SAE INTERNATIONAL FORMULA SAE®

STUDENT HANDBOOK

FORMULA SAE LINCOLN & ELECTRIC

LINCOLN, NEBRASKA

JUNE 21-24, 2017

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

EVENT SITE REVIEW

ADVICE, EXPECTATIONS & POLICIES:

ARRIVAL – In order to prevent traffic backlogs in Industrial Park please fo not arrive earlier than 9 AM Wednesday. *Early Registration available Tuesday.

ASK QUESTIONS – If you have a question – ask! If you have any questions about any part of the competition, the schedule, the procedures, the Rules or anything else, ask one of the officials. The first place to bring questions is to the staff in the registration area. Rules questions may be presented to the technical inspectors.

ANNOUNCEMENTS - Although we have loudspeakers in various parts of the site, FSAE covers a large area and it can be difficult for announcements to be heard everywhere. You can help us make sure everyone knows what's being announced by passing the announcements along to your team mates and others teams in your area. Announcements requesting parts, tools, or assistance can be made by the announcer in the main tent.

BATTERY DISPOSAL EV TEAMS– Battery disposal containers will be placed outside the EV Charging Tent.

BE ON TIME- The schedule is included in the student handbook and posted online. It is your responsibility to be on time and aware of event schedule changes announced.

BRING YOUR DOCUMENTATION - When you come to tech inspection bring all the documentation and correspondence connected to your (1) SEF submission, (2) Impact Attenuator Data Report and (3) any Rules Questions you submitted. The inspectors do not have immediate access to this material and you may need it to answer questions about your vehicles design and construction. The inspectors want you to pass tech and pass it easily, but they need your help to make that happen.

DON'T RUN – Running tells people there's an emergency. Don't run unless life or limb is in danger.

DRIVER MEETINGS – Attending all drivers' meetings is mandatory if you are planning to drive. Attendance may be taken; absence will result in no driving.

DYNAMIC/TECH AREA PASSES – Each team is issued 4 dynamic passes. You must have a pass to fain access to the dynamic areas as well as tech inspection.

ELECTRICAL POWER – There is no electrical power on the site. If you need electrical power you must bring a generator. There will be power provided in the Electric Charging Tent; this serves as the "fuel station" for Electric Teams. The other generators onsite will be used by the organizers and are already dedicated to operations.

ENTERING AND EXITING THE SITE – All traffic is to endter and exit gate located on NW 36 St. You can get to this street from W. Luke or W. Mathis – they also have gates which are NOT for FSAE use.

EVENT CLOSING TIMES – Each event is assigned an operation start/stop time. It is your responsibility to be on time. Your car must have crossed the strating line by that time or you can't run.

REGISTRATION – Everyone must sign SAE International's liability waivers and receive a wristband, which must be worn at all times throughout the event.

REMOVING CARS OVERNIGHT – Removing your car overnight is entirely your decision. If you have passed inspection you must get Tech approval before removing the car.

RESTRICTED AREAS– At Lincoln Airpark we are only authorized to use area within the ORANGE SNOW FENCE and certain surrounding facilities. We are not permitted on the other parts of event site. Please respect these restrictions. If caught violating this rule, you will be escorted off the premises and may have to deal with Homeland Security.

RESTROOMS– Portable toilets are positioned at convenient locations throughout the site. There are no other restrooms onsite.

EVENT SITE REVIEW

SECURITY – Keep your equipment locked up. This is a large site and security can't be everywhere. Don't leave your tools, computers and other equipment lying around where they could be stolen. The competition site is open to the public.

SPECTATORS – Spectators are welcome, but must remain within the designated spectator areas. Spectators who disregard the spectator area lines or signs may be ejected from the site. Team members without competitor wristbands are considered to be spectators and must obey all the spectator rules. Please note to all spectators closed toed shoes are not required but preferred. No pets allowed; except Guide Dogs.

SOCIAL MEDIA– Follow us on Twitter @formulaSAE - #fsaelincoln and check out our Facebook Page during the event! https://www.facebook.com/FormulaSAE

TRASH – Trash control is critical at FSAE Lincoln. This site is adjacent to the Lincoln Airport and trash cannot be permitted to blow onto the airfield. You are required to keep your paddock clean and properly dispose of trash in containers or bags. Use the trash containers and trash bags available. Trash bags are always available at the announcer or registration/information area. Ask and you shall receive.

Nebraska can be very windy and loose paper and trash will blow around. Your paddock's cleanliness is your responsibility. Because the site is so large please help us manage the trash, if you see a trash can to the point it will overflow (1) do not use it and (2) please tell someone in registration tent or nearest event volunteer.

WATER – There is not a readily accessible source of potable water at FSAE Lincoln. If you need water for drinking or cleaning you must bring it with you or purchase from the onsite vendors. There is NO water sponsor this year however Honda has provided each team with 2 cases of water and 1 case of Gatorade to start you off on the right foot.

WEATHER – In June the local weather can be unpredictable. We encourage you to be prepared for all weather types from sun to rain.

WRISTBANDS – Wristbands are required of all participants (students and volunteers) as well as spectators to be onsite. Individuals under the age 18 will receive a hand stamp/wristband for entrance permission.

CEREMONIES:

Welcome Ceremony Sponsored by Honda – Main Tent

In addition to the Captains' meeting on Wednesday afternoon (with its emphasis on "do's and do not's), we are holding a "Welcome Ceremony" sponsored by Honda. Key Volunteers who are present will be introduced. All teams, faculty and any volunteers who are present are welcome to attend. The Honda ceremony starts at 11:00am.

Award Ceremony Sponsored by GM – Main Tent

Families and friends are welcome to attend with the team. Volunteers are also welcome to attend. The Award Ceremony is scheduled for ~ 7:00 p.m. on Saturday, June 24th. The awards presented for both the IC & Electric Classes. There will also be a prize drawing* for: The "EZ Pass" for a free 2018 FSAE Lincoln Registration provided by SAE International.

*Teams must be present with 3+ members to win.

EVENT SITE REVIEW CONT.

CEREMONIES CONT'D:

Award Ceremony Sponsored by GM – Main Tent

Families and friends are welcome to attend with the team. Volunteers are also welcome to attend. The Award Ceremony is scheduled for ~ 7:00 p.m. on Saturday, June 24th. The awards presented for both the IC & Electric Classes. There will also be a prize drawing* for: The "EZ Pass" for a free 2018 FSAE Lincoln Registration provided by SAE International.

*Teams must be present with 3+ members to win.

CONCESSIONS:

Anyone who is interested may purchase food from the concessions near the main tent; there will be several food vendors onsite. The concessions will range in price for breakfast, lunch, dinner and snacks items.

The hours are: Wednesday, June 21 – Saturday, June 24: ~8:00 a.m. - ~5:00 p.m.*

*If business dictates, concessions may close earlier.

LUNCHES ONSITE:

Volunteers will be provided lunches. These will be delivered to event areas.
Teams will be responsible for providing their own lunches on all days except for Friday. Teams may bring food onsite; cook on site as well in specific areas. Or purchase from onsite Concessions.

Honda Sponsored Pizza Lunch for Teams – Wednesday June 21 following the welcome ceremony (Main Tent)

PADDOCKS:

Each team will be assigned a roughly 25' x 75' paddock. Teams may park vehicles and erect tents (only if weighted) and sunshades within their paddock at their discretion – provided the paddock is kept clean and nothing – absolutely nothing – is permitted to blow out of the paddock. Please Note: we are operating near an active runway.

KEEP YOUR PADDOCKS CLEAN– We are responsible for keeping the parts of the Lincoln Airpark used for FSAE clean. Trash cans are provided in the paddocks and throughout the FSAE site. If you need trash bags we have them available - just ask at the announcer. Please keep your paddock clean and make sure it is completely clean before your team leaves at the end of each day in addition to the end of event. PLEASE DO NOT leave any furniture, used tires, etc. behind. IT IS IMPERATIVE THAT YOU KEEP ALL TRASH CONTAINED AS WE ARE CLOSE TO A WORKING AIRPORT RUNWAY.

PARKING:

Enter gate through Site Access Point (off of W. Mathis, W. Luke & 36th Streets). All parking will be directed by volunteers. Teams will be directed to the FSAE Paddock Area; all other individuals (team members, volunteers and spectators) will be directed to general parking.

PHOTOGRAPHY:

There will be no photography allowed from within the dynamic areas.

PUSH BAR:

You can only move your car if you use the push bar.

TRANSLATORS:

If you have a driver who isn't fluent in English, you must have a translator. Translator must be in dynamic area and available to converse with officials when driver is on course.

FIRST AID

There will **NOT** be a First Aid Station onsite. All incidents will be covered EMTs.

To expedite matters in case of serious accident or injury after-hours, call 911. This number works from all land lines as well as mobile and coin-operated phones. It is always free of charge.

HOSPITAL

Closest hospital from Lincoln Airpark is ~10 miles; onsite EMTs will transport patients to:

Bryan West Memorial Hospital

1600 S. 48th Street

Lincoln, NE 68506

(402) 489-0200

It is your team's responsibility to be aware of closest hospital to team's accommodations.

DRIVING DIRECTIONS

DRIVING DIRECTIONS TO THE HOSPITAL

You start at the Lincoln Airpark

1. Start out going west on W Mathis St toward NW 42nd St.
2. Take the 1st left onto NW 48th St.
3. Merge onto I-80 E toward Omaha.
4. Merge onto Homestead Expy / US-77 S via EXIT 397 toward NE-2/Beatrice/Nebraska City.
5. Take the Rosa Parks Way exit.
6. Keep left to take the ramp toward Downtown Lincoln.
7. Merge onto Rosa Parks Way.
8. Rosa Parks Way becomes K St.
9. K St becomes Capitol Pky.
10. Turn left onto A St.
11. Turn right onto S 48th St.
12. 1600 S 48TH ST is on the left.

ELECTRIC SHOCK

WHAT SHOULD I DO IN CASE OF ELECTRIC SHOCK?

- Call for medical help. EMTs are onsite for medical assistance.
- Push one of the emergency shutdown buttons and wait until the TSAL is switched off
- Try to speak with the victim and ask him/her about his/her health
- Insulate yourself if you must move a victim away from a live contact - wear dry gloves or cover your hands with cloth and cover potential contact paths with the car with the HV isolation blanket. Watch your footing to make sure that you do not slip or fall when trying to move the victim.
- Do not move the victim if there is a possibility of neck or spinal injuries unless it is absolutely necessary (for example from a path of live current).
- Cover burns with a sterile dressing. On the surface, electrical burns may not look serious, but the burn can be severe deeper in the tissue.
- Keep the victim comfortable, warm and at rest, and monitor breathing.

STORM SHELTER

In the event of severe weather (i.e. thunder storms) , we are instructed by Lincoln Airpark Authority to gather inside the Danley Building. *Listen for announcements instructed by SAE via announcer.

In the event of severe weather, i.e. Tornado warnings, we are instructed by Lincoln Airpark Authority to gather under ops building/fire station.

CONTACT INFORMATION

Registration Tent is the central contact point for teams and volunteers regarding all issues concerning the event and will be staffed by volunteers with radios and contact list.

Provides:

- Information point for all competitors
- Contact interface to the officials
- Registration of all team members
- Distribution of all event materials and swag
- Posting of event scores

The Official announcer will be in the Main Tent at all times the competition is in progress.

Provides:

- Assistance can be made by the announcer for teams requesting parts, tools and assistance.
- Lost and Found

SAE OFFICIALS:

Kaley Zundel, Manager, Collegiate Design Series	412-719-2865
Sam Barill, Manager, Collegiate Design Series	412-512-7187
Bob Sechler, Education Relations Dept. Manager	
Amanda Paciorkowski, University Programs Developer	
Sara Guffey, University Programs Coordinator	724-591-2324

RESTRICTED AREAS & ACCESS

DYNAMIC AREA & DYNAMIC AREA ACCESS: At Formula SAE the "dynamic area" is one of the "restricted areas" and is defined as any part of the competition site where cars are running under power. The "dynamic area" includes the following parts of the site:

- Brake test area
- Courses
- Event queues and surrounding areas
- Dynamometer and surrounding area
- Noise test area
- Practice track

The dynamic area is considered highly restricted and may only be accessed by individuals with the proper credentials: (1) dynamic area pass and (2) a wristband as follows:

- COMPETITOR: Access limited to times the dynamic area gate is open – Must have a dynamic area pass
- EVENT CREW WITH DYNAMIC AREA PASS: Access limited to times the dynamic area gate is open -- Must have a dynamic area pass AND be assigned to work the dynamic area.
- Note: Scorekeeping crew may access the dynamic event site at any time to install timing/scoring equipment.
- FACULTY: Access limited to times the dynamic area gate is open – Must have a dynamic area pass. Faculty must use one of their team's passes.
- JUDGES: Judges have very limited access to the dynamic area.
- MEDIA: Access limited to times the dynamic area gate is open. Notes (1) Photographers and video crews must have a spotter. (2) Media, photographers, video crews and spotters must have dynamic area passes. (SAE staff are responsible for all media access.)
- OFFICIAL/ORGANIZER: All area access at all times
- VIP/SPONSORS: VIPS/Sponsors are not permitted in the dynamic area unless escorted by SAE staff and will not be issued dynamic passes.

DYNAMIC AREA PASSES: Access to the dynamic event area is limited to 4 people per team, including drivers and faculty, and each team is issued four (4) dynamic area passes. To gain access to the dynamic event area team members, including drivers, must wear and display (1) a dynamic area pass, and (2) a plastic wrist band. Team dynamic area passes may be shared with faculty advisors.

Faculty advisors are not issued separate dynamic area passes, but may use one of the 4 passes issued to their team.

Official Translators are issued separate dynamic event passes.

Dynamic area passes are also issued to organizers, event crew working that area, staff and other people needing access to the area.

Dynamic area passes are not issued to spectators and may not be loaned to spectators.

RESTRICTED AREAS & ACCESS CONT.

PADDOCK – The "paddock" is the section of the event site where the teams set up their work site and park their transporters. Individual paddock spaces will be assigned by the organizers.

If you are in the paddock, keep in mind that teams may be pushing their vehicles through the aisle ways and power tools may be in use. Be aware of what is going on around you and use common sense.

PARTICIPANTS – To be classified as a "participant" an individual must (1) be at least 18 years of age and affiliated to university, (2) have signed the FSAE liability waiver and (3) have been issued a wrist band.

Only "participants" have access to the restricted events areas.

RESTRICTED AREA– The "restricted area" is any part of the competition site where teams are likely to be running their vehicle engines.

The dynamic event areas, including the noise test site, the brake test site and the practice area are restricted,

Entry into any restricted area is limited to individuals with the proper wrist band.

Dynamic area entry - The dynamic events area is considered highly restricted and may only be accessed by people with all of the following: (1) FSAE issued I.D. badge, (2) dynamic area pass and (3) a plastic wrist band.

Restricted areas must be separated from the remaining parts of the competition site by a fence or tape /rope area designators.

SPECTATORS – Registration staff will make every effort to have all spectators sign the MIS liability waiver. There is no minimum age for spectators, but as a matter of operational policy any spectator under 18 years of age must be accompanied by an adult at all times.

Spectators over 18 years of age who sign the waiver will be issued wrist bands.

Spectators less than 18 years of age will be issued hand stamp / wrist bands.

Spectators must remain in the parts of the site open to the public.

Spectators are not considered "participants" and may not enter the dynamic events area.

WRISTBANDS – Wristbands are required to enter any of the FSAE restricted areas.

To receive a wrist band a person must (1) be at least 18 years of age and (2) sign the liability waiver.

Individuals under 18 years of age may be issued a hand stamp / wrist band and may not enter any restricted area. Minors will receive a hand-stamp / wrist band indicating their parent/legal guardian has signed the minor waiver on their behalf.

WRISTBAND TYPES:

- PLASTIC: Student, faculty, official, volunteer, sponsor, media, and VIP
- PAPER: Spectators

DAILY OPERATIONS SCHEDULE

Daily Operations	
Lincoln Airpark Site Open:	Wed. 9:00 a.m. - 7:30 p.m. Th. - Sat. 7:30 a.m. - 7:30 p.m.
Student Registration (Tent):	Wed. 9:00 a.m. - 4:30 p.m. *Th. 8*:00 a.m. - 12:00 p.m. *Fri. - Sat. All students will be registered as spectators*
Volunteer Registration & Info (Tent):	Wed. 8:00 a.m. - 5:00 p.m. Thu. - Sat. 7:15a.m. - 5:00 p.m.
Tech Inspection (Danley Bldg):	Wed. 1:00 p.m. - 7:00 p.m. (no new cars after 6:00 p.m.) Th. 8:00 a.m. - 5:00 p.m. Fri. By appointment until 2:00 p.m.
Scales (Danley Bldg):	Wed. 9:30 a.m. - 5:00 p.m. Th. 8:00 a.m. - 5:00 p.m. (after Noon by appointment only)
Tilt/Noise/Brake:	Th. 8:30 a.m. - 5:00 p.m. Fri. 8:30 a.m. - 5:00 p.m. (after 2:00 p.m. by appt only)
Fuel Station	Th.-Fri. 8:30 a.m. - 4:00 p.m. Sat. 7:30 a.m. -~4:00 p.m.
Practice Area:	Th. Noon - 5:00 p.m. Fri. 8:00 a.m. - 5:00 p.m. Sat. 7:30 a.m. - 3:00 p.m.

NOTES:

- Cars must complete all 3 parts of tech by 5:00 p.m. Friday to qualify for Endurance.
- 30 minutes' notice is required for all appointments, which can be booked through the announcer in Main Tent.

DETAILED SCHEDULE

(times preceded by * are approximate)

TUESDAY, JUNE 20		Location
3:00 p.m. - 7:00 p.m.	Student Registration and Paddocking (DROP OFF ONLY)	Registration Tent
WEDNESDAY, JUNE 21		**Location**
10:00 a.m.	Gear Check Opens	Danley Bldg
11:00 a.m.	Welcome Ceremony Captain and Advisors Meeting immediately following	Main Tent
11:30 a.m.	***Tech Inspector Volunteer Review Session***	***Danley Bldg***
11:45 a.m. - 12:45 p.m.	Lunch Break; Student Pizza Lunch sponsored by Honda	Main Tent
4:00 pm – 5:10 pm	***Design Judge Orientation/Review***	***TBD***
5:10 pm – 5:25 pm	***EV Safety Orientation Review for Design Judges***	***Danley Bldg.***
5:30 pm	Drivers Meeting - Brake and Practice – MANDATORY Competitor – Design Briefing	Main Tent
7:30 p.m.	Official Closing of the Site	
8:00 p.m.	Everyone must be off site	
THURSDAY, JUNE 22		**Location**
7:30 a.m.	***Judges Meeting for Design***	***TBD***
8:00 a.m.	***Judges Meeting for Cost***	***Cost Tent***
8:00 a.m. – 5:30 pm	Design Judging – 1st Round Open	TBD
8:30 a.m.	***Judges Meeting for Presentation***	***Arnold Elementary School***
9:00 a.m. - 5:00 p.m.	Cost Event Open	Main Tent
9:00 a.m. - 5:00 p.m.	Presentation Event Open	Arnold Elementary School
Noon - 1:00 p.m.	Lunch Break	
2:00 p.m.	Dynamic Event Courses Open for Driver Walks	
5:30 p.m.	Drivers Meeting - All Dynamic Events - Mandatory	Main Tent
6:30 p.m.	***Design Judges Meeting - Judges only***	**Offsite**
7:30 p.m.	Official Closing of the Site	
8:00 p.m.	Everyone must be off site	
~10:00 p.m.	Design Finalist announced online (www.sae.org and social media)	

DETAILED SCHEDULE CONT.

(times preceded by * are approximate)

FRIDAY, JUNE 23		Location
7:30 a.m.	***Course Crew Briefing - Acceleration and Skid Pad **EV safety Briefing for Dynamic Volunteers***	***Event Courses***
8:00 a.m. - 11:30 p.m.	Skid Pad Event and Acceleration Events Open	Track
9:00 a.m. - 4:30 p.m.	Design Feedback for Non-finalists by appointment	TBD
9:30 a.m. - 10:00 a.m.	Presentation Feedback Seminar for Q&A	Main Tent
11:30 a.m. - 1:00 p.m.	Snacks and Beverages sponsored by Nebraska Ethanol Board	Main Tent
1:00 p.m.	***Course Crew Briefing - Autocross **EV safety Briefing for Dynamic Volunteers***	***Track***
1:30 p.m. - 4:30 p.m.	Autocross Event Open	Track
5:00 p.m. - 7:30 p.m.	Design Finals	Danley Bldg
7:30 p.m.	Official Closing of the Site	
8:00 pm	Everyone must be off site	
SATURDAY, JUNE 24		**Location**
8:00 a.m.	***Endurance Course Crew Briefing *EV Safety Briefing for Dynamic Volunteers***	**Track**
8:30 a.m. - ~4:00 p.m.	Endurance/Fuel Economy Event Open	Track
~9:00 AM	Top 3 Teams Design Finalists Announced	
9:00 a.m. - 4:00 p.m.	Design Feedback by appointment	TBD
~Noon - 1:00 pm	Lunch Break	Main Tent
~4:30 pm	Presentation Highlights	Main Tent
~5:45 pm	Design Review of Top IC and EV Teams	Main Tent
~7:00 p.m.	Awards Ceremony Sponsored by General Motors	Main Tent
8:30 p.m.	Official Closing of the Site	
9:00 p.m.	Everyone must be off site	
SUNDAY, JUNE 25		
9:00 a.m. - 2:00 p.m.	Site Open ONLY for Pick-Up of Transporters	

SCHEDULE NOTES

Notes:
1.Drivers Meeting – There will be only one drivers meeting covering all dynamic events at 5:30 pm Thursday. There will be brief drivers meeting for Brake and Practice at 5:30 Wednesday. Drivers are required to attend driver's meetings. Failure to attend driver's meetings may result in the revocation of your driving privileges.
2.Event Closing Time - Acceleration, Skid Pad and Autocross close exactly at the scheduled time. Your car must have crossed the starting line before the event closing time in order to be allowed to complete that run.
3.Course Walks – Autocross and Endurance will be available to walk starting Thursday @ 2 pm and will be accessible up to the start of the event. Drivers are **required** to walk the course for each event in which they will be behind the wheel. Course walks will not be scheduled for individual events.
4.Removing Vehicles – Vehicles may be taken off site at the individual team's discretion provided Part 1 of the Inspection Sticker has been removed by Tech Chief.
5.EMS will provide any/all medical attention.
6.All teams not shipping cars must remove their vehicles, etc. from the site no later than 2:00 pm Sunday, June 25, 2017.
7.Teams shipping cars must have them picked up and removed from the site by 10:00 am Monday, June 26, 2017.
8.Announcements can be heard via FM radio (Frequencies will be posted in the Reg. /Info. Tent).

SUPPORT SERVICES

Support Services	
Lincoln Electric Welding Services **Wed. 1:30 p.m. - 5:00 p.m.** **Th. - Fri. 9:00 a.m. - 5:00 p.m.** **Sat. 9:00 a.m. - Noon** **Hoosier** **Wed. 1:30 p.m. - 5:00 p.m.** **Th. - Fri. 9:00 a.m. - 5:00 p.m.** **Sat. 9:00 a.m. - Noon** **Food Vendors - See map for location*** **All days ~8:00 am - 5:00 pm** ** As business dictates. May close earlier if deemed appropriate.*	
Lincoln Airpark Fire trucks on site: Wed. - Sat. 7 a.m. - ~8 p.m. **Ambulance on site** Wed. - Sat. 7 a.m. - ~8 p.m.	**Information (Main Tent/Danley Bldg)**: Th.-Sat. 7:30 a.m. - 5:00 p.m.

