STEM RACING™

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SINGAPORE WORLD FINALS 25 COMPETITION REGULATIONS

Front Cover – evolut1on, Germany, Aramco STEM Racing™ 2024 World Champions

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Please note: any amendments made prior to the event will be indicated ~~using red strikethrough text~~. New text will be indicated using blue text.

ARTICLE C1 – DEFINITIONS

C1.1 World Finals Event

The World Finals event is managed by STEM Racing™ and is held over several days to include various programmed social and competition activities. The event aims to provide all participants with an educational and personal development 'Experience of a Lifetime'. Specifically, the competition aims to determine the World Champions of STEM Racing™ according to the 2025 STEM Racing™ World Finals Technical and Competition regulations.

C1.2 STEM Racing™ In-Country Co-ordinator (ICC)

Person/s and/or an organisation approved by STEM Racing™ to manage and co-ordinate STEM Racing™ within a specified country or region of the world.

C1.3 Parc fermé

A secure area where all submitted cars and components are held to prevent unauthorised handling but to allow technical inspections to be conducted by the Judges. (Literal meaning in French of 'closed park').

C1.4 Competition Programme

The competition programme will detail the schedule of judging activities for all teams.

C1.5 World Finals terms and conditions for entry

This is a document issued by STEM Racing™ which constitutes an agreement between STEM Racing™, ICC's and supervising teachers regarding participation by teams in the World Finals event.

C1.6 Key performance indicators (KPI's)

These are portions of text that feature on the scorecards within a corresponding points range. The KPI's describe the type of evidence the Judges will be looking for in order to score the team appropriately.

C1.7 Car race time value

A 'car race time' value is the actual time taken for a STEM Racing™ car to travel the track from start to finish, measured from the instant the start box fires to when the car breaks the finish line timing beam. In the case of reaction races, the 'car race time' value is calculated as the 'total race time' value displayed on the electronic start gate minus the 'reaction time' value displayed for that race.

C1.8 Total race time value

The 'total race time' value is displayed in the total time field on the electronic start gate at the conclusion of every race. This time is the sum of the 'car race time' value and any 'reaction time' value displayed on the electronic start gate.

C1.9 Reaction time value

A 'reaction time' value is the time recorded from the instant the five (5) start lights extinguish to the instant the start trigger is activated by the driver. This value is displayed in the reaction time field on the electronic start gate.

C1.10 Project elements

These are any materials and resources that the team presents as part of its entry for any judging activity.

C1.11 Race event

The World Finals competition includes three separate race events. These are: Reaction Racing 1, Reaction Racing 2, and Knock-out Racing.

C1.12 Engineering drawings

Engineering drawings are CAD produced drawings, which along with relevant CAM programmes, could theoretically be used to manufacture the fully assembled car by a third party. Such drawings must include all relevant dimensions, tolerances and material information. STEM Racing™ engineering drawings must include detail to specifically identify and prove compliance for the virtual cargo and wing surfaces. Engineering drawings can include: orthographic projection, auxiliary projection, section views, isometric projection, oblique projection, perspective and annotated renderings.

C1.13 Renderings

Renderings are images intended to illustrate the three-dimensional form of an object. These can be generated in isometric projection, oblique projection or perspective.

C1.14 Team Digital Upload Folder

This is a team-specific digital upload folder, where all digitally submitted work must be uploaded to STEM Racing™. Each team will receive a unique link to their own Team Digital Upload Folder, which will be provided by email directly to competing teams and ICC's after team registration.

C1.15 Partnerships

A partnership can be defined as a collaborative relationship between organizations. The purpose of this relationship is to work toward shared goals through a division of labour that all parties agree on.

ARTICLE C2 – GENERAL INFORMATION

C2.1 Competing teams

C2.1.1 STEM Racing™ will request that each In-Country Co-ordinator (ICC) selects teams for entry to the World Finals event from their region. Once approved by STEM Racing™, these teams will then be invited to compete in the World Finals by the ICC. The invited World Finals teams will normally be the overall winner of the in-country national final, a second and third team chosen at the discretion of the ICC to suit the In-Country competition. This third team could also be an internal or international collaboration.

C2.1.2 Each team must consist of a minimum of 3 students to a maximum of 6. If a student's date of birth falls after the 1st of January 2006 and they turned the age of 19 in the year the event takes place, they are eligible to compete.

C2.1.3 Only members of the official competing team (maximum 6) are permitted to wear the team's uniform.

C2.1.4 STEM Racing™ will provide help to establish international collaboration teams where needed by liaising between the relevant ICC's. Teams nominated to form international collaboration teams are usually runner-up or minor placed winning teams from respective National Finals.

C2.1.5 International collaboration teams must consist of a minimum of 4 members and up to a maximum of 6 with a minimum of 2 members from any one country (i.e. 3 countries collaborating is the maximum) and where possible be as balanced as possible in order to represent a fair split of team members between the collaboration countries.

C2.1.6 When teams combine to form a collaboration, a maximum of six students must be nominated as the official competing team members. The remaining students may be referred to as affiliated students. Regulation C2.2.3 does not apply to International collaboration teams who have previously participated, provided the same international collaboration team is not entered. (Please note, from 2015, students who have previously attended a World Final as a collaboration team will be allowed to compete a further time at a forthcoming World Final).

C2.1.7 During the competition, only the official core team members (maximum of 6) can represent the team at registration, Pit Display set up, Scrutineering review, Verbal Presentation, Design & Engineering judging, Project Management, Enterprise judging, Safe/Fit to race fix, racing, on-stage presentations, competition activities and any direct communication with the Chair of Judges or Event/Competition Directors.

C2.1.8 If an international collaboration team wins an award, only the official core team members may take to the stage and be involved in key photo, media and publicity sessions. Any trophies must be shared between the team following the World Finals event. Only the collaboration award will have two actual trophies associated with it. Award certificates will be duplicated for awards won by collaboration teams.

C2.1.9 All international collaboration teams must sign a memorandum of understanding (MOU) document that acknowledges the team construction, financial obligations and team member responsibilities. This document must be signed by each team member, a school official and the ICC as witness. This document should initially be created by the ICC. Example MOU are available upon request from STEM Racing™.

C2.1.10 Team affiliated students are welcome to attend the World Finals but must pay the participation fee to join in all official activities. They may play no part in the judging assessment process as outlined in C2.1.7. STEM Racing™ reserves the right to impose a penalty of up to 20 points at the discretion of the chair of judges if it is felt team affiliated students are influencing the judging process.

C2.1.11 Team affiliated students, supervising adults / teacher must adhere to C2.1.3. If a uniform is to be worn it must be significantly different to the official core team. This is to assist the Judges in recognising the official core students.

C2.1.12 Non-international collaboration teams may not have affiliated students associated with the team and any additional delegates will only be recognised as team guests**.**

C2.2 Returning Students

C2.2.1 A student can only participate in a maximum of 2 World Finals.

C2.2.2 Any member of a World Finals Team (with the exception of C2.2.3), or the whole team, may return to participate in one other World Finals event, provided they have qualified to do so through their National Competition.

C2.2.3 After the 2018 World Finals, World Champions will not be able to compete in another World Finals event. They may however be invited to join the Judging panel at a future World Finals event.

C2.3 Competition programme, team number and team name

C2.3.1 STEM Racing™ will issue the competition programme showing all scheduled judging activities, with judging times listed against team competition numbers.

C2.3.2 STEM Racing™ Ltd. will determine the team number each team will be allocated. These team numbers will correspond with those published in the competition programme.

C2.3.3 The competition programme may be revised slightly to accommodate a team from the host country participating in the first race of the event.

C2.3.4 No teams participating in the challenge are permitted to use any of the Formula One Word Marks (shown below) in their team name, logo, domain name, and/or any social media handle. For example, “Infinity F1” is not allowed and should be changed to something similar such as “Infinity” or “Team Infinity”. No team will be permitted to use any of the prohibited word marks within their team name when participating in STEM Racing™ from 2017 onwards.

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C2.3.5 Duplicate team names will be asked to rename with the Country code after their name. It is optional for teams to change their team logo, but all judging, references and mentions will use the official corrected name.

C2.3.6 During registration teams will be asked to define their official team’s name and their “short” team’s name. The official team’s name will be used to identify your team by default. Please refer to C2.3.4 for guidance on creating a suitable team name. The short name is the name that will be displayed for your team where space is limited (for example, small on-screen graphics). This must be no more than 15 characters (including spaces) and be typed exactly as you want the name to appear.

C2.3.7 Prohibited characters – Teams may be asked to alter their team and organisation names if they contain special characters outside of A-Z, a-z, 0-9 as these may cause issues with data processing. Some of the reserved characters are listed below. These may be amended at any point by STEM Racing™ Ltd. Superscript or subscript characters will also be ignored.

- Team names **<u>must not</u>** include following reserved characters:
  - < (less than)
  - > (greater than)
  - : (colon)
  - " (double quote)

- / (forward slash)
- \ (backslash)
- | (vertical bar or pipe)
- ? (question mark)
- * (asterisk)

C2.4 Team responsibilities

C2.4.1 Teams must read the World Finals Technical Regulations carefully to ensure their cars comply with those regulations.

C2.4.2 Teams must read the World Finals Competition Regulations (this document) carefully to ensure that all project elements satisfy these regulations and that they understand the requirements and procedures for all aspects of the competition and judging.

C2.4.3 During the competition it is the team's responsibility to ensure that team members are present at the correct time and location for all scheduled activities.

C2.5 Role and responsibility of ICC and supervising teacher/adult.

C2.5.1 All ICC's and supervising teachers/adults should carefully read and understand the terms and conditions for entry to the STEM Racing™ World Finals event, and must have explained all relevant information within this agreement to their team/s.

C2.5.2 It is the primary responsibility of any event accredited supervising teacher/adult and/or the ICC to ensure duty of care/well-being for all their student team members, as appropriate for their home country legislation. Any concerns arising during the event in relation to this should be brought to the attention of the STEM Racing™ Event Directors immediately.

C2.5.3 The event accredited supervising teacher/adult and/or ICC is expected to be present during any judging activity with their team, but, must not interact in any way with the student team, Judges or judging process. Any incident considered inappropriate will be brought to the attention of the Chair of Judges and 10 penalty points may be applied to their associated team.

C2.6 Regulations documents

C2.6.1 STEM Racing™ issues the regulations, their revisions and amendments made.

C2.6.2 Competition Regulations – (This document). The Competition Regulations document is mainly concerned with regulations and procedures directly related to judging and the competition event. Competition Regulation articles have 'C' prefix.

C2.6.3 Technical Regulations – A document; separate to this one which is mainly concerned with those regulations that are directly related to STEM Racing™ car design and manufacture. Technical Regulation articles have a 'T' prefix.

C2.7 Interpretation of the regulations

C2.7.1 The final text of these regulations is in English, should any dispute arise over their interpretation, the regulation text, diagrams and any related definitions should be considered together for the purpose of interpretation.

C2.7.2 Text clarification - Any frequently asked questions that are deemed by STEM Racing™ to be related to text needing clarification will be answered. The question and the clarification will be published to all teams at the same time.

C2.8 Supplementary competition regulations

Other documents may be issued by STEM Racing™ that provide teams with further logistic and other important event information. Any supplementary regulations will be issued to all ICC's or lead teachers and team managers, where the team manager has supplied STEM Racing™ with a contact email address. Copies of all supplementary regulations issued will be available online either via the website, event app or social media pages.

C2.9 Design ideas and regulation compliance queries

Teams are not permitted to seek a ruling from STEM Racing™ or any competition official or judge before the event as to whether a design idea complies with the regulations. Rulings will only be made by the Judges at the World Finals event. Design compliance to the regulations forms part of the competition. As in Formula 1®, innovation is encouraged, and STEM Racing™ teams may also find, sometimes controversial, ways of creating design features by pushing the boundaries in order to get an extra competitive edge.

C2.10 Team partnerships

C2.10.1 STEM Racing™ teams are encouraged to develop mentoring partnerships with businesses, industry, or higher education organisations throughout their project.

C2.10.2 All teams will be required to complete a 'Team Partnerships' declaration using the template issued by STEM Racing™. A declaration is required even in the case of no partnerships to declare. This is submitted as per Article C2.13.

C2.10.3 All design work, text and scripting for all project elements presented for assessment must be wholly undertaken and created by the team. This includes all CAD and CAM data, electronic portfolio and graphic content.

C2.10.4 All aspects of any partnerships should also be represented in the team's portfolio. For project elements produced utilising some outside assistance, teams should be able to demonstrate to the Judges a high level of understanding of, and justification for, any of the processes used.

C2.10.5 'Common sense' will prevail for project elements or components that a team has purchased from a supplier. E.g. bearings, screw eye, display hardware. Teams should be able to explain and justify why a specific component was selected / purchased over other similar available components.

C2.11 Mandatory project elements required for World Finals entry

Following is a summary of the mandatory elements required for judging:

- Two (2) identical STEM Racing™ cars including all optional replacement components
- One (1) STEM Racing™ display car for use in judging activities
- One (1) fully machined, unfinished, unassembled STEM RACING model block car body identical to the car body used on car A & B
- One (1) Halo and One (1) Helmet identical to the car body used on car A & B (for specification judging purposes)
- One (1) digital and Two (2) physical copies of the Design & Engineering Portfolio
- One (1) digital and Two (2) physical copies of the Project Management Portfolio
- One (1) digital and Two (2) physical copies of Enterprise Portfolio
- A Pit Display
- A 10-minute Verbal Presentation
- A set of engineering drawings including orthographic and 3D renders for Scrutineering judging.
- A digital team logo
- All relevant CAD data and access to CAD software
- 'Team Partnerships' declaration(s)

- Car Submission Checklist which must include the official STEM RACING Model Block holographic stickers

The above list is detailed in the remainder of ARTICLE C2.

