

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

HIGHLIGHTS...

- Turbocharging and Low-Emissions Diesel Engines

- Message from the Chair
- Recap of November Meeting

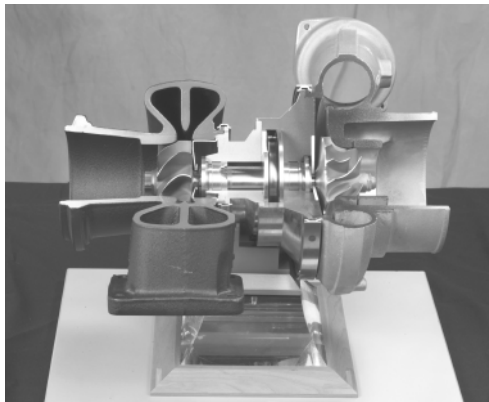
- A World in Motion
- SOLS

Dinner Presentation...

Turbocharging and Low-Emissions Diesel Engines

By: Steve Arnold

Last year, one of our presentations asked the question: "Is there a hybrid in your future?" This presentation deals with advances in diesel turbocharger technology that brings up the question: "Is there a diesel in your future?" Today, roughly 60 percent of all new cars sold in Europe are equipped with diesel engines. And this year, U.S. refiners must begin offering low sulfur diesel fuel that's roughly equivalent to the clean diesel fuel available in Europe.



Oil free, 95,000 rpm diesel turbocharger. Courtesy National Aeronautics and Space Administration John H. Glen Research Center at Lewis Field

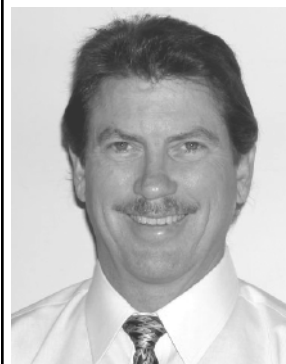
So, the answer is "yes" to both questions - there is a diesel and there is a hybrid in your future, and both of them will probably be the same vehicle. And diesels love turbochargers. So there is probably a turbocharged diesel in your future too.

Over the past decade, the dramatic improvements in power density, responsiveness and low emissions in both turbo-diesel passenger vehicle and commercial vehicle engines have demanded significant alterations to the basic architecture of turbochargers. The emissions legislation already enacted worldwide demands further reaching changes to the basic concept of turbocharging. This presentation will explain the complex linkage between the aerodynamic

machine (the turbocharger), the positive displacement machine (the engine), and the new combustion and emissions technologies required to meet the new mandates. Several novel turbocharger concepts that provide significant new benefits will be discussed.

Steve Arnold

After graduating from the University of New Mexico in 1976, Steve Arnold began his association with turbomachinery in the Aerospace industry working on gas turbines for AiResearch



Manufacturing Co. Subsequent positions with MTI (Stirling Engines) and Schwitzer, Warner-Ishi, and Garrett (turbochargers) increased the focus on turbomachinery.

He joined Garrett in 1995 as Director, Commercial Vehicle Product Engineering, and has fathered a number of new products; the Advanced Variable Nozzle Turbine (AVNT), the Integral EGR pump (IEGR), and the Low Speed Turbocharger (LST). Steve was awarded the 2002 Honeywell Senior Leadership

Award for Innovation for taking the AVNT from concept to production. The AVNT achieved 300,000 units' annual sales volume in 2003. Steve and the AVNT team also received the 2000 Honeywell Quest for Excellence Award.

Steve's current role as Director of Innovation and New Concepts brings together his expertise in turbomachinery and passion for engines. His work is focused on understanding the needs and requirements of upcoming generations of engines, inventing and validating new boosting concepts synergistic with those requirements. He is currently working on several new concepts and has numerous patents pending in addition to the 25 patents granted.

*******SPECIAL MEETING LOCATION*******

Address below, map/directions on page 3.

DATE	TIME	LOCATION	COST With Dinner	Presentation Only	
JAN 19	Social	- 6:00 pm	Radisson Fort McDowell Resort	Members - \$20	\$10
	Dinner	- 7:00 pm	10438 North Fort McDowell Road	Guests - \$25	\$10
	Presentation	- 8:00 pm	480-836-5300	Students - \$10	no charge

RSVP by 2:00 pm Monday January 16.

Call Mindy Erway: 602-364-7122

Message from the Chair

Our November dinner meeting went very well with Ted Robertson, President of SAE International, presenting on the Dearborn Duce, a replica of the 1932 Ford Coupe that is being made by Ted's company, American Specialty Car, Inc. (ASC). Ted has been



Allan Watts, Section Chair.

traveling around the world representing SAE, and we were privileged to have him stop by Arizona and meet with us. I would like to thank Max Rumbaugh and Derek Logan who set up an entire day of activities for Ted, including breakfast, a trip to ASU Polytechnic, and a trip to the Toyota Proving Grounds northwest of Phoenix. I was fortunate enough to join Ted and the others for breakfast and for the trip to Toyota, as well as to see his presentation at the dinner meeting. Ted told us that being President of SAE is more than a full time job, but he is honored to be able to serve in the role for this organization.

