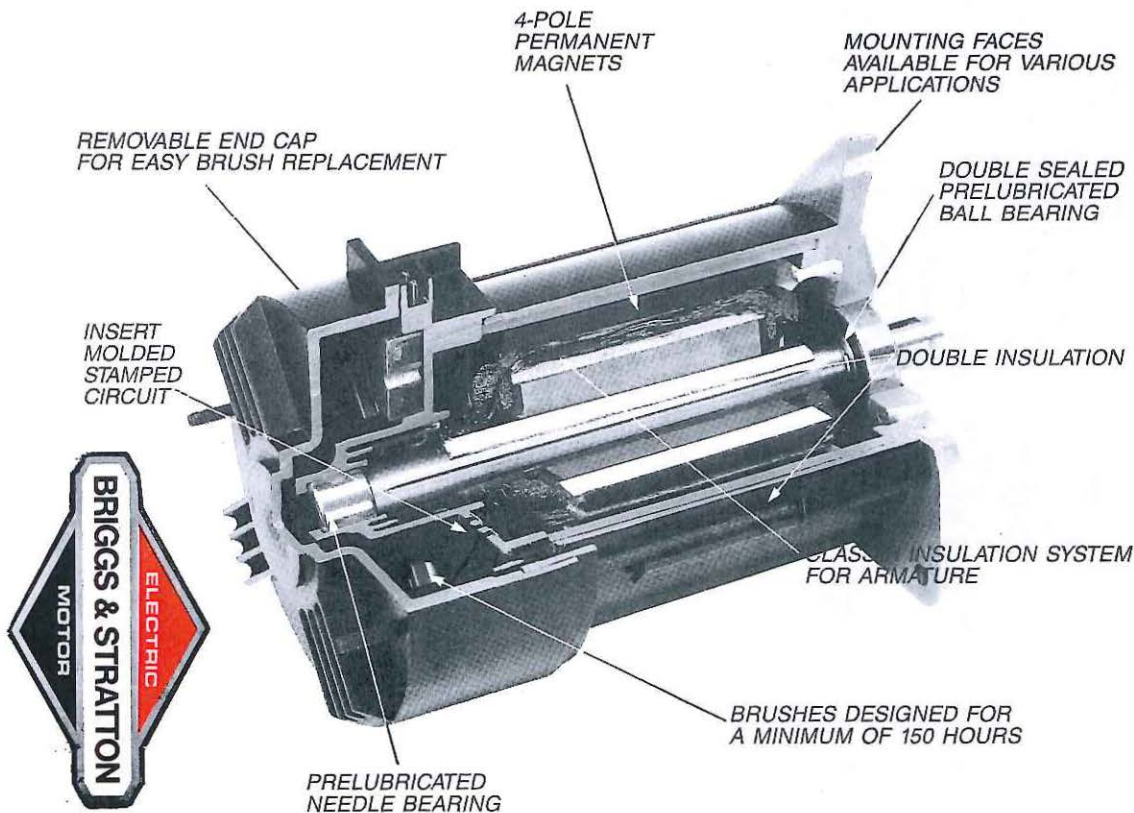
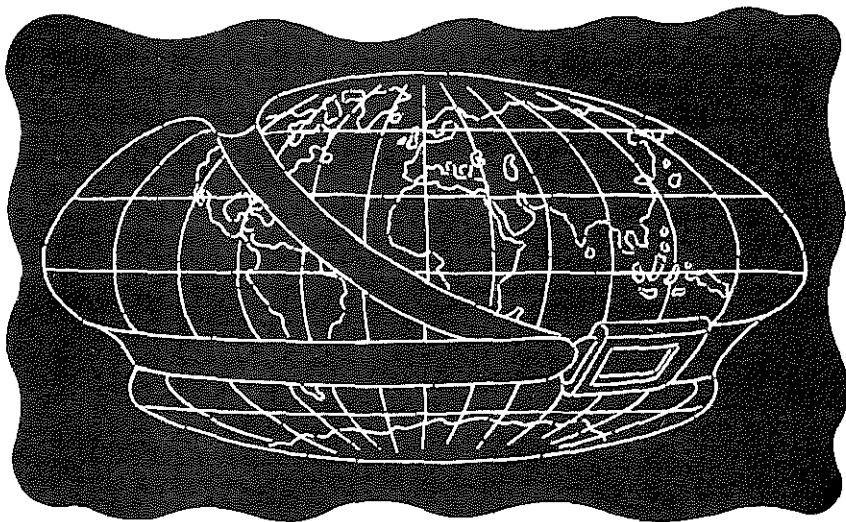


SAE

CHICAGO
SECTION
VOL. 54
NO. 7

NOVEMBER, 1986





We make seat belts for the world.

