2019/2020
Competition Regulations
Version 1.1
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PREFACE – SUMMARY OF MAIN REVISIONS FROM REVIEW OF 2018/2019 SEASON

This document only contains ‘Competition Regulations’. A separate document encompasses the ‘Technical Regulations’. This preface provides an overview of all competition related regulations that have been revised from the 2018/2019 season’s regulations.

It is each team’s responsibility to thoroughly read this document in order to identify wording changes and to understand any impact this MAY have on their project.

All changes between 2018/2019 season and V1.0 of 2019/2020 are identified within the document by using red underlined text. All changes made in V1.1 are identified by use of green underlined text.

These regulations will be valid for all 2019 State Finals and the 2020 National Final. Some changes MAY ONLY be valid for National Finals.

ARTICLE C1 - DEFINITIONS - Nil changes

ARTICLE C2 - GENERAL REGULATIONS
C2.4.1 No participation by students failing to submit Media Consent Forms before the event.
C2.4.1.5 Car Finishing photographic evidence now required within Engineering Compliance Booklet.
C2.4.1.6 Grievance Form submission now via online
C2.5.5 Updated advice for securing Trade Display items
C2.6.2 Minor wording update
C2.9.1 Cadet Class new arrangements for provision of Car Finishing evidence
C2.9.2 Development & Professional Class new arrangements for provision of Car Finishing evidence and new requirement for USB of portfolios and compliance booklet. Removal of orthographic on last page of Engineering Portfolio

C2.10.2 Article reference updated

ARTICLE C3 - COMPETITION AND JUDGING FORMAT
C3.7 Updated table of points allocations
C3.10.2 Updated critical technical regulations list

ARTICLE C4 - SPECIFICATIONS JUDGING
C4.1.43 Article reference updated

ARTICLE C5 - ENGINEERING JUDGING - Nil changes

ARTICLE C6 - POSTER JUDGING - Nil changes

ARTICLE C7 - PORTFOLIO JUDGING
C7 Updated points allocation
C7.1.2 Article reference updated
C7.1.3 Updated wording for portfolio page content
C7.1.5 Inclusion of new portfolio penalty

ARTICLE C8 - MARKETING JUDGING
C8 Updated points allocation for Development Class at State Finals
C8.2.1.1 Renaming of branding criteria
C8.3.1 New Trade Display recommended build considerations

ARTICLE C9 - VERBAL PRESENTATION JUDGING
C9 Updated points allocation
C9.2.2 Updated points allocation

ARTICLE C10 - RACING
C10.3.6 Updated wording for Knock out Racing procedure

ARTICLE C11 - CAR REPAIRS
C11 Removal of word ‘Servicing’ from heading

ARTICLE C12 - GRIEVANCES
C12 Updated procedure for submission of grievances

ARTICLE C13 - JUDGES
C13.3.7 Minor wording update

ARTICLE C14 - AWARDS
14.1.1 Inclusion of Best Newcomer Award definition and 7.1 - 7.3 as criteria for Best Portfolio Award

ARTICLE C15 - APPENDICES
Appendice 1 Updated Awards Matrix
Appendice 2 New Shell Scheme Trade Display Diagrams
Appendice 3 Updated Development Class Content Page Plan
Appendice 4 Updated Professional Class Content Page Plan
Criteria 8 Updated Trade Display Scorecard (criteria, descriptors & points values)
Criteria 10 Updated Verbal Presentation Content Scorecard (points values)
ARTICLE C1 - DEFINITIONS

C1.1 Australian Competition Season
The standard sequence of Australian F1 in Schools™ competitions runs across two calendar years. The State Finals held Sept/Oct/Nov in one year will feed to the National Final in February/March/April of the following year. This encompasses a complete season, for which the regulations SHOULD remain constant. REA Foundation Ltd reserves the right to update / revise the regulations if deemed appropriate.

C1.2 Australian Competition Calendar
This is a calendar of Regional, State and National Final events which is available via the Events Calendar tab within the F1 in Schools™ menu on the REA Foundation Ltd. website, www.rea.org.au.

C1.3 Regional Finals
Regional Final events are generally the first level of competition for ANY team but usually ONLY take place in NSW and QLD where large numbers of teams are registered for the competition. The decision regarding the need for Regional Finals in all other states of Australia is under ongoing review and will depend on the number of Team Registrations received by the advertised deadline. REA Foundation Ltd. will inform teachers of ANY changes to requirements as soon as possible once final numbers are known. Regional Finals are managed by Regional Hub Coordinators identified by REA and usually take place over 1 day.

