

SAE ARIZONA • NEVADA SECTION

MEETING: Nov 17

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

HIGHLIGHTS...



- GM's New 4-Cylinder Duramax Diesel
- Message from the Chair
- Recap of October Meeting
- SAE's Job Board in Top 50
- Chevrolet Celebrates 100 Years
- Derek Logan New Position
- AWIM in Arizona
- About Tucson Sub-Section

November Presentation

GM's New 4-Cylinder Duramax Diesel by Brent Hendrickson

In 2001, GM introduced a new V8 diesel engine for Heavy-Duty pickups. At the time of introduction, GM had dropped to less than 10% of the Heavy-Duty market share. There was little fanfare in the introduction, and the significance of the new motor at that time may be described as "underestimated". Since that time, Duramax has established a reputation – to become synonymous with power, capability, quality and durability. In the U.S. HD market, the Duramax brand is highly respected and implies a standard of excellence that continues to grow - pushing the Duramax and the HD market competitors to even higher levels of quality and performance.



Brent Hendrickson

In September 2011, half-way around the world in Thailand, GM launched a brand new engine plant to produce a newly designed 4-cylinder Duramax engine. The first application is GM's new Colorado mid-sized pickup – also launching initially in Thailand. Why Thailand? Thailand is the #2 pickup market in the world (U.S. being #1) producing more than 1 million pickups every year. The engine/vehicle mix is also more than 90% diesel for these markets.

While the purpose of this new Duramax may be slightly different than the U.S. V8, the overall goal is the same: to offer market-leading performance, capability, quality and durability - drawing on the reputation that the U.S. Duramax has forged, and expanding it to a new global audience.



On a global scale, GM

produces more than one million diesel engines annually. The portfolio of diesel engines ranges from 1.0L/1.3L up through the 6.6L V8 Duramax. The new L4 Duramax



fills a gap in GM's diesel portfolio for engines greater than 2.0L displacement for light-duty pickups, utility and other light-duty commercial applications. Given the continued growth in this segment globally, with the additional regulatory and market challenges to improve fuel economy, this engine is also a key enabler for GM's global vehicle portfolio.

The new engine comes in two displacements: 2.5L and 2.8L. Engines are mated with a 5-speed manual transmission standard. The 2.8L also has an optional 6-speed (6L50) automatic transmission. The 2.5L has a purpose to provide exceptional value. Power and torque are 150 hp (110 kW) and 350 Nm (258 lb-ft). The 2.8L is the "feature" engine, providing greater refinement, towing capability and class-leading torque at 470 Nm (346 lb-ft) with 180 hp (132 kW). Fuel economy numbers are not yet announced.

In addition to the Thailand launch, a second site will also start production of the engine in Brazil later this year to support South American applications.



DATE	TIME	LOCATION	COST	With Dinner	Presentation Only
Nov. 17	Social	- 6:00 pm	Hilton Phoenix Airport	Members - \$23	\$10
	Dinner	- 6:30 pm	2435 S. 47th St, Phoenix-85034	Guests - \$27	\$10
	Presentation	- 7:30 pm	(Paste address into Google for map.) Hotel - 480.894.1600	Students - \$12	no charge
			Payable by cash or check		
RSVP by Monday Nov 14 info@saearizona.org					

Message From the Chair

We had a great meeting with Dr. Bob Falco presenting on Synthetic Fuels. The turnout was good and there were a lot of good questions after Dr. Falco was finished presenting. See October Meeting Recap for more details. We also had the honor of students from the NAU SAE Student Section attending our last meeting. It is always good to see the next group of Engineers that are preparing for their future. For November, we will have a presentation from Brent Hendrickson, Chief Engineer on GM's new small diesel. It sounds like a big step forward for GM. It should be interesting. For next spring, we will have Ron Will, who is an automotive designer for Phantom Design. Watch the upcoming newsletter for the exact month.



Larry Wilson - Chairman

We are still looking for a member to serve as the Secretary for our Board. We are anxious to fill that remaining slot. I will buy your dinner at an upcoming AZ SAE Dinner Meeting if you can step up and serve in that position or recommend a member that will fill the position. This is conditional on the Board approving the candidate. I look forward to hearing from you. This is good starting position on the board that will lead to the Chair position. If you have the time to help with this, please consider volunteering.

In January, Matthew M. Miller from the SAE Foundation will be attending our dinner meeting. John Lester will be presenting a check from our Arizona/Nevada Section to the SAE Foundation. If you would like to contribute additional donations to this great foundation, please contact John Lester at johnlester@sprintmail.com.

