

# International Off-Highway & Powerplant Congress

## Technical Session Schedule

As of 03/24/2002 08:01 pm

**Tuesday March, 19**

### Transmission Controls and Data Communications Including Driveline Components

**Session Code: OHTD5**

**Room S103**

**Session Time: 10:00 a.m.**

This session will deal with control and diagnosis of driveline components and off-road equipment. It will specifically look at automatic control systems for transmissions and clutches, and onboard vehicle diagnostic systems.

**Organizers -** Richard C. Leary, ArvinMeritor Inc.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
10:00 a.m.	2002-01-1335	<b>AutoJust Clutch</b> <i>Andrew Szadkowski, ZF Meritor Automotive LLC; Ronald B. Morford, ZF Meritor LLC; Muneer Abusamra, Meritor Transmission &amp; Clutch Division</i>
10:30 a.m.	2002-01-1336	<b>New Electronic Control System for Off-Highway Transmissions</b> <i>Lawrence A. Gutsch, Robert L Crum, Allison Transmission</i>
11:00 a.m.	2002-01-1334	<b>Universal On-board Diagnostic System for On-road and Off-road Equipment</b> <i>Alexander Uspenskiy, Vladimir P. Boikov, Belarusian State Polytechnical Academy</i>
11:30 a.m.	2002-01-0876 *	<b>Practical Application of Model-Based Software Design for Automotive</b> <i>Richard C. Swortzel, Scott Ranville, New Eagle Software</i>

\* Previously published and/or presented at the SAE 2002 World Congress & Exhibition

Planned by Transmission and Drivelines Committee / FCIM Activity

**Tuesday March, 19**

### Off-Highway Technology Roadmap: A Joint Industry/Government Effort

**Session Code: OH10**

**Room S103**

**Session Time: 1:00 p.m.**

This session focuses on the findings of a joint industry/government effort at identifying potential energy-savings and emissions-reduction technology pathways for the off-highway machines of the future. The effort commenced in April, 2001. Printed copies of the roadmap will be available at the session.

**Organizers** - Frank Stodolsky, Argonne National Laboratory

**Chairpersons** - Kirby J. Baumgard, John Deere Product Engineering Ctr.; Gurpreet Singh, US Dept. of Energy

**Panelists** - Kirby J. Baumgard, John Deere Product Engineering Ctr.; John R. Hull, Frank Stodolsky, Argonne National Laboratory; Shawn D. Whitacre, National Renewable Energy Laboratory

## Tuesday March, 19

### Advances in Surface Engineering - Part 1

**Session Code:** OH1

**Room S111**

**Session Time:** 10:00 a.m.

This session contains the keynote lecture on plasma processing for stainless steel. The remainder of the session will focus on intensive quench (IQ) processing. IQ processing may be used to replace oil and polymer quenching in some applications as well as a potential replacement for carburizing and induction heat treating. IQ processing involves quenching sufficiently fast to maximize surface compressive stresses to improve fatigue failure processes. Planned by SAE's FCIM Committee and IFHTSE.

**Chairpersons** - Aleksander Nakonieczny, Institute of Precision Mechanics

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
10:00 a.m.	2002-01-1337	<b>Plasma Thermochemical Processing of Austenitic Stainless Steel for Combined Wear and Corrosion Resistance</b> <i>T. Bell, Univ of Birmingham; C. X. Li, Univ. of Birmingham</i>
10:30 a.m.	2002-01-1338	<b>Basic Principles, Properties and Metallurgy of Intensive Quenching</b> <i>Michael A. Aronov, Nikolai I. Kobasko, Joseph A. Powell, IQTechnologies Inc.</i>
11:00 a.m.	2002-01-1339	<b>Intensive Quenching of Forgings in Automotive Industry</b> <i>Nikolai I. Kobasko, IQTechnologies Inc.</i>
11:30 a.m.	2002-01-1340	<b>Application of Intensive Quenching Technology for Steel Parts</b> <i>Michael A. Aronov, Nikolai I. Kobasko, Joseph A. Powell, IQTechnologies Inc.</i>

*The papers in this session are available in a single publication, SP-1705, and also individually.*

Planned by Transmission and Drivelines Committee / FCIM Activity

## Tuesday March, 19

### Nitriding Processes

Session Code: OH3

Room S111

Session Time: 1:00 p.m.

This presentation in this session will detail advances in surface nitriding technology and process equipment. Planned by SAE's FCIM Committee and IFHTSE.

Organizers - Andrzej Lis, Technical University of Czestochowa

Time	Paper No.	Title
1:00 p.m.	2002-01-1361 CANCELLED	<b>Advances in the Use of Pulsed Plasma Ion Nitriding Equipment</b> <i>David Pye, Toolcity</i>
1:30 p.m.	2002-01-1362	<b>The Nitriding of Gears Using the Pulsed Plasma Ion Nitriding Technique and Control of the Surface Metallurgy</b> <i>David Pye, Toolcity</i>
2:00 p.m.	2002-01-1363	<b>Properties and Microstructure of Water Quenched and Tempered and Nitrided HSLAA 100/130 Steel</b> <i>Andrzej Lis, Jadwiga Lis, Leopold Jeziorski, Technical University of Czestochowa</i>
2:30 p.m.	2002-01-1364 CANCELLED	<b>Nitriding Stainless Steels</b> <i>A. M. Kliauga, Universidade Federal de Sao Carlos</i>
3:00 p.m.	2002-01-1365	<b>The Low Temperature Nitriding of Austenitic Steels Under Glow Discharge Conditions</b> <i>Tadeusz Wierzchon, Warsaw Univ of Technology; Aleksander Nakonieczny, Janusz Trojanowski, Institute of Precision Mechanics</i>
3:30 p.m.	2001-01-3379 *	<b>Engineered Surfaces for the Transport Industries</b> <i>Paul Stratton, BOC Gases; Keith Bennett, KMB Metallurgical</i>

<b>3:30 p.m.</b>	<b>2002-01-1366</b> <b>CANCELLED</b>	<b>Structure and Properties of Nitrocarburised Coatings Produced in a Fluidised Bed Furnace</b> <i>D. Fabijanic, Georgie Kelly, Peter Hodgson, Deakin Univ</i>
	<b>2002-01-1368</b>	<b>An Anti-Corrosion and Wear-Resisting Compounding Nitrided Layer on Precise Pressed Parts of Soft Steels (Written Only -- No Oral Presentation)</b> <i>Xinmin Luo, Jiangsu Univ of Sci &amp; Tech; Honghong Shao, Huinan Liu, Jiangsu Univ. of Sci &amp; Tech.</i>

*\* Previously published and/or presented at the Automotive and Transportation Technology Congress and Exposition*

*Planned by Transmission and Drivelines Committee / FCIM Activity*

## **Tuesday March, 19**

### **Estate Planning for Engineers**

**Session Code: OHAC2**

**Room S112**

**Session Time: 10:00 a.m.**

Presentations and discussions pertaining to what it takes to retire, tax laws and their impact on retirement savings, and planning under the Tax Relief Act of 2001.

**Organizers -** Gary W. Krutz, Purdue Univ-West Lafayette

**Chairpersons -** Gary W. Krutz, Purdue Univ-West Lafayette

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>10:00 a.m.</b>	<b>2002-01-1331</b>	<b>What Does it Take to Retire?</b> <i>Gary W. Krutz, Purdue Univ. - West Lafayette; Tim Krutz, Purdue Univ-West Lafayette; Mark Rutan, Edward Jones</i>
<b>10:30 a.m.</b>	<b>2002-01-1332</b>	<b>New Tax Laws and Their Impact on Saving for Retirement</b> <i>Carl Camp, Eclectic Associates Inc.</i>
<b>11:00 a.m.</b>	<b>2002-01-1333</b>	<b>Personal and Charitable Planning Under the Tax Relief Act of 2001</b> <i>Gordon Chavers, Purdue Univ-West Lafayette</i>

*Planned by Advanced Concepts and Technologies / FCIM Activity*

## Tuesday March, 19

### New Fluid Power Applications & Components

Session Code: OHFP3

Room S112

Session Time: 1:00 p.m.

Presentations will focus on control systems, a new component, and modeling of hydraulic and pneumatic systems.

