



Issue Highlights

Formula SAE — 2007 Fuels	1
FSAE Push Bars – A Review of Requirements.....	2
Formula SAE - Head Restraints.....	3
2007 Formula SAE - Michigan Proving Ground (MPG) Shipping Procedures for International Teams	4-5
Chassis Design - Principles and Analysis.....	6
SAE Student Membership Opportunity!	7

FORMULA SAE®

2007 Fuels

Sunoco is again supporting the Formula SAE events in the USA by supplying the fuels for both the Formula SAE (Michigan) and Formula SAE West (California) events.

The fuels will come from the same batches and will have the following specifications;

"94 Octane"

- The (R+M)/2 will be 93.
- The Research Octane Number (ROM) will be 97-98.
- This fuel will be commercially available Sunoco Ultra 93 from a Philadelphia area refinery.
- It will be reformulated gasoline (RFG).
- It will contain 9-10% ethanol by volume.
- It will be similar in characteristics to the "94 Octane" fuel provided for the 2006 events.

"100 Octane"

- The (R+M)/2 will be 100.
- The RON will be 105.
- It will be Sunoco 260 GT unleaded race fuel.
- This fuel will be supplied from Sunoco's Pennsylvania pilot plant.
- It will be reformulated gasoline (RFG).
- It will contain 9-10% ethanol by volume.
- It will be similar in characteristics to the "100 Octane" fuel provided for the 2006 events.
- More information can be found at:
<http://www.sunoco.com/Site/Consumer/RaceFuels/UnleadedFuels/Sunoco260GT.htm>

E85

- It will contain 80-82% ethanol by volume.
- This fuel will be supplied from Sunoco's Pennsylvania pilot plant.
- The denatured ethanol is mixed with CFR40-86 "Indolene" emissions certification gasoline to make the E85.

Michael Royce,
Chairman,
FSAE Rules Committee.

13th February 2007.

FSAE Push Bars – A Review of Requirements

For the last couple of years Formula SAE teams have been required to move their cars around the competitions using push bars (Rule 5.11.1). Overall, the push bar requirements (Rule 5.11.2) are fairly open - but not completely open. For example, there are no explicit design or material requirements, and broadly speaking, we leave it to each team's imagination to come up with a design that best matches their car. Some very ingenious designs have been created, and even though no points are awarded for push bar creativity, the officials have been impressed.

While push bars can be simple or elaborate, there are a few basic characteristics they **must** possess. At recent competitions we've noticed that some push bars did not satisfy those requirements. The characteristics that were most frequently missed include:

"...attaches to the rear of the car..." – Attaching a pole across the roll hoop and having the pushers walk on each side does not comply with the rule.

"...that allows two (2) people..." - The bar must allow two people to simultaneously grasp the bar and push the vehicle without being contortionists or getting in each others way.

"...standing erect behind the vehicle..." – Simply put, the pushers have to be behind, not alongside, the car. The issue here is that the rear tires tend to run over the heels of the pushers if they are alongside the car.

"This device must also be capable of decelerating, i.e. slowing and stopping the forward motion of the vehicle and pulling it rearward." – The "push bar" is really a push and pull bar.

Rule 5.11.1 also requires that the car is moved **"with all four (4) wheels on the ground ..."**. We have seen some cars where the "push bar" is also a quick jack and lifts the rear wheels off the ground. This does not meet the Rules.

There are a lot of different ways to meet those requirements ... use your ingenuity.

2008 Formula SAE

SAE International is pleased to announce that the 2008 Formula SAE is making a move to Michigan International Speedway (MIS), Brooklyn, Michigan. The competition will be held Tuesday, May 13th through Saturday, May 17th. Moving Formula SAE to MIS will give the teams the opportunity to compete at a first class, dedicated motor sports venue. Further information on MIS is available on their website <http://www.mispeedway.com/>

Formula SAE Head Restraints

Looking at photographs from recent Formula SAE events, we cannot but help notice that many teams must not understand the reason for one of the sections of Rule 3.4.4 Head Restraint, because they are definitely not in compliance with it.

