RSTE
Refrangible Society of Technophile Engineers

INDIA'S FIRST P.C.M.^{20} VEHICLE DESIGN COMPETITION

80+
AWARDS

4 LAKHS+
WORTH PRIZE MONEY

7
STATIC TESTS

5
DYNAMIC TESTS

SUVC
SAUR URJA VEHICLE CHALLENGE

Promoting Creative Education

COMPETITION BETWEEN

SMART VEHICLES AND MASTER VEHICLES

ONLY FIRST FIFTY TEAMS ALLOWED

ONLY FIRST FIFTY TEAMS ALLOWED

INDEX

A. INTRODUCTION

About the event

VISION: -To bring the focus of the individuals towards Latest Technology & Methods to utilize clean energy.

MISSION: - To provide creative education for students through project-based learning, case studies, and frameworks.

GOAL:- To build Technical, Management, Communication, and Marketing skills among students and develop a Member Satisfaction Index of 9 out of 10.

SUVC is a complete one-year project-based learning program in which students can develop their innovative thinking, soft skills, competitive skills and other sets of skills through frameworks provided by professionals working in various MNCs. SUVC helps students in expanding their concepts in the automobile sector and latest technology used.

It is a National-level engineering vehicle-design event in which a diligent team of minimum 7 members and maximum 40 members design and manufacture a S & M-class vehicle according to the rulebook and compete with other teams in 7 Static Tests and 5 Dynamic tests to take the title of SUVC. It is a platform for team members to build and have command over various real and practical problems. The event is organized by RSTE (Refrangible Society of Technophile Engineers).

About the Society

RSTE (Refrangible Society of Technophile Engineers) is a govt. registered society under Act 1973, Section 44 which is run by Automobile Engineers studied from B.S.F. institute and hence very much concerned about the time management and discipline. Society is passionate about green and clean environment. RSTE highly appreciates feedback of society members as well as event participants and is willing to extend every possible help required. Its purpose is to convert innovative ideas of individuals into sustainable real solutions through engineering innovation. RSTE Society also provides sponsorship to teams who are participating in the Creative Product Exhibition, Motorsport Events or any such event.

B. ADMINISTRATION REGULATION

By following regulations of RSTE, students learn to respect their college administration, teachers, seniors and others who provide the knowledge.

B.1 SUVC Objective

The SUVC competition provides a platform to teams of university undergraduate and graduate students to conceive a design, fabricate, develop and compete with a self-made vehicle.

B.1.1 To give teams the maximum design flexibility and freedom to express their creativity and imagination, there are very few restrictions on the overall vehicle design.

B.1.2 The challenge for the teams is to develop a vehicle that can successfully pass in the entire various static and dynamic test described in the rulebook. The competition provides a platform for teams to demonstrate their skills in front of corporate personalities and prove their creativity and their engineering abilities among all the teams present.

B.1.3 By the help of this competition, participants can develop their various soft skills which in turn can help them in achieving their desired Job Designation in the corporate world. Following are some of the key skills developed in previous SUVC participants with their corporate designation based on a survey done by RSTE.

SKILLS	DESIGNATION IN MNCs
Management skills	Manager/HR
Technical skills	R & D Engineer/ Technical Head
Leadership Skills	Team Leader/ Project Head
Presentation Skills	Professional Trainer/ Speaker
Communication Skills	Expert/Judges/Officers

B.2 Vehicle design objectives

B.2.1 For the purpose of SUVC competition, teams should assure that they work for a design firm that is designing, fabricating, testing and demonstrating a prototype vehicle in the segment of a smart and master vehicle.

B.2.2 Vehicles should have high efficiency in terms of power utilization and high performance in terms of acceleration, braking, handling, and driver ergonomics.

B.2.3 Additional design factors to be considered include aesthetics, cost, ergonomics, maintainability,

manufacturability, and reliability.

B.2.4 Once the vehicle has been completed and tested, the teams will work on business plan layout, for Business Plan round and other services offered at professional level.

B.3 Official announcement and competition information

Teams are required to visit their official team mail id and event website on a regular basis. All the official announcement will be published on the website, team official mail id, and Facebook page. For any info visit – www.suvcrste.com

Teams are requested to put their queries on official mail id (contact@suvcrste.com). All queries will be solved within 48 hours on the working days.

B.4 Language

The official language used for documents, presentations and queries will be **English** only.

B.5 Understanding the Rules

Teams are responsible for reading and understanding the rules in their entirety for the competition in which they are participating. The section and paragraph headings in these rules are provided to facilitate reading: they do not fully explain all the paragraph contents.

B.6 Right to Demur

In case of maintaining good relations with customers, some officials commit orally to teams. It is the responsibility of the team to take orally commitments into written to demur such commitment. **Only written commitments** are allowed to demur.

B.7 Demur Process

The registered teams will be appointed a mentor from the organizer side. **The teams must come with the mentor allotted to demur any rules**. If the mentor is not available then the team must send a request application to the organizer for allotting a new mentor to them.

B.8 Rules Compliance

By participating in SUVC competition, the team members, faculty advisors and other personnel of the participating university agree to comply with, and be bound by, the rules and all rules interpretations or procedures issued or announced by SUVC, the SUVC Rules Committee and other organizing bodies. All team members, faculty

advisors and other university representatives are required to cooperate with, and follow all instructions from competition organizers, officials and judges.

B.9 Loopholes

It is virtually impossible for a set of rules to be so comprehensive that it covers all possible questions about the vehicle's design parameters or the conduct of the competition. Please keep in mind that safety remains paramount during SUVC, so any perceived loopholes should be resolved in the direction of increased safety/ concept of the competition. And the student is encouraged to notify any loopholes to the SUVC rule committee to avoid dispute during events.

B.10 Participating in the Competition

Teams, team members as individuals, faculty advisors and other representatives of a registered university who are present on-site at a competition are considered to be "participating in the competition" from the time they arrive at the event site until they depart the site at the conclusion of the competition or earlier by withdrawing.

B.11 Right to Impound

SUVC and the organizing bodies reserve the right to impound any on-site registered vehicle at any time during a competition for inspection and examination by the organizers, officials and technical inspectors.

B.12 General Authority

SUVC and the organizing bodies reserve the right to revise the schedule of any competition and/or interpret or modify the competition rules at any time and in any manner that is, in their sole judgment, required for the efficient operation of the event a whole.

B.13 Penalties

Organizers have the right to modify the penalties listed in the various dynamic event to better reflect the design of their event courses, the course lengths or any special conditions unique to the site. The standard dynamic event penalties in these rules are default values that will be applied unless there is a change by the organizer.

SUVC – 2020: TENTATIVE DATE SCHEDULE

By following proper time schedule students will learn time management and can manage their priorities.

S. No.	Description	Tentative Date
1.	Acute Registration Category	20 March - 31 May 2019
2.	Active Registration	1 June -15 August 2019 Final revised rulebook publishing
3.	Phase 1 document submission last date	21 November 2019
4.	Phase 2 document submission last date	31 Dec 2019
5.	Phase 3 document submission last date	31 Jan 2020 Last team formation
6.	Virtual	Oct 2019 – Dec. 2019
7.	Final event	Feb- March 2020

- **Workshop, Virtual and final event date will be decided as per teams voting. Votes will be allowed only till 31 May 2019.**
- **Venue will be decided as per teams voting (For Virtual and Final Event). Votes are allowed till 31 May 2019.**

Respective College can also invite organizers to conduct Virtual round in their institute. It will help them to save transportation expenditure on signing the MOU between both parties.

©SUVC | www.suvcrste.com | Ph. 8770201773, 9617577301|
https://www.facebook.com/suvcrste

C.GENERAL INSTRUCTIONS

By following general instructions, students will learn about the basic functioning of a company.

- **Every Team is awarded three Memorable Award for Faculty Advisor, Team Leader for their futuristic thinking and the whole team for their team spirit till the final event.**
- Team Individual Member can participate in **National-level Creative Product Exhibition** held simultaneously during the Event.
- **We are always ready to help the participants, if they find any type of problems in Calculation or Production; they are free to ask us on contact details mentioned in Help & Support at their respective departments.**
- Teams should check their official mail and Whatsapp group regularly. Framework of Phase Reports, Track's Map will be mailed to the teams and their official group.
- We appreciate the work of every team. Due to the heat of action in case of any miscommunication with any team during the final event, the teams are requested to get help at the helpdesk as soon as possible.
- After every dynamic and static round, the timing and scoring points will be written in SUVC exclusive score sheet by the judges and the Captain/Vice-Captain should verify it on the spot.
- Every team has **2 attempts** for each dynamic round & ONLY **1 attempt** for each static round.
- **After the Award ceremony as a token of memory, teams can take their Pit Identification Banner along with them.**
- Vehicle-related documents should be submitted on the given dates. Any team having their exams on these dates will be excused only if they notify about the exams to society beforehand.
- Teams will present their concepts, CAD models, presentations on different departments of their developing Vehicle in Virtual of SUVC-20, where industry experts will judge teams on the basis of written test and viva voce for 200 Marks, accordingly Virtual Winner will be decided. Teams can also clear all the doubts related to vehicle as well as the main event in this Virtual Round.
- RSTE-Technical Clubs established in various colleges can also organize workshop and training programs in their campus to make an award-winning vehicle, gain sponsorships from RSTE and begin your long and fruitful journey with us.

POINTS DESCRIPTION

1) Virtual Round: 200 Marks

Viva Voice	100
Written Test	100

2) Final Event: 2000 Marks

a) Static Test (800 Marks)

1.	Technical Inspection	200
2.	Weight and Egress Test	50
3.	Design Round	150
4.	Business and Marketing Plan	100
5.	Vehicle Cost Round	100
6.	Innovation Round	100
7.	Build Quality Round	100

b) Dynamic Tests (1200 marks)

1.	Brake and Acceleration Test	150
2.	Auto Cross Check	150
3.	Suspension and Traction Check	150
4.	Challenging Round	300
5.	Endurance Round	450

3) Creative Product Round: 200 Marks

Working	100
Theoretical Literature and Presentation	100

D.TEAM REQUIREMENTS

By following team requirements, students will learn about decision-making and HR policies.

Educational Eligibility

- A participant should be an undergraduate, pursuing engineering from any trade or stream from a recognized University/Technical Institute.
- RSTE-Technical Club Members.
- He/she can be pursuing diploma from any recognized Technical Institute in any trade or stream.
- Only 2019 graduated students can participate.

Team Eligibility

- **Team Name**

Each team should have a unique name, through which they will register in the Competition.

Each team should have its own logo; a logo should have a USP: Unique, Simple & Purpose defining.

A team can have a motto, or catchy lines, to make their vehicle more attractive.

Teams which have members from different college/universities should register themselves under a single college name and single team name, with their understanding.

- **Team Size**

Team size should have maximum of 40 members and minimum of 07 members excluding faculty advisors.

- **Team Members**

A team should have minimum: -

One Faculty advisor: Faculty Advisor should guide and motivate the team towards the team's objective, innovation and check their team progress and help them in organizational/institute paperwork/procedures to win the title of SUVC.

One Team Leader: Team leader should encourage the team members to work towards all SUVC objectives and form strategies for the team to win in the final event and make team members enough capable that they can continue learning in the upcoming year and are able to assign captain and other members on their own.

One Captain: Captain should control all the deadlines and make the team to finish their work within the time frame. The captain should be technically sound in addition togood management skills.

One Vice-Captain: In the absence of the captain, vice-captain should handle all the responsibilities of the captain.

One Accounts Head: Take care of all financial records and suggests decisions as per the team's financial budget.

One Marketing Head: Should take care for team's Fb page, WhatsApp group, sponsors, investors, crowd funding, photographs, etc.

Two Drivers: Should be physically fit and attentive while driving with the ability to sustain in fire proof suit for at least 3 hours continuously.

- **Official Mail-Id**

Teams should have their specific corporate type email account which consists of **SUVC** prefix or suffix.
Example:**SUVC.teamsurya@gmail.com**
All the important information and announcements will be sent on this account only. Emails from ONLY official email account will be considered for Help and Support.

- **Official WhatsApp Group**

Teams have to maintain an official WhatsApp group in which minimum one SUVC organizers should be present as admin so that quick/short notice will be transferred to the team. A team can also discuss their winning strategies in this group.

- Teams preferred to have maximum of 2 faculty advisors and one H.O.D. For Complete girls' team, it is advisable to have minimum one female faculty advisor.
- Faculty advisors will be preferred to accompany their team to the event and Virtual but are not allowed to help their team directly in(product designing, research work and various tests) any condition.
- Each Team must fill Indemnity, Caution Money form, Certificate Issue form and Liability form before entering the dynamic event.
- Team should have gate in and gate away pass for unloading and loading their vehicle at the event site which will be provided at the helpdesk.

E. REGISTRATION

By following registration process, students learn about a company's legalities and financial analysis.

Registration Process

A team can contact us via the website, email or phone (provided at the last of this rulebook in organizer Team Details).

- Following which organizers will send the **Registration Form (also available on the website)**, teams then have to fill the form and **get enrollment id** from SUVC organizers on their team's email account.
- Teams are required to **pay the enrollment fees** within 7 days
- Add the complete details of all team members in the **offline Registration Form** provided including captain, vice-captain and faculty advisor and **submit it along with full registration fee** to us after enrolling. **Compulsory to bring the hard copy of Registration Form during final event**. Also, **submit color scanned copy of Registration Form in PDF format** on our email account.
- Date of submission of this Registration Form by team will categorize teams for Registration fees.
- **Submit registration fee in the society account** according to the information given in the next section.
- **Upload payment proof** on SUVC official email account.

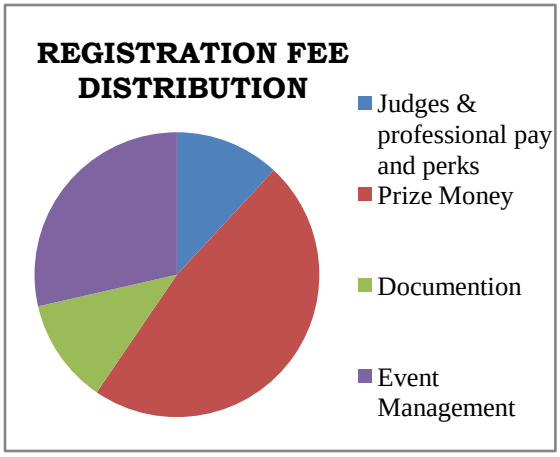
Registration Fees

Registration Category	Registration Date	TOTAL FEE (FOR NON-RSTE MEMBERS)	SUVC Enrollment Fee	SUVC Event Registration Fee	
				Non-RSTE Members	RSTEClub Members
Acute	20 March - 31 May 2019	**26725 INR**	5000 INR	21725 INR	8,499 INR
Active	01 June – 15 August 2019	**29315 INR**	5000 INR	24315 INR	9,499 INR
Obtuse	After 15 August 2019	**31475 INR**	5000 INR	26475 INR	10,499 INR

* Above mentioned fees are in INR including all taxes.

This total fee includes following registration fees:

1. Virtual Round Fees
2. Final Event Registration Fees
3. Pit allotment Fees.
4. 7 - Static Round Enrollment Fees
5. 5 - Dynamic Round Enrollment Fees
6. Certificate and ID card issuance fees.
7. Yearly SUVC helpdesk Fees.
8. SUVC QFD subscription.



Acute category: Team submitting the **Registration Form** before 31 May, 2019 will be considered in the Acute category.