**Organizers -** Peter W. Backes, Mico Inc.; Gary D. McConeghey, Sauer-Danfoss

Time	Paper No.	Title
1:00 p.m.	2002-01-1357	<b>Damping Swing on a Loader Backhoe</b> <i>Eric Sharkness, New Venture Gear Inc;</i> <i>Dennis J. Heyne, CNH</i>
1:30 p.m.	2002-01-1358	<b>Flow Amplifiers in Hydrostatic Steering</b> <i>Nicola Nervegna, L. Gilardino, S. Manco,</i> <i>M. Pavanetto, Politecnico di Torino</i>
2:00 p.m.	2002-01-1359	<b>Low Energy Pump for Engine Oil</b> <i>Derek George Saunders, Hydronic Corp.</i>
2:30 p.m.	2002-01-1360	<b>New Flow Rate Coefficient of Valve Adapting to Match Pneumatic System Deisgn and Its Connection with Dynamic Characteristics</b> <i>Kimio Shimada, Fluid Power Control Laboratory</i>

*The papers in this session are available in a single publication, SP-1708, and also individually.*

*Planned by Fluid Power Committee / FCIM Activity*

## Tuesday March, 19

### Motion Control

Session Code: OH12

Room S204

Session Time: 10:00 a.m.

This session explores the use of Motion Controllers to provide better control of equipment, while saving energy and cost. This is applicable to Hydraulic and Pneumatic systems. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Thomas S. Wanke, Milwaukee School of Engineering

Time	Paper No.	Title
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10:00 a.m.	2002-01-1341 ORAL ONLY	<b>Trajectory Following Control in the Automatic Loading Operations of a LHD-loader</b> <i>Jouni Mattila, Tapio Virvalo, Tampere Univ of Technology</i>
11:00 a.m.	2002-01-1342	<b>Selecting a Motion Controller</b> <i>Peter Nachtwey, Delta Computer Systems Inc.</i>
11:30 a.m.	2002-01-1343	<b>Energy-Saving Adaptive Robust Motion Control of Single-Rod Hydraulic Cylinders with Programmable Valves</b> <i>Bin Yao, Song Liu, Purdue Univ-West Lafayette</i>
12:00 p.m.	2002-01-1344	<b>Build Better Machines through Optimized Motion Control</b> <i>Peter Nachtwey, Delta Computer Systems Inc.</i>

## Tuesday March, 19

### Modeling/Design I

**Session Code: OH13**

**Room S205**

**Session Time: 10:00 a.m.**

Computers have given the technical world a wonderful tool for the analysis of systems, and prediction of performance. This session will cover the use of software in this analysis, including Artificial Intelligence. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** James C. Miller, Deere & Company World Headquarters

Time	Paper No.	Title
10:00 a.m.	2002-01-1345	<b>Expert System Environment for Fluid Power -- Achievements and Challenges</b> <i>Jonny Carlos Da Silva, Univ. of Santa Catarina</i>
10:30 a.m.	2002-01-1346	<b>Modeling an Electronically-Controlled Magnetic Actuator Operating a Hydraulic Valve and Cylinder</b> <i>John R. Brauer, John H. Lumkes, Milwaukee School of Engineering; Dingsheng Lin, Ansoft Corporation</i>

11:30 a.m.

2002-01-1347

**Internet Based Product Configuration,  
CAD Drawing Generation - A Review of  
Present Systems and Technologies**

*William J. Wolfe, TAS/AGITO INC*

**Tuesday March, 19**

**Modeling/Design II**

**Session Code: OH14**

**Room S205**

**Session Time: 1:30 p.m.**

This session, a continuation of Modeling/Design I, will cover additional programs for prediction of performance, comparing theoretical results to actual performance. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Joseph Cohn, Parker Hannifin Corp.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
1:30 p.m.	2002-01-1374	<b>Wavelet Analysis for Piston Pump Fault Diagnosis</b> <i>Qin Zhang, Univ. of Illinois at Urbana-Champaign; Y. Gao Yingjie, X. Kong, Yanshan Univ.</i>
2:00 p.m.	2002-01-1375	<b>Flow Ripple in a Gerotor Pump</b> <i>Pedro Javier Gamez Montero, Esteve Codina Macia Macia, Universitat Politecnica de Catalunya</i>
2:30 p.m.	2002-01-1376	<b>CFD Simulations of Oil Flow and Flow Induced Force Inside Hydraulic Valves</b> <i>Roger Yang, Husco International</i>

**Tuesday March, 19**

**Pumps/Motors**

**Session Code: OH15**

**Room S212**

**Session Time: 10:00 a.m.**

This session will cover design aspects of pumps and motors, with emphasis on a new reversible variable pump and motor, and on Low Speed-High Torque motors. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Organizers -** Aaron T. Becker, Sauer-Danfoss

**Chairpersons -** Dierk G. Feldmann, Technical University of Hamburg

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
10:00 a.m.	2002-01-1348	<b>New Type of Reversible, Invertible, Variable Hydraulic Pump/Motor</b> <i>Alexander Droujinine, Yurity Volkov, Alexander Stroganov, Alexander Zimnikov, Lumex Ltd.</i>
10:30 a.m.	2002-01-1349	<b>Design of a Hydraulic Wheel-Pump/Moltor for a Hydrostatic Automobile</b> <i>Plyoros Jirawattana, Frank J. Fronczak, Norman H. Beachley, Univ. of Wisconsin Madison</i>
11:00 a.m.	2002-01-1350	<b>Multi-Objective Optimization Design of Gerotor Orbit Motors</b> <i>Xingen Dong, Parker Hannifin Corp.</i>

## Tuesday March, 19

### Water Hydraulics

**Session Code:** OH16

**Room S212**

**Session Time:** 1:00 p.m.

This session will cover a wide range of subjects related to ever increasing use of water as the fluid medium. The subjects will include discussions of the materials used in the systems, monitoring/controlling the fluid, control of systems, and the application in systems. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Matti Linjama, Tampere Univ. of Technology

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
1:00 p.m.	2002-01-1377	<b>On-Line Monitoring the Condition of Loaded Water Hydraulic Actuators</b> <i>He Yunbo, Patrick S. K. Chua, G. H. Lim, Alfred Tan, Nanyang Technological University</i>
1:30 p.m.	2002-01-1378	<b>High-speed On/Off Position Control of a Low-pressure Water Hydraulic Cylinder Drive</b> <i>Matti Linjama, Harri Sairiala, Kari T. Koskinen, Matti Vilenius, Tampere Univ. of Technology</i>

<b>2:00 p.m.</b>	<b>2002-01-1379</b>	<b>Proportional Position Control of Low-Pressure Water Hydraulic Cylinder</b> <i>Harri Sairiala, Matti Linjama, Kari T. Koskinen, Matti Vilenius, Tampere Univ. of Technology</i>
<b>2:30 p.m.</b>	<b>2002-01-1380</b>	<b>Effects of Microbial Growth on Filtration in Water Hydraulic System</b> <i>Hannu Riipinen, S. Varjus, S. Soini, J. Puhakka, Kari T. Koskinen, Matti Vilenius, Tampere Univ of Technology</i>
<b>3:00 p.m.</b>	<b>2002-01-1381</b>	<b>New Materials and Component Design - Key Factors for Water Hydraulic Systems</b> <i>Karl-Erik Rydberg, Linkoping Univ.</i>
<b>3:30 p.m.</b>	<b>2002-01-1382</b>	<b>Modified Water Powered Greens King VI Mower</b> <i>Michael Thomas, Louis Cassens, Purdue Univ-West Lafayette; Gary W. Krutz, Purdue Univ. - West Lafayette</i>

*The papers in this session are available in a single publication, SP-1708, and also individually.*

## Tuesday March, 19

### Hydraulic Fluid Monitoring, Cleanliness, and Recycling

**Session Code: OH17**

**Room S213**

**Session Time: 10:00 a.m.**

Control of the condition of hydraulic fluids is continually becoming more important, as well extending the life of fluids. The continually improving methods of monitoring fluids and rejuvenating fluids will be discussed in these presentations. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Yutaka Tanaka, Hosei Univ.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>10:00 a.m.</b>	<b>2002-01-1351</b>	<b>Condition Monitoring of Fluid Power Systems: A Survey</b> <i>Jahmy Hindman, Univ. of Saskatchewan</i>
<b>10:30 a.m.</b>	<b>2002-01-1352</b>	<b>A New Technology for Oil Management: Electrostatic Oil Cleaner</b> <i>Akira Sasaki, Shinji Uchiyama, Kleentek Industrial Co., Ltd.</i>

<b>11:00 a.m.</b>	<b>2002-01-1353</b> <b>ORAL ONLY</b>	<b>Hydraulic Fluid Reclamation - Opportunities and Challenges</b> <i>Robert Profilet, Robert William Bowden, Thomas W. Johnson, Equilon Enterprises LLC; Richard T. Dixon, Shell Global Solutions</i>
<b>11:30 a.m.</b>	<b>2002-01-1354</b>	<b>Machine Condition Monitoring: Definition of an Oil Condition Index</b> <i>Holger Sommer, Team Engineering Inc.</i>
<b>12:00 p.m.</b>	<b>2002-01-1355</b> <b>CANCELLED</b>	<b>Condition Monitoring of Lubricants</b> <i>Francis Davidson, Wayne S. Goldenberg, Koehler Instrument Co.</i>