C2.11.1 Cars - Each team must produce two (2) identical STEM Racing™ race cars and one (1) display car.

C2.11.2 Portfolios - Each team must produce:

- One (1) digital and Two (2) physical copies A3, 11-page (maximum) Design & Engineering portfolio
- One (1) digital and Two (2) physical copies A3, 12-page (maximum) Enterprise portfolio
- One (1) digital and Two (2) physical copies A3, 7-page (maximum) Project Management portfolio

Portfolios must be presented in an A3 (or equivalent) sized format. Refer to ARTICLE, C5, C6 & C7 of these regulations along with the Design & Engineering, Project Management and Enterprise judging scorecards for portfolio requirements. Teams must submit their portfolio documents (Design & Engineering, Project Management, Enterprise) in digital format to the STEM Racing™ World Finals before **Sunday 14th September 2025 23:00 (GMT/UTC +00:00)**. Late submissions will incur a **20-point penalty**. Submissions must be via Team Digital Upload Folder. (Refer ARTICLE C1.14)

If you have any issues uploading your documents, you can also submit them by email to stemracinghq@gmail.com**.** It is recommended that when creating PDF files, teams consider embedding any unusual font types they may have used within their documents to help ensure they display correctly when opened by the Judges.

The following file conventions must be adhered to:

- Documents must be submitted in separate single Portable Document Format (PDF) files.
- PDF files must be no greater than 20Mb in size for the email option and no greater than 75MB for the STEM Racing™ upload folder option.
- Text included in the PDF files must be **highlightable** to facilitate the similarity checking process. STEM Racing™ reserves the right to impose a penalty of up to 20 points to any team failing to comply with this request at the discretion of the chair of judges.

The files must be named:
"**teamnumber_team_name_country_engineering.pdf**",
"**teamnumber_team_name_country_projectmanagement.pdf**"
"**teamnumber_team_name_country_enterprise.pdf**"
"**teamnumber_team_name_country_engineering_drawings_renders.pdf**"
so they can be recognised easily when submitted.
For example: "**T01_STEM_RACING_UK_projectmanagement.pdf**".

C2.11.3 Pit display - Each team will be provided with a dedicated exhibition style space for set-up of their pit display elements. The specific style and size of this space will be announced in supplementary event competition regulations. Refer to ARTICLE C7 for further pit display specifications and content requirements.

C2.11.4 Verbal Presentation - Teams will be required to deliver a Verbal Presentation in relation to their project to the Judges. The presentation must not last longer than 10 minutes. If teams are unable to deliver the presentation in English, then an interpreter can be present (teams need to bring their own translator) and a time of 20 minutes will be allocated, but the team must notify us if this is the case no later than **Monday, 25st August 2025**. Teams should bring their own laptop with any slide

show or other multimedia files that need to be shown as part of their Verbal Presentation. Any team who needs a laptop for Verbal Presentation judging and is unable to bring one to the World Finals must contact STEM Racing™, (global-admin@stemracing.com), at least one month before the event. Refer to ARTICLE C7 of these regulations for details regarding presentation content and other requirements.

C2.11.5 Electronic data - Teams must submit all additional project data as specified below: Data submitted must include:

All CAD parts and assembly files to assist the scrutineering process.
The files must be named: "**teamnumber_team_name_country_filename**", so they can be recognised easily when submitted. For example: "**T01_STEM_RACING_UK_full_car_assembly.stl**".

Teams must submit their files to STEM Racing™ before **Sunday, 14th September 2025 23:00 (GMT/UTC +00:00).** Late submissions will incur a **20-point penalty**. Submissions must be via Team Digital Upload Folder. (Refer ARTICLE C1.14) This data may be referred to for judging purposes and possible marketing and promotion following the event.

C2.11.6 Engineering Drawings (refer to ARTICLE C1.12) and Renderings (refer to ARTICLE C1.13) for Specification Judging. Teams must submit both a digital copy and a hard copy of any engineering drawings and renderings of their car assembly and parts they wish to be referenced by the Engineering and Specification Judges. The digital submission must exactly match the hard copy in content and format.

Each team must produce:

- One (1) hard copy of A4 Engineering drawings including orthographic view
- One (1) hard copy of A4 3D car renders
- One (1) digital copy of A4 Engineering drawings including orthographic view
- One (1) digital copy of A4 3D car renders

Mandatory table of contents for Engineering Drawings
Teams **MUST** include the following Engineering Drawing Table of Contents

1. Orthographic drawings with detailed dimensions of fully assembled car indicating regulation compliance
2. Exploded isometric drawing with key to main components
    a. Car body
    b. Virtual cargo
    c. Chamber
    d. Tether line guides
    e. Front wheels / wheel support system
    f. Rear wheels / Wheel support system
    g. Nose cone
    h. Front wing / support structure
    i. Rear wing / support structure
3. Orthographic drawings with detailed dimensions of virtual cargo including a sectioned view.
4. Location of official STEM Racing™ decals dimensioned from key structural parts (eg wheel centre).
5. Chamber details including wall thickness and depth.
6. Orthographic drawings with detailed dimensions of tether line guides.
7. Orthographic drawings of wheels with sectioned view and detailed dimensions.
8. Orthographic drawings with detailed dimensions of front wheels / wheel support system.
9. Orthographic drawings with detailed dimensions of rear wheels / wheel support system.
10. Orthographic drawings with detailed dimensions of nose cone.

11. Orthographic drawings with detailed dimensions of front wing and support structure highlighting wing surface/boundary.
12. Orthographic drawings with detailed dimensions of rear wing and support structure highlighting wing surface/boundary.
13. Detailed description of intended quality and finish in relation to individual components / assembled car.

Hard copy requirements:

The drawing set must include an Orthographic Drawing - A 1st or 3rd angle orthographic projection, including plan, side and end elevations of the fully assembled car. 3D rendering/s of the final car design must also be included. These elements must be produced using CAD. The orthographic technical drawing should include dimensions and corresponding regulation numbers to illustrate regulation compliance. These drawings must be presented on paper only pages no larger than A4 in size. Please note, Engineering Drawings and Renderings will be stored along with your car and spare parts after Registration and Element Submission, so hard covers and / or large bindings are not advisable. Paper versions of the Engineering Drawings and Renderings are to be submitted with the team's cars (Refer ARTICLE C2.13.1).

Digital copy requirements:

Teams must submit their A4 Engineering Drawings and Renderings in digital format to the STEM Racing™ World Finals before **Sunday 14th September 2025 23:00 (GMT/UTC +00:00)**. Late submissions will incur a 20-point penalty. Submissions must be via Team Digital Upload Folder. (Refer ARTICLE C1.14)

C2.11.7 Computer for Design & Engineering judging - a computer with the CAD software used by the team and with all CAD parts and assembly data should be used during the Design & Engineering judging session so that the team can demonstrate their CAD work and better explain how they engineered their car design.

C2.11.8 'Team Partnerships' declaration – Every team must complete the declaration template online as issued by STEM Racing™. All partnerships and any outside assistance must be included. This document will be referenced by Judges so they can better understand team partnerships and ask questions, and therefore must be a full and accurate declaration.

Please complete the partnership declaration here.

C2.12 Team registration

C2.12.1 Teams are required to register with STEM Racing™ at the event. At this registration, teams will be issued with World Finals accreditation, event programmes and detailed welcome pack. The team manager and supervising adult for each team must attend and submit their project elements. Each team must submit their flight details by **Friday 5th of September 2025**. Each team will then be given a specific time and location to register prior to their arrival at the venue, this time slot must be adhered to.
Registration will close at 18:00 local time on the designated registration day.
STEM Racing™ reserves the right to impose a penalty of up to 50 points to any team arriving late at the discretion of the Chair of Judges.
STEM Racing™ advises that teams plan their travel to arrive at least 3 hours before registration officially closes.

C2.12.2 Official STEM Racing™ 30x15mm car decals will be provided for teams that have not manufactured their own. These decals must be fitted to each of the two submitted cars by the STEM Racing™ team during Specification judging. You can download the decal artwork here.

C2.13 Submission of project elements

C2.13.1 A time and location will be published in the event programme for when each team must submit their project elements. This will occur well before judging commences. Following is a list of the elements which must be submitted by each team at this time:

PHYSICAL PROJECT ELEMENTS

- One (1) nominated Car A identified using a white or black background STEM Racing™ 'Car A' logo decal
- One (1) nominated Car B identified using a white or black background STEM Racing™ 'Car B' logo decal
- One (1) fully machined, unfinished, unassembled STEM RACING model block car body identical to the car body used on car A & B
- One (1) Halo and One (1) Helmet identical to the car body used on car A & B (for specification judging purposes)
- Optional Replacement Components
  - Nose cone & front wing assembly – maximum of two (2)
  - Rear wing assembly – maximum of two (2)
  - Front wheels – maximum of four (4)
  - Front wheel support structure – maximum of two (2)
  - Rear wheels – maximum of four (4)
  - Rear wheel support structure – maximum of two (2)
- One (1) set of A4 Engineering drawings (with mandatory table of contents)
- One (1) set of A4 Car renders for Scrutineering judging
- Two (2) physical copies of the Design & Engineering Portfolio
- Two (2) physical copies of the Project Management Portfolio
- Two (2) physical copies of Enterprise Portfolio
- Project Elements Submission Checklist, which must include the official STEM RACING Model Block holographic sticker.

DIGITAL PROJECT ELEMENTS

- 1 x digital A3, 11-page (1-page front cover + 10 pages of content) Design & Engineering Portfolio
- 1 x digital A3, 12-page (1-page front cover + 10 pages of content + 1 page back cover) Enterprise Portfolio
- 1 x digital A3, 7-page (1-page front cover + 6 pages of content) Project Management Portfolio
- Digital A4 Engineering drawings (with mandatory table of contents)

- Digital A4 Car renders for Scrutineering judging
- Electronic copy of all additional project data
- 'Team Partnerships' declaration(s) must be completed online prior to the event.

All digital project elements must be digitally submitted before **Sunday 14th September 2025 23:00 (GMT/UTC +00:00).** Refer to ARTICLE C2.11.

C2.13.2 During project submission, each team will be given the opportunity to check the weight of their cars on the official World Finals scales. If either car being submitted is under the minimum weight, the team will be permitted 15 minutes to fix any issue so that both cars can be submitted at or above the minimum weight.

C2.13.3 Small coloured 'dot' stickers (approximately 5mm in diameter) and supplied by STEM Racing™, will be adhered to the underside of each car. The stickers will feature the team's competition number.

C2.13.4 Once cars and replacement components have been submitted, they are considered as being in parc fermé.

C2.14 Project elements to be retained by STEM Racing™

It is a condition of World Finals entry that each team permits STEM Racing™ to retain one (1) car, one of each physical portfolio (Design & Engineering, Project Management, Enterprise) and the electronic copy of all specified project data submitted. Teams also permit STEM Racing™ to use any of these project elements for marketing purposes and/or publication as exemplar projects for reference by others.

C2.15 Benefit of doubt

The Chair of Judges will, where appropriate, seek to use 'benefit of doubt' when the assessment of compliance is marginal or unclear. In this situation, teams will be given the benefit of doubt rather than a firm penalty if a penalty cannot be clearly measured or identified.

C2.16 Spirit of the competition

Teams are expected to act in the spirit of the competition, both before and during the STEM Racing™ World Finals. Any team deemed by the Chair of Judges to be acting outside of the spirit of the competition, can be removed from certain or all aspects of the competition. For example, a team attempting to abuse the technical regulations to their advantage may, at the discretion of the Chair of Judges, be removed from racing and receive no points for this activity. A team deemed to be acting in an unsportsmanlike manner towards another team or other persons may be removed from some or all judging areas.

The spirit of the competition is simple; embrace and respect the rules and regulations, do your very best to compete legally and fairly, while contributing positively to the STEM Racing™ World Finals. Make friends, create positive relationships, network professionally and enjoy yourselves.

C2.17 Plagiarism

Plagiarism within any project work submitted by teams is not permitted. All teams must complete the Originality Declaration as part of their online team registration. Where plagiarism has been detected, the Chair of Judges may choose to penalise or exclude the team from that element of the competition.

ARTICLE C3 – COMPETITION AND JUDGING FORMAT

C3.1 Competition programme

C3.1.1 Each team will be judged as per the competition programme. The competition programme will be formulated by STEM Racing™ to best and fairly accommodate all judging and other competition activities. Teams will rotate around judging activities as per this programme, with each rotation usually of 30 minutes in duration.

C3.1.2 Judging Streams – The competition programme will normally be divided into multiple parallel judging streams (Stream A, Stream B, Stream C and Stream D), to help ensure quality judging time intervals within the event time constraints. A number of strategies are implemented within the judging process, including judge briefings and judge reviews for cross-moderation to ensure there is consistency across the judging streams.

C3.2 Judging categories

There are six (6) main judging categories, each with its own team of Judges/officials and specified judging activities as detailed in further articles.

