



Collegiate Series 2023 Rules
Released: October 3rd, 2022

TABLE OF CONTENTS

1.0 INTRODUCTION

2.0 RISK AND SAFETY

3.0 GOVERNING AUTHORITY

4.0 PARTICIPATION & ELIGIBILITY REQUIREMENTS

5.0 PROGRAM ROLES

6.0 VEHICLE SPECIFICATIONS AND REQUIREMENTS

7.0 ACADEMIC CHALLENGE

8.0 EVENT REQUIREMENTS

APPENDIX A - Participation Forms

APPENDIX B – Power and Energy Monitor

Summary of key changes in this revision:

- All sections: Renumbered and reorganized
- Section 2.0 Risk and Safety: Updated
- Section 5.0 Program Roles: Updated and clarified
- 7.0 Academic Challenge: New scoring and revised events
- 8.9 Qualifying: New qualifying process
- 8.10 Race Length: Specified race length

Process to revise this ruleset:

- At his/her discretion, the Director of Event Operations (DEO) may request feedback and input from other stakeholders and subject matter experts.
- The DEO will draft the revised rules document.
- The DEO will circulate the draft rules document to and gain approval from the Race Operations Director, Purdue Risk Management, and Purdue Legal.
- The DEO will publish the final approved rules document to the evGrandPrix website and notify all participants.

1.0 INTRODUCTION

- 1.1 The mission of the Purdue evGrandPrix Collegiate Program is to provide a fun and exciting opportunity for students to apply their engineering and technology education to design and build an electric go-kart to compete against other collegiate teams. The goal is for students to develop important professional skills that create incredible career opportunities.
- 1.2 This integrated program is learning by doing within a Motorsports environment. Using electrically powered go-karts as the focus, the program inspires students to commit their creative energies to learning about, developing, and showcasing the future of electric vehicle technologies.
- 1.3 To compete in the evGrandPrix, students organize a team at their school and partner with industry, government agencies, and community outreach programs that help to fund the program.
- 1.4 The evGrandPrix is an educational program that has a Motorsports theme. The primary objective is to ensure that an effective ruleset has been put in place to give the students the opportunity to immerse themselves in applying STEM principles while making sure risks are minimized. Safety is the top priority, and the goal is to maintain a safe environment that enables a fun and rewarding educational experience for all participants.

2.0 RISK AND SAFETY

- 2.1 Assumption of Risk, Liability Release, Medical Insurance, Acknowledgement, and Indemnity

ASSUMPTION OF RISK – EVERY MEMBER AGREES TO BE BOUND BY THE RULES AND ASSUMES ALL OF THE RISK OF SUCH MEMBER’S INVOLVEMENT AND/OR PARTICIPATION IN AN EVENT.

LIABILITY RELEASE – RECOGNIZING THAT KART RACING AND ALL OF THE ACTIVITY ASSOCIATED WITH IT (“ACTIVITY”) CAN BE A HAZARDOUS UNDERTAKING, MEMBERS FOR THEMSELVES, THEIR HEIRS, EXECUTORS, REPRESENTATIVES, SUCCESSORS AND ASSIGNS, AGREE, BY THEIR MEMBERSHIP, THAT THEY RELEASE AND DISCHARGE EVGRANDPRIX, PURDUE UNIVERSITY, THE TRUSTEES OF PURDUE UNIVERSITY, AND ANY OF ITS OR THEIR DEPARTMENTS, TRUSTEES, AFFILIATED, EMPLOYEES, OFFICERS, AGENTS, AND INSURERS (“THE RELEASED PARTIES”) FROM ANY AND ALL LIABILITY FOR DAMAGES TO PROPERTY, PERSONAL INJURY, AND/OR DEATH, IN ANY WAY RELATING TO ANY EVENT OR THE MEMBERS’ INVOLVEMENT AND/OR PARTICIPATION IN THE ACTIVITY, REGARDLESS OF HOW THE INJURY OR EVENT MIGHT ARISE INCLUDING WITHOUT LIMITATION RACE OFFICATING, RULE INTERPRETATION AND VIOLATIONS, PHYSICAL CONDITION OF THE TRACK, AND/OR EMERGENCY TREATMENT OR RESCUE.

ACKNOWLEDGEMENT – MEMBERS RECOGNIZE THIS RELEASE APPLIES REGARDLESS OF



WHETHER OR NOT INJURY OR EVENT MIGHT BE CAUSED IN WHOLE OR IN PART BY THE NEGLIGENCE OR OTHER FAULT OF THE RELEASED PARTIES. MEMBERS MAY BE ASKED TO ACKNOWLEDGE THIS ASSUMPTION OF RISK AND RELEASE BY OTHER AGREEMENTS THEY MIGHT SIGN AS A PREREQUISITE TO PARTICIPATE IN THE ACTIVITY.

INDEMNITY – EACH MEMBER ACKNOWLEDGES THAT MEMBER IS RESPONSIBLE FOR VIOLATION OF MEMBER’S AGREEMENTS BY MEMBER, MEMBERS’S REPRESENTATIVES INCLUDING LOVED ONES AFFECTED BY MEMBER’S INVOLVEMENT PARTICIPATION, AND MEMBER’S PARTICIPANTS AND GUESTS. THIS RESPONSIBILITY APPLIES TO ALL VIOLATIONS OF MEMBER’S AGREEMENTS WITH EVGRANDPRIX. THIS INCLUDES THE MISUSE OF CREDENTIALS AND THE FAILURE TO ACCEPT THE ASSUMPTION OF RISK, THE WAIVER AND RELEASE OF LIABILITY, THE BINDING NATURE OF THE RULES, EVGRANDPRIX’S INTERPRETATION OF THE RULES, AND THE FINALITY OF THE APPEAL PROCEDURE. MEMBER UNDERSTANDS THAT THIS RESPONSIBILITY INCLUDES THE DUTY TO INDEMNIFY AND HOLD THE RELEASED PARTIES HARMLESS FROM AND AGAINST ANY AND ALL LOSSES, LIABILITIES, DAMAGES, COSTS OR EXPENSES (INCLUDING BUT NOT LIMITED TO REASONABLE ATTORNEYS’ FEES AND OTHER LITIGATION COSTS AND EXPENSES) INCURRED BY ANY OF THE RELEASED PARTIES AS A RESULT OF ANY CLAIMS OR SUITS THAT I (OR ANYONE CLAIMING BY, UNDER OR THROUGH ME) MAY BRING AGAINST ANY OF THE RELEASED PARTIES TO RECOVER ANY LOSSES, LIABILITIES, COSTS, DAMAGES, OR EXPENSES THAT ARISE DURING OR RESULTING FROM MY PARTICIPATION IN THE ACTIVITY, REGARDLESS OF WHETHER OR NOT CAUSED IN WHOLE OR PART BY THE NEGLIGENCE OR OTHER FAULT OF ANY OF THE RELEASED PARTIES.