*The papers in this session are available in a single publication, SP-1708, and also individually.*

## Tuesday March, 19

### Hydraulic Lubrication and Vibration

**Session Code: OH18**

**Room S213**

**Session Time: 1:00 p.m.**

There is a need for both predicting the performance of fluids with respect to lubrication and increasing the performance and quality of hydraulic fluids. This session will discuss prediction tools using the TRIZ method, performance of fluids, and the use of fluid drives to reduce vibration. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Akira Sasaki, Kleentek Industrial Co., Ltd.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>1:00 p.m.</b>	<b>2002-01-1383</b>	<b>Application of Systematic Innovation Trend Prediction Tools to the Design of Future Bearing and Lubrication Systems</b> <i>Darrell Mann, Univ. of Bath</i>
<b>1:30 p.m.</b>	<b>2002-01-1384</b>	<b>Hydraulic Fluids - A Design Element Preconditions and Possibilities for Long-Life Lubrication</b> <i>Wolfgang Bock, Fuchs Petrolub AG</i>
<b>2:00 p.m.</b>	<b>2002-01-1385</b>	<b>Fluid Power Elements in Active Mechanical Vibration Reduction Systems</b> <i>Roman Korzeniowski, Janusz Kowal, Univ. of Mining and Metallurgy</i>

*The papers in this session are available in a single publication, SP-1708, and also individually.*

## **Tuesday March, 19**

### **Hydraulic Fluid Properties**

**Session Code: OH19**

**Room S213**

**Session Time: 3:00 p.m.**

This session will cover a wide variety of subjects, including the erosion characteristics of materials in a water hydraulic system, the removal of entrained air in a system, and evaluating the rating of fire resistant fluids. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Sean Wiltz, Caterpillar Inc.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>3:00 p.m.</b>	<b>2002-01-1386</b>	<b>Evaluation of Erosion-Resisting Properties of Plastics and Metals Using Cavitating Jet Apparatus</b> <i>T. Kazama, Muroran Inst. of Tech.; A. Yamaguchi, X. Wang, Yokohama National Univ.</i>
<b>3:30 p.m.</b>	<b>2002-01-1387</b>	<b>Solution of Air Entrainment for Fluid Power Systems</b> <i>Ryushi Suzuki, Opus System; Yutaka Tanaka, Hosei Univ.</i>
<b>4:00 p.m.</b>	<b>2002-01-1388</b>	<b>A Comprehensive Approach to Hydraulic Fluid Fire Safety</b> <i>W. D. Phillips, Great Lakes Chemical Corp.</i>

*The papers in this session are available in a single publication, SP-1708, and also individually.*

## **Wednesday March, 20**

### **The 42V Automotive Electrical System: Will Off-Highway Vehicles Follow? - Seminar**

**Session Code: OHAC3**

**Room S103**

**Session Time: 10:00 a.m.**

Electrical power demand in motor vehicles is expected to significantly exceed the four to five percent annual growth rate that has been characteristic over the past two decades. Continued electrification of traditional mechanical loads, such as power assist steering, as well as, the introduction of new loads, such as ac power points, will quickly exceed the capability of the conventional 14V power generation and distribution system. A higher voltage system has been the focus of a MIT/Industry Consortium, as well as the Forum Bordnetz in Europe. All are in agreement that global cooperation and standardization will be needed. The 42V PowerNet is rapidly gaining worldwide consensus as the next generation electrical system for automobiles and light duty trucks. If this technological change is near for on-highway vehicles, will off-highway vehicles be following also? Attend this seminar on 42V electrical systems and participate in the ensuing discussion to evaluate the possibilities.

**Organizers -** Norman Traub, SAE International

**Moderators -** Gary W. Krutz, Purdue Univ-West Lafayette

*Planned by Advanced Concepts and Technologies / FCIM Activity*

### **Wednesday March, 20**

#### **Future of Electric Drives in Off-Highway Equipment**

**Session Code:** OHTD4

**Room S103**

**Session Time: 1:00 p.m.**

This panel will cover the future of electric vehicle drives in Off-Highway Equipment, with an update on these issues: the leading motor/generator technology, the leading control technology, what horse-power range or vehicle type is the best fit for electric drives, the roadblocks that electric drives need to overcome in order to become more widely used. The session will then be opened for questions for the panelists.

**Organizers -** William E. Reeves, Funk Mfg Co.

**Panelists -** Alan T. Gilbert, UQM Technologies Inc.; Michael Turner, Switched Reluctance Drives, Ltd.

*Planned by Transmission and Drivelines Committee / FCIM Activity*

### **Wednesday March, 20**

#### **Surface Finish and Wear**

**Session Code:** OH7

**Room S111**

**Session Time: 10:00 a.m.**

Surface aspects as microstructure, finishing process and coating related with wear will be presented as well as the common modes of surface damage mainly in roller bearings. Planned by SAE's FCIM Committee and IFHTSE.

**Chairpersons -** Charlie Brooks, Univ. of Tennessee

**Assistant Chairpersons -** Lauralice Canale, Universidade de Sao Paulo

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
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- 10:00 a.m.**      **2002-01-1389**      **Effect of Carbon Coating on Scuffing of Steel Surface During Oil Lubrication**  
*Oyelayo O. Ajayi, A. Kovalchenko, Ali Erdemir, George R. Fenske, Argonne National Laboratory*
- 10:30 a.m.**      **2002-01-1390**      **Abrasive Wear Resistance of a Fe Based Hard Coating Containing Cr and Nb**  
*L. C F Canale, O. R. Crnkovic, A. F. Farah, C. F. Ferrarini, Universidade de Sao Paulo*
- 11:00 a.m.**      **2002-01-1391**      **Impact of Isotropic Superfinishing (ISF) on Wear and Fatigue (Contact and Bending) for Gears, Bearings and Similar Part Surfaces**  
*Lane Winkelmann, Mark Michaud, Gary Sroka, Rem Chemicals Inc.; A. Alan Swiglo, IIT Research Institute*
- 2002-01-1392**      **Structure of Carburized Layers About High Wear Resistance (Written Only -- No Oral Presentation)**  
*Magorzata Przyeckal, Wojciech Gestwa, Poznan Univ of Technology; George E. Totten, Dow Chemical Co*
- 2002-01-1393**      **Effects of the Heat Treatment on the Abrasion and Toughness Properties in a White Cast Iron Cr Nb Alloyed (Written Only -- No Oral Presentation)**  
*A. F. Farah, L. C F Canale, O. R. Crnkovic, Universidade de Sao Paulo*
- 2002-01-1394**      **Heat Treatment in High Cr White Cast Iron Nb Alloyed (Written Only -- No Oral Presentation)**  
*Lauralice Canale, O. R. Crnkovic, Alessandro Farah, Universidade de Sao Paulo*
- 2002-01-1505**      **Surface Modification Design: Carburizing With Atmospheres (Written Only -- No Oral Presentation)**  
*Magorzata Przylecka, Wojciech Gestwa, Poznan Univ. of Technology; George E. Totten, G E Totten & Associates Inc.*

*The papers in this session are available in a single publication, SP-1705, and also*

individually.

Planned by Transmission and Drivelines Committee / FCIM Activity

## Wednesday March, 20

### Residual Stresses

Session Code: OH4

Room S111

Session Time: 1:00 p.m.

Various methods to predict and control residual stresses and their impact on manufacturing processes will be discussed. Planned by SAE's FCIM Committee and IFHTSE.