- Specification & Scrutineering Judging
- Design & Engineering Judging
- Project Management Judging
- Enterprise Judging
- Verbal Presentation Judging
- Racing

C3.3 Judging scorecards

The STEM Racing™ World Finals judging scorecards provide detailed information in relation to what the Judges will be looking for. They include key performance indicators, which are referred to by the Judges in awarding points during judging activities. The 2025 World Finals judging scorecards can be found in the appendix of this document. Please read the whole document without assumptions from previous rules documents.

READING THE SCORECARDS CAREFULLY IS IMPORTANT. THEY PROVIDE CRITICAL INFORMATION FOR TEAMS AS TO WHAT NEEDS TO BE PRESENTED FOR EACH JUDGING CATEGORY.

C3.4 World Champions

The STEM Racing™ World Champions perpetual trophy will be awarded to the team with the highest sum total from all judging categories (ARTICLE C3.5). In the case of a tied points score, the team with the highest time trial score will be determined the winner.

THE CHAIR OF JUDGE'S DECISION IS FINAL

C3.5 Point allocations

Points will be awarded to teams across six (6) categories with maximum possible scores as detailed in the following table:

World Finals Judging Categories and Point Allocations	
Specification & Scrutineering Judging	
Specifications	100 points
Engineering Drawings	20 points
3D Renders	20 points
Quality of Finish and Assembly	20 points
Design & Engineering Judging	
Design & Engineering Portfolio	180 points
Project Management Judging	
Initiating	35 points
Planning	25 points
Executing	20 points
Monitor and Controlling	10 points
Enterprise Judging	
Enterprise Portfolio Only Assessment	100 points
Team Identity	20 points
Pit Display	60 points
Verbal Presentation Judging	
Technique	60 points
Composition	40 points
Subject Matter	40 points
Racing	
Time Trials	105 points
Reaction Racing	105 points
Knock-Out Racing	30 points
Fastest Car Bonus	10 points
TOTAL	1000 points

The International Rules Committee may at their discretion add point scoring judging categories into the event. This would be completed under controlled conditions during the competition.

C3.6 Classification of technical regulations

C3.6.1 The technical regulations are classified as either: **GENERAL**, **SAFETY**, **PERFORMANCE**.

GENERAL	SAFETY	PERFORMANCE
Regulations that shape the way the car fundamentally looks and works, vital to the style of a STEM Racing™ car.	Mandatory rules that govern the safe running of the car. Cars must meet these rules to be considered 'safe to race'.	Rules that have a direct impact on the performance of the vehicle, these typically carry the heaviest penalties.

C3.6.2 If a race car is judged as being NON-COMPLIANT with any Performance regulation they will be **INELIGIBLE** for the awards of: '**Fastest Car'** and '**Best Engineered Car'**.

If a race car is judged as being NON-COMPLIANT with any Performance regulation, racing leaderboards will show an "under investigation" symbol next to the team's race time.

For the Knock-out Competition, should there be any teams with Performance regulation failure(s) for both cars seeded in the top 24 teams then they will only be permitted to race in round one of the knock-out competition and will be automatically knocked out during round one regardless of the race result.

All Performance regulations are highlighted in yellow throughout the Technical Regulations Document:

T3.3, T3.6, T4.2, T4.4.1, T5.6, T7.2, T7.3, T7.4, T7.5, T7.6, T7.7, T7.8, T7.9, T7.10, T7.11, T8.6.1, T8.6.2, T8.6.3, T8.7, T8.8, T9.5.1, T9.5.2, T9.5.3, T9.6, T9.7.

For more information regarding Compliance with regulations, please consult T2.5 of the Technical Regulations document.

ARTICLE C4 – SPECIFICATION & SCRUTINEERING JUDGING (160 points)

C4.1 What will be judged?

Specification & Scrutineering judging is a detailed inspection process where BOTH race cars plus the optional replacement components are assessed for compliance with the STEM Racing™ World Finals Technical Regulations. The Engineering drawings, renderings and quality of finish & assembly will also be assessed. Refer to the scrutineering and specification judging scorecards for scoring details.

C4.1.1 Optional replacement components must be identical in design to those fitted to both cars (Car A & Car B) and must be submitted with the cars. Only the following replacement components are permitted:

- Nose cone & front wing assembly – maximum of two (2)
- Rear wing assembly – maximum of two (2)
- Front wheels – maximum of four (4)
- Front wheel support structure – maximum of two (2)
- Rear wheels – maximum of four (4)
- Rear wheel support structure – maximum of two (2)
- Halo & Helmet – maximum of two (2)

Submitted replacement components that are determined by the Judges to not be identical to that which are fitted to the car will not be allowed to be used. Submitted components will remain in parc fermé and only be handed back to the team if needed during racing and/or car servicing.

C4.2 Team preparation

Teams must ensure that their cars (Car A & Car B) and any optional replacement components are complete and ready for specification judging and racing before they are submitted. Notice is also drawn to the performance regulations, refer ARTICLE C3.6. Teams must have also submitted an electronic copy of all specified project data such as scrutineering engineering drawings, which may all be referenced. Refer ARTICLE C2.11

C4.3 Who needs to attend?

This inspection will take place live in the presence of the team (represented by up to 2 team members and 1 supervising adult). Teams will proceed through stations where STEM Racing judges will verify all dimensions and specifications. Each station visit will last approximately 10 minutes, during which scrutineers will review the cars' elements for compliance with the 2025 Technical Regulations.

C4.4 Judging process/procedure

Teams begin specification judging with a full allocation of 100 points. Any infringements of the Technical Regulation articles, on either car, will result in points being deducted as detailed in the Technical Regulations.

THE PROCESS

1. Before the measuring process begins, STEM Racing will create a photographic record of both of your race cars.
2. The designated team members may observe the measuring process, but they are not permitted to intervene.
3. If the judges detect a compliance issue with a specific regulation, the team will be informed.
4. Teams may ask questions, provided they do not interfere or cause delays within the station's allocated time.
5. Each judging station will have two judges present. Scrutineering supervisors, including the Head of Scrutineering and the Chair of Judges, will oversee this process.

6. At the conclusion of the specification process, teams will have an opportunity to appeal any judge's decision. Please see ARTICLE C11 – PROTESTS.
7. Teams flagged for performance-related regulation issues will be marked on the racing leaderboards with an "under investigation" symbol.

In addition, the engineering drawings, renderings, and overall quality of finish and assembly will be assessed, though this evaluation will occur behind closed doors. Refer to the scrutineering and specification judging scorecards for detailed scoring criteria.

CONTINUAL ASSESSMENT
Spot checks of the cars may take place at any point during the competition. STEM Racing reserves the right to review specification results if necessary. Teams will be informed of any changes to the initial assessment, and an appeal window may be made available at the discretion of the Chair of Judges.

C4.5 Safe/Fit to race fix

Teams that have been judged during initial scrutineering to have incurred a Safe/Fit to Race regulation from the list below will be provided with a special 20-minute car service time, prior to the commencement of racing. Cars must meet these rules to be considered 'Safe/Fit to race. If during this service time the car can be modified so as to comply with the failed regulation(s), the team will then only incur HALF the point's penalty for that infringement, without being classified as having incurred a **SAFETY** infringement.

T3.2 T4.4.4, T4.4.5, T5.1, T5.3, T5.4, T5.5, T5.6, T6.1, T6.2, T6.3 and T7.13

C4.6 Specification judging decision appeals

C4.6.1 Scrutineering Decision Appeals

These must be submitted within two hours of the team completing their specification review judging. Other rules for submitting these will be the same as for protests.

C4.6.2 Submitting a Protest

Any protest issues must only be submitted by the team manager by email (global-admin@stemracing.com) to an Event Director, who will register this and immediately submit it to the Chair of Judges. This must occur no later than 21:00 (local time) on racing day 2. Any protest or appeals submitted after this time may be disregarded. The Chair of Judges decision related to any protest is final.

Teams should carefully consider their grounds for submitting a protest or appeal. Any protest or appeal that is unsuccessful, with the Judges initial decision remaining unchanged, will result in the team having a 15-point penalty applied against their total score.

ARTICLE C5 – DESIGN & ENGINEERING JUDGING (180 points)

C5.1 What will be judged?

The Design & Engineering Judges will examine each team's 11-page Design & Engineering portfolio so that they can assess the teams' car design and use of CAD/CAM technologies along with the quality of manufacture of both race cars submitted. The specific areas to be assessed are:

- Design Concepts
- CAD 3D Modelling
- Application of Computer Aided Analysis
- Use of CAM/CNC
- Other Manufacturing & Assembly
- Research & Development
- Testing
- Design Process Evaluation
- Document Presentation

Refer to the Design & Engineering judging scorecard for key performance indicator information.

C5.2 Team preparation

A laptop needs to be ready and taken to the Design & Engineering judging team along with any other items which may help the team explain any engineering or manufacturing concepts. The Design & Engineering Judges will not have access to the team pit display for judging purposes. Teams may choose to, but do not need to take their display (3rd) car to the Design & Engineering judging. Preparation should include careful reading of the scorecard. The key performance indicators for the design process, application of CAD / CAM, analysis and associated data organisation, describe what the Judges will be looking for.

C5.3 Who needs to attend?

This judging session must be attended by the team manager and team design and manufacturing engineers as a minimum.

C5.4 Judging process / procedure

Teams will be awarded points as per the key performance indicators shown on the Design & Engineering scorecard. Judges will review the Design & Engineering portfolio in a 'closed to teams' session programmed before the commencement of scheduled judging sessions. The scheduled Design & Engineering judging interview session will focus on the overall engineering and design of the car. This is an informal interview where Judges will ask the team to demonstrate their CAD / CAM work and query teams on what they have done. The quality of car manufacture and car assembly will be judged during a separate 'closed to teams' session.
An interpreter can be present during the judging session (teams need to bring their own translator) but no extra time will be added.

C5.5 Design & Engineering Portfolio requirements

The Design & Engineering portfolio must be in a digital and printed format of A3 or similar size. The portfolio is limited to 11 pages (1-page front cover + 10 pages of content). This can be a single page front cover plus 10 single sided or 5 double sided sheets. If a portfolio comprises more than 11 pages, the Judges will only review the first 11 pages for assessment purposes. There MUST be content related to the use of CAM and CNC manufacturing included in the portfolio and this will be referenced by the Engineering Judges. Content related to the car, design ideas, design development, research, testing and evaluation should be presented within the portfolio.

ARTICLE C6 – PROJECT MANAGEMENT JUDGING (90 points)

C6.1 What will be judged?

The Project Management judges will examine each team's 7-page Project Management Portfolio so that they can assess the following specific areas.

Project Management:

- Initiating
  - Initiation Process
  - Project schedule
- Planning
  - Budget & Resource management
  - Roles and Responsibilities
- Executing
  - Team & Stakeholder Communications
  - Risk Management
- Monitor and Controlling
  - Monitoring & Controlling

Refer to the Project Management scorecard for detailed point scoring and key performance indicator information.

C6.2 Team preparation

Each team must prepare one (1) Project Management portfolio as per ARTICLE C2.11. Most importantly, teams need to read the Project Management judging scorecard carefully to ensure that all areas to be assessed are included within the context of their Project Management portfolio.

C6.3 Who needs to attend?

All team members must be present during the Project Management judging session.

C6.4 Judging process / procedure

The Project Management judging will take place during dedicated judging session. Team members may be asked questions by Judges to help them find certain content and/or seek further explanation. In addition to the scheduled judging session, the Judges will also be given time to conduct pre-judging and review of each team Project Management portfolio. This will be a 'closed to teams' session programmed before the commencement of scheduled judging sessions.
An interpreter can be present during the judging session (teams need to bring their own translator) but no extra time will be added.

C6.5 Project Management Portfolio requirements

The Project Management Portfolio must be in a digital and printed format of A3 or similar size. The **Project Management portfolio** is limited to 7 pages (1-page front cover + 6 pages of content). This can be a single page front cover plus 6 single sided or 3 double sided sheets. If the portfolio comprises more than 7 pages, the Judges will only review the first 7 pages for assessment purposes.

For Project Management, teams are asked to detail their project management processes employed with the delivery of the STEM Racing™ Project. The STEM Racing™ Project Management Guide should be used for reference. You can find the guide here.
The number of pages allocated to each key performance indicators is at the discretion of each team.

ARTICLE C7 – ENTERPRISE JUDGING (180 points)

C7.1 What will be judged?

The Enterprise Judges will examine each team 12-page Enterprise Portfolio and Pit Display so that they can assess the following specific areas.

- Enterprise Portfolio only assessment:
  - Marketing Strategy & Materials
  - Sponsorship & Return on Investment
  - Digital Media Proficiency
  - Sustainability
  - Document Presentation
- Pit Display
  - Design Process (Documented in Enterprise Portfolio)
  - Content, Clarity, and Impact
  - Functionality & User Experience execution
- Team Identity
  - Overall Team Identity

The **Pit Display Criteria** (Design Process, Content, Clarity and Impact and Functionality & user experience) will primarily be based on the Pit display, Pit display designs, enterprise portfolio and the interviews with the Enterprise judges.

The **Overall Team Identity** will be assessed based by looking at all aspects of the team's identity. This will be primarily based on the Pit display, enterprise portfolio and the interviews with the Enterprise judges. Judges may also review other documentation, such as the engineering and project management portfolios and images of the car to confirm the team's identity has been applied consistently.