IC STATIC EVENT SCHEDULE

Car #	School Name	Design Bay	Design Time	Cost Bay	Cost Time	Presentation Bay	Presentation Time
1	Auburn Univ	G	9:00 AM	G	1:30 PM	G	3:30 PM
2	Univ of Washington	K	8:00 AM	A	11:30 AM	D	2:30 PM
3	California State Poly Univ - Pomona	E	10:00 AM	E	2:00 PM	E	11:30 AM
4	Missouri University of Science and Tech	J	8:00 AM	G	10:30 AM	C	2:30 PM
5	Iowa State Univ	H	4:00 PM	C	9:00 AM	C	10:30 AM
7	Rose Hulman Inst of Tech	J	10:00 AM	E	3:30 PM	C	1:30 PM
10	Wayne State Univ	J	2:00 PM	C	3:30 PM	E	10:00 AM
11	Faculdade de Engenharia de Sorocaba	F	5:00 PM	B	2:30 PM	B	9:00 AM
14	California State Univ - Northridge	K	11:00 AM	D	10:00 AM	D	1:00 PM
15	California Baptist University	G	1:00 PM	G	3:00 PM	G	9:30 AM
16	Arizona State Univ - Tempe	L	1:00 PM	A	3:00 PM	A	9:30 AM
17	Instituto Tecnologico de Chihuahua	K	5:00 PM	B	1:00 PM	B	3:00 PM
18	Univ of Nebraska - Lincoln	D	9:00 AM	D	1:30 PM	D	3:30 PM
19	San Diego State Univ	I	1:00 PM	B	10:30 AM	F	2:30 PM
20	California State Univ - Los Angeles	E	2:00 PM	E	9:00 AM	E	11:00 AM
21	Univ of Saskatchewan	I	11:00 AM	G	10:00 AM	F	1:30 PM
22	Univ of Calif - Irvine	F	1:00 PM	F	3:00 PM	F	9:30 AM
23	Texas A & M Univ - College Station	H	8:00 AM	E	10:30 AM	A	2:30 PM
24	Queen's Univ - Ontario Canada	E	4:00 PM	C	2:00 PM	C	11:30 AM
25	California Polytechnic State Univ-SLO	L	11:00 AM	A	2:30 PM	A	9:00 AM
26	Western Washington Univ	I	9:00 AM	C	11:30 AM	F	1:00 PM
27	Virginia Commonwealth Univ	G	2:00 PM	G	9:00 AM	C	11:00 AM
28	Univ of New Mexico	F	8:00 AM	F	1:00 PM	F	3:00 PM
29	Univ of Houston - Houston	L	2:00 PM	A	9:00 AM	A	10:30 AM
31	Univ of Alberta	H	11:00 AM	F	10:00 AM	E	1:30 PM
33	Concordia University	D	3:00 PM	D	9:30 AM	A	11:00 AM
34	Oregon Inst of Tech	D	2:00 PM	D	9:00 AM	D	11:00 AM
35	Colorado School of Mines	F	9:00 AM	F	1:30 PM	F	3:30 PM
37	Univ of Wisconsin - Platteville	J	4:00 PM	C	10:00 AM	C	2:00 PM
39	Univ of Texas - Austin	L	9:00 AM	A	1:30 PM	A	3:30 PM
40	Univ of Calgary	I	5:00 PM	B	9:30 AM	B	1:00 PM
41	Univ of Colorado - Denver	J	11:00 AM	A	3:30 PM	G	1:30 PM
42	Kennesaw State University	I	4:00 PM	C	9:30 AM	C	1:00 PM
43	Syracuse Univ	F	11:00 AM	F	2:30 PM	F	9:00 AM
44	Univ of North Dakota	D	1:00 PM	D	3:00 PM	D	9:30 AM
45	Portland State Univ	G	4:00 PM	C	3:00 PM	C	9:30 AM

IC STATIC EVENT SCHEDULE CONT.

Car #	School Name	Design Bay	Design Time	Cost Bay	Cost Time	Presentation Bay	Presentation Time
46	Univ of Texas - San Antonio	H	9:00 AM	B	11:30 AM	E	1:00 PM
47	Univ of Louisville	K	4:00 PM	B	9:00 AM	B	10:30 AM
49	Southern Methodist Univ	I	3:00 PM	A	11:00 AM	B	10:00 AM
51	Univ of Calif - Berkeley	F	4:00 PM	C	2:30 PM	C	9:00 AM
52	Georgia Southern Univ	E	11:00 AM	E	2:30 PM	E	9:00 AM
53	Univ of North Texas	D	4:00 PM	C	1:30 PM	C	3:30 PM
54	Univ of Calif - San Diego	L	3:00 PM	A	9:30 AM	A	1:00 PM
55	California State Univ - Sacramento	H	3:00 PM	E	11:00 AM	A	10:00 AM
56	Oklahoma State Univ	D	11:00 AM	D	2:30 PM	D	9:00 AM
57	North Carolina State Univ - Raleigh	F	3:00 PM	F	9:30 AM	E	10:30 AM
58	Univ of Southern California	I	2:00 PM	G	11:30 AM	G	10:00 AM
60	California State Univ - Long Beach	K	1:00 PM	D	10:30 AM	G	9:00 AM
61	California State Univ - Fullerton	E	3:00 PM	E	9:30 AM	B	11:00 AM
62	Univ of Oklahoma	G	8:00 AM	G	1:00 PM	G	3:00 PM
63	IPN Esime Zacatenco	J	5:00 PM	B	10:00 AM	G	2:00 PM
65	Univ of Texas - Arlington	E	9:00 AM	E	1:30 PM	E	3:30 PM
67	Univ of Delaware	H	2:00 PM	F	11:30 AM	F	10:30 AM
69	Univ of Calif - Los Angeles	K	2:00 PM	D	11:00 AM	F	10:00 AM
70	Univ of Arizona	F	2:00 PM	F	9:00 AM	F	11:00 AM
71	Universidad Panamericana	E	5:00 PM	B	2:00 PM	B	11:30 AM
72	Chandigarh Engineering College	L	5:00 PM	C	1:00 PM	C	3:00 PM
73	Clarkson University	H	1:00 PM	A	10:30 AM	E	2:30 PM
76	Univ of Hawaii - Manoa	J	3:00 PM	B	11:00 AM	C	10:00 AM
77	Hindustan University	G	11:00 AM	G	2:30 PM	G	1:00 PM
78	Univ of Calif - Riverside	G	3:00 PM	G	9:30 AM	G	11:00 AM
79	Univ of North Carolina - Charlotte	J	9:00 AM	D	11:30 AM	E	2:00 PM
80	California State Univ - Chico	E	1:00 PM	E	3:00 PM	E	9:30 AM
82	Honda Technical College Kansai	J	1:00 PM	C	10:30 AM	G	2:30 PM
86	Univ of Engrg & Tech - Lahore	D	10:00 AM	D	2:00 PM	D	11:30 AM
93	Yeungnam College of Science & Tech	K	9:00 AM	E	11:30 AM	D	2:00 PM
95	Univ of Illinois - Urbana Champaign	E	8:00 AM	E	1:00 PM	E	3:00 PM
96	Univ of Kansas - Lawrence	I	10:00 AM	D	3:30 PM	B	1:30 PM
97	Oakland University	F	10:00 AM	F	2:00 PM	F	11:30 AM
99	San Jose State University	I	8:00 AM	F	10:30 AM	B	2:30 PM
100	Louisiana State Univ	K	3:00 PM	C	11:00 AM	D	10:00 AM
101	Georgia Institute of Technology	L	8:00 AM	A	1:00 PM	A	3:00 PM
104	Kansas State Univ	K	10:00 AM	F	3:30 PM	D	1:30 PM
105	Univ of Missouri	H	10:00 AM	B	3:30 PM	A	1:30 PM
107	Virginia Tech	D	8:00 AM	D	1:00 PM	D	3:00 PM
108	Western Michigan Univ	G	10:00 AM	G	2:00 PM	G	11:30 AM
109	Kettering Univ	L	10:00 AM	A	2:00 PM	A	11:30 AM
110	Western University	L	4:00 PM	A	10:00 AM	A	2:00 PM

EV STATIC EVENT SCHEDULE

Car #	School Name	Design Bay	Design Time	Cost Bay	Cost Time	Presentation Bay	Presentation Time
E202	Univ of Pennsylvania	B	8:00 AM	I	1:00 PM	I	10:00 AM
E204	McGill Univ	A	8:00 AM	H	1:00 PM	H	2:30 PM
E205	Missouri University of Science and Tech	C	8:00 AM	J	1:00 PM	J	3:00 PM
E206	Massachusetts Inst of Tech	C	9:00 AM	J	1:30 PM	J	10:30 AM
E207	San Jose State University	B	11:00 AM	I	2:30 PM	I	9:00 AM
E208	California Polytechnic State Univ-SLO	B	3:00 PM	I	9:30 AM	I	1:00 PM
E210	Univ of Calif - Davis	C	2:00 PM	J	9:00 AM	J	11:00 AM
E211	Universidade Estadual de Campinas	A	4:00 PM	J	10:00 AM	H	2:00 PM
E212	Colorado State University	A	2:00 PM	H	9:00 AM	H	11:00 AM
E213	San Diego State Univ	C	3:00 PM	J	9:30 AM	J	1:00 PM
E214	Purdue Univ - W Lafayette	B	10:00 AM	I	2:00 PM	I	3:00 PM
E215	California Institute of Technology	C	4:00 PM	I	11:30 AM	I	1:30 PM
E217	Univ of Kansas - Lawrence	B	9:00 AM	I	1:30 PM	I	10:30 AM
E219	Univ of Illinois - Urbana Champaign	B	2:00 PM	I	9:00 AM	I	11:00 AM
E220	Virginia Tech	B	1:00 PM	J	11:00 AM	I	9:30 AM
E221	Univ of Wisconsin - Madison	C	10:00 AM	J	2:00 PM	J	11:30 AM
E222	Georgia Institute of Technology	C	1:00 PM	J	3:00 PM	J	9:30 AM
E224	Univ of Texas - Austin	C	11:00 AM	J	2:30 PM	J	9:00 AM
E225	Univ of Utah	A	5:00 PM	I	3:00 PM	J	1:30 PM
E226	Université Laval	A	6:00 PM	J	11:30 AM	J	10:00 AM
E227	Univ of Waterloo	A	3:00 PM	H	9:30 AM	H	1:00 PM
E228	Pakistan Navy Engineering College	B	5:00 PM	H	10:00 AM	J	2:30 PM
E229	Univ of British Columbia	A	1:00 PM	H	3:00 PM	H	9:30 AM
E231	Univ of North Carolina - Asheville	B	4:00 PM	H	11:30 AM	H	1:30 PM
E233	Univ of Michigan - Dearborn	A	9:00 AM	H	1:30 PM	I	11:30 AM
E234	Universidad Nacional Autónoma de México	C	5:00 PM	H	10:30 AM	i	2:30 PM
E237	Univ of Washington	A	10:00 AM	H	2:00 PM	H	11:30 AM
E238	Olin College of Engineering	A	11:00 AM	H	2:30 PM	H	9:00 AM

IC REGISTERED TEAM LIST

#	University Name	Country
1	Auburn Univ	United States
2	Univ of Washington	United States
3	California State Poly Univ - Pomona	United States
4	Missouri University of Science and Tech	United States
5	Iowa State Univ	United States
7	Rose Hulman Inst of Tech	United States
10	Wayne State Univ	United States
11	Faculdade de Engenharia de Sorocaba	Brazil
14	California State Univ - Northridge	United States
15	California Baptist University	United States
16	Arizona State Univ - Tempe	United States
17	Instituto Tecnologico de Chihuahua	Mexico
18	Univ of Nebraska - Lincoln	United States
19	San Diego State Univ	United States
20	California State Univ - Los Angeles	United States
21	Univ of Saskatchewan	Canada
22	Univ of Calif - Irvine	United States
23	Texas A & M Univ - College Station	United States
24	Queen's Univ - Ontario Canada	Canada
25	California Polytechnic State Univ-SLO	United States
26	Western Washington Univ	United States
27	Virginia Commonwealth Univ	United States
28	Univ of New Mexico	United States
29	Univ of Houston - Houston	United States
31	Univ of Alberta	Canada
33	Concordia University	Canada
34	Oregon Inst of Tech	United States
35	Colorado School of Mines	United States
37	Univ of Wisconsin - Platteville	United States
39	Univ of Texas - Austin	United States
40	Univ of Calgary	Canada
41	Univ of Colorado - Denver	United States
42	Kennesaw State University	United States
43	Syracuse Univ	United States
44	Univ of North Dakota	United States
45	Portland State Univ	United States
46	Univ of Texas - San Antonio	United States
47	Univ of Louisville	United States
49	Southern Methodist Univ	United States
51	Univ of Calif - Berkeley	United States
52	Georgia Southern Univ	United States
53	Univ of North Texas	United States
54	Univ of Calif - San Diego	United States
55	California State Univ - Sacramento	United States
56	Oklahoma State Univ	United States

IC REGISTERED TEAM LIST CONT.

#	University Name	Country
57	North Carolina State Univ - Raleigh	United States
58	Univ of Southern California	United States
60	California State Univ - Long Beach	United States
61	California State Univ - Fullerton	United States
62	Univ of Oklahoma	United States
63	IPN Esime Zacatenco	Mexico
65	Univ of Texas - Arlington	United States
67	Univ of Delaware	United States
69	Univ of Calif - Los Angeles	United States
70	Univ of Arizona	United States
71	Universidad Panamericana	Mexico
72	Chandigarh Engineering College	India
73	Clarkson University	United States
76	Univ of Hawaii - Manoa	United States
77	Hindustan University	India
78	Univ of Calif - Riverside	United States
79	Univ of North Carolina - Charlotte	United States
80	California State Univ - Chico	United States
82	Honda Technical College Kansai	Japan
86	Univ of Engrg & Tech - Lahore	Pakistan
93	Yeungnam College of Science & Tech	South Korea
95	Univ of Illinois - Urbana Champaign	United States
96	Univ of Kansas - Lawrence	United States
97	Oakland University	United States
99	San Jose State University	United States
100	Louisiana State Univ	United States
101	Georgia Institute of Technology	United States
104	Kansas State Univ	United States
105	Univ of Missouri	United States
107	Virginia Tech	United States
108	Western Michigan Univ	United States
109	Kettering Univ	United States
110	Western University	Canada

EV REGISTERED TEAM LIST

#	University	Country
E202	Univ of Pennsylvania	United States
E204	McGill Univ	Canada
E205	Missouri University of Science and Tech	United States
E206	Massachusetts Inst of Tech	United States
E207	San Jose State University	United States
E208	California Polytechnic State Univ-SLO	United States
E210	Univ of Calif - Davis	United States
E211	Universidade Estadual de Campinas	Brazil
E212	Colorado State University	United States
E213	San Diego State Univ	United States
E214	Purdue Univ - W Lafayette	United States
E215	California Institute of Technology	United States
E217	Univ of Kansas - Lawrence	United States
E219	Univ of Illinois - Urbana Champaign	United States
E220	Virginia Tech	United States
E221	Univ of Wisconsin - Madison	United States
E222	Georgia Institute of Technology	United States
E224	Univ of Texas - Austin	United States
E225	Univ of Utah	United States
E226	Université Laval	Canada
E227	Univ of Waterloo	Canada
E228	Pakistan Navy Engineering College	Pakistan
E229	Univ of British Columbia	Canada
E231	Univ of North Carolina - Asheville	United States
E233	Univ of Michigan - Dearborn	United States
E234	Universidad Nacional Autónoma de México	Mexico
E237	Univ of Washington	United States
E238	Olin College of Engineering	United States

PADDOCK RULES

Everyone (participants, volunteers & spectators) at Formula SAE Lincoln/Electric would like to enjoy an accident free event. The following guidelines have been established to advise teams of potential unsafe practices in the paddock area.

BEHAVIOR: Alcohol, illegal drugs, weapons or other illegal material are prohibited on the event site during the competition. Use of motorcycles, quads, bicycles, skateboards, rollerblades, scooters, or similar person-carrying devices in any part of the competition area, including the paddocks, is prohibited. (Rules D10.5, D11.6, D11.7)

DRIVER'S EQUIPMENT: Anytime the driver is in the cockpit with the engine running, the following approved safety equipment must be worn: helmet, driver's suit, racing gloves, goggles/face shields, racing shoes, and hair covering, if necessary (Rule B17 "Equipment Requirements").

DRIVING PRACTICE: Practice is only to take place in the designated areas during designated hours.

ENGINE RUNNING (IC ONLY): Engines may be run in the paddock provided the car has passed parts 1 and 2 of technical inspection and the following conditions are satisfied (Rule C.2.7):

The car is on an adequate stand, and (B) The drive wheels are at least 10.2 cm (4 in) off the ground, or the drive wheels have been removed. Note – People may not be underneath the vehicles while engines are running.

ENGINE RUNNING/SETTING THE TRACTIVE SYSTEM ACTIVE (EV ONLY): Any time the tractive system is activated an Electrical Safety Officer (ESO) must be involved. Activation of the tractive system in the paddock is allowed provided the car has passed EV tech inspection and the following conditions are satisfied (Rule C.27).The car is on an adequate stand, and (B) The drive wheels are at least 10.2cm (4 in) off the ground, or the drive wheels have been removed. Note – People may not be underneath the vehicles while the tractive system is active.

FIRE EXTINGUISHERS: Fire extinguishers are to be immediately accessible at all times. All team members must be familiar with their use. A fire extinguisher must accompany the car wherever it is in the paddock or moved to any part of the site. A team member must hold a fire extinguisher ready whenever the car is running in your stall.

FIRES & SMOKING: No open fires in the paddock including BBQ grills, oxy-acetylene torches, heaters, cigarettes, etc. Electric hot plates and MIG or TIG welding (with gas bottles safely secured) are allowed in your stall. Propane BBQ grills (NO charcoal) may be used only in the designated grass area near Danley Building. Smoking is prohibited onsite.

FUEL & OIL: No open fuel containers. All fuel containers must be DOT approved. Waste oil, etc., is to be taken to the fuel station for disposal. Fueling/Refueling is only allowed at the fuel station.

JACKING: When supporting cars off the ground, use strong, sturdy stands which support the vehicle in a stable and secure way. Do not use milk crates, piles of wood, four of the strongest team members, etc.

RESTRICTED AREAS: Please reference the Restricted Areas document.

UNDER NO CIRCUMSTANCES IS ANYONE TO CROSS OVER ORANGE SNOW FENCE.

TRASH: It is the Teams' responsibility to keep their Paddocks clean throughout the event. There are trash dumpsters and receptacles near every paddock row. No trash (including broken parts, old furniture, worn out tires or other materials) may be left behind at the end of the event. (Rule D10.7) Please Note: We are operating next to an active runway. Please be receptive to trash overflow.

VEHICLE MODIFICATIONS: If you make any major modifications to your car beside FSAE Rule T1.2.2, cars must return to scrutineering for re-approval

PADDOCK RULES CONT.

VEHICLE MOVEMENT (IC ONLY): Vehicles may not move under their own power anywhere but on the practice or competition tracks. Whenever a car is moved, (Rule D13.1) there must be:

- A driver wearing a full safety suit seated in the cockpit
- A fire extinguisher accompanying the car at all times
- Someone pushing the car with a push bar

VEHICLE MOVEMENT (EV ONLY):Vehicles may not move under their own power anywhere but on the practice or competition tracks. Whenever a car is moved, (Rule D13.1) there must be:

- A driver wearing a full safety suit seated in the cockpit
- A fire extinguisher accompanying the car at all times
- Someone pushing the car with a push bar
- The detachable handle or key of the tractive system master switch must be taken-off completely and kept by an Electrical Safety Officer (ESO).
- In the event the car has not passed E-Scrutineering, the HVD must be disconnected while the car is moved around on the event site. This also includes taking part in static events.

WORKING ON THE VEHICLE (ALL TEAMS): Tools are expected to be used safely. Wear safety glasses when cutting, grinding, etc. Wear appropriate eye protection while welding.

WORKING ON THE VEHICLE (EV TEAMS): Additional requirements apply for FSAE Electric. Activities on the energized tractive system or accumulator must take place in the Charging Tent. An Electrical Safety Officer (ESO) and at least one more team member, who can intervene in case of emergency, must attend every activity on the tractive system. Only members of your team and Scrutineers are allowed to stay behind the barrier tape/markings. After any activity on the tractive system during which seals were broken an E-Scrutineering is mandatory! Work on the energized tractive system or accumulator must satisfy the following guidelines:

- Car/accumulator must be separated with barriers
- All team members working on the system must wear appropriate personal protective equipment (gloves).
- Insulated tools must be used when working on any live circuit
- A sign is clearly visible stating “High Voltage Work” including the maximum voltage of the system being worked on and the name/contact info of the ESO.
- At least one team members must not directly be involved in the work conducted on the accumulator, but must be there to assist in case of an incident.

PADDOCK RULES CONT.

Activities on the de-energized tractive system outside the accumulator may be performed in the paddock. The following procedure must be followed:

1. Switch off the tractive system master switch and lock out per team procedure.
2. Open/Remove the HV disconnect
3. Check for zero-potential using the three point test
4. Install a sign, that declares the car as electrically secured/de-energized. Note the name of the ESO supervising the activities on the sign. The ESO is the only person who may remove the sign and re-energize the tractive system.

In case of measurements on the energized system or an activation of the tractive system in the tent for testing purposes please keep to the following procedure:

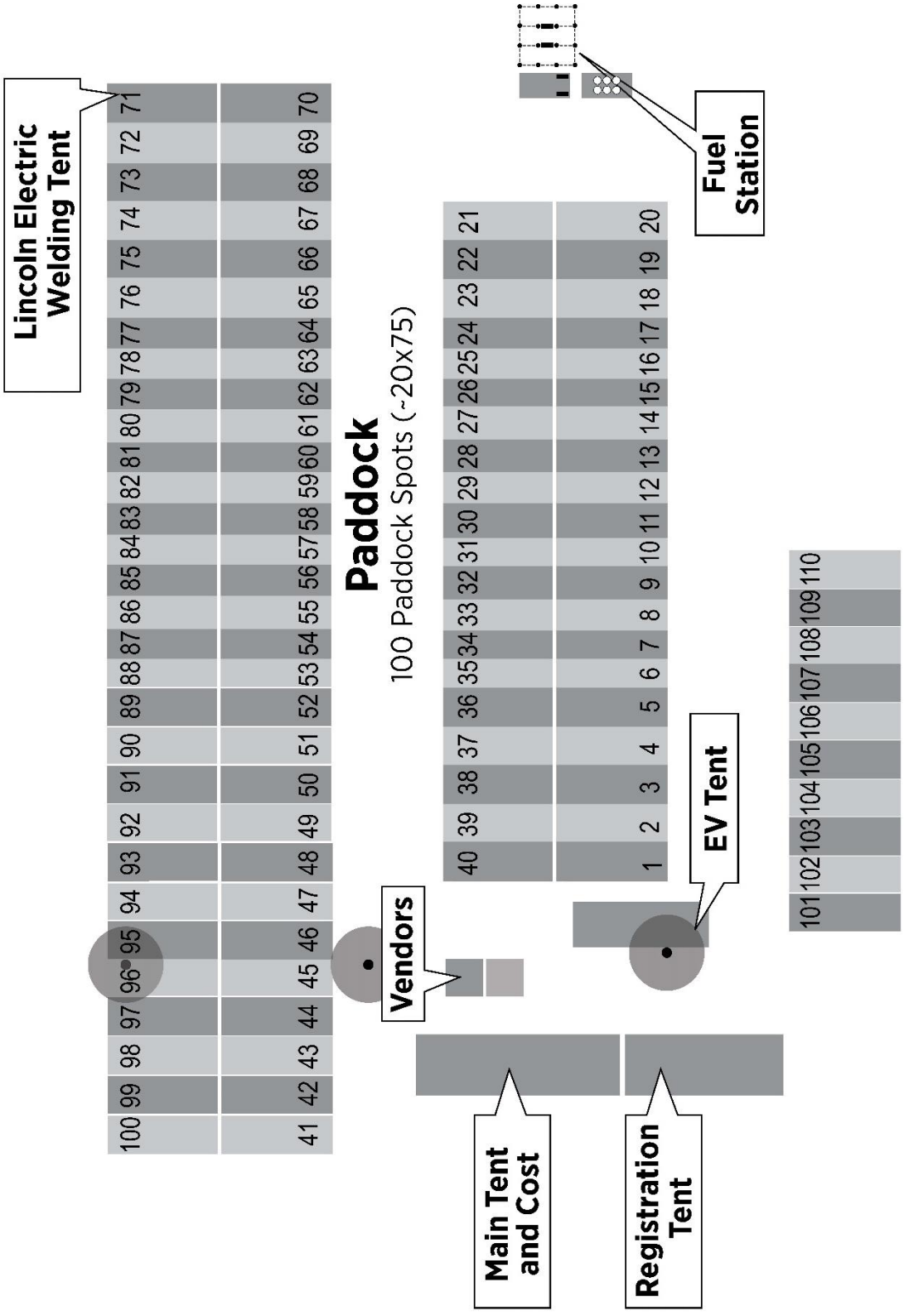
1. Separate the car with barrier tape/markings provided by officials
2. The car must be jacked up and the drive wheels removed
3. One team member must be prepared to push emergency button at any time
4. Team members who take part in the measurement activities must wear compliant safety equipment and use appropriate measurement devices and tools.
5. The tractive system must only be activated for as long as necessary

A SPECIAL NOTE FOR DRIVERS: All drivers should do a check of critical fasteners and components on their vehicles to assure complete control during the driving events. Fasteners come loose, parts break due to fatigue, and occasionally someone forgets to torque a nut – this may have serious consequences for your safety!

REMEMBER: USE THE KILL SWITCH in case of an engine, brake malfunction, or any serious incident such as crash or fire.

HAVE FUN – DRIVE SAFE – USE COMMON SENSE

PADDOCK LAYOUT



DANLEY BLDG. LAYOUT

COST

EVENT CAPTAIN: Susan Zukowski

LOCATION: Main Tent

OVERVIEW:

Each team will prepare a report of their car's cost to be evaluated by the cost judges. The concept of the cost event is to obtain an accurate estimate of cost of the car in a limited production. The report is in effect your cost proposal to the senior management of a company to get them to invest in your product line. The more information that you can supply to them, the more professional the look of your materials, the more likely the company may be willing to look at the product itself. This is the goal of the cost report itself. Additionally, the teams will also prepare an electronic Bill of Materials using a shared database with standard materials and processes and a detailed process description. This evaluates not only the cost of the car, but also the team's ability to prepare an accurate engineering cost estimate and know exactly how the vehicle would be built. The car with the lowest corrected cost and the best report will win the event. The event can be divided in to three separate sections - the cost report itself, visual inspection, and 'real case scenario' discussion.