Organizers - Harry W. Walton, Blueridge

Time	Paper No.	Title
1:00 p.m.	2002-01-1406	<b>An Analytical Comparison of Atmosphere and Vacuum Carburizing Using Residual Stress and Microhardness Measurements</b> <i>Gerald Dennis Lindell, Twin Disc Inc.; Daniel H. Herring, The Herring Group; David Breuer, Metal Improvement Co.; Beth Matlock, Tech. Inc.</i>
1:30 p.m.	2002-01-1407	<b>PVD-Wear Resistant Coatings of Homogeneous and Graded Ti (C,N): Residual Stresses and Mechanical Performance Under Hertzian Load</b> <i>T. Dummer, Robert Bosch GmbH; O. Vohringer, D. Lohe, Karlsruhe Univ</i>
2:00 p.m.	2002-01-1408	<b>Influence of Macro Residual Stresses on the Fatigue Behavior of Smooth and Notched Specimens Made From a High Strength Steel</b> <i>Detlef Löhe, Karlsruhe Univ.; Joachim E. Hoffmann, Fachhochschule Rheinland-Pfalz</i>
2:30 p.m.	2002-01-1409	<b>Shot peening Plus Subsequent Short-Time Annealing-A Way to Increase the Residual Stress Stability and Alternating Bending Strength of AISI 4140</b> <i>Rainer Menig, University of Karlsruhe; Volker Schulze, Detlef Lohe, Otmar Vöhringer, Karlsruhe Univ.</i>

<b>3:00 p.m.</b>	<b>2002-01-1410</b>	<b>Heat Fatigue Behavior of 4Cr5MosiV1 and 8407S Steels</b> <i>Li Lin, Xiaochun Wu, Luoping Xu, Shanghai Univ.</i>
<b>3:30 p.m.</b>	<b>2002-01-1411</b>	<b>The Effect of Prior Microstructure on the Hardness and Residual Stress Distribution in Induction Hardening Steels</b> <i>L. C F Canale, Universidade de Sao Paulo; Charlie Brooks, Univ of Tennessee; Tom Watkins, Oak Ridge National Lab; V. Rudnev, Inductoheat</i>
<b>4:00 p.m.</b>	<b>2002-01-1412</b>	<b>The Influence of Residual Stresses on the Susceptibility to Hydrogen Embrittlement in Hardened Steel Components Subjected to Rolling Contact Conditions</b> <i>Harry W. Walton, Blueridge</i>
<b>4:30 p.m.</b>	<b>2002-01-1559</b>	<b>Residual Stress and Fatigue Strength of Carburized Steels and Gears</b> <i>Kiyoshi Funatani PhD, Imst Institute</i>

*The papers in this session are available in a single publication, SP-1705, and also individually.*

*Planned by Transmission and Drivelines Committee / FCIM Activity*

### **Wednesday March, 20**

#### **Bearings & Seals**

**Session Code: OHTD1**

**Room S112**

**Session Time: 10:00 a.m.**

New developments in technology allow enhanced bearings to operate with increased life in debris contaminated systems that are a reality in actual field operations.

**Organizers -** Paul E. Bachleda, Koyo Corp. of USA; John E. Chadwick, Timken Corp.; Mark Cutler, SKF USA Inc.; T. Michael Johns, Koyo Corp. of USA

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
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<b>10:00 a.m.</b>	<b>2002-01-1369</b>	<b>Experimental and Analytical Methods for Assessing Bearing Performance under Debris Contaminated Lubrication Conditions</b> <i>Harvey P. Nixon, Thomas E. Springer, Timken Corp; Michael Hoeprich, Timken Research; Douglas Clouse, Timken Co.</i>
<b>10:30 a.m.</b>	<b>2002-01-1370</b>	<b>Off-Highway Vehicle Wheel Bearing Performance</b> <i>Richard Browner, Torrington Co</i>
<b>11:00 a.m.</b>	<b>2002-01-1371</b>	<b>The Effect of Surface Microstructure on Debris Dented Rolling Element Bearing Performance</b> <i>Brian Roache, Ryan Pitsko, Alan Chidester, John Imundo, Torrington Co.</i>
	<b>2002-01-1372</b>	<b>Metrics and Conversions for Process Quality Analysis (Written Only -- No Oral Presentation)</b> <i>Stephen Luko, Torrington Co</i>

*The papers in this session are available in a single publication, SP-1707, and also individually.*

*Planned by Transmission and Drivelines Committee / FCIM Activity*

### **Wednesday March, 20**

#### **Advances in Surface Engineering - Part 2**

**Session Code: OH8**

**Room S112**

**Session Time: 1:00 p.m.**

Various technologies to produce surface engineered films and their resulting properties will be discussed. Planned by SAE's FCIM Committee and IFHTSE.

**Organizers -** David Pye, Toolcity

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>1:00 p.m.</b>	<b>2002-01-1413</b>	<b>Laser Glazing of 1080 Steel Surface for Improved Tribological Properties</b> <i>Robert A. Erck, Oyelayo O. Ajayi, S. H. Aldajah, J. G. Hershberger, George R. Fenske, R. j. Dimelfi, Argonne National Laboratory</i>

<b>1:30 p.m.</b>	<b>2002-01-1414</b>	<b>Processing and Microstructure of Laser Melt Injected WC in a Ti-6AL-4V Matrix</b> <i>V. Ocelik, Jeff De Hosson, University of Groningen</i>
<b>2:00 p.m.</b>	<b>2002-01-1415</b>	<b>Studies of WC/C and TiN/ (Ti, Al) N Multilayer PVD Coatings Combined with Cross-Sectional Election Microscopy</b> <i>Jeff De Hosson, N. Carvalho, B. Kooi, University of Groningen</i>
<b>2:30 p.m.</b>	<b>2002-01-1416</b>	<b>Laser Clad A1SiCuNi Functionally Gradient Coatings</b> <i>Y. T. Pei, Jeff De Hosson, University of Groningen</i>
<b>3:00 p.m.</b>	<b>ORAL ONLY</b>	<b>Thermal Spray Technology: Leading the Way for Functional Surfaces and Sensors</b> <i>Lysa D. Russo, State Univ. of New York-Stonybrook</i>
<b>3:30 p.m.</b>	<b>2002-01-1373</b>	<b>Comparison of Quenching Processes for Hardening a Coil Spring</b> <i>B. Lynn Ferguson, Andrew M. Freborg, Gregory Petrus, Deformation Control Technology</i>

*The papers in this session are available in a single publication, SP-1705, and also individually.*

*Planned by Transmission and Drivelines Committee / FCIM Activity*

## **Wednesday March, 20**

### **Valves**

**Session Code: OH20**

**Room S204**

**Session Time: 10:00 a.m.**

Valve design, and relief valves are featured in this session. The valve design, includes the use of CFD and estimation techniques. A new relief valve is described, as well as examination of instability, again, using CFD. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Raj Rajamanickam, White Hydraulics Inc.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
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<b>10:00 a.m.</b>	<b>2002-01-1395</b>	<b>Utilization of Statistical Techniques in a Two Step Parameter Estimation for a Hydraulic Valve</b> <i>Greg J. Schoenau, Alireza Ansarian, Richard T. Burton, Univ. of Saskatchewan</i>
<b>10:30 a.m.</b>	<b>2002-01-1396</b>	<b>New Type of Pressure Relief Valves: The "Soft Relief" and "Soft Start" Valves</b> <i>Bernd Zähe, Sun Hydraulik GmbH; Todd Prinsen, Steve Weber, Sun Hydraulics Corp.</i>
<b>11:00 a.m.</b>	<b>2002-01-1397</b>	<b>Application of Computational Fluid Dynamics in Improving Valve Performance</b> <i>Linda Till, Glenn R. Wendel, Southwest Research Institute</i>
<b>11:30 a.m.</b>	<b>2002-01-1398</b>	<b>Study of Instabilities of a Direct Acting Relief Minivalve Flow Configuration</b> <i>David Huguet Ballester, Esteve Codina Macia Macia, Universitat Politecnica de Catalunya</i>

*The papers in this session are available in a single publication, SP-1708, and also individually.*

## **Wednesday March, 20**

### **Safety and Maintenance**

**Session Code: OH21**

**Room S205**

**Session Time: 10:00 a.m.**

The safety, maintenance, and operation aspects of Hydraulic Quick Couplers is addressed, from the user's perspective. This will include how to implement a maintenance plan. Planned by SE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Abbey Vijlee, Schroeder Industries

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>10:00 a.m.</b>	<b>2002-01-1399</b> <b>ORAL ONLY</b>	<b>Hydraulic Quick Couplers</b> <i>Todd M. Perrine, Kokosing Construction Co.</i>

## **Wednesday March, 20**

## Hydrostatic Drives

**Session Code: OH22**

**Room S205**

**Session Time: 1:00 p.m.**

These presentations highlight the work being done to increase the efficiency of Hydrostatic Transmissions. They also cover the analysis of Systems using simulation. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Organizers -** Aaron T. Becker, Sauer-Danfoss

**Chairpersons -** Gary D. McConeghey, Sauer-Danfoss

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>1:00 p.m.</b>	<b>2002-01-1417</b>	<b>Optimum Control of a Hydrostatic Powertrain in the Presence of Accessory Loads</b> <i>Bapi Surampudi, Southwest Research Institute</i>
<b>1:30 p.m.</b>	<b>2002-01-1418</b>	<b>New Method of Numerical Calculation of Losses and Efficiencies in Hydrostatic Power Transmissions</b> <i>Harald Ortwig, FH Trier University of Applied Sciences</i>
<b>2:00 p.m.</b>	<b>2002-01-1419</b>	<b>New Approaches for Computer Support in Application Engineering, Development and Design of Hydrostatic Systems</b> <i>J. Schmidt, Technische Universitat Hamburg-Harburg; Dierk G. Feldmann, Technical University of Hamburg-Harburg; B Pott, Technical Univ of Hamburg-Harburg</i>
<b>2:30 p.m.</b>	<b>2002-01-1420</b>	<b>The Method of Great Efficiency Improvement in Continuously Variable Integrated Hydrostatic Transmissions</b> <i>Alexander Droujinine, Yuriy Volkov, Alexander Stroganov, Alexander Zimnikov, Lumex Ltd.</i>
<b>3:00 p.m.</b>	<b>2002-01-1421</b> <b>ORAL ONLY</b>	<b>A Double View on Hydromechanical Transmissions</b> <i>Massimo Biggi; Roberto Paoluzzi, Luca G. Zarotti, Cemoter Cnr</i>

4:00 p.m.

