



Collegiate Design Series News

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Formula SAE Series – Event Updates!

Event Site - Formula SAE.

Ford has confirmed, as they announced on Tuesday, November 17th that the event can return to the Michigan Proving Grounds. More details on event site will follow as SAE is looking into making changes for smoother entry, registration and team paddocks. Please stay tuned to the monthly newsletter and the FSAE website.

Document deadlines – Formula SAE and Formula SAE West.

SAE has been getting many inquiries on where to find these. As stated in the rule book, APPENDIX A- 7, Formula SAE Series Competition and Document Submission Information, information on the dates, locations and document submission deadlines and addresses for the competitions of the Formula SAE Series are not included in the Rules. This information will be posted separately on the Formula SAE section of the SAE Collegiate Design Series website as it becomes available. You will find all the document deadlines online each event website under Competition Information heading.

Transponders – Formula SAE and Formula SAE West

All vehicles must be equipped with at least one AMB TranX260 Rechargeable or AMB TranX260 Direct Power transponder.

Transponders will be used as part of the timing system for the dynamic events at Formula SAE and Formula SAE West. Each team is responsible for having a functional, properly mounted transponder of the specified type on their vehicle. Vehicles without a specified transponder will not be allowed to compete in any event for which a transponder is used for timing and scoring.

Please be sure to purchase your transponder before attending the event.

Logistic Details – Formula SAE and Formula SAE West

- Registration for team members. SAE International will be organizing an early registration at both events for **ONLY** those teams who have pre-registered with Kaley Shellhammer by sending in the pre-registered forms which examples can be found online at <http://students.sae.org/competitions/formulaseries/fsae/> . If your team is planning to pre-register, please send all documents into SAE together. Email is best option!
- All hotels are currently being contracted and will be posted online as they come available.
- Any shipping details that we may have for teams requiring information such as location to ship, time availability for drop off and pick up, key contacts, etc will also be made as they come available.

BAJA SAE TRANSPONDERS

All teams are required to purchase an AMB Transponder. Teams are not permitted to compete unless their vehicle is equipped with a transponder.

Transponders can be purchased at:

http://www.amb-it.com/shop/amer/catalog/index.php?cPath=7_9

Personal AMB MX Rechargeable Transponder \$235.00



Collegiate Design Competitions

Please note there are NO waiting lists for the competitions. Our competitions have a maximum number of entries based on the organizing host, volunteers, days available and so forth.

We try to be accommodating to everyone, but unfortunately there is no time that works well for everyone. We do our best to publish our deadlines. If your team/school knows in advance there might be a situation please let us know and we will do our best to work with you.

We appreciate your patience and understanding in this matter; we are looking into ideas for possibly revising our approach for registration for the 2008 competitions.

Thank you,

The CDS staff



STUDENT VOLUNTEERS WANTED!

Where: Orlando, Florida

When: March 20 – 22, 2007

Why: Professional Aviation Maintenance Association (PAMA) is holding its 36th Annual Maintenance Symposium in Orlando, Florida, March 20-22, 2007 and is looking for student volunteers who can commit to helping out and staffing events at the symposium. Full and half-day opportunities are available.

Benefits: Any students who volunteer at least 4 hours of time will receive free entrance for all 3 days of this event.

These events include full-day and multi-hour sessions taught by leading industry experts, professional development workshops, PAMA National Maintenance Olympics, PAMA's Annual Chili Cook-off, Exhibit Booths, and selling raffle tickets. For more info [visit www.pama.org](http://www.pama.org)

The Symposium is held in tandem with Aviation Industry Expo. This offers attendees the opportunity to visit with hundreds of exhibitors and network with thousands of industry professionals.

SAE Collegiate Design participants jump on the Y.E.S. Program bandwagon to receive free plastic machinery components from igus

Igus® Inc. says Y.E.S. to the participants of the SAE (Society of Automotive Engineers) Collegiate Design Series so they can say Y.E.S. to success! Igus, a leading developer of plastic machinery components, donates free products to students and teams participating in all SAE-sponsored events, including the Aero Design, Clean Snowmobile Challenge, Formula Series, Baja SAE Series and the Supermileage.

By becoming a member of igus' Y.E.S. (Young Engineers Support) Program, SAE students have the opportunity to use high-performance products without breaking the bank. Aside from saving a bundle of money for their vehicle/aircraft, students also get an education on the merits and benefits of plastic machinery components, one of the main objectives of igus' student program. Through Y.E.S., SAE students can receive:

- Energy Chain® cable carriers to guide and protect cables and hoses;
- Chainflex® continuous-flex cables, available in more than 700 sizes and styles;
- iglide® plain plastic bearings, a long-lasting, self-lubricating, maintenance-free alternative to bronze, metal-backed and custom injection-molded bearings;
- DryLin® linear bearings and guide systems, which are compact, corrosion-free and have a low coefficient of friction; and
- igubal® spherical bearings, self-aligning bearings in spherical, pillow block and rod end styles.

SAE participants will enjoy the numerous benefits igus products have to offer. Because they are lightweight, lubrication- and worry-free, teams can eliminate time-consuming maintenance and improve the functionality of their vehicle or aircraft. Some SAE students have already discovered the many upsides to using igus' products. For the 2006 Formula SAE, students from North Carolina State University used donated iglide bearings on both the steering rack and shifter linkage of their race car. The students placed 6th against 120 teams and attributed a portion of their success to the maintenance-free, lightweight features of iglide bearings.

