Rules for the 2026 Race

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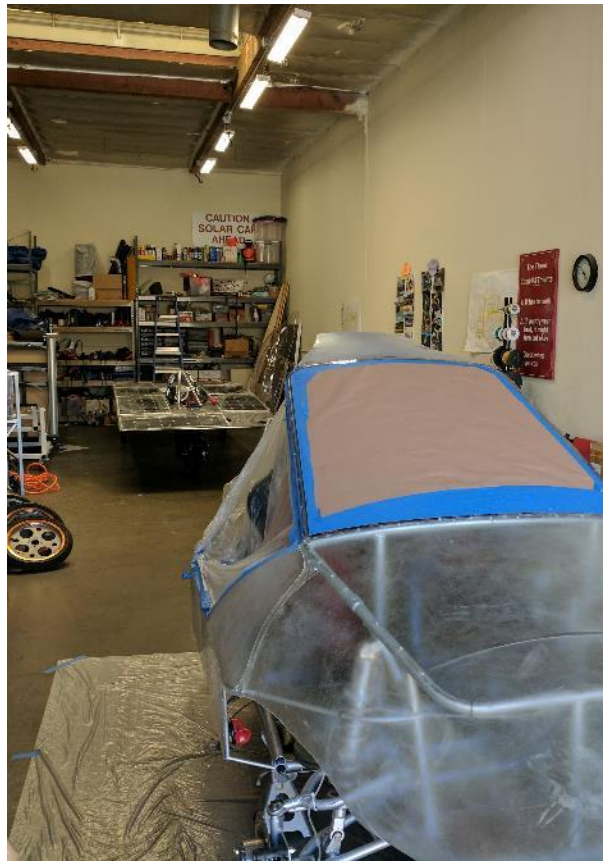
EVENT UPDATES

- **The Rules are periodically clarified or amended to meet the needs of the specific race.**
- **Rule 29 requires solar car teams to make periodic reviews of these updates to stay up-to-date.**

Rules Overview

- Do:
  - Keep copies of rules throughout workshop
  - Following engineering lifecycle: requirements, design, implementation, verification
- Don’t:
  - Just read once or all in one sitting
  - Look at another car’s design and assume it complies with rules (grandfather; waivers)

- Changes from 2025 rules noted in Blue



Categories of Rules Changes

- Mechanical Subsystem
- Electrical Subsystem
- Electric-Solar Powered/Cruiser Division
- Administrative

Mechanical Subsystem

- **Rule 5.2.2 – Roll bar must withstand 5G vertical load OR comply with previous dimensions (see previous roll-bar presentation)**
- **Rule 10.1.1 – Hub motors may be used in Classic and Advanced Classic Division if list price does not exceed $2,000**

Electrical Subsystem

- Rule 5.7.2 – Liquid electrical tape is not allowed
- Rule 5.12.1(d) – Require automatic flashers for turn indicators
- Rule 5.13(i) – Driver forced air ventilation shall not have independent switch to turn it off/on

Electric-Solar Powered/Cruiser Division

- Rule 32.2.7/Rule 33.2.8 – Clarifies dimension for Trunk
- Rule 33.2.3 – Cruiser Division must have entry/exit doors that can be latched
- Rule 33.27 – Clarifies that Cruiser Division array must be integrated into the car body (no overhangs allowed)
- Rule 33.3 – Cruiser Division cars can have batteries up to 10.5 kWh

Administrative

- Various clean-up and consolidated rules
- Rule 3.6 –
  - Addition of Budget to Final Report (registration)
  - Requirement to provide list price of hub motor
- Rule 3.9 – Oral Presentation updated to Video Presentation and In-Person Dialogue/Questions
- Rule 6.1.2 – Clarify that ties are broken for highest average speed for solar car miles driven
- Rule 7.10 – Staff may conduct random inspections of cars during or after event; outside of racing time

Registration

Sections 1 – 3: Purpose, Administration, Entries and Registrations

Registration Documents and Registration Fee requirement March 1st:

(1) Detailed CAD drawings showing mechanical structure, including "crush zones." Crush zones must be clearly labeled. Location of major components and notional driver must be shown.

(2) Detailed schematic / wiring diagram showing electrical system.