Active category: Team submitting the **Registration Form** between 01June, 2019 & 15August, 2019 will be considered in Active category.

Obtuse category: Team submitting the **Registration Form** after 15August, 2019 will be considered in Obtuse category.

Teams have the chance to pay the registration fees in two installments:

- Installment 1 is to be paid within 7 days after submission of Registration Form.
- Installment 2 is to be paid within 1 month (30 days) after submission of Installment 1.
- Registration fees must be submitted to the society within the deadlines, late fees will be charged **INR 200/-** per day.

Teams who are unable to submit the fee in due time will not be levied any late fee charges if they notify the organizers beforehand mentioning their genuine reason.

Fee Submission Mode:

- Online Money transfer (using IFSC) through any bank.
- NEFT through any bank.

If teams inform about their unavailability at least 45 days before the main event then the organizers may consider to refund or transfer some percentage of the paid registration amount in their team account. It totally depends on the organizers' decision to refund or transfer the amount. Teams do not have the right to claim any registration amount.

Society Account details:

Name: REFRANGIBLE SOCIETY OF TECHNOPHILE ENGINEERS

Account number: 635601010050047

IFSC code: UBIN0563561

MICR code: 474026006

BR code: 563561

Address: HIGH COURT, GWALIOR, 474011

Teams finding any problem regarding payment issue are requested to contact us at +91-8770201773.

Registration Fees will not be refundable in any case until and unless the event is cancelled due to major problems (like flood, bad weather, emergency govt. policies). The organizer reserves the right to cancel or abandon the event and, in that case, only Registration Fee will be refundable or transferrable to the next event.

If teams want to book final event t-shirts for their team members and want to have a professional appearance, They should inform organizers at the time of registration along with t-shirt sizes for their team members.

F. Driver's Requirement

By following driver's requirements, students will learn about the motorsport terminologies and familiar with racing driver equipments.

F.1 Driver's Eligibility

F.1.1 Vehicle driver must be from the team.

F.1.2 All the driver must have valid Indian government issued driving license.

F.1.3 Both drivers must have individual medical insurance.

F.2 Driver Safety Equipment

F.2.1 Driver suit: Teams should have a minimum of one-layer single piece driver suit with a standard rating of SFI3.2A/1 (or higher)/ FIA Standard1986.

F.2.2 Under clothing: Under clothing must be fire resistance and free from synthetic or plastic material. Cotton underclothing or SFI Rated is allowed.

F.2.3 Helmet: Only Closed Face Helmet Is allowed. It can be of **ISI Rated**, SFI rated, FIA rated or Snell rated.

F.2.4 Balaclava: Balaclava must be made from Fire resistant material. SFI rated Balaclava is preferred.

F.2.5 Neck support: Only Full Circle (360 degree)Neck Support is allowed. Horseshoe is NOT allowed.

F.2.6 Gloves: SFI rated gloves are allowed.

F.2.7 Shoes: Fire resistant shoes with SFI rating are allowed.

F.2.8 Socks: Fire resistant socks are allowed.

F.2.9 Fire Extinguisher: Two Fire Extinguishers each of minimum 1 Kg will be required. One fire extinguisher will be installed in the vehicle and other should be carried by the team member every time when vehicle is moving out of the pit. Fire extinguisher installed in the vehicle should be within the reach of driver after harnessed by seat belts.
Fire extinguisher refill date should not be more than one year prior from current date and sufficient pressure should be maintained.

F.2.10 First-Aid Box: Each Team must have their own first-aid box consisting normal medicines and bandages for sudden and minor wounds on body.

G. Document Submission

By submitting documents on time, students will become familiar with various frameworks provided by MNC's professionals.

Yearly documents (Phase Reports) submission helps judges to evaluate points in static events and get pre-information about the teams' progress. Some marks will be added in the following static rounds at the time of the final event for the teams who submit their phase reports on time in the layout provided by organizers:

1. **Design Round (Phase 1, Phase 2 and Phase 3) Files.**
2. **Innovation Round (Phase 2) Files.**
3. **Cost Round (Phase 1) Files.**
4. **Technical Inspection (Phase 1, Phase2 and Phase 3) Files.**

Teams and team members can also send regular educational videos (monthly wise) created by the team to be published in SUVC YouTube channel and are to share it among the students to get a chance for winning the SUVC visionary Award.

G.1 Phase- 1

1. **Team Introduction:** This report is primarily focused on the vision, goals, achievements, and uniqueness of the team. It also inquires about the likes and dislikes, strengths and weaknesses of the team members. This helps the team to create a solid image in front of everyone.

2. **Original CAD File**: It should contain all the views of the vehicle with complete assembly and overall dimensions.

3. **Marketing and Cost Analysis Report**: It should have all the market research and cost analysis along with the supplier details.

4. **Design analysis Report:** This report consists of Design Validation Plan (DVP) and Design Failure Mode Effect and Analysis (DFMEA). It should contain all the failure mode of the vehicle under various load condition, its effect on vehicle performance, and how to rectify them.

5. **Winning Plan**: It should contain the working layout, strategies of the team with respect to time for winning the competition.

G.2 Phase 2

1. **ETKA report**: It contains all the small and big components and assembly photos, specification used in the vehicle which includes definition, technical specification, dimension, cost and supplier details.

2. **CFD Diagrams Report:** This report will be having the Current Flow Diagrams of the various electrical components used in the vehicle. It should contain wiring diagram and wiring harness diagram of each and every component in e-form so that the circuit problem can be solved easily by anyone.

3. **Energy design and calculation**: It should contain the energy utilization calculations and its design parameters during the running time of the vehicle and on ideal conditions.

4. **Innovation Report:** It should contain proper description of Technical Innovation with proper calculations, applications and its estimated cost.
   The teams should prepare a video explicitly showing the working, explaining all facts and figures and are requested to submit it along with the Phase Reports.

   To avoid any misunderstanding, Innovations will be considered as per the following definition:

   Innovation in its modern meaning is a "**new idea, creative thoughts, new imaginations in form of device or method**". Innovation is often also viewed as the application of better solutions that meet new requirements, unarticulated needs, or existing market needs.

G.3 Phase 3

1. **Video submission:** The total time of the video will be 4 minutes and 30 seconds in MP4 format, 360P. First 2 minutes and 30 seconds should include the introduction of the team and manufacturing of the vehicle. Last 2 minutes should contain the dynamic running of the vehicle on the road or a track.

2. **College Level Technical Inspection Sheet:** Teams have to fill the vehicle information in the College Level Technical sheet provided by the organizers and to submit it in PDF format by scanning the document duly signed by Team Captain/Faculty Advisors.
   Faculty Advisor(s) must ensure the Technical Inspection Sheet before coming to final event so that the vehicle can pass T.I. with ease.

3. **Vehicle Report:** The report should contain all the content of vehicle which is to be submitted in the Phase 1 design report and if any modification is done from Phase 1, they can do. This report will be chosen for the design award and its presentation will be held during the final event.

4. **Vehicle testing report**: During the testing time of the vehicle, the teams should maintain a testing report of vehicle behavior. It should contain the information of vehicle parts, components or departments which malfunctioned during the running time and how the team rectified these problems.

5. **Owner's Manual:** It should have all the information about all vehicle component specification and their operation. It should also contain Vehicle Cost including Running Cost, Maintenance Cost and Life of Vehicle.

All the documents should be scanned and submitted in PDF format.

Every report's name should start by team name.

Example: **Team_XYZ_Cost Report.pdf**
Team_XYZ_innovation video.mp4

All the guidelines to make these reports including all the deadlines will be sent to the team's official email account. Teams failing to submit the report on given deadlines will face penalty or disqualification from the static award of that category.

If any team is not able to submit the reports due to their college exams, then they will be given some extension ONLY if they inform this to the society beforehand.

H. VEHICLE REQUIREMENTS

By following vehicle requirements students will learn technical terminologies and are able to design their own vehicle.

FROM 2019 ONWARDS, WE ARE ALLOWING TWO CLASSES OF VEHICLES IN OUR COMPETITION

1. ***S-class: Smart Vehicles***
2. ***M-class: Master Vehicles***

BRIEF LAYOUT FOR BOTH CLASSES OF THE VEHICLES

Specification	Description	S-Class	M-Class
Power Train	Power Source	Electric Motor	Electric Drive
	Power Capacity	Up to 2.5 KW	Up to 7.5 KW
PCM ratio	Vehicle design factor	Up to 10	Up to 20
Eligible Vehicles	Rulebook standards	SUVC Rulebook + Other basic safety factors.	SUVC Rulebook + Other basic safety factors.
Vehicle Dimensions	Maximum Length	3048mm	3556mm
	Maximum Width	1730mm	1730mm
	Maximum Height	1550mm	1550mm
	Minimum Ground Clearance	80mm	120 mm
Weight	Maximum Curb Mass	250 kg	375 kg
Wheels	Number of wheels in the front	2	2
	Number of wheels in the back	1 or 2	2

Allowed smart vehicles looks like

Allowed Master Vehicles looks like

The following requirements and restrictions will be checked during Technical Inspection. Non-Compliance must be corrected before operating on power.

About S (Smart) Class:

These vehicles are preferred to have the maximum speed up to 60kmph and should be energy efficient capable to run on direct solar energy. High Ground clearance and more stable vehicles will be most preferred. Teams should use maximum **PCM ratio (up to 10)** and design their vehicle light weighted (Maximum Curb Mass 250 kg).

About M (Master) Class:

These vehicles are high power source vehicles already designed and developed to defeat any existing vehicles. Off-road and other vehicles available in the market or college participating in events like E-kart, E-ATV Professional Electric and Solar, etc. The aim is to build research-oriented students to understand the needs of the market and grow accordingly. We advise the teams to modify the vehicles according to the needs of the general non-technical customers who want to purchase such vehicles to reduce pollution and save running cost. These vehicles can also be donated to the hospitals, handicapped people in the future. The maximum speed of these vehicles is restricted to 60kmph and preferred to have high torque with load carrying capacity of 200 kg. The teams should use maximum **PCM ratio up to 20** and design their vehicle light weighted (Maximum Curb Mass 375 kg).

Only authorized vehicles will be entertained which are developed under some rules and restrictions of other events. Teams have to get these rules and restrictions verified by the organizers before the final event. The Static and Dynamic rounds' judging criteria, formula and overall score will be the same for both the classes.

Time and Laps in the Dynamic round of both classes will be recorded separately for scoring.

PCM RATIO = Total rated power from power source (in watt)/Curb Mass of Vehicle (in kg)

If PCM ratio is exceeding, then Exemption Factor will be multiplied with the time and laps for Dynamic rounds.

Exemption Factor = 1- {(Your PCM RATIO – Class PCM Ratio)/Class PCM Ratio}.

Exemption Factor will also be calculated if the vehicle power source is exceeding than the given parameters.

Rules for S-class vehicles

H.1 Motor

1. The maximum rated power of motor to be used is **2500 Watt.**
   The teams should show all original specification bills at the time of T.I.
   Original Power chart should also be shown to the organizer at the time of T.I.
2. The operating voltage should be equivalent to **48 Volt**
3. It should be controlled by motor controller only.
4. The teams can use BLDC Hub Motor for three-wheels vehicle.
5. The teams should use Flange BLDC motor for four-wheels vehicle.
6. Mounting of the motor should be rigid and tightened with lock-nuts. Proper bushes should be used.
7. Appropriate DC ampere rating fuse should be used to control the over-passage of current in live wire.
8. Rating of the motor and specifications should be clearly displayed on original bills and on the motor.
9. Proper cooling system should be provided to protect the motor from heating during running.
10. It should be installed behind the firewall and away from driver compartment.

H.2 Motor controller

1. The motor controller must be used in the vehicle. Motor will run by motor controller ONLY.
2. Bypassing the motor controller is strictly prohibited.
3. It should be rigidly fixed on the vehicle and should be at least 5 cm away from the tractive motor. Proper cooling system should be provided to protect it from overheating.
4. The wiring should be protected by fuses and proper junction connectors should be used.
5. It should be installed behind the firewall and away from driver compartment.

H.3 Reversing Mechanism

1. Teams must use reversing mechanism of vehicle with the help of motor controller by connecting suitable wiring or by using idle gear.
2. Proper switch indicating reverse to the driver should be used.
3. Proper reverse lighting should be installed in the vehicle while taking reverse.

H.4 Batteries/Accumulators

1. Batteries including tractive and SLI battery should **not exceed 5KWH** capacity.
2. Operating voltage of tractive batteries should **not exceed 48 Volt DC.** They should be placed inside a

tested protective cover and must have an inbuilt BMS.

3. SLI batteries used should be operated at **12 volts/9 Volt DC.**
4. Tractive and SLI batteries wiring must be physically separated and have separate connections according to their uses.
5. Proper insulation and rating of fuse must be used on each and every electrical component used in the vehicle.
6. Teams should have proper socket to charge both type of batteries in vehicle.
7. Proper cooling system should be provided to protect them from overheating.
8. It should be installed behind the firewall and **away from driver compartment.**
9. We prefer to use Li-ion batteries along with inbuilt BMS. Teams can also use lead acid batteries for cost effectiveness.

- **Tractive batteries:** batteries which are used to power the motor must not ground to chassis or roll cage.
- **SLI batteries**: These are used to power the electronic components like horn, Brake-light, etc. It will be preferred that NLV should be grounded to chassis.

H.5 Solar collector

1. Team can design their solar panel according to their calculations. Solar panel must be rigidly mounted to the vehicle.
2. The maximum permitted voltage that may occur between any two electrical connections is **60V DC.**
3. **Panel should not be overhanging beyond 6 inches from the rooftop on front, back as well as on the sides.**

H.6 Charge controller or MPPT

We prefer to use charge controller which are able to provide direct load without using battery power and can also charge the batteries in case needed. Also, mounting should be rigid for the charge controller. Input voltage can be 72 volts but output voltage should not be greater than 60 volts and it should synchronize with the operating voltage of motor.
Use of MPPT for team is also allowed but it should be rigidly mounted to the vehicle.

H.7 Dashboard

The Dashboard of the vehicle must show the current and voltage consumption by the tractive components with the help of multimeter or any such device. It should have switches for reversing, horn, lights. indicators etc. and preferably a speedometer. It must have proper charging or discharging indicator for the batteries.

Rules for M-class vehicles

The most suitable vehicles for M class will be

Professional Class Vehicle **E-ATV Vehicles,**	***Commercial Electric Vehicles*** **Hybrid Vehicles.**

- Maximum Power Source used should not exceed 7500 Watt (Hybrid).
- Maximum electric motor rated power allowed will be 5000 Watt only. Maximum operating voltage allowed will be 96 Volt Dc.
- Power Source can be Hybrid or Electric Drive. Specifications must be clearly shown in the data sheet provided by vendors.

