SAE International®

MAY 2005

ARIZONA-NEVADA SECTION NEWSLETTER

MEETING: MAY 19

Section Web Site: www.saearizona.org - ***Sign up for your newsletter on our website.***

HIGHLIGHTS...

Dinner Presentation...

Automotive Tire Technology

By John W. Daws, Ph.D., P.E.

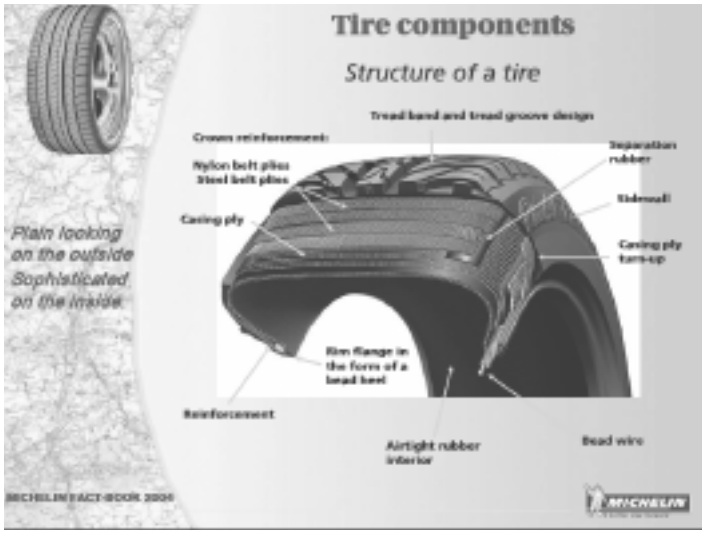

Image courtesy Michelin

The modern automobile tire is the result of roughly 150 years of development. In 1845 the first pneumatic tire was patented by Robert William Thomson, a Scottish engineer. His invention consisted of a canvas inner tube surrounded by a leather outer tire. Thomson's tire was only applied to horse drawn carriages. By Dunlop's time, vulanized rubber had been invented and the bicycle proved a far more suitable application for pneumatic tires.

The first automobile tires, in the early 1900's, would last only about 2,500 miles. But continual advances in chemistry and engineering have made tires that can withstand continual abuse and deliver as much as 50,000 miles of trouble-free driving. Warranties on some extended-life tires cite a life expectancy of 80,000 miles or more. This month, John Daws will give us a look at what goes into modern tires.

John W. Daws, Ph.D., P.E.
Senior Managing Engineer, Vehicle Engineering

Dr. John W. Daws is a Senior Managing Engineer and a Director of Exponent's Vehicle Engineering practice. He has more than 19 years of technical and managerial experience in the tire industry. Dr. Daws specializes in the analysis of tire failure and the effect of tires on vehicle handling. He has done extensive work relating the fractography of tire failure surfaces to the various modes of failure, especially dynamic failure modes like tread separation. He has also performed handling testing to determine the effect of tire selection on extreme vehicle maneuvers.

Dr. Daws has participated in the development of passenger tires for vehicle manufacturers and well as for the replacement market, and has extensive experience in the various types of testing performed in those environments. He also has extensive machine development experience in the tire manufacturing arena, and has spent considerable time relating tire performance to manufacturing processes used in the industry.

Prior to joining Exponent, Dr. Daws was employed by Michelin North America, where he was responsible for the determination of vulcanization effects on tire performance using finite element analysis, machine testing, and field testing.

Dr. Draws holds patents and is the author of a number of technical publications on tire construction and failure analysis.

Top-Secret Coffee Talk

Our coffee talk for this month still remains under wraps. I've heard rumors about the presentations, but neither Derek Logan nor Kevin Willson will say for sure what they have in store for us. But I suspect it's something really interesting. And if we don't like what we see, Kevin Willson has promised to buy everyone's dinner. (He didn't actually say that, but since it's showing up in print, perhaps he'll do it anyway.)

DATE	TIME		LOCATION	COST	With Dinner	Presentation Only
May 19	Social	- 6:00 pm	Crowne Plaza Hotel (Holiday Inn)	Members	- $20	$10
	Dinner	- 7:00 pm	44th St. & Washington	Guests	- $25	$10
	Presentation	- 8:00 pm	602-273-7778	Students	- $10	no charge

RSVP by 2:00 pm Monday May 16. Call Bob Riley: 623-872-3475

Message from the Chair


Kevin Willson in Dodge Viper.