This year, nearly 32 million new passenger cars will hit the road worldwide. And a company called TRW will build more seat belts for them than any other independent supplier.

TRW has been an innovator in seat belt design for 24 years. We were a pioneer in emergency locking retractors for seat belts. We helped develop the world's first passive seat belt system. Designed the first emergency pretensioner device. And right now, we're hard at work in both North America and Europe, developing advanced inflatable restraint systems.

TRW—where high technology is helping make the world a safer place to drive.



**Automotive
Worldwide Sector**

CHICAGO SECTION Chairman's Message



Last month I stressed the importance of attending local section meetings. Participation in local section meetings provides the backbone on which regional and national meetings are built. New ideas and formats can be tried at the local level and result in increased involvement.

An example of this type of meeting is the Second Agricultural Machinery Conference being held on November 3, 4, and 5 at the Stoffers 5 Seasons Inn in Cedar Rapids, Iowa. This joint meeting sponsored by the Mississippi Valley SAE Section, Iowa ASAE Section, and Quad City ASAE Section provides an excellent program on agricultural machinery technology. This meeting became a reality as local groups saw a requirement for this type of meeting, got involved, and developed a very successful program.

If you would like to get involved in SAE planning activities, contact your section officers.

Chicago Section Chairman

A handwritten signature in black ink that reads 'Kenneth C. Wolfgram'. The signature is written in a cursive, flowing style.

Kenneth C. Wolfgram

FELCPLY®

FEL-PRO HEAVY DUTY CYLINDER HEAD GASKETS

SAE The Engineering
Resource For
Advancing Mobility

8001 COMMUNITY AVE. FIVE DRIVE WARREN, MI 48090

SAE Technical Paper Series

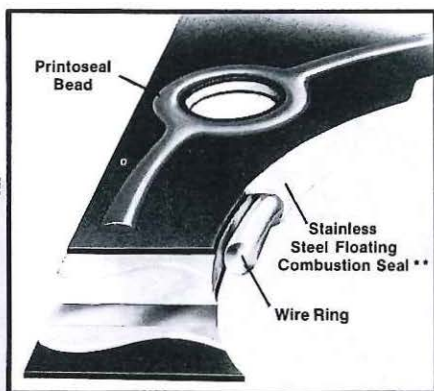
840188

Designing and Testing Cylinder Head Gaskets for High Performance Sealing

Daniel E. Czernik

Fel-Pro Inc./Felt Products Mfg. Co.

International Congress
& Exposition
Detroit, Michigan
February 27-March 2, 1984



Felcopy technology forms the basis for two heavy-duty, problem-solving gaskets: PermaTorque/Blue® and Printoseal®.*

**Write FEL-PRO For Complete Technical
Information On All Your Gasketing Requirements
and A Number of SAE Papers By FEL-PRO's
Product Engineering Group.**

**U.S. Patent No. 3,565,449

*Printoseal process
under license from
Dowty Seals, Ltd. Great Britain
U.S. Patent No. 3477867.



Fel-Pro Incorporated
7450 N. McCormick Blvd.
Box C 1103, Dept. CSAE-1186
Skokie, Illinois 60076

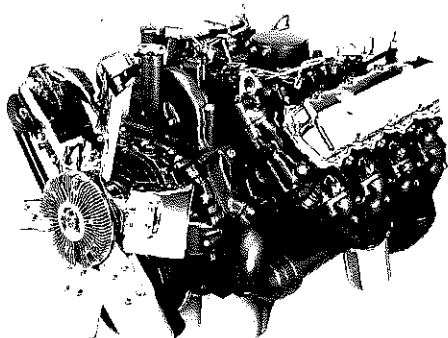
Powerful Ideas for OEM Needs.