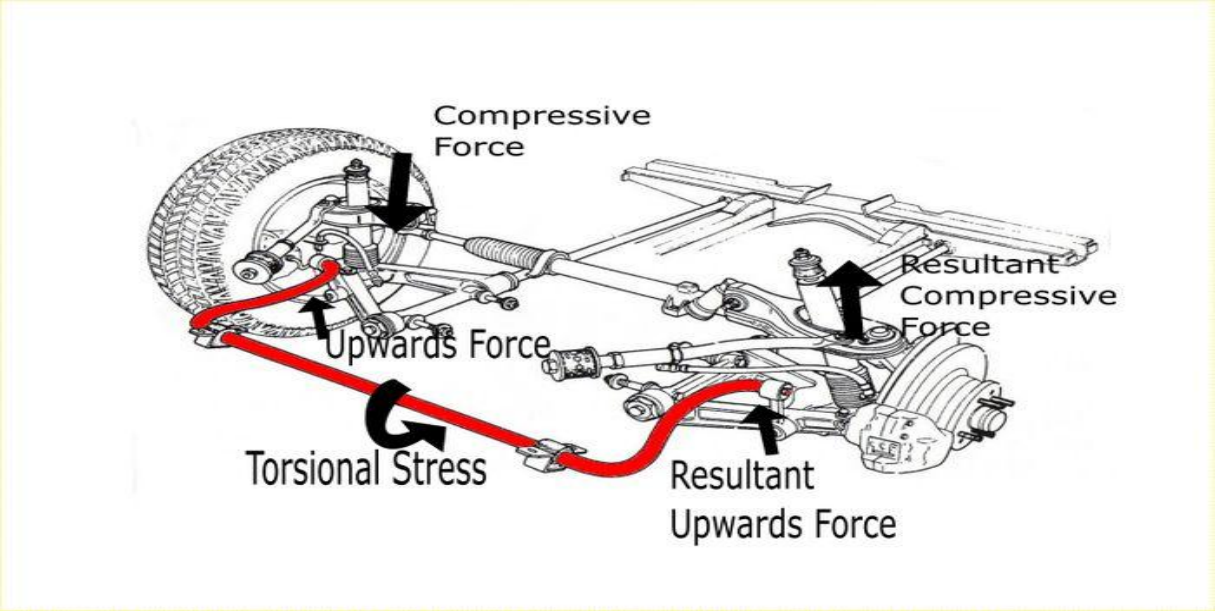
In case of high-powered Electric Vehicles, Accumulators must not exceed 5 KWH operating on not more than 48 volts.

This class is for experienced team(s) who is participating in other events. Rules must comply with other event rulebook and rules of event participated/participating. Teams have to submit the rulebook before the final event to the organizers and rest all common requirements should follow.

H.8. General Vehicle Body Restriction.

H.8.1. Vehicle Type

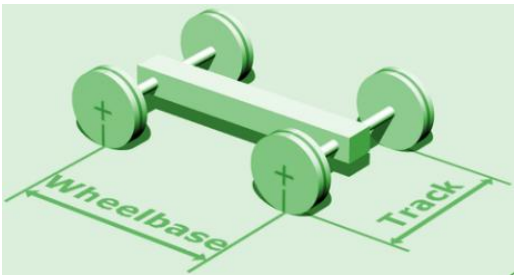
- Teams can make 3-wheel (for S class only) or 4-wheel vehicle according to their requirement. If teams are making a 3-wheel vehicle, then they must have 2 wheels in front of the vehicle (tadpole configuration) and must use an **anti-roll bar** in the front wheels along with the suspension to get more stability and protection against rolling of the vehicle.

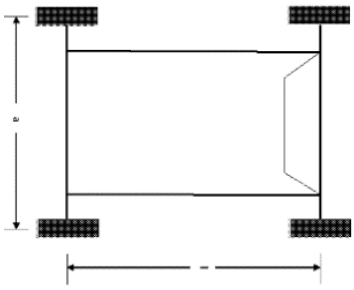


H.8.2 Dimensional Restriction.

H.8.2.1 Wheelbase

Distance between front wheel center line to rear wheel center line.
Wheelbase of the vehicle must lie between 2134mm (84 inches) and min 1525mm (60 inches).





H.8.2.2 Wheel track

Vehicles should have ratio of wheelbase and wheel track within 1.4 to 1.8.Wheel track must not be greater than 60 inches (for both S-class& M-class).

Suggestion for all participants: Get the ratio near to golden ratio (1.618 ~ 1.7).
Example: wheelbase length - 2100mm and wheel track - 1290.

H.8.2.3 Vehicle Height –

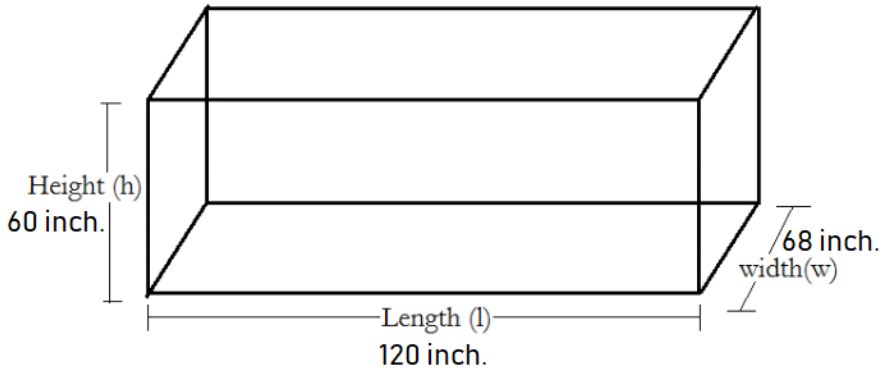
Vehicle height must not be greater than 60 inches.

H.8.2.4 Vehicle weight -

Vehicle weight should not exceed250 kg and in case of multi-seater vehicles, it should not exceed375 kg (without driver).

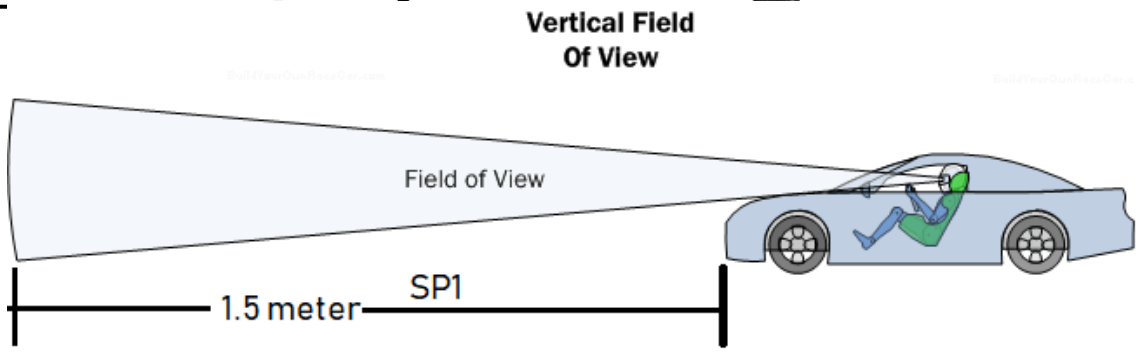
H.8.2.5 Dimension restriction

Vehicle overall dimension must not be greater than following parameters; 120inches (Length) * 68inches (Width)* 60inches (height).



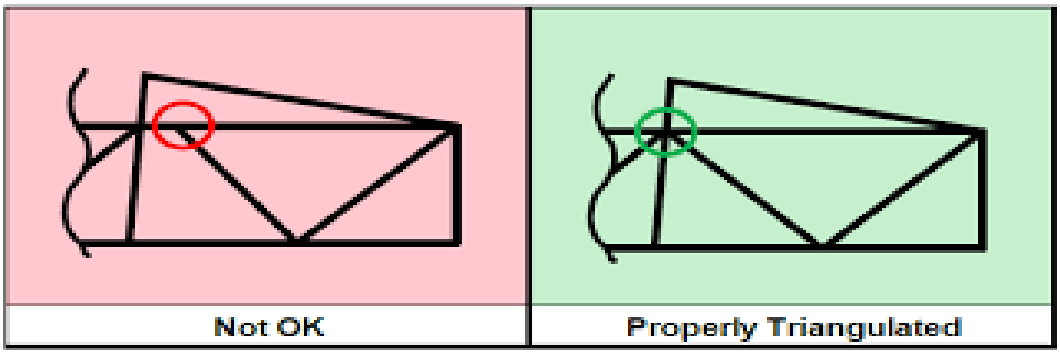
H.8.2.6 Driver visibility

An object, 1.5m from the front most part of the vehicle must be visible from the driver position. For side vision, 100° left and 100° right of the direction of travel should be clearly visible. **NO barriers allowed in this region.**



H.8.2.7 Triangulation

An arrangement of frame members projected onto a plane, where a co-planar load applied in any direction, at any node, results in only tensile or compressive forces in the frame members. This is also what is meant by "properly triangulated". Frame should be properly triangulated at all nodes.



H.8.3 Space Frame.

- Teams can fabricate any kind of monocoque frame according to their requirement and SUVC rulebook. 3-wheelers (for S-class only) and 4-wheelers both type of vehicles are acceptable.
- S-class vehicles can be open cockpit and roof top type (overhanging of solar panels is not allowed from the roof top).
- Teams can also design multi-seater car and professional type solar car under SUVC rules.
- Teams having old vehicles can also participate with modification according to SUVC rules.

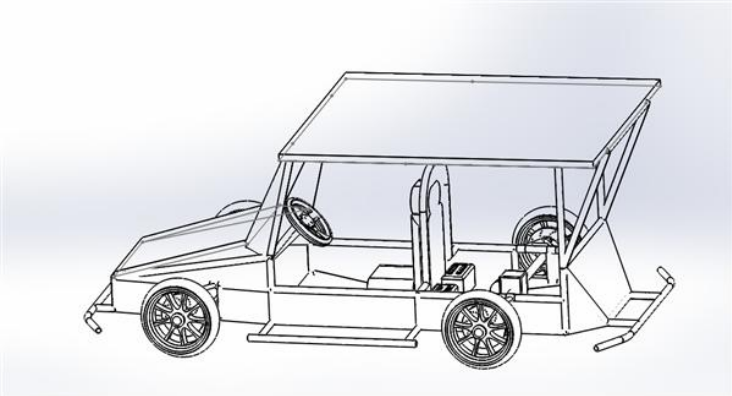
H.8.3.1 Primary member:

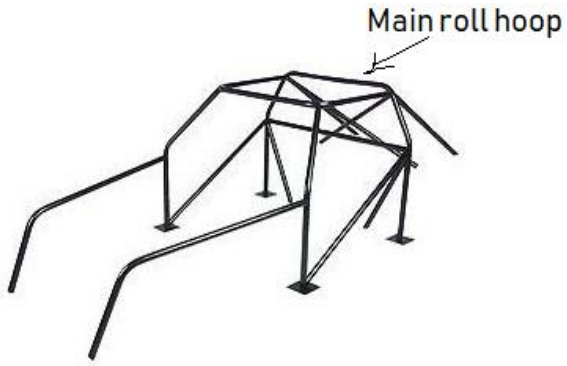
1) Main Roll hoop
2) Front roll hoop
3) Roll hoop braces and support
4) Side Impact Structure
5) Front Bulkhead
6) Front Bulkhead Support System and
7) All Frame Members.

NOTE: All Roll hoop members should be continuous members. The roll Hoop must be supported by two braces extending in the forward or rearward direction on the both left and right sides of the Main Hoop. If the Main Hoop leans forward, the braces must be forward of the Main Hoop, and if the Main Hoop leans rearward, the braces must be rearward of the Main Hoop.

Main Roll Hoop:

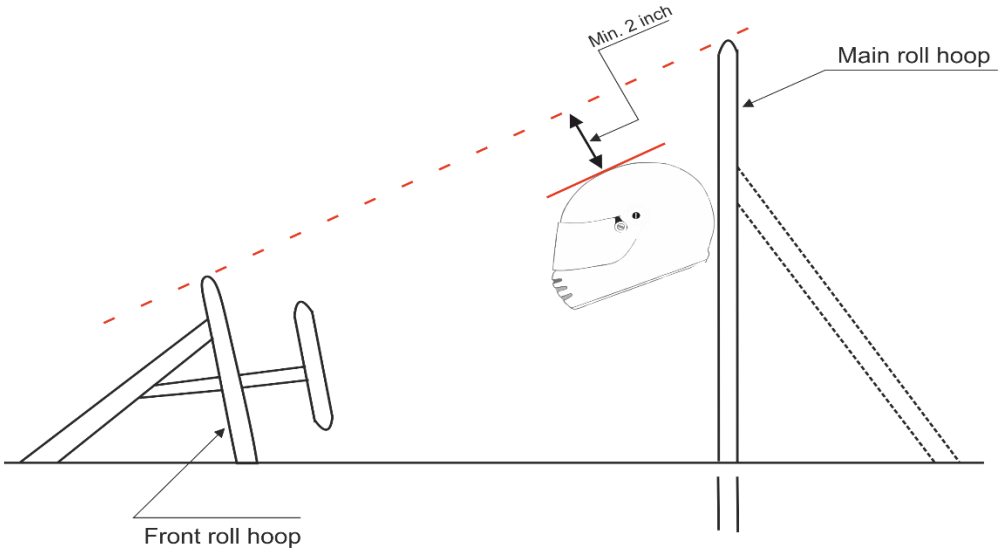
1. Main roll hoop should be a continuous member.
2. The driver's head and hands must not contact the ground in any rollover attitude.
3. Mandatory gap of driver helmet's top point to Roll hoop top point should be at least 2 inches.
4. In the side view of the vehicle, the portion of the Main Roll Hoop that lies above its attachment point to the Major Structure of the Frame must be within ten degrees (10°) of the vertical.





Helmet clearance

Teams designing open cockpit type vehicle must ensure 2inches (50.8mm) gap between driver helmet's top point and a line joining front roll hoop and rear roll hope.



H.8.3.2 Secondary member:

1.) Pedal assembly mounting
2.) Motor mounting
3.) Suspension mounting
4.) Wishbone mounting
5.) Seat and seatbelt mounting etc.

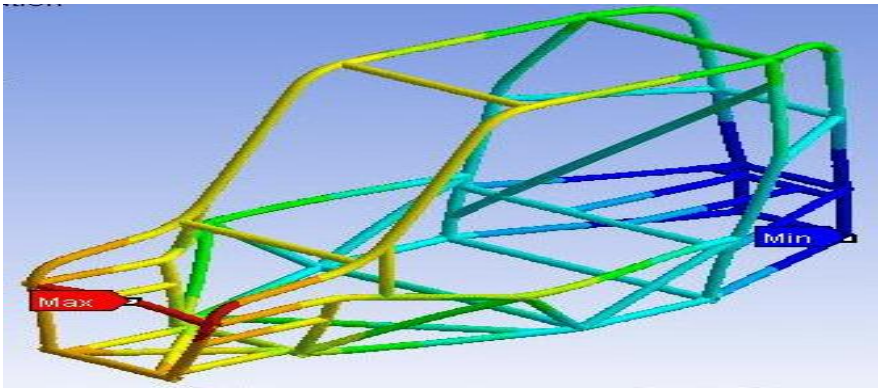
NOTE: All secondary members should be properly welded over the primary members.

H.8.3.3 Tertiary member:

1.) Body panel points
2.) Controller points
3.) Fire wall points
4.) Dashboard panel points etc.

