engine testing

The **Froude Consine** Texcel V8 engine test system is a control and data-acquisition system that is designed for transient test applications. The system can be supplied as part of a package of test equipment or as an upgrade to existing engine test cells. Passenger car and truck regulatory exhaust emissions tests may be carried out such as U.S. Federal test cycle FTP75, ECE-15,

and Euro IV. When used in combination with an AC dynamometer, the system may reduce development time by simulating in-vehicle engine testing. It will then correlate the data against that produced by a vehicle tested on a chassis dynamometer. Features include vehicle definition such as road-load model, gearbox, and clutch simulation; drive cycle definition, editing, storage, and management; and logging and data analysis. The use of ASAM-ACI and ASAM-MCD industry-standard software interfaces enables the controller to communicate with high-level development tools and ECU analysis tools. The engine and dynamometer can be controlled manually or automatically using the test sequence editor. An Ethernet link exports data to the company network.
Booth 2551

## Service Issues Day events planned

Today's Service Issues Day program gives engineers and technicians the opportunity to dialogue about critical issues facing both communities. Service Issues Day activities will begin at 8:00 a.m. in Room D2-15. Attendees will be updated on 42-V and new technologies affecting the service community in 2002. STS President Bob Pattengale of Ease Diagnostics will present STS research results regarding 42-V service technical requirements, concerns, and technician education and training issues. The day will include panel discussions on the relevance of industry-accepted practices and standards in the automotive service and parts market and the impact new technologies will have in the service community.

Jenny R. Hessler

## The steely side of metal

A four-door gasoline-powered sedan that meets 2004 U.S. and European crash safety requirements with five star performance, carries a $9500 estimated manufacturing cost, and achieves a city/highway average of 52 mpg is made of what?

The answer, according to presentations during Monday technical sessions by members of the **American Iron and Steel Institute** (AISI), is Advanced High-Strength Steels (AHSS). "These new, high-tech steels are an entirely new category of materials that combine very high-strength with excellent formability," said Andrew Sharkey, President and CEO of the AISI, based in Southfield, MI.

Extensive use of AHSS defines the Ultra Light Steel Auto Body-Advanced Vehicle Concept (ULSAB-AVC) project. "ULSAB-AVC is the latest in a continuing series of customer-centered initiatives our industry has executed over the past decade," said Sharkey, noting that various studies—ranging from a fabricated body-in-white (the ULSAB project of 1998) to the development of lightweight trucks for both military and commercial use (the IMPACT project)—demonstrate the viability of lightweight steel. So far, more than $44 million has been invested in the studies.

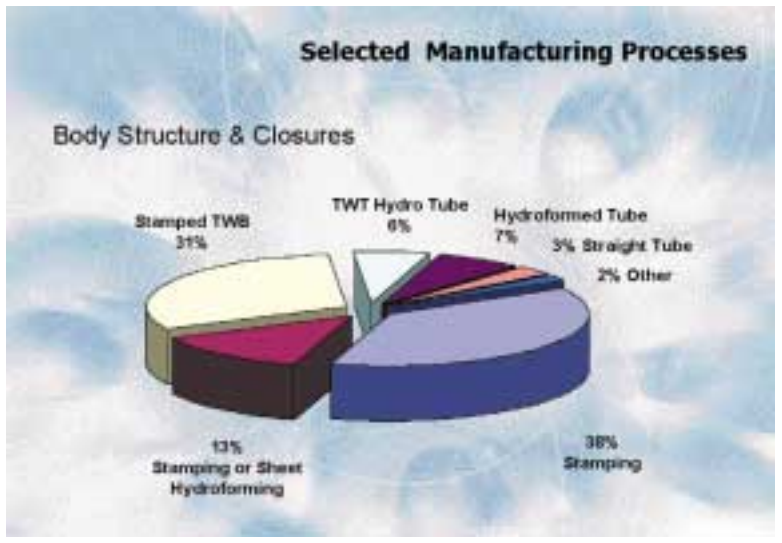
The ULSAB-AVCs, virtual vehicles dressed as both a 998-kg (2200-lb) gasoline-powered car and a 1031 kg (2273-lb) diesel-powered car, are represented via a two-door European C-Class hatchback and a four-door North American midsize sedan. AVCs reflect the latest advancements with High Strength Steels (HSS) and AHSS.