We've been generating powerful ideas for nearly a century and bringing them to the marketplace in engines that deliver legendary dependability, durability and performance. And we're committed to supply original equipment manufacturers with our legendary engines today, and for years to come.

Navistar International Corporation has helped pioneer the engineering, research and development of internal combustion engines since 1889. Our engines have built a proven record in construction, agriculture, transportation and forestry equipment, as well as marine and recreation.

Today, we are one of the largest engine manufacturers in the world, with, we believe, the most capable research and engineering staff in the business. And we've made the commitment to serve the OEM market. We have the capacity to meet your needs.

So when you need a power plant, choose a powerful idea from Navistar.



**International
6.9 Liter Diesel Engine**

Navistar International Corporation, 401 N. Michigan Ave., Chicago, Ill. 60611



INTERNATIONAL®

from NAVISTAR



HEAVY-DUTY ELECTRONICS

DOHNER & ASSOCIATES, INC. (DAI) provides electronic control systems and engineering services to Heavy-Duty and Off-Highway Equipment Manufacturers.

DAI has developed Electronic Systems to control:

- | | |
|---|--|
| <input type="radio"/> Tractor Hitches | <input type="radio"/> Hydrostatics |
| <input type="radio"/> Transmissions | <input type="radio"/> Gasoline Engines |
| <input type="radio"/> Combine Functions | <input type="radio"/> Diesel Engines |

We can modify a standard design - or custom engineer a new design - to your exact specification, at competitive prices.

To learn more, call us at the number shown below.
Or complete this form and mail it to us.

Applications



- | | |
|-------------------------|--------------------------|
| Agricultural Equipment | <input type="checkbox"/> |
| Construction Equipment | <input type="checkbox"/> |
| Industrial Equipment | <input type="checkbox"/> |
| On-Highway Trucks | <input type="checkbox"/> |
| Stationary Power Plants | <input type="checkbox"/> |
| C.I. & S.I. Engines | <input type="checkbox"/> |

Services



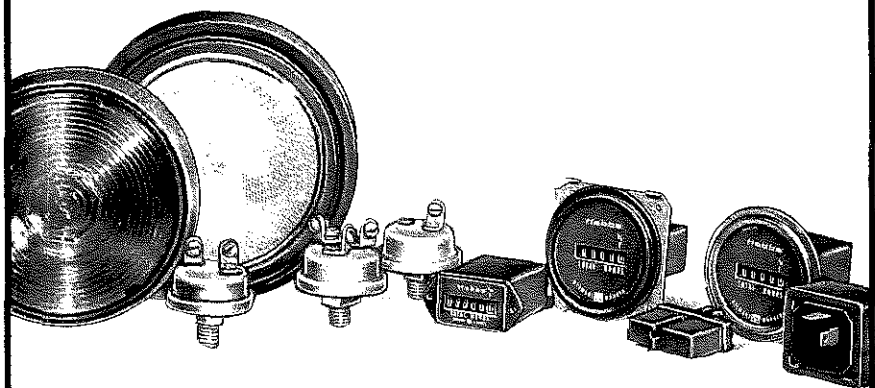
- | | |
|------------------------|--------------------------|
| Control System Design | <input type="checkbox"/> |
| Software Engineering | <input type="checkbox"/> |
| Computer Simulation | <input type="checkbox"/> |
| Prototype Fabrication | <input type="checkbox"/> |
| Development Testing | <input type="checkbox"/> |
| Production Electronics | <input type="checkbox"/> |



DOHNER & ASSOCIATES, INC.
6804 HOBSON VALLEY DRIVE
SUITE 112
WOODRIDGE, ILLINOIS 60517
(312) 971-2442

Intelligent solutions to heavy-duty problems

Name _____
Company _____
Address _____
City _____
State/Zip _____
Phone () _____



When machines talk, the language they use is Hobbs.