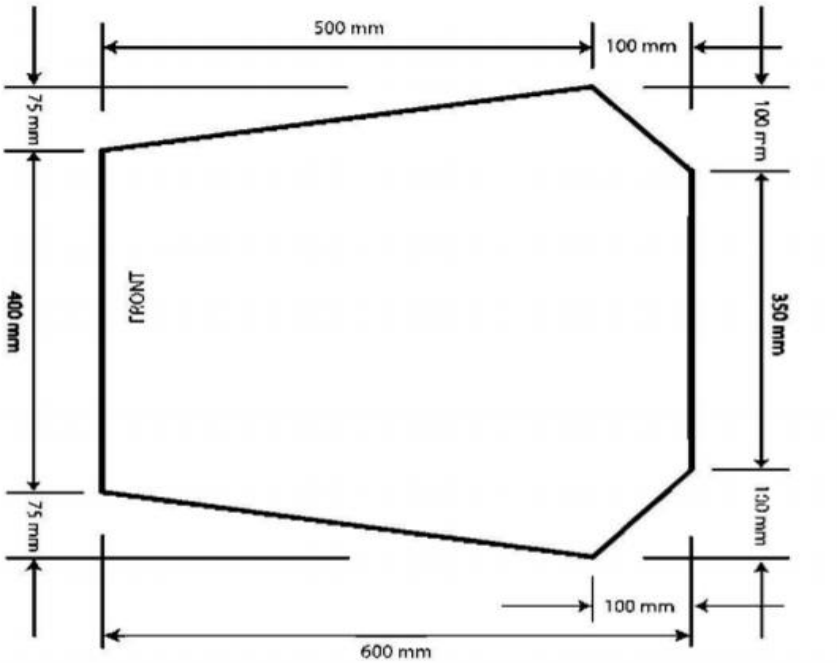
H.8.3.4 Impact zones

Vehicles should have minimum three impact zones to protect driver from Front, Side, Rear,etc.



H.8.4 Driver cockpit

Driver cockpit should be of an adequate size, a template shown in following figure will be inserted into the cockpit opening. At the time of T.I., judges will insert this template vertically in the cockpit area, any part of the cockpit should not restrict the template during this procedure.



H.8.4.1 Driver seating position

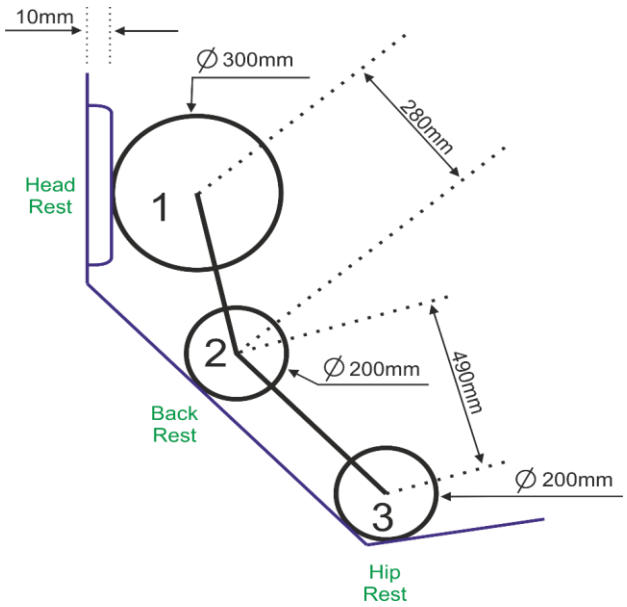
Team have to follow **SAE 95th percentile Male template and 5th percentile female rule**.

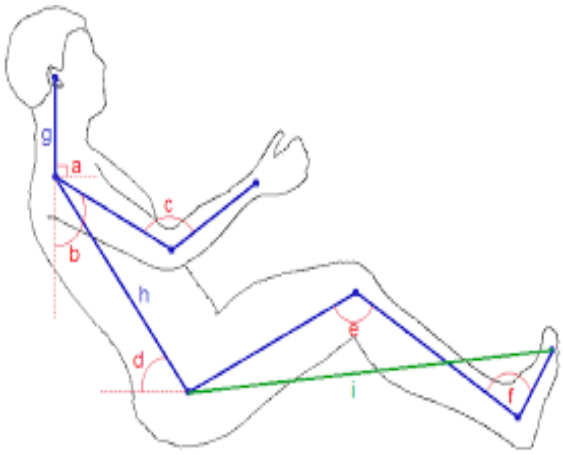
95th Percentile Male Template Dimensions

A two-dimensional template is used to represent the 95th percentile male is made to the following dimensions:

a. Circle 1 of diameter 300 mm (11.81 inch) will represent the head (with helmet).
b. Circle 2 of diameter 200 mm (7.87 inch) will represent the shoulder/cervical region.
c. Circle 3 of diameter 200 mm (7.87 inch) will represent the hips and buttocks.

- Center to center distance between circle 2 (200mm) and circle 3 (200mm) will be 490mm (19.29inches)
- Center to center distance between circle 1 (300mm) and circle 3 will be 280 mm (11.02 inches).
- Angle at hip rest, back rest and knee should be greater than 90 degrees and foot rest point should be lower than hip rest point.
- Above figure is not on actual scale, teams must consider dimensions for designing and inspection.
- Teams should present their ergonomics of vehicle in the final design round with supporting documentations.





H.8.5 Material Selection

1. Only **seamless pipes** are allowed to construct frame.
2. Teams can only use circular cross – section pipes of diameter varying between 0.8 inch to 2 inches.
3. Primary Frame should be constructed with circular cross – section pipe. For supporting of components, teams can use another cross-section structure.
4. Minimum thickness of pipe allowed is 1mm.
5. In case of steel alloy, minimum carbon percentage is **0.1 %.**
6. Teams should come with material testing reports at the time of Technical Inspection.
7. Teams can use any grade of Steel, Aluminum, and Carbon Fiber for Frame.
8. Preferred material for the frame of primary member is AISI 4130.
9. Whole frame of vehicle should be built using a single material where dimensions can vary.
10. Also, the teams should have at least one open end tube in the frame (this end must be capped.)

H.8.6 Ground Clearance

1. Minimum Ground Clearance must be 80mm.
2. Ground Clearance will be checked when driver is sitting in the car.
3. Non-compensation for chain sprocket, Gears would be inspected while checking ground clearance.

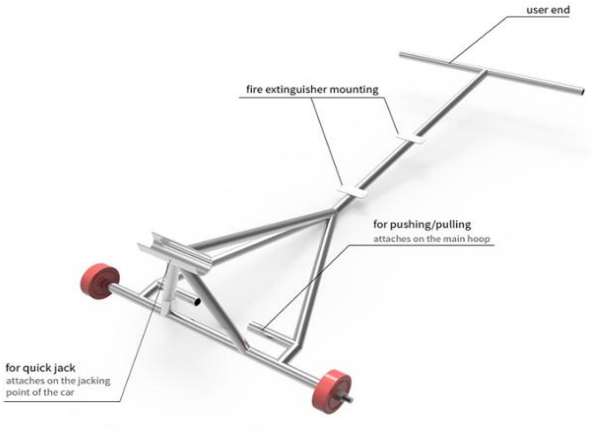
H.8.7. Jack Point

1. Two jack points should be present, one in Front & one in Rear.
2. Both should be capable of supporting vehicle's weight.
3. It should be built from circular cross-section pipe with minimum 300 mm length and minimum diameter of 1 inch.
4. It must be oriented horizontally and perpendicular to the centerline of the vehicle and painted with **red color**.
5. Push/pull rod should be easily fixed with jack points.

H.1.8 Push-pull rod

Each team have to design a push-pull rod in such a way that it is capable of pushing and pulling the vehicle by help of maximum 2 people manually.

Quick jack (Temporary Jack) is integrated with the push bar which is used to move the disabled car. (By the use of quick jack, teams can jack their vehicle easily and efficiently.)



Sample figures

H.8.9 Tri-pod jack

Teams must bring their own jacks (at least two) which are able to hold the vehicle completely with driver sitting inside.
They can also create tripods which are capable enough to handle the weight of the vehicle including driver.

H.8.9.1 Hitch Point

Vehicle should have a minimum one hitch point by which it can be easily towed in case of jammed wheel due to brakes.
Hitch point should ONLY be mounted on to the frame and NOT on the bumper.
Also, Hitch point and jack point should be mounted separately.

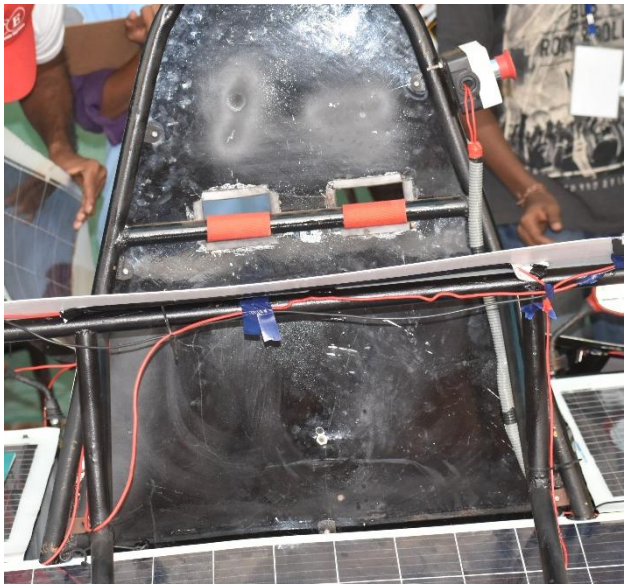
H.8.10 Tires and Wheels

1. Minimum Diameter of the Rim must be 10 inches.
2. Minimum width of the tire must be 90 mm.
3. Teams can use any type of tires (wet, dry, slick, semi slick, etc.).
4. Wheels should be fixed with proper locks, nuts and pins. Wobbling of wheel is not allowed.

H.8.11 Fire wall

1. Fire wall must separate the driver from high voltage electrical components.
2. The design must show evidence of addressing all three types of heat transfer, namely conduction, convection and radiation.
3. Electrical equipment's must not be mounted over the firewall, motor controller, battery, accumulators and cooling fans.
4. A firewall must separate the battery from the driver.
5. It must be rigid and made up of fire-resistant material.
6. It can be bolted, riveted, welded to the chassis.
7. Firewall should be minimum of 150% of driver-seating surface area and capable of covering the driver completely with all the safety equipment in any driving condition.
8. There should be no direct mounting on the firewall.

Front side

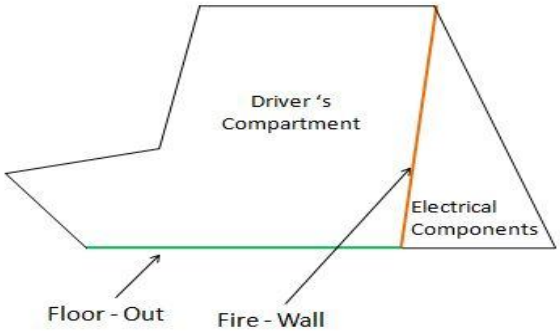


Back side

H.8.12 Floor Close-Out/Floor-panel

1. All vehicles must have a floor close-out (floor panel) made from one or more panels.
2. Panel should be solid and non-brittle.
3. Any part of the vehicle will not be allowed downside of floor panel.

A General Chassis with Firewall



NOTE: The design reports submitted by the teams prior to the main event should not vary more than 40% with the vehicle presented during the main event.

H.9 Basic Electrical Requirements

For S and M Class, major points are mentioned in the class wise description.

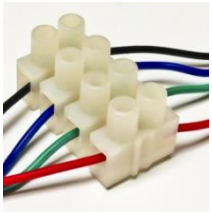
H.9.1 Battery Cover

1. All the batteries should be placed in a battery cover which is made up of fireproof material.
2. All the battery connections should be such that they do not touch any conducting part of the vehicle.
3. Batteries should be easily removable from the battery cover when required.
4. It should be rigidly fixed in the vehicle and properly tightened.
5. **Caution/ Danger Sign Sticker** must be pasted on tractive battery cover and should be clearly visible from a minimum distance of 2meters.

H.9.2 Wiring

1. The wiring must be properly insulated.
2. Joints should be formed by using proper connectors.
3. Twisted wire joints are not preferred.
4. **Live wire will be red in color.**
5. Wiring of tractive and NLV components must be physically segregated, doubly insulated, and should contain proper fuses.
6. Loose connections are strictly prohibited so as to prevent short-circuit in vehicles.





H.9.3 Fuse

1. Separate Fuse should be used for SLI and tractive components.
2. **Use of Fuse is mandatory for tractive,** SLI batteries and other electrical components used in the vehicle.
3. Fuses rating and specification should be clearly marked on the fuse boxes. Teams can also use relay.
4. Teams can also use DC MCB of particular ampere rating which should be equivalent to motor's maximum current rating. **DC Voltage and ampere rating must be clearly visible on MCB.**

H.9.4 Kill Switch and MCB

1. Minimum two kill switches must be used in the vehicle.
2. Kill Switches should be **Push to off** clearly marked push information emergency mark near to kill switch
3. Switch should be mounted rigidly on the vehicle.
4. Kill switch must cut off the tractive power of the vehicle.
5. One kill Switch should be in the driver compartment near to the driver and driver should be able to reach it when harnessed with seat belts.

H.9.5 Horn

An audible horn should be installed in the vehicle which will be powered by the SLI battery.

H.9.6 Battery Charging System.

1. **Vehicle should contain a charging system or a suitable charger to charge the batteries** (Tractive for hybrid or electric vehicles and SLI for all vehicles).
2. It should be easily accessible for repairing purposes and must be away from the driver compartment.

H.10Running Gears Requirements

H.10.1 Steering System

1. Steering wheels must be mechanically connected to the wheels, steer-by-wire and electrically actuated steering is prohibited.
2. Rear wheel steering is NOT allowed.
3. Steering system must have **positive steering stops** that can prevent the steering linkage from locking up; Stops may be placed on Upright or on rack which must prevent overturning and tires from contacting the body or suspension.
4. Rack and pinion type steering gear is preferable.
5. Any extra boost-up effort by means of hydraulic or electrical boosters is not allowed.
6. Steering must be designed according to the **vehicle geometry**.
7. All components of the department should be properly fixed and free play of steering wheel should not be greater than 7 degrees.
8. Rack on both sides should be properly covered by rubber boot.
9. In any angular position, the top of the steering wheel must be no higher than the top of the frame.
10. Steering wheel shape should be similar to circular or oval shape, “H-type” steering will not be allowed.

H.10.2 Suspension System

1. Suspension should be on all wheels.
2. Suspension should be with proper geometry and proper actuation with weight transfer.
3. All suspension mounting should be visible at Technical Inspection either by direct view or by qualifying circuit.
4. Wishbone/A-arms should be of Seamless Tubes.
5. Use of Anti roll bar in vehicle is preferred along with suspension.
6. Suspension should not be highly rigid or highly spongy. The suspension used must have a minimum of 4 inches (101.6 mm) of travel i.e. 2 inches (50.8mm) jounce and 2 inches (50.8 mm) rebound.
7. Bottom of vehicle should not touch the surface in any condition of loading. Suspension will be tested when the driver is sitting in vehicle.

H.10.3 Brakes

1. The car should be equipped with a Hydraulic braking system on at least two wheels which is operated by a single control.
2. Brake must be installed on the powered wheel.
3. It must have two independent Hydraulic Circuits.
4. Brake-by-wire system is prohibited.
5. All brake lines and hoses must be properly mounted, it should not be allowed to contact with any movable parts.
6. Teams can use DOT3, DOT4, and DOT5 as brake fluid.
7. No leakage will be allowed in braking system.
8. Brake over travel switch must be installed in the car, such that in case of brake failure it will shut down the system.
9. Every Vehicle must be equipped with Red Brake Light. Each brake light must be clearly visible from the rear even in bright sunlight.
10. During brake test, vehicle should come to stop in a straight line, brakes must be applied on all the brake wheels simultaneously.
11. Brake Pedal Should be properly mounted according to the pedal ratio.