2002-01-1422

**Concepts and Development Trends for Efficiency Improvement of Hydrostatics in Mobile Applications**

*Karl-Erik Rydberg, Linköping Univ.*

**Wednesday March, 20**

**Noise Pulsation**

**Session Code: OH23**

**Room S212**

**Session Time: 10:00 a.m.**

These presentations will cover the means of diagnosing the source of noise and vibration in machines and systems, to effectively reduce the noise and vibration. Analysis of noise and vibration from pump cavitation will also be presented. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Tom Bray, Milwaukee School of Engineering

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
10:00 a.m.	2002-01-1400	<b>Chaotic Signal Pattern Recognition Using Orthogonal Wavelet Packet Method</b> <i>Qin Zhang, Univ. of Illinois at Urbana-Champaign; W. Jiang, Yinjie Gao, X. Kong, Yanshan Univ.</i>
11:30 a.m.	2002-01-1401	<b>Assessment of Energetic Measuring Techniques and Their Application to Diagnosis of Acoustic Condition of Hydraulic Machinery and Equipment</b> <i>Waclaw Kollek, Politechnika Wroclawska</i>

**Wednesday March, 20**

**Simulation**

**Session Code: OH24**

**Room S212**

**Session Time: 1:00 p.m.**

New simulation programs will be presented, as well as practical applications of simulation, including computational Fluid dynamics, (CFD). Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** James Benson, Murray State Univ.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
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<b>1:00 p.m.</b>	<b>2002-01-1423</b>	<b>Development of Simulation Program BDSP for Hydraulic Control Systems</b> <i>Hironao Yamada, Takayoshi Muto, Gifu Univ.</i>
<b>1:30 p.m.</b>	<b>2002-01-1424</b>	<b>Hydraulic Stiffening of a Rotating Flexible Beam</b> <i>Francisco Javier Freire Venegas, Esteve Codina Macia Macia, Munir Khamashta Shahin Shahin, Universitat Politecnica de Catalunya</i>
<b>2:00 p.m.</b>	<b>2002-01-1425</b>	<b>Solution of Excavator Hydrostatic Drive Instability by SNAS Technology</b> <i>Jiao Zhang, Michael R. Schwab, Caterpillar Inc.</i>
<b>2:30 p.m.</b>	<b>2002-01-1426</b>	<b>Computational Fluid Dynamics (CFD) Analysis to Optimize the Pump Suction Line Configuration of a Hydraulic Control System</b> <i>Priyatosh Barman, Caterpillar Inc.</i>
<b>3:00 p.m.</b>	<b>2002-01-1427</b> <b>ORAL ONLY</b>	<b>Modelling and Simulation of a Balanced Vance Pump</b> <i>Antonio Giuffrida, Rosario Lanzafame, Univ of Catania</i>

### Wednesday March, 20

#### Hydraulic Pump Testing - I

**Session Code: OH25**

**Room S213**

**Session Time: 10:00 a.m.**

These presentations will cover the development of new procedures and tests for determining fluid characteristics, such as fluid lubricity. This will include using piston pumps, as well as tests that are not product dependent. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Roland J. Bishop, Dow Chemical Co.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>10:00 a.m.</b>	<b>2002-01-1402</b>	<b>Recently Developed Procedures and Tests to Investigate the Lubricating Capability of Different Types of Hydraulic Fluids</b> <i>Dierk G. Feldmann, Technical University of Hamburg</i>

<b>10:30 a.m.</b>	<b>2002-01-1403</b>	<b>An Extended 35VQ-25 Vane Pump Test as a Viable Method for Differentiating Antiwear Hydraulic Fluid Performance</b> <i>D. L. Clason, Lubrizol Corp.</i>
<b>11:00 a.m.</b>	<b>2002-01-1404</b> <b>ORAL ONLY</b>	<b>Eaton Test Procedure for Evaluation of Fluids for Open Loop Axial Piston Pumps</b> <i>Thelma Marougy, Eaton Hydraulics Inc.; Srinivas Patri, Nathan J. Alme, Eaton Corporation; Gerald Alms, Dow Chemical Co.; Matthew J. Tiefenback, Eaton Corporation</i>
<b>11:30 a.m.</b>	<b>2002-01-1405</b>	<b>Development of the Rexroth High-Pressure Piston Pump Test for Hydraulic Fluid Qualification</b> <i>Roland J. Bishop, Dow Chemical Co.; Charles Fey, Bosch Rexroth Corp.; Reiner Michael, Brueninghaus Hydromatik GmbH; Hans M. Melief, Bosch Rexroth Corp.; George E. Totten, G.E. Totten &amp; Associates Inc.</i>

### Wednesday March, 20

#### Hydraulic Pump Testing II

**Session Code: OH26**

**Room S213**

**Session Time: 1:00 p.m.**

This session is a continuation of Hydraulic Pump Testing I, with presentations on fluid development using pump tests, including piston pumps. It will also include a presentation on a new hydraulic fluid and fluid selection. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** D. L. Clason, Lubrizol Corp.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>1:00 p.m.</b>	<b>2002-01-1428</b> <b>ORAL ONLY</b>	<b>Hydraulic Oil Development Strategy. The Role of Pump Testing</b> <i>Ken J. Young, Shell Global Solutions</i>
<b>1:30 p.m.</b>	<b>2002-01-1429</b>	<b>Assessment of the Eaton V-104 Vane Pump as an Antiwear Lubrication Tester</b> <i>Roland J. Bishop, Dow Chemical Co.; George E. Totten, G.E. Totten &amp; Associates Inc.</i>

2:00 p.m.	ORAL ONLY	<b>Farm Tractor Fluid: Copper Corrosion Performance (Field Service and Screen Test Comparisons and Results)</b> <i>David Ripple, Lubrizol Corp.</i>
2:30 p.m.	2002-01-1430	<b>Predicting the Pump Efficiency of Hydraulic Fluids to Maximize System Performance</b> <i>Steven N. Herzog, Doug Placek, RohMax USA Inc.; Christian D. Neveu, Rohmax France</i>
3:00 p.m.	2002-01-1431 ORAL ONLY	<b>Development of a Standard High-Pressure Hydraulic Piston Pump Test: Status of ASTM D.02.N.07 Piston Pump Task Force Activities</b> <i>Gary H. Kling; Roland J. Bishop, Dow Chemical Co.; Peter Offutt, Caterpillar Inc.; George E. Totten, G.E. Totten &amp; Associates Inc.</i>

*The papers in this session are available in a single publication, SP-1709, and also individually.*

## Thursday March, 21

### Brakes, Clutches & Friction Materials - Part I

**Session Code: OHTD9**

**Room S103**

**Session Time: 10:00 a.m.**

A new metal matrix composite friction material will be introduced, advantages of moving track testing to accurate lab testing and improving friction material stability through surface topography.

**Organizers -** James L. Houch, Jerry Olson, Raybestos Inc.

Time	Paper No.	Title
10:00 a.m.	2002-01-1438	<b>The Effect of Modules and Thermal Diffusivity on Sintered Material Performance</b> <i>Frederick A. Lloyd, Raybestos Inc.; Wilson O. Silverthorne, Raytech Composites Inc</i>
10:30 a.m.	2002-01-1483	<b>An Integrated Process for Moving Testing from the Track to the Laboratory</b> <i>James K. Thompson, Link Engineering Co</i>

11:00 a.m.