THE COST REPORT:

The actual cost report is due into the judges approximately six to seven weeks prior to the event at the venue. Books must be mailed before the post mark deadline or the book will incur a penalty of 10 points per day after that date. The cost report is judged on the basis of the cost of the car and quality of the cost report. The cost of the car is determined by the cost of the parts and fabrication using established manufacturing practices and the application of "Lean Manufacturing" principles. The report will follow the guidelines set forth in the published rules. From this analysis, the judges (in 9 distinct areas of expertise) will determine if all parts and processes were included and if unreasonably low (determined by the experience of the judges) - the judges will add penalties if there are errors, items omitted, or have costs below reasonable estimates – at either standard point(s) deduction or at a rate equal to twice the cost error, whichever is greater. We have eight teams that review each and every book based on their expertise. The costs and penalties will then determine the cost score. The report score will be given based on the quality of the report and its overall presentation. The report score ranges from 0 to 40 points. The price score will be awarded based on the following formula:

$$\text{PRICE SCORE} = \frac{40 * (PMax) / (Pyour) - 1}{(PMax) / (PMin) - 1}$$

TOTAL COST SCORE =

Price Score (max 40) [Generated by formula above] + Report Score (max 40) [Accuracy, Format, Part Content] + Visual Inspection and "Real Case" Discussion Score (max 20)

(NOTE: Pyour is the adjusted cost of your team's car with penalties, Pmin is the adjusted cost of the lowest cost car in the competition, PMax is the adjusted cost of the highest cost car in the competition)

THE VISUAL INSPECTION AND "REAL CASE" EVALUATION:

On the day of the event, the cost event judges will man seven bays with appointments in each bay every half-hour in order to see every competing car. This is to make sure that the parts that are on the vehicle are reported in the cost report and that nothing has been added since the cost report's publication.

COST CONT.

The focus of the cost event centers on the cost of the vehicle and the process of building the vehicle and the components contained therein. At the time of check-in at our event, the designated team representative will randomly draw to determine which of the nine random "real case" scenarios the team will be discussing in detail. These cases will encompass real issues that the team may encounter and how they would handle them in reference to their own team vehicle, systems or parts. The cost judges will also question the students regarding the report, process, and "real case". This is a critical step in the cost event process. This discussion of the 'real case' and the visual inspection on the even day can only help the student's team. If this appointment is missed the team will sacrifice the twenty points for this portion of the event. If the team feels that for some reason their appointment time needs to be changed they will need to contact the event captain to make necessary arrangements.

The time allotted for the appointment on event day is ½ hour per team at the designated time for that school. That time can then be broken down as follows.

CHECK IN:	1 or 2 minutes
VISUAL INSPECTION:	4 to 5 minutes
REAL CASE SCENARIO DISCUSSION**:**	20 Minutes

Addenda to the report can be taken into consideration to cover any necessary changes made in the car. These addenda will only be accepted at the time of registration at the event and must be in the format proscribed by the rules (Appendix C-5).

In addition to the above, the cars with the lowest costs will be subject to a physical audit to make sure that they included all processes and materials on their vehicle in the cost report. The audits will be held on the same event day but by a separate team of auditors some time after their initial appointment with the cost area. The adjustments that this team of auditor makes will be included in the final scores as well.

The final scores are tabulated and presented at the end of the judging day to the statisticians and are posted the next morning for the students viewing. Once posted, the scores may be protested for only 30 minutes, after which the scores become final.

TIPS FOR A GOOD COST REPORT:

- Follow the rules - put the items and processes where the guidelines tell you to put them
- Include an eBOM (Electronic Bill of Material) on CD in MS Excel that follows the format of the 2017 FSAE Rules.
- Create the eBOM using the on-line FSAE Cost Event Database utilizing standard materials, processes and tools.
- No receipts necessary any more
- Include any photographs, pictures, drawings, blue prints, etc. in the appropriate sections of the book to help us understand the design processes used in manufacturing the parts
- If you must - err on the high side rather than cut yourself short
- Detail any processes or materials not already specified in the standard tables and submit AIR (add item request) to have them added to the standards table if needed.
- Be careful to postmark by deadline, no need to throw away good points by slack timing.
- Carefully consider Make/Buy decisions – these often result in dollars being spent more wisely.

REAL CASE SCENARIO

Rule C.3.3.3 states that the third part of the Cost Event will be a "real case" scenario where students will have to respond to a challenge related to cost or manufacturing of the student vehicle."

THE REAL CASE SCENARIO FOR THIS EVENT WILL BE ONE OF THE FOLLOWING:

The Cost Judges have reviewed the Cost Report that you have submitted and they have determined that the cost of the _____ on your car is substantially higher than expected.

Your task at the event is to present the Cost Judges with your proposals to reduce the cost of the _____ on your car by 15%.

The presentation must fulfill the following requirements:

- No longer than 5 minutes
- Flip chart pages (optional)
- No handouts or use of electronic devices.
- Must be based on the system on your car.

Your presentation will be evaluated on:

- The process or methodology(ies) used to develop the proposal(s)
- The alternatives presented
- The credibility of the proposals

The team's presentation skills will NOT be scored.

The blanks above will be randomly drawn choices of the following:

1. Wire Harness
2. Seats and Restraints
3. Impact Attenuator

Rules Committee,

FSAE.

IC COST SCHEDULE

* IC Cost Event - 7 Bays, each appointment is 1/2 hour long

	a	b	c	d	e	f	g
	1	2	3	4	5	6	7
8:00 AM	Training	Training	Training	Training	Training	Training	Training
8:30 AM	Training	Training	Training	Training	Training	Training	Training
9:00 AM	029 - Univ of Houston - Houston	047 - Univ of Louisville	005 - Iowa State Univ	034 - Oregon Inst of Tech	020 - California State Univ - Los Angeles	070 - Univ of Arizona	027 - Virginia Commonwealth Univ
9:30 AM	054 - Univ of Calif - San Diego	040 - Univ of Calgary	042 - Kennesaw State University	033 - Concordia University	061 - California State Univ - Fullerton	057 - North Carolina State Univ - Raleigh	078 - Univ of Calif - Riverside
10:00 AM	110 - Western University	063 - IPN Esime Zacatenco	037 - Univ of Wisconsin - Platteville	014 - California State Univ - Northridge	#N/A	031 - Univ of Alberta	021 - Univ of Saskatchewan
10:30 AM	073 - Clarkson University	019 - San Diego State Univ	082 - Honda Technical College Kansai	060 - California State Univ - Long Beach	023 - Texas A & M Univ - College Station	099 - San Jose State University	004 - Missouri University of Science and Tech
11:00 AM	049 - Southern Methodist Univ	076 - Univ of Hawaii - Manoa	100 - Louisiana State Univ	069 - Univ of Calif - Los Angeles	055 - California State Univ - Sacramento	#N/A	#N/A
11:30 AM	002 - Univ of Washington	046 - Univ of Texas - San Antonio	026 - Western Washington Univ	079 - Univ of North Carolina - Charlotte	093 - Yeungnam College of Science & Tech	067 - Univ of Delaware	058 - Univ of Southern California
12:00 PM 12:30 PM	**LUNCH BREAK**						
1:00 PM	101 - Georgia Institute of Technology	017 - Instituto Tecnologico de Chihuahua	072 - Chandigarh Engineering College	107 - Virginia Tech	095 - Univ of Illinois - Urbana Champaign	028 - Univ of New Mexico	062 - Univ of Oklahoma
1:30 PM	039 - Univ of Texas - Austin	#N/A	053 - Univ of North Texas	018 - Univ of Nebraska - Lincoln	065 - Univ of Texas - Arlington	035 - Colorado School of Mines	001 - Auburn Univ
2:00 PM	109 - Kettering Univ	071 - Universidad Panamericana	024 - Queen's Univ - Ontario Canada	086 - Univ of Engrg & Tech - Lahore	003 - California State Poly Univ - Pomona	097 - Oakland University	108 - Western Michigan Univ
2:30 PM	025 - California Polytechnic State Univ-SLO	011 - Faculdade de Engenharia de Sorocaba	051 - Univ of Calif - Berkeley	056 - Oklahoma State Univ	052 - Georgia Southern Univ	043 - Syracuse Univ	077 - Hindustan University
3:00 PM	016 - Arizona State Univ - Tempe	#N/A	045 - Portland State Univ	044 - Univ of North Dakota	080 - California State Univ - Chico	022 - Univ of Calif - Irvine	015 - California Baptist University
3:30 PM	041 - Univ of Colorado - Denver	105 - Univ of Missouri	010 - Wayne State Univ	096 - Univ of Kansas - Lawrence	007 - Rose Hulman Inst of Tech	104 - Kansas State Univ	#N/A

EV COST SCHEDULE

*Electric Cost Event - 3 Bay, each appointment is 1/2 hour long

	H (EV)	I (EV)	J (EV)
	8	9	10
8:00 AM	Training	Training	Training
8:30 AM	Training	Training	Training
9:00 AM	E212 - Colorado State University	E219 - Univ of Illinois - Urbana Champaign	E210 - Univ of Calif - Davis
9:30 AM	E227 - Univ of Waterloo	E208 - California Polytechnic State Univ-SLO	E213 - San Diego State Univ
10:00 AM	E228 - Pakistan Navy Engineering College	#N/A	E211 - Universidade Estadual de Campinas
10:30 AM	E234 - Universidad Nacional Autónoma de México	#N/A	#N/A
11:00 AM	#N/A	#N/A	E220 - Virginia Tech
11:30 AM	E231 - Univ of North Carolina - Asheville	E215 - California Institute of Technology	E226 - Université Laval
12:00 PM 12:30 PM	**LUNCH BREAK**		
1:00 PM	E204 - McGill Univ	E202 - Univ of Pennsylvania	E205 - Missouri University of Science and Tech
1:30 PM	E233 - Univ of Michigan - Dearborn	E217 - Univ of Kansas - Lawrence	E206 - Massachusetts Inst of Tech
2:00 PM	E237 - Univ of Washington	E214 - Purdue Univ - W Lafayette	E221 - Univ of Wisconsin - Madison
2:30 PM	E238 - Olin College of Engineering	E207 - San Jose State University	E224 - Univ of Texas - Austin
3:00 PM	E229 - Univ of British Columbia	E225 - Univ of Utah	E222 - Georgia Institute of Technology

DESIGN

EVENT CAPTAIN: Dr. David Redszus

LOCATION: Danley Building

ACTIVITIES

THURSDAY: 1st round judging
FRIDAY: Design Finals
FRI & SAT: Team Feedback in Paddocks
SATURDAY: Public Design Review

DESIGN JUDGING PROCEDURE:

Design judging starts promptly at 8:00 am on Thursday (see detailed design assignment schedule) in the Danley building. Each time slot is one hour long, with approximately 45 minutes for the judges to review the vehicle and interact with the team members. The remaining time is used by the judges to compile/compare notes and score the car. Teams will be notified by the judges when the car may be released from the queue. The first round of judging will end at 6:00 pm.

Typically 8-10 cars are selected for Design Finals. Design Finals are to be held Friday evening in the Danley Building (see schedule), and is not open to the general public.

Based upon the result of Design Finals, the top three cars are announced on Saturday morning. These cars will be presented at the Public Design Review (in the Main Tent) on Saturday late afternoon (see schedule) where the overall Design winner will be announced. Regardless of whether you are one of the top 3, you are strongly encouraged to attend this review.

In addition, judges are available to visit your pit for private team specific feedback/consultation on Friday and Saturday. This opportunity is a great way to see what the Design Judges like (and dislike) about a FSAE car, for your improvement next year. Please contact the Design event personnel on Thurday or early Friday to schedue this visit.

DESIGN GUIDELINES:

Student teams must submit Design Report (DR) and Design Spec Sheet (DSS) well prior to the competition. These two documents are used to pre-screen the teams, for balanced judging queues, as they provide judges a 'sneak peak' at the designs. Teams that do not submit both a DR and DSS in a timely fashion are disqualified from the design event, and receive zero points. Per FSAE rules, each DR contains no more than four (4) pages of text, includes three pages of vehicle drawings (3-view drawings) and may include one page of optional material (8 page total). Pages beyond 8 are ignored. The DR is not judged based on length or amount of material. The DR should highlight design goals, processes, and details in engineering terms, not merely a marketing piece nor list of parts purchased and placed on vehicle. The intended audience is one or more experienced engineers. While concise, the DR should cover all major vehicle systems, highlighting notable features. The DSS is a pre-set template teams use to detail system and component level specifications. This template must be adhered to.

It is the students' responsibility to prove to the judges that their vehicle is a first year car. Second year cars are not allowed at FSAE – Lincoln. If the structure of the frame is not obviously a completely new design from previous years, then thorough photo documentation should be provided to prove that the car is new as defined by the rules. If documentation shows that the remaining parts of the vehicle have not been significantly altered or if sufficient new design work has not taken place, up to 20% of overall competition score (incuding dynamics events) may be deducted.

All cars must be weighed before Design Judging. It is recommended that car be weighed at least 30 minutes prior to your design judging time slot. Specific weights (with and without driver) are recorded and marked on-car for the duration of the competition. Teams who are late or miss their slots risk not being judged. For instance if a team finishes getting weighed at 9:40 for a 9:30 time slot, they have ten less minutes to be judged. In fairness to all competitors, vehicles will be rolled in and out on schedule.

DESIGN CONT.

Design judging consists of 12 groups (queues) of judges. Each queue may have as many as five design judges. This means 12 cars are being judged simultaneously. We strive to make this as transparent a process as possible. The judges in each queue evaluate the following areas: Suspension; Frame/Body/Aero; Powertrain; Cockpit/Controls/Brakes/Safety; Systems Management/Integration; Manufacturability/Serviceability; Aesthetics/Style; & Creativity. Teams should preview the Design Judging Score Sheet on the official FSAE website. The score sheet gives competitors insight into how they will be judged, as well as a detailed breakdown of each judging category. Judges have one or more area of expertise, and will seek out the student team member(s) responsible for each particular functional subsystem of the car. There may also be roving judges with expertise in the areas of Aerodynamics, Composites Construction, and Electronics Integration. Such judges bring a higher level of expertise to these specialty areas, as well as help to provide judging consistency between queues. Such judges are assigned based on DR content. If your car makes use of aero, composites, or electronics, please ensure they are noted in your DR!

Team should have a representative who is prepared to discuss each of the above areas with each judge individually. This typically means five or more students. If the judges have to split their time between a single student; lower scores could result according to how much information the judges feel they have received. Students should bring any and all information they feel is relevant (charts, graphs, parts, photos, computers, video, etc.) to support their design efforts. The judges will give more credit to documented engineering than to word of mouth, vendor-supplied details, or internet hearsay. Simply showing up with a great car is not good enough. A high emphasis is placed on the student team's ability to Design, Build, Refine & Validate, and most importantly understand its car.

Design judge(s) from your queue are happy to visit you on Friday and/or Saturday, to return your score sheet, explain how/why you received the marks you did, as well as provide feedback on your team's design processes. The judges are strongly encouraged to make thorough notes and provide written feedback to the participants. Students are encouraged to approach Design Judges on the days following the Design Event to request additional feedback on their designs. This has historically proven to be among the most valuable parts of the competition for teams!

There will be a phone number posted and announced, which students can call in order to schedule an appointment for a debrief session with your Design Judges. The post-event debrief sessions can be very informative and all teams are encouraged to participate. Also, please ensure judges are given a current team on-site contact phone number, so they may contact you during design feedback scheduling.

At the conclusion of First Round Design Judging on Thursday, each judging queue typically nominates one or more cars for consideration into design finals. Technical comparisons between cars from different queues are considered and additional observations from the Chief Design Judges, Design Event Captain, and roving judges help assure consistency and objectivity in the final grading and finalists' selection. The Design Finalists are announced later that night online. Detailed scores for non-finalist teams are posted prior to mid-day Friday.

During Design Finals, only four team members are permitted with the vehicle at any time to converse with the judges. Any remaining team members must be outside the immediate judging area. Teams with more than four team members that remain in the judging area will be penalized. Team members may switch places (tag in, tag out) to have their proper systems represented.

Remember, the Design Event is an important assessment of your team's demonstrated knowledge of the vehicle design process and the various subsystems of your design. It is an opportunity for you to become a better engineer. It is NOT merely a review of how well you can make your car go faster!

GOOD LUCK!

IC DESIGN SCHEDULE

*Design Event - 9 bays - Each time slot is ONE hour long

	D	E	F	G	H	I	J	K	L
	4	5	6	7	8	9	10	11	12
8:00 AM	107 - Virginia Tech	095 - Univ of Illinois - Urbana Champaign	028 - Univ of New Mexico	062 - Univ of Oklahoma	023 - Texas A & M Univ - College Station	099 - San Jose State University	004 - Missouri University of Science and Tech	002 - Univ of Washington	101 - Georgia Institute of Technology
9:00 AM	018 - Univ of Nebraska - Lincoln	065 - Univ of Texas - Arlington	035 - Colorado School of Mines	001 - Auburn Univ	046 - Univ of Texas - San Antonio	026 - Western Washington Univ	079 - Univ of North Carolina - Charlotte	093 - Yeungnam College of Science & Tech	039 - Univ of Texas - Austin
10:00 AM	094 - Florida A&M Univ/Florida State Univ	003 - California State Poly Univ - Pomona	097 - Oakland University	108 - Western Michigan Univ	105 - Univ of Missouri	096 - Univ of Kansas - Lawrence	007 - Rose Hulman Inst of Tech	104 - Kansas State Univ	109 - Kettering Univ
11:00 AM	056 - Oklahoma State Univ	052 - Georgia Southern Univ	043 - Syracuse Univ	036 - Wichita State Univ	031 - Univ of Alberta	021 - Univ of Saskatchewan	041 - Univ of Colorado - Denver	014 - California State Univ - Northridge	025 - California Polytechnic State Univ-SLO
12:00 PM	**LUNCH BREAK**								
1:00 PM	044 - Univ of North Dakota	080 - California State Univ - Chico	022 - Univ of Calif - Irvine	015 - California Baptist University	073 - Clarkson University	019 - San Diego State Univ	082 - Honda Technical College Kansai	060 - California State Univ - Long Beach	016 - Arizona State Univ - Tempe
2:00 PM	034 - Oregon Inst of Tech	020 - California State Univ - Los Angeles	070 - Univ of Arizona	027 - Virginia Commonwealth Univ	067 - Univ of Delaware	058 - Univ of Southern California	010 - Wayne State Univ	010 - Wayne State Univ	029 - Univ of Houston - Houston
3:00 PM	033 - Concordia University	061 - California State Univ - Fullerton	057 - North Carolina State Univ - Raleigh	078 - Univ of Calif - Riverside	055 - California State Univ - Sacramento	049 - Southern Methodist Univ	076 - Univ of Hawaii - Manoa	076 - Univ of Hawaii - Manoa	054 - Univ of Calif - San Diego
4:00 PM	053 - Univ of North Texas	024 - Queen's Univ - Ontario Canada	051 - Univ of Calif - Berkeley	045 - Portland State Univ	005 - Iowa State Univ	042 - Kennesaw State University	037 - Univ of Wisconsin - Platteville	047 - Univ of Louisville	110 - Western University
5:00 PM	086 - Univ of Engrg & Tech - Lahore	071 - Universidad Panamericana	011 - Faculdade de Engenharia de Sorocaba	077 - Hindustan University	#N/A	040 - Univ of Calgary	063 - IPN Esime Zacatenco	017 - Instituto Tecnologico de Chihuahua	072 - Chandigarh Engineering College

EV DESIGN SCHEDULE

*Electric Design Event - 3 bays - Each time slot is ONE hour long

	A (EV)	B (EV)	C (EV)
	1	2	3
8:00 AM	E204 - McGill Univ	E202 - Univ of Pennsylvania	E205 - Missouri University of Science and Tech
9:00 AM	E233 - Univ of Michigan - Dearborn	E217 - Univ of Kansas - Lawrence	E206 - Massachusetts Inst of Tech
10:00 AM	E237 - Univ of Washington	E214 - Purdue Univ - W Lafayette	E221 - Univ of Wisconsin - Madison
11:00 AM	E238 - Olin College of Engineering	E207 - San Jose State University	E224 - Univ of Texas - Austin
12:00 PM	**LUNCH BREAK**		
1:00 PM	E229 - Univ of British Columbia	E220 - Virginia Tech	E222 - Georgia Institute of Technology
2:00 PM	E212 - Colorado State University	E219 - Univ of Illinois - Urbana Champaign	E210 - Univ of Calif - Davis
3:00 PM	E227 - Univ of Waterloo	E208 - California Polytechnic State Univ-SLO	E213 - San Diego State Univ
4:00 PM	E211 - Universidade Estadual de Campinas	E231 - Univ of North Carolina - Asheville	E215 - California Institute of Technology
5:00 PM	E225 - Univ of Utah	E228 - Pakistan Navy Engineering College	E234 - Universidad Nacional Autónoma de México
6:00 PM	E226 - Université Laval	#N/A	#N/A

SALES PRESENTATION

EVENT CAPTAIN: Reed Greenwood

LOCATION: Arnold Elementary School, 5000 Mike Scholl St. Lincoln, NE 68524

DIRECTIONS:

1. Head out event site gate; turn left onto NW 36th Street
2. Turn right onto Mathis Street
3. Turn right onto NW 48th Street
4. Turn left onto W Cumming Street (passing Mike Scholl Street)
5. Parking will be located in back upper lot off W Cuming Street
6. Approx. 6 min travel time

PRESENTATION SEMINAR: Friday, June 23, 2017 at 9:30 AM in Main Tent

PRESENTATION HIGHLIGHTS: Saturday, June 24, 2017 at ~4:30 PM in Main Tent

OVERVIEW:

After a year of planning, fabricating, and testing a new, prototype vehicle, each team aspires to sell their vehicle design to a make-believe corporation. The competitors in this event will be judged on their ability to create and deliver a business case that convinces the judges that the team's design best meets the demands of the amateur, weekend competition market, and that it can be profitably manufactured and marketed (see A1.2 in the 2017 Formula SAE rules for notes on Vehicle Design Objectives). The team that makes the best presentation will win the event and score 75 points.

THE PRESENTATION:

Competitors are to make a presentation to upper level executives of an imaginary corporation. The presentation should tie together all factors that would influence the marketability, manufacturing feasibility and profitability of their vehicle design. It should include an understanding of the marketplace and target customer, and show how their team's design meets the requirements for each. Should focus on car team designed.

THE EVENT:

Each competitor will be assigned a 30 minute window and location. This includes the time the judges need to score. Judges may allow a team to begin early, but the completion time (30 minutes) should be strictly enforced. The presentation itself is not to last any longer than ten minutes, at which point the judges will stop any presentations continuing. A question and answer period of up to five minutes will immediately follow, wherein only judges may ask questions and only presenters may answer. The audience (usually team members) may not ask questions or make comments. It is allowable for a presenter to only participate in the question and answer section, however he/she must be a member of the 'presentation group,' as defined by S5.3.2 of the 2017 Formula SAE rules.

SALES PRESENTATION CONT.

A team of two to four judges will grade the competitors. The judges will use the form in Appendix S-6 of the Formula SAE rules for event scoring: "Presentation Judging." This form breaks the scoring down into five equally weighted categories: Content, Organization, Visual Aids, Delivery, and Questions. A perfect score on the judges' form will be 50 points. The judges' combined score may be adjusted because some judging teams may grade, on an average, higher or lower than other judging teams. The competitor's final score will be calculated using the equation defined in the PRESENTATION SCORE section.

In an attempt to encourage commonality amongst static events, the 2017 Formula SAE Rules contain Section 3.1, the Business Logic Case. Presentation Event Judges are asked to use the Business Logic Case to judge whether the given presentation is appropriate for the market and business strategy that the team has identified. See Article 3, Sections S3.1 through S3.3 for a detailed description of the Business Logic Case.

PRESENTATION HIGHLIGHTS:

The three top-scoring teams will be required to publicly reprise their presentations. For 2017, the Presentation Highlights remain a non-scored event and will be held (tentatively) at 4:30 PM before the Awards Ceremony. The winners will be awarded immediately following the presentation highlights. The expansion of this event is an effort on behalf of the organizers to inspire creativity amongst competitors in subject matter that is typically not engineering curriculum-inclusive.

PRESENTATION SCORE = 75 * Pteam /Pmax

If a team misses their allocated period, the team will receive zero (0) Presentation points.