It's hard to believe that I have been Section Chair for a year now as we close out the 2004-2005 season with another wonderful and informative presentation. This year has been a tremendous success for the Arizona-Nevada section with a full slate of topics that have covered many aspects of the SAE. So far we have covered automotive introductions with the Chrysler 300C and future introductions with the new Packard and the Nissan X-trail. Aerospace was represented last month with a presentation from Boeing on their soon to be released 787. Advances in the realm of engine development were brought to us from FEV with a presentation on clean diesel technology along with insights into the economics of developing these new technologies. The infrastructure of a Hydrogen Economy was brought to us by the Technology Development Department of APS with a look at the Hydrogen Power Park located in downtown Phoenix. An ever-increasing part of Engineering, Product Liability, was presented to us by Snell and Wilmer. Academia in the East Valley was presented by the provost of ASU East, Gerald Jakubowski, with an emphasis given to the emerging Polytechnic campus that is being formed. And we were also fortunate to have past SAE President John Leinonen present a history of the SAE as part of our SAE 100 celebration in January.

So how do we close out such a successful year? We bring in Dr. John Daws of Exponent (formerly of Michelin) to present the trend toward ultra low profile, large diameter wheel and tire combinations being used on trucks and SUVs. His presentation will focus on the tires and the affects on the static and dynamic properties of a vehicle. So the next time you see one of these trucks rolling done the road on 18", 20" or even 22" wheels and tires, you'll have a better understanding of what this does to influence the ride and handling of that truck.

Thanks to everyone who has helped in finding speakers and working with them to get these presentations put together for the section. With the help of the section members, this Board has been able to add to the many things offered to the members of the Arizona-Nevada section. We have been able to deliver quality meetings with topics that have a wide range of interests. We were thrilled to also be able to involve the student sections from both U of A and ASU in section meetings and in the tour at Caterpillar in Tucson earlier this year. I know the Board is already planning for next year and is looking into even holding a meeting in Tucson for our members down south.

I look forward to seeing you at the May meeting where we will be electing our Board members for next year and hearing from Dr. Daws on the latest in tire technology.

Kevin Willson
Section Chair

Recap of April Meeting

by Max Rumbaugh, Jr.

The Arizona-Nevada SAE Section successfully conducted its first electronic meeting with a room filled with members. A live audio presentation from Seattle by Al Miller, Manager of Technology Integration for the Boeing 787, was coordinated with a PowerPoint presentation by Kathy Collins of Boeing Mesa in the section meeting room.


Kevin Willson (right) thanks Kathy Collins (left) for a great job with our first tele-presentation. Al Miller, the co-presenter, was live in Seattle at the time of the presentation here in Phoenix.

Al provided an extensive review of the technical details of the new commercial aircraft along with many changes to enhance the pleasure of flying by frequent fliers like himself.

The 787 will be substantially more efficient than are the current production aircraft by either Boeing or Airbus. This efficiency gain is achieved primarily by the use of composites and by improvements in the engines provided by GE and Rolls Royce. Approximately 50% of the increased efficiency comes from the use of composites which account for 50% of the material used in the plane. It is estimated that a 35% reduction in weight is achieved by using composites vs aluminum.

The use of composites allows the windows to be substantially larger than currently possible. It also allows the fuselage to be out-of-round to provide greater headroom, greater carry-on luggage areas and more shoulder room for the passengers. Composites are not as safe from ground vehicle damage as aluminum, but can be repaired in one hour if hit by a truck or other ground equipment if it has sustained minor, non-structural damage.

The composites can sustain higher inside air pressure than the aluminum bodies. Thus, the inside pressure will be the equivalent of 6,000 feet altitude rather than the norm of 8,000 feet. Studies show that people feel better during and after flying at this higher interior air pressure.

WiFi technology will be used in place of the current hardwired electronics for passenger entertainment. This will also provide more room for under seat storage, and will permit passengers on-line computer use and cell phone use while

in transit. Al noted that travelers will no longer be isolated from their office while traveling. They will be "on call" even at 41,000 feet in the air.

Since many large portions of the airplane will be produced overseas, three special 747s are being built to transport those parts to Seattle for final assembly. This will permit just-in-time delivery of the major parts and reduced in-process inventory due to air shipment vs sea transport. Thus, in reality, two airplanes are being designed, the 787 and the substantially modified 747.

First shipments to the customers will occur in 2008. To achieve that tight schedule, final signoff on the design of one of the three 787 configurations will be in 6-7 weeks. This necessitated that Al conduct the presentation electronically from his office. Yet, an extensive question and answer time was held after his presentation. This first use of a remote electronic presentation proved to be successful and permitted local SAE members to benefit from another timely and valuable session.