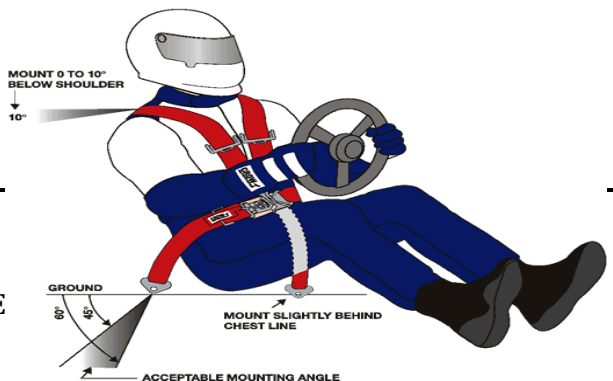
H.10.4 Transmission System

1. All Vehicles should be rear wheel drive only.
2. All rotating parts like CVT, sprocket, belt, gears, etc. must be fitted with scatter shield.
3. Accelerator pedal must be Right foot operated.

H.11 Safety

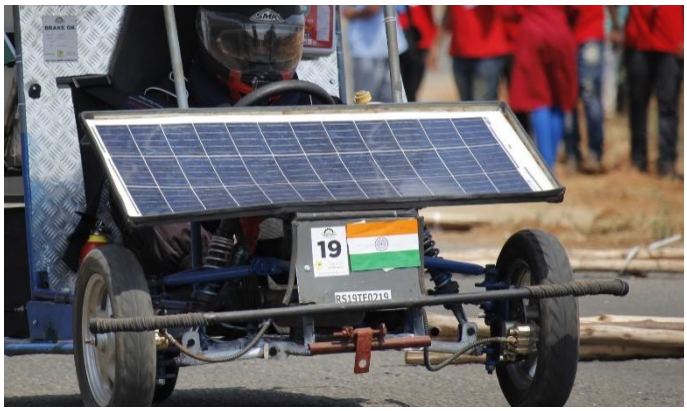
H.11.1 Seat Belts

1. Teams must use 5-point harness, metal to metal contact seat belts.
2. Seat belt mounting must be on the rigid members of the vehicle.
3. Seat belt must be in good condition, NO wear and tear allowed.
4. Driver should not be able to move after wearing the seat belt.
5. The shoulder harness must be the “over-the-shoulder type”. Only separate shoulder straps are permitted (i.e. “Y”-type shoulder straps are not allowed). The “H”-type configuration is allowed.
6. Seat belts must not stretch/strain the seats.



H.11.2 Bumpers

1. Teams must use bumpers in front as well as rear of the vehicle.
2. Side bumper is optional, but if the side impact zone is not suitablethen teams have to attach side bumpers in which caseside bumpers should cover the driver cockpit length.
3. Bumper should not exceed the dimension restriction of the vehicle and should be of closed type.
4. No Solar Plate should be exceeding the bumper.
5. Bumpers should be made by seamless pipes.
6. Bumper should be from one wheel to the other in a vehicle, short bumpers are not allowed.
7. Bumpers should be rigid and should not exceed height of wheels.
8. The bumper should also be able to bear front impact load, as well as vertical load up to the 100kg.
9. During T.I., judges will check the rigidity of the bumper in every aspect.
10. If any team fails to have rigid bumpers then they **will not be allowed in Endurance**, however teams can **attend the other Dynamic Event** (with some penalty).



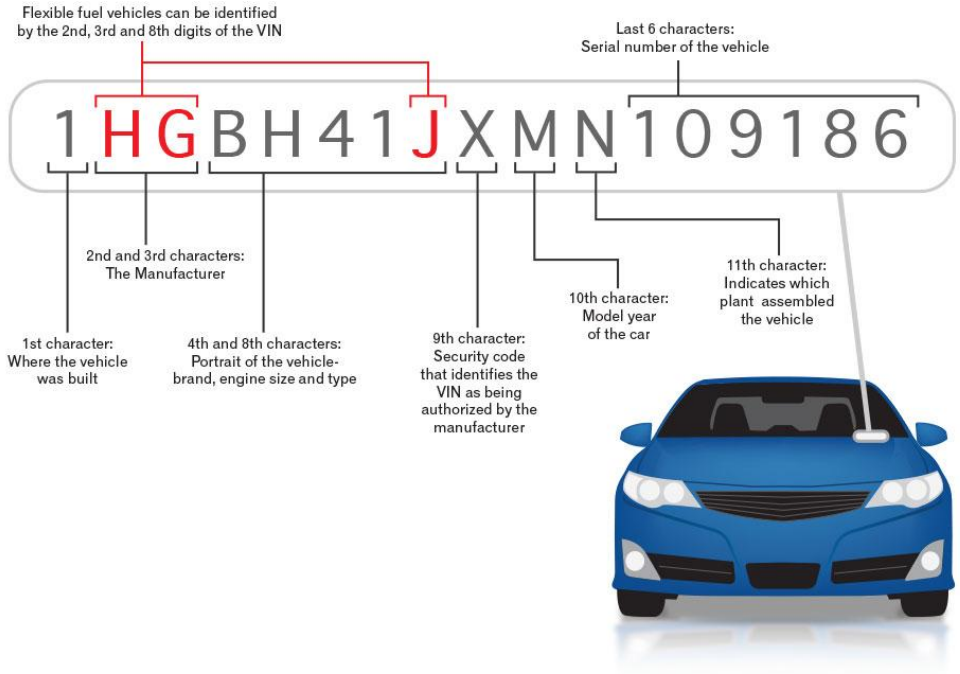
Front bumper

Rear Bumper

H.12 Others

H.12.1 Vehicle Identification Number

VIN will be formed by team that should be imprint on frame Tube of the vehicle by deeply grooving and having 17 digits including alphabetical. They should paste VIN number in front of the vehicle on page.



H.12.2Vehicle Registration Number

Vehicle should consist of Vehicle Registration Number which should be written and printed on number plate fixed in front and back side of the vehicle.
Team Vehicle Number will be: RS20SM20_ _, last two digits will be given by the organizers 15 days before the final event.

H.12.3 Driver's Seat

1. Driver seat must be supported with base frame.
2. Driver seat must be rigidly attached.
3. Nut, bolt and other metallic parts will not be allowed near the driver seating area.
4. Each team should have a driver Seat with **Back Rest and head restrain**.
5. Proper Heat Insulation should be provided to ensure that the driver doesn't come into contact with any metal**.**

6. Driver seat height should not exceed the main hoop of the vehicle.

H.12.4 Side/Rear View Mirror

1. It is compulsory for all teams to use side mirror which reflects rear view of the vehicle.
2. Mirrors should be properly fixed and able to see clear vision.

H.12.5 Fasteners

1. Motor, suspension, steering, braking and transmission should be fastened by locknut.
2. Only nut with lock pin and nylon locknut are allowed.
3. At least 3 thread of every bolt should be visible outside.
4. Teams can use rivets in firewall and body panels.

H.12.6 Luggage Compartment

Vehicle should have a luggage compartment of minimum 50 liters capacity strongly mounted to it and capable to carry weight upto of 15 kg for first-aid kit and necessary tools.

H.12.7 Multi-seater and Door

Teams are advised to use multi-seat, windscreen, window and doors in their vehicle to compare it with the available automobiles via case study. It helps to enhance their knowledge and add key features in their vehicle for build quality award (strongly recommended for M-class).

H.12.8 Dashboard

Teams must use dashboard in their vehicle to show speed, remaining fuel, and other driver-assistance systems of vehicle.

H.12.9 Switches

Teams must use proper OEM switches along with specification of functioning.

H.12.10 Necessary Tools Kit

Teams must have their own tool kit for repairing, assembling and disassembling the vehicle and its components at any time.

H.12.11 Front/rear lamps

Teams should install head lamps to have proper lighting in the dark.
Vehicle should consist of front and rear lamps capable enough to drive at night.

I. FINAL EVENT

I.1 Points Evaluation

I.1 Virtual Round:

Teams will be first judged in the Virtual round of SUVC before entering the final event. Minimum 5 team members have to come for the Virtual round and are recommended to attend workshop (which is free for RSTE Members and paid for SUVC participants) to score more in virtual. **Only qualified teams (scoring minimum 35 % marks) will get confirmed vehicle registration number from the organizer side**. A written test, presentation and viva voce will be carried out during Virtual round and the winner scoring highest marks will be awarded with **Virtual Winner Award** at the time of the final event Award ceremony.

I.2 Creative Product Round:

SUVC would like to introduce the **Creative Product round** in which participants of SUVC and other students (participating exclusively for this round) has to design and build a unique and innovative Utility Product that can be directly implemented in general purpose and should be in working condition. Product will be presented in front of experts from various companies during the final event. Our experts will judge the product and the team/team member(s)/student(s) will be awarded with **Best Creative Product Award** at the time of the final event Award ceremony.

I.3 Phase Reports:

Phase Reports will be used to score following rounds:

- Design Round (Phase 1, Phase 2 and Phase 3 Files).
- Innovation Round (Phase 2 Files).
- Cost Round (Phase 1 Files).
- Technical Inspection (Phase 1, Phase2 and Phase 3 Files).

Virtual Round: 200 Marks

Viva Voice	100
Written Test	100

Final Event: 2000 Marks

a) Static Test (800 Marks)

1.	Technical Inspection	200
2.	Weight and Egress Test	50
3.	Design Round	150
4.	Business and Marketing Plan	100
5.	Vehicle Cost Round	100
6.	Innovation Round	100
7.	Build Quality Round	100

b) Dynamic Tests (1200 marks)

1.	Brake and Acceleration Test	150
2.	Auto Cross Check	150
3.	Suspension and Traction Check	150
4.	Challenging Round	300
5.	Endurance Round	450

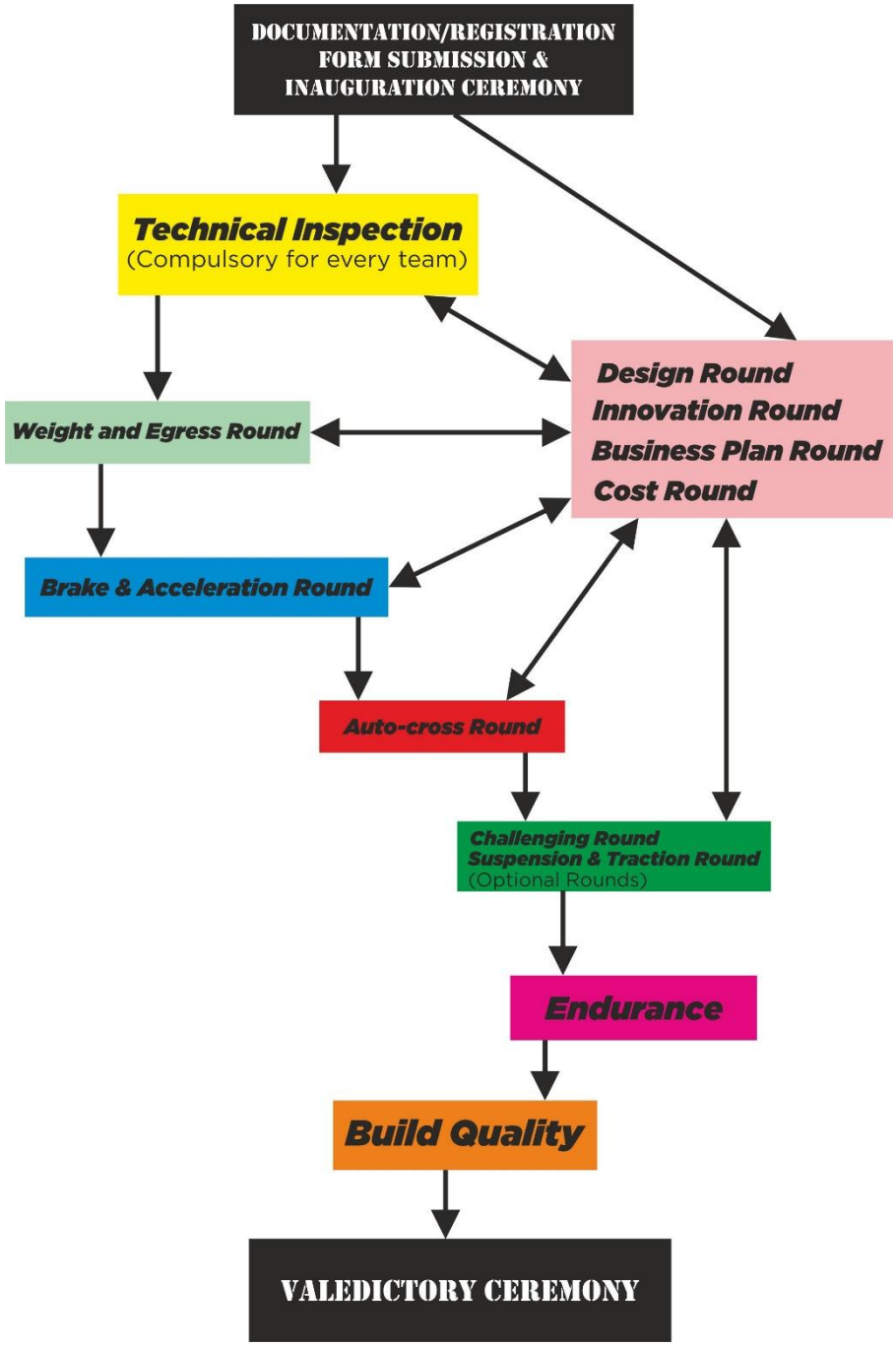
Creative Product Round: 200 Marks

Working	100
Theoretical Literature and Presentation	100

Team member should ensure their scoring parameters from the judge preferably before or at the time of attempting a particular round. After the attempt, they will not be allowed to claim or protest any modifications.

Final Event will be having many static and dynamic rounds. The vehicles will be judged in a series of static and dynamic tests such as Design, Business plan, Cost, Brake & Acceleration, Autocross, Solar Performance, Suspension Traction and Final Endurance round, etc.

For attempting Endurance round, teams must obtain T.I. OK, Egress Ok and Brake Ok stickers.



I.2 Day wise schedule

Zeroth day:

As teams reaches the event site, they have to unload their vehicles on day zero and directly take their vehicles to their allocated pits. Teams are requested to prepare their vehicle for Technical Inspection when arriving for the final event.

No Hot pit will be available before second day or Technical Inspection.

1) **First Day:**
   - **a)** **Registration**: SUVC offline registration form to be submitted at the Registration Desk with proper photos and attachment duly signed with seal by authorities.
   - **b)** **Final Event Registration:** Liability, Caution Money, Certificate issuance, and other legalities form provided by organizers to be submitted at the Registration Desk**.**
     (Optional) Team members can register for Creative Product Round and must inform the organizers for participating in this round beforehand.
     (Optional) Final year team members can register for Placement Drive, if conducted, and must inform the organizers for participating in this drive beforehand.
   - **c)** **Inauguration Ceremony**: After opening ceremony all vehicles must line up for a group photo and for receiving SUVC sticker.
     Teams must also wait for **individual photoshoot**.

No Hot pit will be available before second day or Technical Inspection.

2) **Second Day:**
   - **a)** **Technical Inspection**: It will start in the morning and ends at the scheduled timing. Teams have to line up their vehicle accordingly so that Technical Inspection can be finished within the specified time (maximum 5 Members are allowed).
   - **b)** **Creative Product Exhibition:** Member should have proper working product, it can be installed in the vehicle also but should be easily removable from the vehicle for the exhibition.
   - **c)** **Static Test**: Teams have to attend various static test as per fixed time schedule allocated by the organizers (maximum 5 Members are allowed).
   - **d)** **Dynamic Test**: Teams have to line up their vehicles to ensure that the dynamic test is ended within the specified time (maximum 5 Members are allowed).