2002-01-1436

**The Influence on Material Formulation  
and Assembly Topography on Friction  
Stability for Heavy Duty Clutch  
Applications**

*Marc Yesnik, Raybestos Composites*

*The papers in this session are available in a single publication, SP-1707, and also individually.*

**Thursday March, 21**

**Brakes, Clutches & Friction Materials - Part II**

**Session Code: OHTD3**

**Room S103**

**Session Time: 1:00 p.m.**

This session will cover a model understanding thermoelastic effects on friction material from testing, factors influencing brake disc-brake pad operating conditions, modeling and predicting thermomechanical effects in single-sided clutch/brake and heat resistant friction materials grooving/surface preparations.

**Chairpersons -** Jerry Olson, Raybestos Inc.

**Assistant Chairpersons -** James L. Houch, Raybestos Inc.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
1:00 p.m.	2002-01-1437 ORAL ONLY	<b>Study of Wet Friction Material Test Under Severe Thermal and Mechanical Loading ("Bump Test")</b> <i>Wenping Zhao, Raytech Composites Inc; Przemysław Zagrodzki, Raybestos Products Co</i>
1:30 p.m.	2002-01-1484	<b>Friction Processes in Disc Brake - Brake Pad Couple</b> <i>Adam Polak, Cracow University of Technology; Stanisław Pytko, Univ. of Mining and Metallurgy; Janusz Grzybek, Cracow University of Technology</i>
2:00 p.m.	2002-01-1439	<b>Thermomechanical Effects in a Single-Sided Multidisk Clutch/Brake Design</b> <i>Przemysław Zagrodzki, PhD, Peter Wagoner, Raytech Composites Inc.</i>

2:30 p.m.

2002-01-1482

**Optimized Grooving and Surface Preparation of High Heat Resistant Materials for Heavy-Duty Vehicles**

*Xiangcong Lin, Yasuyo Yamamoto, Dynax Corp; Kazuhito Mukai, Dynax Corp.; Satoshi Ikawa, Dynax America Corp*

*The papers in this session are available in a single publication, SP-1707, and also individually.*

*Planned by Transmission and Drivelines Committee / FCIM Activity*

**Thursday March, 21**

**New Product - Vehicle**

**Session Code: OH11**

**Room S104**

**Session Time: 1:00 p.m.**

This session will spotlight new product introductions and allow attendees to learn the details about products being introduced to the off-highway markets.

**Organizers -** N. Kumar Kittusamy, Natl Inst. for Occupational Sfty & Hlth

**Time**

**Paper No.**

**Title**

1:00 p.m.

2002-01-1555

**Development of KUBOTA "New B-Series Tractor"**

*Akifumi Nishino, Mitsuhiro Takekata, Kubota Corp.; Kiyoshige Maezawa, Kubota Tractor Corp.; Kiyokazu Nakanishi, Kubota Corp.*

1:30 p.m.

2002-01-1556  
**ORAL ONLY**

**Technical Challenges Faced during the Design and Development of the Latest Generation of JCB 'Single Armed' Skid Steer Loaders**

*Andy Smith, JCB Compact Products*

**Thursday March, 21**

**Induction Heat Treatment Processing**

**Session Code: OH6**

**Room S111**

**Session Time: 10:00 a.m.**

Induction heat treating of machine parts including computer simulation of processes, application of magnetic flux controllers and presentation of new thermochemical treatment process with induction heating in active media.

Planned by SAE's FCIM Committee and IFHTSE.

**Organizers -** Valentin Nemkov, Fluxtrol Mfg Inc.

**Chairpersons -** Valentin Nemkov, Fluxtrol Mfg Inc.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
10:00 a.m.	2002-01-1440 <b>CANCELLED</b>	<b>New Challenges in Metal Heat Treatment for the Automotive Industry</b> <i>D. Loveless, Inductoheat; Valery Rudnev, High Frequency Current Institute; R. Cook, Inductoheat, Inc.</i>
10:00 a.m.	2002-01-1557	<b>Induction Hardening Simulation of Steel and Cast Iron Components</b> <i>Leo Chuzhoy, Jun Cai, Kenneth W. Burris, Douglas A. Rebinsky, Caterpillar Inc.; Krishna S. Raichur, Patrick H. Campbell, Belcan Corp.</i>
10:30 a.m.	2002-01-1441 <b>CANCELLED</b>	<b>The User-Friendly Computer Modeling of Coupled Electromagnetic, Heat Transfer and Microstructural Phenomena in Induction Heat Treating of Steels</b> <i>V. Rudnev, Inductoheat; Sergey Gurevich, Nikolai Zimin, Tatiana Alexandrova, Anna Alonso, Irina Iokhina, High Frequency Current Institute</i>
10:30 a.m.	2002-01-1558	<b>Induction Heat Treating, Off-Highway Case Studies</b> <i>Fred Specht, Ajax Magnethermic</i>
11:00 a.m.	2002-01-1442	<b>Possibilities of New, Patented Technology LINTERPROCESS (TM) in Significant Increasing of Durability and Longevity of Various Machine Parts</b> <i>S. M. Gugel, Sanova-Polytec</i>
11:30 a.m.	2002-01-1443	<b>Computer Assisted Design of Induction Processes for Surface Engineering of Vehicle Parts</b> <i>Robert Goldstein, Centre for Induction Technology; Valentin Nemkov, Robert T. Ruffini, Fluxtrol Mfg Inc.</i>

*The papers in this session are available in a single publication, SP-1705, and also individually.*

*Planned by Transmission and Drivelines Committee / FCIM Activity*

## Thursday March, 21

### Surface Metallurgical Processes

Session Code: OH5

Room S111

Session Time: 1:00 p.m.

This session deals with processes like carburizing, furnace technology and simulation tools used for the evaluation of heat treatment processes and forging processes. Planned by SAE's FCIM Committee and IFHTSE.

Chairpersons - Detlef Löhle, Volker Schulze, Univ. of Karlsruhe

Time	Paper No.	Title
1:00 p.m.	2002-01-1473	<b>Fundamentals of Steel Alloy Selection and Process Design</b> <i>David Pye, Toolcity</i>
1:30 p.m.	2002-01-1474	<b>Enhanced Carburising Using a Novel Accelerant</b> <i>Paul Stratton, BOC Group</i>
2:00 p.m.	2002-01-1475	<b>A Design Tool for Tuning and Optimizing Carburizing and Heat Treat Processes</b> <i>B. Lynn Ferguson, Andrew M. Freborg, Gregory Petrus, Deformation Control Technology</i>
2:30 p.m.	2002-01-1476	<b>Utilization of Low-Pressure Carburising or Plasmacarburizing for Improved Performance of Fuel Injection Systems</b> <i>Thomas Wingens, Ipsen International Inc.</i>
3:00 p.m.	2002-01-1477 CANCELLED	<b>The Application of Fluidised Bed Furnace and Reactor Technology to Alter, Modify and Improve the Surface of Metal Parts</b> <i>Ray Reynoldson, Quality Heat Technologies</i>
3:30 p.m.	2002-01-1478	<b>Carbo-Austempering(TM) - A New Wrinkle?</b> <i>Kathy L. Hayrynen, Kristin R. Brandenburg, John R. Keough, Applied Process Inc.</i>

**2002-01-1480**      **PREFORMS: A Reverse Engineering Software for Forging Process Optimization (Written Only -- No Oral Presentation)**  
*Gregory Petrus, Andrew M. Freborg, B. Lynn Ferguson, Deformation Control Technology*

**2002-01-1481**      **The Influence of Different Cooling Centres on Properties of Carburized Layers (Written Only -- No Oral Presentation)**  
*Magorzata Przyeckal, Wojciech Gestwa, Poznan Univ of Technology; George E. Totten, G E Totten & Associates*

*The papers in this session are available in a single publication, SP-1705, and also individually.*

*Planned by Transmission and Drivelines Committee / FCIM Activity*

## **Thursday March, 21**

### **Injury Biomechanics**

**Session Code: OH9**

**Room S112**

**Session Time: 10:00 a.m.**

This session is aimed to bring the current knowledge in the area of injury biomechanics. The prime focus will be given to the methodology and/or results pertaining to the Off-Highway vehicular environments. The fundamental studies in basic biomechanics will also be solicited.