Ron Weary and crew had a meeting in October with our SAE brethren in Tucson. I look forward to finding out the results of that meeting. Watch the newsletter for the results of those meetings.

Fall is finally here and Thanksgiving is approaching fast. I look forward to seeing you at the next dinner meeting.

Larry Wilson Chair SAE Arizona - Nevada Section

Recap of October's Meeting by Bob Holso

Immediate Past Chair Steve Atkins arranged to have Dr. Robert Falco address the section about producing gasoline and diesel fuel from natural gas and biogas. With academia credentials from Princeton and Cambridge, along with teaching and research activities at Michigan State University, Mr. Falco has been a consultant for leading aerospace companies, automotive companies and several National Laboratories as it relates to energy transfer in fluids.

Dr. Falco reviewed the historical and ongoing need for oil; not only in the United States, but around the world. It

is estimated that next year, 2012, the world will require 87 million barrels of oil per day. Combined with the increasing needs of emerging nations like China, India, Brazil, etc. the estimated daily requirement for 2030 is 105 million barrels per day. Transportation use of oil has increased 36% over the past 30 years. And with recent worldwide auto sales exploding in those emerging countries, oil needs will increase exponentially.

Unfortunately, oil production, as well as known reserves of oil is declining. Within the United States for example, oil production peaked in 1971 at 9.5 million barrels of oil per day and continues to decline every year.

The answer to our continued domestic need for oil, according to Dr. Falco does not lie in the tar sands oil extraction or through acceleration of ethanol fuel production. The answer lies in utilizing the natural gas reserves that are available within the United States as well as bio material generated by our waste and the millions of cows in the U.S. Dr. Falco suggests that there is enough natural gas in the U. S. to satisfy our needs for 100 – 120 years, and the dairy cow and beef cattle wastes are virtually untapped resources.

The process to develop a “synthetic” gasoline using natural gas may be the answer. Exxon and Shell have been converting natural gas to liquid for several years outside the United States. There are stumbling blocks to this technology however; including the expense and development time to build processing plants, as well as the carbon issues (green house gases) emitted using the current processes.

According to Dr. Falco, one way to eliminate carbon dioxide in the process is to develop a “solar oven” hot enough to convert the feedstock and recycle the CO₂. The key will be to develop solar reactors that can generate concentrated heat in excess of 860 degrees celsius. Of course the United States has great solar resources, generally in the south and southwest. Natural gas could be piped from regions where it is abundant to these locations for processing.

The bottom line is that high octane gas can be produced from natural gas, algae and waste biomass. If the process can be refined from today's first generation attempts (solving some of the issues mentioned previously), synthetic gasoline can meet our fuel needs for years to come. However, much more work is needed to streamline the process so that it becomes more efficient, more cost effective and above all, greener.



L.-R.: Larry Willson And Dr. Falco

Dr. Falco estimates that synthetic gas may be produced for as little as \$2.00 per gallon. Additionally, there would be no infrastructure or vehicle changes required to switch to syngas. Another major advantage to becoming energy self-sufficient in the United States is the jobs that can be created. Recognizing the gridlock that exists today with our legislators on even minor issues poses a huge challenge which Mr. Falco suggests will require a cultural change to occur and it must be a grass roots public effort

**SAE International Job Board Recognized
as one of the 50 Best!**
by Sandra Sutermaster

Masters in Engineering has recognized SAE International's Job Board as one of the 50 best engineering job sites in a posting published August 30, 2011. Masters In Engineering is a website dedicated to providing students with the information and tools needed in order to pursue their Masters degree.

**Chevrolet's 100th Birthday Present:
1 Millionth Cruze Sale**

DETROIT – Chevrolet celebrated its Centennial on November 3, 2011, by saying thanks a million – literally – to buyers of its top-selling Chevrolet Cruze. The compact car, which launched globally in 2009 and in North America in 2010, reached 1 million sales that week.

Cruze is the top-selling compact sedan through 10 months of 2011 in the United States. It is ranked third in its segment in the region that includes China, Russia, India and other developing markets. Globally, Cruze is the fourth best-selling nameplate in its segment and the seventh best-selling nameplate overall.

The Cruze was designed and engineered using GM's global product development process. The top 10 markets for Cruze since its 2009 model year introduction are: China, the United States, Russia, Canada, Mexico, India, Turkey, South Korea, Israel and Spain.

Perry said Cruze, as well as the new subcompact Chevrolet Sonic and upcoming Chevrolet Spark minicar, are key to Chevrolet's efforts to attract buyers under 30 to the Chevrolet brand because 44 percent of them choose compact cars.