Hot pit will be available from this day onwards.
Teams must ensure proper rules and safety measures.

3) **Third Day:**

a) **Technical Inspection**: It will start in the morning and ends at the scheduled timing. Teams have to line up their vehicle accordingly so that Technical Inspection can be finished within the specified time (maximum 5 Members are allowed).

b) **Creative Product Exhibition:** Member should have proper working product, it can be installed in the vehicle also but should be easily removable from the vehicle for the exhibition.

c) **Static Test**: Teams have to attend various static test as per fixed time schedule allocated by the organizers (maximum 5 Members are allowed).

d) **Dynamic Test**: Teams have to line up their vehicles to ensure that the dynamic test is ended within the specified time (maximum 5 Members are allowed).

Hot pit will be available on this day also.
Teams must ensure proper rules and safety measures.

4) **Fourth Day:**

a) **Static Test**: Teams have to attend various static test as per fixed time schedule allocated by the organizers (maximum 5 Members are allowed).

b) **Dynamic Test**: Teams have to line up their vehicles to ensure that the dynamic test is ended within the specified time (maximum 5 Members are allowed).

c) **Faculty Meeting:** Faculty meeting will be held for gathering valuable feedbacks and suggestions towards SUVC.

No Hot pit will be available from day 4 onwards**. Although, on special written permission of the judges or the organizers, hot pit can be provided to a team.**

5) **Fifth Day:**

a) **Driver Meeting:** Before starting the final endurance, a driver meeting will be held to instruct all the instructions about the track.

b) **Final Dynamic Test (Endurance)**: Endurance will be held on the first half of the day.

c) **Build Quality:** Teams completing minimum 5 laps will be qualified for Build Quality round.

d) **Valedictory Ceremony**: All the awards will be distributed in this ceremony. Top 3 teams must wait for **final photoshoot** after the valedictory function.

e) **Final Gate Pass**: Teams will collect their Gate Away pass from the organizers and allow loading their vehicles in truck after gate pass.

No Hot pit will be available.

6) **Final Day:**

a) **Financial Settlement:** All team's financial bills and settlements will be completed on this day. Teams should collect their prize money and take their caution money on this day. No claim of bills and finance will be entertained for the previous year.

b) Other Services: Final Year Members are invited to attend the placement drive.

c) Gift Ceremony: All Volunteers and Organizers will be provided with some token of memory.

I.3 Guidelines

- In Technical Inspection, only 5 members including the driver are allowed (faculties can only motivate the students but are not allowed to do any work).
- Static Rounds will be conducting in parallel, so other team members have to be present at other Static Rounds as well.
- Only after receiving T.I. OK, teams can go to Egress Test and Brake Test.
- Only after getting Brake and Egress Test OK, teams can go to various Dynamic Rounds.
- On the Fifth day, only endurance and build quality round will take place. No hot pit and other rounds available.
- Final day consist of financial settlements and placement drive.
- Other Details about the Static as well as Dynamic Rounds are mentioned in Judging Criteria.
- **No power tools operation is allowed in the pit except soldering.**
- **Teams should charge their accumulators with proper charger shown during T.I.**

J.JUDGING CRITERIA

J.1Technical Inspection Round (200 Marks)

- This Inspection is compulsory for all the teams; inspectors will check thoroughly whether the vehicles follow the rules and satisfy the requirements of SUVC-20 participating vehicles.
- Teams should make their vehicles according to this rulebook. Other general safety points can also be checked which are not mentioned here.
- Teams are requested to prepare their vehicle for this round so that they can immediately proceed to take their attempt as soon as they arrive the event site.
- Teams will only get maximum of **3 attempts** to clear this round. However, teams must ensure to take these attempts within the permitted time. No extra time will be provided.
- More attempts will also be given to the teams if they approach within the permitted time with a **20 points** deduction for **each attempt** from Total T.I. Marks.
- Teams should be ready with all the bills and certifications of the components used.
- After clearing this round, a sticker of **"T.I. OK"** will be pasted on the vehicle.
- After receiving T.I. OK, teams must take their vehicle for **Weight Test** and **Egress Test** before going to **Brake Test**. After receiving Brake OK sticker, they can attempt rest of the Dynamic Rounds.
- The teams receiving **T.I. OK in least attempts, lining up their vehicle within time, Best Egress time, and following all the Safety Points** will be awarded as **Safest Vehicle Award.**

Score = 30(For teams who have submitted their phase reports on time) +
20(Final Event available vehicles should take first attempt) +
50(For clearing T.I.) +
50×[1/(Number of attempts + Correction Time)] +
25×[ET(Least)/ET(Yours)] +
25 (For teams following rules and showing professionalism)

ET = Egress Test Time (Best of Two)

Including driver maximum 5 members are allowed in T.I.
Penalties will be imposed in terms of marks in this round.

J.2 Egress and Weight-Test (50 Marks)

After clearing T.I, Team driver must qualify egress test. In this test, driver will sit in the car along with all the driver equipment wearing seat belts firmly. **Within 5 seconds he/she has to first press the kill switch and then come out from the driver compartment. Timing will be noted down in T. I. Sheet.**

- Weight has very high impact on the performance of the Electric Vehicle thus this round carries 50 points.
- We request all the team to design their vehicle with as minimum weight as possible.
- The weight of the vehicle will be taken by putting each wheel on weight machine and the scores will be given by:

S-class: $$\textbf{Weight score} = 50\times\frac{\left(\frac{250}{W_Y}-1\right)}{\left(\frac{250}{W_L}-1\right)}$$ W_Y: Weight of your vehicle.

M-class: $$\textbf{Weight score} = 50\times\frac{\left(\frac{375}{W_Y}-1\right)}{\left(\frac{375}{W_L}-1\right)}$$ W_L: Weight of the Lightest vehicle.

The team with the lowest weight will be given **Gravity-Award.**

Maximum 5 Members are required to attempt this round.
Teams must verify their vehicle weight and egress time at the time data entry by the judges.

J.3 Vehicle Design Round (150Marks)

- As SUVC is a design-oriented competition, thus this round carries maximum marks (150) among the static rounds and so the teams are requested to focus on this round.
- Teams should make a report which should have all the data and calculations of their vehicle.
- Teams will be judged by industrial experts where they will be asked questions and given marks accordingly.

Sr. No.	Category	Points
1.	Drive Train (Power Unit and Transmission)	20
2.	Vehicle Capacity and calculations (km, duration)	20
3.	CAD Design and Analysis; DFME and DVP	20
4.	Steering, Suspension & Brakes	20
5.	Testing Report, Safety, Ergonomics & Aesthetics	20
6.	Phase1, Phase 2 and Phase 3 Files	50

- Other guidelines will be sent to team's official email account.
- Teams facing any problem in making of these reports, **are free to contact us** via mail, calls etc.
- Teams have to submit printed file/content/analysis data for **Design Award.**

Maximum 5 Members are allowed to attempt this round as per time schedule. Only 1 attempt will be given to the teams, teams have to be ready in advance with their vehicle for this attempt.

J.4 Business and Marketing Round (100Marks)

- In this round, teams have to prepare a presentation about how they can market their vehicle. The Business plan must vividly explain how the team can maximum the profit on commercializing the vehicle.
- The presentation should be of at least 10 slides.
- Teams can bring prototypes, charts and posters to make presentation more attractive.

Sr. No.	Category	Points
1.	Business plan- Type of business, Problem solved, customer size, competitors, registration process, expansion plan, year wise budget.	20
2.	Marketing Plan- Modes of marketing, Survey and sponsors, marketing budget	20
3.	Analysis and Process (Ex- SWOT, E.O.Q., 4-P, etc.)	20
4.	Financial Stability Plan	20
5.	Investor Plan	20

- Other guidelines will be sent to team's official email account.
- Teams have to submit a printed file to be eligible for this award. The top scorer of this round will receive **B - Plan Award.**

Maximum 5 Members are allowed to attempt this round. Only 1 attempt will be given to a team, so the team members have to be ready for this attempt. This round will take place in the presentation hall as per the time schedule.

J.5 Vehicle Cost Round (100 Marks)

- In this round, teams have to submit Cost Report which should address the total cost of the vehicle.
- It should include the cost of each and every component of the vehicle.
- Teams are requested to have proper bills of their Vehicle's component.
- Team having most accurate Cost Report with proper bills will be awarded.
- Other guidelines will be sent to team's official email account.

Sr. No.	Category	Points
1.	Total Vehicle Cost Involved	20
2.	Department wiseCost Distribution	20
3.	Department Wise bills for Components used	20
4.	Manufacturing and Human Cost Involved	20
5.	Phase 1 File	20

Teams have to submit a printed File to be eligible for this award. The top scorer of this round will receive Cost Effective Award.

Maximum 5 Members are allowed to attempt this round as per time schedule. Only 1 attempt will be given to the teams, teams have to be ready in advance with their vehicle for this attempt.

J.6 Innovation Round (100 Marks)

- In this round, teams have to present their Innovative product with a report which will properly describe about their Innovation.
- Teams can innovate in any department of their liking.

Sr. No.	Category	Points
1.	Innovation Literature and Cost Involved	20
2.	Innovation Application	20
3.	Innovation Working, Video	20
4.	Question and Answers	20
5.	Phase 2 Files	20

- The Innovation should be designed in such a way that it should also follow all the rules of this Rulebook.
- Teams have to submit a printed File to be eligible for this award. The top scorer of this round will receive **Innovation Award.**

Maximum 5 Members are allowed to attempt this round. This round will be taking place in the team pit as per time schedule and if innovation is implemented in the vehicle. Only 1 attempt will be given to the teams, teams have to be ready in advance with their vehicle, if required, for this attempt.

J.7 Build Quality Test (100 Marks)

- The main objective of build quality round is to judge manufacturability and reliability of the vehicle after completion of endurance round. Other parameters like weight, components, etc. can also be checked to ensure that all things are same as checked during T.I. & weight test.
- All Endurance participating are eligible for this round. Some safety features of the vehicle will be checked first before starting the endurance.
- After completion of final endurance, nobody will be allowed to make any changes in the vehicle, teams found guilty of making changes will be disqualified from this round and penalized for the same.
    - **Build Quality:** Only top 10 most-lap scoring vehicles will be surveyed by the judges for build quality test and **must be present after the endurance at the finishing line within time**.
    - Rest vehicles will be scored by the judges as per safety points checked during T.I. and scores of other dynamic rounds (Out of 50 ONLY).
- This test does not mean having good body cover or body panels.
- In this round, judges will have a close look at all the mountings, assembly and all electrical connections.

Sr. No.	Category	Points
1.	Number of times vehicle stop/failures occur during endurance	20
2.	Bolt and Buts looseness, Welding point check, brake check, steering check, suspension check, transmission check, etc.	20
3.	Wiring and electric connection check, electric component heating check	20
4.	All Components rigidity check, all mounting check, Broken part check, part removal check,	20
5.	Any changes in vehicle parameters and components after T.I. check, Safety check, etc.	20

- The team with the minimum failure and haltage during endurance time will be awarded with **Build Quality Award.**

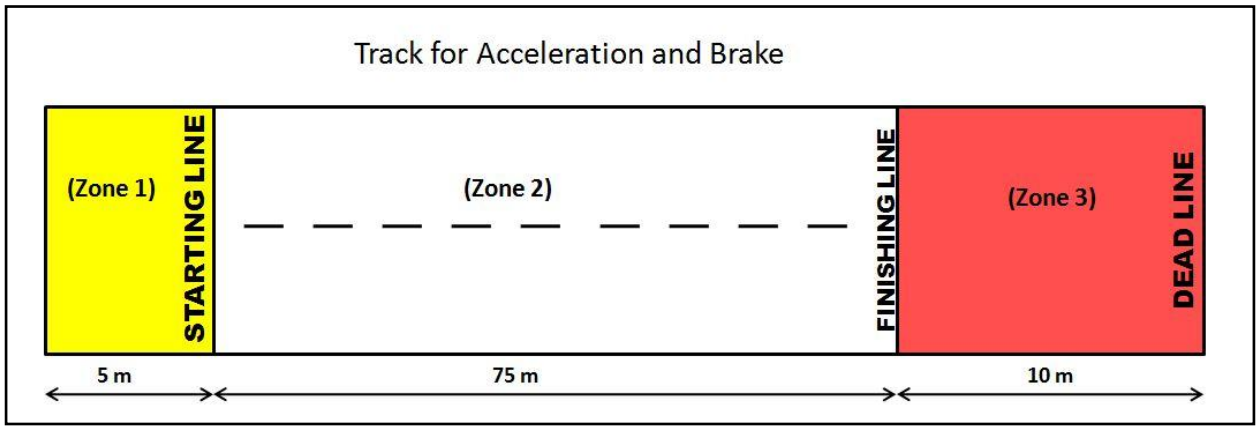
Driver and Captain are allowed to attempt this round which will be taking place at the finishing line.

J.8 Acceleration and Brake Test (150 Marks)

- Teams after obtaining T.I. OK; can attempt for Brake and Acceleration Test.
- This test is to check the acceleration as well as Stopping Distance of the Vehicle.
- Each team has 2 attempts and Best of the two attempts will be taken into account.
- As there will be a queue of teams waiting for their attempt, teams are requested to wait patiently and get into Zone 1 as soon as they get their chance.

  One practice area will be provided for the vehicles before taking their brake test attempt.

  Each team has only one chance to practice in this area under the surveillance of organizers after clearing the T.I. only.



- The Track is divided into 3 parts.

1) **Zone 1**: Teams have to stand in this zone with their vehicle and only **3 members** are allowed **including Driver.** The judges will brief the driver about the Rules and will also check the seat belts and Driver's Equipment. Vehicle then will be placed such that the front 2 wheels touch the starting line.

   Time will start once whistle is blown by the judge.

   Maximum 1 minute will be given to cross the starting line.

2) **Zone 2:** Driver have to accelerate the vehicle in this zone. Zone 2 consists of plain dumber or concrete road not having any breakers.

3) **Zone 3**: Driver have to stop the vehicle in this zone. The vehicle should completely cross the

finishing line, and should be stopped before Dead line.

Teams have to attempt this round within the time schedule.

Penalties will be imposed in terms of adding more time or direct deduction in marks.

Case	Condition	Action
1.	Vehicle not able to start for some problem in zone 1.	Attempt will be counted.
2.	Brakes applied before finishing line.	Not considered but attempt will be counted.
3.	Car crossed Deadline.	Not considered but attempt will be counted.
4.	Car stopped between Finishing and Dead line	Brake OK and time will be noted down for Acceleration Test. Brake Ok sticker will be pasted

- As front wheel crosses the finish line, timing will be stopped.
- The time will be taken by the stop watches and score will be given by

S-class: $$\textbf{Acceleration score} = 150 \times \frac{\left(\frac{200}{T_Y} - 1\right)}{\left(\frac{200}{T_L} - 1\right)}$$ T_Y: Time taken by your Vehicle..

M-class: $$\textbf{Acceleration score} = 150 \times \frac{\left(\frac{120}{T_Y} - 1\right)}{\left(\frac{120}{T_L} - 1\right)}$$ T_L: Least time taken by any vehicle.