"The original ULSAB used mainly mild and conventional high strength steels with yield strengths up to 50.8 ksi (350 Mpa). The ULSAB-AVC used generally 50.8 ksi (350 Mpa) yield strengths and higher," said Blake Zuidema, Director, Center for Product and Applications Development for **National Steel** Corp., headquartered in Mishawaka, IN.

Body structure of the ULSAB-AVC is comprised of approximately 80% AHSS with the remaining 20% represented in other grades of HSS. The body structure contains 81 major parts and has a mass of 218 kg (481 lbs).

AHSS grades incorporate multi-phase microstructures, which contain martensite, bainite, and/or retained austenite. The resulting high-performance strength and formability "is an advantage for automotive applications," said Jody Shaw, Manager, Technical Marketing for **U.S. Steel** Corp. in Pittsburgh.

*ULSAB-AVC virtual study concepts reflect a SAFE (Safe, Affordable, Fuel Efficient, Environmentally Responsible) motif.*




*Stamping dominates the manufacturing processes for ULSAB-AVC.*

The cyberspace concept vehicles use advanced steels in areas beyond the body structure. For example, the double wishbone front suspension uses AHSS tailored blanks. Instrument panel beam, fuel tank, seat frames, bumper beams, wheels, and closures (hood, doors, deck lid) are steel. The closures incorporate high and advanced high-strength steels as well as tailor welded blanks and tubular hydroformed components.

"Tailored blanks account for nearly 40% of the body structures, with hydroformed parts making up more than 20% and tailored tubes comprising 6%. Stamping is the predominant steel forming method in ULSAB-AVC with more than 70% of the body structures and closure parts warranting use of this process," said Marcel van Schaik, Director of Materials Technologies for AISI.

Computer simulation tests predict the AVCs would earn five star safety ratings in the U.S. and Europe for full frontal, frontal offset, side impact, and side pole crash. (The safety ratings would tie to the anticipated requirements for 2004.) "We didn't feel that it was appropriate to build (a hardware prototype) now to prove what's already validated in our models," said Ron Krupitzer, Senior Director-Automotive Applications for AISI. The ULSAB-AVC study involved 33 steel producers. **Porsche Engineering Services**, Inc. of Troy, MI, was contracted for design and engineering management.

Kami Buchholz

## Security at the SAE 2002 World Congress

In light of the events going on in the world today, security is taking on a more important role for this year's event. SAE is doing everything possible to secure the event. Please use common sense in what you are carrying. Your patience and understanding during this time is appreciated.

*2001 SAE President...continued from page 1*

• Initiated top-level discussions with VDI-FVT (the German motor transport association), leading to a new and expanded MOU.
• Conducted the first-ever, all electronic BOD meeting.

Education was a big focus for the 2001 President, and he was able to see SAE's "*A World In Motion"* educational program formally accepted by the Los Angeles Unified Public Schools, Chicago Public Schools, and DODEA (Department of Defense Educational Activity). The program, which furthers the educational effort to get fourth through eighth graders interested in math and science, counts GM's Rick Wagoner as its Executive Committee Chair. Together, Wagoner and Schilke renewed their commitment to America's Promise—The Alliance for Youth in May of 2001 and were presented with the America's Promise symbolic *Little Red Wagon* by America's Promise Director and former Montana Governor Marc Racicot on the steps of the Capitol Building in Washington, DC. America's Promise was founded in 1997 by General Colin Powell to mobilize people from every sector of American life to build the character and competence of youth.

Currently, *AWIM* reaches over 1.5 million children in North America, and more than 15,000 schools and volunteer mentor engineers are involved. Schilke's wife Ro was also a key player with SAE's global *AWIM* efforts this year, and the former high school principal often traveled with her husband around the globe promoting the initiative. According to SAE's K-12 Education Program Manager Kathleen O'Connor Byrnes, Ro has been "a wonderful education ambassador" for the *AWIM* program by visiting schools in Mexico City, Germany, England, Brazil, Hong Kong, Taipei, Australia, and Russia. "Ro's knowledge of education and her ability to communicate with people around the world have been an incredible asset to SAE's *AWIM* program," said Byrnes. *AWIM* has pledged to reach an additional 1000 schools by 2003 and to work aggressively with state boards of education, seeking their commitments to adopt the programming on a state-wide basis.

To that end, Schilke is confident that New York City Schools will also adopt the *AWIM* program before his term ends. He is also continuing to work on finalizing arrangements and programs with the SAE Mexico and Russian sections.