2.2 Safety

- 2.2.1 Safety Policy – While the evGrandPrix seeks to maintain safe conditions for competitors and others, members recognize that conditions may not be safe and can be affected by human error. At any event, each member acknowledges and agrees that racing is a hazardous activity and each member’s involvement and/or participation is with expressed assumption of this risk.
- 2.2.2 While acknowledging the inherent risk of racing to competitors and other members involved and/or participating in an event, members are personally responsible for their own safety, for the safety of each member of their team, and for the safety of their racing equipment.
- 2.2.3 evGrandPrix may take any action including canceling, postponing, temporarily stopping or delaying an event, if evGrandPrix staff determines that safety requires such action. evGrandPrix may order off the track any member or kart that evGrandPrix determines constitutes a hazard. evGrandPrix may prohibit any member or member’s equipment from entering or continuing in an Event.

3.0 GOVERNING AUTHORITY

- 3.1 This document presents the vehicle specifications to be followed for the building of a racing go-kart and the team equipment needed to compete in the Collegiate evGrandPrix Program. The specifications contained herein will be always enforced.
- 3.2 The specifications and requirements herein are to be interpreted and penalties applied and enforced by the evGrandPrix Director or a committee he/she establishes for that purpose.
- 3.3 Race Events are sanctioned by Purdue University and/or a qualified organization of its choosing.
- 3.4 This document is a living document that is continually edited and updated. All updates will be communicated and published to all participants. If an item is not specifically listed as authorized, it is assumed to be prohibited until addressed. Participants may request a rules clarification or deviation by completing and submitting the *Rules Request form* to the evGrandPrix Director. The request must be submitted no later than 30 days before the event to which it pertains. The evGrandPrix Director or a committee he/she establishes will review the request and respond as soon as reasonably possible.

4.0 PARTICIPATION & ELIGIBILITY REQUIREMENTS

- 4.1 Each team must be comprised solely of students currently enrolled full-time in a degree program at a college or university. Teams may include students from multiple universities, but one university must be the official representing university for the entire team. All interactions between evGrandPrix and the team will be through the representing university. Students that have graduated within the past 6 months remain eligible to participate.
- 4.2 A representing university or student organizations within the university may compete with multiple karts, but each kart must have a designated team (race crew) during all official evGrandPrix events such as qualifying and the race. No student may serve on more than one race crew during evGrandPrix events.
- 4.3 During official evGrandPrix events, each kart's team (race crew) must consist of no less than three (3) people and must include one (1) driver, one (1) crew chief, and at least one (1) track worker. No student may be a member of more than one team during official evGrandPrix events.
- 4.4 All drivers and crew chiefs must complete Drivers Safety training before participating in any evGrandPrix event.
- 4.5 Required Forms & Memberships

- 4.5.1 Participants: All participants are required to sign a *Waiver, Release, and Hold Harmless Agreement* for every event in which they participate. Participants under 18 must have the agreement signed by their parent or legal guardian. This form must be submitted to the Director of Event Operations prior to participation in evGrandPrix events.
- 4.5.2 Teams: Each team must complete, sign, and return the *Annual Series Commitment / Participation Agreement* to the Director of Event Operations prior to participating in an evGrandPrix event.

Conduct – Good sportsmanship and honorable conduct are always expected of participants. Everyone associated with the evGrandPrix is expected to behave in a respectful and orderly manner. This policy includes but is not limited to teams, drivers, family members, crew, spectators, sponsors, and guests. Physical violence, verbal abuse, threats, or intimidation directed at anyone during or outside an event will be subject to immediate disciplinary action, including disqualification and ejection from the event.

5.0 ROLES & POSITIONS

- 5.1 evGrandPrix Director – The evGrandPrix Director is assigned by Purdue University to oversee and manage the evGrandPrix Program.
- 5.2 Director of Event Operations (DEO) – The Director of Event Operations is designated by the evGrandPrix Director to manage evGrandPrix events including, but not limited to, Test & Tunes and the evGrandPrix race. The DEO is the final authority on rules interpretations and enforces proper and appropriate conduct of all Program staff, volunteers, participants, and spectators. The DEO may appoint personnel and organize subcommittees as deemed necessary to help carry out their duties. These duties include, but are not limited to, Safety Director, Technical Inspector, Chief Scorer, and Director of Race Operations.
 - 5.2.1 Safety Director – The Safety Director is designated by the DEO and ensures all aspects of safety adhere to the rules and commonly known safe practices during evGrandPrix events. The Safety Director reports all concerns and recommendations to the DEO and the DEO determines and enforces the course of action.
 - 5.2.2 Technical Inspector – The Technical Inspector is designated by the DEO for a technical inspection of each kart. Each kart must receive approval from the Technical Inspector before it is allowed to participate in an evGrandPrix event.

- 5.3 Director of Race Operations – The Director of Race Operations (DRO) is designated by the DEO. The DRO is responsible for all decisions during the race and oversees the race from start to end. The DRO is also responsible for driver training and track worker training.
- 5.3.1 Chief Scorer – The Chief Scorer is designated by the Director of Race Operations and is responsible for establishing qualifying times and accounting race laps and penalties to determine race finishing position.
 - 5.3.2 Pit Steward – The Pit Steward is designated by the DRO and reports directly to the DRO. During the race, the Pit Steward has final authority in the pit area. When a kart suffers a penalty flag (black flag), the Pit Steward will enforce the penalty. The Pit Steward may designate Pit Workers to help with his/her responsibilities.
 - 5.3.3 Gate Attendant – The Gate Attendant is designated by the DRO and is responsible for ensuring everyone entering the track area has the proper credentials and is wearing the appropriate PPE.
- 5.4 **Crew Chief** – Each team must have a designated Crew Chief. The Crew Chief is the official spokesman for the crew. No one other than the Crew Chief may handle a situation with the Director of Race Operations, Director of Safety, or Director of Event Operations. The Crew Chief is responsible for ensuring their team and vehicle adhere to all rules.
- 5.5 **Track Workers** – To participate, each team must provide one track worker to work the event. All track workers must complete an approved track workers training session. It is encouraged that non-drivers and crew chiefs of race teams receive track workers' training to the Awareness Level as defined in NFPA 610.

6.0 VEHICLE SPECIFICATIONS AND REQUIREMENTS

6.1 Chassis

- 6.1.1 Frame – Teams must race with a commercially available “sprint kart” chassis. Reducing the structural integrity of the OEM chassis in anyway is prohibited. It is permissible to add components to the chassis, but All parts of the race vehicle must always clear the ground. If any part of the race vehicle is seen to be dragging or deemed a potential a hazard during technical inspection, practice, qualifications, or race, penalties may be incurred.
- 6.1.2 Wheelbase – Distance must be 43” maximum and 39.75” minimum. Wheelbase measurement is taken on a line beginning at a point perpendicular to the rear axle centerline forward to the point on the horizontal spindle front axle centerline on which the hub rides nearest the kingpin bolt. Both sides must meet this max and min rule.
- 6.1.3 Tires – The approved tire for the series is Hoosier racing tire compound R60B. The sizes are 4.5/10.0/5 fronts and 7.1/11.0/5 rears. Tires must be run as supplied by the manufacturer, no alterations or additives are allowed. Those found to have altered a tire(s) will be subject to disciplinary action.
- 6.1.4 Track Width – Minimum track width is 28” as measured from the outside of one tire to the outside of the opposite tire. Maximum track width or kart width is 55 and 1/8” as measured from the outside to outside of the widest point of the kart.
- 6.1.5 Wheels – All wheels shall be of racing quality and void of any defects. Wheel bearings shall be of a ground ball or roller type only.