The portion of the rule to which I am referring is:

“A head restraint must be provided on the car to limit the rearward motion of the driver’s head. and be located no more than 25 mm (1 inch) away from the helmet in the uncompressed state.”

Many of the teams are not complying with this 25 mm (1 inch) maximum. This dimension has been set to reduce the chance of a whiplash injury to the neck in the event of a rear or frontal impact. Yes, in a frontal impact too! The driver’s helmet can come into heavy contact with the head restraint when the head rebounds rearwards after everything else comes to a stop!

Also, to be effective, the head restraint should be vertical or near vertical. If it is not, when the driver’s helmet hits it, the helmet will tend to slide up or down the slope of the head restraint. The result can be that the impact will tend to either compress the neck if the head restraint leans forward too much, or stretch the neck if it leans backwards too much.

We will be instructing the technical inspectors to watch for these items more closely, and will require non-compliant cars to be corrected before they are allowed to compete. So, please pay attention, and make sure you are in compliance for all your drivers from the shortest to the tallest. (This also is in the Rules!)

February 16th 2007.

Michael Royce,
Chairman,
FSAE Rules Committee.

2007 Aero Design East

Teams please note that the SAE Aero Design website is updated with the event schedule and presentation times! Visit it at: <http://www.fwthunderbirds.org/SAE%20Aerodesign.htm>

2007 Formula SAE

Michigan Proving Ground (MPG)

Shipping Procedures for International Teams

Note – The following procedures apply specifically to shipments to Michigan Proving Ground, but they contain include items that should be considered for all international shipments.

These procedures are only a starting point – Check with your shipper or freight forwarder to make sure your shipment meets their requirements. Also be sure the shipment complies with all relevant US Customs regulations.

SAE staff can not give advice on shipping, customs regulations or visas.

Incoming Shipments

Earliest Delivery Date – Shipments must not arrive at MPG earlier than 9:00 am EDT Thursday, May 10, 2007.

Shipping Address

Name of University / Formula SAE
c/o Ford Michigan Proving Ground
74240 Fisher Road
Romeo, MI 48065

MPG shipping has an answering machine on 586-752-8726.
Faxes can be directed to 586-752-8877.

Customs & Shipping Paperwork - All paperwork, documentation and/or forms required for inbound/outbound shipping or customs clearance must be completed and supplied by the school/university. Michigan Proving Ground staff can not prepare any shipping documents for inbound or outbound shipments.

Paperwork is the sole responsibility of the team.

Customs Regulations - It is the responsibility of the team to adhere to all US Customs regulations. All inbound shipments are subject to US Customs inspections.

Team Contact - To provide support services for inbound / outbound shipments, and especially to resolve any problems that might arise, each team must provide MPG with the names and telephone numbers of two (2) contact people - preferably the team captain and the faculty advisor. See below for details.

Shipping Crates/Containers – Shipping crates/containers must have Hi-Low fork access from ends and sides. Be aware that crates are likely to be stored outside and should be weatherproof.

Crate/Container Marking - All shipping containers must have the school's name permanently and clearly marked.

Wood Crates - Wood crates must be of insect resistant or treated materials suitable for international transportation.

Crating & Uncrating - Crating and uncrating is the sole responsibility of the team.

Important Reminder – Do not pack the tools you need to open the crate inside the crate itself.

Unloading & Loading – Loading and unloading is the responsibility of the teams. MPG has limited fork lift/dock capability.

Damaged Shipments – Inspecting shipments and reporting and documenting damage to the shipment is the sole responsibility of the receiving team. Neither MPG nor SAE is responsible for damage to your shipment from any cause including negligence.

Outgoing Shipments

General - All shipments must be packed and the crates properly sealed and labeled before the team leaves the site on Saturday.