(3) Budget spreadsheet with list price and actual cost

(3) Digital team photo [emailed]

(4) Manufacturer's data sheets for batteries showing type & capacity

(5) Manufacturer's data sheets for solar array, including list price

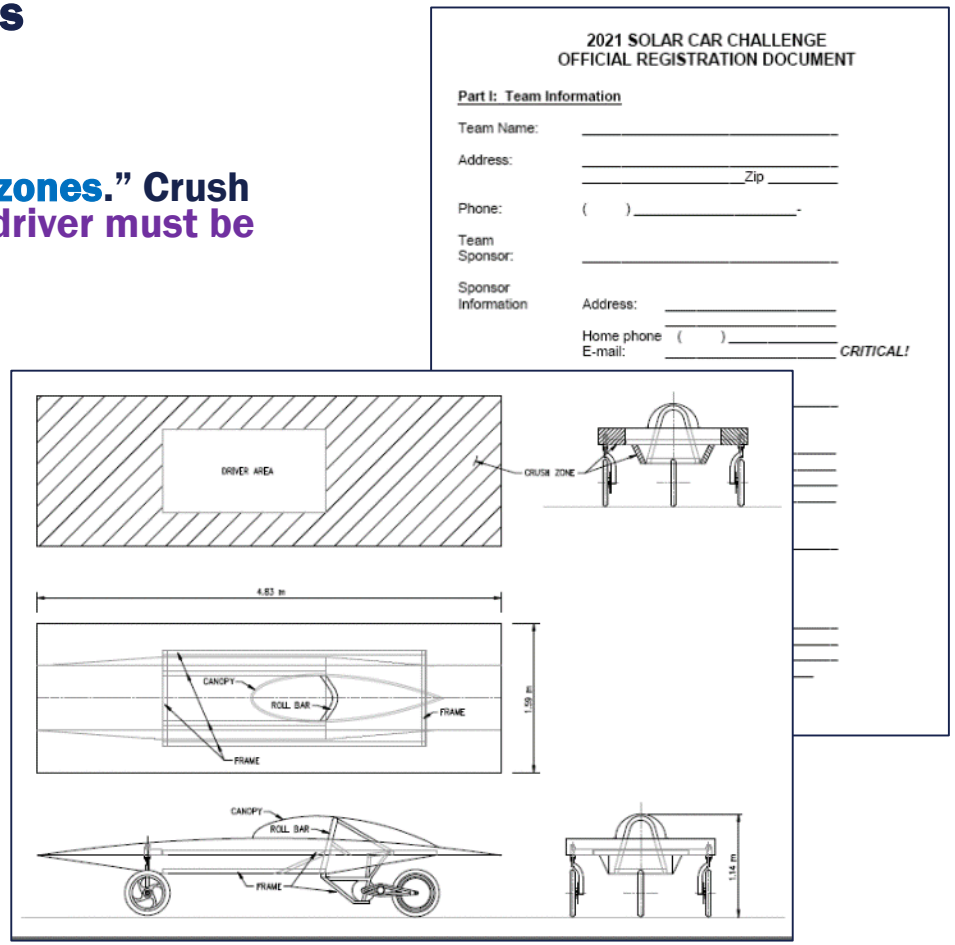
(6) Manufacturer's data sheets for motor and motor controller

(7) Manufacturer's data sheets for array and battery disconnect switches

(8) Manufacturer's data sheets for main fuses

(9) Manufacturer's data sheets for wheels and brakes

(10) Manufacturer's data sheets for suspension and steering



Rule 3.8 – Design of Solar Car

- It is the intent of the event that the solar cars ***be designed and constructed by high school students*** on the solar car team.
- <u>No portion of another vehicle's frame may be reused</u> in a solar car unless the team re-engineers/ modifies the frame to fit the team's solar car design or to install separate off-the-shelf components.