6.2 Bumpers and Bodywork

- 6.2.1 Front Impact Bumper – All karts must be equipped with a commercially available front crushable, which is attached to the front bumper to minimize shock in the event of a front impact. The front crushable must be a CIK nose.
- 6.2.2 Impact Bumper Push Back Brackets – All front nose/bumpers must use push back bumper brackets. A time or position penalty will be accessed should the front nose/bumper become dislodged during an event. Driver must be able to latch and unlatch the mount by hand with no tools.
- 6.2.3 Rear Bumper – All karts must have rear protection that extends from the outside of the rear tire/wheel assembly. This must be a CIK-style plastic rear bumper.

- 6.2.4 Sidebars – Sidebars, commonly referred to as “nerf” bars, must be of a “C” type as viewed from above and surround the mainframe in such a manner that any side impact will be transferred to the mainframe directly. Sidebars must have a minimum effective width as measured from the top of the bumper to the bottom of the bumper of six (6) inches, and they must be in a vertical line with each other. Bottom bars must be seven (7) inches or less above the ground, and top bars must be six (6) inches or more above the bottom bar. Distances shall be measured from the centerlines of the bars.
- 6.2.5 Sidebars may be used to mount batteries on the vehicle. Proper protection should be in place to protect battery packs and other components that are mounted on the side.
- 6.2.6 Sidebars must extend to the middle of the rear tires at a minimum. They are not to extend beyond the outer edge of the rear tires.
- 6.2.7 Driver Fairing – A CIK-style driver fairing must be attached to all karts. The driver fairing must have a 3” clearance to any part of the steering wheel. Driver’s fairings may not exceed the level plane of the top of the steering wheel measured with the wheels in a straight line.

6.3 Batteries

- 6.3.1 All race vehicles must be powered from electricity supplied by a battery.
- 6.3.2 All batteries and/or battery packs must be encased in an acceptable enclosure that will prevent the batteries from being punctured. Batteries must be securely attached to the vehicle in such a manner to protect them from direct impact and withstand the forces of impact.
- 6.3.3 Batteries must display all original manufacturers’ labels. Teams must provide battery cell datasheets if requested.
- 6.3.4 Battery Voltage – Battery packs, capacitors, and all other electrical components are limited to a peak voltage of 100 volts.
- 6.3.5 Battery Capacity – A kart’s total stored energy must never exceed 4,320 watt-hours. Teams may use this energy in any number of packs.

Example: A 48-volt system with 90 Amp-hours (Ah) of capacity produces 4,320 watt-hours of energy. The system may consist of two 45Ah packs, three 30Ah packs, or six 15 Ah packs. Other voltages and amp-hour combinations are permitted, so long as the total energy capacity per kart does not exceed 4,320 watt-hours.

Energy storage capacitors may be used for regenerative braking systems, but the energy stored in capacitors is included in the max allowable energy calculation. Teams must provide a method to fully discharge capacitors before the race.

- 6.3.6 Battery and storage capacitors must be wired, so all electrical power is directed through the Power Energy Monitor device. The team is responsible for providing manufacturers specifications to document amp-hour and cell voltage and show total watt-hour calculations if asked by a technical inspector or race official.
 - 6.3.7 Battery Enclosure – Batteries must be enclosed in a solid, shatterproof enclosure, which must meet the approval of the race safety officials. Battery cells inside the enclosure must be isolated by an insulating material and mounted to maintain electrical isolation. The top of a battery pack must be covered by a non-conductive material. Polycarbonate is an encouraged, material for this purpose. The enclosure may contain holes for running cables, and/or for heat dissipation. The purpose of the enclosure is not to create an airtight package, but to protect the batteries from damage in collisions, and to prevent objects and personnel from contacting the battery terminals. Acrylic is strictly prohibited for use in the battery enclosure.
 - 6.3.8 Battery Pack Fastening – Batteries must be enclosed and adhere to battery specifications. Batteries will be safely removable, with proper terminal connections and covers. Elasticized fasteners will not be allowed to secure the batteries to the vehicle. Proper quick disconnects are required and must be properly rated for the expected current draw of the race vehicle. An acceptable quick disconnect is one of the Anderson Multipole family. Race officials will inspect all battery attachment systems to determine that the batteries will remain securely attached to the kart during the race and any foreseeable accident scenario.
- 6.4 **Wiring** – All wires must be rated to handle the voltage and current load that can be applied through the circuit. For clarification, please consult the wire size chart located in the National Electrical Code Article 400 Table 400.5(B). In all cases, manufacturer data will supersede the general information from the NEC. Wiring must be well insulated and securely attached to the vehicle. All wiring must be kept free from moving parts and protected from chafing. Wires that pass through a hole with sharp edges or sheet metal must be protected by an insulating grommet or another suitable device. Terminals must be secured and protected so they will not come loose or short out during competition. No electrical terminals may be exposed. No part of the electrical system may use the vehicle frame as a conductor, and the frame must remain ungrounded.

- 6.5 **Fusing** – A fuse or circuit breaker is required for the electrical circuit between the battery and any electrical load. All fuses or circuit breakers will be mounted in electrically rated enclosures as close as practically possible to the source of power. All fuses or circuit breakers will be sized to protect the wiring to which they are connected. Fuses will be sized to carry no more than 85% of the maximum allowable current for the wiring. This means the peak current of the fuse has to be less than the peak current of the wire being used at all times. The main traction drive fuse will be inspected for appropriate type, voltage, and current rating. If the fuse must be replaced, the kart will need to be re-inspected before allowing the vehicle to operate in the event.
- 6.6 **Emergency Switches** – An emergency stop circuit must be employed on the vehicle. The circuit will consist of a kill switch located on the steering wheel and a mushroom-style emergency stop switch located in a location that is easily recognizable, labeled, and accessible to emergency personnel. The recommended kill switch mounting position is between the steering wheel uprights to eliminate wire failure from the movement of the steering wheel. The recommended mounting position for the emergency stop is on the side of the kart near the battery pack. The kill switch and the emergency stop switch will be wired in series with the solenoid coil of the main contactor. Interrupting the current to the solenoid coil will turn off the main contactor and isolate the battery pack.
- 6.6.1 The power circuit will contain a contactor (also known as a solenoid relay) for the purpose of isolating the battery pack when not in use and during an emergency. This contactor must have a current rating that exceeds the maximum peak current draw of the vehicle
 - 6.6.2 The “high current” or “power circuit” begins at the battery pack (positive terminal) and proceeds through your main power cable, through a high-current fuse, through a main contactor, to the motor controller (which has its own cables to the motor) before reaching the negative terminal of the battery pack. Therefore, the low-current E-stop circuit that is in-line with the contactor’s activation solenoid has the ability to interrupt the high-current circuit.
- 6.7 **Motor** – Motors will be rated by the manufacturer to handle the expected power load over the duration of the race. The peak power available to the motor drive system must never exceed 14kW.
- 6.7.1 Power shall be defined as the instantaneous voltage multiplied by the instantaneous current delivered by the battery averaged over 500 milliseconds. The system may use any combination of instantaneous battery voltage and instantaneous current, so long as this value does not exceed 14kW. The voltage used for this calculation is not the battery pack nominal voltage but the actual voltage, so teams must be aware of the real time voltage present in their packs

when setting control limits.