Refer to the Enterprise scorecard for detailed point scoring and key performance indicator information.

C7.2 Team preparation

Each team must prepare one (1) Enterprise Portfolio and Pit Display as per ARTICLE C2.11. Most importantly, teams need to read the Enterprise judging scorecard carefully to ensure that all areas to be assessed are included within the context of their Enterprise portfolio and Pit Display.
It is each team's decision how and where each area is presented. Teams should be mindful of the time constraints of judging when making these decisions.

C7.3 Who needs to attend?

All team members must be present during the portfolio and display judging session.

C7.4 Judging process / procedure

The Enterprise judging will take place during dedicated judging session. Team members may be asked questions by Judges to help them find certain content and/or seek further explanation. In addition to the scheduled judging session, the Judges will also be given time to conduct pre-judging and review of each teams Enterprise Portfolio and Pit Display. This will be a 'closed to teams' session programmed before the commencement of scheduled judging sessions. An interpreter can be present during the judging session (teams need to bring their own translator) but no extra time will be added.

C7.5 Enterprise Portfolio requirements

The Enterprise Portfolios must be in a digital and printed format of A3 or similar size.

The **Enterprise portfolio** is limited to 12 pages (1-page front cover + 10 pages of content + 1 page back cover). This can be a single page front cover plus 10 single sided or 5 double sided sheets and a single page back cover. If the portfolio comprises more than 12 pages, the Judges will only review the first 11 pages for assessment purposes. The back cover of the portfolio should include the STEM Racing™ logo, the team logo and a team photo.

- **Marketing Strategy & Materials**

  For the marketing element, teams are asked to summarise their approach and reasoning to gaining awareness via marketing activities.

- **Sponsorship & Return on Investment (ROI)**

  For this element, teams are asked to explain their engagement with sponsors, explaining the relationship and benefits. Teams should also explain their activities linked to return of investment.

- **Digital Media Proficiency**

  For this element, teams are asked to outline their approach and reasoning for social media platforms, electronic mailings, website, and other online communications. The Digital Media element within the document will be assessed in conjunction with a review of the team's Digital Media campaign executed.

- **Sustainability**

  For this criterion, teams are to outline their sustainability strategy and activities which give consideration to economic, environmental, and social factors.

The number of pages allocated to each key performance indicators is at the discretion of each team.

C7.6 Pit Display setup and parameters

C7.6.1 The Team Pit Display is at the heart of a STEM Racing™ event. It is the base of a team and says everything about a Team's identity, USP (Unique Selling Point), brand and design development journey. STEM Racing™ will provide each team with a self-contained exhibition style display space including integrated lighting and 1 x power supply with pins and rating configured to the host country format. Teams need to supply any power adaptors they may require. Display spaces are normally of approximate dimensions 3m wide x 1m deep x 2.4m high. The precise space description and dimensions will be announced closer to the event

C7.6.2 A time period will be scheduled for when all teams will set-up their Pit Displays. A time limit of two hours will be enforced; this will be confirmed in supplementary regulations. STEM Racing™ reserves the right to apply a penalty of **up to 20 points** at the discretion of the Chair of Judges for teams that do not complete their set-up within the time limit, do not leave their stand in a safe state and clear their pit and surrounding area of all rubbish.

C7.6.3 No part of the teams completed Pit Display is allowed to protrude beyond the physical dimensions of their allocated pit space. This includes anything that might protrude above the pit space highest point e.g. flags. Teams are not permitted to remove any part of the provided exhibition booth to fit the pit display. A penalty of up to 10 points may be applied at the chair of judge's discretion.

C7.6.4 **ONLY** student team members are permitted to set-up their pit displays. There must be no supervising teacher / adult or other outside assistance, unless deemed by STEM Racing™ to be a health and safety issue. A penalty of up to 20 points may be applied at the Chair of Judge's discretion.

C7.6.5 STEM Racing™ and/or the Chair of Judges may instruct a team to take action to reduce noise or remove display inclusions deemed to be inappropriate. STEM Racing™ will instruct teams to remove or alter any display inclusions considered to be a safety hazard.

C7.6.6 Any electrical appliance connected to the power supply must be safe and compatible with the host country power rating.

C7.6.7 The pit display should be designed in such a way as that it can be dismantled and rebuilt in a different location during or after the event. This is to allow pit displays to be rebuilt for promotional purposes in strategic locations over the Grand Prix weekend.

C7.6.8 As part of our sustainability objectives, teams will no longer be able to send pit displays as freight to any future World Finals including the 2025 event. If your team attempts to freight anything to the venue, we will refuse delivery.

C7.6.9 All pit display materials must be "hand carried", by the team, into the World Finals event venue. Cases with wheels to be rolled in are allowed. We recommend that the dimensions would be acceptable by an airline for checked baggage into the hold of an aircraft. All materials brought into the venue must be taken away at the end of the event. Production companies will not be allowed to assist teams on the transportation or assembly of pit displays.
STEM Racing™ recommends no item should weigh more than 30kg and total length + height + depth of any item should not exceed 240cm.

Pit display set up – Team Abiyya from Saudi Arabia – Aramco STEM Racing™ World Finals 2023

C7.6.10 There will be no waste (rubbish) disposal options during pit build and breakdown. Your pit display area must be left as you found it.

IMPORTANT HEALTH & SAFETY: The Health and Safety of yourselves and those around you must be considered when working on all aspects of your Pit Display to ensure a safe environment for everyone. STEM Racing™ expects teams to produce a risk assessment and method statement to ensure all team members are aware of any risks in the construction of the pit display. Displays must be safe for other participants and visitors to the event. STEM Racing™ reserves the right to apply a penalty of **up to 20 points** at the discretion of the Chair of Judges for unsafe activity and any unsafe elements of the pit display may be removed.

ARTICLE C8 – VERBAL PRESENTATION JUDGING (140 points)

C8.1 What will be judged?

The Verbal Presentation Judges will assess each teams' 10-minute Verbal Presentation across the areas of technique, composition and subject matter:

- Technique
  - Engagement & Presentation Dynamics
  - Team Contribution
- Composition
  - Content Quality, Relevance & Subject Understanding
  - Time, Clarity and structure of content
- Subject
  - Innovation – detail key innovations related to car design, project management, marketing or any other aspect of the team's project
  - Collaboration – detail any partnerships or mentoring from outside the team and justify in terms of improving project outcomes
  - STEM Racing™ learning journey

Refer to the Verbal Presentation judging scorecard for detailed point scoring and key performance indicator information.

C8.2 Team preparation

Each team is required to prepare a Verbal Presentation as per the requirements at ARTICLE C2.11. Teams need to have all presentation resources tested and ready with them for Verbal Presentation judging. Most importantly, teams should read the Verbal Presentation judging scorecard carefully to ensure their Verbal Presentation features all elements and content that the Verbal Presentation Judges will be looking for.

C8.3 Who needs to attend?

All team members must be present during the Verbal Presentation judging session.

C8.4 Judging process / procedure

Verbal Presentation judging is scheduled for the same duration of other judging sessions, usually 30 minutes. Teams will be given an opportunity at the start of their time to set-up and test their laptop and any other presentation technologies and resources. The team will inform the Judges when they are ready to begin. The Judges start timing the 10 minute duration (20 minutes if not speaking English and using an interpreter), and will provide a discreet time warning signal when one minute of presentation time remains. The team will be asked to cease presenting when the time limit has been reached. At the conclusion of the teams' presentation time, the Judges may choose to provide some feedback and / or ask any clarifying questions they feel necessary.

C8.5 Verbal presentation judging provisions

STEM Racing™ will provide a dedicated private space, such as a small meeting room, where each team will deliver their presentation to the Judges. This space will include a data projector and screen, or LCD screen and multimedia sound system. These will be in fixed positions but usually with sufficient cable length to allow teams some freedom for choosing where they wish to locate their laptop. A single table will also be made available with its use and location in the presentation space being optional.

C8.6 Verbal presentation video recordings

The Verbal Presentations of all teams will be used for the purpose of judging review and/or may be used for post event publicity and promotional purposes by STEM Racing™ .

ARTICLE C9 – RACING (250 points) UNDER REVIEW

C9.1 What races will be conducted?

The STEM Racing™ World Finals racing points will be awarded through the staging of two types of race events:

- Reaction Racing – manual / driver launch mode, 8 races in total, each car will race in each lane once over the 4 sessions.
- Knock-out Competition Races – manual / driver launch mode, one race in each lane per round of competition (Qualification for the Knock-out, please see C9.7.1).

Reaction racing will be split over four sessions of two races. **The average 'car race time' value from all reaction races will determine the Fastest Car Award (refer C9.6).** The knock-out competition is the last of the scheduled races. Refer to ARTICLE C3.5 and further information following for details on how points are calculated and awarded.

C9.2 Team preparation

C9.2.1 Teams should be familiar with the operation of the STEM Racing™ Race System. There will normally be a section demonstration track within the venue where teams can practice race starts during free time prior to their scheduled races.

C9.2.2 Manual / driver starts - One or more team members (driver/s) must be appointed for launching of their team's car using the manual launch method. Each lane of the track has a dedicated starting area 1m x 1m which shall be clearly marked on the floor. The driver must only make contact with the floor within this dedicated area and must not touch or lean on the track.

C9.2.3 Finish line management - At least one member of the team must be appointed as responsible for managing the finish line Car Deceleration System (refer C9.11), and return of car along the track to the start.

C9.2.4 Start line car staging – Race Judges will be responsible for staging the car at the start line. Team members are not permitted to adjust the car's alignment themselves but may request a single realignment by the judges. Under no circumstances may team members interfere with the Power Unit Cartridge or the vertical alignment of the start box. At the end of the staging process, all four wheels of the car must be in contact with the track surface.

C9.2.5 Teams must ensure that both cars are race ready, a car service session will be provided before the next race event (refer C10.2). If a teams' car is damaged beyond achievable repair then teams will forfeit any races that the car would have been used for.

C9.3 Who needs to attend?

All team members must be present during their scheduled racing sessions.

C9.4 Reaction race procedure

Cars are launched in manual / driver reaction mode during four racing sessions, each comprising of two races total per team, two (2) races in each lane. The TOTAL RACE TIME displayed and the REACTION TIME displayed for each race is recorded. The reaction races will be conducted as follows:

a) Teams race in order as shown in the competition programme. To begin racing, the lowest team number will start in lane 1. All cars will be loaded onto the track, Car A first then Car B.
b) One team member to track finish for deceleration system control.
c) Judge arms Start Box - SAFETY ON.
d) Race 1 (Car A) - Judge sets cars on track/tether line and inserts Power unit cartridge – makes initial start box adjustments.

e) Please see C9.2.4 for more detail.
f) Driver and team stands trackside with corresponding lane start trigger.
g) Judge checks deceleration system is ready, all team members to stand in designated safety zone as instructed by track judges, track is clear for racing, team information on race system is correct, switches Start Box - SAFETY OFF.
h) Judge presses the start system reset button – cars are launched by driver pressing start trigger.
i) Judge records TOTAL RACE TIME and REACTION TIME displayed on start gate.
j) Team member at finish moves car into storage zone at the end of the track.
k) Race 2 (Car B) conducted in same lane as above, driver can be inter-changed as nominated.
l) Team member at finish control returns car and empty power unit cartridge along track to the start with minimum handling.
m) Judges remove cars from tether line and change lanes, team information on race system is correct.
n) Cars removed from track and returned to Parc Fermé.

C9.5 Reaction race scoring

All eight (8) 'total race times' recorded from the reaction races are considered. The fastest of these eight (8) times is used in the following formulae to calculate the points awarded:

- Fastest 'total race time' = 105 pts
- 2nd fastest 'total race time' = 100 pts
- 3rd fastest 'total race time' = 95 pts
- Slowest 'total race time' = 5 pts
- Base Time = 120% of 3rd fastest 'total race time'
- 4th fastest and all other teams score points using the following formula:
- Team Points = 5 + (90 / (Base Time – fastest 'total race time')) x (Base Time – teams fastest 'total race time')
- Any team with a best 'total race time' that is slower than the base time will score 5 points. To further discriminate between any teams scoring 5 points, a deduction of 1 point will be made for any did not finish (DNF) reaction race result.

C9.6 Time trial race scoring

The eight (8) 'car race times' recorded during racing will be considered. From these eight (8) races, the team's 2nd, 3rd, 4th and 5th best **'car race times'** will be averaged. This average time is used in the following formulae to calculate the points awarded:

- Fastest average (avg.) time = 105 pts
- Second fastest avg. time = 100 pts
- Third fastest avg. time = 95 pts.
- 'Base Time' = 115% of the third fastest avg. time of all teams avg. times.
- Fourth (4th) to slowest avg. time score points using the following formula:
  Team Points = 20 + (75/(Base Time – 3rd fastest avg.)) x (Base Time – teams avg.)
- Any team that has an average slower than the base time will score 20 points. To further discriminate between these teams, a deduction will be made of 2.5 points for any did not finish (DNF) time trial result.
- If after discarding a team's fastest time there remains less than 4 times from races finished, due to DNF's, the slowest time recorded is again input to the average equation until there are a total of four times to average.

C9.6.1 Fastest Car Race Time Bonus

A 10-point bonus will be awarded to the team with the single fastest 'car race time' value from all time-trial races.