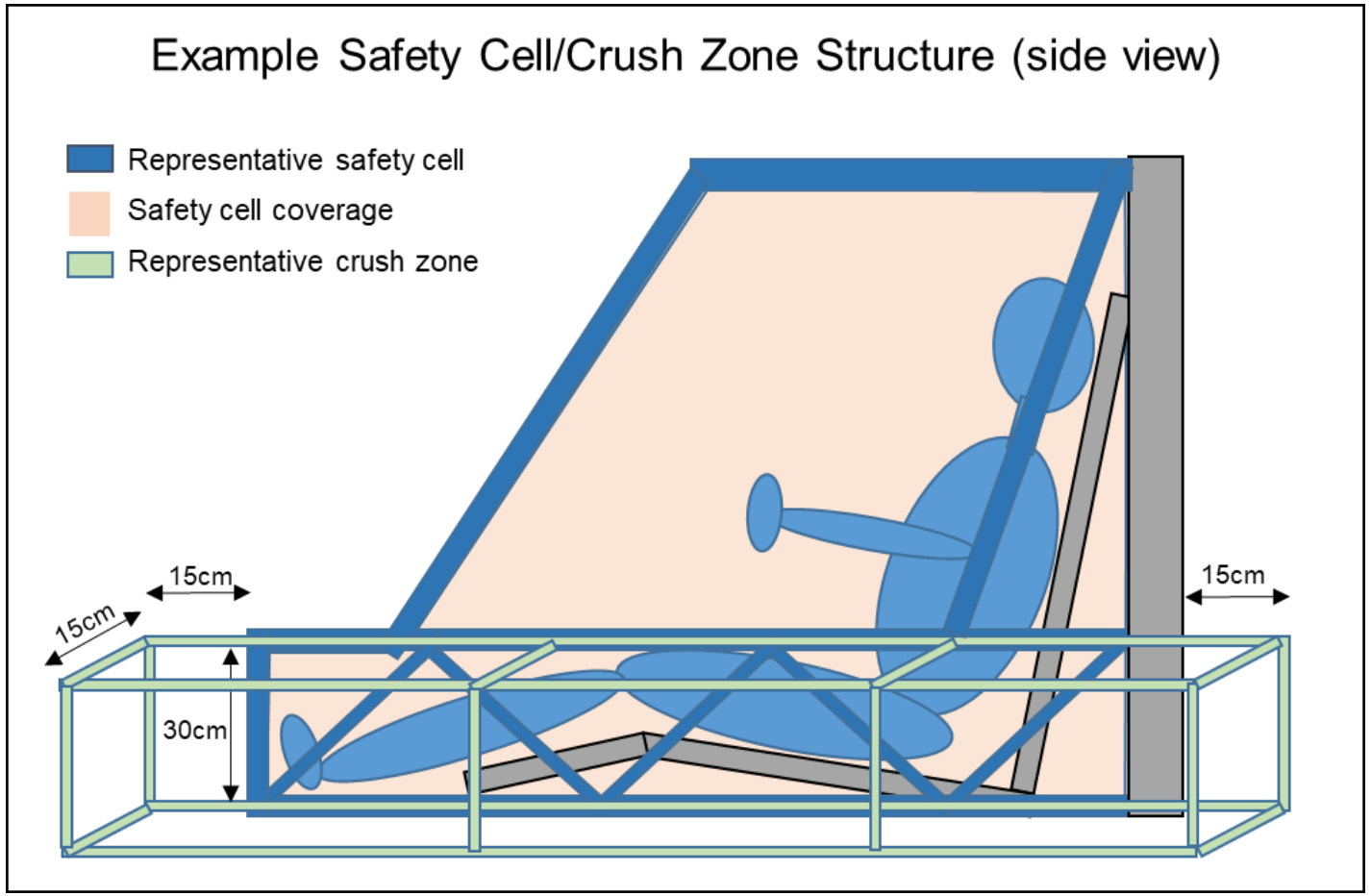
Section 10: DIVISIONS

- **Classic Division:** Hub motors **< $2,000 allowed**; lead-acid or LiFePO4 batteries; solar modules or cells at ≤ 23% efficient
- **Advanced Classic Division:** Classic Division cars with 3 or more years experience in Solar Car Challenge
- **Advanced Division:** Hub motors; prefabricated solar car molds; advanced battery chemistries
- **Electric-Solar Powered Car Division:** Solar cells on charging station; Classic Division technology; 2 x **5.25** kWh battery packs; workable trunk
- **Cruiser Division:** Seating for four; totally enclosed; solar array integrated into the skin of the vehicle; workable trunk

Rule 5.2.x – Safety Cell, Crush Zone, Roll Bar

- Safety Cell– ***rigid protection*** encompassing entire driver; minimum OD of 1.9cm; minimum 5cm clearance to driver
- Crush Zone – structural components ***designed to collapse*** on impact; minimum 15cm clearance to driver; minimum coverage
- Roll Bar – ***protects driver in event of rollover***; continuous piece of metal; minimum 5cm vertical clearance; minimum OD of 5cm; minimum wall thickness based on material; welded to frame **OR 5G protection**