New Officers & A New Season

While this newsletter announces the last meeting for this year's slate, your governing board is hard at work on plans for next year. We welcome any and all ideas that our membership may have for presentation topics. If you know someone who has a topic of interest to present, please contact one of the board members with your information.

Next year, Ted Robertson, President of SAE International, will visit us in November. We'll have a presentation on Sky Harbor Airport. And to kick off the year, we are planning a special meeting on the introduction of the new C6 Z06 Corvette, powered by a 500hp LS2 V8!

It promises to be a great year and we look forward to your ideas and your assistance in helping make another great year for the Arizona/Nevada section happen!

Next Year's Slate of Officers

Elected Positions:

Chairman:	Allan Watts
Vice Chairman:	Dave Vasquez
Treasurer:	John Lester
Secretary:	Bill Gest
ANC Delegate:	Jeff Brown
1st ANC Delegate Alternate:	John Lester

Appointed Positions:

Vice Chair-Newsletter:	Bob Riley
Webmaster:	Dave Vasquez
Vice-Chair - Student Activities:	Derek Logan
Asst. Vice - Chair-Student Activities:	Howard Daudet
Vice Chair - Arrangements:	Paul Curry
Vice Chair - A World in Motion:	Steve Trimble
Asst. Vice Chair - A World in Motion:	Joshua Rubin
Immediate Past Chair:	Kevin Willson

New Fuel Cell Car from DaimlerChrysler

Geneva - At the 2005 Geneva Motor Show, DaimlerChrysler, presented the next generation of its fuel cell vehicles: the new Mercedes-Benz B-Class is extending the family of fuel cell vehicles to the segment of sports tourers. The B-Class, an automobile for travel, family and leisure, incorporates a unique sandwich concept developed by Mercedes-Benz that makes it predestined for this type of drive unit.

DaimlerChrysler's new fuel cell car introduced at the Geneva Autoshow.

Sporty, dynamic driving is reconcilable with emission-free operation, as is impressively demonstrated by the technical data: the high-torque electric motor will develop more than 100 kW; this amounts to 35 kW more than the power unit of the predecessor generation, the A-Class "F-Cell".

Thanks to a reduction in fuel consumption and a further enhanced storage capacity, the operating range has now been increased to almost 400 km (250 miles). The components' reliability and longevity have also been further improved.

Crash-Responsive Head Restraints

New crash-responsive head restraint is standard equipment on some Mercedes cars.

The NECK-PRO head restraints are linked to an electronic control unit: if the sensor system detects a rear-end collision of a predefined degree of severity, it releases pre-tensioned springs inside the head restraints, causing the latter to move forwards by 40 millimetres and upwards by 30 millimetres in a split-second; this has the effect of providing support for the heads of front seat occupants at an early stage. In this way, Mercedes-Benz has improved the level of protection for the occupants in a rear-end collision and reduced the risk of whiplash injuries.

The new crash-responsive head restraints for the driver and front passenger are standard equipment in the C-Class Saloon and Estate, the CLK-Class Coupé and Cabriolet, The E-Class Saloon and Estate and in the four-door CLS Coupé.

Mini Baja West Opportunities for Participation

The Mini-Baja 100 is only two months away! The SAE will not have another event like this until the 22nd Century. Our Section has the honor of hosting it, and we need your help to make it the best Mini-Baja ever! Whether you have experience or not, you can be a part of this once-in-a-hundred-years opportunity to celebrate SAE's 100 years as an organization. Sign up to volunteer for any or all days via the Mini-Baja 100 website at: http://www.sae.org/exdomains/minibaja100/volunteer.htm.

For more information, contact Derek Logan at derek.logan@email.sae.org.

Positions available include:

Technical Inspector - Examine entries for compliance with the rules.

Design Judge - Judge the teams' designs and evaluate design reports.

Presentation Judge - Judge the teams' presentation skills.

Continued next column....

Meeting Schedule

May 19	- Automotive Tire Technology & Testing
	SUMMER HIATUS

Continued from prior column....

Dynamic Events Crew - Operate and Marshall the dynamic events.

Endurance Event Crew - Operate and Marshall the 100 mile endurance event.

Scorekeeper - Assemble event records, determine scores and declare the winners.

General Event Crew - Fill in to help keep the event running smoothly.

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Society of Automotive Engineers
Arizona Section
69 West Wilshire Drive
Phoenix, AZ 85003

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