PRESENTATION TIPS:

- Spell-check all visual aids, presentation tools, etc.
- There is no dress code. However, bad first impressions are difficult to remedy.
- Remember that equipment has been known to fail. Copies can be ruined in transit, etc. Consider alternatives in case something should go wrong. Each team is responsible for bringing their team's own equipment. Remember, extension cords can be important and laptop speakers may not project sound very well.
- Have a team member record your presentation and the judges' commentary for your team's future FSAE efforts. Teams are allowed to have as many spectators that will reasonably fit into the presentation room. People not associated with the presenting team are allowed to view presentations only if the presenting school gives their permission before the start of the presentation. This includes news reporters and photographers.
- The most technically knowledgeable person on the team may not be the best person to lead the presentation team. A team may want to choose someone who is a charismatic public speaker.

IC SALES PRESENTATION SCHEDULE

*Presentation Event - 6 conf. rooms/suites, each appointment is 1/2 hour long

	a	b	c	d	e	f	g
	1	2	3	4	5	6	7
8:00 AM	Training	Training	Training	Training	Training	Training	Training
8:30 AM	Training	Training	Training	Training	Training	Training	Training
9:00 AM	025 - California Polytechnic State Univ-SLO	011 - Faculdade de Engenharia de Sorocaba	051 - Univ of Calif - Berkeley	056 - Oklahoma State Univ	052 - Georgia Southern Univ	043 - Syracuse Univ	060 - California State Univ - Long Beach
9:30 AM	016 - Arizona State Univ - Tempe	#N/A	045 - Portland State Univ	044 - Univ of North Dakota	080 - California State Univ - Chico	022 - Univ of Calif - Irvine	015 - California Baptist University
10:00 AM	055 - California State Univ - Sacramento	049 - Southern Methodist Univ	076 - Univ of Hawaii - Manoa	100 - Louisiana State Univ	010 - Wayne State Univ	069 - Univ of Calif - Los Angeles	058 - Univ of Southern California
10:30 AM	029 - Univ of Houston - Houston	047 - Univ of Louisville	005 - Iowa State Univ	#N/A	057 - North Carolina State Univ - Raleigh	067 - Univ of Delaware	#N/A
11:00 AM	033 - Concordia University	061 - California State Univ - Fullerton	027 - Virginia Commonwealth Univ	034 - Oregon Inst of Tech	020 - California State Univ - Los Angeles	070 - Univ of Arizona	078 - Univ of Calif - Riverside
11:30 AM	109 - Kettering Univ	071 - Universidad Panamericana	024 - Queen's Univ - Ontario Canada	086 - Univ of Engrg & Tech - Lahore	003 - California State Poly Univ - Pomona	097 - Oakland University	108 - Western Michigan Univ
12:00 PM 12:30 PM	**LUNCH BREAK**						
1:00 PM	054 - Univ of Calif - San Diego	040 - Univ of Calgary	042 - Kennesaw State University	014 - California State Univ - Northridge	046 - Univ of Texas - San Antonio	026 - Western Washington Univ	077 - Hindustan University
1:30 PM	105 - Univ of Missouri	096 - Univ of Kansas - Lawrence	007 - Rose Hulman Inst of Tech	104 - Kansas State Univ	031 - Univ of Alberta	021 - Univ of Saskatchewan	041 - Univ of Colorado - Denver
2:00 PM	110 - Western University	#N/A	037 - Univ of Wisconsin - Platteville	093 - Yeungnam College of Science & Tech	079 - Univ of North Carolina - Charlotte	#N/A	063 - IPN Esime Zacatenco
2:30 PM	023 - Texas A & M Univ - College Station	099 - San Jose State University	004 - Missouri University of Science and Tech	002 - Univ of Washington	073 - Clarkson University	019 - San Diego State Univ	082 - Honda Technical College Kansai
3:00 PM	101 - Georgia Institute of Technology	017 - Instituto Tecnologico de Chihuahua	072 - Chandigarh Engineering College	107 - Virginia Tech	095 - Univ of Illinois - Urbana Champaign	028 - Univ of New Mexico	062 - Univ of Oklahoma
3:30 PM	039 - Univ of Texas - Austin	#N/A	053 - Univ of North Texas	018 - Univ of Nebraska - Lincoln	065 - Univ of Texas - Arlington	035 - Colorado School of Mines	001 - Auburn Univ

EV SALES PRESENTATION SCHEDULE

*Electric Presentation Event - 3 conf. room/suites, each appointment is 1/2 hour long

	H (EV)	I (EV)	j (EV)
	1	2	3
8:30 AM	Training	Training	Training
9:00 AM	E238 - Olin College of Engineering	E207 - San Jose State University	E224 - Univ of Texas - Austin
9:30 AM	E229 - Univ of British Columbia	E220 - Virginia Tech	E222 - Georgia Institute of Technology
10:00 AM	#N/A	E202 - Univ of Pennsylvania	E226 - Université Laval
10:30 AM	#N/A	E217 - Univ of Kansas - Lawrence	E206 - Massachusetts Inst of Tech
11:00 AM	E212 - Colorado State University	E219 - Univ of Illinois - Urbana Champaign	E210 - Univ of Calif - Davis
11:30 AM	E237 - Univ of Washington	E233 - Univ of Michigan - Dearborn	E221 - Univ of Wisconsin - Madison
12:00 PM 12:30 PM	LUNCH BREAK		
1:00 PM	E227 - Univ of Waterloo	E208 - California Polytechnic State Univ-SLO	E213 - San Diego State Univ
1:30 PM	E231 - Univ of North Carolina - Asheville	E215 - California Institute of Technology	E225 - Univ of Utah
2:00 PM	E211 - Universidade Estadual de Campinas	#N/A	#N/A
2:30 PM	E204 - McGill Univ	E234 - Universidad Nacional Autónoma de México	E228 - Pakistan Navy Engineering College
3:00 PM	#N/A	E214 - Purdue Univ - W Lafayette	E205 - Missouri University of Science and Tech

FUEL STATION (IC ONLY)

FUEL CAPTAIN: Janice Hueske

LOCATION: Near Paddocks. See Map

The fuel station will provide unleaded racing gasoline (93 and 100 octane) or E85 (ethanol). No other fuel or additives are permitted.

All vehicles must indicate with a sticker, the type of fuel on or near the fill pipe. This sticker can be obtained at Tech Inspection.

NOTE: No vehicle will be provided with fuel until it has passed scrutineering. The first portion of a four-part sticker will be applied in a location near or on the nose cone of the vehicle.

Follow specific safety guidelines while in the fueling area:

1. Engines must be off; cars are to be pushed to and from fueling.

2. Only the vehicle push crew and the driver are allowed to enter the fueling station. All must have dynamic passes at each visit.

3. Only the driver, in the complete driving gear, with a full and completely functional fire extinguisher in hand, is permitted in the area as fuel is dispensed.

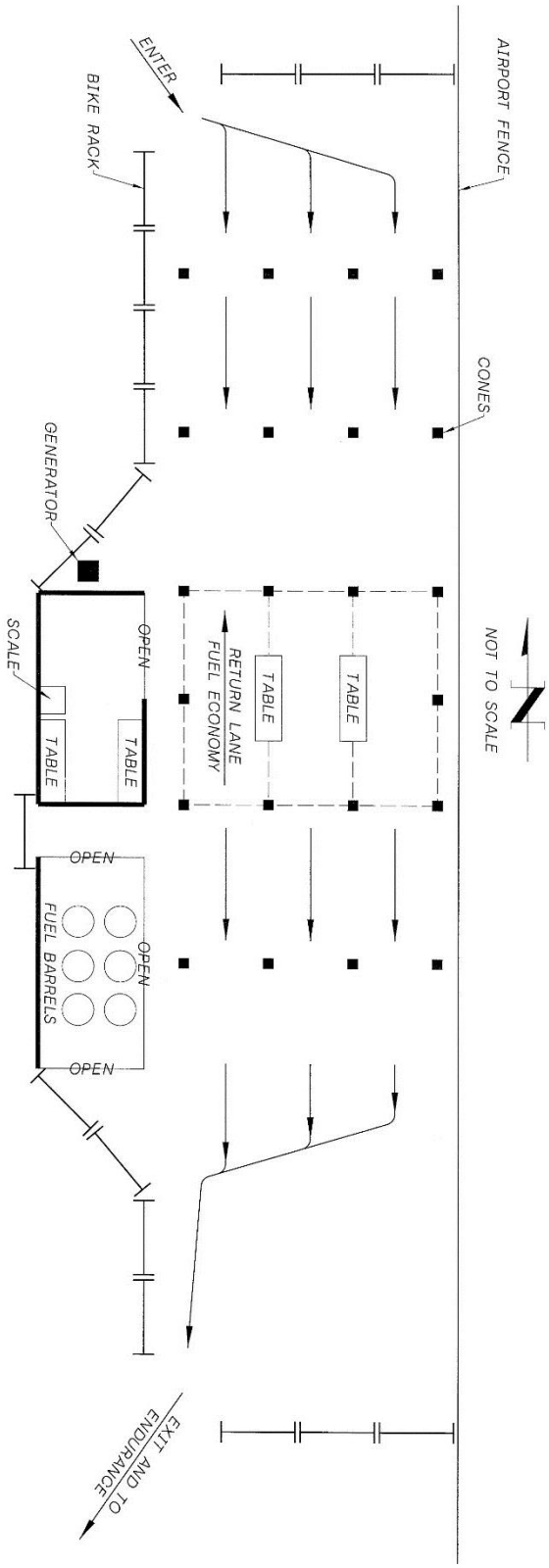
4. A Permanent line mark must be used to indicate the “full” level. NO TAPE

5. Tank is to be filled to this level each time fuel is received.

6. Fuel station must update the tech sheet before vehicle proceeds to tilt. Tilt will not accept vehicles with a tech sheet lacking fuel information.

The first time the vehicle receives fuel, the car must proceed (with engine off) to the tilt table.

FUEL STATION (IC ONLY) CONT.



CHARGING TENT/ACCUMULATOR WORKPLACE

LOCATION: Near Paddocks. See Map

The charging of tractive system accumulators is exclusively allowed in the charging tent.

No more than four team members of an individual EV team are allowed to be in the charging area at the same time; members must have dynamic passes. Only charging devices marked during E-Scrutineering may be used. Accumulators must be removed from the vehicle and on the accumulator hand cart when charging. A team member has to always stay with the accumulators during charging. The accumulator containers must have a label with the following data:

- Team name
- Safety responsible (SR)
- Approximate time at which the charging period ends (date and time).

The team member supervising the car while charging should have necessary knowledge to act accordingly if any problems occur.

Activities on accumulators are permitted exclusively at the charging tent. Only EV team members and FSAE officials have access to it. A volunteer is present at all times to monitor activity. No more than four team members of an individual EV team are allowed to be in the charging area at the same time. Work on the accumulators must always be supervised by a safety responsible.

Charging Power provided in the charging tent will be 125V, single phase, AC with the circuit breaker at 20A through common North American (NEMA) three write grounding receptacles. Teams should be aware that the continuous current of a circuit breaker installed in an application is dependent on multiple factors and typically the continuous current is ~80% of the rated current. Teams are responsible for providing any electrical cords needed to connect your charging equipment to main power receptacles. PLEASE NOTE: The charging tent is 40’ wide and 80’ long and all the receptacles are located in single power box. Exactly where that box will be located in relation to the side of the tent cannot be determined until tent is set up.

Each team will be assigned to a roughly 10’ x 15’ work/charging area. Each bay will be equipped with an 8’ long table and 2 chairs. Work/charging stations will not be permanently assigned; they are on a first serve, first come basis when team enters tent.

Equipment – Electrical teams are required (Rule EV 8.4) to have the following tools with them whenever their accumulators are being charged or are open:

- Insulated cable shears
- Insulated screw drivers
- Multi-meter with protected probe tips
- Insulated tools, if screwed connections are used in the tractive system
- Face shield
- HV insulating gloves which are within test date
- 2 HV insulating blankets of at least 1.0m2each
- Safety glasses with side shields for all team members that might work on the tractive system or accumulator

NOTE: Only mechanical work that does not involve the energized electrical system or accumulators may be performed in the team’s paddock. Under NO CIRCUMSTANCE may you open any electrical system or accumulator container in your paddock.

TECHNICAL INSPECTION

Cars have to pass a technical inspection process before being allowed to practice or take part in the dynamic events. Cars/teams will be given technical inspection stickers for each process they passed as outlined below:

IC Cars –	Part 1	Mechanical Scrutineering
	Part 2	Tilt Test
	Part 3	Noise Test
	Part 4	Brake Test

EV Cars –	Part 1	Electrical Scrutineering (Ready-to-Drive Noise Test will be completed here)
	Part 2	Mechanical Scrutineering
	Part 3	Tilt Test
	Part 4	Rain Test
	Part 5	Brake Test

ELECTRICAL SCRUTINEERING

CHIEF OF TECH: Danny Bocci

LOCATION: Danley Building

The car may only be moved around on the event site with all master switches and shutdown buttons in off-position and the HVD open. Therefore, the GLV-master switch, the TS-master switch, the right, the left and the cockpit shutdown button have to be turned off! Furthermore, the detachable handle or key of the tractive system master switch has to be removed and kept safe by a safety responsible.

Technical Inspectors will mark or seal various different approved parts (i.e. insulation monitoring device, accumulator containers, energy meter, etc.). The car can be disqualified from any dynamic event by using unmarked parts or substituting marked parts. Parts with broken seals are equivalent to being unmarked.

Broken seals can only be replaced by a technical inspector.

TO SCRUTINEERING YOU MUST BRING:

- Accumulator charger to be used during the event
- All accumulator containers to be used during the event
- Data sheets for all used parts in the tractive system
- Copy of the ESF
- Accumulator Container Hand Cart
- Tools and protection equipment as defined in the FSAE rules
- Print-out of rule questions (if needed)
- Additional tools/devices necessary to prove functionality of safety systems

NOTE: Four team members maximum in the inspection box

INSULATION MONITORING DEVICE TEST :

The insulation monitoring device will be tested during E-scrutineering. This is done by connecting a resistor between the TSMPs and electrically conductive vehicle parts while the tractive system is active. The size of the resistor is defined as 250 Ohm/V related to the maximum tractive system operation voltage. The test is passed if the insulation monitoring device shuts down the tractive system within 30 seconds when the resistor is connected .

The IMDT may be repeated at any time during the event. After the car passes the test for the first time, critical parts of the tractive system will be sealed. The vehicle is not allowed to take part in any dynamic event if any of the seals are broken until the IMDT is successfully passed again.

WHERE:
-Safety Gear & Rain Check: outside Danley Building
-Vehicle Check (EV): inside Danley Building – EV is located on right.
-Vehicle Check (ME): inside Danley Building on left.

MECHANICAL SCRUTINEERING

CHIEF OF TECH: Matt Petty

LOCATION: Danley Building

OVERALL PROCEDURE:

Technical Inspection will be broken down into three (3) parts:

- Checks of the all the drivers' safety gear and the "rain" tires.
- Vehicle Checks
- Starting Thursday, additional Driver Checks (helmet clearance, head restraint, seat belts and egress) for the remaining drivers. Only one member per team will be checked Wednesday

The checks for additional drivers will open on Thursday morning. If a driver is not at the track by Thursday, the team must contact the Chief of Tech to arrange for an appointment prior to their dynamic event.

WHERE:

- For the Safety Gear checks, outside Danley Building.
- For the Vehicle Checks, enter Danley Building.
- The checks of the additional drivers will be inside Danley Building. (Starting Thursday)

PROCEDURE:

You must have with you:

- The car
- The Inspection Sheet (Tech Form). Fill in the information in the top section.
- The push bar
- Copies of your Structural Equivalency Form, and if any, your Rules question e-mails
- A driver with his/her full set of safety gear.
- The car on your "dry" tires. Per Rule B.6.4.1, your dry tires are the ones on the car at Tech Inspection.
- The Impact Attenuator that you tested (Rule B.3.21.4) & permitted copy of report.

MECHANICAL SCRUTINEERING CONT.

PROCEDURE: ADDITIONAL DRIVER CHECKS

With you, you must have:

- The car
- The Inspection Sheet and Driver Sheet. Fill in the drivers' names.
- The push bar and fire extinguisher.
- Certain Driver's gear: helmet, arm restraints, gloves, long pants, long-sleeved shirt, and close-toed shoes must be worn for the egress, harness, and clearance checks. Driving suits, balaclavas, and race shoes are not required.

Note: Only four (4) team members will be allowed into the actual Tech Inspection area. All other team members, the Faculty Advisor and other spectators will be required to watch from outside the inspection area. The Dynamic Passes will be used as the "pass" into the inspection area. Team members may rotate in and out of the inspection area as required as long as there are no more than four in the inspection area at any one time.

Only when you have all parts of the Tech sticker will you be allowed to compete in the dynamic events or run on the practice track.

If you have items that need to be rectified, the Tech form will be returned to you (the team), you will not get your sticker, and you will have to present your car at Tech again.

TAKE-A-NUMBER INSTRUCTIONS

So that you do not have to stand or sit out in the rain or the hot sun while waiting to get into Technical Inspection, we will again be using the “Take-a-Number” system.

When your car is ready for Technical Inspection:

Come to the area of Tech Inspection marked “Safety Gear Checks”.

BRING:

- Bring all items listed under the "DRIVER'S EQUIPMENT" section of Page 1 of the Tech Form
- Your “rain” tires.
- You do not bring your car at this time.

PROCEDURE:

- Once your safety gear and “rain” tires are approved, you will be given the next available numbered tag.
- When finished with safety gear checks, you may return to your paddock with your tag and relax.
- When your number is next, bring your car to the entrance of Technical Inspection.
- Note: It is a team’s responsibility to keep track of how quickly cars are going into Tech Inspection. So have someone keep an occasional eye on how the numbers are progressing on our mobile scoring website (http://mobile.fsaeonline.net)
- If you (a team) expect to have a time conflict with a Static Event (Design, Cost or Presentation), please be aware that the Static Event has priority. If your vehicle is currently undergoing Technical Inspection, but you need to leave to attend a Static Event, simply inform your Inspector. You will be allowed to remove your vehicle from the Technical Inspection area, and can resume Technical Inspection later.

TILT TABLE

EVENT CAPTAIN: Gary Young

LOCATION: Dynamic Area. See Map

Tilt testing checks if the vehicle complies with the liquid spillage and rollover stability rules. No vehicle is permitted at this station until it has passed mechanical Scrutineering. The stickers that must be applied to the car will serve as proof of this. At this point we want to remind the teams to bring the car in 'ready to race' condition. That means that all the liquids of the car should be filled properly, all components of the car are mounted.

The vehicle will be placed upon the table with the tallest driver aboard fully suited and all safety restraints secured. The vehicle should be oriented on the tilt table in the direction that is most likely to create spillage. The table will then be tilted to an angle of 45 degrees. There must be no fluid leakage at this angle. If the vehicle passes this test, the angle is increased to 60 degrees. This angle is used to represent a cornering force of 1.5 Gs. If the upper wheels remain on the table the vehicle passes. (Some vehicles may lift one wheel. The event captain should be consulted if this occurs). The person in charge at the tilt table must sign an inspection form, which travels with the car. A sticker is applied (on the car), to indicate it passed the tilt table test.

EV vehicles are now free to proceed to the rain test. IC vehicles are now free to proceed to Brake and Noise areas. Should the vehicle (IC and EV) fail at either of the two angles, the car must be repaired and re-tested. Vehicles may be asked to return to this station for re-certification at the discretion of the officials.

SAFETY GUIDELINES

- Four team members maximum (incl. the tallest registered driver) in the tilt table area
- All engines and master switches off, push car on and off table. Care must be taken to avoid damage to the vehicle when pushed on and off the tilt table.
- Inside wheels are to be placed against the guard of the tilt table.
- Attach a strap to rollover hoop and side of table which is to be elevated. Allow a little slack. (Team members may be asked to hold the car, if a strap is not available).
- Be sure table is clear before raising and especially when lowering. Inform people in area when raising or lowering (e.g. "Coming Down"/"Going Up").
- Use absorbent material to soak up leaks (may be obtained at fuel station). Keep a fire extinguisher at hand.

RAIN TEST (EV ONLY)

EVENT CAPTAIN: Danny Bocci

LOCATION: Immediately east of the fire station near pad drains. See Map

Teams have to pass a special rain test during technical inspection. The car has to pass E-scrutineering, Scrutineering, and Tilt Table before the rain test can be conducted.

During the rain test, the tractive system has to be active and none of the drive wheels may be in contact with the ground. It is not allowed to have a driver seated in the car during the rain test.

Cars will be exposed to 2 minutes of water spray then monitored for 2 minutes before test is complete. Once passed, teams/car will receive approved tech sticker.

NOISE TEST (IC ONLY)

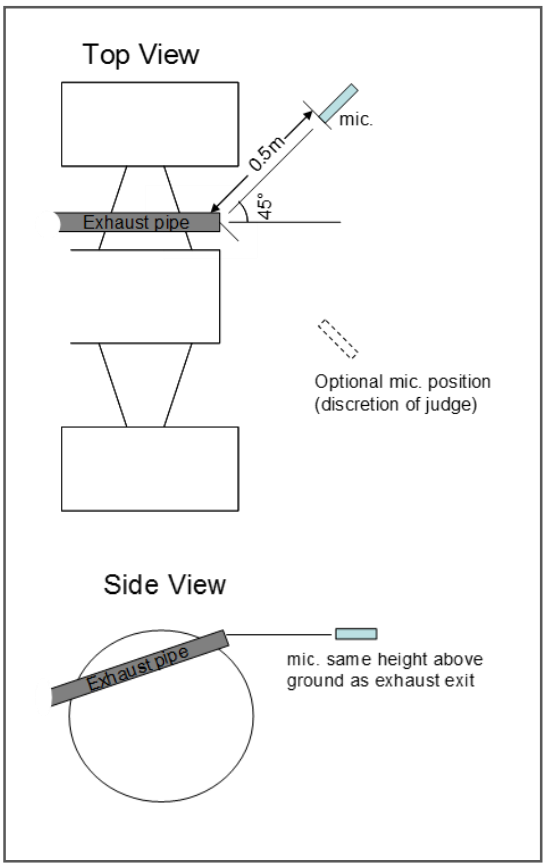
EVENT CAPTAINS: Chad Walber

LOCATION: Dynamic Area. See Map.

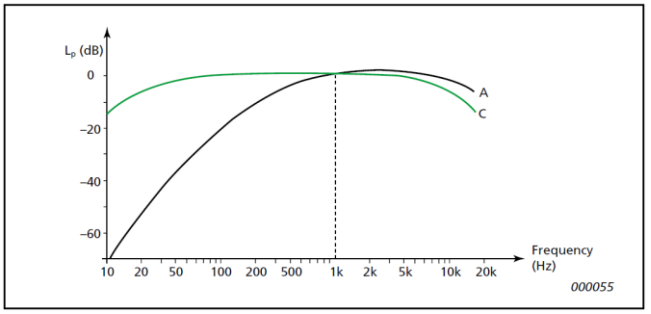
DESCRIPTION: No vehicle is permitted to Noise or Brake testing until it has: a) passed Tech Inspection and, b) passed the Tilt Table Test. Proof of this is the two "tech" stickers, which must be applied to the car. Then teams can proceed to Noise where the noise level will be tested, if passed, a 3rd sticker will be applied to indicate Noise Compliancy. Then teams can proceed to the Brake test for the 4th and final tech sticker. Once all 4 stickers are completed then a vehicle is approved to compete in all dynamic events.

Noise Test Event Description

The static sound level test shall occur at a designated test station on a warmed-up vehicle. The vehicle will be placed in the station with the engine running and the transmission in neutral. The sound level meter will be positioned 0.5m from, and level with, each exhaust outlet. The microphone will be positioned at an angle of 45 degrees from the outlet in the horizontal plane (see drawings) and be un-obstructed. There are two steps to the noise test. 1) With the engine idling, the measurement must not exceed 100 dBC. If the team passes this test, the run up test will be run. If a team fails idle they must exit the area. 2) With the engine at the designated test speed, the measurement must not exceed 110 dBC. The designated test speed is approximately ¾ of the maximum engine speed as calculated by the SAE published formula. In the case of dual exhausts, both exhausts will be tested with the loudest one being the basis for judgment. Meters are calibrated and will be checked and verified on-site on a regular basis! The reading of the meter by the official is final and not open for debate/protest.



PLEASE NOTE – If your vehicle does not have a working tachometer, it is the teams' responsibility to come to the noise area prepared with ALL necessary tools ready for a tachometer reading (laptops, gauges, etc…). The target test speed is set by SAE and is published in advance.
Test speeds will be rounded to the nearest 500.
It is calculated by taking 2X stoke in mm and dividing it into 914.4X1000. If you have a rev-limiter that interferes with you being able to reach the target test speed you must disengage it or set it higher.



ALL TEAMS MUST HIT THE TARGET TEST SPEED – NO EXCEPTIONS!

BRAKE TESTING (IC ONLY)

EVENT CAPTAINS:: Ali Zangeneh

LOCATION: Dynamic Area. See Map

When the vehicle passes noise, it may go to the Brake Event. There, the tech sticker will be awarded if the vehicle meets the brake requirements. Provided no changes have been made to the muffler or exhaust system, teams that pass noise but do not pass brake do not have to go through noise again if they work on the vehicle.