During the past year, Chevrolet has increased its market share among so-called millennials in the United States by 1 percentage point, largely on the strength of the Cruze. Cruze also has helped Chevrolet bring new buyers to the brand. So far this year, 42 percent of Cruze buyers in the United States traded in non-GM vehicles, led by the Honda Civic, Ford Focus and Ford Taurus.

The Cruze is sold in more than 100 countries and is Chevrolet's top-selling nameplate. A five-door hatchback version was introduced this year in Europe.

Cruze is powered by a family of fuel-efficient, small-displacement gas engines – including a 1.4L turbocharged Ecotec that is standard on LT, LTZ and Eco models in the United States – as well as a 2.0L diesel engine in Europe. A diesel engine will be introduced in North American versions of the Cruze in 2013.

The 2012 Chevrolet Cruze Eco equipped with the 1.4L Ecotec turbo and standard six-speed manual transmission with Eco overdrive gear is the most fuel-efficient, gas-powered/non-hybrid vehicle in America, with an EPA-estimated 42 mpg highway.

Cruze equipped with the 1.4L turbo/six-speed automatic combination achieves an EPA-estimated 38 mpg highway. The standard 1.8L/six-speed manual combination (Cruze LS) delivers 36 mpg highway.



**Derek Logan Assumes New Role as
Manager of Nissan's Proving Ground
Operations**

Derek Logan has assumed a new position at Nissan - Manager of Proving Ground Operations at Nissan Technical Center, North America. Derek has been at Nissan's Arizona Test Center since April, 2003, where, among other projects, he contributed to proving out the reliability of the Leaf, which led to Nissan's successful entry into the electric vehicle field. Derek has also served on SAE International's Board of Directors. He is now on SAE's Executive Nominating Committee (ENC) and on the Organizing Committee for the 2012 Section Officers Leadership Seminar (SOLS).



A WORLD IN MOTION.

AWIM IN AZ
by Don Robins



Don Robins with AWIM students

The SAE sponsored 'A World In Motion' program is off to a good start for the 2011/2012 school year. We have 2 active programs, one in Phoenix and one in Chandler. We had 22 volunteers attend a training session, 13 of which were ASU students. Four more programs will start in January. If you would like to volunteer, or if you just want more information, go to www.awim.org or contact Don Robins at drobins1137@msn.com. AWIM is designed to bring Engineers into Elementary and Junior High School classrooms to work on 'hands on' projects to get students excited about math and science.

Tucson Connection Exploratory Committee
SAE Arizona-Nevada Section

Dr. Parviz Nikravesh Curt Pedersen
David Vasquez Ron Weary

A Planning Meeting of selected Tucson area members and University of Arizona Student members is scheduled for January 25, 2012. Discussions will focus on actions and events for Tucson members that can be conducted under the auspices of the Arizona-Nevada Section. Progress will be reported in future Newsletters. Stay tuned!

For Your Real Estate Needs



Ana Logan
Realtor

Cell (480) 282-7678
Alogan@cox.net



Your Friend and
active supporter of
SAE since 1989

Upcoming SAE Events, Conferences, and Symposia

SAE 2011 School Bus Powertrain Innovation Symposium - Reducing Fuel and Maintenance Costs Using Propane, Compressed Natural Gas and Hybrid Electric Technology

When: December 5, 2011
Where: Raleigh, North Carolina, USA

2011 Global Drivetrain Virtual Summit

When: December 7, 2011
Where: World Wide Web, Pennsylvania, USA

SAE 2012 Government/Industry Meeting

When: January 25-27, 2012
Where: Washington, District of Columbia, USA
co-located with the Washinton Auto Show

SAE 2012 Hybrid Vehicle Technologies Symposium

When: February 21-22, 2012
Where: San Diego, California, USA

Arizona-Nevada Meeting Schedule

- November 17, 2011	Brent Hendrickson, Chief Engineer of GM's new small diesel
- January 19, 2012	Chris Long, the Orbital VP
- February 16, 2012	TBD
- March 15, 2012	TBD
- April 19, 2012	TBD
- May 17, 2012	AWIM & University Students



Proof Engineering is mechanical and structural engineering consulting company in Chandler, AZ. We offer design, analysis, product development, prototype and manufacturing engineering services. Some of our core strengths are specialty vehicles, mobility engineering, car seats and off-road construction equipment. Please visit us at www.proofengineering.com or call (480) 478-0041. Proof Engineering Co. supports SAE International.

Larry Wilson Section Chair laryleti@cox.net (480) 586-0916	Robert Holso Vice Chair rdholso1@cox.net	Secretary	John Lester Treasurer johnlester@sprintmail.com (480) 733-6532	Robert Riley Newsletter Editor 623-872-8010
---	--	-----------	--	---