And even after his official year as President ends when he formally turns things over to Dr. S.M. Shahed this Friday, Schilke will continue to work for SAE into 2002 and beyond as a member of the BOD, Chair of the Annual Nominating Committee for 2003, and Co-Chair of the SAE 100th Anniversary Committee. He is also slated to attend and speak at some overseas meetings as well as U.S.-based section meetings.

Jenny R. Hessler

## Congress Member Lounge offered

The SAE Member Lounge, located in Congress Central (W2-60), is available for members whose dues are paid in full. Snacks as well as light lunches or breakfasts will be offered daily through the support of SAE's membership benefit program sponsors, including Sprint PCS, Selman & Co., Chorus Call, Hartland Insurance Group, Liberty Mutual Insurance Co., George Moving & Storage Inc., and United Parcel Service. Member Lounge hours are daily 8:00 a.m.–5:00 p.m. (until 4:00 p.m. on Tuesday).

SHOW 2002 DAILY

# Exhibitor Directory Addendum

***The following is a listing of new exhibitors, cancellations, and booth changes as of February 21, 2002. Watch for additions and changes here in future issues of the Show Daily.***

**AAA Michigan**
38751 W. 12 Mile Rd.
Farmington Hills, MI 48331 UNITED STATES
**Booth 3353**
Provides members auto, home, and life insurance coverage at affordable rates; members enjoy the safety of AAA emergency roadside assistance, as well as access to an extensive travel agency; also provides members financial planning and investment advice through AAA Trust Investment Services (a federally chartered savings bank).

**Bell Technologies**
6120 Hanging Moss Rd.
Orlando, FL 32807 UNITED STATES
http://www.sypris-tm.com
marketing.stm@sypris.com
**Booth 1652**
See Sypris Test & Measurement.

**CME Corp. Mitsuba**
2945 Three Leaves Dr.
Mount Pleasant, MI 48858-4597 UNITED STATES
**Booth 2530**
American subsidiary of Mitsuba Corporation specializing in mechatronics featuring electrical motors, actuators, electronic controllers and components for automotive, motorcycle, and other applications. Products include actuation of motorized vehicle functions including engine starting, windshield wiper systems, power window motors, cooking fan and motor units, sunroof motors, electronic throttle controls, etc.

**Clevite de Mexico S.A. de C.V.**
Ave. Sta. Rosa No. 265
Lerma Edo De Mexico 52000 MEXICO
**Booth 3412**
A global supplier of engine bearings and bushings to broadly satisfy a diverse range of customer needs; offers high quality, performance, service, and competitive pricing.

**Comsol Inc.**
8 New England Executive Pk., Ste. 310
Burlington, MA 01803 UNITED STATES
**Booth 3361**
http://www.comsol.com
Makers of FEMLAB, a multiphysics modeling and simulating tool that models equipment and processes from all fields of engineering; based on MATLAB, FEMLAB models systems of nonlinear partial differential equations (PDEs) in an open, flexible environment allowing the customer to couple mass, heat and momentum transport to other physics applications such as electromagnetics, chemical engineering and structural mechanics. Physics can be applied in FEMLAB as model equations in tailored, ready-to-use forms, or specified freely to suit any arbitrary type of physical phenomenon (linear, nonlinear or time-dependent).

**Danly Tool & Equipment Inc.**
1216 Allanson Rd.
Mundelein, IL 60060 UNITED STATES
**Booth 1833**
http://www.danly.com
Leading manufacturer of die sets, die making supplies and components. Product set includes a wide range of catalog die sets, guide posts, bushings, die springs, punches, air presses, wear plates and cams, and other diemakers' supplies. Also supplies special die sets, steel plates (machined, ground, and cut), special punches and customized products.

**Data Masters Inc.**
1535 N. Leroy, Ste. C
Fenton, MI 48430 UNITED STATES
http://www.data-masters.com
**Booth 1167**
Over 20 years of experience helping companies improve productivity via visual information systems; provides systems to monitor production counts, machine conditions, alarm conditions, etc. and convey this information automatically, to a network of high impact visual media. Production costs can typically be reduced 2%-4% with these systems.

**EDP Technical Services**
36704 Commerce Rd.
Livonia, MI 48150 UNITED STATES
**Booth 540**
http://www.edp-company.com
edp@wwnet.com
Environmental test services: vehicle test chambers with chassis dynamometer (up to 250 hp loading) -50°F to +170°F; component test chamber -150°F to +650°F. Contract electronic design, prototype and manufacturing: low volume through-hole and SMT specialists.

