



ARKANSAS ELECTRIC VEHICLE RALLY

Rules & Regulations

Please refer to the following documents for additional information regarding event location and schedules:

COMPETITION SCHEDULE

ARKANSAS EV RALLY ANNOUNCEMENT

The schedule and location of events is subject to change. Copies of all Rules, Specifications, and Forms are available upon request. Be sure to pick up a copy of the final schedule at Registration.

ELIGIBLE VEHICLES

One class of vehicle will be included in the 2010 Arkansas EV Rally. Each vehicle must comply with the appropriate vehicle specifications, provided separately, for that class of vehicles. Schools may enter more than one vehicle in a particular class. Teams and their vehicles must compete in all events. Trophies will be awarded for each event, as well as overall awards. Refer to Scoring for discussion of multiple entries.

EM-TVs – includes electric vehicles meeting the prescriptive specifications for this class or assembled from kits provided by EV Master, Inc. Single and dual motor vehicles will compete in the same class.

TEAM MEMBER CONDUCT/UNSPORTSMANLIKE CONDUCT

Alcohol, drugs, and other controlled substances are not allowed. The use of these substances by any team member will disqualify the entire team. Smoking is prohibited in all competition, display, charging, and garage areas.

Any participant who at any time or in any place uses improper, inflammatory language or gestures or exhibits reckless behavior shall be guilty of unsportsmanlike conduct and will be removed from the competition immediately. Teams may be disqualified from an event for unsportsmanlike behavior.

The Arkansas EV Rally reserves the right to revoke any participant's credential. Also refer to the Protest Procedure described on the last page of these rules.

FORMS AND WAIVERS

Before the Arkansas EV Rally begins, team members and faculty advisors MUST sign forms, waivers of liability, etc. These documents will be sent several weeks prior to the event. Any participant who does not complete the appropriate form will not be allowed to register. That person will remain a spectator at all competitive events. PROPERLY SIGNED WAIVERS FOR ALL TEAM MEMBERS MUST BE PRESENTED AT REGISTRATION.

REGISTRATION FOR TEAMS

Pre-registration is required for all schools planning to compete. All team members **MUST** be registered by the close of registration in order to compete. Team members and teachers who are involved in Technical Inspection may register for the entire team. (See section on Technical Inspection below.)

PLEASE BE SURE TO ALLOW ENOUGH TIME IN CASE OF DELAY.

TEAM SIZE

There is no limit on the size of each school team. Competition is designed for a minimum of five team members. Under no circumstances will only one student compete in the Troubleshooting competition. If necessary, faculty may supervise more than one team from the same school.

Teams are free to invite any VIPs, parents or guests to the event. There is no fee.

DRESS CODE

Rally participants are expected to dress and present themselves in a professional manner. Refer to vehicle specifications for specific protective clothing requirements during vehicle events.

HOSPITALITY

As part of the Arkansas EV Rally, lunch will be provided. All other meals are on your own.

DRIVER QUALIFICATION/DRIVER EQUIPMENT

Drivers of full-size vehicles for all events must be at least 16 years of age, must possess a valid drivers license, and must have experience driving the competition vehicle.

Drivers of all vehicles must submit a completed, signed waiver at Registration. It is the responsibility of the driver, their teachers, advisors, and school to have sufficient experience and capability to drive the vehicles in competition. AREVR and its sponsors assume no responsibility for evaluating the ability of drivers to compete but reserve the right to disqualify drivers from competition. Drivers must wear a competition safety helmet with a rating of Snell 90 or better. Team members must comply with all safety requirements detailed in the vehicle specifications for the appropriate vehicle class. Teams shall be responsible for providing all specified equipment.

MOVEMENT OF VEHICLE

Whenever vehicles are moved at the competition site, vehicles must be driven at a walking pace with at least one team member walking beside the vehicle. When vehicles are moved from the competition site to an outside site, they must be hauled appropriately or properly escorted.

MODIFICATION OF VEHICLES DURING THE COMPETITION

Teams are encouraged to build well-rounded vehicles that perform well in all driving events that test the performance of a vehicle under a variety of conditions. Vehicles must compete in all events. Modification of vehicles during competition to gain a performance advantage is limited to drive system and tire changes (including motor wiring and gear ratios). Modifications and repairs required as a result of equipment and component failure may be performed as needed.