A Formula SAE team from the University of British Columbia also looked to igus for similar reasons. With weight constraints and maintenance issues topping the team's list of priorities, the students decided to use iglide J bearings because they are lightweight and an ideal alternative to the bronze and metal bushings previously employed in the vehicle. Iglide J was used on the anti-roll-bar support, which greatly reduced friction in the

vehicle's suspension. The bearings were easy to install, which saved the team precious time.

Igus products have not only been used on racecars, but SAE bjas and aircrafts as well. Students from the University of British Columbia used iglide bearings on the nose of their Aero Design aircraft in order to secure the main wheel axle in the nose gear fork. With iglide, there was an extremely low wear rate on the aluminum fork and bolts due to the elimination of metal-to-metal contact.

Plastic also was a problem solver for the SAE Baja team at the University of Rhode Island (URI). In 2004, the team switched from aluminum to plastic bearings and never looked back.

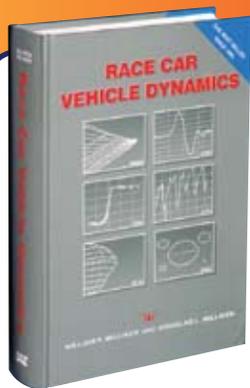
"The igus bearings allow our suspension, steering systems and pedals to move more smoothly under all conditions," said Ryan Tanner, captain of the 2005 URI baja team and team member since 2001. "We are extremely pleased with the performance of all the igus products."

Most recently, the URI students used igubal rod ends in the steering and pedal mechanisms. Their vehicle also employs iglide M250, which is well-suited for the rugged terrain of the baja competition, and iglide T500 bearings, which possess low moisture absorption and high temperature resistance.

"The Y.E.S. Program is an excellent opportunity for today's young engineers to learn about and work with innovative, plastic components," said Carsten Blase, vice president of igus. "There are a multitude of applications where SAE students can use igus products. By taking advantage of our free donations, SAE teams will discover they are able to save money and reduce maintenance so they can focus more energy on another important aspect of the competition – gaining experience for a future in engineering."

SAE teams can learn more about the Y.E.S. Program and request products at www.igus.com/yesprogram or by contacting Courtney Toomey, Y.E.S. Program administrator, via e-mail at ctoomey@igus.com. Teams also can find igus on the supplier list for each SAE series at <http://students.sae.org/competitions/>. Igus looks forward to hearing from SAE teams and also encourages SAE students and professors involved in any type of engineering project or competition to contact igus for products or to request an in-class product presentation.

For more information contact:
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Race Car Vehicle Dynamics

By William F. Milliken and Douglas L. Milliken

SAE Best Seller Since 1995

Truly comprehensive in its coverage of the fundamental concepts of vehicle dynamics

and their application in a racing environment, Race Car Vehicle Dynamics has become the definitive reference on this topic. Although the book's primary focus is the race car, the engineering fundamentals it details are also applicable to passenger car design and engineering.

Written for the engineer as well as the race car enthusiast, Race Car Vehicle Dynamics includes much information that is not available in any other vehicle dynamics text. Authors Bill and Doug Milliken have developed many of the original vehicle dynamics theories and principles covered in this book, including the Moment Method, "g-g" Diagram, pair analysis, lap time simulation, and tire data normalization. The book also includes contributions from other experts in the field.

Chapters cover: The Problem Imposed by Racing; Tire Behavior; Aerodynamic Fundamentals; Vehicle Axis Systems; Simplified Steady-State Stability and Control; Simplified Transient Stability and Control; Steady-State Pair Analysis; Force-Moment Analysis; "g-g" Diagram; Race Car Design; Testing and Development; Chassis Set-Up; Historical Note on Vehicle Dynamics Development; Tire Data Treatment; Applied Aerodynamics; Ride and Roll Rates; Suspension Geometry; Wheel Loads; Steering Systems; Driving and Braking; Suspension Springs; Dampers (Shock Absorbers); and Compliances.

The book also includes an extensive listing of references and a list of symbols, conveniently located on the inside front and back covers for ease of use. Well-illustrated with over 450 figures and tables.

About the Authors

Bill and Doug Milliken have pioneered the transfer of aeronautical stability control technologies to the automobile. They have been involved in developing many original vehicle dynamics theories and principles, including the Moment Method, "g-g" Diagram, Pair Analysis, Lap Time Simulation, and Tire Data Normalization. As President and Vice President of

Milliken Research Associates, Inc., respectively, they have collaborated on research programs for race teams, automobile, and tire companies for over 20 years. Bill has been involved in various aspects of racing and race car engineering since the 1940s, and has over forty years of experience in automotive and aeronautical vehicle dynamics. He was recently inducted into the Sports Car Club of America Hall of Fame. Doug Milliken is a Design Judge for the Formula SAE Competition.

Reviews

"The definitive reference work on vehicle dynamics in general, and in racecars in particular..." - Racecar Engineering

"An impressive... blend of analytical understanding and hard won practical experience from both passenger and race car design." - Automotive Engineer (published by IMechE)

"No other source provides such complete answers to why racing cars behave as they do. Very highly recommended." - Vintage Motorsport

"Probably the most important book yet written on this vital and all-embracing subject." - Racecar Engineering

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"Probably the most important book yet written on this vital and all-embracing subject." - Racecar Engineering

"A bible...terrific." - Autoweek

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