C9.7 Knock-out Competition

Teams will take part in a knock-out (single elimination) competition. Teams will be issued the knock-out competition seeding and competition bracket prior to the race event commencing. The number of participating teams will be confirmed closer to the event.

C9.7.1 Seeding - The seeding order for the first knock-out round is determined through seeding all teams using the average fastest 'total race time' they achieved from the time trial racing event.

Cars judged to have performance regulation failures will have 0.5 seconds per performance regulation failure per car added on to their fastest 'total race time' for seeding purposes, see formula below:

$$\boldsymbol{Seeding\ Time} = \frac{\begin{pmatrix} \boldsymbol{Car\ A\ fastest\ 'total\ race\ time'} \\ \boldsymbol{+ (0.5 \times Car\ A\ Performance\ Regulations)} \\ \boldsymbol{+\ Car\ B\ fastest\ 'total\ race\ time'} \\ \boldsymbol{+ (0.5 \times Car\ B\ Performance\ Regulations)} \end{pmatrix}}{\boldsymbol{2}}$$

During knock-out racing teams will have 0.1 seconds per performance penalty per car added to their pre-set reaction times.

C9.7.2 Knock-out competition procedure - During the knock-out competition BOTH race cars will be used. Cars are launched in manual / driver reaction mode, with two (2) races total, one (1) race in each lane, for each round of the knock-out. The team with the fastest 'total race time', as displayed on the start gate, from the two races conducted, is the winner of that knock-out round. In case of a tied result, a further 'sudden death' race will be conducted, this will be a repeat of race 2. The knock-out competition will be conducted as follows:

a) Teams race in order of the competition draw. Top of draw in lane 1.
b) Prior to the cars being set on the track for each round, each team will be required to nominate which car (A or B) they will use for their first race. Each teams' other car will be used for the second race.
c) One team member to track finish for deceleration system control.
d) Judge arms start box - SAFETY ON – makes initial start box adjustments.
e) Race 1 - Judge sets all cars on track / tether line and inserts power unit cartridge
f) A team member is then allowed 30 seconds to 'fine tune' the alignment of their car, please see C9.2.4 for more detail. The deceleration system must also be set during this time.
g) Driver stands trackside with corresponding lane start trigger.
h) Judge checks deceleration system is ready, all team members to stand in designated safety zone as instructed by track judges, team information on race system is correct, track is clear for racing, switches start box - SAFETY OFF
i) Judge presses the start system reset button – cars are launched by driver pressing start trigger.
j) Judge records TOTAL RACE TIME displayed on start gate.
k) Team member at finish moves car into storage zone at the end of the track Judges set cars for Race 2.
l) Check team information on race system is correct
m) Race 2, driver can be inter-changed.
n) Cars removed from track and returned to Parc Fermé.

C9.7.2 Knock-out competition scoring example. This will depend on the number of competing teams.

Points are awarded based on the round of competition a team is eliminated as follows:

- Seeded outside top 32 = 2 pts
- Eliminated in Round 1 (Round of 32) = 6 pts
- Eliminated in Round 2 (Round of 16) = 8 pts
- Eliminated in Quarter Final = 15 pts
- Eliminated in Semi Final = 22 pts
- Eliminated in Final = 26 pts
- Knock-out Winner = 30 pts

C9.8 DNF (Did not Finish) race results

Damage or part separation occurring during a race, before the car crosses the finish line, (e.g. wheel or any other part of the car separating), or a car not crossing the finish line at all, effects in a DNF race result. The Judges may refer to video evidence to verify a DNF result.

C9.9 False Starts

C9.9.1 A false start (jump start) occurs when the driver depresses the trigger button before the 5 start gate lights have extinguished. The screen will display a false start message.

C9.9.2 All reaction false starts will incur a 2.5 point penalty and by default forfeit that race. This penalty does not apply to knock-out racing.

C9.9.3 During knock-out racing – If one team false starts (jump starts), the other team should continue to race as normal. The team who false started forfeits that race, scoring a DNF, and the other team's time is recorded. If both teams false start, the race counts as one of the two (2) runs.

C9.9.4 During any manual / driver starts, if a driver false starts and distracts the other driver the race will be re-run and the driver who caused the distraction will forfeit their race.

C9.9.5 Distractions outside of the race start area will be assessed by the lead track judge and track officials to determine if the race should be re-run. All competitors must, and other spectators will be instructed to, keep noise down to a minimum and to not use flash photography.

C9.10 Track, tether line and timing system information

C9.10.1 The STEM Racing™ Elevated Race Track, supplied by Denford Ltd will be used. The official length of the track, from start line to finish is 20 metres. A monofilament tether line of diameter 0.6mm, fixed at the finish end, passes down the centre of each lane. At the start end the line passes through 90 degrees over a single pulley then attached to a 1.0kg mass suspended above the floor.

IMPORTANT: Teams are not permitted to add anything to the race track or race system. This includes the car staging area.

C9.10.2 Launch/Timing - The STEM Racing™ Launch/Timing System will be used for launching cars and timing races and driver reaction times to 1/1000th of a second.

C9.11 Car Deceleration Systems

C9.11.1 Teams must use the Halo deceleration system. The Halo Deceleration System acts to bring cars to rest once crossing the finish line. STEM Racing™ will provide a Halo Deceleration System which is integrated into the final track section after the finish line. This consists of an arresting cable which is aligned with the circular notch of the Halo. If a team fails T4.4.4 Halo notch height they will be required to use the Brushes Car Deceleration System.

C9.11.2 The final 350mm of the track after deceleration systems is reserved for a storage zone to store raced cars before they are returned to the track start.

C9.12 Race Power Packs

Compressed gas cartridges to be used for all World Finals competition races will be supplied by STEM Racing™. Each race cartridge will be separately weighed before competition to ensure that all race cartridges used for races are within a weight range of 0.5 grams. All race cartridges will be kept in a temperature-controlled environment of 21 degrees Celsius.

C9.13 Car weight checks

Cars will have their weight checked at the race track prior to commencing a race event. This is done to ensure each car remains at a legal weight during all races. If a car is judged to have gone under weight whilst stored in parc fermé, the Judges will add ballast to return the car weight to what it was when first submitted to parc fermé, without penalty.

C9.14 Judges handling cars

The race Judges will not be required to comply with any special car handling requests made of them by teams. This includes use of any special gloves or tools.

ARTICLE C10 – CAR REPAIRS AND CAR SERVICING

C10.1 Car repairs

C10.1.1 All damage issues and related repair work during racing is at the Judge's discretion and may be referred to the scrutineering Judges and/or Chair of Judges for a final decision.

C10.1.2 No items can be removed or added to a car during racing, other than Power unit cartridges, except in the case of a repair.

C10.1.3 No penalty is applied for damage incurred during knock-out racing or a car's final race of any race event.

C10.2 Car servicing

C10.2.1 Teams will be scheduled time to carry out penalty-free maintenance and repairs on their race cars in the designated car service area. There will be a car service session after each race session. The duration of each car service session will be confirmed closer to the event.

C10.2.2 A shorter car service session will be allowed between further rounds of the knockout competition.

C10.2.3 Only team members and Judges are allowed to enter the car service area.

C10.2.4 Tool kits are allowed to be taken into car service. Teams must supply all of their own tools and other necessary resources. Judges will not be able to assist teams with any additional resource requirements.

C10.2.5 Maintenance and alterations can only be made to the front and rear wings, nose cone, tether line guides, wheels and wheel support systems. The car body MUST NOT be modified or substituted.

C10.2.6 Each team will be required to complete a car service log form, declaring any maintenance or repair work completed. This will be validated by the Judges.

C10.2.7 Teams must hand their race cars and completed car service log to the service area Judges BEFORE the conclusion of their scheduled service interval. A penalty will apply for exceeding the scheduled service time limit of 5 points for every minute late.

ARTICLE C11 – PROTESTS

C11.1 Scrutineering decision appeals

These must be submitted within two hours of the team completing their specification review judging. Other rules for submitting these will be the same as for protests.

C11.2 Submitting a protest

Any protest issues must only be submitted by the team manager by email (global-admin@stemrcaing.com) to an Event Director, who will register this and immediately submit it to the Chair of Judges. This must occur no later than 21:00 (local time) on racing day 2. Any protest or appeals submitted after this time may be disregarded. The Chair of Judges decision related to any protest is final.

C11.3 Unsuccessful protests

Teams should carefully consider their grounds for submitting a protest or appeal. Any protest or appeal that is unsuccessful, with the Judges initial decision remaining unchanged, will result in the team having a **15-point penalty** applied against their total score.

THE CHAIR OF JUDGE'S DECISION IS FINAL

ARTICLE C12 – JUDGES

C12.1 Overview

There will be six (6) teams of Judges plus officials that form the entire judging panel. Each judging team will have one Judge appointed as the Lead Judge. Judges are nominees from ICC's and other education and industry experts invited by STEM Racing™. All Judges sign a 'declaration' and code of conduct to ensure there are no conflicts of interest with respect to Judges and the teams they are judging.

C12.2 Chair of Judges

An independent authority appointed by STEM Racing™ to oversee all judging procedures. The Chair of Judges will determine the final judging decision where a protest has been submitted or other judging issue needs resolution. The Chair of Judges will also preside over a meeting of all Lead Judges to ratify the final results along with nominations and winners for relevant awards.

C12.3 The Judging teams

C12.3.1 Specification & Scrutineering Judges - will assess both race cars plus the rendered images and engineering drawings as per the Specification & Scrutineering scorecards.

C12.3.2 Design & Engineering Judges - will assess each team as per the Design & Engineering scorecard.

C12.3.3 Verbal Presentation Judges – will assess each team as per the Verbal Presentation scorecard.

C12.3.4 Project Management– will assess each team as per the Project Management scorecard.

C12.3.5 Enterprise Judges – will assess each team as per the Enterprise and Pit Display and Team identity scorecards.

C12.3.6 Race officials – will oversee and rule on all race events and any incidents.

C12.3.7 Car servicing officials – will oversee all car service activities and rule on any infringements that may occur.

C12.4 Judging Decisions

THE DECISION OF THE JUDGES AND OFFICIALS IS FINAL.

ARTICLE C13 – AWARDS

C13.1 Awards Celebration

The World Finals awards will be presented at the Awards Celebration Gala Dinner. Details of this event will be released closer to the event.

C13.2 Participation Recognition

All students will receive an official participation certificate.

C13.3 Prizes and Trophies

C13.3.1 Formula 1® Team Trophies – In past years STEM Racing™ has been extremely fortunate to have all Formula 1® teams generously supply purpose built 'ONE OFF' trophies for various awards. These trophies are unique and some are constructed from Formula 1® car components.

C13.3.2 Awards – Teams that win an award will be presented with a **SINGLE main trophy** or similar memento and the team members and / or supervising teacher will need to decide how this memento is to be shared and displayed amongst the team stakeholders.

C13.3.3 Student mementos – students winning an award may be presented with their own individual medallion or certificate.

C13.3.4 STEM Racing™ World Champions Trophy – This is a perpetual trophy presented to the World Champions, and as such, must be returned to STEM Racing™ before the following years World Finals event. Our Title partner, Aramco will also be providing a World Champions trophy for the winner to keep forever.

C13.4 List of awards to be presented

All awards below will be presented to the team that achieves the highest score in each category taken from the scorecards unless otherwise indicated (*) below. (this list may be amended at the discretion of STEM Racing™).

1. World Champions – STEM Racing™ World Champions Trophy
2. 2nd Place
3. 3rd Place
4. Best International Collaboration Team Award
5. Best Newcomer Award
6. Best Engineered Car Award
7. FIA Scrutineering Award
8. Sponsorship & Marketing Award*
9. Innovative Thinking Award*
10. Chair of Judges Recognition of Achievement Award*
11. Research and Development Award*
12. Fastest Car Award
13. Team Identity Award*
14. Pit Display Award*
15. Verbal Presentation Award*
16. Project Management Award*
17. Digital Media Award*
18. Knockout Competition Winners
19. FIA Women in Motorsport Award*
20. Sustainability Award*
21. Fastest Nose Change Award
22. Autodesk AI (Generative design) Award

APPENDIX...