C1.4 State & National Finals
State and National Final events are managed by Re-Engineering Australia Ltd., are generally held over 2 - 3 days and MAY include various programmed social and competition activities. These events aim to provide all participants with an educational and personal development experience. Specifically, the competitions aim to identify and prepare teams to represent Australia at the World Finals of F1 in Schools™.

C1.5 World Final Competition
The Australian National Final will feed into a World Final which is usually held anywhere from September through November each year depending on the country hosting this competition. For teams aspiring to represent Australia at the World Final, please be aware that the World Final Competition Regulations are different to the Australian Competition Regulations.

C1.6 F1 in Schools™ National Coordinator / In Country Coordinator
A person employed by Re-Engineering Australia Ltd. (REA) to manage the F1 in Schools™ competition in Australia on behalf of F1 in Schools Ltd. UK and to identify, manage and co-ordinate teams nominated to represent Australia at the F1 in Schools™ World Final.

C1.7 Language Used
The language of the regulations is tiered. Those clauses expressed as “MUST” are mandatory and failure to comply will attract objective point and/or racing penalties and in the extreme, disqualification. Those expressed as “SHOULD” or “MAY” reflect some level of discretion and choice.

Some clauses will be satisfied through team registration processes or declarations signed as complied with as part of the Challenge Terms and Conditions, whilst others will be tested through a variety of objective and subjective judging.

C1.8 Parc Fermé
A secure area where Car A & B are held to prevent unauthorised handling, but to allow technical inspections to be conducted by the Judges. (Literal meaning in French of ‘closed park’).

C1.9 Event Programme
This programme will detail the schedule of all competition activities from Event Registration through to the Awards Presentation.

C1.10 Judging Schedule
A separate Judging Schedule will detail the times and locations of all judging activities for all teams.
C1.11 Terms and Conditions for Entry
There are forms prepared by Re-Engineering Australia Ltd. that teams and teachers are required to complete and submit prior to an event. These forms outline a range of Terms and Conditions that MUST be complied with as part of the initial registration process and participation of all teams in the competition. Failure to submit these forms MAY result in teams being ineligible to compete at an REA Foundation Ltd. managed State or National Final. Copies of all forms can be found within the Resources tab within the F1 in Schools™ menu of the REA Foundation Ltd. website. For detailed information refer to ARTICLE C2.4.

C1.12 Regulations Documents
C1.12.1 Issuing Authority
REA Foundation Ltd. issues the regulations, their revisions and amendments.

C1.12.2 Competition Regulations
This document is mainly concerned with regulations and procedures directly related to judging and the competition event. Competition Regulation articles have a ‘C’ prefix. This document SHOULD be read in conjunction with the F1 in Schools™ Australian Technical Regulations document.

C1.12.3 Technical Regulations
A document separate to this one which is mainly concerned with those regulations that are directly related to F1 in Schools™ car design and manufacture. Technical Regulation articles have a ‘T’ prefix.

C1.12.4 Interpretation
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.

C1.12.5 Text Clarification
ANY frequently asked questions that are deemed by REA Foundation Ltd. to be related to text needing clarification will be answered. The question and the clarification will be published on the REA Foundation Ltd. website.

C1.12.6 Supplementary Competition Regulations
Other documents MAY be issued by REA Foundation Ltd. that provide teams with further logistic and other important event information. ANY supplementary regulations will be issued to all teachers and team managers of registered teams, where a valid contact email address has been supplied to REA Foundation Ltd and published on the REA Foundation Ltd. website.

C1.13 Key Performance Indicators (KPI’s)
These are portions of text that feature on the score cards 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.

C1.14 Net Race Time Value
A ‘net race time’ value when racing in Automatic Launch (Time Trial) Racing, is the actual time taken for a F1 in Schools™ car to travel the track from start to finish, measured from the instant the launch pod fires to when the car breaks the finish line timing beam. In the case of Manual Launch (Reaction) Racing, the ‘net 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.

C1.15 Gross Race Time Value
The ‘gross 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 ‘net race time’ value and ANY ‘reaction time’ value displayed on the electronic start gate. During time trial races where the automatic launch mode is used there is a zero reaction time value.

C1.16 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 depressed by the driver. This value is displayed in the reaction time field on the electronic start gate.
C1.17  Project Elements
These are ANY materials and resources that the team presents as part of its entry for ANY judging activity and which are submitted at event registration or as advised.

C1.18  Racing Modes
There are two ‘modes’ of racing used at Australian State and National Final competitions which are used to determine results for the Grand Prix Race and Knock-out Race events. These are Automatic Launch (Time Trial) Racing and Manual Launch (Reaction) Racing. For more information, refer to ARTICLES C10.2 & C10.3.