Hour meters. Pressure and vacuum switches. Snap-action switches. Cold weather starting devices. Buzzers. Flashers. Halogen headlamps. Shock-resistant headlamps. Warning lights. Whatever machines need to call for help or perform more efficiently. Hobbs makes them better than anyone.

Hobbs is a prime supplier to the powered equipment industry. Anywhere something turns, spins or moves, Hobbs has a product to help it run better. Call or write today for our complete line of products. Hobbs Division, Stewart-Warner Corporation, Yale Blvd. and Ash St., Springfield, Illinois 62705. Call 217/753-7600.

Represented by: Ziegenbein Associates, Inc.
200 Bishop's Way, Brookfield, WI 53005

Hobbs, Communication between machine and man.

SYMBOL OF



EXCELLENCE

Hobbs Division
STEWART-WARNER
CORPORATION

FOX VALLEY DIVISION
SAE Chicago Section

TUESDAY, NOVEMBER 18, 1986

SPEAKER



C.W. RIEDIGER

CHAIRMAN



JEFFREY BUTLER

THE CATERPILLAR 416 BACKHOE LOADER

BY

CRAIG W. RIEDIGER

Caterpillar recently introduced its first backhoe loader—a significant extension to the existing product line of construction equipment. It is a highly versatile machine entering a well-developed marketplace. This paper describes design considerations, the development program, and vehicle design features associated with the 416 Backhoe Loader.

CRAIG W. RIEDIGER graduated from Iowa University in 1973 with a B.S. in Mechanical Engineering. Craig joined Caterpillar in 1973 and has held positions as vehicle test engineer, design engineer, and currently as supervising design engineer.

JEFFREY BUTLER graduated from Bradley University in 1980 with a B.S. in Mechanical Engineering and Aurora University in 1985 with a M.S. in Business Administration. Jeff joined Caterpillar in 1981 and currently is in Reliability Engineering.

Meeting Location

Saratoga Hotel
Corner of Rte. 31 and I-5
North Aurora, IL

5:30 p.m. SOCIAL HALF HOUR

6:00 p.m. DINNER

7:00 p.m. TECHNICAL SESSION

Meeting Sponsors

CATERPILLAR INC.
NTN BEARING COMPANY
BARRY CONTROLS

Student Support

HYDRO-COMPONENTS
R & D INC.

ELGIN SWEEPER COMPANY

Reservations:

Mrs. JoAnn Hill
(312) 859-5116

or contact your Plant Representative

Dinner reservations required.

Deadline: 12:00 NOON
NOVEMBER 17, 1986

Prices

\$11.00	MEMBERS
\$13.00	NON-MEMBERS
\$ 6.00	COLLEGE STUDENTS

SPEAKER



DANIEL J. EDMINSTER

CHAIRMAN



CHESTER L. FRANCIS

SAE -CHICAGO

TUESDAY, NOVEMBER 10, 1981

DESIGNING

AUTOMATED MANUFACTURING

120 VOLT — 1000 WATT

START TO PRODUCTION

B

DANIEL J. EDMINSTER

The 120 volt—1000 watt electric motor is designed to replace a 3 to 4 horse power gasoline engine in order to develop a motor capable of automating the art manufacturing process so that it can be produced.

Many unique situations and solutions are presented.

1. Walk behind lawn mower
2. Single stage and two stage
3. Motor/Hydraulic Pump for
4. 6/1 gear reduction.
5. Motor which is equipped

The high torque double insulated motor is designed in lower ampere draw, greater accelerating capabilities which are not normally found in designs.

DANIEL J. EDMINSTER is manager of the Products Div. of Briggs and Stratton. He holds an Electrical Engineering degree from the University of Engineering. He has been involved in his career.

CHESTER L. FRANCIS is Associate Professor at the University of Iowa in mechanical engineering since 1965.