At the Brake Test Area, each driver WILL be instructed on the proper procedure. With the car at the start line of the station, a green flag (or similar signal) should be used to signal the start of each run. The driver must accelerate (typically getting into 2nd gear) until reaching the braking area, which is a box defined by water barriers. Once inside this box, the driver must apply the brakes with enough force to demonstrate full lock-up of all four wheels, the engine must remain running during the complete test.

If the vehicle passes, the person in charge will sign-off the approval form and provide the team with the final "tech" sticker. The vehicle is now free to proceed to the practice track or on to the dynamic events. (The approval forms shall be retained by the brake crew and turned in at the tech tent periodically.

If the vehicle is unable to pass the brake tests in three attempts, the car must be repaired and then brought back for retest. The vehicle will not be allowed to compete without passing all tests. Note: The vehicle will not be permitted on the practice track without an entire tech sticker; no exceptions.

Also, Operation of Brake Testing Event Area in DAMP conditions is at the discretion of the Captain of the specific area. See FSAE rules for tire use at specific conditions, Rule #B6.4.1. Also see Part D "Dynamic Event Regulations" Article 2 Weather Conditions and Article 3 Running in Rain for further clarifications.

Re-certification may be required if work is performed on the vehicle's braking system or exhaust system, or if the vehicle is involved in an incident that results in vehicle damage.

**At all times, drivers must be wearing complete and proper safety equipment and proper safety rules must be maintained.

BRAKE TESTING (EV ONLY)

LOCATION: Dynamic Area. See Map

Brake Testing checks that the vehicle can be brought to a controlled stop. No vehicle is permitted at this station until it has passed E-scrutineering, mechanical scrutineering, tilt table testing and rain testing. Proofs of this are the respective stickers which must be applied to the car.

Each driver must be instructed as to the proper procedure for the brake test. With the car at the start line of the station a green flag (or similar signal) should be used to signal the start of each run. The driver must accelerate on a short straight until reaching the braking area, which is a box defined by pylons. Before entering in this box, the tractive system has to be switched off by the driver and the brake pedal must be actuated as far as possible. The brake test is successful if all four wheels lock.

Note: It may take up to 5secs until the Tractive System Active Light goes off after shutting down the tractive system.

If the vehicle is unable to pass the test in three attempts, the car must be repaired and then brought back for retesting. The vehicle will not be allowed to compete without passing this test. Re-certification may be required if work is performed on the vehicle's brake system or if the vehicle is involved in an incident which results in vehicle damage.

ENERGY METER INSTALLATION

The energy meter will be installed during E-scrutineering. The energy meters will be available at E-scrutineering. They will also help with installation, if needed, and answer any questions.

The proper function of the energy meter will be evaluated by the energy meter responsibles after the team has passed E-scrutineering.

The energy meter responsible will read out data from time to time to determine, if the 80kW limit was obeyed during the dynamic events.

After the data is read out, the energy meter has to be removed from the car and returned to the E-Scrutineering area.

We encourage all teams to record own efficiency data for the unlikely event of an energy meter failure during the endurance event. Any attempt to manipulate the intended function of the energy meter may lead to a disqualification from the entire event. If you have any questions with respect to the energy meter, please ask for the energy meter responsible at registration.

PRACTICE TRACK & PAD

EVENT CAPTAIN: Jim McNeil
LOCATION: Dynamic Area. See Map

DESCRIPTION: The practice area will consist of two locations; Practice Pad and Practice Track. The practice pad is a relatively large (80' x 130' with cone barriers) open test area designated by the event organizers to provide teams with an opportunity to conduct brief dynamic tests of their vehicle during the available hours of the competition. The Practice Track is a relatively large (200 – 250 m) course providing teams ability to practice handling skills with actual course obstacles. No vehicle will be permitted to enter the Practice Track unless it has a) passed Tech Inspection (EV and ME), b) passed the Tilt Table Test and c) passed the Brake & Noise Inspection Test and for EV cars d) Rain Test. The vehicle will not be permitted on the Practice Track without the fourth or fifth tech sticker; no exceptions.

Each driver must understand and follow proper driving procedures at this facility. In addition, it must be understood that the Practice Track volunteers and SCCA officials are in control of the facility and adherence to their direction is mandatory.

Only one car at a time will be allowed at the Practice Track. At all times, drivers must be wearing complete and proper safety equipment and proper safety rules must be maintained. Once signaled to begin testing, the driver is free to perform any test maneuvers he or she feels necessary to evaluate the vehicle (within the limits of the track perimeter, please.) One SCCA volunteer will be the "official" at the track and coordinate the beginning and end of each team's approximate 5-minute time limit. The official will use green and red flags or some other method of alerting the driver to the beginning and end points.

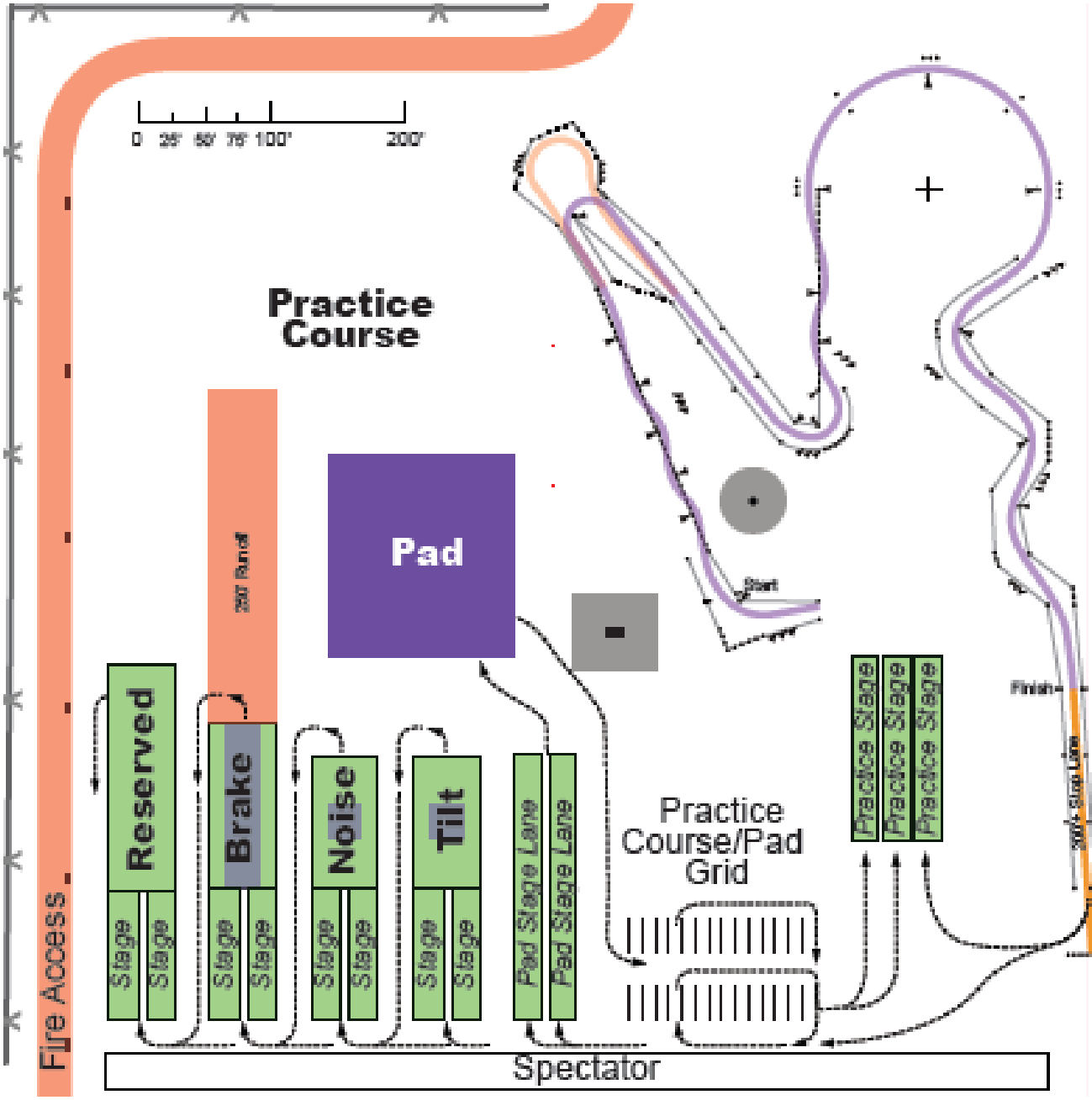
If during the course of dynamic testing the vehicle sustains some type of damage or significant mechanical breakdown, the vehicle will be required to exit the track and make the necessary repairs. The Tech Inspection sticker may be removed from the vehicle by a Practice Area Official thus requiring an additional Tech Inspection prior to participating in additional dynamic tests or events.

PLEASE NOTE – Operation of the Practice Event Area in DAMP conditions is at the discretion of the Captain of the specific area. See FSAE rules for tire use at specific conditions, Rule #B6.4.1 Also see Part D "Dynamic Event Regulations" Article 2 Weather Conditions and Article 3 Running in Rain for further clarifications.

Safety guidelines for the Practice Tracks:

- Only one car at a time in the Practice Track area. The next car will not be permitted to enter the area until the last one has completed its exit.
- Three (3) volunteers (preferably four (4)) will be on hand to manage the operation of the Practice Track.
- Never place yourself in the line of travel of any car. Stay well away from the "hot" areas, always at a safe distance behind the barriers.
- Have fire extinguishers handy.
- Use brooms and oil-dry as needed to keep the Practice Track clean and dry.
- Any vehicle damage or contact must be reported to the area (station) manager(s). Additionally, remove the 1st tech sticker and report car number to tech tent so car can be re-evaluated after repair.
- Do not permit spectators to sit or lean on the barriers surrounding the practice tracks.

PRACTICE COURSE MAP



DYNAMIC EVENT GENERAL INFO

TEAM/DRIVER MEETINGS - MANDATORY: Attending drivers meetings is mandatory if you are planning to drive. All team captains and drivers must attend. The briefings will contain general event information and detailed information about the dynamic events. Check the schedule.

DYNAMIC EVENTS AREA– The dynamic events area will be indicated by lines on the pad and signs on the lines. Although fences defining the dynamic area will exist in some areas – the dynamic event rules remain in effect for any of those that are without fences. Specifically – Each team will be issued four (4) dynamic passes which must be displayed by the team members in the dynamic area.

Team members without dynamic area passes are classified as spectators and must remain in the spectator areas.

DYNAMIC/TECH AREA PASSES- Each team is issued 4 dynamic area passes. FSAE Electric Teams will be given an additional pass for the Electrical Safety Officer. You must have a pass to gain access to the dynamic events area. This pass is also used for tech inspection as we limit the number of team members with the car in tech to 4. FSAE Electric teams will have 5 in Tech with their ESO. Passes will also be required for EV team members entering the Charging Tent.

WEATHER– This is one of the factors which cannot be influenced by the event organization. So please be aware that the timetable will not change due to rain. Under normal conditions, the track is declared dry. If it is necessary to declare damp or wet conditions, there will be signs and announcements made at the dynamic event area. Please read the rules for more information.

CAR SET-UP ALTERATIONS(FSAE Rules T1.2.2) – Teams do not have to use the same car set-up for all the dynamic events and are encouraged to make adjustments (i.e., tire pressure or suspension settings) to give the vehicle characteristics best suited to each specific event. However, the car must comply with the rules (i.e., ground clearance, etc.). Teams that remove their car from the event site automatically lose their stickers from technical inspection (E-Scrutineering or Mechanical Scrutineering).

ACCELERATION

EVENT CAPTAIN: Tim Gornik

LOCATION: Dynamic Course Area. See Map.

EVENT CONCEPT:

The objective of the Acceleration Event is to evaluate the vehicle's demonstrated acceleration capability by measuring the elapsed time required for the vehicle to travel a distance of 75 m (246 ft.) from a standing start. The event is designed to focus on engine performance and on the suspension's ability to maximize tire grip.

EVENT FORMAT:

Up to four Acceleration Runs are permitted for each car. Two drivers are allowed per car. Each driver is permitted two Acceleration Runs. Elapsed Time will be recorded for each Acceleration Run. Any penalties will be assessed to the Acceleration Run during which the penalty occurred. The fastest corrected elapsed time (including penalties) of the completed Acceleration Runs will be used to calculate the score for each car.

- NO Acceleration Runs will be permitted after 12:30 P.M.
- NO tools and/or spare parts are permitted in the staging lanes.
- NO "traction enhancing" agents are permitted to be used on the tires or track surface.
- NO "burnouts" are permitted.

EVENT PROCEDURE:

Stage your car in the appropriate Staging Line for either Driver 1 or Driver 2. Cars in the Driver 1 Staging Line will be given priority. Drivers must be properly belted into the car with all required safety equipment properly installed, as directed by the Event Workers, before the car is first in line to start an Acceleration Run. An Event Worker will direct the driver to approach the Start Line. Cars will be staged approximately 0.3m (1 ft.) behind the Start Line.

The driver is permitted to start an Acceleration Run only when the Event Worker waves the green flag. Timing will start when any part of the vehicle crosses the Start Line. The Acceleration Run is counted (one of the permitted Acceleration Runs) when any portion of the car crosses the Start Line.

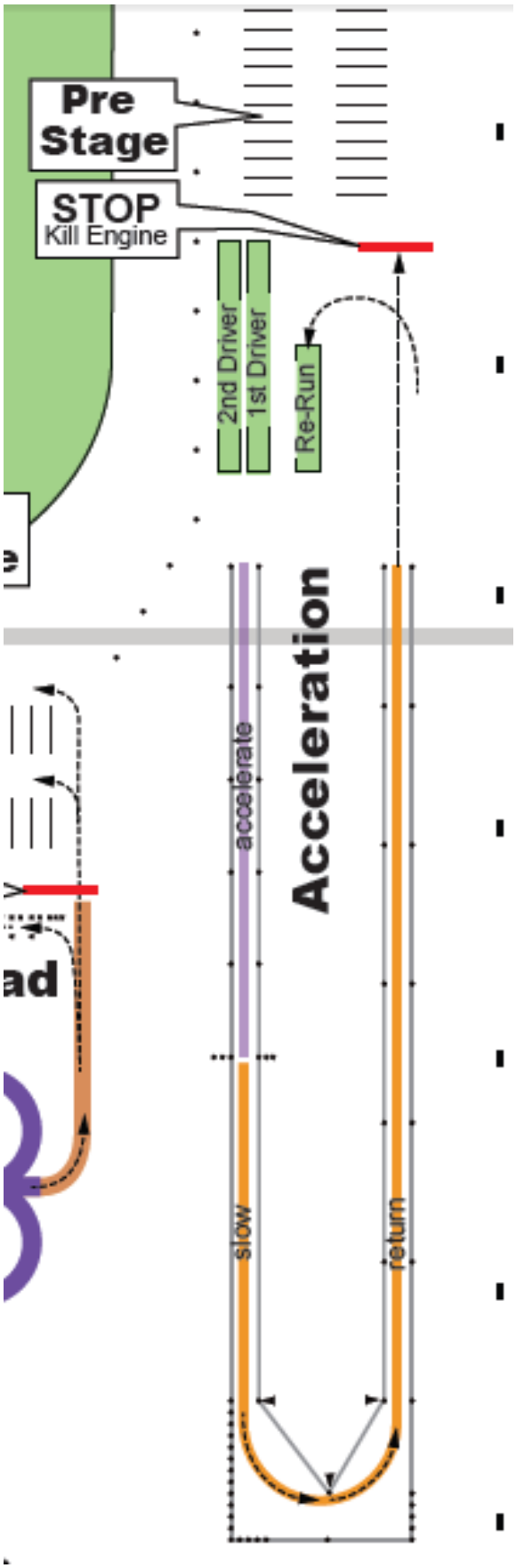
Timing will end when the vehicle crosses the Finish Line located 75 m (246 ft.) from the Start Line. The Finish Line is marked with a Checkered Flag.

After a driver's first run, the driver will have the option to immediately take a second run, or leave the staging area to complete his/her second run later during the event. Each car must exit the staging area before changing drivers.

PENALTIES:

- A two second penalty will be assessed to the Acceleration Run per cone knocked down or out of position.
- A DNF (Did Not Finish) penalty will be assessed to the Acceleration Run for cars that go off course.
- A DNF penalty (forfeit of a permitted Acceleration run) may be assessed to the team for infractions committed in the staging area, start line or return lane.

ACCELERATION COURSE MAP



SKID PAD

EVENT CAPTAINS: Joe Losito

LOCATION: Dynamic Course Area. See Map.

EVENT CONCEPT:

The goal of the Skid Pad event is to measure the vehicle's maximum cornering capability by measuring the total time required for the vehicle to complete one left hand and one right hand circle. The event is designed to focus on the vehicles suspension design characteristics and tune-ability for maximum lateral grip, and minimize the effect of driver reflexes during transitional maneuvers.

EVENT FORMAT:

Two drivers are allowed per car; two runs per driver. Each run consists of a driver completing two (2) right-hand laps immediately followed by two (2) left-hand laps of the course. Lap times will be recorded for the second lap of each the right-hand and the left-hand circle (the first lap of each is not timed).

SCORING:

Lap times will be recorded for the 2nd lap of each circle for a given run on the Skid Pad. These times will be averaged together and added to any penalties and used to calculate lateral acceleration for each run. The fastest average time (including penalties) from either driver during any of the 4 runs will be used to calculate a score for that vehicle.

STAGING:

Cars line up in the staging area. The first 3 cars in line are permitted to run their engines provided the driver is wearing a helmet and securely fastened. A person holding a Green Flag will motion a car to approach the starting line, which is located approximately 20 m (65.62 feet) from the timing line used for scoring. When the starter waves the green flag, the driver will approach the Skid Pad and proceed onto the RIGHT-HAND circle. After completing 2 laps, the driver must continue onto the LEFT-HAND circle and complete 2 more laps. After completing the second Left-hand lap (the fourth lap in total) the driver will exit the Skid Pad. After a drivers first run, they have the option of immediately taking a second run, or leaving the staging area and running later in the day. In order to keep the event running in a timely manner, other teams can run Skid Pad in between a team's first and immediately second run. Each car must exit the staging area before changing drivers.

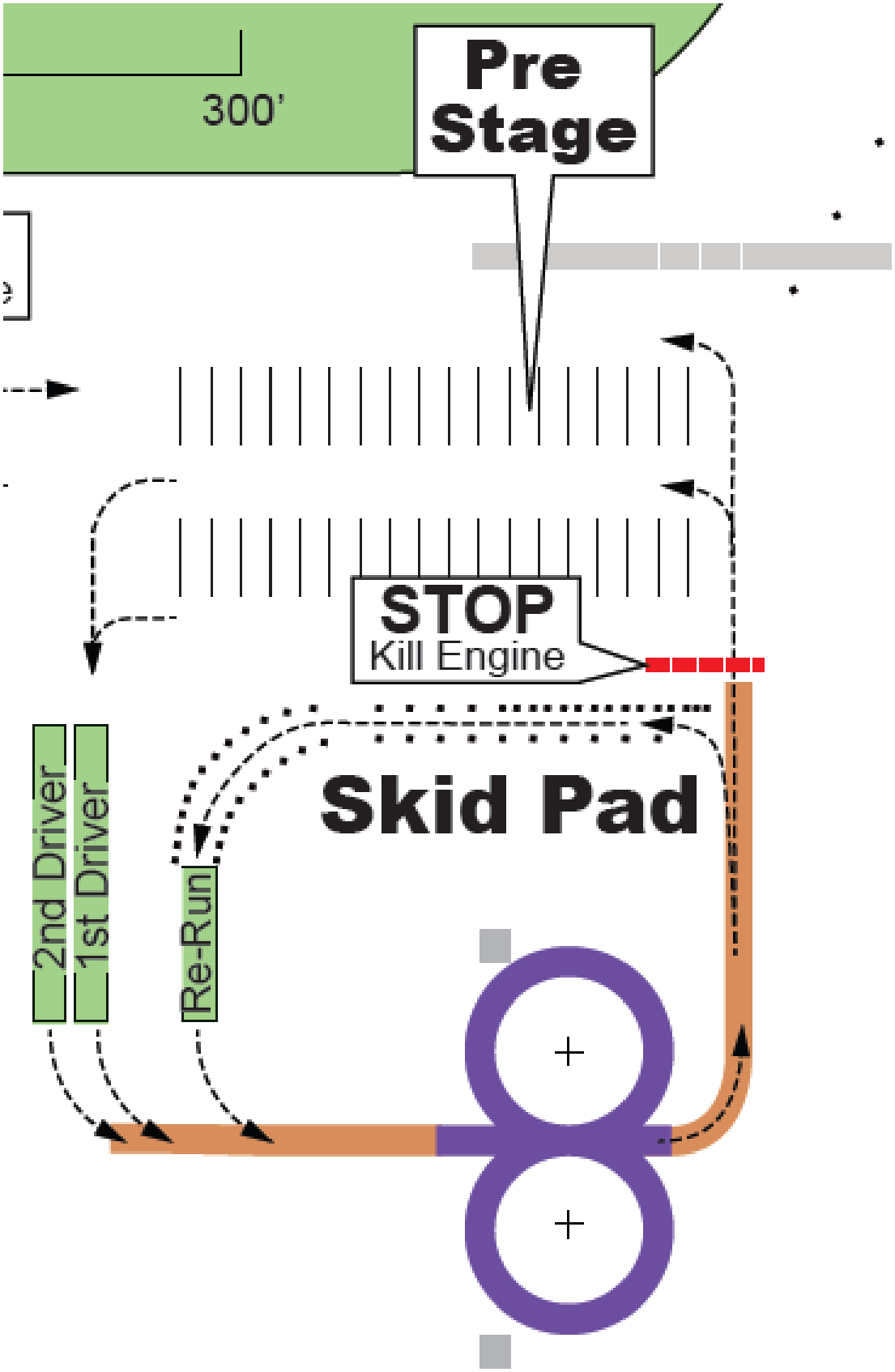
All cars must complete all Skid Pad runs by 12:30 p.m.

PENALTIES:

- 0.25-second penalty per cone knocked down or out of position.
- DNF penalty for cars that go off course.
- DNF for cars that run an incorrect number of laps.

No toolboxes and/or spare parts will be allowed in the queue area or staging lanes unless deemed necessary for starting the vehicle's engine.

SKID PAD COURSE MAP



AUTOCROSS

EVENT CAPTAINS: Jacob Homer

LOCATION: Dynamic Course Area. See Map.

THE EVENT:

The Autocross event is designed to test the car's handling qualities without the hindrance of competing cars. The event has two heats. Each heat has a different driver. A heat is composed of one driver making two runs of the course. The fastest of the runs completed, including penalties, will be used to calculate the team score. Cars that are unable to complete the course with a time within 145% of the fastest car will only be awarded 7.5 points. Track length: Approximately 800m (2600 ft.)

PENALTIES:

- A 2-second penalty for each cone knocked down or out of position (indicated by a chalk square at the base of the cone).
- A 20-second penalty for going off course and not re-entering at a point prior to the missed gate. Missing one or more gates of a given slalom counts as a single off-course penalty.
- All cones in the dynamic area can be scored as penalties. This includes cones before the start line and after the finish line.

STAGING:

Following the announcement of the start of the event, all cars should begin staging in the first heat line on a first come first served basis. Upon completion of the first heat driver's two runs, a car may either go to the second heat line or back to the paddock for repair and/ or adjustments.

- When there are no cars in the first heat line, cars in the second heat line will be allowed to run. Cars that have not run a first heat have precedence over second heat cars. The event may be cancelled or cut short due to weather or time, so it is important to be on time for the first heat. It is encouraged for teams to join the second heat line immediately after completing the first heat.
- At 5:00 PM the Autocross Event is scheduled to close, and no additional runs may be made after the closing. Cars in line will not be allowed to run the course after 5:00. If there are delays in starting the event, rain delays, or extended track closures, the event captain has the discretion to extend the closing time if conditions permit. Please see the event captain or listen for announcements for any extensions.

A safety inspection (helmet, belts, kill switch) will be performed before entering the final staging area; each car will be staged 6.0 m (19.7 feet) behind the start timing lights and will accelerate from a standing start.

After a driver's first run, the driver has the option of taking the second run immediately, or leaving the staging area and running later in the heat. A shortcut-turn, immediately following the finish line, will allow the driver to proceed directly to the start for a second run. This is called the re-run line. If a driver chooses to not take a re-run, he/she should proceed through the exit.

AUTOCROSS CONT.

It is intended that the race be conducted without the hindrance of competing cars. If there is a stopped or slow vehicle ahead, the driver should proceed at a safe distance (3m) around the incident and/or follow the direction of the course workers, and then reenter the track to finish the run. Once past the finish line, the shortcut should be taken to go directly to the start line. At this time, the driver will be notified if another run will be allowed. If a slow or stopped vehicle ahead is judged by the track officials to not be a hindrance, a re-run will not be allowed.

