

Section Web Site: [www.sae-arizona.org](http://www.sae-arizona.org) - Sign up for your newsletter on our website.

## HIGHLIGHTS...

- Hybrid by Toyota
- Coffee Talk

- Message from the Chair
- Recap of March Meeting

- Pit Crew for a Day
- SAE Reservations

Dinner Presentation...

## 2007 Toyota Camry Hybrid by David Hermance

This month's presentation, given by David Hermance, will be on the 2007 Camry Hybrid manufactured by Toyota. Toyota was the first to introduce a modern hybrid electric powered automobile with its very popular Prius. In May, Toyota is poised to introduce the 2007 Camry Hybrid.. All previous Toyota hybrid vehicles have been produced in Japan. The 2007 Camry Hybrid will be the first Toyota modern hybrid-powered automobile produced in America.

First displayed at the North American Auto Show in Detroit, this will be a unique opportunity for Arizona/Nevada SAE Section members to hear first hand the new and unique technical details of the newest hybrid to come on the market.

A few safety features of the Camry Hybrid are the standard Vehicle Dynamic Integrated Management system, which orchestrates antilock brakes, traction control, stability control, and steering boost-to the Whiplash Injury Lessening seat design. The Camry Hybrid also has a new image: a sleeker shape, two-inch longer wheelbase, fancier instrument panel, tilting-telescoping steering wheel, a matte-chrome

grille, blue-tinted headlight reflectors, LED tail lamps, and the hybrid badges.

David will cover the many changes and improvements on the Camry Hybrid including the engine, battery, inverter planetary, gear set and transaxle. Modifications in driver feel during acceleration will also be described.

Hybrid vehicle sales are increasing rapidly. Toyota expects to continue to be a leader in the technology and marketing of hybrids. In 2006 Toyota plans hopes to sell more than 300,000 hybrid vehicles globally.

Here is an opportunity to learn why hybrids are attracting so much attention and changing the image of automobile companies.



David Hermance



David Hermance is Executive Engineer for Advanced Technology Vehicles Environmental Engineering at Toyota Technical Center U.S.A. (TTC). Based at TTC's facility in Gardena, California, David is responsible for advanced technology vehicle communication for the North American market and emission regulatory activities in California.

David joined Toyota in 1991. Prior to this, he was with General Motors from 1971-1991, serving as Department Head for Durability Test Development and in a variety of roles in the vehicle Emissions Laboratory.

### Coffee Talk

The Engineering Department Advisor to our SAE Student Club is heading up an effort to begin an Automotive Engineering Program at ASU Polytechnic. He will be giving the coffee talk on the new curriculum and program plans.

DATE	TIME	LOCATION	COST	With Dinner	Presentation Only
Apr 20	Social	- 6:00 pm	Crowne Plaza Hotel (Holiday Inn)	Members - \$20	\$10
	Dinner	- 6:30 pm	44th St. & Washington	Guests - \$25	\$10
	Presentation	- 7:30 pm	602-273-7778	Students - \$10	no charge
<b>RSVP by 2:00 pm Monday April 17.</b>			<b>Call Mindy Erway: 602-364-7122</b>		

## Message from the Chair

The March meeting was a smashing success with a very interesting topic and a speaker that was both entertaining and informative. I was very disappointed that I had to miss it. At one time, I was more concerned with road vehicles and driving on pavement, but my interest has migrated to off-road vehicles and responsible off-road driving. I find the three-dimensional aspects of off-road driving to be very appealing and also I appreciate the fact that a private individual has many opportunities in states such as Arizona and Nevada to do very challenging off-road driving at the limit of their abilities without putting anyone else at risk or inviting a confrontation with law enforcement. The technical challenges that are faced in the design and construction of an off road racing vehicle are very interesting as well. Special thanks go to both the speakers and to Derek Logan for setting up the main speaker and the coffee talk speaker for the March meeting.



Allan Watts, Section Chair.

Our April meeting promises to be one of the best presentations of the year. Hybrid vehicles are one of the hottest topics in automotive technology and provide significant reductions in fuel consumption in many types of driving. Toyota has been a leader in the development of hybrid vehicles and has demonstrated a commitment to this area of technology. Furthermore, the Camry is one of the most popular vehicles in the US and the hybrid Camry represents a significant step forward for the integration of hybrid technology into vehicles that appeal to large numbers of people. Special thanks go to Max Rumbaugh for setting up the speaker for the April meeting.

Allan Watts  
Section Chair

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## Recap of March Meeting by Derek Logan

### *AutoZone Coffee-talk Presentation:*

Eric Barta, Operations Manager, AutoZone Distribution Center, gave us a wonderful presentation on AutoZone's Southwest Distribution Center. The distribution center services 306 AutoZone stores and 117 Midas shops in 11 states throughout the southwest. 25 tractor-trailer drivers haul 45 trailers over 2200 miles per week to keep the stores stocked. These trailers need to be filled quickly to get them back on the road, so operations are a key activity to keep the parts moving.