**PLEASE POST THIS
"GUESTS WELCOME"**

D SECTION

MBER 11, 1986

ING FOR NUFACTURING T ELECTRIC MOTOR CTION 2 YEARS

DMINSTER

rive motors are used in place of
. The purpose of the project was
omatic assembly utilizing state of
more competitive product could

s will be explained, and included:

snowthrowers.
use on log-splitters.

or hydraulic pump mounting.

permanent magnet design results
ration and inherent dynamic brak-
nal with current induction motor

anager of Engineering Electrical
in Menominee Falls, Wisconsin.
egree from the Milwaukee School
ved with electric motors most of

ount Manager for Robert Bosch
al. He is a graduate of the Univer-
ng and has been a SAE member

OAK MEADOWS COUNTRY CLUB

WOOD DALE ROAD
BETWEEN LAKE STREET (ROUTE #20)
AND
IRVING PARK ROAD (ROUTE -19)

5:30 p.m. Social Half-Hour
"ATTITUDE ADJUSTMENT HOUR"

6:00 p.m. Dinner
7:00 p.m. Technical Session

MEETING SPONSOR

Robert Bosch Corporation

TICKET PRICES

Members	\$12.50 each
Non-members	\$14.50 each
Students	\$ 6.00 each

DINNER RESERVATIONS REQUIRED

Single Table Reservations Restricted to 8 people
Contact your plant representative

or Chicago Section Office

(312) 810-0405

ANNOUNCEMENT
"BRING A FRIEND"

MICHIANA DIVISION
SAE Chicago Section

TUESDAY, NOVEMBER 18, 1986

SPEAKER



DR. JOHN UHRAN

CHAIRMAN



DR. TONY MICHEL

ARTIFICIAL INTELLIGENCE AND THE ENGINEER
BY
DR. JOHN UHRAN

The basic facts and background for potential users of artificial intelligence will be presented. Design of, need for and future directions will be explained and the impact of this technology in the engineering profession will be discussed.

DR. JOHN UHRAN, a professor in the Dept. of Electrical and Computer Engineering, University of Notre Dame, has been teaching at Notre Dame since 1966 after having taught at Purdue University. He has followed computer technology since the dept. first obtained a PDP-8 computer and has taught many regular and seminar courses on various computer topics. He is presently helping to establish a presence for artificial intelligence on the campus by working with small groups of students on development projects.

DR. TONY MICHEL is presently the Chairman of the ECE Dept., University of Notre Dame. He previously taught and did research at Iowa State University for 16 years. He is a specialist in the stability of linear and non-linear systems and has been instrumental in the recent growth and broadening of the graduate program in the department.

SPECIAL FEATURES: **Joint Meeting** with St. Joseph Valley Section of American Society of Mechanical Engineers.

Computer Display illustrating some engrg expert system software: by Omni Micro Business Centers.

Meeting Location

Ramada Inn
52890 US 33 North
South Bend, IN

6:00 p.m. - Social Period
6:00 p.m. - Computer Demo.
7:00 p.m. - Dinner
8:00 p.m. - Technical Presentation

Student Support:
Hydro-Components R & D Inc.

Reservations:

Keith Fulmer
Allied Automotive
(219) 237-2115

Deadline: 4:00 p.m. EST
Thursday, November 13, 1986

Prices

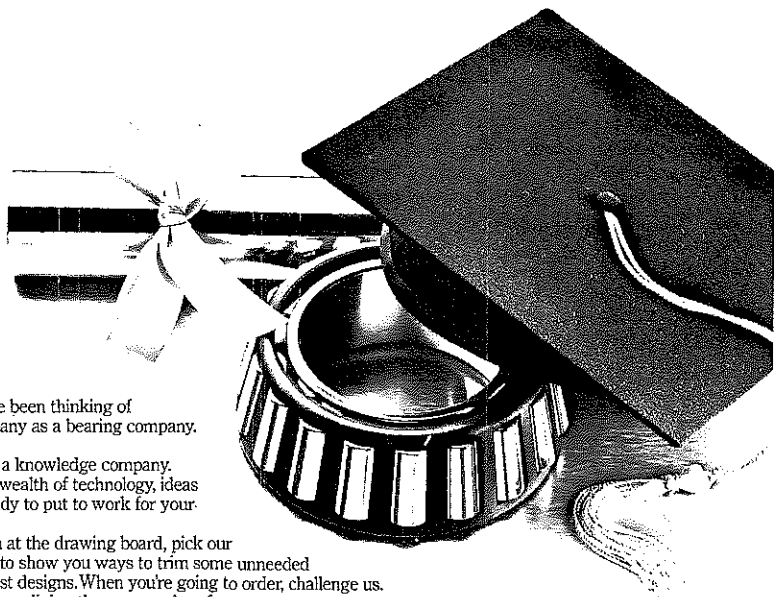
\$10.00

\$12.00

MEMBERS

NON-MEMBERS

IT'S NOT JUST WHAT WE MAKE. IT'S WHAT WE KNOW.