- **Pole position** for Endurance will also be decided by this test. The team scoring maximum Marks will get pole position 1. The team scoring minimum marks will get last pole position.
- Best of two attempts will be counted for teams who have got Brake OK in both the attempts.
- More attempts will be given with **15 points deduction for each attempt** from Total Marks of the

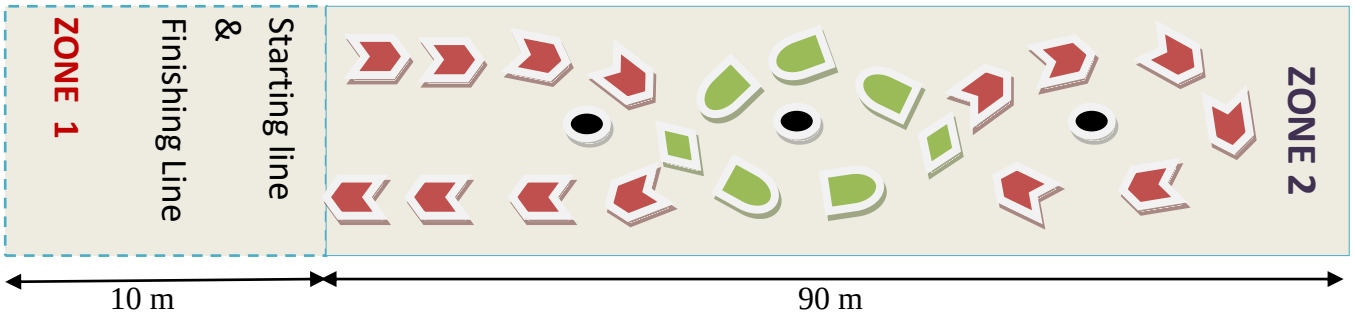
teams.

- The team with the highest score will be awarded with **Speedo Award.**

J.9 Auto-Cross (150 Marks)

- Auto – cross is designed to test the vehicle's steering and cornering. This Event will have lots of sharp turns in the track.
- Team after getting Brake OK sticker will attempt this round.
- Each team has 2 attempts and best of the two attempts will be taken into account.

Sample track (original track may vary)



Symbol	Description	Specification
	Cones (Number of cones varies)	Minimum Distance between cone will be 3.5 m
	ZIG ZAG Vehicle Symbol (Driver will be informed)	Minimum turning radius will be 6 m
	FIGURE 8 Vehicle Symbol	Proper distance between cones will be provided to make figure of 8

1) **Zone 1**: Teams have to stand in this zone with their vehicle and only **3 members** are allowed **including Driver.** The judges will brief the driver about the Rules and will also check the seat belts and Driver's Equipment. Vehicle then will be placed such that the front 2 wheels touch the starting line.
Time will start once whistle is blown by the judge.
Maximum 1 minute will be given to cross the starting line.

2) **Zone 2**: Driver have to drive the vehicle in this zone. Zone 2 consists of plain dumber or concrete road in which cones will be placed. Vehicle should move as per guideline given by the judge.

Teams have to attempt this round within the time schedule.

Penalties will be imposed in terms of adding more time or direct deduction in marks.

Case	Condition	Action
1.	Vehicle not able to start for some reason in zone 1	Attempt will be counted.
2.	Vehicle stops due to failure between the track	Time Not considered but attempt will be counted
3.	Cone Hit, Crossing the track	Penalty 2 sec.
4.	By passing the cone	Penalty 6 sec.
5.	By passing the figure 8	Penalty 30 second

- As front wheel crosses the finish line timing will be stopped.
- The time will be taken by the stop watches and score will be given by

S-class: $$\textbf{Score} = 150 \times \frac{\left(\frac{480}{T_Y} - 1\right)}{\left(\frac{480}{T_L} - 1\right)}$$ T_Y: Time taken by your Vehicle..

M-class: $$\textbf{Score} = 150 \times \frac{\left(\frac{480}{T_Y} - 1\right)}{\left(\frac{480}{T_L} - 1\right)}$$ T_L: Least time taken by any vehicle.

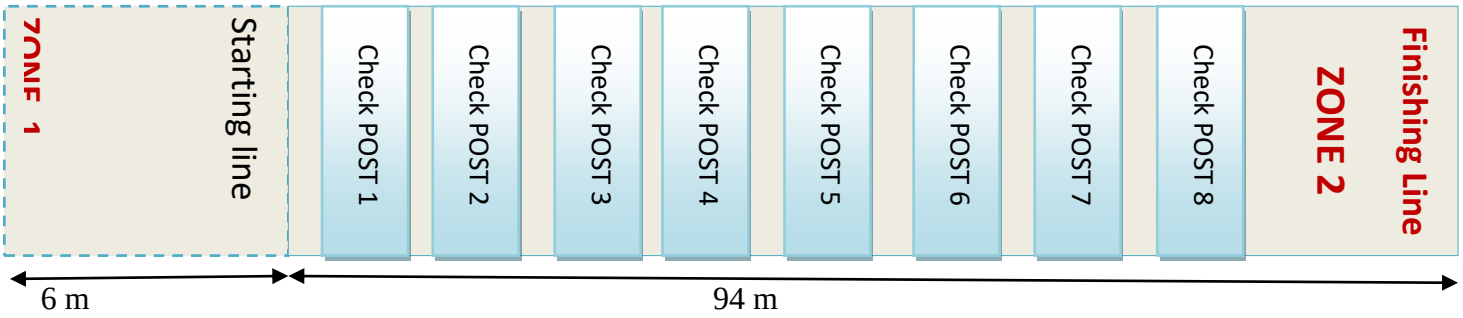
Teams will get only 2 attempts to be evaluated.
However more attempts will be givenwith**15 points deduction for each attempt** from Total Marks of the teams.

The team with the Highest Score will be Awarded with **Best Auto Cross Award.**

J.10 Suspension & Traction (150 Marks)

- This Event is designed to check suspension of Vehicles. Thus, it will have a lot of obstacle like we face on Indian Roads. The track will be off-road and have bumps, sharp turns, small hill climb, etc.
- This event will be designed in such a way that the teams can actually test their vehicle's capabilities; it will be very challenging as well as inspiring for the teams.
- Team after getting Brake OK sticker will attempt this round.
- Each team has 2 attempts and Best of the two attempts will be taken into account.

Sample track (original track may vary)



SYMBOL	Description	Specification
Check POST 1-8	Check Post 1-8 (Consist of various suspension check test on each post)	Consist of various artificial made checks on off-road track.

1) **Zone 1**: Teams have to stand in this zone with their vehicle and only **3 members** are allowed **including Driver. T**he judges will brief the driver about the Rules and will also check the seat belts and Driver's Equipment. Vehicle then will be placed such that the front 2 wheels touch the Starting Line.
Time will start once whistle is blown by the judge.
Maximum 1 minute will be given to cross the starting line.

1) **Zone 2**: Driver have to drive the vehicle in this zone. Zone 2 consists of off- road track designed by

organizers to check suspension.

Teams have to attempt this round within the time schedule.

Penalties will be imposed in terms of adding more time or direct deduction in points marks.

Case	Condition	Action
1.	Vehicle not able to start for some reason in zone 1	Attempt will be counted.
2.	Vehicle stops due to failure between the track	Time Not considered but attempt will be counted.
3.	Cone Hit, Crossing the track	Penalty 2 sec.
4.	Bypassing the Check Post	Penalty 15 sec.

- As front wheel crosses the finish line, timing will be stopped.
- The time will be taken by the stop watches and score will be given by

S-class: $$\textbf{Score} = 150 \times \frac{\left(\frac{480}{T_Y} - 1\right)}{\left(\frac{480}{T_L} - 1\right)}$$ T_Y: Time taken by your Vehicle..

M-class: $$\textbf{Score} = 150 \times \frac{\left(\frac{480}{T_Y} - 1\right)}{\left(\frac{480}{T_L} - 1\right)}$$ T_L: Least time taken by any vehicle.

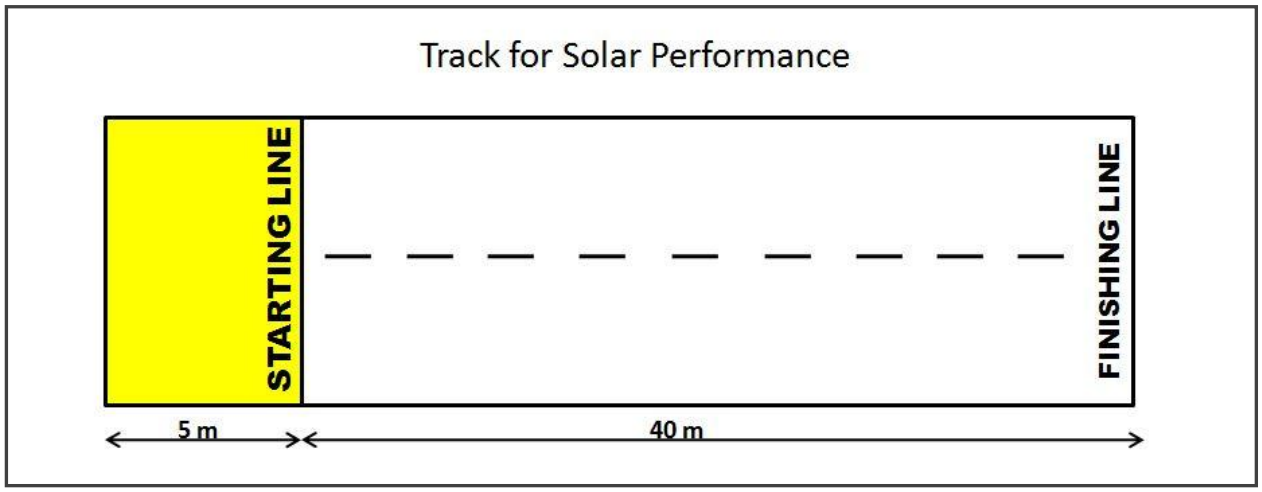
Teams will get only 2 attempts to be evaluated.
However more attempts will be givenwith**15 points deduction for each attempt** from Total Marks of the teams.

The team with the Highest Score will be Awarded with **Suspension and Traction Award.**

J.11 Challenging Round (300 Marks)

For S-class (Solar Performance Challenge)

- This Event is designed to check the efficiency of solar system and to promote Solar Energy for S-class. It is the most important event for S-class teams.
- The vehicle has to cover 40m with the solar power.



In this Event, battery connections have to be removed. Teams can remove battery from the vehicle (to reduce the weight).

Teams initially will be provided 3 minutes to start their vehicle to cross starting line.
Timing will start once whistle is blown by the judge.
Once vehicle crosses starting line total of 7 minutes more will be provided to finish the line.
If vehicle is not able to cross the line within those 7 minutes then distance travelled is measured and marks will be allotted as per the distance travelled by the vehicle.

Category 1:

The time will be taken by the stop watches and score will be given by

$$\textbf{Solar Performance} = 100 \times \left(\frac{T_M}{T_Y}\right) + 200$$

T_Y: Time taken by your Vehicle.

T_M: Minimum time taken by any Vehicle.

Category 2:

Team which is not able to run their vehicle by Solar Energy will get marks by

$$\textbf{Solar Performance} = 150 \times \left(\frac{R_{Yours}}{R_{Max}} \right)$$

Here, R = Power Output of Solar Panel (W) / Mass of Vehicle.

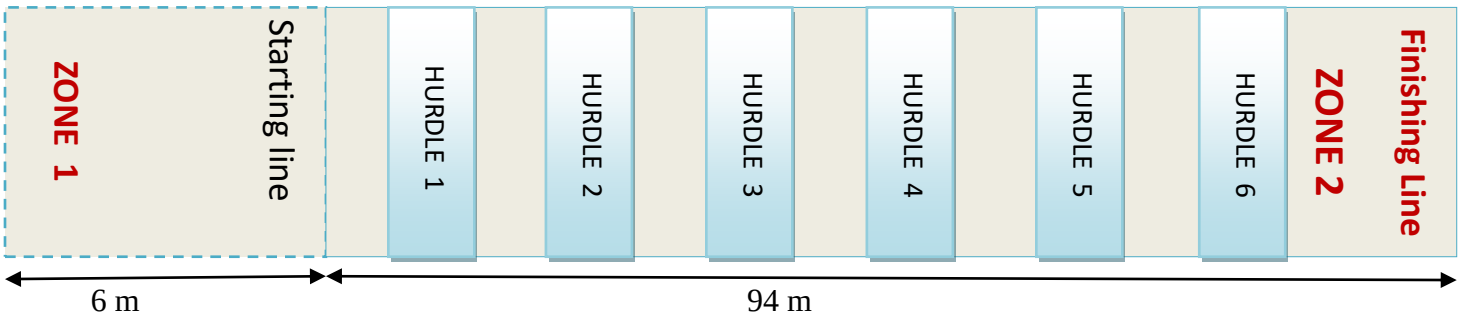
For category 2,voltage check will be done by organizers which should be equivalent to motor operating voltage or battery charging voltage. If vehicle's solar panels fail to provide that voltage then the marks will not be evaluated.

The highest scorer of this round will achieve the title of **Best S-class Vehicle Award.**

For M-class (Climb and Hurdle Challenge)

- This Event is designed to check the Utility of the vehicle towards general public. It is the most important Event for M class teams.
- **The vehicle has to cover an off-road track made by organizers consisting of various hurdles, slopes, bumps and grind.**
- In this test, load capacity and gradient check of vehicle is performed. Teams after getting Brake OK sticker can attempt this round.
- Each team has 2 attempts and Best of the two attempts will be taken into account.

Sample track (Original track may vary)



Symbol	Description	Specification
	HURDLE 1-6 (Consist of various Hurdles on whole track)	Consist of various artificial made Hurdles on road and off-road track.

1) **Zone 1**- Teams have to stand in this zone with their vehicle and only **3 members** are allowed **including Driver. T**he judges will brief the driver about the Rules and will also check the seat belts and Driver's Equipment. Vehicle then will be placed such that the front 2 wheels touch the Starting Line.
Time will start once whistle is blown by the judge.
Maximum 1 minute will be given to cross the starting line.

2) **Zone 2**- The driver has to drive the vehicle in this zone. Zone 2 consists of off- road and on road track designed by organizers to check the suspension.

Teams have to attempt this round within the time schedule.
Penalties will be imposed in terms of adding more time or direct deduction in marks.

Case	Condition	Action
1.	Vehicle not able to start for some reason in zone 1	Attempt will be counted.
2.	Vehicle stop due to failure between the track	Time Not considered but attempt will be counted.
3.	Cone Hit, Crossing the track	Penalty 2 sec.
4.	Bypassing the Hurdle	Penalty 60 sec.

- As front wheel crosses the finish line, timing will be stopped.
- The time will be taken by the stop watches and score will be given by

$$\text{Score} = 250 \times \frac{\left(\frac{480}{T_Y} - 1\right)}{\left(\frac{480}{T_L} - 1\right)} + 50(\text{Completion of track covering all hurdles})$$

T_Y– Time taken by your Vehicle.

T_L – Least time taken by any vehicle.

Teams will get only 2 attempts to be evaluated.
However more attempts will be given with **15 points deduction for each attempt** from Total Marks of the teams.