Safety Cell / Crush Zone Details



- **Both Safety Cell and Crush Zone must encompass the entire driver**
- **Crush zone are structural components *designed to collapse* on impact**
- **Safety Cell structure protects driver in event of collision; should not deform**
- **Safety Cell requires padding to protect driver**
- **Crush zones must protect both driver AND battery pack**
- **Outer part of crush zone should be in a vertical plane at least 30cm in height**

Section 5.4/5.7 – Electrical

- **Rule 5.4 (Battery): 5.25 kWh max at 20 hr discharge rate; terminals must have locking washers (see 5.7.3 below).**
  - **For Lithium-based chemistries, use nominal (1C) capacity**
- **Rule 5.4.2 (Main Fuse): 125% of expected peak current, separate enclosure; rated as appropriate for DC voltage**
- **Rule 5.4.3 (Enclosures): Rigid, must have forced-air ventilation; no venting into driver's compartment; cannot be located at front of vehicle**
  - **No forced air ventilation required for LiFePO4 (teams may still implement)**
  - **Battery boxes cannot be located in front of driver**
- **Rule 5.7.1 (Wire): No HV wiring in driver's compartment**
- **Rule 5.7.3 (Connections): Connections conducting > 36V must be secured by locking washer**

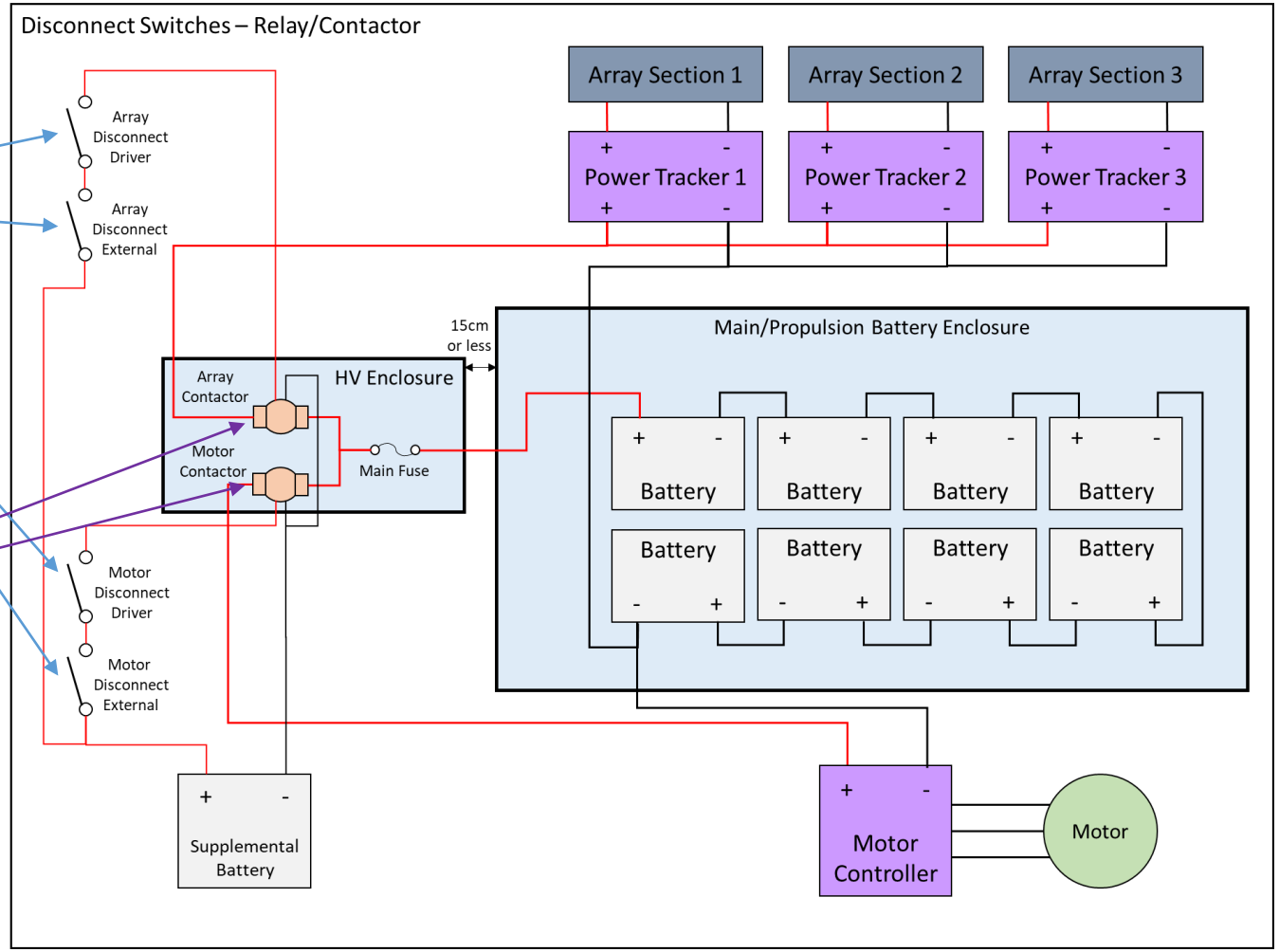
Rule 5.4.5 – Disconnect Switches

- Two sets of two switches required
  - Motor Disconnect / Array Disconnect
  - Internal ("Driver"), External
- Relay/contactor must interrupt full load current at system voltage
- Switch operates control signal of relay/contactor
  - Can be either "push-pull" or "push-rotate"
- No high voltage wiring in driver compartment!

Relay/Contactor Circuit

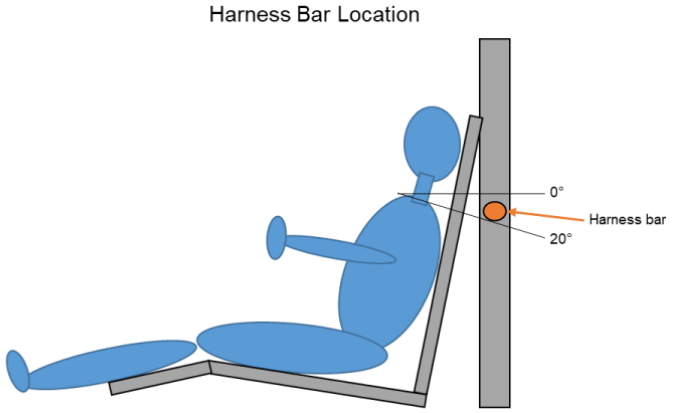
Control Switches

Relay/ contactor



Rule 5.13 – Driver Safety

- (a) Safety Belt must be 5 point lap/shoulder harness; *attached to structural member per manufacturer's instructions*.
  - Requires mounting shoulder belts vertically lower than driver's shoulder
- (b) Cars with body shells must have shells attached to each other