FOR YEARS, you've been thinking of
The Timken Company as a bearing company.
Or a steel company.

Now think of us as a knowledge company.

A company with a wealth of technology, ideas
and skills that we're ready to put to work for your
company right now.

When you sit down at the drawing board, pick our
brains. We may be able to show you ways to trim some unneeded
weight from your newest designs. When you're going to order, challenge us.
We'll share ideas for streamlining the way you buy from us.

When you're setting up production, call us in. We'll show your people a few
special tricks we've learned that may save you time and money.

The Timken Company. The knowledge company. Put us to the test. We think
we'll pass with flying colors.

The Timken Company, Canton, Ohio 44706.

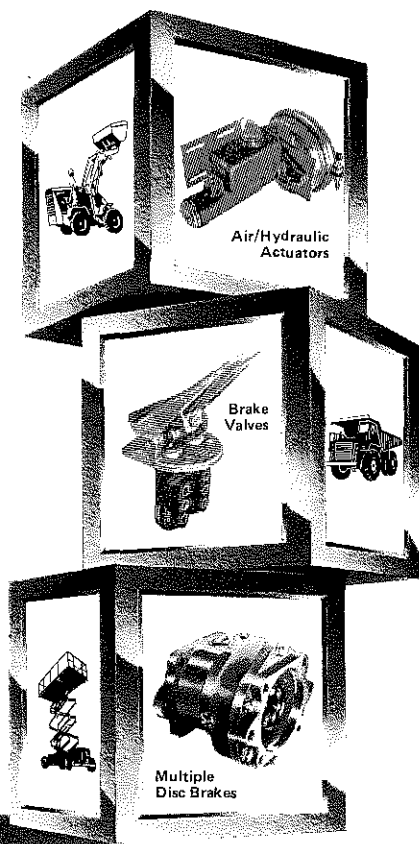
TIMKEN®
REGISTERED TRADEMARK

BUILDING A BETTER BRAKE SYSTEM WITH

MICO Quality Hydraulic Brake Components

MICO is meeting today's hydraulic fluid power needs with innovative ideas . . . answering the challenges of adverse environmental conditions . . . filling the demands for complete brake systems and simplicity of design with MICO's full range of hydraulic brake products.

Call us, we're listening.

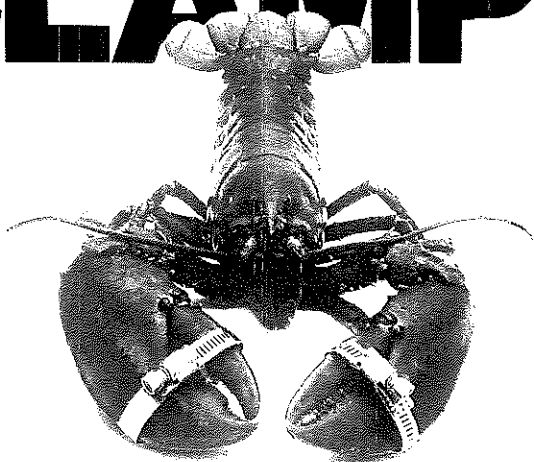


1911 Lee Boulevard, P.O. Box 2118, Dept. N-57, North Mankato, Minnesota U.S.A. 56002-2118
Phone: (507) 625-6426 TELEX 910-565-2444

MICO WEST

701 East Francis Street, P.O. Box 9058, Dept. N-57, Ontario, California U.S.A. 91762-9058
Phone: (714) 947-4077 TELEX 510-600-0132

THINK CLAMPS



They're not just for hose connections.