AREVR staff must be notified before performing all modifications and repairs. Following all modifications and repairs, the vehicle must be re-inspected before it can be allowed to compete. Refer to vehicle specifications for additional guidance on modifications and component replacement.

TECHNICAL INSPECTION

5 POINTS

Technical Inspection will be conducted on Friday morning beginning at 8:30 a.m. on a first-come, first served basis. Inspection must be completed by 9:00 a.m. Friday morning. Please allow adequate time to arrive, unload and prepare for inspection. Technical inspection will be located at the competition site. Directions to the site may be found on the Local Info sheet. Teams that arrive late to their scheduled time at Technical Inspection will forfeit 1 point.

Only two students and one adult are required to be present at Technical Inspection. Two students will lead inspectors through the checklist. Inspect your own vehicle before coming to the competition to insure compliance. If your vehicle is rejected, you will be allowed 30 minutes to work on it and present it for re-inspection. YOUR VEHICLE MUST SUCCESSFULLY COMPLETE TECHNICAL INSPECTION TO PARTICIPATE IN ANY OF THE EVENTS.

VEHICLES SHOULD COME TO THE COMPETITION FULLY CHARGED. There will be no on-site charging on Thursday. If charging is allowed at the competition site on Friday, your charger must be inspected as part of Technical Inspection.

TROUBLESHOOTING

20 POINTS

This competition will be held on Friday at the competition site. The specific location will be announced. The troubleshooting event is intended to provide students with an opportunity to diagnose faults in an EV. Each team will select three (3) members to participate in the Troubleshooting competition. Teams will be scheduled to compete and a schedule will be posted at registration. Teams which arrive late for their scheduled time will forfeit 3 points.

Troubleshooting is a timed event. Prior to the start of the timed period, an AREVR staff member will review the rules with contestants, make sure they are wearing proper safety gear, and answer questions. The total time of the event is seven (7) minutes for visual inspection, identification of several faults that have been placed in the vehicle's electrical system, and written assessment. Students will be provided with the vehicle's wiring diagram and an assessment sheet to record their assessments. Students may use a multimeter and the vehicle's wiring diagram to diagnose the faults. Notes may not be used. A multimeter will be provided for the teams that do not bring one. ***STUDENTS MUST WEAR RUBBER GLOVES AND SAFETY GLASSES OR GOGGLES FOR THIS EVENT.***

The team must provide its assessment entirely on a written form provided. Students will be expected to provide both a diagnosis for the fault and a possible solution.

Judging and scoring will be based on the following categories:

- Fault Diagnosis 50%
- Prescribing solution 50%

The winner of the event will be the team that most accurately describes the faults and provides the best solutions. In the event of a tie between teams, the winner will be the team that has the quickest time in submitting their written assessment and the clarity and completeness of the written assessment.

The entire team may be present to view this competition, however, other teams are excluded. A team will be disqualified from Troubleshooting if viewing team members communicate with participating team members. Efforts will be made to ensure that students from other teams will not be allowed to view the competition before their scheduled time.

Teams will be given the choice of performing troubleshooting on either the EV Master EM-TV or an EV simulator. However, to facilitate keeping on schedule, **it may be necessary to assign teams to one or the other if there are not enough volunteers.** Teams should familiarize themselves with both. Wiring diagrams for the vehicle and simulator will be provided in advance of the competition for study.

STUDENT ORAL PRESENTATIONS

15 POINTS

This competition will be held on Friday at the competition site concurrently with the Troubleshooting competition. Teams will be scheduled to compete and a schedule will be posted on Friday at registration. It will be the responsibility of each team to make sure that they are on time. Teams that arrive late for their scheduled time will forfeit 3 points. Each school team will make a presentation choosing from one of the following two categories (A or B):

A. Describe your school's EV program by addressing the following questions:

1. What are the educational benefits for students involved in the EV program?
2. What are the impacts of the EV program on you, your school, and your community?
3. What is the value of EV education in general to businesses and industries involved with advanced transportation?

B. Use a debate format to support or refute the following statement:

"Battery-powered electric vehicles have become obsolete, replaced by hybrid and fuel cell powered vehicles. All further research and development in alternative transportation should be directed to these areas."