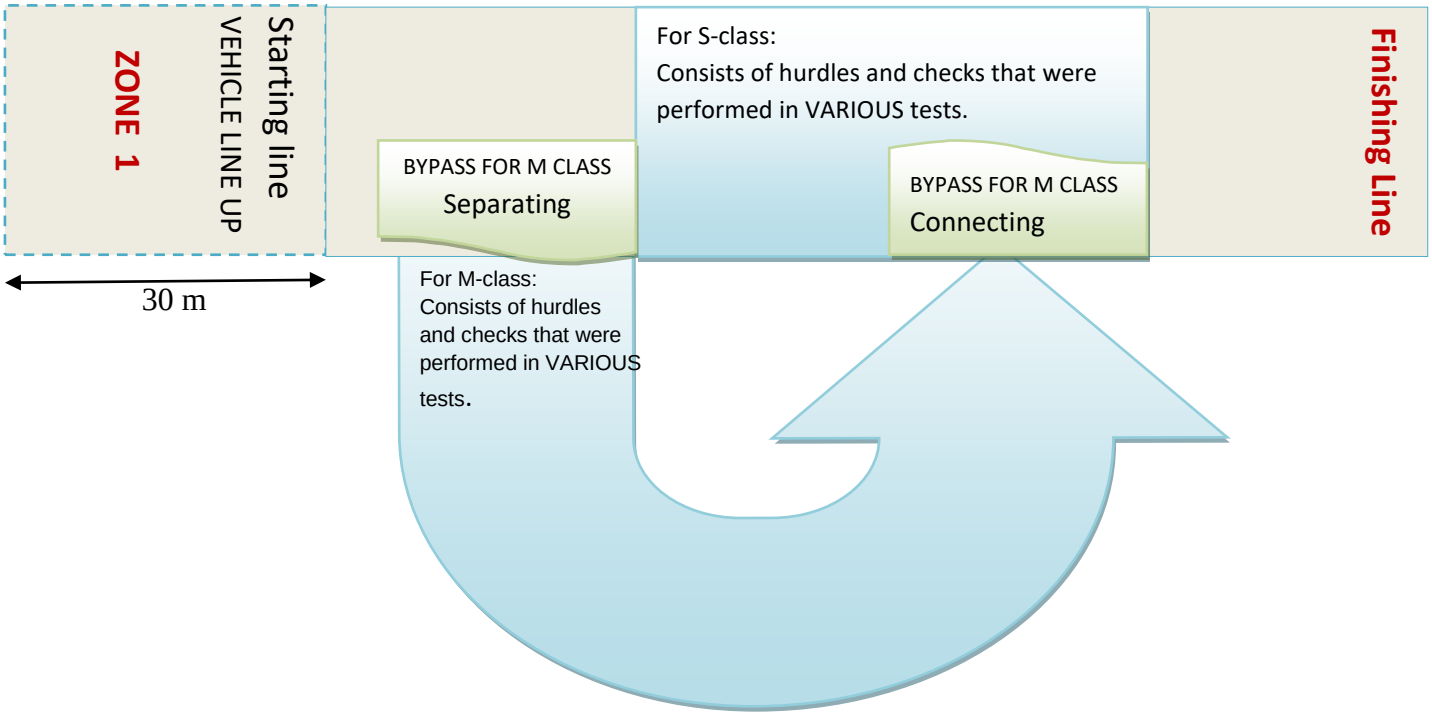
The highest scorer of this round will achieve the title of Best M-class Vehicle Award.

J.12 Endurance (450 Marks)

- Endurance is designed to test the overall efficiency of the solar car.
- In this test, Vehicle has to be driven for **2 hours** continuously.
- A specific track will be provided and drivers have to repeatedly drive on that track to score more and more laps.
- Teams with maximum number of laps will be the winner of this round.
- The laps will be counted by the judges and scores will be given accordingly.

Flag Color	Meaning
Green	**Start.**
Red	**Stop immediately.**
Checkered Flag	**Finishing Line.**
Yellow Flag (steady)	**Something happened ahead slow down the car.**
Yellow Flag (waving)	**Something happened ahead prepare for halt.**
Black Flag	**Warning by Judge (should drive properly).**
Blue Flag	**Request from own team to stop.**

Sample track (original track may vary)



$$\text{Endurance} = 450 \times \frac{L_Y}{L_M}$$

L_Y: Laps taken by your Vehicle.

L_M: Most laps taken by any Vehicle.

- The team with the highest score will be awarded with **Endurance Award.**
- This award will be separate for both S class and M class.

Top 10 most-lap scoring teams must ensure to be available for build quality round just after the endurance. Other vehicles (completing less than 5 laps) may get the chance to take part in the rally round just after the endurance.

J.13 SUVC Title Winner

SUVC Title winner will be selected from both S and M Class teams combined. The top scorer from overall marks (2000) will be crowned SUVC Title Winner.

J.14 SUVC Runner Up

SUVC Runner Up will be selected from both S and M Class teams combined. The top runner up from overall marks (2000) will be awarded the SUVC Runner Up award.

J.15 SUVC Second Runner Up

SUVC Second Runner Up will be selected from both S and M Class teams combined. The top Second runner up from overall marks (2000) will be the winner of SUVC Second Runner Up award.

J.16 SUVC Virtual Winner

SUVC teams should go with virtual of SUVC. Only qualified teams are eligible for final event. The top scorer from overall marks (200) among both S and M class teams combined will be the winner of SUVC Virtual Award.

J.17 RSTE Visionary Award to SUVC participating College

RSTE Visionary Award presented to those SUVC participating colleges who have helped in the vision of our society in terms of

1. providing creative education to students through various programs by opening RSTE Colligate Clubs in their Campus
2. supporting SUVC in terms of conducting workshops, Virtual rounds.
3. spreading SUVC awareness and rulebook among nearby colleges and other information regularly
4. encouraging to students to participate in **National-level Creative Product Exhibition which is going to be held simultaneously along with SUVC event.**
5. Helping SUVC participating teams to provide fund and support.

J.18 SUVC Visionary Award to SUVC participating Team.

Visionary Award will be presented to those teams who helps in the vision of our SUVC which is to bring the focus of individuals towards Latest Technology & Methods to utilize clean energy.

- Teams who recommend other teams to participate in SUVC or to increase SUVC Family Members will be nominated for this award. The maximum number of teams referred by participating teams will be winner of this award.
- Helping SUVC to provide companies for placements and/or sponsors.

- Send regular educational videos (monthly) made by team to be published in SUVC YouTube channel and share among students.
- Giving suggestions and feedback for improving our channel.

The teams who believes in "We don't work for Each other, We Work With Each Other'' will win the SUVC Visionary Award.

J.19 BEST CREATIVE PRODUCT TO REGISTERED MEMBERS

Team members or other students will make a creative product and exhibit it in a national-level creative product exhibition. Judges will evaluate their products and the top scorer will be the winner of this award.

J.20. Social Buzz

The main objective of social buzz round is to appreciate work of team getting popularity among general public through e- media.

1. Facebook
2. YouTube
3. WhatsApp
4. Instagram

It also helps them to generate sponsorships for their vehicles. Teams have to submit their team video as per our guidelines and it will be uploaded on our official YouTube channel.

Teams getting maximum views, likes on video and other promotional activities will be awarded with highest score. All other Guidelines will be informed at the time of final event.

The team with the highest Score will be awarded with **Social Buzz Award.**

J.21. Best Pilot Award

The driver which shows excellent driving skills, hit minimum penalties, shows professionalism, and makes the team proud during the final event will receive this award. Only one driver will receive this award among all drivers.

J.22. Best Female Participation Award: nominated by Team

From each participating team, one girl participant will be nominated by team for best female participation Award at the time of registration.
Nominated girl will be interviewed by respective judges technically and team leadership qualities. The best SUVC participating girl as per judge's opinion will be awarded with BEST Female Participation Award.

K. SUVC COMPETITIVE ACHIEVEMENTS

Sr. No.	Category	Rewards Upto	
		S- class	M- class
1.	SUVC Title Winner	1,00,000 Cheque+ Trophy	
2.	Overall Runner-up	50,000 Cheque+ Trophy	
3.	Overall Second Runner Up	30,000 Cheque+ Trophy	
4.	Virtual Winner	Cash Reward + Cheque+ Trophy+ Certificate	
5.	Best Endurance	Cash Reward + Cheque+ Trophy+ Certificate	Cash Reward + Cheque+ Trophy+ Certificate
6.	Best Utility	Cash Reward + Cheque+ Trophy+ Certificate	Cash Reward + Cheque+ Trophy+ Certificate
7.	Suspension and Traction	Cash Reward + Cheque+ Trophy+ Certificate	Cash Reward + Cheque+ Trophy+ Certificate
8.	Best Auto Cross	Cash Reward + Cheque+ Trophy+ Certificate	Cash Reward + Cheque+ Trophy+ Certificate
9.	Best Acceleration	Cash Reward + Cheque+ Trophy+ Certificate	Cash Reward + Cheque+ Trophy+ Certificate
10.	Safest Vehicle	Cash Reward + Cheque+ Trophy+ Certificate	Cash Reward + Cheque+ Trophy+ Certificate
11.	Best Design	Cash Reward + Cheque+ Trophy+ Certificate	Cash Reward + Cheque+ Trophy+ Certificate
12.	Gravity Award	Cash Reward + Cheque+ Trophy+ Certificate	Cash Reward + Cheque+ Trophy+ Certificate
13.	Build Quality Award	Cash Reward + Cheque+ Trophy+ Certificate	Cash Reward + Cheque+ Trophy+ Certificate
14.	Best Vehicle Cost Award	Cash Reward + Cheque+ Trophy+ Certificate	Cash Reward + Cheque+ Trophy+ Certificate
15.	Best B- Plan	Cash Reward + Cheque+ Trophy+ Certificate	Cash Reward + Cheque+ Trophy+ Certificate
16.	Best Innovation	Cash Reward + Cheque+ Trophy+ Certificate	Cash Reward + Cheque+ Trophy+ Certificate

All teams must make themselves available for an official media call if required during event.

*The organizer reserves the right not to present an award in any given category. Reward Money will be provided after deduction of taxes in the mode of online payment, cheques, coupons, gifts, etc.

SUVC EXCLUSIVE AWARDS SELECTED FROM BOTH S & M CLASS

Sr. No.	Category	Position	Rewards Up to
1.	RSTE Visionary Award	First	Cash Reward + Cheque+ Trophy+ Certificate
2.	SUVC Visionary Award	First	Cash Reward + Cheque+ Trophy+ Certificate
3.	Best Creative product	First	Cash Reward + Cheque+ Trophy+ Certificate
4.	BEST Pilot Award	First	Cash Reward + Cheque+ Trophy+ Certificate
5.	Social Buzz	First	Cash Reward + Cheque+ Trophy+ Certificate
6.	Best Female Participation	First	Cash Reward + Cheque+ Trophy+ Certificate
7.	Team Spirit Award	Virtual Cleared Teams	Mementos
8.	Guru Dronacharya Award	Faculties coming for final event	Mementos
9.	Team Leader Award	Nominated by team during final event	Mementos
10.	Appreciation Award	Volunteers, judges, special guests	Mementos

All teams must make themselves available for an official media call if Required during event.

***The organizer reserves the right not to present an award in any given category. Prize Money will be provided after deduction of taxes in the mode of online payment, cheques, coupons, gifts, etc.**

Team Spirit Award:

Those teams who have attended the Virtual of SUVC-19 and scored above 50% marks (Minimum 100) will receive Team Spirit Award.

Guru Dronacharya Award:

From each team one faculty will be nominated who have accompanied their team during final event. Faulty should be present during faculty meeting and provide suggestions and feedbacks at the faculty meeting.

Team Leader Award:

A leader should be nominated by teams individually at the time of Registration.
It's the duty of existing team leader to decide new team leader for SUVC-20. Those existing leaders who decide their new team leader, team captain and team vice-captain will receive team leader award on team's vote. Team has to give a name from team members for nomination. They have to fill the form provided by the organizers.

L. FAQ'S (FREQUENTLY ASKED QUESTIONS)

Q. Our team is participating in events conducted by reputed Motorsports events society like SAE, ISIE, etc. Can our team participate in SUVC?
Ans. Yes, you can participate but make sure your vehicle should follow all rules and regulations mentioned in rulebook of SUVC.

Q. What is SUVC?
Ans. SUVC is a vehicle design competition organized to promote creative education among engineers and comprises of 7 static test and 5 dynamic test which are designed to test your vehicle and become familiar to face big motorsports events in future. It is a reputed event conducted under Govt. Registered Society under act 1973.

Q. What is the eligibility to become judge for SUVC?
Ans. Judges Eligibility - Corporate working member + Motor sport event experience + Technical Graduation followed by an interview by the organizers.

Q. What are the classes available in SUVC and how can I choose a particular class?
Ans. SUVC consists of two classes: S class (For Solar Vehicles) and M class (E-ATV and other E- Mobility Vehicles). On the basis of power source, you can select a particular class.

Q. We are making vehicle for E-ATV, can I participate in SUVC?
Ans. Yes you can participate in SUVC under M class. Before confirming registration kindly go through rulebook and ask queries, if any.

Q. Who will be the overall winner of SUVC?
Ans. The overall winner of SUVC will be selected from both S class and M class together to

make a better competition on the basis of overall score. The static round judging criteria will remain same for both classes and for dynamic rounds only lap and time will be counted separately. Although final score of all team will be taken together to decide the winner of SUVC and all rounds.

For other queries feel free to contact us at:

+91 8770201773, suvc20@gmail.com

M.HELP AND SUPPORT

S. No.	Department	Contact No.	WhatsApp No.	Professional Email
1.	Registration, Electrical	+91 8770201773	+91 8770201773	partner@suvcrste.com
2.	Deadlines and Penalty management	+91 9340809235,	+91 9340809235	suvc.zh@suvcrste.com
3.	Technical and Product Selection Query	+91 9617577301	+91 9617577301	suvc19@gmail.com
4.	Document management	+91 8269709963	+91 8269709963	contact@suvcrste.com
5.	Marketing Management	+91 9176485032	+91 9176485032	sap@suvcrste.com
6.	Financial management	+91 9770771453	+91 9770771453	care@suvcrste.com

Sometimes it happens that organizers are unable to pick up calls due to the work load so we request the teams to be patient and drop a WhatsApp message to get quick replies.

Website: www.suvcrste.com

Official Email ID:suvc20@gmail.com **Facebook Page: www.facebook.com/suvcrste**

Corporate Email ID:contact@suvcrste.com **YouTube: www.youtube.com/suvcrste**

S/RK-19
contact@suvcrste.com

Printed in India
R19.5SE.32.18
Mob:91 9617577301

We connect students with reliable vendors to get quality products at genuine prices.

RAPO ENERGY

MOTRAC MOTORS

SOLAR INDIA

Roll Cage Pipe	Brake Assembly	Steering Assembly	Suspension
AISI 4130 1" O.D.×2mm, 3mm	Master cylinder + brake pedal + fluid reservoir + dot4 fluid + tubes + hoses + others	Rack & pinion + others	Suspension + nuts & bolts + others
Rs 640 per meter onwards	Rs 10999 onwards	Rs 9999 onwards	Rs 19889 onwards

Motor Kit	Battery Kit	Solar Panel Kit	Wiring Kit
Motor + controller + throttle + connector + others	Battery + charger + connector + battery level indicators + others	Solar panel + charge controller + connector + others	DC wires + connectors + DC MCB+ DC fuse + fuse holder + others
Rs 12999 onwards	Rs 18889 onwards	Rs 16999 onwards	Rs 4999 onwards

Driver's Safety Gears	Customizable Wheel Assembly	Auxiliary	Creative Product	Fasteners
Driver suit + helmet + shoes + socks + others	Hub + disc + rim + tyres + others	Horn+light+others	E-cycle+electronic items+science models+others	Ball joint + him joint + universal joint + L-clamp + grated nut bolts + LN nut bolts + others
Prices as per availability	Prices as per availability	Prices as per availability	Prices as per availability	Prices as per availability