6.7.2 Power and Energy Limit Enforcement – The power and energy limits will be enforced by the race officials using the Power Energy Power Monitor (PEM). The race vehicles must pass a technical inspection before installation of the PEM. Teams will prewire and prepare a mount on their vehicle as specified and must make wiring schematics available to the race officials before the measurement system can be installed.

6.7.2.1 The PEM will record each kart’s real-time power (as measured by actual pack voltage multiplied by actual pack current) during the race. Results will be reviewed after completion of the race and any kart that is deemed to have used more than 14kW of power from their battery pack, at any time, will be disqualified from the race. The PEM implements a very brief moving average to “smooth out” the data and, therefore, it ensures “blips” do not result in disqualification.

6.7.2.2 Teams are encouraged to tune their karts to this 14kW power limit during practice. It is the responsibility of the teams to understand and manage the power that their kart is using at any time.

6.7.2.3 The power limit will be monitored and enforced during race qualifications. It is up to the Director of Race Operations as to the penalty that is applied for breaking the power limit during qualifications.

6.7.2.4 The PEM will also measure the total energy used by each kart for the purpose of calculating efficiency. This number will be used to determine each kart’s placement in the Energy Efficiency category.

6.8 **Throttle** – Race vehicles shall be equipped with a foot-operated throttle potentiometer with two return springs, which will return the potentiometer to produce zero speed signals when the pedal is released. One spring must be located between the throttle pedal and the vehicle frame. A throttle return spring must also be located on the potentiometer throttle box to assure the potentiometer returns to zero signal when the pedal is released or in case a throttle cable is broken to prevent undesired actions.

6.9 **Motor Controller** - Any type of power controller is allowed. The forward power command to the motor must return to zero when the driver releases the accelerator pedal. There are no restrictions on energy management throttle control. Computers on the vehicle are permitted.

- 6.10 **Data Acquisition** – Instruments and systems on or off the vehicle are legal for data acquisition purposes. Personal computers or laptops are not allowed to be mounted to a kart at any time. Students must utilize data acquisition instruments rather than full-size laptops
- 6.11 **Remote Control** – Remote control of a vehicle is prohibited. No control signal can be transmitted back to the race vehicle for “on the fly” adjustments.
- 6.12 No karts with the ability for reverse direction are permitted.
- 6.13 **Brakes** – All race vehicles shall be equipped with pedal-operated hydraulic brakes as supplied by the manufacturer, operating in such a manner as to stop both rear wheels equally. Brake linkages must have at least two (2) inches of clearance off the ground. A cotter pin must be placed through the pivot pin, which connects the brake linkage lever to the master cylinder. Brake discs must be at least 1/8” thick. Brakes must be able to lock both rear wheels at maximum speed. No hand brakes are allowed.
- 6.14 **Chain oilers** – No chain oilers are allowed.
- 6.15 **Chain size** - #35 chain is the only allowable chain. Belt drive systems all allowable provided they are commercially available karting equipment.
- 6.16 **Gear Ratio** - A single drive sprocket and a single axle sprocket only. No type of a gearbox or any method of changing a gear ratio on the fly is allowed. No use of a jack-shaft is allowed.
- 6.17 **Mechanical Driveline Guards** –
- 6.17.1 Open mechanical drivelines including chain, belt, or gears must be guarded to reduce the possibility of personal injury and contact with the racing surface. All open mechanical components must be guarded to prevent whipping if chain or belt breaks, prevent incidental contact with moving parts, and to prevent injury from rotating parts and pinch points. The guard is to be securely mounted.
 - 6.17.2 Sprockets and sheaves mounted on the rear axle drive components must include a blank sprocket guard. The blank sprocket guard must be at least 1/4” larger in diameter than that of the axle sprocket or sheave being used. The bottom of the blank sprocket must maintain clearance above the racing surface at all times
- 6.18 **Steering Control** – The steering control must be unaltered and as supplied from the manufacturer.
- 6.18.1 All steering assembly fasteners shall be c-clipped or castellated and cotter pinned. All steering assembly fasteners shall be of grade five (5) or better and a minimum of 3/8 inch in diameter. All rod ends shall be protected from collision. Nylon lock nuts are not permitted in the steering assembly. No plastic steering components are allowed.

- 6.19 **Steering Wheel** – The steering wheel shall be of a circular or enclosed wing design. No post or handlebar steering wheels are allowed. The steering wheel shall be attached to the hub by at least three c-clipped or cotter pin bolts with cotter pinned nuts or by bolts with safety wired heads where a threaded hub is used. Any sharp protrusions shall be covered. All nuts and bolts must be available for inspection. All bolts require safety wire, pins are not acceptable.
- 6.20 **Front Spindle and Rear Axle** – The front spindle and rear axle shall not extend beyond the wheel widths. Rear-axle size is a 50mm commercially available tubular axle. The axle must be made of steel only. No filler such as carbon fiber is permitted.
- 6.21 **Seat and Floor Pan** – The floor pan must fill the space inside of the frame extending from the front frame member to the seat and made of a material that meets specification 6.25. Seats may be made of resin-impregnated fiberglass fabric. The fiberglass seat must be in good condition with no cracks or holes and be fastened to the metallic seat supports using fender-type washers and spacer grommets. No holes large enough for any part of the driver's body to inadvertently pass through shall be permitted. The seatback must not exceed a 135-degree angle from the floor pan. The seat bottom must be higher than the lower edge of the frame tubing.
- 6.22 **Seat Belts** – Seat belts or any type of driver restraint system that holds a driver into the seat is prohibited. Drivers must not be held in the seat in any fashion that would pin them underneath the kart should it become inverted or become airborne.
- 6.23 **Rain/Wet/Damp Conditions** – It is prohibited to operate, test, inspect, power-up, or handle any kart or component of a kart when rain, wet or damp conditions exist.
- 6.23.1 No race preparation, maintenance, testing, practicing, or racing is allowed should a scheduled event be called off for inclement weather. The evGrandPrix does not compete in wet weather conditions.
- 6.24 **Vehicle Weight**
- 6.24.1 The minimum driver weight is 150 pounds. Any driver weighing less than 150 must add weight ballast to the kart equal to the amount in which the driver is under 150 pounds, rounded to the nearest pound.
- 6.24.2 If weight ballast is used, it must be mounted securely to the kart by a bolt(s) of at least 5/16" in diameter. Weights over 7 pounds must use at least two 5/16" bolts. All bolts must be cotter-keyed, safety wired or double nutted. All weight must be white in color for visibility. Mounting of weight to the nerf bars, front bumper or rear bumper is prohibited. No weight may be added to the driver.