It is each university's responsibility to schedule the pick-up of your outgoing shipment and prepare all the paperwork required for the shipment. All shipping and customs forms **must** be filled out by team/university representatives.

MPG personnel are not allowed to make arrangements for import or export shipping and scheduling.

Pick up Date – Outgoing shipments must be picked up by the carrier and removed from MPG property **no later than** 4:00 pm EDT Monday, May 21, 2007

Outgoing Carrier - Teams **must** provide MPG staff with the name of the carrier that will pick up your outgoing shipment.

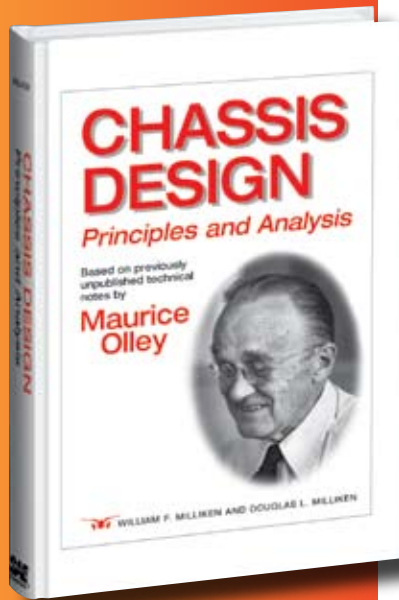
Expedited Shipments - Any shipment expedited from MPG at the request of a school must be accompanied by the team's chargeable account number (Fed Express/ DHL).

Required Information for Incoming Shipments:

You **must** email the following information to Kathleen McDonald katklauz@aol.com at least one (1) week before the FSAE competition opens:

Contact Information – The names and cell phone numbers of two (2) team members or advisors who can be contacted concerning the shipment.

Outgoing Shipment Carrier – The name of the carrier picking up your outgoing shipment and the carrier's phone number.



Chassis Design - Principles and Analysis

By William F. Milliken and Douglas L. Milliken

Based on Previously Unpublished Technical Notes by Maurice Olley

Chassis Design: Principles and Analysis is based on Olley's technical writings, and is the first complete presentation of his life and work. This book provides insight into the development of chassis technology and its practical application by a master. Many examples are worked out in the text and the analytical developments are grounded by Olley's years of design experience.

Chapters cover:

- Maurice Olley - His Life and Times
- Steady-State Cornering - Slip Angle Effects (Primary)
- Steady-State Cornering - Steer Effects (Secondary)
- Transient Cornering
- Ride
- Oscillations of the Unsprung
- Suspension Linkages
- Roll, Roll Moments and Skew Rates
- Fore-and-Aft Forces
- Leaf Springs - Combined Suspension Spring and Linkage

Well-illustrated with over 400 figures and tables, as well as numerous appendices.

Published in February 2002

676 Pages

Hardbound

Product Code: R-206

ISBN Number: 0-7680-0826-3

List Price: \$79.95

SAE Member Price: \$63.96

SAE Student Membership Opportunity!

For a limited time, March 1 through April 13, students wishing to become an SAE student member can take advantage of this special offer!

All students who join during this time period will have their name entered into a drawing to win a \$100 American Express Gift Card. The AMEX gift cards can be used as cash anywhere you shop.



As an SAE Student Member, you will be able to take advantage of the following benefits:

- Digital Access to ALL three SAE Magazines
- Member Only Access to the SAE Online Career Center to view and apply for internships and jobs, learn valuable career tips, and more
- Eligibility to participate in collegiate design competitions
- Networking opportunities with industry professionals at local section meetings

SAE Student Membership dues are only \$10 USD. All you need to do is fill out the application online at: http://www.sae.org/servlets/preLogin?REQUEST_TYPE=StudentApplication

SAE International is dedicated to advancing mobility engineering worldwide. There's nothing to lose and so much to gain. Become a member today!