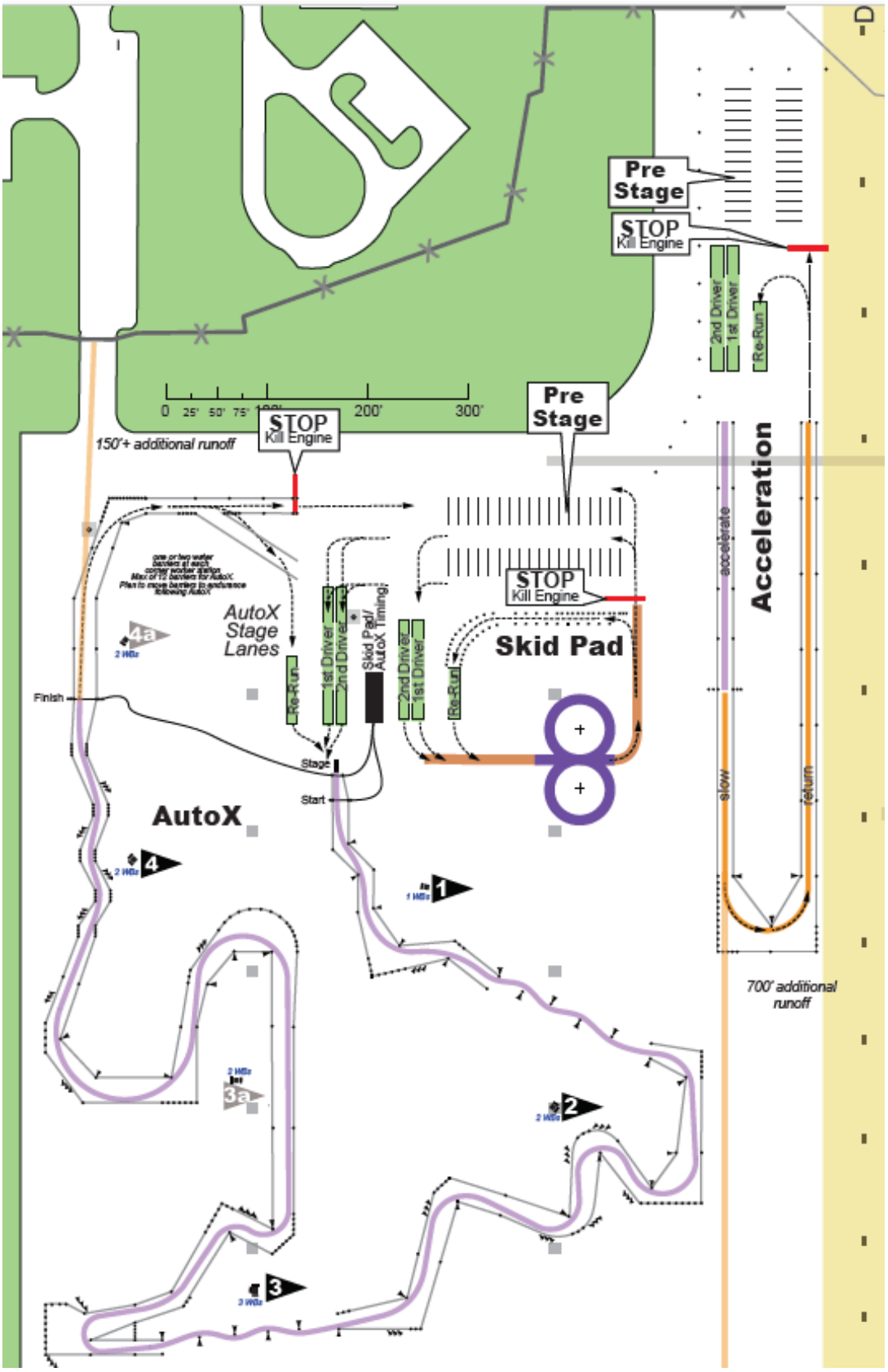
A driver's run may be stopped by a track official (indicated by a waving red flag or hand gesture), your car may be directed to complete the track or directed to follow a straight route back to the starting line (with caution). This is common when a red flag is shown in the first half of the course. Caution – course workers may also signal your car due to a malfunction (broken suspension, muffler, leaking oil, etc.). If this occurs, the car should be driven off course and brought to a controlled stop as soon as possible. Avoid stopping directly on the course. This prevents potential incidents with following cars and limits the amount of oil/water spilled on to the racing surface, preventing long delays.

If a car fails during a driver's first run, vehicle repairs can be made to the car, and the driver can return to complete the second run.

NOTES:

- Once the car passes the start timing line, the run has been officially attempted and cannot be re-started. If the car stalls before triggering the timing lights, it can be pushed back for a re-start. This is only allowed once. If the car demonstrates difficultly in launching it will need to be pulled away and repaired.
- Please be aware that several cars may be running the course at the same time. Once past the finish line, slow the vehicle and exit in a controlled manner. Do not park the car at the exit of the course; this can create an unsafe situation and will cause traffic to back up.
- Drivers will be allowed to walk the course starting Thursday afternoon.

AUTOCROSS COURSE MAP



ENDURANCE & FUEL EFFICIENCY

EVENT CAPTAINS: Lawrence Raitinger

LOCATION: Dynamic Course Area. See Map.

PURPOSE:

The goals of the endurance and fuel efficiency events are to test the durability and fuel efficiency of the vehicles. The dual nature of the event can lead to compromises in designing for its 22 km. Note: No repairs or work may be performed on the vehicle during the event (with the exception of tire changes due to weather conditions and to accommodate the second driver).

DESCRIPTION:

The event is approximately 22 km, with two drivers completing 11 km segments each. A completely filled fuel tank is required to be eligible to run this event. No refueling is allowed during the event. Each team is given three minutes to complete the driver change.

The run order for the event will be based primarily on the Autocross event. The run order will be slowest to fastest autocross times. If a team did NOT score in the Autocross event, the vehicle will run at the beginning of the Endurance event, with the order based first on the finishing order of the Acceleration event, and then on the finishing order of the Skid Pad event. Teams without a score in any event used to determine the run order will run in the order established by the event captains. Teams must run within the 20 cars after them in the run order. For example, the team with run order position 10 must run before the team with run order position 30. The out of order penalty will be applied to teams that are not able to run in their designated run order position. The last 20 teams scheduled must run before the last car is called. All teams will be provided a minimum 15-minute window. If the last scheduled team of the heat is not able to run when called, they will receive the "out of order" penalty and will be given 15 minutes to enter the track before they are disqualified.

The event captains reserve the right to adjust the run order as necessary during the event to maintain safe operations and the flow of the event.

If the weather conditions of the prior dynamic events have been variable, a team's Skid Pad or Acceleration result may be used as a substitute or supplement to the team's finish order in the Autocross event.

ENDURANCE PROCEDURES:

In order to compete in the Endurance event, teams must have their four-part tech sticker by 5:00 PM on Friday. Teams who have not successfully passed all parts of tech by 5:00 PM Friday will not be eligible to participate in Endurance on Saturday. Teams who have a sticker pulled have the opportunity to re-visit technical inspection on Saturday to regain the sticker; however, cars are only eligible to run Endurance at their scheduled slot (within 20 cars, or 15 minutes) in the run order.

The team must have their fully fueled (see Fuel Efficiency Procedures below) vehicle in the staging/prep area at the appointed time. Only two crewmembers and the two drivers assigned to the endurance event are allowed in the staging area for the vehicles. When the car is called to the staging line (consisting of the next three cars to go on track), the team must push the "race ready" car with driver completely belted in to the staging line. Once the car is pushed to the staging line it cannot be touched by any team member except the driver in the car. The only tools allowed in the possession of the team members at the staging line are those needed for driver seating adjustment during driver change. No laptops, pressure gauges, baffles, tire wraps, etc. will be allowed at the staging line. Nothing can be brought to the starting line that is not intended to stay on the car.

ENDURANCE & FUEL EFFICIENCY CONT.

When there is a space for the vehicle on the course and the timing/scoring system is set, the first driver will be motioned to the starting line. The person staging the vehicles is not obligated to give teams any advance notice prior to entering the track. An official will perform a safety check of the vehicle and the driver restraint system. The starter will stage the vehicle's front tires at the beginning of the entrance to the track. When there is an opening on the track, the course marshal (starter) will wave the green flag, signaling the go-ahead for the driver to start. If the vehicle stalls, the driver must wait for another green flag before being allowed on the course.

Note: If the vehicle cannot be restarted, the team members must move the car away from the staging area. The team will then have until 20 cars have attempted to start or 15 the minutes following in the run order to attempt to start endurance again (an out of order penalty will be incurred). If a team running out of order has a vehicle that stalls and cannot be restarted at the entrance to the track, the car will be deemed disabled and will be disqualified from the event.

On the last lap of the first driver, a checkered flag will be displayed directing the vehicle to exit to the driver change area. It is the Driver's responsibility to correctly exit the track; any person directing the car off the course is an additional aid only. Only three team members (including drivers) are allowed in the driver change area at once. After the vehicle arrives in the driver change area, the team has three minutes to get the second driver belted in, and driving out of the driver change area. Only adjustments to fit the second driver (or weather related tire changes) may be performed on the vehicle. No other work is allowed.

When the second driver is ready, the vehicle should be slowly driven to the starting line queue. An official will perform a safety check of the vehicle and the driver restraint system. The course marshal will stage the vehicle's front tires at the beginning of the entrance to the track. When there is an opening on the track the course marshal will wave a green flag signaling the go-ahead for the driver to start. If the vehicle stalls, the driver must wait for another green flag before being allowed on the course. Note: If the vehicle cannot be restarted without external assistance, the car will be deemed disabled and will be disqualified from the event.

Upon completing the last lap with the second driver, the checkered flag will be displayed and the vehicle will exit the course and will be directed to the fueling station. It is the Driver's responsibility to exit the track, any person directing the car off the course is an additional aid only. The vehicle is to be pushed to the fueling station where the fuel efficiency will be calculated.

If either first or second driver is shown a red flag during their driving session, they must come to a controlled stop within viewing distance of the nearest flagging station and turn off their vehicle. (If they see the red flag just before the driver change exit, they may coast into the driver change area and turn off their vehicle.) All cars on track during a red flag event will be towed to the driver change area where they will wait, with driver belted in vehicle, until the track is clear. The lap in which the red flag was shown will not count in time or fuel economy calculations. When the track is clear, the drivers will be told to start their vehicle and will be released on track to finish their laps. Teams involved with a red flagged track will not be able to add any fuel to their vehicle.

WEATHER CONDITIONS:

- Teams must fit rain tires to their vehicle if the course is declared Wet.
- Teams have the option of dry or rain tires if the course is declared Damp.
- Teams may change tires at any time while their car is in the staging area inside the "hot" area.
- All tire changes after a car has received the green flag to start the event will take place in the driver change area.
- Teams may not perform any work on the vehicle other than the tire change in the driver change area.

ENDURANCE & FUEL EFFICIENCY CONT.

WEATHER CONDITIONS CONT.

- Teams are allowed 10 minutes to change their tires in the driver change area if a Dry track is declared Damp, or if a Dry or Damp track is declared Wet. If the tire change is happening at the same time as a scheduled driver change, the 10 minutes are in addition to the 3 minutes allowed for the driver change.
- Teams are allowed to change their rain tires to dry tires if the course is Dry or Damp. However, this change is not permitted during the driver change, and the time taken to change the tires is included in the team's total time for the event.

The following chart summarizes the possible track condition changes, the team's options, and the time allotted for changes:

TRACK CONDITION	TEAM'S CURRENT TIRE CHOICE	TRACK DECLARED	TIRE CHANGE?	TIME HELP	ALLOWED AT DRIVER CHANGE?
DRY	DRY	DAMP	OPTIONAL	10 MIN.	Y
DRY	DRY	WET	MANDATORY	10 MIN.	Y
DAMP	DRY	WET	MANDATORY	10 MIN.	Y
DAMP	RAIN	WET	---	---	---
DAMP	DRY	DRY	---	---	---
DAMP	RAIN	DRY	OPTIONAL	0	N
WET	RAIN	DAMP	OPTIONAL	0	N
WET	RAIN	DRY	OPTIONAL	0	N

EXAMPLE: The track is Dry -- the team is competing on dry tires. If the track is declared Damp, a tire change is optional to the team. 10 minutes is allowed to make the change during the driver change.

GENERAL NOTES:

- The vehicle will be expected to be ready for competition with the first driver at the team's run order position. If the endurance event is running late, the vehicle is still expected to be ready when its run order position is reached. If the vehicle is not ready when the official starter motions the vehicle to the starting line a two minute "out of order" penalty will be assessed and the team will lose their time slot to run the event. Teams are only allowed to run within the 20 cars after them in the run order in their heat. For example, the team with run order position 10 must run before the team with run order position 30. The last 20 teams scheduled must run before the last car is called. All teams will be provided a minimum 15 minute window. If the last scheduled team of the heat is not able to run when called, they will receive the "out of order" penalty and will be given 15 minutes to enter the track before they are disqualified. Teams cannot run earlier than their scheduled run order.
- The driver change will be scored as an extra-long lap. It will be assumed by scoring that the change was completed in the required time (less than 3 minutes) unless notified otherwise. An official will be in the driver change area timing each vehicle and monitoring that no work is done to the vehicle other than the driver change. The official will keep track of each team's time and will notify scoring if a team has exceeded the three minute limit (from time vehicle arrives in driver change area to time vehicle leaves area). There is no competitive advantage to changing drivers in less than three minutes.

ENDURANCE & FUEL EFFICIENCY CONT.

- Tire changes from dry to rain tires will be scored as an extra-long lap. It will be assumed by scoring that the change was completed in the required time (less than 10 minutes) unless notified otherwise. An official will be in the driver change area timing each vehicle and monitoring that no work is done to the vehicle other than the tire change. The official will keep track of each team's time and will notify scoring if a team has exceeded the ten minute limit (from time vehicle arrives in driver change area to time vehicle leaves area). There is no competitive advantage to changing tires in less than ten minutes.
- Tire changes from rain to dry tires will have the time required to change tires added to the team's total time. The time taken to get to, and out of, the driver change area will NOT be added. An official will be in the driver change area timing each vehicle and monitoring that no work is done to the vehicle other than the tire change. The official will keep track of each team's time and will notify scoring of the time required to change tires (from time vehicle arrives in driver change area to time vehicle leaves area).
- No toolboxes will be allowed in the staging lanes or driver change area. (It is assumed only hand tools would be required to adjust the vehicle for the second driver.) In the event of tire changes due to weather conditions, tire changing equipment will also be allowed in the driver change area. Toolboxes will be allowed in the dynamic area along the wall separating the practice area. Teams may work on the car in this area only. Any work done on the vehicle must be approved by a tech inspector before the team will be allowed on the endurance course.
- If the vehicle leaves the course because of a mechanical/electrical problem of any type, the event is considered over for that vehicle and scoring will be notified and record the team as DNF. The vehicle will NOT be allowed to return to the track.
- If the vehicle contacts a barrier on the course, the event is considered over for that vehicle and scoring will be notified. The vehicle will NOT be allowed to return to the track.
- The vehicle may be restarted if it stalls on the track, but external assistance is not allowed.
- The driver may pull in the driver change area to have belts re-tightened if necessary, though the additional time for this procedure will be counted.
- The driver may also pull the vehicle off course to remove any cones that may become trapped; though the additional time will count against the team.
- The lap times for the vehicle will be monitored. If the vehicle is not running within 145% of the fastest lap time run on the course (by the fastest car) the vehicle may be black-flagged and removed from the event. If this occurs with the first driver, the second driver will NOT be allowed to run, as the event will be considered over.

COURSE PREPARATION:

The endurance course will be set up on Thursday afternoon. Drivers are able to walk the course up to 8:00 a.m. Saturday.

NO MOTORIZED VEHICLES ARE ALLOWED ON THE COURSE EXCEPT DURING THE EVENT ITSELF. VIOLATORS OF THIS POLICY MAY BE DISQUALIFIED FROM THE EVENT.

ENDURANCE & FUEL EFFICIENCY CONT.

FUEL EFFICIENCY PROCEDURES:

Calculation of fuel consumption will be made by the fueling officials and will be based upon the weight of the fuel consumed.

The vehicle starts the endurance event after being fueled to the 'full' mark. After completing the event, the vehicle returns to fuel station and is refueled. The weight of the fuel consumed is determined by weighing a fuel container, filling the vehicle to the 'full' mark, and weighing the fuel container again. The weight of the fuel consumed is the difference of the two measurements. This is accomplished by weighing the fuel can before and after filling the tank. The driver will be asked to observe and initial this measurement.

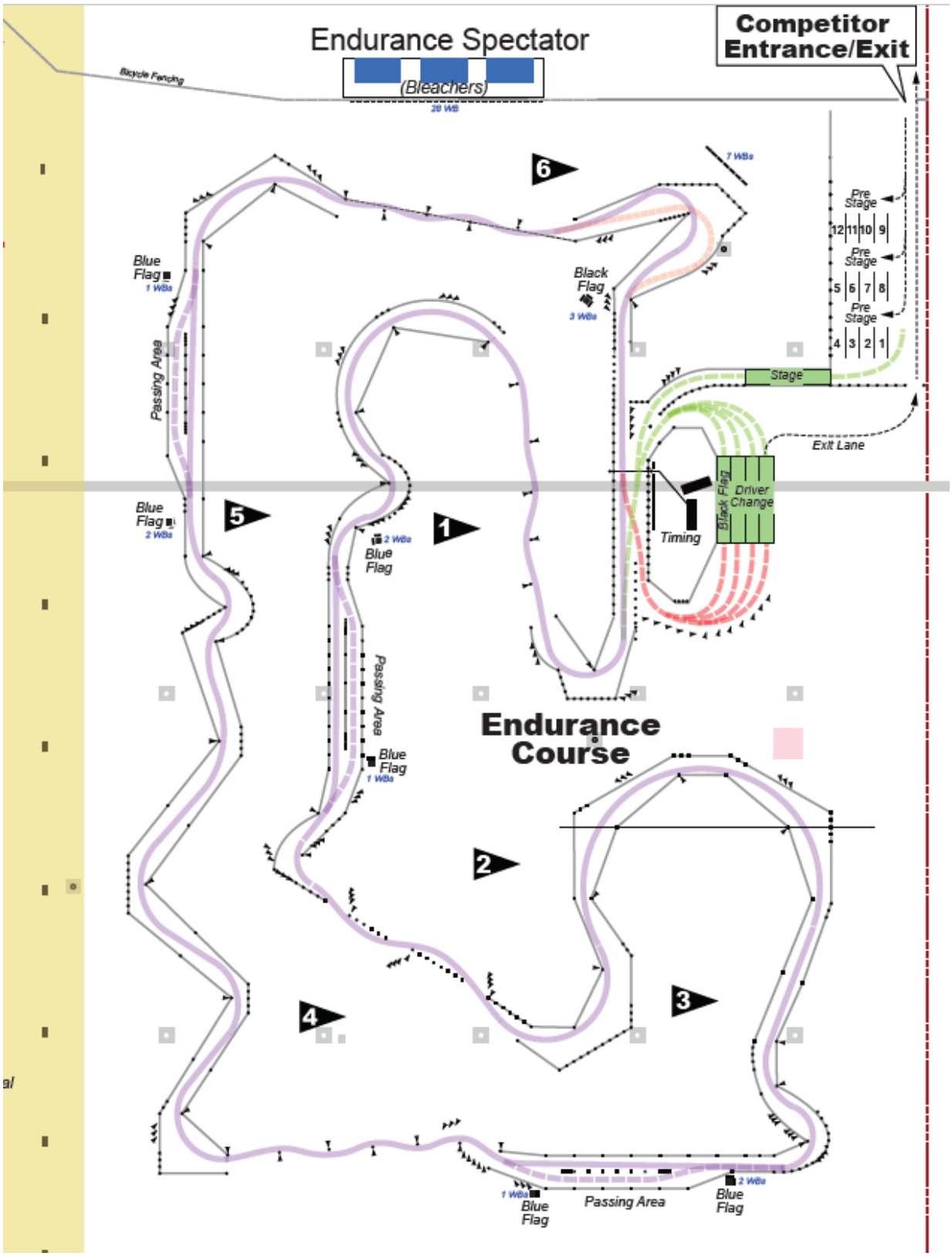
The 'full' mark is a clearly defined scribe line in the filler neck or sight tube as defined by Rule IC2.6.6. The vehicle will be filled to this mark before starting the heat and again upon completion of the endurance event heat.

At the fueling station it is critical that visibility of the scribe line in the fuel filler neck is very clear.

Also, no shaking of the vehicle will be permitted during initial fill (prior to Endurance event) nor final fill (after the Endurance event).

NOTE: All Vehicles must return for re-fuelling, even after as little as one lap to enable the calculation of the efficiency score.

ENDURANCE COURSE MAP



AWARDS

SPIRIT OF EXCELLENCE AWARD – IC CLASS

This award recognizes the Top 10 finishers with overall highest accumulative scores.

SPIRIT OF EXCELLENCE AWARD – EV CLASS

This award recognizes the Top 3 finishers with overall highest accumulative scores.

COST AWARD

This award recognizes the Top 3 IC finishers and Top 3 finishers with highest scores in Cost.

ENGINEERING DESIGN AWARD

This award recognizes the Top 3 IC finishers and Top 3 EV finishers with highest scores in Design.

PRESENTATION AWARD

This award recognizes the Top 3 IC finishers and Top 3 EV finishers with highest scores in Presentation.

ACCELERATION AWARD

This award recognizes Top 3 IC finishers and 1st Place EV finisher with the highest scores in Acceleration.

AUTOCROSS AWARD

This award recognizes Top 3 IC finishers and 1st Place EV finisher with the highest scores in Autocross.

COOPER TIRE ENDURANCE AWARD

This award recognizes Top 3 IC finishers and 1st Place EV finisher with the highest scores in Endurance.

COOPER TIRE FUEL EFFICIENCY AWARD

This award recognizes Top 3 IC finishers and 1st Place EV finisher with the highest scores in fuel efficiency.

SKID PAD AWARD

This award recognizes Top 3 IC finishers and 1st Place EV finisher with the highest scores in Skid Pad.

THREE VIEW DRAWING EXCELLENCE AWARD (IC CLASS ONLY)

Awarded to the top ten Formula SAE teams who submit the best executed three view drawings, per the Formula SAE Rule S6.4. Top three awarded; 4-10 honorable mention.

SCCA – Carroll Smith Faculty Award

Awarded to faculty advisor nominated by students and reviewed by peer group.

MERCHANTS

*subject to change

A Street Auto Parts

4003 A St

Lincoln, NE 68510-4620

(402) 489-9378

www.astreetautoparts.com

Advance Auto Parts

2101 S 10th St

Lincoln, NE 68502-3444

(402) 742-0334

www.advanceautoparts.com

AutoZone

2904 Cornhusker Hwy

Lincoln, NE 68504-1518

(402) 467-1075

www.autozone.com

CarQuest Auto Parts

1821 N St

Lincoln, NE 68508-1734

(402) 477-4106

www.carquest.com

Eagle Motorsports

300 Speedway Circle, Ste 165

Lincoln, NE

Call Mike Long @ 217-414-2967

Factory Motor Parts

2829 N 33rd St Ste 3

Lincoln, NE 68504-2325

(402) 464-9306

www.factorymotorparts.com

Fred's Auto Electric

5042 Rent-Worth Ct

Lincoln, NE 68516-2505

(402) 423-7119

www.alternatorsandstarters.com

Alternators and Starters for Virtually Anything"

General Fire & Safety Equipment Co Inc.