6.25 Fasteners

- 6.25.1 Grade five (5) fasteners, at a minimum, are required for all non-metric screw/bolt-type fasteners of 0.250-inch diameter and larger. Class 8.8 is required for metric fasteners of 6mm and larger. A grade five (5) fastener is indicated by three- lines on the head of the cap screw where the lines will be at a 120-degree angle. A class 8.8 fastener is marked as 8.8.
- 6.25.2 Kingpins, pedal attachment points, steering wheel bolts, and all parts of the brake throttle, and steering linkages shall be c-clipped, cotter-pinned or safety wired. If using cotter pins, they shall fit snugly in the holes and pass through the nuts or a serrated section of a castellated nut.
- 6.25.3 A distorted thread or expansion type steel lock nut may be used instead of cotter pins where the nut or bolt is not subjected to excessive rotation. These nuts may not be reused more than five (5) times as recorded in the team's safety log.
- 6.25.4 C-Clips or safety wire is to be used on bolts installed in threaded components. The safety wire must pass through the bolt head.
- 6.25.5 Nylon- fiber locknuts are required to secure seat mounting bolts, chain guards, motor and controller mounts, and floor pans. They may also be utilized on fasteners that are #10 or smaller in size. Nylon nuts must be snug and unable to be loosened by hand during an inspection.
- 6.25.6 The front axle nuts must be nylon as supplied, and E-clips or snap rings installed.

6.26 **Plastics and Composites** – Plastics and composites are only allowed for non-structural members. Acrylic-based plastics are not allowed on the racing vehicle.

6.27 **Welds** – Only TIG welds of high quality, as determined by the technical inspectors, shall be accepted for any welds other than the original factory welds. Butt welds must be reinforced by an inner sleeve at least twice the tubing diameter in length. ANY NON-FACTORY WELDS MUST BE CLEAN AND UNPAINTED FOR INSPECTION. No plastic body filler or load will be allowed in seams. Any broken or poor-quality welds observed on a race vehicle by the inspectors shall disqualify the race vehicle from further participation until the welds can be made to pass inspection.

6.28 **Cameras** - Cameras may be mounted on the kart provided it does not interfere with driver's vision or ability to drive the kart. All cameras must be marked with a team name and kart number. Cameras cannot be larger than 2" x 2" x 2", must be mounted with an approved mounting bracket from the camera manufacturer and must pass tech inspection. No cameras are allowed to be mounted to a helmet.

6.29 Battery Management System

- 6.29.1 Any kart that utilizes a lithium battery pack must have a Battery Management System (BMS) installed.
- 6.29.2 The BMS must reliably, accurately, and constantly measure the total pack current total pack voltage and voltages of all cells. When single cells are directly connected in parallel, only one voltage measurement is needed. The BMS must isolate the battery pack (deactivate the kart) if it sees a cell voltage outside the allowed minimum and maximum voltage levels stated in the cell data sheet or any other unsafe condition,
- 6.29.3 The BMS must reliably, accurately, and constantly measure the temperatures of the battery cells.
 - 6.29.3.1 Temperatures must remain below 60° Celsius, or the maximum cell temperature stated in the cell data sheet, whichever is lower.
 - 6.29.3.2 Cell temperatures must be measured at the negative terminal of the respective cell.
 - 6.29.3.3 The temperature sensor used must be in direct contact with the cell's negative terminal or the negative terminal busbar less than 10 mm away from the cell terminal.
 - 6.29.3.4 For lithium-based cells, the temperature of a minimum of 20% of the cells must be monitored by the BMS. The monitored cells must be equally distributed inside the battery pack.
 - 6.29.3.5 Multiple cells may be monitored with one temperature sensor if all conditions in 6.29.3 are met for all cells.
 - 6.29.3.6 Temperature sensors must have appropriate electrical isolation between the sensor and cell, or in the sensing circuit.
- 6.29.4 All teams will be prepared to describe their BMS's wiring, programming, and general functionality during tech inspection. The Tech Inspector will have the final say as on whether a kart's BMS meets the required safety functionalities.

7.0 Academic Challenge

The Academic Challenge consists of non-race activities to create a comprehensive learning experience for the students. Points from the Academic Challenge are added to the final race placement to determine the overall evGrandPrix Series Champion.

7.1 evGrandPrix Series Scoring

Final Race Placement = 50 points

Energy Efficiency during the race = 20 points

Design Report = 30 points

SERIES TOTAL = 100 Points

7.2 Final Race Placement (50 points)

7.2.1 Race Placement – Each team will be ranked in the order they finish the evGrandPrix race. Points will be allocated as follows:

1st place = 50 points

2nd place = 45 points

3rd place = 40 points

All other karts that finish on the lead lap will receive two (2) points fewer than the kart finishing in front of them. For example, if 4th and 5th place finish on the lead lap, they would receive 38 points and 36 points, respectively.

For each lap behind the lead lap, the points awarded will be five (5) fewer than the last kart on the previous lap. Continuing the above example, if 6th and 7th place finish one lap behind the leader, they would be awarded 31 points and 29 points, respectively. And if 8th and 9th place finish two laps behind the leader, they would be awarded 24 points and 22 points, respectively.

This scoring would continue until a kart receives 0 points and all karts finishing behind that kart would also receive 0 points.

7.3 **Energy Efficiency (20 points)** – At the conclusion of the race, race officials will retrieve PEM data from each kart. “Energy Efficiency Rating” will be calculated using the formula on the Energy Management Calculation sheet. The ratings will be ordered from the least amount of energy to most and assigned a place value. Your placement will be assigned to a point value.

7.4 Design Report (30 points)

7.4.1 Each team will submit a written report to explain the design decisions they made and how they improved the performance of their kart.

- 7.4.2 The team will be graded using the “Design Report” rubric. The rubric is out of 100 percent. All participating team scores will be ordered from highest to lowest and assigned a point value from 30 to 0.
 - 7.4.3 The report must not exceed 2,000 words (no page limit). Points will be deducted for exceeding the word limit. Charts, graphs, and images that clearly communicate the designs incorporated into the kart, the predicted improvement, the actual results, and explanation of differences between predicted and actual results are encouraged.
 - 7.4.4 Reports not submitted by the published deadline will not receive a score.
- 7.5 **Championship Calculations** – Each kart’s total points gained from the Design Report, Race Placement, and Energy Efficiency will be totaled and teams will be ranked from highest to lowest. The team with the highest points will be declared the series champion. In the case of a tie, Race Placement will be the deciding factor.

8.0 EVENT REQUIREMENTS

The requirements in this section apply to all evGrandPrix events that involve the karts driving.

8.1 Pre-event

- 8.1.1 Motorsports Safety Awareness training – All personnel involved must complete this training annually.
- 8.1.2 Motorsports Safety Operations training – DRO, Safety Director, Pit Steward, Pit Crew members, and track workers must complete this training annually.