Teams must prepare an abstract and bibliography and submit three copies to the judges. Each team will select no fewer than two students and no more than four students to be involved in the presentation. Presentations must be live, without the aid slides, overheads, TV and video equipment, or computer-based presentations. No AV equipment will be provided. If props and supporting materials are utilized, the time limit will include any set-up time. The presentations should focus on the topic and effective delivery, not the mechanics of AV presentation.

The presentations must be no less than 4 minutes and no more than 7 minutes in length. Presentations will be judged on effectiveness of addressing the topic (45%), overall creativity (45%), and adherence to rules (proper length, etc. 10%). Please refer to additional notes and scoring forms for Oral Presentations.

ACCELERATION

10 POINTS

This competition will be held Friday at the competition site. Teams will run in the order assigned Friday morning. Failure to enter your vehicle in its required order for each attempt will result in a DNF for that attempt. Remember, your vehicle cannot compete unless it has passed technical inspection.

The course will be a timed straight-line course. A starting flag or light will signal the start. Vehicles' elapsed time will be measured from the starting signal to the end time the vehicle exits the course. Vehicle speed at the end of the course will also be measured. Competition staff may flag a driver to stop if unsafe conditions are observed. Failure to comply with rules, competition staff instructions, or reckless operation can result in disqualification for that event.

There will be at least two attempts per team. The field of vehicles will be able to make three (3) attempts if time allows. Teams can use the same driver on each attempt or change drivers. A team's fastest elapsed time will be the recorded team time. The fastest overall elapsed time will be the competition class winner.

AUTOCROSS COURSE

15 POINTS

This competition will be held Friday at the competition site. Teams will run in the order they were assigned on Friday. Failure to enter your vehicle in its required order for each attempt will result in a DNF for that attempt. Remember, your vehicle cannot compete unless it has passed technical inspection.

The course will be a timed course marked by rubber pylons that will require both left and right turning. A time penalty will be assessed for each pylon that is displaced. Competition staff may flag a driver to stop if unsafe conditions are observed. Failure to comply with rules, competition staff instructions, or reckless operation can result in disqualification for that event. Drivers will be given an opportunity to walk the course prior to the competition.

There will be at least two attempts per team. The field of vehicles will be able to make three (3) attempts if time allows. Teams can use the same driver on each attempt or change drivers. A team's fastest time will be the recorded team time. The fastest overall time will be the competition class winner.

EV QUIZ BOWL

20 POINTS

This competition will be held on Friday at the competition site. Each team will select no fewer than two students and no more than four students to be involved. The competition will consist of two rounds:

ROUND 1

- All questions valued at 5 points each
- A reader will read the question aloud to the group. The question will be read only once. After the question is read, teams have 20 seconds to record their answers.
- Teams will provide written answers. (Cards and markers furnished)
- No penalties for incorrect answers
- Answers will be Fill-in-blank or Multiple Choice
- Round 1 concludes in 20 questions or 30 minutes, whichever comes first

ROUND 2

- Points from Round 1 continue
- A reader will read the question aloud to the group. The question will be read only once. After the question is read, teams have 20 seconds to record their answers.
- Teams will provide written answers. (Cards and markers furnished)
- All questions are valued at 10 points each.
- No penalties for incorrect answers
- Answers will be Fill-in-Blank or Multiple choice.
- An optional “Bonus Question” valued at 15 points could be asked.
- Round 2 concludes in 20 questions or 30 minutes which ever comes first.

There will be a 10-minute break to post scores and determine the top 3.

RANGE

15 POINTS

This competition will be held Friday at the competition site. Teams will start in the order they were assigned on Friday. Failure to enter your vehicle in its required order will result in a Did Not Finish (DNF). Remember, your vehicle cannot compete unless it has passed technical inspection.

EM-TVs will follow a course contained within the competition area.