The worm drive clamp is an amazingly versatile invention. It has thousands of uses. New ones are discovered every day by those who think clamps when it comes to fastening. Send for our catalog. Talk to us. You could boost your company's productivity and profits.

Your imagination's the only limit.



IDEAL DIVISION/PARKER HANNIFIN CORPORATION
3200 PARKER DRIVE/ST. AUGUSTINE, FL 32084



43rd ANNUAL PLAY DAY
September 4, 1986
St. Andrews and Bartlett Hills Country Clubs

The Entertainment Committee and everyone in the SAE-Chicago Section is indebted to those companies listed below who gave valuable prizes to make the day the success that it was. Thank you!!!

PRIZE DONORS

Aeroquip Corp.	Jessen Mfg. Co.
Air Maze Corp.	Kelsey-Hayes Co.-Gunitite Divn.
Borg Warner Automotive, Inc.	Matis Inc.
Robert Bosch Corp.	Motorola Inc.-Auto. Prod. Divn.
Caterpillar Inc.	Navistar International Corp.
Champion Spark Plug	NTN Bearing Corp. of America
Cherry Electrical Products	Nelson Divn.-Exhaust Filtration Sys.
Chicago Rawhide	Omni Pac, Inc.
Clark Equip. Co.-Components Divn.	Parker Hannifin Corp.
Clevite Ind., Inc.-Engine Parts Divn.	Reinz Wisconsin Gasket
Dana Corp.-Victor Products Divn.	Robert Shaw Controls Co.
Dana Corp.-Spicer Trans. Divn.	Sheller Globe-Leece Neville
Fed. Mogul Corp.-Component Group	The Timken Co.
Fel-Pro Inc.	TRW-Valve Division
Garlock Inc.	United Air Cleaner Co.
Hendrickson-Suspension	H.A. Weatherhead & Assoc.
Hydro-Components R & D Co.	Western Rubber Co.
Imperial Eastman	Zollner Pistons

GOLF SCORE WINNERS

Low Gross

Bartlett Hills — **Pete Simonson - 89**
St. Andrews No. 1 — **Bob Ludlow - 77**
St. Andrews No. 2 — **Mike Mason - 70**

Low Net

Bartlett Hills — **Chuck Downs - 66**
St. Andrews No. 1 — **Ed Walinski - 64**
St. Andrews No. 2 — **Mike Cheek - 70**

If inadvertently your name has been omitted please contact the Chicago Section Office.



EXECUTIVE COMMITTEE

K.C. Wolfgram (Caterpillar)	Chairman . . .	(312)-859-5859
C.F. Cervenka (Consultant)	Past Chairman . . .	(312)-968-9459
M.R. Fernandez (Fram-Allied-Corp.)	Vice Chairman . . .	(312)-349-9483
J.A. Damusis (Dana Corp.)	Treasurer . . .	(312)-960-4200
T.J. Owen (Chicago Rawhide)	Secretary . . .	(312)-742-7840

DIVISION VICE-CHAIRMAN

J.D. Carlson (Elgin Sweeper Co.)	Fox Valley . . .	(312)-741-5370
S.J. Borden (Allied Corp.)	Michiana . . .	(219)-237-5635

Address all **Correspondence** to S.A.E. Chicago Section Office.
25 South Cass Avenue, Westmont, IL 60559 • Phone: (312) 810-0405

SAE – WHAT IT DOES FOR YOU!

1. Broadens your horizons.
2. Gets you out of your cloistered existence.
3. Gives you an opportunity to meet and associate with top level people.
4. Keeps you informed of the latest technological advancements in and beyond your field.