8.2 Technical Inspection

- 8.2.1 All karts must pass a technical inspection before participation in any track event. Passing technical inspection does not guarantee rules compliance. Following technical inspection approval, teams may make adjustments to improve their kart’s performance (e.g. track width, caster/camber, Ackermann, seat position, sprocket size, etc.), but the kart must always comply with the rules. A kart may be protested and/or disqualified because of noncompliance with any rule. The Technical Inspection team has the right to inspect any kart at any time for any reason.
- 8.2.2 All teams are required to perform their own technical inspection on their kart and ensure compliance to the *technical inspection sheet* prior to presenting their kart to the Technical Inspector at the event. The Technical Inspector’s role is to verify compliance.

- 8.2.3 Fire Extinguishers – Each team must have at least one fire extinguisher accompanying the kart at all times, including by not limited to technical inspection, practice, qualifications, and the race. All fire extinguishers must meet the following:
- Capacity: 0.9 kg (2 lbs)
 - Equipped with a manufacturer installed pressure/charge gauge.
 - Rating (U.S. & Canada): 10BC or 1A 10 BC
 - Inspection (not expired)
- 8.2.4 Upon approval of the Technical Inspector, an inspection sticker, band, or other indicator will be placed on the kart to show that it has been approved to enter the track for the event.
- 8.2.5 Workmanship – The Technical Director, has the right to question poor workmanship and the resulting safety hazard it presents and require the team to repair the deficiency.

8.3 Battery Charging

- 8.3.1 Battery Charging – Battery charging and equipment is the responsibility of the race teams. Battery charging must be supervised by a team member at all times. Chargers with open components and circuits or damage will not be allowed. A specific battery charging area will be provided where charging equipment can be set up and operated. Proper care must be used to ensure safety for all when charging is occurring. If event staff have safety concerns, the DEO or Safety Director may ask the team to modify their charging process or location.

8.4 Team Equipment

- 8.4.1 Required Safety Equipment – All team-required safety equipment is the responsibility of the individual race team and shall be brought to technical inspection and shall also be available for re-inspection at any time.
- 8.4.2 Helmet – The driver must wear a helmet which:
1. Is closed face with an integral, immovable chin guard
 2. Contains an integrated visor/face shield supplied with the helmet
 3. Meets an approved standard
 - a. Snell K2010, K2015, K2020, M2010, M2015, M2020, SA2010, SAH2010, SA2015, SA2020
 - b. SFI Specs 31.1/2010, 31.1/2015, 41.1/2010, 41.1/2015
 - c. FIA Standards FIA 8860-2004, FIA 8860-2010, FIA 8860-2018, FIA 8859-2015
 4. Is properly labeled with its standard.

- 8.4.3 Driver's suit must be manufactured for racing. The suit must be constructed of heavyweight, abrasion-resistant nylon. The driver's suit must cover the ankles and wrists while seated in the kart. Exposed skin will result in a black flag penalty.
- 8.4.4 All drivers must wear appropriate gloves that will prevent or minimize abrasions.
- 8.4.5 The driver shall wear an approved neck brace, socks covering the ankles, and full coverage shoes.
- 8.4.6 The driver shall wear an approved rib protector under his or her suit.
- 8.4.7 Long hair -- No hair may be outside of the driver's helmet. A head sock or other method must be used to restrain hair. This is a black flag offense.
- 8.4.8 Crew Clothing – At all times in the pit and paddock area, all crew members must wear shirts and closed-toe shoes. All graphics on clothing must be in good taste.
- 8.4.9 Appearance – It is essential that every effort is made to present the most professional racing appearance possible. To this end, certain minimum requirements shall be imposed on all competitors.

8.5 Pits Requirements

- 8.5.1 Pit Passes – A pit pass is required to enter the pits. All crew members will be issued a pit pass at check-in and must always keep it visible. Each pit pass is for the individual in which it has been issued and may not be transferred to another person.
- 8.5.2 Closed-toe shoes – Anyone working in the Pit Area or Racing Surface MUST wear closed-toe shoes.
- 8.5.3 Non-Members in the Pits – If any person is found working on a go-kart in the pits which is not an official member of a crew, and that crew is aware of his/her presence, that go-kart and crew will be disqualified from further participation in the event for that day. Only individuals displaying a special pit pass will be allowed on the grid for the race. Team advisors and support personnel should avoid working on the go-kart but are allowed to verbally direct, coach, and discipline the student team members. The DRO shall have complete discretion regarding personnel in the pits and on the grid.
- 8.5.4 Leaving Pit Area – Once a go-kart enters the pits for a race event, it may not leave until the race is complete. Doing so disqualifies the go-kart from the event.

8.6 Driving Requirements

- 8.6.1 All drivers must complete the *Driver Safety Training* and be registered with event staff. The DRO or their designee will provide registered drivers with a method to

designate them as a driver (bracelet or similar) and they must display this to the DRO or their designee each time they wish to enter the track. A photo ID may also be requested to verify identity.

- 8.6.2 All rookie drivers will have fluorescent tape on the rear of the kart to designate rookie status for the first on-track event attended. The Technical Inspector will apply the tape at technical inspection. A Driver will be considered a rookie until they finish their first event and get a satisfactory rating from the DRO.
- 8.6.3 Any foul driving, unnecessary bumping, crowding, chopping, blocking, or unsportsmanlike conduct on the track or pits is grounds for penalization or disqualification.
- 8.6.4 All drivers must constantly be aware of the traffic in his/her area and be prepared to yield to a faster competitor. A kart being passed is obliged to yield at the earliest chance. A blue flag will be shown, and that driver receiving the flag must follow the procedures of the Blue Flag. Failure to follow the Blue Flag will result in a Black Flag.
- 8.6.5 A kart that is significantly slower than others on the track must also stay out of racing line to allow others to pass freely and safely.
- 8.6.6 A go-kart may not improve its position with all four wheels off the track unless the kart(s) it passes are directly involved in an accident.
- 8.6.7 All go-karts must enter and exit the pits at a reasonable and safe speed.
- 8.6.8 Drivers must signal by raising one hand so that go-karts behind them can see if they are driving out of the ordinary pattern, such as exiting to the pits, yellow flag, accidents, etc.
- 8.6.9 If their kart has shut down or spun out, drivers must signal by raising both hands high in the air to indicate they will not make any move until the field passes. If the kart is still drivable, the driver may continue driving once a track worker signals that the track is clear. If the go-kart is not able to continue, but can be rolled, the driver should remain in the go-kart to steer as the track workers move the go-kart into a safe location until the end of the event. If the go-kart cannot roll, when it is safe, the driver should exit the kart and help the track workers move the kart to a safe location until the end of the event. The DRO will communicate to the teams when they may retrieve their damaged karts following the end of the event.
- 8.6.10 All hand signals should be made in such a manner so as not to confuse officials or other drivers on the track.