- (d) Windshield must protect entire head
- (e) Cars equipped with appropriate fire extinguisher for battery chemistry
- (j) Seat back braces required for seats on adjustable rails



Seat back brace

Section 32 – Electric-Solar Powered Car

- Simulates a “real world” solar application
  - Two passenger vehicle
  - Charging Station simulates permanent facility used to charge vehicle
- Same rules as Classic Division, with exceptions
- Rule 32.2.3a (Configuration): Passengers must be seated side-by-side
- Rule 32.2.6 (Battery): Two battery boxes, each with maximum 2kWh capacity; safe battery exchange procedure
- Rule 32.2.7 (Disconnects): Solar Car must have two Motor Disconnects; Charging Station must have single Array Disconnect
- Rule 32.2.8 (Trunk): Externally accessible storage required
- Must provide team member to monitor Charging Station during race hours
- Rule 32.7 (Team Assignments): Accomplish one special task each day to demonstrate real-world function

Section 33 – Cruiser Division

- Resemble regular passenger vehicle; provides opportunity to strategize based on number of passengers
  - Points = # of passengers x distance traveled
- Same rules as Advanced Division, with exceptions
  - Must have four wheels
  - Must accommodate four passengers; each with immediate access to door for entry/exit (implies 2x2 configuration)
  - Rule 33.3 – Allows for 10.5 kWh battery capacity
  - Rule 33.3.5 – Body must be completely enclosed
  - Rule 33.3.6 – Solar array must be integrated into car body
  - Rule 33.3.7 – Must have externally accessible storage space

Cross-Country Race Guidelines

- Addendum provided to participants
- Teams must trailer if they have not reached end of day location by 5:00pm (+ delta time)
- Coordinate passes of solar car teams with your judge
- Solar Car and Primary Chase Vehicle operate as one – never allow separation between
- Flagging procedures – especially important for road races!
- Judges will be seated in Primary Chase Vehicle's front row passenger seat
- Off-course procedures – return to where you went off-course