Mr. Barta, a former Air Force officer with Launch Control Operations at Vandenberg, discussed some initiatives AutoZone has taken to improve the process of filling its trail-

ers. One high-tech system uses a Voxware voice recognition system. Employees talk to the computer and it tells them what parts to pull. This frees up their hands so they can work more efficiently. It also greatly reduces errors. If they have a question, they simply ask the computer for clarification.



Eric Barta (left), Derek Logan (middle), Nick Vanderwey (right).

We thank Mr. Barta for his very informative presentation about AutoZone's huge distribution facility. We also enjoyed the cool decals of AutoZone's sponsored NASCAR #22, driven by

Kenny Wallace.

### *Off-road Racing Main Presentation:*

Those arriving early could hear the hotel shaking as Nick Vanderwey idled his 700hp Chevrolet Class 8 Off-road Race Truck to its display area. The smell of 108-octane racing fuel added just the right touch to the beautiful site of this awesome machine. Mr. Vanderwey climbed out the window opening and joined the spectators to share information of his winning Flying Dutchmen race truck. (Also known as the "Got Milk" race truck.)

By the time of the main presentation much of us had seen the truck and all of the massive shocks, tires, etc., but we had no idea what it took to build it. Mr. Vanderwey, a former rocket "scientist" from Orbital Sciences Corporation, quit his high-profile engineering job to help his family build up their dairy farm. As the farm became successful he was able to start building his dream truck. Nick had done some off-road racing in the early '90s, but he always wanted to build a real strong competitor. So, with his background in Mechanical Engineering he went to work.

His design uses a full-size Chevy truck frame (the only stock part), stuffed with a 428ci small block producing 700 hp and 600 ft-lbs of torque. An AutoZone Exide battery starts this high-compression engine and then the power is transferred to the wheels through a Turbo 400 tranny and a 5.0:1 ratio third member. 37" BF Goodrich racing tires with inner liners keep him moving over the harsh desert terrain. The truck weighs in at 6000 lbs, with a 46/54% weight ratio, and gets 2.3 mpg. To tame the bumps (and jumps) it has 20" of front wheel travel and 26" at the rear.

Mr. Vanderwey's design has proved to be very successful. Nick has won the Baja 1000 once (so far), the Baja 500 four times (most Class 8 wins ever!), the Primm 300, and, the weekend before his presentation, he won the San Felipe 250. Nick was also the SCORE Class 8 Champion in 2002!

We thank Mr. Vanderwey for showing us his truck and providing an interesting presentation on off-road racing and what it takes to be successful.

## Pit Crew for a Day

by Kevin Willson

A new program that is starting up this year with SAE is the Pit Crew for a Day Program which teams up Engineering students with a professional racing team for an event. The Garrett sponsored Bothwell Motorsports team out of California is the first participant in this program and kicked off the year with the NDRA (National Drag Racing Association) season opener in Phoenix. Beginning at 9am on Saturday morning the 18th of March, three ASU students (the "two Erics" and Brian) and myself joined the Bothwell Motorsports team at Firebird International Raceway to be part of their pit crew for the weekend.



Brian Johnston and Eric Jones enjoying their free meal.

Our host Ron Thompson quickly introduced us to Gil and Steve Bothwell (the team owner and crew chief respectively) and then brought us into the team trailer for safety orientation and familiarization with the race car we would be working on for the week-

end. The NDRA is a drag racing organization for the "sport compact" crowd so the car we were working on was a Pontiac Sunfire.

I was only there through the first qualifying run on Saturday but was able to learn a lot in a short time. The three students were able to stay through the weekend and were enjoying themselves immensely when I had to leave. Bothwell Motorsports is committed to a full season of racing this year and will be trying to get student participants from SAE sections across the country.

We hope to see Bothwell Motorsports again next year for another group of students to learn about the world of professional racing. A special thanks goes to Ron Thompson for helping set this event up for the Arizona section with help from SAE Arizona Vice Chair Dave Vasquez. What follows is a letter to Dave from Brian Johnston from ASU on his experience with the Pit Crew for a Day Program:

Dear David,

Recently I, along with three other members of the Society of Automotive Engineers was able to take part in the Garrett Bothwell Motorsports Pit Crew for a day program at Firebird International Raceway. This program was an amazing learning experience. Coming into the weekend I admit that I wasn't the biggest fan of drag racing, nor did I know very much about it. However, the entire organization welcomed us to their team, and I learned more than I could have even hoped to during the weekend.