**Chairpersons -** Srirangam Kumaresan, Univ. of California-Santa Barbara

**Assistant Chairpersons -** Anthony Sances, Biomechanics Institute

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>10:00 a.m.</b>	<b>2002-01-1444</b>	<b>Effects of Suspension Tuning on Off-Road Vehicle Operating Speeds over Wavy Terrain and Occupant Endurance</b> <i>Alex Roberts, David A. Renfroe, Phillip M. Partain, Stanley B. Andrews, Joseph F. Partain, Renfroe Engineering Inc.</i>
<b>10:30 a.m.</b>	<b>2002-01-1445</b>	<b>Biomechanics of Inertial Head-Neck Trauma</b> <i>Narayan Yoganadan, Frank Pintar, Brian D. Stemper, Medical College of Wisconsin</i>

**11:00 a.m.**      **2002-01-1446**      **Biomechanical Injury Evaluation of Laminated Glass During Rollover Conditions**  
*Anthony Sances, Biomechanics Institute;  
Fred Carlin, Srirangam Kumaresan, Univ.  
of California-Santa Barbara*

### **Thursday March, 21**

#### **Advanced Concepts in the Off-Highway Market**

**Session Code: OHAC6**

**Room S112**

**Session Time: 1:00 p.m.**

A presentation of various advanced concepts in the off-highway market, from rapid concepting to system design.

**Organizers -** Jonathan L. Tolstedt, Phoenix International/John Deere

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>1:00 p.m.</b>	<b>2002-01-1465</b>	<b>Algorithm Design using LabView</b> <i>Dan Aceituna, Phoenix International</i>
<b>1:30 p.m.</b>	<b>2002-01-1466</b>	<b>Prototyping as a Means of Requirements Elicitation</b> <i>Jonathan L. Tolstedt, Phoenix International</i>
<b>2:00 p.m.</b>	<b>2002-01-1467</b>	<b>On the Development and Verification of High Fidelity Agricultural Tire Models</b> <i>Amir S. Kazempour, Goodyear Tire &amp; Rubber Co.; Boris P. Volfson, S. K R Iyengar, John Deere Product Engineering Ctr.</i>
<b>2:30 p.m.</b>	<b>2002-01-1468</b>	<b>Finite Element Topography &amp; Shape Optimization of a Jounce Bumper Bracket (Written Only -- No Oral Presentation)</b> <i>Murali Krishna, Dana Corp.</i>
<b>3:00 p.m.</b>	<b>2002-01-1469</b>	<b>Reduction of Vibration in Tractor using Semi-active Suspension</b> <i>Nobutaka Tsujiuchi, Takayuki Koizumi, Tomoyuki Jinde, Doshisha Univ.; Eiichi Ishida, Kubota Corp.</i>
<b>3:30 p.m.</b>	<b>2002-01-1470</b>	<b>CANopen in Industrial Vehicles</b> <i>Thilo Schumann, CAN in Automation</i>

<b>4:00 p.m.</b>	<b>2002-01-1471</b>	<b>Remote Diagnostics for the Construction and Agriculture Industry: Extended Market Reach and Improved Support Operations</b> <i>Michael Kapolka, NEXIQ Technologies Inc.</i>
<b>4:30 p.m.</b>	<b>2002-01-1472</b>	<b>Control of the Circumferential Wheel Forces as the Basis for Controlling Off-Road Vehicle Dynamics</b> <i>Vladimir V. Vantsevich, Lawrence Technological University; Mikhail S. Vysotski, Dmitri Doubovik, National Academy of Sciences of Belarus</i>

*Planned by Advanced Concepts and Technologies / FCIM Activity*

## Thursday March, 21

### Vehicles

**Session Code: OH27**

**Room S204**

**Session Time: 10:00 a.m.**

This session will have presentations on hydraulically driven vehicles. These are off-road vehicles and all terrain vehicles for unique purposes, including being suited for dangerous applications and off-road competition. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Paul J. Heney, Hydraulics & Pneumatics

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>10:00 a.m.</b>	<b>2002-01-1447</b>	<b>Development of Automatic Road Repair Vehicle - Field Robot</b> <i>Hirako Yuta, Ichiryu Ken, Tokyo University of Technology</i>
<b>10:30 a.m.</b>	<b>2002-01-1448</b>	<b>Development of SATV (Super All Terrain Vehicle) and HMT (Hydro Mechanical Transmission) System</b> <i>Takahisa Nagao, Ichiryu Ken, Tokyo University of Technology</i>
<b>11:00 a.m.</b>	<b>2002-01-1449</b>	<b>Development of New Power Line Driven by Constant Pressure System</b> <i>Hiroyuki Sugawara, Ken Ichiryu, Tokyo University of Technology; Yutaka Kondo, Tokyo Inst. of Technology</i>

11:30 a.m.

2002-01-1450

**An Off-Road Competition Hydraulic Vehicle**

*Thomas Joseph Labus, Milwaukee School of Engineering*

**Thursday March, 21**

**Filtration/Contamination**

**Session Code: OH28**

**Room S204**

**Session Time: 1:00 p.m.**

This ever-popular session will cover the testing of filter elements, as well as cleanliness and contamination sensitivity. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Laurie Taylor, Fluid Technologies Inc.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
1:00 p.m.	2002-01-1485 ORAL ONLY	<b>Roll-Off Cleanliness of a Hydraulically Operated System</b> <i>Abbey Vijlee, Schroeder Industries</i>
1:30 p.m.	2002-01-1486 CANCELLED	<b>Dynamic Filter: Filtration Performance and the Health of Your Hydraulic System</b> <i>Charles Juhasz, Larson Testing Laboratories</i>
2:00 p.m.	2002-01-1487	<b>Experiences Implementing Particle Counter Calibration and Performance Verification through ISO 11171-1999</b> <i>Holger Sommer, Team Engineering Inc.</i>
2:30 p.m.	2002-01-1488	<b>Improving the Filter Performance under Variable Flow Conditions with Hydraulic Dampers</b> <i>Petteri Multanen, Jari Rinkinen, Tampere Univ. of Technology; Heikki Kangasniemi, Kai Happola, Parker Hannifin Corp.</i>

<b>3:00 p.m.</b>	<b>2002-01-1489</b>	<b>Reducing Variability in Multi-Pass Filter Test Results Among Laboratories</b> <i>Barry M. Verdegan, Nelson Industries; Brian M. Palmer, Jean Yves Picard, Fleetguard Inc.; Bryan Steffen, Scott Phillips, Fleetguard/Nelson; Lionel Laleouse, Fleetguard Inc.; Eric Quillen, Fleetguard/Nelson; Kendall R. McBroom, Nelson Industries</i>
<b>3:30 p.m.</b>	<b>2002-01-1490</b>	<b>Contamination Sensitivity of Fluid Power Machinery</b> <i>Xiaojian Tao, Southwest Research Institute</i>

### Thursday March, 21

#### Hydraulic Systems I

**Session Code: OH29**

**Room S205**

**Session Time: 10:00 a.m.**

Hydraulic systems will be described, from the practical electrohydraulic system design, to higher performance/higher efficiency systems.

**Chairpersons -** Phillip E. Robinson, Parker Hannifin Corp.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>9:30 a.m.</b>	<b>ORAL ONLY</b>	<b>Successful Design of Electrohydraulic Systems</b> <i>Don Caputo, Parker-Hannifin Corp.</i>
<b>10:00 a.m.</b>	<b>2002-01-1432</b>	<b>Design of Dynamic and Efficient Hydraulic Systems Around a Simple Hydraulic Grid</b> <i>Peter A J Achten, Ron van Malsen, Georges EM Vael, Innas BV</i>
<b>10:30 a.m.</b>	<b>2002-01-1433</b>	<b>Hydraulic System Configuration for Improved Efficiency</b> <i>Glenn R. Wendel, Southwest Research Institute</i>
<b>11:00 a.m.</b>	<b>2002-01-1434</b>	<b>Clamping Systems for 3-Dimensional Laser Welding</b> <i>Torsten Boldt, Institute of Fluid Power Trans &amp; Control; Hubertus J. Murrenhoff, Aachen Univ.</i>

11:30 a.m.