1. Awards Matrix
2. 2025 World Finals Scorecards
3. Race Procedure & Troubleshooting Flowchart
4. Pit Display Reference Dimensions
5. Project Submission Checklist
6. Table of contents for engineering drawings

Awards Matrix

Please find below a matrix that shows which judging categories contribute towards each award:

Judges	Heading	Sub Heading	World Champions	2nd Place	3rd Place	Best International Collaboration	Best Newcomer	Best Engineered Car	FIA Scrutineering Award	Sponsorship & Marketing Award	Innovative Thinking Award	Team Identity Award	Pit Display Award	Verbal Presentation Award	Sustainability Award	Research & Development Award	Digital Media Award	Project Management Award	Fastest Car Award
Scrutineering	Scrutineering	Specifications	•	•	•	•	•	•	•										
		Engineering Drawings	•	•	•	•	•	•											
		Rendering	•	•	•	•	•	•											
		Quality of Finish and Assembly	•	•	•	•	•	•											
Design & Engineering	Design & Engineering Portfolio	Design Concepts	•	•	•	•	•	•											
		3D Modelling	•	•	•	•	•	•											
		Application of CAA	•	•	•	•	•	•								•			
		Use of CAM/CNC	•	•	•	•	•	•											
		Other Manufacturing & Assembly	•	•	•	•	•	•											
		Research & Development	•	•	•	•	•	•								•			
		Testing	•	•	•	•	•	•								•			
		Design Process Evaluation	•	•	•	•	•	•											
		Document Presentation	•	•	•	•	•												
Project Management	Initiating	Initiation Process	•	•	•	•	•											•	
		Project Schedule	•	•	•	•	•											•	
	Planning	Budget and Resource Management	•	•	•	•	•											•	
		Roles and Responsibilities	•	•	•	•	•											•	
	Executing	Team & Stakeholder Comm.	•	•	•	•	•											•	
		Risk Management	•	•	•	•	•											•	
	Mon. and Cont.	Monitoring & Controlling	•	•	•	•	•											•	
Enterprise	Enterprise	Marketing Strategy & Materials	•	•	•	•	•			•								•	
		Sponsorship & return in Investment	•	•	•	•	•			•								•	
		Digital Media Proficiency	•	•	•	•	•			•							•		
		Sustainability	•	•	•	•	•								•				
		Document Presentation	•	•	•	•	•												
	Team Identity	Overall Team Identity	•	•	•	•	•			•		•							
	Pit Display	Pit Display Design Process	•	•	•	•	•						•						
		Pit Display Content Clarity and Impact	•	•	•	•	•						•						
		Functionality & User Experience	•	•	•	•	•						•						
Verbal Presentation	Technique	Engagement & Presentation	•	•	•	•	•							•					
		Team Contribution	•	•	•	•	•							•					
	Composition	Content Quality, Relevance & Subject	•	•	•	•	•							•					
		Time, Clarity and Structure of Content	•	•	•	•	•							•					
	Subject	Innovation	•	•	•	•	•				•			•					
		Collaboration	•	•	•	•	•							•					
		STEM Racing™ Learning Experiences	•	•	•	•	•							•					
Racing	Racing	Time Trials	•	•	•	•	•												•
		Reaction	•	•	•	•	•												•
		Damage During Racing	•	•	•	•	•	•											

Scrutineering Judging Scorecard	Team Number: Team Name: Country:

Scrutineering					
Engineering Drawings	Little or no detail, Little or no annotation. No table of contents. No regulation compliance was shown.	Basic views included. Some dimensions are included but not sufficient annotations. Insufficient regulation compliance was shown. A basic table of contents.	Multiple views including First or Third-angle orthographic projection matching the final car. Some parts or materials are represented. Some Regulation compliance shown (eg T. 4.2 Virtual Cargo identification.) Good table of contents.	First or Third-angle orthographic projection matching the final car and unrendered isometric view or similar. Additional views to show sufficient detail. Parts list/bill of materials. Excellent regulation compliance shown (eg T.4.2 Virtual Cargo identification.) Complete and ordered table of contents.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Rendering	Poor quality renders. Insufficient views.	Multiple views. Some inconsistencies matching the final car.	Multiple views. Good match to the final car Good render technique.	Multiple views. Perfect match to the final car including branding. Realistic environment and lighting High-end render technique.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Quality of Finish and Assembly	Poor finish and assembly. No justification for intended quality and finish documented in the final page of the engineering drawings document.	Reasonable finish with some inconsistencies. Reasonable assembly. Some justification for intended quality and finish is documented in the final page of the engineering drawings document.	Good overall intended finish. Intended quality and assembly with attention to detail. Justification for intended quality and finish is well documented in the final page of the engineering drawings document.	Intended quality, assembly and finish on all components is exceptional. The two cars are identical. Justification for intended quality and finish is comprehensively documented in the final page of the engineering drawings document.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
				Scrutineering Total =	/60

Notes:

Design & Engineering Scorecard	Team Number: Team Name: Country:

Design & Engineering Portfolio Only Assessment

Design Concepts	Single or minimal concepts for car components with no links to research. No relevance to final car.	Basic concepts of car components with limited links to research. Limited relevance to final car.	Good technically inspired ideas that are relavent for different car components linked to research.	Excellent technically inspired ideas for multiple car components with research-detailed. Relevance of the concept strongly justified.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
3D Modelling	Minimal application of 3D modelling techniques. Only final design 3D modelled.	Basic use of 3D modelling tools and techniques. More than 1 design included with different iterations.	Good use of advanced 3D modelling tools, showcasing skill and technique. Dimensional constraints of the STEM RACING model block considered. Design approach explained. Design for manufacture considerations noted. (ie fillets, tolerance of machining).	Expert use of a wide range of complex 3D modelling techniques, demonstrating exceptional skill and innovation. Design for manufacture directs process. (ie machining tool availability, fit clearances). Quality of CAD surfaces analysed.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Application of Computer Aided Analysis	Poor choice and no justification of simulation parameters. Weak analysis with poorly presented/no results. No design choices made based on FEA/CFD study.	Limited choice and justification of simulation parameters. Limited analysis and results. Little to no design choices made based on FEA/CFD study.	Well-justified choice and understanding of simulation Good analysis with clear, well-presented results. Some design choices made based on FEA/CFD study.	Excellent choice & understanding of simulation parameters. Detailed analysis with clear, well-presented results. Proven design improvements made based on FEA/CFD study.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Use of CAM/CNC	No or minimal evidence of CAM/CNC understanding or manufacturing.	Basic evidence of CAM/CNC processes and manufacturing.	Good use and understanding of CAM/CNC processes to achieve manufacturing goals. Manufacturing issues noted with limited problem solving.	Evidence of excellent understanding of CAM/CNC technologies. Appropriate techniques and processes used to achieve manufacturing goals. Manufacturing issues discussed with innovative problem-solving solutions.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Other Manufacturing & Assembly	No or minimal manufacturing presented. No or minimal consideration of quality assurance and workplace safety documented. No or minimal justification of outsourcing.	The manufacturing process is mentioned without detail. Basic consideration of quality assurance and workplace safety documented. Basic justification of outsourcing.	Good manufacturing process and stages described. Good consideration of quality assurance and workplace safety documented. Appropriate use of manufacturing resources documented (i.e. tools, finishes, jigs, fixtures). Outsourcing clearly explained and justified.	Details all manufacturing stages and processes. Quality assurance and workplace safety considerations evident. Appropriate outsourcing justified with make vs buy analysis.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Research & Development	No or limited evidence of R&D.	Basic evidence of R&D with some principles considered.	Some scientific & mathematical theories and principles considered. Logical research based design developments explained and justified.	Relevant R&D throughout the entire product design & development cycle. Design concept developments refined and justified from research & test findings.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Testing	No or little evidence of testing on the fully assembled car and individual components.	Limited testing. Some evidence of method and outcomes on the fully assembled car and individual components.	Good testing. Different evidence of method and outcomes. Some evidence of virtual and physical testing on the fully assembled car and individual components.	Appropriate testing with excellent methods and outcomes documented. Comprehensive evidence of virtual and physical testing on the fully assembled car and individual components.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Design Process Evaluation	No or limited Ideas or process evaluations at different stages. No or limited documentation of evaluation-linked improvement actions.	Basic Ideas or process evaluations at different stages. Basic documentation of evaluation-linked improvement actions.	Multiple Ideas or process evaluations at different stages. Good documentation of evaluation-linked improvement actions.	Excellent ongoing idea evaluations linked to improvement actions. Comprehensive documentation of evaluation-linked improvement actions.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Document Presentation	Difficult to follow with basic presentation standard.	Basic organisation.	Good and clear structure, well organised.	High impact and professional throughout. Consistent and clear organisation.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
				Design & Engineering Portfolio Only Assessment Total =	/180

Notes:

Project Management Scorecard	Team Number: Team Name: Country:

Project Management Assessment

Initiating

Initiation Process	No or limited evidence of an Initiation process.	Evidence of an Initiation process with goals and deliverables identified, leading to a basic scope statement.	Evidence of an Initiation process including Kick-off meeting. Project charter created with goals and deliverables identified. Good scope statement developed, identifying acceptance criteria for each deliverable.	Kick-off meeting evidenced. Detailed Project Charter created, clearly defining all deliverables. Comprehensive scope statement developed, identifying acceptance criteria for each deliverable.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Project Schedule	No or limited evidence of tasks to be completed.	Evidence of a project schedule, showing a breakdown of time required to complete essential tasks.	Clear evidence of a project schedule and Work Breakdown Structure. Detailed Gantt chart created to identify all tasks, dependencies, and time estimations. Resource allocation is included for major project phases.	Comprehensive project schedule with detailed Work Breakdown Structure and Gantt chart. All tasks, dependencies, and time estimations are clearly identified. Key dependencies are identified, and critical path analysis is included.	
	0 1 2 3	4 5 6 7	8 9 10 11	12 13 14 15	
				Initiating Total	/35

Planning

Budget and Resource Management	No or limited evidence of strategies to manage budget and/or resources.	Some evidence of resources required and how they are to be acquired and managed. Some evidence of budgeting.	Clear evidence of budgeting and use of basic accounting methods to track expenditure. Identification of where, when, and how resources are to be acquired and used. Initial cost estimates for major project components.	Comprehensive budgeting with detailed cost breakdown and methods for tracking expenditure. Thorough resource management plan, including procurement strategies, resource allocation, and utilization forecasts. Cost-benefit analysis for key project decisions.	
	0 1 2 3	4 5 6 7	8 9 10 11	12 13 14 15	
Roles and Responsibilities	No or limited evidence of clear roles and responsibilities within team.	Team roles and responsibilities identified, with some evidence of task and/or activity breakdown.	Team members identified and a structured team created with defined job functions and appropriate responsibilities. Evidence of a basic Responsibility Assignment ('RACI') Matrix.	Highly structured team with clearly defined job functions, skill requirements, and detailed responsibilities. Comprehensive RACI Matrix covering all project activities. Evidence of a team development plan and strategies for managing team dynamics.	
	0 1 2	3 4	5 6 7	8 9 10	
				Planning Total	/25

Executing

Team & Stakeholder Communications	No or limited evidence of engagement between team members and stakeholders.	Evidence of a communication plan and engagements between team members and with stakeholders.	Clear communication plan implemented between team members and stakeholders. Key stakeholders registered and reported to regularly. Multiple communication tools used effectively.	Comprehensive communication strategy with tailored approaches for different stakeholder groups. Regular, documented communication with all stakeholders using diverse, appropriate channels. Evidence of feedback loops and continuous improvement in communication processes. Stakeholder engagement matrix utilized to manage relationships.	
	0 1 2	3 4	5 6 7	8 9 10	
Risk Management	No or limited evidence of risk identification and management.	Evidence of risk identification and response management plans in place.	Clear evidence identifying all relevant risks, area(s) of impact and response planning. Assessment of impact on resources, timing, scope and quality.	Comprehensive risk management strategy including detailed risk register, risk analysis, and prioritization. Proactive risk strategies implemented with contingency plans. Regular risk reviews and updates throughout the project lifecycle. Evidence of opportunity management alongside risk management.	
	0 1 2	3 4	5 6 7	8 9 10	
				Executing Total	/20

Monitoring and Controlling

Monitoring & Controlling	No or limited or isolated project evaluation.	Ongoing evaluation of most areas. Documented evidence of problems identified and suggested solutions.	Regular 'Status Reports', documenting tasks signed off and highlighting areas of concern. Scope creep identified with a clear action plan for tasks that overrun. Key performance indicators (KPIs) tracked and reported.	Regular and detailed project tracking processes consistently applied. Comprehensive 'Status Reports' include: Analysis of work completed versus resources used, Comparison of planned versus actual progress, Predictions of future project performance, Clear procedures for managing project changes, with all modifications documented.	
	0 1 2	3 4	5 6 7	8 9 10	
				Monitoring and Controlling Total	/10

Initiating + Planning + Executing + Monitoring and Controlling = Project Management Total =	/90

Notes:

Enterprise Scorecard	Team Number: Team Name: Country:

Enterprise Portfolio Only Assessment

Marketing Strategy & Materials	Lack of coherent marketing strategy, poorly developed marketing materials, and minimal content relevance.	Partially coherent marketing strategy, average quality marketing materials, needs enhancement in content relevance.	Good marketing strategy, reasonably developed marketing materials, and satisfactory content relevance.	Well-defined marketing strategy, high-quality marketing materials, and highly relevant content.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Sponsorship & Return on Investment (ROI)	No or incomplete Sponsor/partner hierarchy. Limited understanding of sponsorship. No evidence of ROI.	Basic Sponsor/partner hierarchy and benefits included. Partial understanding of sponsorship. Some evidence of return of investment (ROI) to relevant sponsors.	A range of sponsor/partner hierarchy and benefits identified. Good understanding of sponsorship, reasonable investment, and satisfactory ROI to relevant sponsors.	Sponsor/partner hierarchy and benefits detailed and justified. Range of relevant sponsors/partners showing mutually beneficial relationships. Creative activities linked to return of investment (ROI).	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Digital Media Proficiency	Limited understanding and utilization of digital media platforms. Minimal engagement with audience, and ineffective content creation.	Partial understanding and use of digital media platforms. Some evidence of strategy documented. Audience engagement needs improving.	Good understanding and utilization of digital media platforms. Good execution in line with documented strategy. Reasonable engagement, and content creation.	Strong understanding and effective utilization of digital media platforms in line with documented plans. High audience engagement, and impressive content creation.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Sustainability	No or limited understanding and implementation of sustainable practices. No or minimal awareness of environmental impact.	Partial understanding and inconsistent implementation of sustainable practices. Needs improvement in awareness of environmental impact. Some evidence of implementation.	Good understanding and moderate implementation of sustainable practices. Some awareness of environmental impact. Implementation documented considering different factors such as economic, environmental, and social.	Strong understanding and effective implementation of sustainable practices. High awareness of environmental impact and active involvement in sustainability initiatives considering economic, environmental, and social factors.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Document Presentation	Poor formatting, lack of structure. Minimal visual appeal in the document.	Average formatting with some structure. Needs improvement in the document visual appeal.	Good formatting, structured document. Satisfactory document visual appeal. Good organisation.	Excellent formatting, well-structured document, and highly appealing visually. High impact and professional throughout. Consistent and clear organisation.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
				Enterprise Portfolio Only Assessment Total	**/100**

Notes:

Pit Display & Team Identity Scorecard	Team Number: Team Name: Country:

Pit Display Assessment

Pit Display Design Process (Documented in Enterprise portfolio)	Limited planning and execution, lack of innovation, and minimal attention to detail in the design process.	Some planning and execution. Insufficient innovation. Needs improvement in attention to design details. Some ideas development documented.	Different ideas & justification of design. Good evidence of development considering factors including team identity, budget, sustainability and time constraints with consideration to functionality and user experience.	A range of ideas, clearly justified, creative final design. Comprehensive evidence of development considering factors including team identity, budget, sustainability and time constraints with consideration to functionality and user experience.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Pit Display Content Clarity and Impact	Repetition of Portfolio contents. Disorganised layout. Little or no evidence of marketing materials. Minimal information about the team's work.	Partially informative content. The pit display is not enhanced by Multimedia or Marketing materials. The Pit display needs more clarity detailing the team's work.	Good organisation and impact. Multimedia is used to enhance the display, with some marketing material on display. Clear and effective presentation and messaging about the team's work.	Clean, well-organised with high impact. Highly professional with attention to detail. Excellent integration of technology, multimedia and marketing materials. Comprehensive information about the team's work.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Functionality & User Experience execution	Non-functional or poorly functional design, inconvenient user experience. Lacks impact, and minimal overall visitor impression.	Basic functionality, average user experience, needs improvement in functionality and overall visitor impression.	Good functionality, and satisfactory user experience. Innovative Pit display and positive visitor impression.	Excellent functionality, seamless user experience, and impressive innovation across the Pit Display. A very positive impression on visitors.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
				Pit Display Total =	/60

Team Identity

Overall Team Identity	Inconsistent, limited or obscure identity through project elements. Weak team cohesion, lack of shared identity.	Partial team cohesion, and inconsistent shared identity through project elements.	Good team identity is consistent through various project components e.g. car matches team uniform.	Excellent and highly effective team identity. Team 'brand' consistently applied through all project elements.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
				Team Identity Total	**/20**
				Pit Display Total + Team Identity Total =	**/80**

Notes:

Verbal Presentation Scorecard	Team Number: Team Name: Country:

Technique					
Engagement & Presentation Dynamics	Monotonous presentation, lack of visual aids, and minimal interaction with audience. Poor delivery technique.	Limited team dynamics, some visual aids. Limited delivery technique and interaction with the audience.	Good team dynamics, effective visual aids, Good delivery and interaction with the audience.	Excellent engagement, captivating and highly interactive delivery, and strong audience connection. Exceptional team dynamics, and impactful visual aids.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Team Contribution	Single team member taking the lead in presentation.	Minimal team participation during the presentation.	Good contributions from most team members.	Excellent teamwork with all members participating effectively.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
				Technique Total	/40

Composition					
Content Quality, Relevance & Subject Understanding	Irrelevant or outdated content, lack of depth, and poor relevance. Unclear explanations.	Partially relevant content, some depth, needs improvement in quality and explanations.	Relevant content, good depth, and reasonably high-quality information. Clear explanations.	Highly relevant content, profound depth, and exceptional quality information with articulate explanations.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Time, Clarity and structure of content	Severe time management issues, with significant rushing or excessive time taken. Less than 8 minutes or more than 12 minutes. Incoherent structure, unclear message, and disorganised content.	Time management issues are evident, with noticeable rushing or excessive time taken. Less than 9 minutes or more than 11 minutes. Partially clear structure, some coherence, needs better content organisation.	Good flow and time management of each topic with minimal rushing or excessive time taken. Clear structure, coherent flow, and organised content.	Excellent time management and balance of each topic without exceeding the time limit. Excellent structure, crystal-clear message (concept), and highly organized content. Excellent attention to detail.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
				Composition Total	/40

Subject					
Innovation	Little project innovation presented with no justifications.	Average project innovations are described but with no justification.	Good project innovations are described and justified and connected to competition elements.	Excellent innovations related to competition elements, or other aspects with high positive project impact.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
Collaboration	None or Little collaboration with industry or higher education mentioned.	Some collaboration with industry or higher education is mentioned.	Good description of collaboration with industry and higher education.	Excellent justification of collaborations with industry and higher education. Links to learning and project outcomes.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
STEM Racing™ learning journey	No or limited real reflections discussed.	Basic explanation of some learning outcomes for some team members.	Good explanation of some learning outcomes for all team members.	A range of personal, life-long learning and career skills acquired and identified as project outcomes for all team members.	
	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	
				Subject Total	/60

Technique Total + Composition Total + Subject Total = Verbal Presentation Total =	/140

Notes:

Specifications Scorecard

Team Number:
Team Name:
Country:

For clarification on individual regulations, refer to the World Finals Technical Regulations.

Please enter ✓ for a pass and **F** for a fail

(8g Pack) – measured with full 8g race power pack cartridges

Reg	Regulation Overview	Min/Max Quick Guide	Penalty per Car	Initial Scrutineering Car A	Initial Scrutineering Car B	Initial Scrutineering CoJ CS	Amendments Car A	Amendments Car B	Amendments CoJ CS	Remarks
ARTICLE T3 – FULLY ASSEMBLED CAR										
T3.1.1	Designed and engineered using CAD / CAM		-5							
T3.1.2	Body manufactured using CNC only	Check unfinished body	-5							
T3.1.3	F1 in Schools holographic sticker	Must be supplied	-5							
T3.1.4	Race cars identical geometry	Visual check	-5							
T3.2.1	Safe Construction – Specification judging	Check T3.2.1	-10							
T3.3	Defined features	Check T1.1	-20							
T3.4	Total width PP+	Min: 65 Max: 85	-5	mm	mm					
T3.5	Total height (8g Pack) PP+	Max: 65	-5	mm	mm					
T3.6	Total weight PP+	Min: 48.0g	-10	g	g					
T3.7	Track clearance (8g Pack) PP+	Min: 1.5	-10							
T3.8	Status during racing	Nothing removed	-5							
T3.9	Replacement Components	Identical to fitted								
	Nose Cone & Front Wing Assembly	Max: 2	-5							
	Rear Wing Assembly	Max: 2	-5							
	Front Wheels	Max: 4	-5							
	Front Wheel Support Structure	Max: 2	-5							
	Rear Wheels	Max: 4	-5							
	Rear Wheel Support Structure	Max: 2	-5							

Page 1 Notes:

Specifications Scorecard

Team Number:
Team Name:
Country:

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Please enter ✓ for a pass and **F** for a fail

(8g Pack) – measured with full 8g race power pack cartridges

Reg	Regulation Overview	Min/Max Quick Guide	Penalty per Car	Initial Scrutineering Car A	Initial Scrutineering Car B	Initial Scrutineering CoJ CS	Amendments Car A	Amendments Car B	Amendments CoJ CS	Remarks
ARTICLE T4 – BODY										
T4.1	Body construction	F1 Model Block only	-20							
T4.2	Virtual cargo – See T4.2 for dims	Between axles	-25							
T4.3	Virtual cargo identification	Check Eng. drawing	-5							
T4.4.1	Halo	Halo exists	-10							
T4.4.2	Halo visibility front and side views	Side & front view	-10							
T4.4.3	Halo visibility	Refer to Article T1.21	-10							
T4.4.4	Halo circular notch height	34.0 (±1.0)	-5	mm	mm					
T4.4.5	Halo safety test	1kg test, safe to race	-5							
T4.5	Helmet	Included	-5							
T4.6	F1 in Schools logo decal location	Between Front & Rear wheels 100% Visible	-5							
T4.7	Team Number	Min: 8.0	-2							
T4.8	Decal Thickness	Max: 0.5	-5							
ARTICLE T5 – RACE POWER PACK CARTRIDGE CHAMBER										
T5.1	Diameter	Min: 18 Max: 18.5	-5							
T5.2	Distance from track surface (8g Pack) PP+	Min: 30 Max: 40	-5							
T5.3	Depth	Min: 45 Max: 58	-5							
T5.4	Max angle of chamber (8g Pack)	Min: -3° Max: 3°	-5							
T5.5	Chamber safety zone (8g Pack)	Min: 3	-10							
T5.6	Power unit cartridge visibility (8g Pack) PP+	Min: 5mm top view	-10							
ARTICLE T6 – TETHER LINE GUIDES										
T6.1	Location	10mm in front / front axle 10mm behind / rear axle	-10							
T6.2	Internal diameter	Min: 3.5 Max: 6	-5							
T6.3	Tether line guide safety	200g test, safe to race	-10							

Page 2 Notes:

Specifications Scorecard

Team Number:
Team Name:
Country:

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Please enter ✓ for a pass and **F** for a fail

(8g Pack) – measured with full 8g race power pack cartridges

Reg	Regulation Overview	Min/Max Quick Guide	Penalty per Car	Initial Scrutineering Car A	Initial Scrutineering Car B	Initial Scrutineering CoJ CS	Amendments Car A	Amendments Car B	Amendments CoJ CS	Remarks
ARTICLE T7 – WHEELS AND WHEEL SUPPORT STRUCTURES										
T7.1	Number and location	4, 2 x 2	-25							
T7.2.1	Distance between opposing wheels – Front PP+	Front Min: 38	-2.5							
T7.2.2	Distance between opposing wheels – Rear PP+	Rear Min: 30	-2.5							
T7.3	Wheelbase PP+	Min: 120 Max: 140	-5							
T7.4	Track contact width PP+	Front Min: 13 Rear Min: 17 exc. chamfer/fillet	-2.5 per wheel	FL: mm	FL: mm					
				FR:	FR:					
				RL: mm	RL: mm					
				RR:	RR:					
T7.5	Diameter PP+	Min: 28 Max: 32	-2.5 per wheel	FL: mm	FL: mm					
				FR:	FR:					
				RL: mm	RL: mm					
				RR:	RR:					
T7.6	Racetrack contact (8g Pack)	All 4 in contact	-2.5 per wheel	FL:	FL:					
				FR:	FR:					
				RL:	RL:					
				RR:	RR:					
T7.7	Rolling surface	Consistent, no tread	-2.5 per wheel	FL:	FL:					
				FR:	FR:					
				RL:	RL:					
				RR:	RR:					
T7.8	Rotation	Abs. Max rolling incline: 3°	-5 per wheel	FL:	FL:					
				FR:	FR:					
				RL:	RL:					
				RR:	RR:					

Page 3 notes:

Specifications Scorecard

Team Number:
Team Name:
Country:

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Please enter ✓ for a pass and **F** for a fail

(8g Pack) – measured with full 8g race power pack cartridges

Reg	Regulation Overview	Min/Max Quick Guide	Penalty per Car	Initial Scrutineering Car A	Initial Scrutineering Car B	Initial Scrutineering CoJ CS	Amendments Car A	Amendments Car B	Amendments CoJ CS	Remarks
ARTICLE T7 – WHEELS AND WHEEL SUPPORT STRUCTURES										
T7.9	Visibility in top and bottom views	In front of front wheels	-2.5							
		Behind front wheels	-5							
		In front of rear wheels	-5							
		Behind rear wheels	-2.5							
T7.10	Visibility in side views	Side views	-10							
T7.11	Visibility in front view (8g Pack) PP+	Max obscured 20mm	-10	mm	mm					
T7.12.1	Wheel support systems	Cylindrical volume	-5							
T7.12.2	Wheel support systems identification	Check Eng. drawing	-5							
T7.13	Wheel Safety Test	100g test per wheel	-2.5							
			-2.5							
			-2.5							
			-2.5							

Page 4 notes:

Specifications Scorecard

Team Number:
Team Name:
Country:

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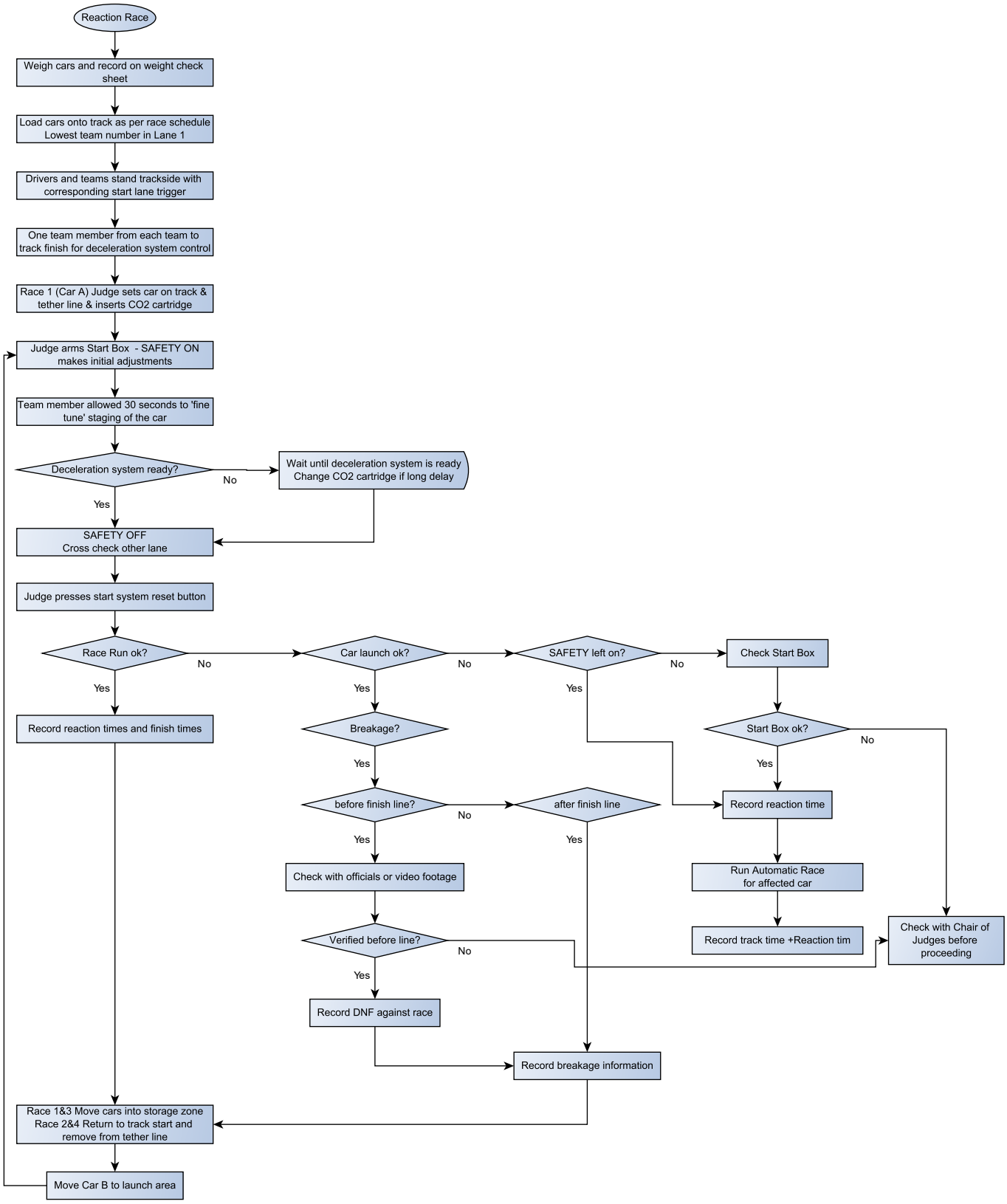
Please enter ✓ for a pass and **F** for a fail

(8g Pack) – measured with full 8g race power pack cartridges

Reg	Regulation Overview	Min/Max Quick Guide	Penalty per Car	Initial Scrutineering Car A	Initial Scrutineering Car B	Initial Scrutineering CoJ CS	Amendments Car A	Amendments Car B	Amendments CoJ CS	Remarks	
ARTICLE T8 – NOSE, FRONT WING AND WING SUPPORT STRUCTURES											
T8.1	Nose, front wing & wing support structure identification	Check Eng. drawing	-5								
T8.2	Nose cone assembly dimension	Max: 40	-5	mm	mm						
T8.3	Front wing(s) description and placement	Wings exist	-5								
T8.4	Front wing(s) construction and rigidity	Span constant during racing + rigid	-5								
T8.5.1	Nose and wing support structure location	In front of Reference Plane A & below 25mm	-10								
T8.5.2	Front wing and front wing end plate location	In front of Reference Plane A & below 20mm	-10								
T8.5.3	Front wing and end plate location	Outside the minimum legal span	-10								
T8.6.1	Front wing span PP+	Min: 50	-2	mm	mm						
T8.6.2	Front wing chord PP+	Min: 15 Max: 25	-1	mm	mm						
T8.6.3	Front wing thickness PP+	Min: 2 Max: 6	-1	mm	mm						
T8.7	Front wing clear airflow	5mm clear 'air' space	-5	mm	mm						
T8.8	Front wing visibility	Visible and not obstructed in front view	-10								
ARTICLE T9 – REAR WING AND WING SUPPORT STRUCTURES											
T9.1	Rear wing and wing support structure identification	Check Eng drawing	-5								
T9.2	Rear wing(s) description and placement	Wings exist	-5								
T9.3	Rear wing(s) construction and rigidity	Span constant during racing + rigid	-5								
T9.4.1	Rear wing and wing support structure location	Wing + Support rear of reference plane B	-10								
T9.4.2	Rear overhang length	Max 40	-5								
T9.4.3	Rear overhang height	Max: 65	-5								
T9.5.1	Rear wing span PP+	Min: 50	-2	mm	mm						
T9.5.2	Rear wing chord PP+	Min: 15 Max: 25	-1	mm	mm						
T9.5.3	Rear wing thickness PP+	Min: 2 Max: 6	-1	mm	mm						
T9.5.4	Rear wing height deviation PP+	Max: 15	-1	mm	mm						
T9.6	Rear wing clear airflow	Min: 5	-5	mm	mm						
T9.7	Rear wing visibility	Visible and not obstructed in front view	-10								

Page 5 notes:

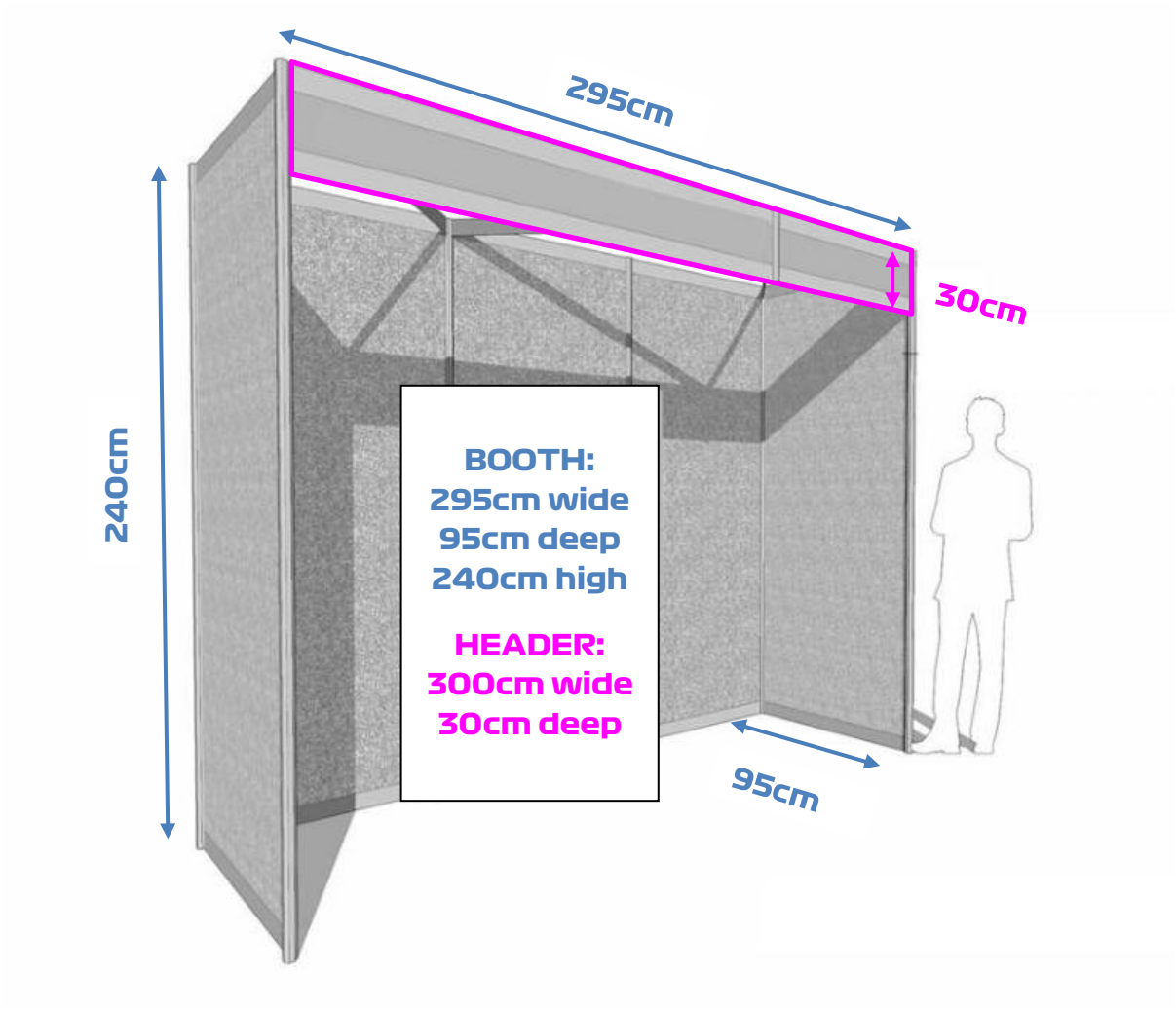
Race Procedure & Troubleshooting Flowchart



Pit Display Reference Dimensions

Teams must design their pit displays using the **estimated** dimensions stated below. Detailed dimensions will be confirmed closer to event. At the discretion of the Chair of Judges, a penalty of up to 20 points may be applied for teams working outside these dimensions.

Pit Header Board Graphic (area highlighted pink): as stated, pit booths will be fitted with an event branded header board by STEM Racing™. Light(s) shall be provided behind the header board as part of the standard build. The pit display must designed in such a way that it fits without removal of the header board or lights.



Physical Project Element Submission Checklist

Team Number:	Team Name:		
Country:			
Project Element	**Checked by Team**	**Received by STEM Racing™**	**Comments: (Completed by STEM Racing™ Officials only)**
A4 Engineering drawings	TEAM TICK	STEM RACINGS TICK	
A4 Car renders	TEAM TICK	STEM RACINGS TICK	
Design & Engineering Portfolios (2)	TEAM TICK	STEM RACINGS TICK	
Enterprise Portfolios (2)	TEAM TICK	STEM RACINGS TICK	
Project Management Portfolios (2)	TEAM TICK	STEM RACINGS TICK	
Team Partnerships declaration			Must be submitted digitally
Electronic copy of all data			Must be submitted digitally
RACE CARS:			
1 x Car A (Ready-to-Race)	TEAM TICK	STEM RACINGS TICK	Weight: g
1 x Car B (Ready-to-Race)	TEAM TICK	STEM RACINGS TICK	Weight: g
1 x Halo and 1 x Helmet identical to those used on car A & B	TEAM TICK	STEM RACINGS TICK	Must be separate components
1 x Fully machined, unfinished, unassembled STEM RACING model block car body	TEAM TICK	STEM RACINGS TICK	
OPTIONAL COMPONENTS: (Maximum of three car sets per item)			
Nose cone & front wing assembly	TEAM TICK	STEM RACINGS TICK	Maximum of two (2) - Sets Submitted:
Rear wing assembly	TEAM TICK	STEM RACINGS TICK	Maximum of two (2) - Sets Submitted:
Front wheels	TEAM TICK	STEM RACINGS TICK	Maximum of four (4) - Sets Submitted:
Front wheel support structure	TEAM TICK	STEM RACINGS TICK	Maximum of two (2) - Sets Submitted:
Rear wheels	TEAM TICK	STEM RACINGS TICK	Maximum of four (4) - Sets Submitted:
Rear wheel support structure	TEAM TICK	STEM RACINGS TICK	Maximum of two (2) - Sets Submitted:
3 x Official STEM RACING Model Block Holographic Stickers	**Car A sticker here**	**Car B sticker here**	**Car Body sticker here**

SIGN-OFF BY	**TEAM MEMBER:**	**STEM RACING™ OFFICIAL:**
Name		
Signature		

Mandatory table of contents for Engineering Drawings

Teams **MUST** include the following Engineering Drawing Table of Contents

1. Orthographic drawings with detailed dimensions of fully assembled car indicating regulation compliance
2. Exploded isometric drawing with key to main components
    a. Car body
    b. Virtual cargo
    c. Chamber
    d. Tether line guides
    e. Front wheels / wheel support system
    f. Rear wheels / Wheel support system
    g. Nose cone
    h. Front wing / support structure
    i. Rear wing / support structure
3. Orthographic drawings with detailed dimensions of virtual cargo including a sectioned view.
4. Location of official STEM Racing™ decals dimensioned from key structural parts (eg wheel centre).
5. Chamber details including wall thickness and depth.
6. Orthographic drawings with detailed dimensions of tether line guides.
7. Orthographic drawings of wheels with sectioned view and detailed dimensions.
8. Orthographic drawings with detailed dimensions of front wheels / wheel support system.
9. Orthographic drawings with detailed dimensions of rear wheels / wheel support system.
10. Orthographic drawings with detailed dimensions of nose cone.
11. Orthographic drawings with detailed dimensions of front wing and support structure highlighting wing surface/boundary.
12. Orthographic drawings with detailed dimensions of rear wing and support structure highlighting wing surface/boundary.
13. Detailed description of intended quality and finish in relation to individual components / assembled car.