2431 Fairfield St

Lincoln, NE 68521-1308

(402) 476-4646

www.generalfiresafety.com

Great Plains Cycle Supply

2542 N 27th St Ste A

Lincoln, NE 68521-1474

(402) 467-4126

www.greatplainscycle.com

HVC Cycle

2521 W L St Ste 6

Lincoln, NE 68522-1026

(402) 817-4795

hvccycle.com

Napa Auto Parts

3630 Cornhusker Hwy

Lincoln, NE 68504-1531

(402) 466-8515

www.napaautoparts.com

Race Again Parts & Service

1359 S. 33rd St.

Lincoln, NE 68510

(402) 601-6817

www.raceagainparts.com

Speedway Motors

304 Victory Ln

Lincoln, NE 68528-1501

(402) 323-3200

www.speedwaymotors.com

Williamson Honda

2770 Yankee Hill Rd

Lincoln, NE 68510

(800) 536-3855

www.williamsonhonda.com

Home Depot

3300 N 27th St

Lincoln, NE 68521-1312

(402) 325-6200

www.homedepot.com

Lowe's Home Improvement

6101 Apple Way

Lincoln, NE 68516-3502

(402) 420-3660

www.lowes.com

Wal-Mart Supercenter #1943-Lincoln

4700 N 27Th St

Lincoln, NE 68521

(402) 438-4377

AUTO PART STORES

*subject to change

Downtown Lincoln
Auto Body Supply Inc.- 2034 O Street- (402) 477-3941
Jim DeFreece Auto Parts- 2210 N Antelope Valley Prkw- (402) 476-0341
Anderson Ford- 6400 Q St- (402) 464-0661

North Lincoln
Olston's Auto Recyclers- 3450 N 35th Circle- (402) 467-4541
Cichoracki Motor- 3100 N 20th St- (402) 325-0000
Anderson Ford- 2500 Wildcat Dr-(402) 458-9830

West Lincoln
O'Reilly Auto Parts- 120 O St- (402) 475-1166
Snow Auto Supply- 1640 West O St- (402) 475-4261
First Street Auto Repair- 1620 S 3rd St- (402) 476-2040
A-1 Automotive- 2540 W O St Ste 3- (402) 477-4660

East Lincoln
O'Reilly Auto Parts- 1201 N 48th Street – (402) 466-4663
Kelly's Auto Repair- 4602 Pierce Dr.- (402) 467-4602
U-Pull-It- 6300 N 70th St- (402) 467-4101
Dynosport- 5735 Johanna Rd Ste D- (402) 475-7223
Adams Auto Service- 1440 N Cotner Blvd- (402) 466-2691

South Lincoln
Duteau Chevrolet Subaru- 7300 S 27th St- (402) 420-3300

Motorcycle Shops
Downtown
Rural Cycle- 1500 N 15th St- (402) 435-1100

North Lincoln
Avenue Cycle- 3304 Madison Ave- (402) 467-1200
Lincoln Cycle & ATV- 3320 Cornhusker Hwy- (402) 464-5551
Star City Motor Sports- 6600 N 27th- (402) 476-7768

West Lincoln
Frontier Harley Davidson- 205 NW 40th St.- (402) 466-9100
JZ Motorcycle- 2130 Magnum Cr Suite 6- (402) 730-6858

East Lincoln
JPK Investment Motors- 2244 N Cotner Blvd- (402) 466-7744

South Lincoln
Brandl Cycle- 5046 Rent-Worth Ct- (402) 423-2825
Rod's Power Sports- Hwy 77 & Saltillo Rd- (402) 474-7777

We strongly recommend calling first to determine if a shop has what you need.

PLACES TO EAT

*subject to change

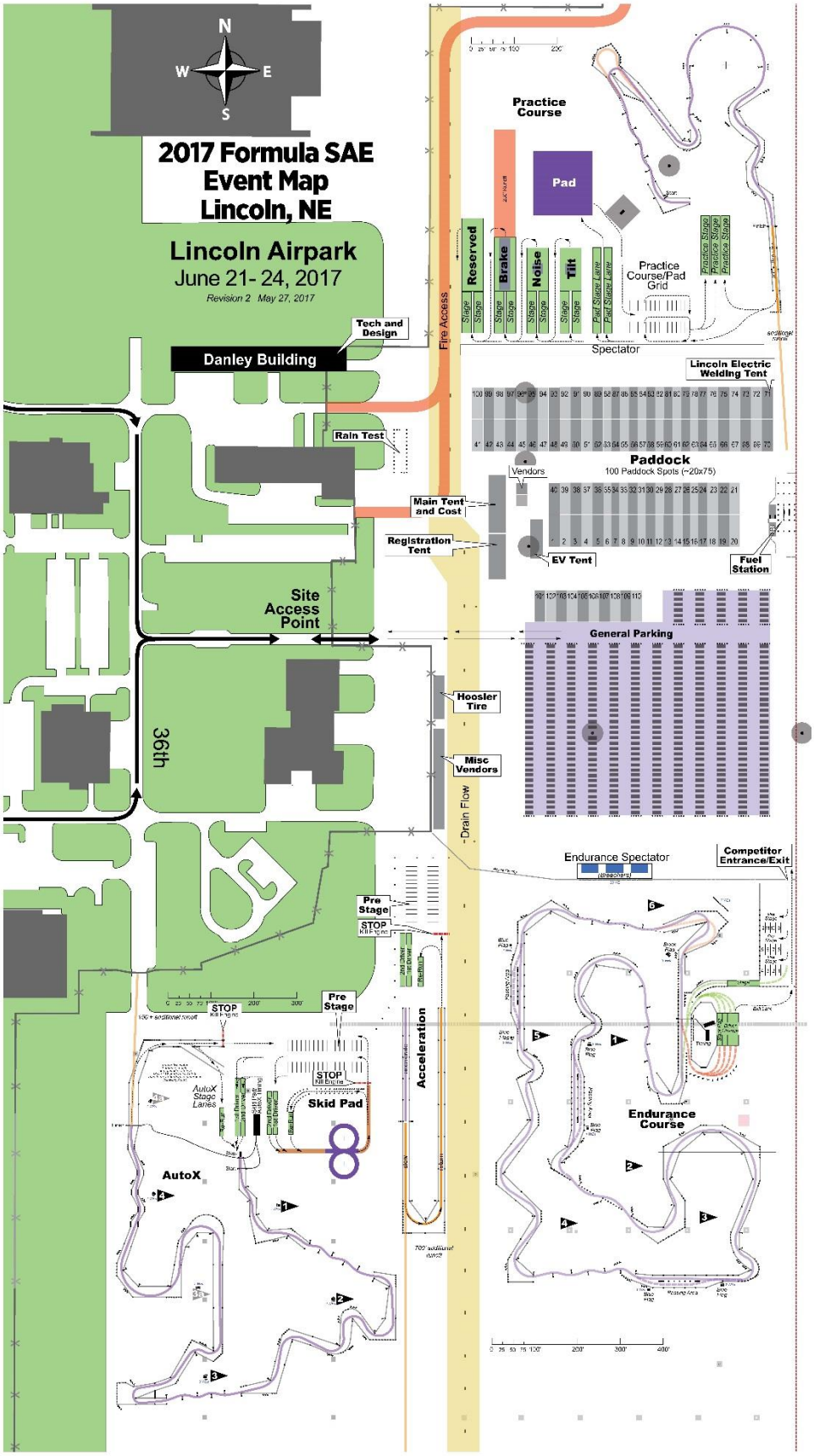
12th Street Pub	1200 O Street, Lincoln, NE 68508	(402) 435-3358
Ali Baba Gyros	112 N. 14th, Lincoln, NE 68508	(402) 435-2615
Amigos/Kings Classic	1407 Q Street, Lincoln, NE 68508	(402) 475-9819
Applebee's	1133 Q Street, Lincoln, NE 68508	402) 476-5165
Arby's	1425 Q Street, Lincoln, NE 68508	(402) 476-7114
Barry's Bar & Grill	235 N. 9th Street, Lincoln, NE 68508	(402) 476-6511
Beacon Lounge	311 S. 11th, Lincoln, NE 68508	(402) 438-7211
Billy's	1301 H Street, Lincoln, NE 68508	(402) 474-0084
Bison Witches Bar & Deli	1320 P Street, Lincoln, NE 68508	(402) 474-3366
Blue Orchid Thai Restaurant	129 N. 10th Street, Lincoln, NE 68508	(402) 742-7250
Bread & Cup	440 N. 8th Street, Lincoln, NE 68508	(402) 438-2255
Brothers Bar & Grill	1339 O Street, Lincoln, NE 68508	(402) 474-0200
Brown Baggers	151 N. 8th, Lincoln, NE 68508	(402) 477-2244
Brueggers Bagels	1205 Q Street, Lincoln, NE 68508	(402) 474-6001
Burger King	2504 O Street, Lincoln, NE 68510	(402) 476-3050
Buzzard Billy's	247 N. 8th Street, Suite 101, Lincoln, NE 68508	(402) 475-8822
Coffee House	1324 P Street, Lincoln, NE 68508	(402) 477-6611
Coffee Trader	1200 N Street, Lincoln, NE 68508	(402) 475-2739
Cold Stone Creamery	232 N 13th, Lincoln, NE 68508	(402) 477-4500
Crescent Moon Coffee	816 P Street, Lincoln, NE 68508	(402) 435-2828
Cultiva Espresso	727 S. 11 Street, Lincoln, NE 68508	(402) 435-1133
daVinci's	745 S 11th, Lincoln, NE 68508	(402) 475-1111
Danny's Downtown Deli	941 O Street, Lincoln, NE 68508	(402) 438-9410
Dish	1100 O Street, Lincoln, NE 68508	(402) 475-9475
Doc's Place	140 N 8th, Lincoln, NE 68508	(402) 476-3232
Doozy's	101 N. 14th, Lincoln, NE 68508	(402) 438-1616
Duggan's Pub	440 S. 11th, Lincoln, NE 68508	(402) 477-3513
El Potrero	247 N. 8th, Lincoln, NE 68508	(402) 477-4551
Embassy Bar & Grille	1040 P Street, Lincoln, NE 68508	(402) 474-1111
Gourmet Grill	1400 O Street, Lincoln, NE 68508	(402) 476-7147
Green Gateau Restaurant	330 S. 10th, Lincoln, NE 68508	(402) 477-0330
Highnooners	1414 O Street, Lincoln, NE 68508	(402) 435-1414
Huskerville Pub & Pizza	2805 NW 48th St, Lincoln, NE 68524	(402) 261-9895
Ivanna Cone	701 P Street, Lincoln, NE 68508	(402) 477-7473
Jack's Bar & Grill	100 N. 8th, Lincoln, NE 68508	(402) 438-6288
Jimmy John's	101 N. 14th, Lincoln, NE 68508	(402) 477-1400
JTK	201 N. 7th Street, Lincoln, NE 68508	(402) 435-0161
Knickerbocker's	901 O Street, Lincoln, NE 68508	(402) 476-6865
Korn Popper	1417 N Street, Lincoln, NE 68508	(402) 474-5818
La Mexicana Market	1637 P Street, Lincoln, NE 68508	(402) 477-0785
Lazlo's Brewery & Grill	710 P. Street, Lincoln, NE 68508	(402) 434-5636
Lazzari's Pizza	1434 O Street, Lincoln, NE 68508	(402) 475-5556
Lincoln Espresso	112 S. 16th, Lincoln, NE 68508	(402) 438-0650

PLACES TO EAT CONT.

*subject to change

Maggie's Vegetarian Cafe	311 N 8th Street, Lincoln, NE 68508	(402) 477-3959
Main Street Café	1325 O Street, Lincoln, NE 68508	(402) 435-1717
Misty's	200 N. 11th Street, Lincoln, NE 68508	(402) 476-7766
Noodles and Company	210 N. 14th, Lincoln, NE 68508	(402) 475-4131
N-Zone Sports Bar & Grill	728 Q Street, Lincoln, NE 68508	(402) 475-8683
Old Chicago	826 P Street, Lincoln, NE 68508	(402) 477-2277
Oso Burrito	1451 "O" Street, Lincoln, NE 68508	(402) 477-1717
Papa John's Pizza	1601 Q Street, Suite C, Lincoln, NE 68508	(402) 476-6262
Red Onion Grill,	141 N. 9th, Lincoln, NE 68508	(402) 475-4844
Samurai Sam's Teriyaki Grill	230 N. 17th, Lincoln, NE 68508	(402) 475-7267
Scooter's Coffeehouse	1033 O Street, Lincoln, NE 68508	(402) 474-5282
Scooter's Coffeehouse	151 N. 8th Street, Lincoln, NE 68508	(402) 475-0115
Sher-E-Punjab	1601 Q Street, Lincoln, NE 68508	(402) 477-3090
Spaghetti Works	228 N. 12th, Lincoln, NE 68508	(402) 475-0900
Starbucks Coffee	1201 P Street, Lincoln, NE 68508	(402) 435-2622
Subway	1317 O Street, Lincoln, NE 68508	(402) 476-8193
Thai Garden	245 N. 13th, Lincoln, NE 68508	(402) 477-0811
The Alley	1031 M Street, Lincoln, NE 68508	(402) 477-2820
The Mill	800 P Street, Lincoln, NE 68508	(402) 475-5522
The Oven	201 N. 8th Street, Lincoln, NE 68508	(402) 475-6118
Tico's Foods of Mexico	317 S. 17th Street, Lincoln, NE 68508	(402) 475-1048
Village Inn Pancake House	111 S. 29th, Lincoln, NE 68502	(402) 476-6525
Vincenzo's	808 P Street, Lincoln, NE 68508	(402) 435-3889
Watering Hole	1321 O Street, Lincoln, NE 68508	(402) 438-3054
Wendy's	1336 Q Street, Lincoln, NE 68508	(402) 474-2322
Yiayia's Pizza Beer & Wine	1423 O Street, Lincoln, NE 68508	(402) 477-9166
Cafe Indigo	701 P Street, Lincoln, NE 68508	(402) 477-7770
Runza Restaurant	937 S. 13th Street, Lincoln, NE 68508	(402) 475-7320
La Tapatia	1037 L Street, Lincoln, NE 68508	(402) 475-2364
Tam O'Shanter Lounge & Steakhouse	105 S. 25th Street, Lincoln, NE 68510	(402) 474-2394
Panera Bread	211 N. 12th Street, Lincoln, NE 68508	(402) 435-0837
McDonald's	2140 K Street, Lincoln, NE 68510	(402) 477-5001
Qdoba Mexican Grill	211 N. 12th St., Lincoln 68508	(402) 477-0090
Juice Stop	1217 Q Street, Lincoln, NE 68508	(402) 435-4442
Pickleman's	1442 O Street, Lincoln, NE 68508	(402) 477-5700
Five Guys Burgers & Fries	1230 'P' Street, Lincoln, NE 68508	(402) 805-4173
Red Mango	210 N. 14th Street, Suite 210, Lincoln, NE 68508	(402) 405-0032
Buffalo Wild Wings	1328 P. Street, Lincoln, NE 68508	(402) 475-2999
Chipotle Mexican Grill	210 N. 14th Street, Suite 7, Lincoln, NE 68508	(402) 474-1133
Hour Lounge	101 N. 14th Street, Suite 6, Lincoln, NE 68508	(402) 261-5860
Mama's Dream Bakery & Deli	233 N. 19th Street, Lincoln, NE 68508	(402) 261-4863
Sbarro's	Nebraska Union, 1400 R Street, Lincoln, NE 68508	(402) 477-1450
Southwest Pit BBQ	1601 P Street, Lincoln, NE 68508	(402) 405-1000
The Sultan's Kite	1311 O St., Lincoln, NE 68508	(402) 477-0013
Sam & Louie's	1332 P St., Lincoln, NE 68508	(402) 475-0777

EVENT SITE MAP



TIMING & SCORING TECHNOLOGY

Mobile IT Infrastructure provided by Digital Engineering Solutions

Connect to the "SAE-GuestsAndTeams" WiFi network
Password: **welcometeams**
Point your browser to: **http://mobile.fsaeonline.net**

You now have access to:

- Review & verify your Static, Dynamic, and Endurance results
- View real time results any time during the competition
- Report any problems with your results:
  - Static and Dynamic problem reports are accepted until 6PM on Dynamic Day
  - Endurance problem reports are accepted up until 15 minutes after the Endurance Race ends

DESIGN JUDGE BIOS

David (Dave) Redszus Ph.D.: (Design Event Captain) **Alma Mater:** Northwestern University: BS Industrial Engineering and Economics, MS Systems Mgmt & Operations Research, Ph.D. Product Development Process Mgmnt. **Employment History**: Precision AutoResearch (founder), Over 35 years total (research, engineering services, and specialty products/software for the motorsports industry). **Expertise:** Technical consultant, trainer, engineer, coach, and racer, advanced driving techniques, vehicle design, and engine development. Data analysis techniques and ability to translate complex issues into racer-understandable language. **Currently Resides in:** IL **First car:** '70 Porsche 911S Targa. **Favorite Race Car:** What other than the Porsche 917-30? Or any other car which causes rules-changes ex-post should be a favorite! **Judge since:** 2004

Steven (Steve) Fox: (Chief Design Judge) **Alma Mater:** Iowa State Law Enforcement Academy, U.S. Army Military Police Academy. **Employment History:** '01+: PowerTrain Technology, President. Quarter Master Industries, Senior Engineer, 20 years, responsible for new product development, manufacturing, and testing. **Expertise:** Skilled Mechanic, Journeyman Machinist, Power transmission design over a broad spectrum of applications, Engine Development, Materials Selection & (Lean) Manufacturing Engineering. Over 40 years total motorsports / engineering career. Currently Design Captain, Formula SAE – Michigan. Past Chief Design Judge for Formula Student Germany, Formula Student Austria, Formula Student India. Design Captain, FSAE-Virginia '08 & '09. SAE Industrial Lecturer. **Currently Resides in:** IL **First car:** '70 Camaro Z-28 **Favorite Race Cars:** Porsche 917-30 & McLaren M8 **Design Judge since:** 1999 when recruited by Carroll Smith

Mark Atterbury P.E.: **Alma Mater:** University of Pittsburgh: BS in Mechanical Engineering '88. **Employment History**: '88 – '90 BMY Combat systems: Tracked vehicles, Assault Bridges, Howitzers; '90 – '96 NACCO Materials Handling: Hyster / Yale narrow isle reach truck design; '96 – '98 Ransomes Cushman Ryan: Police Patrol Vehicle, Custom Shop manager; '98 – present Exmark Mfg Inc: Bagging system design, ROPS design - test and implementation, Evaporative emissions design and compliance, Cutting deck design. **Expertise:** Jack of all trades, master of none. SM Alfa GTV6 – Eaton M60, MegaSquirt, EDIS **Currently Resides in:** NE **First car:** $300 **'**66 Bonneville convertible (think Christine) **Favorite Race Car:** Alfa Romeo P3 (Jano and Nuvolari vs Mercedes and Auto Union on the 'Ring in '35). **Judge since:** 2017

Siddarth 'Sid' Attravanam: **Alma Mater:** University of Texas at Arlington: BS (Hons.) in Mechanical Engineering (minor in Electrical Engineering) **Employment History**: '14 – present: Cooper Tire & Rubber Company: R&D Engineer, Vehicle Modeling, Simulation and Track Testing; '13 – '14 Optimum G: Vehicle Dynamics Intern; '13: Fixrim Racing: Track Engineer **Expertise:** Vehicle handling modeling, simulation and testing, data acquisition, driver metrics **Currently Resides in:** OH **First car:** '01 Toyota Celica GTS **Favorite Race Car:** Ferrari F2004 **Design Judge since:** 2015

Isaac Aunkst: **Alma Mater:** Penn State: BS in Electrical Engineering Technology. **Employment History**: '07 – '14: General Dynamics Electric Boat: R&D Engineer developing and testing electric propulsion concepts for submarine applications; '14+: Harley-Davidson Motor Company: Design Engineer - Electrical. **Expertise:** Electrical Propulsion Development, Medium Voltage Motors and Controllers, Power Quality Testing, Instrumentation, Data logging. **Currently Resides in:** WI **First car:** 1987 Toyota 4Runner **Favorite Race Car:** Ford Fiesta RS WRC **Judge since:** 2016

Chris Batsch: **Alma Mater**: Florida A&M: BS Mechanical Engineering, Cal State Long Beach: Executive MBA. **Employment History**: Hendrickson Intl., Business Unit Director; Rancho Suspension, Engineering Supervisor; Honda, Validation Engineer. **Expertise**:Performance off-road suspension, military and racing. Vehicle ride and handling analysis and simulation. **Currently Resides in**: IL **First car**(s): '88 Ford F-150 4x4 **Favorite Race Car**: Big Oly

DESIGN JUDGE BIOS CONT.

Michael Black: **Alma Mater**: Rutgers Mechanical Engineering '90, Licensed Professional Engineer. **Employment History**: Ford Motor Company, 15+ Years Automotive Body and Body Structure Product Design. Military Contractor, Machine Design. Initiated Rutgers FSAE Team '89. FSAE Volunteer since 1995. **Expertise**: Automotive Structures, Metallic Materials, Threaded Fasteners, Chassis Design. **Currently Resides in**: MI **First car**: '72 Merc Colony Park Wagon w/ 429 engine & simulated wood grain side panels. **Favorite Race Car**: McLaren MP4 F1 driven by Ayrton Senna or any car driven by Senna. **Design Judge since**: 2000

Michael Bobbitt: **Alma Mater:** Virginia Tech: BS Mechanical Engineering **Employment History:** General Motors, Tire Test Engineer; Pratt & Miller, Race Engineer and Software Program Manager; Penske Racing, Aerodynamic Design/Test Engineer; Honda R&D, Chassis Fuel System Design Engineer. **Expertise:** Tire testing, vehicle dynamics, lap time simulation, vehicle testing and data analysis, chassis design, vehicle integration, aerodynamics First Car: 2004 VW Passat Favorite Racecar: Porsche 917 Design Judge since: 2016

Samuel Buller (Judging Assistant): **Alma Mater**: University of Nebraska – Lincoln: BS in Mechanical Engineering. **Employment History**: '16 – present: Honda R&D Americas, Inc: Upperbody Design Engineer (Structural). **Expertise**: Automotive Structures, Frame/Chassis Design and Development, Systems Integration, Suspension. **Currently Resides in**: OH **First car**: '00 BMW 3 Series Coupe (5sp). **Favorite Race Car**: Porsche 917/30, "the car that killed Can-Am" – 1580hp, 1800lbs, 0-60 in 1.9s. **Design Judge since**: 2017

William (Billy) Burkey: **Alma Mater:** Carnegie Mellon University, BS ME '07 **Employment History:** SpaceX, Lead Structures Engineer **Expertise:** Mechanisms and Kinematics, Structural Design, Analysis and Optimization, Structural Validation and Testing, Aerospace Metallic and Composite Materials **Currently Resides in:** Los Angeles, CA **First car:** 1986 Pontiac Fiero GT **Least-Favorite Race Car:** 1986 Pontiac Fiero GT. **Design Judge since:** 2012.

John Burford: **Alma Mater**: University of Texas - Arlington. **Employment History**: Altair Engineering '1998 – '2004; Contractor '2004 – 2015: experience in multiple fields: Military, Automotive, Heavy Duty Trucks, and Aerospace. Currently working for Aurora Flight Sciences. **Expertise**: CAE analyst focusing on Multi-Body Dynamics and Structural Optimization **Currently Resides in**: VA **First car**: '84 Pontiac Firebird. **Favorite Race Car**: Group C/IMSA GTP Mazda 787 **Design Judge since**: 2011

Marko Cater, P.E.: **Alma Mater**: Carleton University: BS Mechanical Engineering. Purdue University: MS, Mechanical Engineering. **Employment History**: 2017+: Zero Motorcycles: Sr. Test Engineer, R&D and Test. 2014 - 2017: Tesla Motors: Staff Test Engineer, Vehicle Test. 2007-2014: Honda R&D Americas: Test Engineer, Vehicle Structure Reliability. **Expertise**: Chassis and Suspension Systems. **Currently Resides in**: OH **First car**: '93 VW Gold Turbo Diesel **Favorite Race Car**: Carleton University 2004 FSAE car. **Design Judge since**: 2011

Nathan Crosty: **Alma Mater**: Michigan State University: BS in Computer Science. **Employment History**: 2015 – present: MathWorks Inc, Application Engineering; '2013-2015; 8 years Automotive OEM Software Engineering; **Expertise**: Large scale software system architecture, Model Based Software Design, Code Generation, Control Design, Simulation. **Currently Resides in**: West Bloomfield Twp, MI **First car**: 1970 Lotus Seven Series 4 **Favorite Race Car**: Tyrrell 006 driven by Jackie Stewart and Francois Cevert **Design Judge since**: 2017

Ben Dean: **Alma Mater**: University of Nebraska – Lincoln: BS in Mechanical Engineering. **Employment History**: '16 – present: Snyder Industries, Inc. Design Engineer; '14 – '16: FCA US LLC Design and Release Engineer, Valvetrain and Timing Drive. **Expertise** Powertrain Design and Development, Component Design **Currently Resides in**: NE **First car**: 1976 Volkswagen Bus, currently disassembled. **Design Judge since**:2017

DESIGN JUDGE BIOS CONT.

Damon Dilworth: **Alma Mater**: Purdue University: BS in Mechanical Engineering with a Minor in Mathematics. **Employment History**: 3 Years at Navistar in product development and release. 2006 to present with Hendrickson Truck in new product development, currently Sr. Engineering Manager of Validation. **Expertise**: Suspension design, structural design, data acquisition, testing and validation **Currently Resides in**: IL **First car**: 1989 Pontiac Bonneville Current Car: 1987 Buick Grand National **Favorite Race Car**: Nitro Funny Car. An NHRA Top Fuel dragster accelerates faster than a jumbo jet, a fighter jet, and a Formula One race car **Design Judge since**: 2013

Ben DiMarco: **Alma Mater**: University of Akron: BS in Mechanical Engineering. **Employment History**: '12 – present: Honda R&D Americas Inc: **Expertise**: Brake System Design Engineer –brake system design concept and sizing, verification of performance and manufacturability, and management of cost/weight. **Currently Resides in**: OH **First car**: '85 GMC Sierra 1500 Shortbed 4x4. **Favorite Race Car**: McLaren MP4/4 – Judge since: 2016

Brian Dondlinger: **Alma Mater**: University of Wisconsin-Madison: BSME, MSME **Employment History**: Harley-Davidson Motor Co.**Expertise**: Powertrain Design, Chassis Design, Vehicle System Integration, Continuous Improvement and Six Sigma, PLM/ERP systems. Author: *Vehicular Engine Design, 2nd Ed.* **Currently Resides in**: WI **First car**(s): '79 Pontiac Firebird Trans Am **Favorite Race Car**:Group B Audi Quattro Design Judge since: 2004

Christopher Drew: **Alma Mater**: University of Texas at Austin: Mechanical Engineering. **Employment History**: Vehicle Performance Engineer, Peterbilt Motor Company; Lead Motorsports Engineer, Pratt & Miller; Test Engineer, Cummins Inc. **Expertise**: Vehicle dynamics, suspension and chassis design, simulations, tires, aerodynamics, etc. **Currently Resides in**: Flower Mound, TX **First car**: 1996 Honda Accord **Favorite Race Car**: Chaparel 2J **Design Judge since**: 2016

Adam Firestone: **Alma Mater**: University of Nebraska - Lincoln: BS in Mechanical Engineering, Kettering University: MS in Mechanical Engineering. **Employment History**: '09 - Present, Honda R&D Americas, Inc.: Systems and Control Engineer, In-Vehicle Engine Research and Development. **Expertise**: Powertrain Control System Design and Calibration. Powertrain/Vehicle Integration and Marketability. **Currently Resides in**: OH **First car**: '72 Pontiac Ventura II 307cid, then 355cid, now 496cid... **Favorite Race Car**: Outlaw Sprint Car **Design Judge since:** 2015.