**EDS**
PLM Solutions
2000 Eastman Dr.
Milford, OH 45150 UNITED STATES
http://www.eds.com/plm
**Booth 3211**
Official sponsor of the SAE 2002 International Pavilion; a leading global services company, providing strategy, implementation and hosting for clients managing the business and technology complexities of the digital economy. The company brings together the world's best technologies to address critical client business imperatives; helps clients eliminate boundaries, collaborate in new ways, establish the customer's trust and continuously seek improvement. Reported revenues of $19.2 billion in 2000; company stock is traded on the New York Stock Exchange (NYSE: EDS) and the London Stock Exchange.

**Emagineworks e-Engineering Group**
24655 Southfield Rd., Ste. 109
Southfield, MI 48075 UNITED STATES
http://www.emagineworks.com
info@emagineworks.com
**Booth 2264**
A results-oriented e-Engineering and Automotive-IT consulting firm providing custom information technology consulting for engineers; software solutions are developed by engineers for engineers; staff consists of masters and doctorates in mechanical or civil engineering with a strong background in developing information technology solutions. Goal is to produce software that works as per specifications in a cost-effective and timely manner; have helped Ford Motor Company, General Motors, General Electric, Anderson Group, and others realize the potential of internet and IT for solving business and engineering problems.

**Hebei Tianma Piston Industrial Co., Ltd.**
No. 8 Nohai Rd.
Economic & Tech Dev. Zone
Cangzhou City
Hebei, 61000 CHINA
**Booth 2961**

**Knowllence**
BP4
Goux les Usiers, F-25520 FRANCE
**Booth 2253**
http://www.knowllence.com
info@knowllence.com
Specializing in the integration of methods of product design (FMEA) and in knowledge management. The company's agencies and partners implement software to support capitalization and traceability, six sigma, safety and feasibility, value management, etc., within the customers business; serving mainly the automotive field, but also aeronautics, pharmacy, and defense.

**Kwang Jin Ind. Co., Ltd.**
Eunhang-dong
Siheung-city
Kyunggi-do, 247-3 KOREA
**Booth 2820**
http://www.kwangjin.com
Develops and produces rotary joints for cooling water, hot oil, hot water, steam, hydraulic oil, air, cutting oil, etc.; swivel joints; connecting flanges, syphon hose, syphon elbows, syphon scoops, joint stands; ceramic fiber - blanket, pyro bloc, bulk fiber.

**Liberty Mutual/Hartland Insurance Group**
691 N. Squirrel Rd.
Auburn Hills, MI 48321 UNITED STATES
**Booth 2966**
SAE member benefits; insurance and financial services.

**Maxwell Technologies Inc.**
9244 Balboa Ave.
San Diego, CA 92123 UNITED STATES
http://www.maxwell.com
**Booth 2173**
Manufactures and markets high-reliability power and computing components and automated test instruments. Maxwell's PowerCache ultracapacitors are high-density energy storage cells that deliver bursts of high power on demand in applications such as automotive electrical systems and powertrains, wireless communications and consumer and industrial electronic devices.

**Metal Forming & Coining Corp.**
MFC Netform
1007 Illinois Ave.
Maumee, OH 43537-1752 UNITED STATES
http://www.mfccorp.com
**Booth 1858**
A QS-9000 manufacturer of net to near net shaped cold forgings and impact extrusions. Markets include automotive, commercial truck, mobile off-highway, and aerospace industries; core product areas include engine, transmission, brake, and driveline. New subsidiary, MFC Netform, Inc., will leverage the company's core competencies to develop new products and solutions with a focus on advanced net-formed metal working processes such as flowforming, orbital forming, ring rolling, laser welding, swaging, and spline forming; the goal is to offer component design flexibility, higher quality and lower cost.

**Metra Electronics**
460 Walker St.
Holly Hill, FL 32117 UNITED STATES
**Booth 3205**
Produces wire harnesses on a timely basis; also produces cost-effective tools within six to eight weeks; offers plastic injection molding and metal stamping as well; additional capabilities include the engineering and manufacturing of power antennas to customer specifications.

**Modern Engineering, Inc.**
2401 W. Big Beaver Rd., Ste. 400
Troy, MI 48084-3303 UNITED STATES
http://www.modernengineering.com
**Booth 1654**
Provides dynamic solutions for technical automotive staffing and engineering services to major automotive companies and their tier suppliers. Solutions enable the design and delivery of quality products and services, while reducing development cost and time.