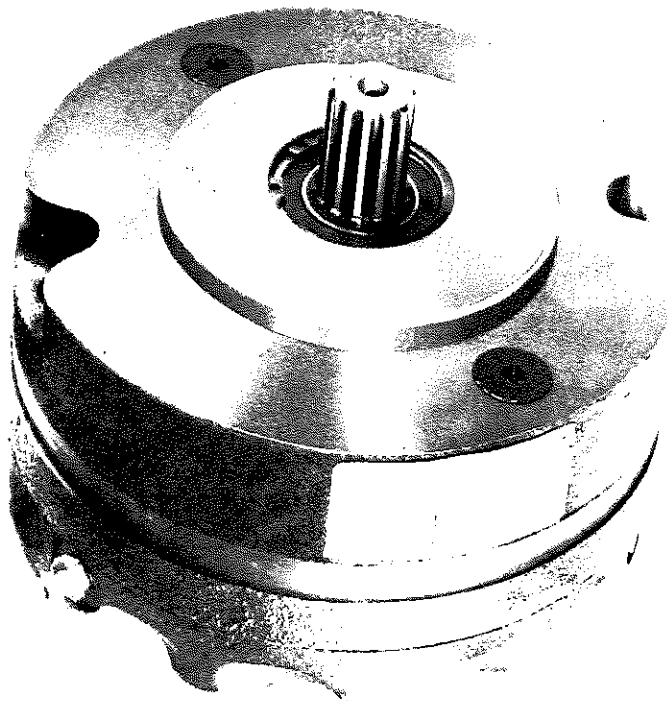


HYDRAULIC BRAKE SYSTEMS AND COMPONENTS
For Mobile and Industrial Equipment

1911 Lee Blvd. / P.O. Box 2118 / No. Mankato, Minnesota U.S.A. 56002-2118 / Phone: (507) 625-6426 / TELEX 910-565-2444

NEW PRODUCT RELEASE

Sy-Tec Series Safe - T-Brake



MICO's new Sy-Tec Series B mount brake is a spring apply, hydraulic release, multiple disc type. This dry design brake features a compact modular design which allows customers to choose from a wide variety of mounting configurations.

These brakes are ruggedly built with large diameter 8620 or 4140 steel shafts for high strength and long disc life. Torques to 4000 lbs. in. with low release pressures which makes these brakes ideal for closed-loop hydrostatic systems. B mount brakes feature a unique balanced piston design and they are interchangeable with older fail-safe brake designs.

Specifications include: (1) maximum operating pressure - 3000 psi, (2) Maximum operating speed - 3900 r.p.m., (3) dynamic energy input capabilities -160 K ft. lbs., (4) Displacement release piston-0.9 cu. in. and (5) maximum operating temp. 270° F.

Typical applications include off-highway vehicles and equipment in the agricultural, construction, material handling, forestry and mining industries. Ideal for use in a multitude of winching applications.

SAE-CHICAGO SECTION

1986-1987 Meeting Dates

Date	Group	Subject
1986		
10-14	Chicago	"Chernobyl-Why It Can't Happen Here"
10-21	Fox Valley	Advances in Automotive Technology—GMC
10-28	Michiana	Stress Vectored Composites
11-11	Chicago	Electric Motors For Small Equipment
11-18	Fox Valley	Caterpillar Tractor 416
11-18	Michiana	Artificial Intelligence
12-09	Chicago	SAE-National President Visit
1987		
1-13	Chicago	Power Plants
1-27	Michiana	
2-10	Chicago	Parts & Accessories
2-17	Fox Valley	Ladies Night—Epcot Center
2-17	Michiana	
3-10	Chicago	Advanced Technology
3-17	Fox Valley	Sealing Seminar—CR Industries
3-24	Michiana	Serviceability by Design
4-14	Chicago	Fuels and Lubricants
4-21	Fox Valley	Diamond Star Motors
4-28	Michiana	
5-12	Chicago	Transportation Equipment

RETURN POSTAGE GUARANTEED



CHICAGO SECTION
25 SOUTH CASS AVENUE
WESTMONT, ILLINOIS 60559

Non-Profit
Organization
U.S. POSTAGE
PAID
LOMBARD, ILL.
Permit No. 296

Garlock Hydraulic Components

CHEVRON® Packing ■ Wear Rings
U-Seals ■ Piston Cups
Rod Scrapers ■ Rod Wipers

At GARLOCK each and every one of our products stands alone as an item manufactured with excellence. Over 90 years of manufacturing and development experience has provided us with the unique ability to keep our seal designs in step with equipment requirements. A true benefit for you.

Colt Industries



Garlock®

Mechanical Packing Division

1666 Division St., Palmyra, N. Y. 14522
315/597-4811