Oscar N. (Nick) Garcia: Alma Mater: Wichita State University: Mechanical Engineering. **Employment History:** Hawker Beechcraft: '07-'10, Spirit Aerosystems: '10-'11, Bombardier Learjet: '12-'14, Spirit Aerosystems '14+ Expertise: Airframe stress analysis **Currently Resides in:** KS **First car:** '96 Ford Thunderbird **Favorite Race Car:** Lotus 49 / Gurney Eagle T2G **Design Judge since:** 2013

Tri Gaffney: **Alma Mater**: University of Missouri-Rolla : BS in Mechanical Engineering; Rensselaer Polytechnic: MS Engineering Science **Employment History**: '98-2014 General Motors; 2007-2014 Kaz Technologies; 2014-Present Pratt and Miller Engineering. **Expertise**: Systems Engineering, Chassis Controls, Active Driveline Systems, Vehicle Performance **Currently Resides in**: MI **First car**: '88 Fiero **Favorite Race Car**: Peugeot 205 Turbo 16 – Group B Judge since: 2008

Mayur Gaikwad: **Alma Mater**: Michigan Tech University: MS in Mechanical Engineering and Graduate Certificate in Hybrid Electric Drive Vehicle Engineering, Mumbai University: BS in Mechanical Engineering. **Employment History**: 2016-Present: Rivian Automotive; Thermal Engineer, 2013-2016: Fiat Chrysler Automotive; Aerothermal Engineer. **Expertise**: Thermal Architecture, Hybrid Powertrain, Vehicle Simulation. **Currently Resides in**: MI **First car**: '13 Volkswagen GTI MK6 **Favorite Race Car**: Porsche 919 Hybrid. **Design Judge since**: 2017

DESIGN JUDGE BIOS CONT.

Rob Giovenale: **Alma Mater**: Western Washington University: Vehicle Research Institute **Employment History**: '02-present Toyota Racing Development. 2001-02 Cascade Autosport. 1996-2001 WWU F-SAE. **Expertise**: Powertrain design and manufacturing. Multi-axis machining. Production based race car chassis construction. **Currently Resides in**: SoCal. **First car**s: 30 Ford A, Triumph TR6. **Favorite Race Car**: anything "too fast to race" **Design Judge since**: 2006

Billy Godbold: **Alma Mater:** Florida State University: MS in Physics. **Employment History:** COMP Performance Group (COMP Cams): 20+ Years, Camshaft Design / Valvetrain Engineering Manager. **Expertise:** Engine Systems Theory, Design and Development, Metallurgy, Motorsports. **Currently resides in:** TN **First car:** '86 Jeep CJ7 (V8 engine swap) **Favorite racecar:** Panoz Esperante GTR-1, but I have never seen a racecar I did not like. **Design Judge since:** 2014

Cyrille Goldstein (Judging Assistant): **Alma Mater**: McGill University **Professional Experience** Electric Motor Design Engineer, Ford Motor Company Electrified Powertrain Engineering -Product Development, Mechanical and systems engineering of electric machines. Design and sign-off for manufacturing of prototype machines and hardware. Coordinate multi-month testing plans for prototype machines Extensive work in CAE tools, primarily CATIA V5 and Abaqus 6.14 Researcher, McGill Automotive Partnership **Design Judge since:** 2017

Ken Gould: **Alma Mater:** Indiana-Purdue University at Fort Wayne, IN with a BS EET **Employment History:** '02+: e-Mobility Technical Systems Engineer for Porsche Cars North America (PCNA), with primary after-sales technical responsibility for the hybrid electric vehicles and GT Sportscars sold in North America. '92 – '00: Ford Europe: System Integration Engineer for European Ford and Jaguar vehicle programs. '81 – '91: Magnavox Government & Industrial Systems (now Raytheon). Developed and manufactured specialized RF and fiber optic defense systems. **Expertise:** Electric propulsion, and controls **Currently resides in:** GA **First car:** 1973 Mercury Capri **Favorite Race Car:** Porsche 917 **Design Judge since:** 2016

Ken Halvorsen: **Alma Mater:** University of Nebraska-Lincoln: Mechanical Engineering. Master's Topic – Ethanol Vehicle Conversion- materials compatibility, dyno work **Employment History:** Delphi Automotive Systems – Test Engineer, Environmental Testing Corporation – Engine Test Manager, Hexagon Lincoln 11 years – Project Engineer, Service Manager. Involved in Sprint Car Racing and Drag Racing since the early '80's **First Car:** 1970 ½ Z/28 **Favorite Race Car:** Penske Donahue '69 Trans Am Camaro **Design Judge since:** 2014

Jeff Holm **Alma Mater**: USAF BS Aerospace Engineering Employment: USAF/US Govt. 1968-1980, Founded HPC (High Performance Coatings 1982 sold in 2006, 2001-2006 Panther Racing IRL, 2010-2015 present: Utah Valley University **Expertise**: Aero, Cockpit Ergo/Safety, Stress Analysis Reside: Jackson Hole WY **First car**: 1959 TR3A **Favorite Race Car**: Mormon Meteor Salt Flats Car. 1939 Duesenberg. Still holds 18 records!

Mark Hutchison: **Alma Mater:** Kettering University (prev. General Motors Engineering & Management Institute): BS in Mechanical Engineering **Employment History:** '94-present: Harley-Davidson Motorcycle Company: Vehicle Tech Staff Engineer **Expertise:** 2-wheel, 3-wheel and 4-wheel chassis design, vehicle dynamics, steering and suspension design, a bit of motorcycle tire testing and modeling, motorcycle dynamic simulation, bolted joints **Currently Resides in:** WI **First Car:** Soap Box Derby car **Favorite Race Car:** Dan Gurney's 1967 AAR Grand Prix Eagle **Design Judge since:** 2013

Alex Jones: **Alma Mater**: Kettering University: BS in Mechanical Engineering concentration in Chassis/Suspension. **Employment History**: 2007 – present: Cooper Tire & Rubber Co. – Tire Development Engineer, Test Development Engineer, OE Tire Development; 2006 – 2007: Yorozu Automotive – Subframe Development. **Expertise**: Tire Mechanics and Driving. **Currently Resides in**: OH **First car**: 1991 Pontiac LeMans Hatchback. **Favorite Race Car**: Chaparral 2J. While not perfect, it pushed the boundaries of the rules and thinking outside the box. I also have a soft spot for banned race cars. **Judge since:** 2017

DESIGN JUDGE BIOS CONT.

Charles Kaneb: **Alma Mater**: Texas A&M, MS in Mechanical Engineering. **Employment History**: '16-present, Senior Product Engineer, Vehma R&D at Magna. '13-'16 Advanced Concept Engineer, Large Vehicle Bodies, Fiat Chrysler Automobiles. '07-'10 Quality Assurance Engineer, SolidWorks. **Expertise**: Body structures & joining, nonferrous materials, crash structures. **Currently Resides in**: MI. **First car**: 1988 Honda CRX. **Favorite Race Car**: Blue Crown Seal Specials - gasoline, FWD, four cylinder naturally aspirated cars that convincingly beat cars featuring RWD, V8 engines, alcohol, supercharging at Indy. **Judge since:** 2017

Brian Langone: **Alma Mater:** Carnegie Mellon University: BS & MS in Mechanical Engineering. **Employment History:** '13+ SpaceX: Structures Engineer, Battery Mechanical Design Engineer. Expertise: Static structural design and analysis, mechanism design, battery pack and interconnect design and analysis. Currently Resides in: CA First Car: '99 BMW M3 **Favorite Racecar:** Williams FW15 **Design Judge Since:** 2017

Bob Lembcke, PE: **Alma Mater**: Oklahoma State University, BSME '74, PE: Mo., Employment: Monsanto/Solutia '/74 – '03, Capital Plant Design/Build, Corporate Rotating Equipment Specialist, Nylon R&D Engineering, retired '03. SERF (ASME code shop, fabrication, and expert witness) ASME life member. Active in: SCCA/IMSA/vintage racing, car collecting and restorations. **Expertise**: Mechanical power, thermodynamics, machinery vibration, polymer properties and manufacturing, troubleshooting/fault/failure analysis. Builder / racer of sports cars since '67, multiple track records and championships. **First car**: '51 Crosley **Favorite Race Car**: Miller 91 Indy car **Design Judge since**: 2017

Ben LeVesque: **Alma Mater**: Michigan State: BS in Electrical Engineering.
Employment History: '2008 – present: Pratt & Miller Engineering: Electronics Department Manager, Systems Engineer. **Expertise**: Hybrid powertrain design, simulation, and control. Platform mobility controls. Vehicle electromechanical subsystem development and integration
Currently Resides in: MI **First car**: '86 Buick Riviera **Favorite Race Car**: Cadillac ATS-V.R Judge since: 2010

Jill Lewis: **Alma Mater:** University of Bath, M.S. Engineering Design & Oregon State University, B.S Mechanical Engineering. **Employment History:** '15 – present: SpaceX Structures Certification Engineer, '13-'15 SpaceX Composite Production Engineer. **Expertise:** Composite Manufacturing, Systems Integration. **Currently Resides In:** CA. **First Car:** 2000 Buick Regal. **Favorite Race Car:** McLaren MP4. Design Judge Since: 2017

Joe Losito: **Alma Mater:** Kansas State University: BS in Mechanical Engineering. **Employment History**: 2014–present: Broderson Manufacturing: Lead Design Engineer **Expertise:** New product development, powertrain design and integration. **Currently Resides in:** Kansas City **First car:** Ford Ranger **Favorite Race Car:** Red Bull RB7 or any vehicle with a Gulf Livery **Judge since:** 2014 (Also the Skidpad Event Captain)

Sean Maloney: **Alma Mater**: 2006-2010, University of Windsor: BS in Mechanical engineering with automotive option, 2010-2012, MASc. tire modelling research; **Employment History**: 16'–Present: Robert Bosch, Chassis Controls Software Engineer; 14' – 16': Robert Bosch, Chassis Controls Calibration Engineer; '12 – 14': Silcotech North America, R%D Engineer; **Expertise**: Anti-lock braking systems, Data acquisition and Embedded Controls; **Currently Resides in**: Lasalle, ON; **First car**: 86' Mazda RX7; **Favorite Race Car**: 1991 Mazda 787B **Design Judge since**: 2016

Maria Moore: **Alma Mater:** University of South Florida **Employment History**: '15 – present: Goodyear: Tire Vehicle Mechanics – Consumer, Commercial, & Race; '14 – '15 Continental Automotive Systems: ABS Calibration Engineer. **Expertise:** Tire and vehicle interaction & data acquisition systems **Currently Resides in:** Oh **First car:** '00 Mitsubishi Eclipse **Favorite Race Car:** Chaparral 2J **Judge since:** 2014

DESIGN JUDGE BIOS CONT.

Thomas Moore: **Alma Mater:** Brigham Young University: BS Mathematics and Technology Education, MS Technology **Employment History:** 15 years Teaching post secondary Automotive Technology prior 15 years with Utah Bureau of Air Quality as Technical Specialist for Mobile Emissions Programs **Expertise:** Automotive Electrical Systems and Advanced Engine Performance; Ignition Systems, Fuel Systems, Automotive Sensors, and Automotive Computer Systems. **Currently Resides in:** Utah **First Car:** 1968 Camaro SS 396 (should have never sold it!) **Favorite Racecar**: Bugatti Veyron **Design Judge since**: 2017

Bhushan Nagarajan: **Alma Mater**: University at Buffalo, SUNY: MS in Electrical Engineering. M. Visvesvaraya Institute of Technology, VTU: BE in Electrical & Electronics Engineering. **Employment History**: '15-Present: Rivian Automotive; Sr. Powertrain Engineer, 2011-2015: FEV Inc.; Electronics & Controls Engineer. **Expertise**: Hybrid Powertrain Controls, Vehicle Simulation, Vehicle Integration-Electrical. **Currently Resides in**: MI **First car**: '08 Nissan Altima **Favorite Race Car**: Audi R8 V10 **Design Judge since**: 2017

Neel S Nayak: **Alma Mater**: Carnegie Mellon University c/o 2008. BS in Mechanical Engineering **Employment History**: 2008-2010: Zodiac Aerospace, Design Engineer; 2010-Present: Space Exploration Technologies (SpaceX), Structures Engineer. **Expertise**: Structural & mechanical design, analysis, and manufacturing. Engineering simulations including finite element analysis and rigid body dynamics. Focus on development projects involving aerospace primary structures, secondary structures, and mechanisms. **Currently resides in**: Los Angeles, CA **Current Project Car**: 1994 Nissan 300ZX Twin Turbo **Favorite Race Car**: 1990-1995 Clayton Cunningham IMSA GTS Nissan 300ZX **Design Judge since**: 2014

Jerry Ohlemeier: **Alma Mater**- University of Kansas, BS Mechanical Engineering. **Employment**: Contemplating retirement, Trelleborg Sealing Solution (seal mfg, sales) 2006 to 2017, Sauer Danfoss (now Danfoss Power Solutions, hydrostat pumps and motors, design eng) 1998-2006, Clark Material Handling (mfg fork lift trucks, powertrain engineer) 1994-1998. Retiring in Lawrence, KS. **First car**: 1966 Ford Fairlane, **Favorite Race Car**: 1956 Ferrari Testarosa (saw Phil Hill drive one at speed).

Bret Olsen: **Alma Mater**: University of Windsor: Mechanical Engineering w/Automotive Option. **Employment History**: 2008 – Present: Chassis Controls Engineer, Robert Bosch. 2006 – 2008: Body Structures Engineer, TAC Automotive. **Expertise**: Brakes, Chassis Controls, Data Logging, Embedded Control Software. **Currently Resides in**: Ontario, Canada. **First car**: 1988 GMC Sierra 1500. **Favorite Race Car**: 1975 Ferrari 312 T **Design Judge since**: 2014

Tim Patek: **Alma Mater:** University of Texas, Arlington. BS and MS Mechanical Engineering, Masters in Business Administration **Employment History**: Mechanical Engineer at Peterbilt Motors since '04. **Expertise:** Class 8 diesel truck component integration and packaging, chassis design, and air brake systems **Currently resides in:** TX **First truck:** 1985 GMC Scottsdale pickup **Favorite race car:** Any that someone is silly enough to let me drive, typically blue FSAE cars. **Design Judge since:** 2015

Joseph Penniman: **Alma Mater**: San Jose State University: Mechanical Engineering **Employment History**: Tesla Motors since 2012, FSAE volunteer since 2011, initiated SJSU FSAE in 2008 as suspension lead and chief engineer **Expertise**: Automotive sensing system development. Mechanical system testing and characterization. CAN bus. Suspension and chassis design. **Currently Resides in**: CA **First car**(s): 1976 Datsun 280z **Favorite Race Car**: Bob Sharp CP 280zx **Design Judge since**: 2015

DESIGN JUDGE BIOS CONT.

Aratz Pinter: **Alma Mater**: Tecnun, University of Navarra, Industrial Engineering, MS Mechanical Engineering 2013.University of Sheffield Aerospace Engineering 2012 **Employment History**:Rivian Automotive-> Aerodynamic Design Lead, Nissan Technical Center Europe-> Drivability and Acceleration Performance Engineer.Gearbox and IC calibration. FSE-> team leader **Expertise**: Mechanical Design, IC Powertrain, Aerodynamics. **Currently Resides in**: MI **First car**: 05 Toyota Aygo **Favorite Race Car**: Mazda 787b **Design Judge since**: 2014 (Spain)

John Rappolt: **Alma Mater**: Cal Poly San Luis Obispo: BS and MS in Mechanical Engineering. **Employment History**: '14-Present: Space Systems Loral: Mechanical Engineer, Structural Analysis. '11-'13: Cal Poly FSAE: Driver Controls Lead, Chassis Lead, Technical Director. **Expertise**: Structures, Metallic Materials, Composite Materials. **Currently Resides in**: CA **First car**: 1998 Toyota Camry **Favorite Race Car**: Ford GT40 MkII for its 1-2-3 finish in the 1966 24 Hours of Le Mans. **Design Judge since**: 2017.

William (Bill) E Redinger P.E.: **Alma Mater:** University of Nebraska: Mechanical Engineering '72. **Employment History:** Ford Motor Company Engine and Foundry Division; Advanced Engine Development, Emission Development and Advanced Engine Emission and Fuel Economy Calibration. OPPD; Power Plant Design, Construction and Operation. **Expertise:** Internal Combustion engines, Chassis Engineering, Aerodynamics, Structures **Currently Resides in:** NE **First Car:** Triumph TR3 **Favorite Race Car:** Lotus 38 **Design Judge since:** 1999

Craig Redinger: **Alma Mater:** University of Nebraska: Mechanical Engineering '97 **Employment History:** Honda Research & Development, 7yrs body-in-white, 5 vehicle concepts, 5 new technology and platform strategies **Expertise:** Platform development, vehicle performance, cost and manufacturability **Currently Resides in:** OH **First Car:** Triumph Mark IV Race Car that was not street legal, purchased at 15yrs of age (Needless to say my mom was not happy at my Dad for letting me purchase it) **Favorite Race Car:** GT40 **Design Judge since:** 2013

Ryan Richman: **Alma Mater**: University of British Columbia BS in Mechanical Engineering. **Employment History**: '14 – present: BD Diesel Performance, Design Engineer. **Expertise**: Turbocharged systems and internal combustion systems. **Currently Resides in**: BC, Canada. **First car**: '98 Volvo V70 Stationwagon (the definition of understeer). **Favorite Race Car**: 1999 BMW M3 Knox Spec

David Rimel: **Alma Mater**: Colorado State University: BS Industrial Management; Colorado School of Mines: MS Environmental Science and Engineering **Employment History**: Vehicular emissions research and testing; Auto paint spray booth consulting, permitting; Body shop owner/operator; 40+ years of vehicle repair and restoration **Expertise**: Automotive body/frame; Vehicular emissions **Currently Resides in**: CO **First Car**: '56 Chevy Bel Air w/ 347 ('57Pontiac) tri-power **Favorite Race Car**: Well executed FSAE project **Design Judge since**: 2012

Neil Roberts: **Alma Mater**: Texas A&M: BS in Aerospace Engineering **Employment History**: '12+: Honda Performance Development, Project Lead for Indycar Aero Kit. '10 – '12 Northrop Grumman Corp, UAV Design Engineer. '96 – '10 Swift Engineering, Senior Design Engineer. '91 – '94 Hall/VDS Racing Indycar Team, Assistant Engineer **Expertise**: Design and engineering of everything except the engine Publications: Think Fast – The Racer's Why-To Guide to Winning **Currently Resides in**: CA **First car**: AMC Gremlin (Never buy a used car in the dark!) **Favorite Race Car**: Swift 014.a Toyota Atlantic (My **First car** as Chief Engineer, and a beautiful car) Judge since: 2000

Eric Schieb: **Alma Mater:** Georgia Institute of Technology, '92, BS in Mechanical Engineering. **Employment History**: Electron Speed, Elan Power Products, TRW Automotive, Kelsey-Hayes, GM (the bulk of this is system-level, data-driven development of automotive, performance, electronic controls) **Expertise:** data-based, hands-on, system-level development. **Currently Resides in:** GA **First car:** Mini 1000 **Favorite Race Car:** The one that is making me think **Design Judge since:** 2002

DESIGN JUDGE BIOS CONT.

Shane Schulze**: Alma Mater**: Michigan State University, BS Mechanical Engineering '02; University of Michigan, MS Engineering Management '06; University of Michigan, MS Electrical Engineering '08. **Employment History**: Currently General Motors hybrid calibration engineer with engine / transmissions / electric motor / HV battery integration. Prior: 13+ years Ford Motor Company HV battery test SME and HV safety SME, including thermal / diagnostics / controls / calibration / design & release on the HV battery and charging systems. **Expertise**: Hybrid and Electric HV battery systems and calibration. **Currently Resides in**: MI **First car**: '86 GMC S15 – first lesson that you should never have spare parts after a rebuild... **Favorite Race Car**: Ford Fusion Hydrogen 999 -world's fastest fuel cell car. **Design Judge since**: 2017

Ana Sopalovic: **Alma Mater**:..Tecnun, University of Navarra, Industrial Engineering, MS Mechanical Engineering '12 **Employment History**: GKN Driveline, '13+ electric powertrain design, development and integration. Started the Tecnun FSE Team in '10 **Expertise**: Mechanical Design, Electric Powertrain, System Integration **Currently Resides in**: MI **First car**: '98 Rover 623GSi **Favorite Race Car**: Shelby Cobra 427 **Design Judge since**: 2014 (Formula Student Spain)

Benjamin Stabler: **Alma Mater:** Stanford University: BS in Computer Science and MS in Electrical Engineering. **Employment History:** 2015-Present: SpaceX: Power Electronics Engineer; 2013-2014: Kespry: CTO; Prior: Mission Motors and Renovo. **Expertise:** Power electronics design and analysis, inverter design, motor control algorithms, battery management. **Currently Resides in:** Los Angeles, CA **First Car:** Honda S2000 (AP2, before traction control was added) **Favorite Race Car:** Ferrari 330 P4, a masterpiece **Judge Since:** 2017

Nachiket Vader: **Alma Mater**: University of Michigan - Dearborn: MS in Mechanical Engineering, University of Mumbai, Bachelors in Mechanical Engineering. **Employment History**: Feb 2016-Present: Rivian Automotive; Powertrain Simulation/Controls Engineer, Nov 2015- Feb 2016: FEV Inc.; Project Engineer, Feb 2013 – Nov 2015: FCA (MBTech NA) Electricified Powertrain Simulation Engineer. **Expertise**: Hybrid Powertrain Simulations, SiL, MiL. **Currently Resides in**: MI **First car**: '03 Saab 9-3 2.0t **Favorite Race Car**: Alfa Romeo Guilia **Design Judge since**: 2017

Hannah Westbrook: **Alma Mater:** University of Pittsburgh: Electrical Engineering, Mechanical Engineering minor **Employment History:** MoTeC Systems East: Applications Engineer, Electronics Lead, FSAE **Expertise:** Motorsports Industry, Data Acquisition systems, Electronics Integration, Powertrain **Currently Resides in:** NC **First Car:** 2003 Honda Civic **Favorite Race Car:** Budweiser Rocket Car. The FIRST car to go supersonic... way back in 1979! **Design Judge since:** 2014

James Whisler: **Alma Mater:** Iowa State University: Mechanical Engineering **Employment History**: MoTeC Systems East: Applications Engineer; Engine Systems Lead, FSAE **Expertise:** Motorsports industry, powertrains, electronics integration, data acquisition systems **Currently Resides In:** NC **First car:** 1976 Datsun 280Z **Favorite Race Car:** Mazda 787B **Design Judge since:** 2013

Christian Yaeger, PE: **Alma Mater**: Georgia Tech, Mechanical Engineering **Employment History**: John Deere Sugarcane Harvesters, Flying Sheep Engineering, Deltawing Racing Cars **Expertise**: Differentials, Torque Vectoring, Transmission Layout, Patent Process **Currently Resides in**: GA **First car**: '92 Accord (RIP 315k) **Favorite Race Car**: '55 Mercedes-Benz 300SLR **Design Judge since**: 2012

SPONSORS

THANK YOU TO OUR 2017 SPONSORS

EVENT PARTNERS

COOPERTIRES

HONDA
The Power of Dreams

SOLIDWORKS

GOLD SPONSOR

GENERAL MOTORS

SILVER PARTNERS

BLUE ORIGIN

Ford
Go Further

LINCOLN
CONVENTION AND VISITORS BUREAU

MathWorks

SPACEX

TENNECO

BRONZE PARTNERS

Hoosier
RACING TIRE

Nebraska Ethanol Board

YAZAKI

FRIEND OF FORMULA

ANSYS

Brüel & Kjær

HUMAN SOLUTIONS ASSYST AVM

Kawasaki

LINCOLN ELECTRIC

PSIM

SCCA FOUNDATION
Sports Car Club of America

SUNOCO
RACE FUELS

VI-GRADE