8.7 Flags

- 8.7.1 Green Flag – The green flag signifies the start of the session. The green flag and/or light will be displayed at the start of the race or practice session and kept visible as long as the track is clear for racing.
- 8.7.2 Yellow Flag – The yellow flag and/or yellow light will be displayed if the track is partially blocked for any reason. Drivers should raise one hand, slow down, hold their position, and be prepared to stop. Passing under the yellow will result in a penalty.
- 8.7.3 Blue Flag – The blue flag, with or without the diagonal yellow stripe, will be given to any kart that is being overtaken by the leaders. The kart receiving the flag must immediately signal the direction they wish to be passed on, move over, and let the other kart pass.
- 8.7.4 Red Flag – When given to an individual kart, the red flag means to stop as quickly and safely as possible, pull inside the infield, and shut down the drive. This means there is something dangerously wrong with the kart, and the driver should stop promptly. When given to the entire field, the red flag and/or red light means the track is hazardous for racing, and all karts must stop immediately where they are on the course. Karts cannot be worked on during a red flag. If and when the race is restarted, the karts will be positioned in order of the last completed lap, except for stoppage due to rain.
- 8.7.5 Rolled Black Flag – The rolled black flag will be given to any competitor whose driving conduct is bordering on penalization. This is only a warning and does not require the kart to leave the track.
- 8.7.6 Black Flag – The black flag means the driver must enter and stop inside their pit immediately for consultation by a race official.
- 8.7.7 White Flag – The white flag will be given to the leading kart one (1) lap before the end of the race.
- 8.7.8 Checkered Flag – The checkered flag signals the end of the race and all competitors should finish the lap at reduced speed and exit to the pits. After the checkered flag is displayed, the top five (5) placing karts are allowed to stay in the infield for post-race ceremonies.

8.8 Practice and Test & Tunes

8.8.1 Eligibility

8.8.1.1 All karts must pass technical inspection before entering the track.

8.8.1.2 All karts must have an approved transponder mounted and installed at the beginning of practice.

8.8.2 For Test & Tunes and at designated periods during race day, the track will be opened for a practice session. If a large number of vehicles are in attendance, the DRO may break the practice time into groups. Any racer participating in the wrong warm-up group will be subject to penalization. When warm-up is completed, all racers will proceed to the pits to await further instructions.

8.9 Qualifying

8.9.1 The race starting grid will be determined via sprint races. The number of karts in each sprint race will be determined by the DRO based on the number of entrants. Each kart will be assigned to a sprint race and gridded based on Design Report scores. The kart with highest Design Report score will be placed in position 1 of heat race #1. Second highest score will be position 1 of heat race #2. Third highest score will be position 1 of heat race #3. Fourth highest score will be position 2 of heat race #1 and so on. Sprint races will be conducted in similar fashion to the main race with all karts lining up in race order, performing at least one parade lap, and then conducting a 15-lap race. Placement for the main race will be determined as follows:

Position 1: The winner of heat race #1

Position 2: The winner of heat race #2

Position 3: The winner of heat race #3

Position 4: 2nd place of heat race #1

Position 5: 2nd place of heat race #2

Position 6: 2nd place of heat race #3

And so on until all karts (maximum 33) are gridded for the main race.

If any or all heat races must be cancelled, race gridding will be done by Academic Challenge points. If there is a tie in Academic Challenge points, a random draw will break the tie.

8.9.2 Power and Energy Limit Enforcement – The power and energy limits will be enforced by the race officials using a Power and Energy Monitor (PEM) installed during Kart inspection before qualifying for the race. The PEM must remain visible at all times on the top of the battery. Any kart that exceeds the power limit during

qualifying will not receive a qualifying position and will be placed at the back of the field for the race.

- 8.9.3 Each individual driver can qualify only one kart and must drive that kart in the main race. If for some unforeseen reason the qualifying driver is unable to drive the kart in the main race, the DRO must be notified. If the DRO approves the use of an alternate driver, the kart will be allowed to start at the rear of the starting field. If an alternate driver attempts to drive the kart in the race without prior approval, that kart will be disqualified.
- 8.9.4 If a kart is not able to participate in a sprint race qualifier, it may be permitted to start at the rear of the field at the discretion of the DRO.
- 8.9.5 During qualifying and the race, karts must display their number (assigned at registration), their school's name, and the evGrandPrix decal.
 - 8.9.5.1 The number must be at least 5" tall is to be displayed on the front, both sides, and rear of the kart. No other decals may be placed within 2" of the numbers.
 - 8.9.5.2 The name of the school or organization for which the team is competing must be displayed on the front and both sides of the kart and must be legible from 15 feet away.
 - 8.9.5.3 The evGrandPrix logo must be displayed on the front bumper of the kart. A decal will be provided to all participants at check-in for the evGrandPrix race.

8.10 Race

- 8.10.1 Race Length – The length of a race shall be 50 laps (~12.5 miles) on the Purdue Grand Prix track. Race placement will be determined based on position at the finish line on the lap in which the leader completes their 50th lap.
- 8.10.2 Crew members are the only authorized persons to service the vehicle during a race event.
- 8.10.3 Race Starting Format – The evGrandPrix may use either a rolling start or a standing start format as determined by the DRO. Before the race start, each kart will complete at least one (1) formation lap.
- 8.10.4 Rain Contingency – If foul weather interrupts a race before completion of 50% of the required laps, all karts will be red-flagged and will stop on the track at the start-finish line in single file order to await further instructions. Unless otherwise directed by the DRO, no work is to be done on the karts. The karts may be covered

if desired. The DRO will determine if the event is to be postponed. If a race is to be restarted, the karts will restart in single file, in the order, they were scored on the lap before when the weather forced the delay. If 50% or more laps have been completed, the race will be deemed officially complete. Finish position will be based on the position of the lap before when the weather forced the delay.

- 8.10.5 Dislodged or Missing Bumpers – If a bumper, side pod, or driver fairing falls off, dislodged or dragging, at the head flagman’s discretion the kart will be shown a mechanical flag and be required to return to the pits.
- 8.10.6 Grid vs. Pit– The Grid area is defined by the Event Director as a place where karts will be placed before entering the track surface. Only team members and officials will be allowed in this area. The Pit area is defined as the area where the team plus support group can work on the kart.
- 8.10.7 Protest – All teams wishing to protest an action on track or a call made by an official must fill out the official race day protest form available at tech within 30 minutes of the end of the session in question.
 - 8.10.7.1 This form must be filled out correctly listing the rule in question, the reason for the protest and be signed by both the driver and crew chief/principle.
 - 8.10.7.2 The evGrandPrix has the right to claim any, and all equipment for testing should those items be called into question during a protest.