- Range will be determined by measuring the number of laps completed of a closed course during a prescribed time interval between 30 and 60 minutes in length. The interval will be announced at registration.
- Vehicles will line up on a starting grid in the order assigned Friday. They will start from a standing start and proceed around the closed course loop at a safe speed. Team members will be required to record lap numbers and elapsed time (to the nearest second) of each lap on a form provided. **Teams should furnish their own stopwatches for timing.** To insure fair counting, we may swap volunteers between teams so that the counts will be observed by other teams’ members.
- Each team will be assigned a pit area adjacent to the course. “Pit stops” will be required at regular intervals (5 – 10 minutes) during the event. During the pit stop the driver must switch and the pit crew must record battery pack voltage on the forms provided at registration.
- Because more than one vehicle will be operating on the course at a given time, drivers must exercise caution – especially when entering and leaving the pit area. Vehicles must stay to the right except to pass. Passing will only be permitted in designated areas on the course.
- Course monitors will use a set of flags to signal the drivers.
 - Red flag = stop on next lap for pit
 - Yellow flag = caution – no passing this will be used if an unsafe condition exists on the course.
 - Black flag = Penalty – this will be used if a driver is observed operating a vehicle in a reckless or unsafe manner or violates the rules. A black flagged driver must pull off the course and stop as soon as it is safe to do so. In the event of a safety violation, AREVR officials may issue a warning. For more serious infractions or repeat offences the official will issue a penalty. In that case, the vehicle must enter the pits immediately on the next lap and remain parked in the pits for a penalty period of 2 minutes. At the end of the penalty period, the vehicle may re-enter the course. Any vehicle that receives more than two penalties will be disqualified for this event. The decision of the officials is final and is not open to dispute.

SCORING

The overall AREVR winner in each class will be determined by adding points earned for each competition based on the value assigned. The overall class scores will be computed using the school's troubleshooting, oral presentation, and quiz bowl scores. Ties will be broken first by the student oral presentation and then by the troubleshooting scores. Point values for each event are as follows:

Technical Inspection (5 points)

0-1 faults	5 points
2 faults	4 points
3 faults	3 points
4 faults	2 points
5 faults	1 point
6 or more	0 points

PLEASE NOTE: NO AWARDS WILL BE GIVEN FOR PLACEMENT IN TECHNICAL INSPECTION.

Troubleshooting - 20 Points

1 st place	20 points
2 nd place	17 points
3 rd place	14 points
4 th place	11 points
All others (except DNF)	5 points

Student Oral Presentations - 15 Points

1 st place	15 points
2 nd place	13 points
3 rd place	11 points
4 th place	9 points
All others (except DNF)	4 points

Acceleration - 10 Points

1 st place	10 points
2 nd place	8 points
3 rd place	6 points
4 th place	4 points
All others (except DNF)	1 point

Autocross Course - 15 Points

1 st place	15 points
2 nd place	13 points
3 rd place	11 points
4 th place	9 points
All others (except DNF)	4 points

EV Quiz Bowl - 20 Points

1 st place	20 points
2 nd place	17 points
3 rd place	14 points
4 th place	11 points
All others (except DNF)	5 points

Range - 15 Points

1 st place	15 points
2 nd place	13 points
3 rd place	11 points
4 th place	9 points
All others (except DNF)	4 points

CHARGING

It is the responsibility of each team to charge their vehicle(s) prior to arrival at the competition area. AREVR staff is making provisions for vehicle charging on-site Friday afternoon maybe time permitting. Vehicle chargers must comply with the charger specifications for that class and pass Tech Inspection. Charger outlets will be 120-Volt circuits. Vehicle charging will be monitored for safety by AREVR staff. Every effort will be made to insure that the vehicles receive the same charge time, however, teams should make sure that vehicle chargers function properly prior to competition. Chargers should be equipped with automatic controls.

PROTEST PROCEDURE

Any participating team can file a protest. The protest can be against a) an entry or team's qualification and conformity to the rules, or b) an incident or person related to the competition during the competition.

In order to discourage unreasonable protests by participants, the protesting team will surrender, as bond, 10 points per protest to the Jury, to be restored or retained based on the outcome.

The protest must be made on the Protest Form, signed by the faculty advisor and presented to the Competition Headquarters for review by the Jury. All protests must be made within an hour of the incident. The Jury will hear the protest as soon as practical, and all parties concerned will be given adequate notice of the time and the location of the hearing. The Jury will be comprised of 2 teachers randomly selected plus one AREVR staff member. The Jury is the only authority to hear and rule on a protest. The Jury's decision is final.

VEHICLE NUMBER

All competing vehicles must have numbers. Refer to the vehicle specifications for number size and placement. Vehicles without numbers will be assigned one at the competition.

AWARDS

Plaques will be awarded for First and Second places in every event for each class except Technical Inspection. Overall trophies will be awarded for the top three teams.