2002-01-1435  
ORAL ONLY

**Developments in High Performance  
Fluid Power Automation**

*Ari Almqvist, Moog GmbH*

*The papers in this session are available in a single publication, SP-1708, and also individually.*

## Thursday March, 21

### Hydraulic Systems II

**Session Code: OH30**

**Room S205**

**Session Time: 1:00 p.m.**

This session will cover a variety of interesting systems and use of components in hydraulic systems. It will include unique systems. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Wayne Book, Georgia Institute of Technology

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
1:00 p.m.	2002-01-1491	<b>A Precision Driving System Composed of a Hydraulic Cylinder and High-Speed On/Off Valves (Development of the System and Its Application to a Micro-machine-tool)</b> <i>Takayoshi Muto, Gifu Univ.; Sojiro Tsuchiya, DENSO Corp.; Hironao Yamada, Gifu Univ.</i>
1:30 p.m.	2002-01-1492	<b>Towards Human Friendly Hydraulics: Passive Teleoperation of Hydraulic Equipment Using a Force Feedback Joystick</b> <i>Perry Y. Li, Univ. of Minnesota</i>
2:00 p.m.	2002-01-1493	<b>Staged Pressure Accumulation in a Partitioned Accumulator</b> <i>Dennis McNeely, QED Services Inc.</i>
2:30 p.m.	ORAL ONLY	<b>Fluid Power in Las Vegas Entertainment Attractions</b> <i>Alan Hitchcox, Hydraulics &amp; Pneumatics</i>
3:00 p.m.	2002-01-1494	<b>Design Aspects of Timber Cutting Hydraulics in a Single-Grip Harvester</b> <i>Juha Inberg, Kalle Einola, Tapio Virvalo, Tampere Univ of Technology</i>

<b>3:30 p.m.</b>	<b>2002-01-1495</b>	<b>Design and Control of Log Feeding Function in a Single-Grip Harvester</b> <i>Kalle Einola, Ponsse Oyj; Juha Inberg, Tapio Virvalo, Tampere Univ of Technology</i>
<b>4:00 p.m.</b>	<b>2002-01-1496</b>	<b>Hydraulic Linear Actuators with High Dynamic Load Stiffness</b> <i>Frank Vollmer, Institute of Fluid Power Trans &amp; Control; Hubertus J. Murrenhoff, Aachen Univ.</i>

*The papers in this session are available in a single publication, SP-1708, and also individually.*

### **Thursday March, 21**

#### **Materials**

**Session Code: OH31**

**Room S212**

**Session Time: 10:00 a.m.**

In this session, a variety of materials, and their applications will be presented. This will include non-metallic materials to prevent wear, ceramics, and the benefits of ductile iron. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Edward T. Heck, HED Inc.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>10:00 a.m.</b>	<b>2002-01-1451</b>	<b>Why Not Convert to Ductile Iron?</b> <i>Bob O'Rourke, Wells Manufacturing Corp.</i>
<b>10:30 a.m.</b>	<b>2002-01-1452</b>	<b>Non-Metallic Composite Innovations with Reliable Solutions to the Power Transmission Industry</b> <i>John B. Zajeski, Polygon Co.</i>

### **Thursday March, 21**

#### **Electrohydraulics**

**Session Code: OH32**

**Room S212**

**Session Time: 12:30 p.m.**

Electrohydraulics is being applied in more and more used. These papers will describe a wide variety of electrohydraulic components and their uses. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Karen Field, Design News Magazine

Time	Paper No.	Title
12:30 p.m.	2002-01-1457	<b>Compact Electrohydraulic Actuator Powerpacks for Distributed Drives - Configuration, Controls, Stationary and Dynamic Performance</b> <i>Dierk G. Feldman, Technische Universitat Hamburg-Harburg</i>
1:00 p.m.	2002-01-1458	<b>Innovative Designs and Control Circuits for Proportional Valves</b> <i>Hubertus J. Murrenhoff, Aachen Univ.</i>
1:30 p.m.	2002-01-1459	<b>Controlling Electrohydraulic Systems with Unique Low-Cost Valves</b> <i>Wayne R. Anderson, Sauer-Danfoss</i>
2:00 p.m.	2002-01-1460	<b>Increasing Market Share: Leading Edge Products Using Electronics and Hydraulics</b> <i>Edward T. Heck, HED Inc.</i>
2:30 p.m.	2002-01-1461 ORAL ONLY	<b>Design and Analysis of a Non-Contact Hydraulic Cylinder Position</b> <i>Eric P. Bystrom</i>
3:00 p.m.	2002-01-1462	<b>Design Parameters and Their Optimization to Get Prerssure Recovery in Two Stage Jet Pipe Electrohydraulics</b> <i>M. Singaperumal, S. Hiremath Somashekhar, R. Krishnakumar, Indian Institute of Technology Madras</i>
3:30 p.m.	2002-01-1463	<b>Development of a Programmable E/H Valve with a Hybrid Control Algorithm</b> <i>Qin Zhang, Haibo Hu, Andrew Alleyne, Univ. of Illinois at Urbana-Champaign; Xiangdong Kong, Yanshan Univ.</i>
4:00 p.m.	2002-01-1464	<b>Digital Electrohydraulic Control for Constant-Deceleration Emergency Braking</b> <i>Hartono Sumali, Purdue Univ - West Lafayette; Jian Ma, Purdue Univ-West Lafayette</i>

**Thursday March, 21**

**Biodegradable Fluids I**

**Session Code: OH33**

**10:00 a.m.**

**Room S213**

**Session Time:**

This session will cover the development of new higher performance biodegradable fluids, as well as the evaluation of biodegradable fluids. Presentations include new fluids for both higher and lower temperature operating conditions. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** George E. Totten, G E Totten & Associates Inc.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>10:00 a.m.</b>	<b>2002-01-1453 ORAL ONLY</b>	<b>Evaluation of Commercial, Biodegradable, Synthetic or Bio-sourced Hydraulic Fluids for Use in Military Combat or Tactical Vehicles</b> <i>Ralph Mowery, Luis A. Villahermosa, Dept of the Army; Bernard R. Wright, Southwest Research Institute; Jill Tebbe, US Army Tank Auto &amp; Armaments Command</i>
<b>10:30 a.m.</b>	<b>2002-01-1454 ORAL ONLY</b>	<b>High Oxidative and Thermal Stable Base Stocks for Bio-Hydraulics</b> <i>Hans Ridderikhoff, Unigema</i>
<b>11:00 a.m.</b>	<b>2002-01-1455</b>	<b>Biodegradable Hydraulic Fluids and UTTO Lubricants</b> <i>Patrick Laemmle, Panolin AG</i>
<b>11:30 a.m.</b>	<b>2002-01-1456 ORAL ONLY</b>	<b>Developments in Hydraulic Fluids for Off-Highway Equipment</b> <i>Richard Dixon, Ken J. Young, Shell Global Solutions</i>

*The papers in this session are available in a single publication, SP-1708, and also individually.*

## **Thursday March, 21**

### **Biodegradable Fluids II**

**Session Code: OH34**

**Room S213**

**Session Time: 1:00 p.m.**

This is a continuation of the Biodegradable Fluids I session, and will include the comparison of the performance of both commercially available fluids and fluid being developed. It will also cover the results of actual application of the fluids. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** David Oesterle, Lubrizol Corp.

Time	Paper No.	Title
1:00 p.m.	2002-01-1497 ORAL ONLY	<b>Multi-functional Performance from a Biodegradable and Fire-resistant Hydraulic Fluid on Mobile Equipment</b> <i>Kevin Kovanda, American Chemical Tech. Inc.</i>
1:30 p.m.	2002-01-1498	<b>A Comparison of Some Biodegradable Hydraulic Fluids and Engine Oils</b> <i>Joseph M. Perez, Kraipat Cheenkachorn, Sevim Erhan, Atanu Adhyvaru, Penn State Univ-University Park</i>
2:00 p.m.	2002-01-1499 CANCELLED	<b>Environmentally Friendly Oils for Hydraulic and Transmission Systems Based on Sunflower Oil</b> <i>Amaya Igartua, Tekniker</i>

## Thursday March, 21

### Biodegradable Fluids III

Session Code: OH35

Room S213

Session Time: 3:00 p.m.

The third session on Biodegradable Fluids will include additional information on higher performance fluids including use in earth moving and military applications. Planned by SAE's FCIM Committee and NFPA's NCFP Committee.

**Chairpersons -** Ken J. Young, Shell Global Solutions

Time	Paper No.	Title
3:00 p.m.	2002-01-1500 CANCELLED	<b>Biodegradable High Performance Hydraulic Fluids - Evaluation in Heavy Earth Moving Equipment</b> <i>Dharma Kodali, Cargill Central Research; Bruce Wilburn, Cargill Inc.</i>
3:00 p.m.	2002-01-1504	<b>Food-Grade Fire-Resistant Water Glycol Hydraulic Fluids</b> <i>George E. Totten, G E Totten &amp; Associates Inc.; John Sherman, BASF Corp.</i>
3:30 p.m.	2002-01-1501 ORAL ONLY	<b>Performance Report on Multi-Grade Hydraulic Fluids Developed from Commodity and Genetically Enhanced Soybean Oils</b> <i>Lou A T Honary, Univ. of Northern Iowa</i>

<b>4:00 p.m.</b>	<b>2002-01-1502</b>	<b>Environmentally Acceptable Hydraulic Fluids</b> <i>Wayne Sumi, Cognis Corp.</i>
<b>4:30 p.m.</b>	<b>2002-01-1503</b>	<b>Development of Military Biodegradable Hydraulic Fluids</b> <i>In-Sik Rhee, Dept of the Army</i>

*The papers in this session are available in a single publication, SP-1708, and also individually.*