APPENDIX A – PARTICIPATION FORMS



Waiver, Release and Agreement on Indemnity

I desire to participate in the evGrandPrix High School Series (the “Activity”) organized and conducted by Purdue University (“Purdue”). In consideration of permission granted by Purdue to allow me to participate in the Activity, I (together with my parent or guardian, if I am under the age of eighteen or under a legal disability) (sometimes referred to collectively as “Participant” below) represent, covenant and agree, on behalf of myself and my heirs, assigns, and any other person claiming by, under or through me, as follows:

1. I acknowledge that the Activity involves certain risks (some of which I may not fully appreciate) and that injuries, death, property damage or other harm could occur to me or others. I accept and voluntarily incur and assume all risks of any injuries, damages, or harm which arise during or result from my participation in the Activity, regardless of whether or not caused in whole or in part by the negligence or other fault of evGrandPrix, Purdue, The Trustees of Purdue University, and/or any of its or their departments, trustees, affiliates, employees, officers, agents or insurers ("Released Parties"). I further acknowledge and agree that Purdue has exercised reasonable care in (a) warning me that the Activity involves certain risks and dangers and (b) providing me with the disclaimers and the other cautionary statements set forth in this document.
2. I waive all claims against any of the Released Parties for any injuries, damages, losses or expenses, whether known and unknown, which arise during or result from my participation in the Activity, regardless of whether or not caused in whole or part by the negligence or other fault of any of the Released Parties. I release and forever discharge the Released Parties from all such claims.
3. I agree to indemnify and hold the Released Parties harmless from and against any and all losses, liabilities, damages, costs or expenses (including but not limited to reasonable attorneys' fees and other litigation costs and expenses) incurred by any of the Released Parties as a result of any claims or suits that I (or anyone claiming by, under or through me) or any third-party may bring against any of the Released Parties to recover any losses, liabilities, costs, damages, or expenses that arise during or result from my participation in the Activity, regardless of whether or not caused in whole or part by the negligence or other fault of any of the Released Parties.
4. I give permission for Workshop instructors, volunteers and emergency personnel to make necessary first aid decisions in the event of an accident, injury, or illness I may suffer during my participation in the Activity. If I need medical treatment, I shall be financially responsible for any costs incurred as a result of such treatment.
5. I have carefully read and reviewed this Waiver, Release and Agreement on Indemnity. **I execute it voluntarily, and I understand it and the legal consequences of signing it, including (a) releasing the Released Parties from all liability, (b) promising not to sue the Released Parties, and (c) assuming all risks of participating in the Activity.** I understand that this document is to be governed by and construed as broadly as possible under the laws of the State of Indiana. I agree that if any portion is held invalid or unenforceable, I will continue to be bound by the remaining terms.

EXECUTED this _____ day of _____, 20_____.

Participant Signature

Participant’s Printed Name



PARENTAL CONSENT (only if participant is under the age of 18)

I, the parent and/or legal guardian of the minor signing above, understand the nature of the Activity, as well as the minor's experience and capabilities, and I believe the minor to be qualified to participate in the Activity. I allow the minor to participate in the Activity.

I hereby acknowledge and agree to each of the provisions set forth in the above document and, on behalf of myself, the above-referenced minor, and any other person(s) claiming by, under or through either one of us, I agree to comply with and be bound by its terms. I understand that I am responsible for the obligations and acts of the minor as described in this document. **I execute it voluntarily, and I understand it and the legal consequences of signing it, including (a) releasing the Released Parties from all liability on my and the minor's behalf, (b) promising not to sue the Released Parties on my and the minor's behalf, and (c) assuming all risks of the minor's participation in the Activity.** I understand that this document is to be governed by and construed as broadly as possible under the laws of the State of Indiana. I agree that if any portion is held invalid or unenforceable, I and the minor will continue to be bound by the remaining terms.

Parent or Guardian Signature (if applicable)

Parent/Guardian Printed Name

Date: _____

Minor's Name: _____



Annual Series Commitment / Participation Agreement

I agree to follow all the rules, regulations, and stipulations within the current official evGrandPrix rules. This agreement bonds not only myself, but the school I represent as well.

I have read the evGrandPrix rules. I understand that it is a living document, and it is my responsibility to keep the latest copy available for review.

By signing this agreement, I agree to the terms herein.

Team Liaison:

Signature

Printed Name

Date

Official School Name



APPENDIX B – Power and Energy Monitor

PEM Specs

Traction drive power and energy will be limited to the maximums outlined in the rules. An electronic instrument will be mounted on the vehicle to indicate and measure, at a minimum, instantaneous power from the battery and the accumulated energy used from the battery. This instrument is referred to as the Power and Energy Monitor (PEM).

The purpose of the PEM is to accurately measure and record the power and energy delivered by the battery of each racer during event competitions. Electric from the battery power, expressed in watts, is calculated using the instantaneous voltage multiplied by the instantaneous current. Energy consumed from the battery, expressed in watt-hours, is calculated by integrating the power over time. During a racing event, a penalty will be assessed to racers that exceed a defined peak power limit. At the conclusion of the event, the total energy consumed by the racer will be noted by a race official.

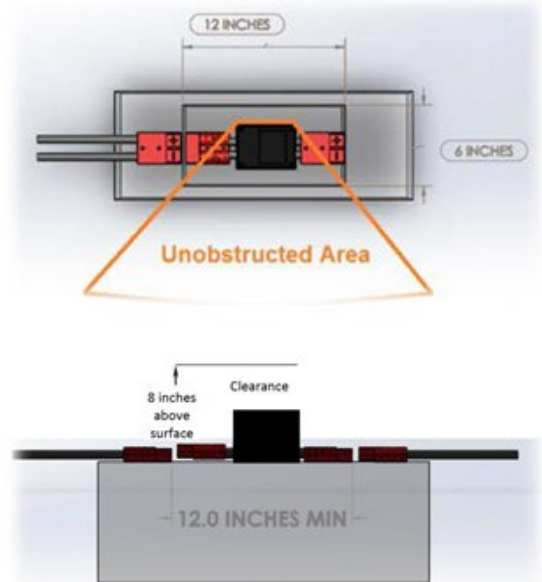
The objective of the PEM is to encourage electric drive innovation by removing restrictions on specified configurations and components, such as motors and controllers, in favor of a maximum performance envelope. This open formula fosters team competition and design variety while preserving competitive racing throughout the field.

- **The PEM hardware module will be provided to teams by race officials before a competition**
- **Teams are responsible for mounting the PEM using only the approved bracket and wire harness**
- **Proper PEM operation will be verified by officials after technical inspection and during open track practice**
- **It is the responsibility of teams to report any issues they have with the PEM to an official as soon as they become aware of such issue**

PEM Vehicle Integration Requirements

On each kart, the following mounting space will be required:

- A flat **unobstructed and non-conductive** area of 12 inches by 6 inches
 - This area should be on top of the battery pack
 - On one end of the PEM
 - + is the maximum battery voltage
 - - is the minimum battery voltage
 - On the other end of the PEM
 - + goes to the positive---end of the drive system (the fuse is first in this system)
 - - goes to the negative end of the drive system (B--- on the controller)
- ** See wiring diagram for details



** The connectors to the vehicle's drive system and the battery **MUST BE the RED ANDERSON SB175 POWERPOLE CONNECTOR** (175 amp).

Please note that **OTHER COLORS WILL NOT WORK** as they are notched differently.

See www.evgrandprix.org/parts for details and suppliers.