**MS Plastic Welders, Inc.**
37732 Hills Tech Dr.
Farmington Hills, MI 48331 UNITED STATES
http://www.ms-plasticwelders.com
sales@ms-plasticwelders.com
**Booth 2963**
Manufacturer of special ultrasonic welding machines and hot air welding machines that are mainly applied in the automotive industry, as well as the automotive supplier industry. The typical product range of the machines is comprised of bumpers, door panels, instrument panels, trunk covers, center consoles, etc.

**Network Appliance Inc.**
495 E. Java Dr.
Sunnyvale, CA 94089 UNITED STATES
http://www.netapp.com
**Booth 427**
Providing data access solutions since 1992; NetApp storage and content delivery platforms (filers and NetCache appliances) are coupled with powerful content distribution and reporting software. This Center-to-Edge solution offers seamless data management from the back-end data center to the edge of the network.

**Nitrex Metal Inc.**
3474 Poirier Blvd.
St. Laurent, PQ H4R 2J5 CANADA
http://www.nitrex.com
nitrex@nitrex.com
**Booth 2060**
Specializes in the testing, development and marketing of nitriding technologies, thermo-chemical processes for hardening the surface of metal parts; used to improve end product performance (wear, fatigue, corrosion) and durability without part deformation. Offers several technologies including Nitreg, Nitreg-C, and ONC for nitriding a broad range of metals and automotive applications.

**Oil Safe Professional Lubrication System**
Companion Products Inc.
2040 Johnson Court, Unit A
Genoa, IL 60145 UNITED STATES
http://www.oilsafe.com
**Booth 2812**
Family of HDPE drums, lids and accessories that protect lubricants from contamination; prevent dangerous and costly oil spills and leakage; make lube tasks faster, safer and easier. Exclusive master distributor of Oil Safe products in the U.S. and Mexico.

**Rösler Metal Finishing USA LLC**
1551 Denso Road
Battle Creek, MI 49015 UNITED STATES
roeslerusa@net-link.net
**Booth 3135**
A world-class manufacturer of surface finishing equipment and processes that serve the industrial global market. Headquartered in Memmelsdorf Germany, Rösler owns and operates 14 locations around the globe. The company's motto, "Finding a Better Way," is backed by an exhaustive research and development plan that keeps the company on the cutting edge of technology.

**Sypris Test & Measurement**
**formerly Bell Technologies**
6120 Hanging Moss Rd.
Orlando, FL 32807 UNITED STATES
**Booth 1652**
A total solutions provider of calibration and repair services, test and evaluation labs and magnetic instrumentation. Located throughout the U.S., provides in-house, on-site, and mobile calibration services for electrical, mechanical, and process control instrumentation. Test labs provide electrical, environmental, climatics and dynamics testing, DPA/failure analysis and component screening. Calibration labs are accredited to ISO / IEC 17025 by A2LA, ISO 9002, ANSI/NCSL Z540.

**Teletronics Technology Corp.**
2525 Pearl Buck Rd.
Bristol, PA 19007 UNITED STATES
**Booth 2058**
http://www.ttcdas.com
sales@ttcdas.com
A leading manufacturer of aerospace electronics offering the latest developmental technology to the automotive industry. Products provide capabilities such as instrumentation and integrated recording and reproduction; systems are designed to accept all types of inputs including strain, pressure, flow meter, position, time, computer input, etc.

**Toefco Engineered Coating Systems, Inc.**
1220 N. 14th St.
Niles, MI 49120 UNITED STATES
http://www.toefco.com
dondeal@earthlink.net
**Booth 3301**
For nearly 50 years, the company has specialized in high volume to jobshop production with expertise in industrial coatings such as Teflon, Xylan, MOS2, powders and others tailored for solving problems in the chemical process, medical, food process, automotive, racing, mold release, appliance, and the general metals industry; price, quality and delivery based on ISO 9002-certification since 1997.

**Yushin Precision Industrial Co., Ltd.**
117B13L, Gozan-dong
Namdong-gu
Inchun, 686-10 KOREA
**Booth 2820**

## Cancellations

Kuss Filtration
Labsphere
LIM Technology, LLC
Machinecrafts Pvt. Ltd.
Metal Flow Corp.
Nitrex Metal Inc.
Optim Electronics Corp.
Trexel, Inc.