C1.19  Launch Energy Recovery System (LERS)
Commencing from the 2017/2018 Season, it will NOT be permitted to attach ANY device, including a LERS device, to the track or starting mechanism or car, or modify the track or starting mechanism in ANY way for ANY race event within the Australian F1 in Schools competition including Regional Finals. Car alignment devices are permitted provided they are removed from the track and starting mechanism prior to a run.

C1.20  Engineering Drawings
CAD produced drawings which SHOULD be such that, along with relevant CAM programs, could theoretically be used to manufacture the fully assembled car by a third party. Such drawings SHOULD include all relevant dimensions, tolerances and material information. F1 in Schools™ engineering drawings MUST include detail to specifically identify compliance intent for the virtual cargo and wing surfaces.

C1.21  Penalties
A range of penalties will be applied for non-compliance with identified competition regulations including:

C1.21.1  Point Penalty
Invoked from non-compliance with some competition regulations governing Portfolio or Trade Display restrictions and Car Servicing/Substitution. These are identified as [Point Penalty].

C1.21.2  Eligibility
Teams need to meet certain eligibility criteria to compete at a State or National Final. Failure to comply with certain eligibility criteria MAY lead to disqualification from the competition or a class of competition. These are identified as [Eligibility].

C1.22  Competition Classes
There are three competition classes in the Australian F1 in Schools™ competition with some having Junior and Senior categories defined by school year levels:

C1.22.1  Cadet Class (1 – 3 team members)
For first time entering students who have NOT participated previously. Students MAY ONLY participate in this class once. This is a simplified project with restricted pathway to state level competitions ONLY and no pathway to the National or World Final.

C1.22.1.1  Junior: Years 5 – 9.
C1.22.1.2  Senior: Years 10 – 12.

C1.22.2  Development Class (3 – 5 team members)
For first time entering students or those who have ONLY participated in the Cadet Class previously. Students MAY ONLY participate in this class once. This class provides either an international or internal collaboration team pathway to the World Final.

C1.22.2.1  Junior: Years 5 – 9 only.

C1.22.3  Professional Class (3 – 5 team members)
Open to all students but usually ONLY entered by students in Years 5 - 9 who have competed in the Cadet or Development classes previously. The National Champion Professional Class team will represent Australia as a ‘stand-alone’ team at the World Final.

C1.22.3.1  Junior: Years 5 – 9.
C1.22.3.2  Senior: Years 10 – 12.
ARTICLE C2 - GENERAL REGULATIONS

C2.1 Representative Team Selection

C2.1.1 State Finals

In all states other than NSW & Queensland, the first level of competition for teams is usually a State Final. However, REA Foundation Ltd. reserves the right to request Regional Finals in ANY state IF registrations received by the advertised deadline exceed the maximum 24 teams allowable (excluding Cadet Class teams) at a State Final.

Schools are required to select their best 2 – 3 teams maximum for participation at a State Final where no Regional Final is in place. The participation of additional teams MUST be negotiated directly with REA Foundation Ltd.

In NSW and Queensland, all teams MUST participate in a Regional Final as their first level of competition. The location and timing of these can be found within the ‘Events Calendar’ tab of the F1 in Schools™ menu on the REA Foundation Ltd. website.

The best Cadet, Development Class, Professional Junior Class and Professional Senior Class teams from a Regional Final will be eligible to move forward to the State Final. Additional teams will be considered on a case by case basis on request to REA Foundation Ltd. by the Regional Hub Manager. ALL Regional Final results MUST be forwarded to REA Foundation Ltd. within 7 days of the completion of the competition event.

Teams will NOT be permitted to move forward to a State Final if they are NOT registered prior to a Regional Final. This is NOT negotiable and Regional Final Coordinators are responsible to ensure ALL teams are registered.

At State Finals, the Chair of Judges MAY combine the Professional Junior and Professional Senior Class teams into one overall Professional Class if representative numbers in these classes are five or less.

C2.1.2 National Final

At each State Final, the champion Development, Professional Junior and Professional Senior Class teams and their supervising teachers (2 maximum) will be invited to represent their state at a National Final. At State Finals where ONLY 1 – 3 teams represent a class of competition, the Chair of Judges will determine if the Class Champions have met the minimum standard required to progress to a National Final. Refer to ARTICLE C14.4 for more information.

At National Finals, the Professional Junior and Professional Senior Class teams will be combined into one overall Professional Class.

REA Foundation Ltd. reserves the right to offer ‘Wildcard’ invitations to selected teams. The number and criteria for selection is at the discretion of REA Foundation Ltd. and is NOT necessarily based on final rankings. