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5th Annual Colloquium on Brakes & Engineering Display and Fibers in Friction Materials Symposium

Sands Hotel & Casino
Atlantic City, NJ

October 5–8, 1987

The Engineering Society For Advancing Mobility Land Sea Air and Space®
400 Commonwealth Drive, Warrendale, PA 15096

5th Annual Colloquium on Brakes & Engineering Display and Fibers in Friction Materials Symposium

Sands Hotel & Casino
Atlantic City, NJ
October 5–8, 1987

GENERAL INFORMATION

Registration

Registration for the 5th Annual Brake Colloquium opens at 8:00 a.m. Monday, October 5, 1987, in the Ballroom Foyer (2nd Floor) of the Sands Hotel. Registration for the Fibers in Friction Materials Symposium will be in this same area. Early registration, Sunday, October 4, from 4:00-7:30 p.m. All persons attending the Brake Colloquium and the Fibers in Friction Materials Symposium must register and obtain a badge. Advance registration may be handled by completing the form included in this program. The form must be received by SAE on or before September 21, 1987.

Registration Fees

	Brake* Colloquium	Fibers** Symposium	Both Events
SAE Members:			
Advance Registration	$ 85	$165	$225
On-Site Registration	$ 95	$175	$250
Nonmembers:			
Advance Registration	$115	$225	$325
On-Site Registration	$125	$235	$345
Session Participants/ Chairmen/Authors	$ 35	$ 50	$ 60

*Brake fee includes attendance at all technical sessions and the Educational Display plus one luncheon ticket.

**Fibers fee includes attendance at all technical sessions, the Educational Display, one luncheon ticket, and one copy of the Symposium Proceedings.

Hotel Reservations

The Sands Hotel and Casino, Indiana Avenue and Brighton Park, is located just off the Atlantic City Boardwalk and will once again host the Brake Colloquium, along with the Fibers Symposium. Rates for rooms have been set at $72.00 for a single, double, or double/double room. The hotel has reserved a block of rooms for the meeting attendees. However, the Hotel Reservation Form included in this program must be used to take advantage of the special room rate. Please make your reservations in writing—DO NOT CALL. Confirmation will be sent directly to you from the hotel.
IMPORTANT—Cut-off date for reservations is September 11, 1987.

Transportation

Air travel to Atlantic City is via Allegheny Commuter to Bader Field (5 min.). Piedmont Airlines uses Atlantic City Airport, which is about 20 minutes from downtown. Ground transportation available at both airports, or call Custom Limo at (609) 344-7535 or Casino Limo at 1-800-452-1110 and (609) 646-5555. Limousine service from Philadelphia Airport costs approximately $110 (one-way) and can be arranged with Custom Limo. Taxi fare from Bader Field to the Sands is approximately $5. For those driving to Atlantic City, parking is complimentary at the Sands for registered guests.

Telephone Information

For information on all events and to leave messages, call (609) 441-4000, during conference hours, and ask for the SAE Information Desk. There is no paging system. All messages will be posted in the Registration Area.

Luncheons

The Brake Colloquium Luncheon will be held on Tuesday, October 6, 1987, from 11:30 a.m. until 1:00 p.m. The Fibers in Friction Materials Symposium Luncheon will be held on Thursday, October 8, 1987, from 12:30 to 1:30 p.m.

Fibers in Friction Materials Symposium

This Symposium is co-sponsored by The Asbestos Institute, the Friction Materials Standards Institute, Inc., and SAE.

Fibers in Friction Materials Symposium Proceedings

A Proceedings of the Symposium papers will be published and sent to each registrant after the Symposium, including brief summaries of discussions. Additional copies of the Proceedings (P-201) can be obtained by mail from SAE Headquarters at $40 member and $48 nonmember.

SUMMARY PROGRAM

5th Annual Brake Colloquium

Sunday, October 4, 1987

4:00 p.m.	Early Bird Registration

Monday, October 5, 1987

8:00 a.m.	Registration
9:00 a.m.	BC 1—Brake System Parts & Components
1:30 p.m.	BC 4—Raw Materials/Performance

Tuesday, October 6, 1987

9:00 a.m.	BC 3—Interfacial Phenomena
10:00-2:00 p.m.	Exhibits
11:30-1:00 p.m.	Luncheon
1:30 p.m.	BC 2—Concepts & Technologies
3:00-6:00 p.m.	Exhibits

Wednesday, October 7, 1987

8:30 a.m.	BC 5—Issues & Philosophies
10:00-2:00 p.m.	Exhibits

Fibers in Friction Materials Symposium

1:00 p.m.	FFM1—Friction Materials Performance Issues
4:30 p.m.	FFM2—Dust Control in the Workplace
3:00-6:00 p.m.	Exhibits
6:30 p.m.	Reception—Hosted by Asbestos Institute

Thursday, October 8, 1987

8:00 a.m.-Noon	Exhibits
9:00 a.m.	FFM3—Fibres and Health Issues
12:30 p.m.	Luncheon
2:00 p.m.	FFM4—Regulatory and Legal Issues

SAE The Engineering Society For Advancing Mobility Land Sea Air and Space

William S. Coleman ..... President
Robert G. Brown ..... Treasurer
Charles C. Colyer ..... Assistant Treasurer
Max E. Rumbaugh, Jr. ..... Executive Vice President

TECHNICAL SESSION SCHEDULE

NO SMOKING will be permitted in the Technical Session Meeting Rooms.

MONDAY, OCTOBER 5

BC-1 — **Copa Room 9:00 a.m.**

BRAKE SYSTEM PARTS AND COMPONENTS

Chairman—*John Brown,* Abex Corp.

Antilock Brake Systems Discussion by OE Manufacturers and Suppliers — **Oral Only**
To be determined

Parking Brake Cables — **Oral Only**
Bob Heimann, Orscheln

Applications for Other Technologies — **Oral Only**
To be determined

Planned By General Committee, SAE Brake Colloquium

BC-4 — **Copa Room 1:30 p.m.**

RAW MATERIALS/PERFORMANCE

Chairman—*Daniel McLaughlin,* Schenectady Chemicals

Performance of Carboflex in Brake Applications — **Oral Only**
William Hettinger, Pres., Ashland Carbon Fibers Div.

Carbon/Carbon Friction Products for Brakes and Clutches — **Oral Only**
David W. Gibson, Hitco

Thermal Stability and Structure in Cashew and Modified Phenol-Formaldehyde Resins — **Oral Only**
Frank Blum, Professor, Univ. of Missouri-Rolla

Performance of Particulate Calcium Sulfate Filler — **Oral Only**
Vic Tripathi, US Gypsum

Test Method for Evaluation of the Flexibility of Brake Linings and Evaluation of Various Resin Systems for Brake Lining Flexibility — **Oral Only**
Chris Ford, Cardolite

Planned By General Committee, SAE Brake Colloquium

TUESDAY, OCTOBER 6

BC-3 — **Copa Room 9:00 a.m.**

INTERFACIAL PHENOMENA

Chairman—*Don Melotik,* Ford Motor Company

Transfer Layer Chemistry by Surface Analytical Techniques — **Oral Only**
R. E. Chase, Prin. Res. Scientist and *D. J. Melotik,* Res. Eng., Ford Motor Company

Analysis of Transfer Films from Brake Linings on Metal Surfaces — **Oral Only**
James L. Lauer, Prof., and *L. A. Duplessis,* Graduate Student, Rensselaer Polytechnic Institute

Thickness of Transfer Films Produced by Dry Friction as Determined by Ellipsometry — **Oral Only**
James L. Lauer, Prof., Rensselaer Polytechnic Institute

Tribo-Chemical Conversion of Asbestos in Brake Friction Materials — **Oral Only**
Dr. Michael G. Jacko, Allied-Signal

Planned By General Committee, SAE Brake Colloquium

TUESDAY, OCTOBER 6

States Ballroom — **11:30 a.m.**

LUNCHEON

All Brake Colloquium attendees are invited to attend a luncheon on Tuesday, October 6, in the States Ballroom located on the second floor of the Sands Hotel. The price of the luncheon is included in the registration fee.

James Pruneski, President, Friction Products Worldwide of Abex Corporation is the featured speaker.

BC-2 — **Copa Room 1:30 p.m.**

CONCEPTS AND TECHNOLOGIES

Chairman—*Phil Dougherty,* Friction Div. Prod.

Sound Dampening Materials for Brake Applications — **Oral Only**
Dr. Edward Vydra, Pre Finish Metals

Future Directions of Non-Asbestos Friction Materials in Europe — **Oral Only**
Dr. Dennis Moran, Res. & Dev. Dir., Mintex Don, Ltd.

Thermal Degradation of Semi-Metallic Disc Pad Materials in Heavy Duty Applications — **Oral Only**
Norm Abbott, Certified Brakes/Allied Signal

High Temperature Adhesives for Brake Lining Attachments — **Oral Only**
Rich Mayhew, American Cyanamid

Mixing and Compounding Equipment — **Oral Only**
Albert Shohet and *Carl Anderson,* Processall, Inc.

Future Direction of Non-Asbestos Friction Materials in Japan — **Oral Only**
Mr. Kanzaki, Nisshinbo Industries

Planned By General Committee, SAE Brake Colloquium

WEDNESDAY, OCTOBER 7

BC-5 — **Copa Room 8:30 a.m.**

ISSUES AND PHILOSOPHIES

Chairman—*Marv Weintraub,* Ford Motor Company

Data Acquisition — **Oral Only**
Bob Knapp, Ford Motor Company

Computer Simulation — **Oral Only**
Len Johnson, Ford Motor Company

Brake Diagnostic Expert Systems — **Oral Only**
Phil Tuchinsky, Ford Motor Company

Status of EPA Regulation of Asbestos — **Oral Only**
Steve Shapiro, EPA

Brake Friction Material Issues — **Oral Only**
Dr. Asball, World Health Organization

Planned By General Committee, SAE Brake Colloquium

WEDNESDAY, OCTOBER 7

FFM1 — **Copa Room 1:00-4:15 p.m.**

FRICTION MATERIALS PERFORMANCE ISSUES

Chairman—*A. Anderson,* Pres., Tribo-Diagnostics Corp., and *P. Dougherty,* Friction Div. Prod., Inc.

Opening Remarks:
Marv Weintraub, Engrg. & Mfg. Staff, Ford Motor Co. *Ed Drislane,* Friction Materials Standards Inst. Inc., and *C. Forget,* The Asbestos Inst.

Brake System Performance—Effects of Fiber Types and Concentrations — **872173**
A. Anderson, Pres., Tribo-Diagnostics

User Panel Discussion:

PANELISTS:
Representatives of car and truck manufacturers and end-users, OEM and aftermarket, to give introductory comments on use of asbestos and non-asbestos fibers in friction system applications, ending with representatives' questions from the audience.

Planned By General Committee, Fibres in Friction Materials Symposium

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FFM2 — **Copa Room 4:30-5:30 p.m.**

DUST CONTROL IN THE WORKPLACE

A review of dust exposure and control methods used in automotive and other manufacturing and repair facilities.

Chairman—*Terry Stewart,* Dir., Occupational Health, Allied-Signal Corp.

Historical Perspective on Materials used; (e.g. Crocidolite, Lead, Antimony Chrysotile, etc.); Manufacturing Technology, Types and Form of Products, Exposures, etc.) — **872174**
Terry Stewart, Dir., Occupational Health, Allied-Signal Corp.

Dust Control Methods and Fibre Exposure in Primary Manufacturing—Yesterday and Today — **872175**
Rita Grisham, Vice Pres., Human Resources, NUTURN Corp.

Dust Control and Fibre Exposure in Automotive Brake Repair Shops — **872176**
To be determined

Automotive Brake Repair Costs: Controlled vs. Uncontrolled Methods — **872177**
To be determined

Planned By General Committee, Fibres in Friction Materials Symposium

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THURSDAY, OCTOBER 8

FFM3 — **Copa Room 9:00a.m.-12:00 Noon**

FIBERS AND HEALTH ISSUES

Chairman—*Dr. Arthur M. Langer,* Assoc. Prof., Mt. Sinai School of Medicine, and *Dr. M. K. Bette Meek,* Health & Welfare Canada

Physicochemical Properties of Fibers and Biological Potential — **872178**
Dr. Robert P. Nolan, Mt. Sinai School of Medicine, and *Dr. Arthur M. Langer,* Assoc. Prof., Mt. Sinai School of Medicine

Toxicity of Asbestos Fiber Types, and the Health Experience in Brake Manufacturing and Repair — **872179**
Dr. Janet Hughes, Dept. of Biostatistics & Epidemiology, Tulane School of Public Health

Toxicity of Man-Made Mineral Fibers (glass and rockwools) — **872180**
Dr. Philip Enterline, Dept. of Biostatistics, Univ. of Pittsburgh

Toxicity of Ceramic and Aramid Fibres, Animal Studies — **872181**
Dr. Kenneth Donaldson, Inst. of Occupational Medicine, Univ. of Edinburgh

Toxicity of Wollastonite — **872182**
Dr. Robert Glenn, Dir., Appalach. Lab. for Occup. Safety and Health, Natl. Inst. of Occupational Safety and Health-CDC

Toxicity of Non-Asbestos Fibers — **872183**
To be Determined

Toxicity of Friction Product Residue—A Comparison of Asbestos and Non-Asbestos Fibre Formulations — **872184**
Dr. Candace Wheeler, Biomedical Sciences Dept., GM Res. Labs.

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FFM4 — **Copa Room 2:00-5:00 p.m.**

REGULATORY AND LEGAL ISSUES

Chairman—*Barry Felrice,* Assoc. Admin. for Rulemaking, Natl. Highway Traffic Safety Administration

New Performance Standards—Harmonization of European and American Standards (NHTSA 135) and Need for Standards in the Aftermarket — **872185**
Barry Felrice, Assoc. Admin., NHTSA

Regulatory Developments on Fibres Used in Friction Material Applications — **872186**
To be determined

Risk Assessment/Raw Materials Substitution Considerations — **872187**
Sir Edward Pochin, Dir., Nat. Radiological Protection Board

Legal Aspects of Raw Material Substitution — **872188**
To be determined

Planned By General Committee, Fibres in Friction Materials Symposium

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ATTENTION NON-MEMBERS

JOIN SAE • ATTEND THIS MEETING • AND SAVE $$

Combined one year SAE membership dues and initiation fees range from $30–$75. All SAE members can attend this entire meeting and save $$ on registration fees. For a membership application and details on other SAE member benefits, please write to:

SAE Membership
Code SAE/BRAKE
400 Commonwealth Drive
Warrendale, PA 15096

or call Kathy Hoffman at (412) 776-4841 ext. 369.

PUBLICATIONS

ibers in Friction Materials ymposium Proceedings

BN 0-89883-461-9, 16 Papers, Paperbound 987.
40.00 Member $48.00 List
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ehicle Braking

his information-packed publication provides comprehensive look at the construction and peration of virtually all of the braking systems in use today. Vehicle Braking gives practical, detailed descriptions of the fundamentals of braking, drum and disc brakes, and ydraulic and air braking systems. There are velve chapters included in B-506: Stopping; raking; Leading and Trailing Shoe Brakes; ther Car Drum Brakes; Basic Hydraulic Systems; Car Disc Brakes; Braking Medium Veight Vehicles; Heavy Truck Brakes; Air raking Systems; Special Purpose Brakes; raking System Refinements; and Braking quipment in Service. Published by Pentech ress Ltd. Written by A.K. Baker. Distributed y SAE only in the Western Hemisphere. ISBN -7273-2202-8, 347 pp., 12 Chapters, asebound 1986.
40.00 Member and List
rder No. B-506

Air Disc Brakes

This interesting publication brings the reader up-to-date on the status of air disc brakes. SP665 concentrates on solving problems exhibited by air disc brakes in the field as well as the fine tuning of brake designs. Complete contents include: Update on Kelsey-Hayes Air Disc Brakes; Overcoming Air Disc Brake Limitations; User's Experience with Heavy Duty Truck Disc Brakes; Air Disc Brakes in the OEM Testing Environment; Air Disc Brakes: Problems and Solutions; Where Has Bendix Gone with Air Disc Brakes?; Air Disc Brakes—User Overview; Rockwell Air Disc Brakes. ISBN 0-89883-936-X, 44 pp., 8 Papers, Paperbound 1986.
$35.00 Member $43.00 List
Order No. SP665

Braking: Recent Developments

Development of low cost anti-lock brake systems for FWD passenger cars; a new anti-skid brake system for drum and disc brakes; lining material technology; plus an in-depth review of international braking regulations are just a few of the topics discussed in this information-packed book. ISBN 0-89883-341-8, 80 pp., 7 Papers, Paperbound 1984.
$20.00 Member $25.00 List
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New
Anti-Lock Braking Systems for Passenger Cars and Light Trucks — A Review

The development of a braking system that maintains vehicle stability and steerability while still producing short stopping distances has been a challenge since the early 1950's. This important safety feature, the anti-lock braking system (ABS), is now widely available on upper range passenger cars, trucks and buses and will continue to extend its usage to an even wider range of passenger cars. Edited by experts in ABS technology, the 29th volume in the "Progress in Technology" series, PT-29 provides considerable insight into the history and development of passenger car ABS. For ease of reference, this in-depth review is divided into five sections: Background, Regulation and Testing, Past ABS Technology, Current ABS Technology, and Advanced ABS Technology — there is also an extensive reference section for additional research. ISBN 0-89883-117-2, 450 pp., 34 Papers, Casebound 1987.
$55.00 Member $70.00 List
Order No. PT-29

A New Look At Medium Duty Hydraulic Brakes

SP642 provides an overview of recent changes made to the brake systems of 9-13.5 ton trucks and buses. This publication chronicles problems with hydraulic brakes, what changes were necessary to correct these problems, and the future of medium duty hydraulic brakes. Contents include: Medium Duty Truck Hydraulic Disc Brakes—Ongoing Challenges for Suppliers; A New Hydraulic Drum Brake; Medium Duty Hydraulic Disc Brake Rotors; Disc Brakes and How They Affect Net Profit; and What's In The Future For School Bus Brakes? Are Disc Brakes Here To Stay? ISBN 0-89883-913-0, 44 pgs., 7 Papers, Paperbound 1985.
$17.00 Member $20.00 List
Order No. SP642

A comprehensive review of the latest in anti-lock braking systems

Anti-Lock Braking Systems for Road Vehicles

This publication includes up-to-date information on the anti-lock braking systems of all types of road vehicles. Contents include: Anti-Lock System Performance Under Winter Conditions - What Whould be Required?; Testing Anti-Lock Braking Systems - the Early Years; Legislative Effects on Design of Anti-Lock Brake Systems; The Potential and the Problems Involved in Integrated Anti-Skid Brake Systems; Low Cost Anti-Lock for Hydrostatic Braking Systems; Anti-Lock Systems for Trailers; Commercial Vehicle Braking Performance with Anti-Lock; The American Experience with Anti-Lock on Heavy Vehicles; Development of Anti-Lock Braking Systems for use on Motorcycles; and Limited Slip Braking. Published by I.Mech.E. (U.K.). Available from SAE only in the Western Hemisphere. ISBN 0-85298-567-3, 276 pp., 20 Papers, Paperbound 1985.
$68.00 Member and List
Order No. MEP226

Worldwide Braking Trends: Medium and Heavy Duty Trucks

This publication discusses current philosophies and future trends in braking technology from the main technical centers of North America, Western Europe, and Japan. Complete contents: European Brake Philosophies for Commercial Vehicles in the Range from 6 to 16 Tons GVW; European Brake Philosophy; Why Air/Hydraulic Brake Systems on Japanese Straight Trucks?; Japanese Truck Brake Philosophy; and Evolution of Medium Duty Hydraulic Brake Systems. ISBN 0-89883-915-7, 52 pgs., 5 Papers, Paperbound 1985.
$15.00 Member $18.00 List
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I plan to attend the: ☐ Brake Colloquium
(check as applicable)
☐ Fibers Symposium ☐ Both Meetings

I am a Participant/Author at
☐ Brake Colloquium ☐ Fibers Symposium
☐ Both Meetings

Total Registration Fee enclosed: $_____
Make check payable to "SAE" or charge to:

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Card No._____ Exp. Date_____

Signature_____

Pre-registration Conditions:
1. Payment must accompany pre-registration form.
2. Pre-registration form and payment must be received by Monday, September 21.
3. No cancellations accepted or refunds made after Tuesday, September 22.

Mail with Payment to:
SAE, Inc.
Dept. 1102/8/0666
400 Commonwealth Drive
Warrendale, PA 15096

HOTEL RESERVATION FORM

5TH ANNUAL COLLOQUIUM ON BRAKES, ENGINEERING DISPLAY & FIBERS IN FRICTION MATERIALS SYMPOSIUM
SANDS HOTEL & CASINO

October 5—8, 1987

All reservations for room accommodations can be made by contacting:
Sands Hotel & Casino
Attn: Reservations Manager
Indiana Avenue and Brighton Park
Atlantic City, NJ 08401

SPEAKER

Please make your reservation in writing-DO NOT CALL. Confirmation will be sent directly to you by the hotel.

Complete this form and mail to the above address.

PLEASE NOTE: CHECK-IN TIME IS 3:00 PM (Expect later check-in on Sunday) CHECK-OUT TIME IS 12:00 NOON

All reservation requests and deposits must be received by September 11, 1987 in order to guarantee accommodations.

YOUR RESERVATION REQUEST CANNOT BE PROCESSED UNLESS THE FIRST NIGHT'S DEPOSIT IS INCLUDED. DEPOSIT WILL BE REFUNDED IF CANCELLATION IS RECEIVED 48 HOURS IN ADVANCE. WE APPRECIATE YOUR COOPERATION.

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COMPANY_____

ADDRESS_____

CITY/STATE/ZIP_____

BUSINESS PHONE_____

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☐ American Express

Card No._____ Exp. Date_____

Please Check
☐ Single Occup. (1 person) $72
☐ Double Occup. (2 people) $72

Plus 12% State Tax

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Sharing with_____

Requests for accommodations prior to and after Conference dates will be accepted on a space available basis only.

Arrival Date _____ Departure Date_____

BRAKE DISPLAY

1987 SAE BRAKE ENGINEERING DISPLAY

An educational and technical display is presented in conjuction with the Colloquium to provide attendees the opportunity to obtain information relative to recent developments and engineering advancements within the brake industry.

(Exhibitors as of August 5, 1987)

Plan to visit the display and meet representatives from:

COMPANY	BOOTH
American Cyanamid Company	25
American Metal Fibers Inc.	2
Ashland Carbon Fibers	16
Borden Chemical Industrial Resins Div.	24
Commercial Industrial Minerals Ltd.	23
Custom Cryogenic Grinding Corp.	6
Engelhard Corporation	22
Evanite Glass Fiber, Inc.	5
FRAS-LE S.A. Friction Materials	15
W. R. Grace & Co.	18
Hills Brothers Chemical Co.	1
HITCO	20
Leinweber Maschinen	10
Monsanto Company	14
NYCO	19
Pittsburgh Coil Technology	8
Pre Finish Metals	4
Pyron Corporation	21
Superior Graphite Co.	11
Thermafiber Div. USG Interiors Inc.	3
U.S. Gypsum Co.	17
Jim Walter Resources Inc.	26

EXHIBIT HOURS:

Tuesday, October 6
10:00 am to 2:00 pm
3:00 pm to 6:00 pm*

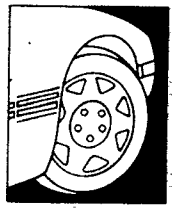
Wednesday, October 7
10:00 am to 2:00 pm
3:00 pm to 6:00 pm*

Thursday, October 8
8:00 am to 12 Noon

(*Reception will be held at the close of the afternoon session.)

Keep up with advancing technology in the auto industry . . .

Attend the



1987 SAE Passenger Car Meeting and Exposition

Hyatt Regency Dearborn
October 19-22, 1987

ATTENTION: engineers, managers, and industry executives. If you are involved in auto design, manufacturing, concepts, materials, testing, or operations of new automobiles, you need to attend this meeting. Here are just a few of the benefits you will receive from attending.

- Choose from over seventy presentations in the manufacturing, maintenance, materials, and auto design areas.
- Find the answers to your design, engineering, and management questions as you meet with colleagues and leaders from the industry.
- Review the history of passenger car design by attending a special session on "Significant Automobiles of the Past Half Century as Told by their Creators."
- Keep up-to-date on the latest advances in the auto industry by meeting face-to-face with representatives from dozens of companies exhibiting at the Exposition.
- Discover what's new in computer technology during the "Engineering Information Through Computer Technology" session.
- Earn CEU's by attending one or more of the continuing education courses offered during the week.
- Learn the latest developments in auto transmissions, wheel bearings, testing and instrumentation, emissions, engines and more.

About the meeting.....

A complete technical program including over thirty sessions will cover subjects from transmissions, safety, parts and components, and engines to computer technology and historical auto designs. The Exposition will include dozens of companies such as Borg-Warner, Lucas Industries, Sun Electric, Truck Lite, Lotus, Motorola, and many others.

For complete meeting details and a FREE copy of the meeting program, write or call Cathy Joyce at SAE Headquarters, Dept. 945, 400 Commonwealth Drive, Warrendale, PA 15096, (412) 776-4841.

Pre-register Today — Call Kathy Hoffman at (412) 776-4841, Ext. 369.

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