At the beginning of the day, consultant Ron Thompson gave a presentation about drag racing, as well

as the technical aspects of the Bothwell Motorsports racecar. After that, we immediately started working on the car. Everything that the pit team did, we did. Among the countless activities that we participated in, we measured tire roll-out, and how to correct uneven tire circumferences, how to refill the CO2 bottles in the car that activated the boost controller and parachute system, swapped gears in the \$40,000 transmission, analyzed data from the racecar, helped change an engine in approximately an hour, and helped set world record for the class! The entire weekend was a very rewarding and exciting experience. I would definitely attend again if the opportunity arose, and I would recommend this program to any SAE member!

--Brian Johnston

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## SAE Reservations

by John Lester

The Arizona Section of SAE has a contract with the Crowne Plaza Hotel to conduct our monthly dinner meetings at their facility. We have to guarantee a certain number of diners 72 hours prior to the dinner meeting. We have always had a good working relationship with the hotel and they have been fairly flexible about the numbers. We have always had to pay for the guarantee that we call in. We do have "no-shows," and we do have walk-ins (no reservations). For the most part we have been able to accommodate these pluses and minuses in a balanced way. The hotel now is tightening their policies, and understandably wants us to be more positive in our minimum guarantees. The hotel always plans for a 10% higher number than our guarantee. If we go over that number as we did in March, it adds to the cost by having to prepare more unexpected meals and set up additional tables. Therefore, we have no alternative but to implement the below stated policy.

1. SAE will continue its policy of accepting reservations up to the deadline as stipulated in the Newsletter. This will be the basis for our guarantee.
2. SAE will accept late reservations with the caveat that we will not guarantee a dinner. If the person(s) show up for the dinner, there is a possibility that we can accommodate them under our guarantee plus 10% policy. If not, the person(s) may eat in the hotel restaurant, or elsewhere. They are certainly invited to attend the SAE program after the dinner at the stipulated meeting charge.
3. To help in this process, please, when making reservations whether by telephone or e-mail, provide the following information:
  - \*Names of each attendee for which you are making a reservation.
  - \*Indicate whether each attendee is an SAE member, a non-SAE member, or a student.
  - \*State clearly whether the reservation is for dinner and meeting, or meeting only.
4. Remember, your reservation is your commitment to attend. We ask that you honor that commitment.

THE UNIVERSITY OF ARIZONA ANNOUNCES:

The 32nd Annual Applied Reliability Testing Institute provides coverage of how to implement and manage the Design-for-Reliability process through testing; how to implement an integrated Reliability & Maintainability Engineering management strategy; a practical approach to attain the high Reliability goals demanded nowadays; how to improve our worldwide competitive posture by creating more Reliable products through testing; solder joint durability and their useful life estimation; the determination of the time-to-failure distributions, failure rates, mean lives, reliabilities, and their confidence limits at desired high confidence levels; small-sample-size, high reliability, short-duration, efficient tests; nonparametric testing; test duration, sample size, and number of failures determination; HALT and HAST; burn-in testing, Qualification and Reliability Demonstration Testing; failure analysis technologies; product assurance techniques for becoming more competitive in today's markets; development cycle time reduction; productivity improvement techniques to achieve U. S. leadership in world markets; all types of goodness-of-fit test; determination of the confidence limits of the actual Reliability, Mean life and Failure Rate of all types of components, products and systems at high confidence levels; Customer Satisfaction Strategies to provide the tools required to design, test and manufacture products which are highly reliable with a minimum if any product recalls, easy to maintain, safe and less costly to operate, and sold at globally competitive prices; plus much more! Numerous practical applications of these methodologies are presented. This Institute will also prepare and help participants pass their ASQ Certified Reliability Engineer (CRE) Examination. Consultation Workshops, plus much more.

The 44th Annual Applied Reliability Engineering and Management Institute provides all engineers, and particularly Reliability Managers and Engineers, and Product Assurance Managers and Engineers in government and Industry a working knowledge of Reliability Engineering Theory and Practice; Mechanical Reliability Prediction; Reliability Testing and Demonstration; Accelerated Testing; Failure Analysis Techniques; Complete Industry Product Assurance Techniques; Maintainability; Customer Satisfaction, Strategies to provide the tools required to design, test and manufacture products which are highly reliable with minimum if any product recalls, easy to maintain, safe and less costly to operate, and sold at globally competitive prices, plus many more! Numerous practical applications of these methodologies are presented. This Institute will also prepare and help participants pass their ASQ Certified Reliability Engineer (CRE) Examination.

THE 32nd ANNUAL APPLIED RELIABILITY TESTING INSTITUTE  
May 8-11, 2006

THE 44th ANNUAL APPLIED RELIABILITY ENGINEERING  
AND MANAGEMENT INSTITUTE  
November 13-16, 2006

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Registration Fee: \$1500      Proceedings Cost: \$50

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### Meeting Schedule

April	- Hybrid by Toyota
May	- Orbital Launch Vehicles
June	- To Be Announced

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