The governing board of our section of SAE has been busy planning speakers for our spring dinner meetings. We have a number of presentations in the works including a presentation on the Toyota Camry hybrid vehicle, which is planned for our April meeting. We are also planning to have at least one presentation on an aerospace project. If you have any suggestions for the topic for a dinner meeting, please let me or one of the other board members know. We would like to know what sorts of topics you would be interested in hearing about at our dinner meetings.

We are going to step outside of our traditional forum for our next dinner meeting in January, and will be having our meeting in conjunction with the Section Officers Leadership Seminar (SOLS) in Fountain Hills. SOLS is a seminar that SAE International puts on every year to train and motivate the incoming chairs of all of the individual SAE sections in the US and throughout the world. This year SOLS is being held in Fountain Hills, and we will have the honor of providing an example of a section meeting. Our speaker for this meeting will be Steve Arnold of Honeywell, who will speak about developments in Diesel turbocharging. As the incoming chair, I attended SOLS in San Antonio last year, and found it to be very interesting to meet all of the other incoming chairs from around the world. They exhibited tremendous motivation and optimism for the engineering profession in the mobility industry, and meeting and talking to them was a lot of fun, as well as very educational. I highly recommend that you not miss our January meeting. I look forward to seeing you there.

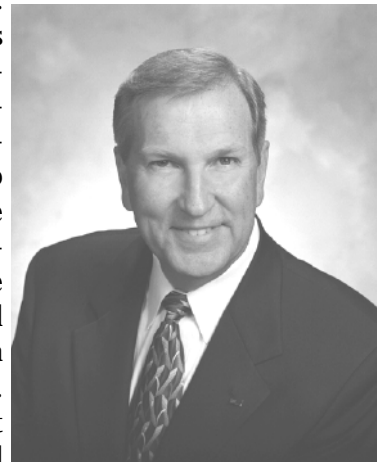
Allan Watts
Section Chair

Recap of November Meeting by Derek Logan

Our November dinner meeting presentation was provided by our very own 2005 SAE President, Ted Robertson. Mr. Robertson, who is also the Vice Chairman of Product Development at ASC (American Specialty Cars) presented ASC's ever-so-popular '32 Ford Roadster replica called the Dearborn Duce. His company designed this modern-day replica and makes the body and convertible systems along with a few other parts. The bodies are then shipped to Hot Rod & Horsepower for final assembly to whatever level the customer wants. Some opt for just the body-on-frame while others opt for a fully drivable version.

Ted explained how the vehicle was designed and provided insight into certain obstacles that were encountered in the development process.

One interesting item was that the vehicle was not symmetric. The doors were different lengths and the fenders were different sizes, so ASC decided to make the doors and fenders symmetric. They also moved the front door openings forward a few inches to provide extra room for ingress and egress. A lot of new development techniques were applied and ASC has now built the first steel-bodied '32 Ford Roadster replica. It is a beautiful reproduction and one that any hot-rodder would want!



2005 SAE President,
Ted Robertson

In addition, Ted went above and beyond the call of duty. He saw that we were glued to our seats, so he through in a few slides about the art of design. It was a very interesting and candid presentation with lots of discussion of his (and our) "pet peeves" in automotive design. Ted mentioned one of his experiences as chief engineer at his previous employer when he inspected the design of one of the door handles. When pulling the handle to open the door, he felt the flashing on the back side - where the fingers touch. He asked about it and the design engineer replied the flashing was there because it was not visible from the outside. Needless to say, Ted made sure it didn't go into production like that.

A lot of thanks goes out to Mr. Ted Robertson for coming all the way from India (via Canada) for our meeting. We really appreciate Ted's support for our section (Arizona is one of his favorite places) and for the support provided by SAE International for helping us have this interesting and informative presentation.

A World in Motion: The Design Experience

Fun and challenge... These are the two main ingredients in SAE's innovative, hands-on physical science curriculum, A World In Motion (AWIM).

A World In Motion, now in its 16th academic year of distribution, makes the challenges of math and science exciting by bringing authentic engineering design experiences into the classroom. The AWIM program is comprised of a series of four curricula referred to as Challenges for students in grades 4 -10.

Designed by the Society of Automotive Engineers International (SAE), the AWIM curriculum joins together teachers, students, and volunteer practicing engineers and sci-

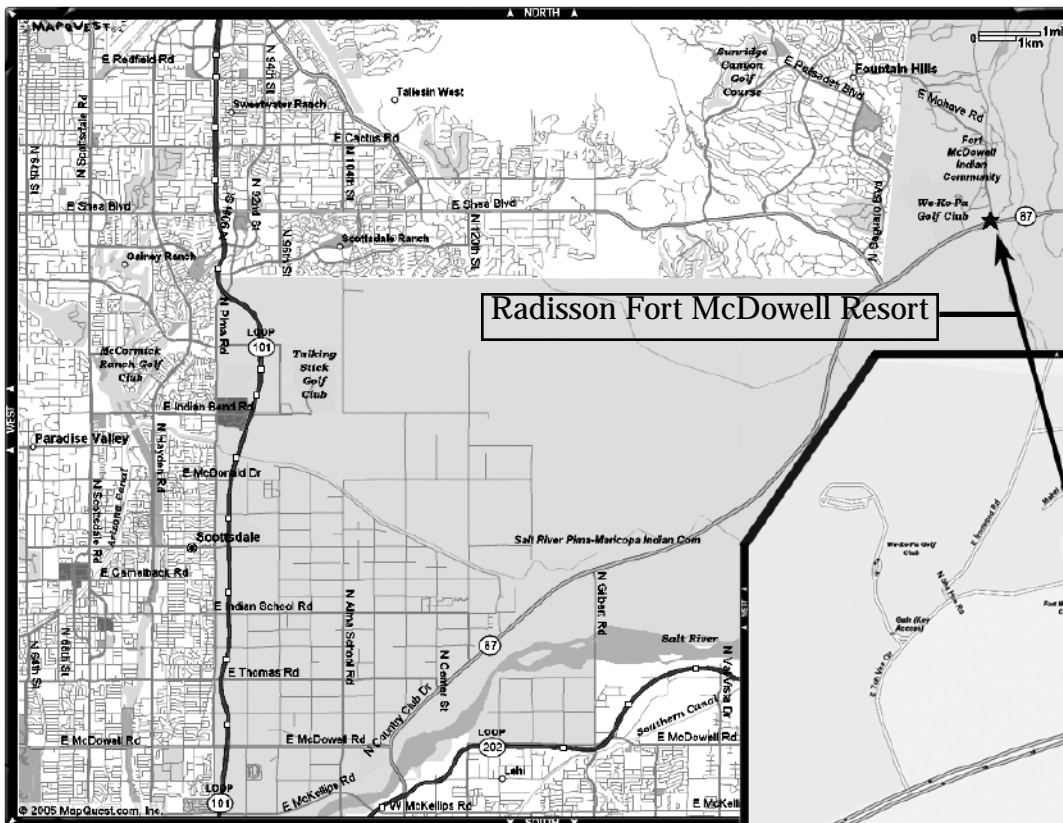


entists in an exploration of physical science. Volunteer engineers play an essential role in motivating the next generation to pursue careers in science and engineering.

Joshua Rudin, from our section, recently went to Scottsdale's Tonalea Elementary where he gave the first pow-erpoint presentation of AWIM. There has been an overall enthusiastic response from other East Valley districts as well. If you would like to participate in AWIM, please contact Joshua at: jcrudin@hotmail.com.

Section Officers Leadership Seminar

Participants in the 27th Annual Section Officers Leadership Seminar (SOLS), along with those in the Student Leadership Development Program, will join us for this month's meeting. This year's SOLS will focus on leadership issues effecting SAE and local sections. The format will help incoming Chairs deal with important strategic issues in the ever changing times of our society. Our section meeting this month will serve as a demonstration meeting for the SOLS participants. We are meeting at the Radisson Fort McDowell Resort, 10483 N. Fort McDowell Road (see map below) where you'll be treated to an outstanding presentation and a \$40-dinner at the normal member price of \$20. Please join us for this rare opportunity to show SAE leaders how to run an SAE Section meeting.



Directions:

Coming from the North:
Take Shea East to the SR-87.
Take the SR-87 to Fort
McDowell Road and go
North to the hotel.

Coming from the South:
Take the SR-87 to Fort
McDowell Road and go
North to the hotel.

*The New Mercedes S 65 AMG
The World's Most Powerful Series-
Production Car*

The compelling top-of-the-line model of the brand new S-Class Mercedes delivers 450 kW/612 hp and reaches peak torque of 1000 Nm - more than any other vehicle in this



Mercedes-Benz S 65 AMG

segment. The standard specification of the new S 65 AMG includes a new sports suspension based on Active Body Control, its unmistakable bodystyling, multi-piece 19-inch

AMG light-alloy wheels, DIRECT SELECT gearshift with steering-wheel gearshift paddles.

The new Mercedes S 65 AMG will debut at the North American International Auto Show in Detroit on January 8, 2006. Its ultra-powerful AMG 6.0-litre V12 bi-turbo engine delivers performance that many sports car drivers can only dream of. It accelerates from 0 to 100 km/h in 4.4 seconds and 0 to 200 km/h in just 13.3 seconds (provisional figures). The top speed is 250 km/h (electronically limited).

Meeting Schedule

January	- Turbocharging and Low-Emissions Diesel Engines
February	- To Be Announced
March	- To Be Announced
April	- Hybrid by Toyota
May	- To Be Announced

Allan Watts Chair 602-364-7331	Dave Vasquez Vice Chair idave@asu.edu	Bill Gest Secretary	John Lester Treasurer 480-733-6532	Robert Riley Newsletter Editor 623-872-8010
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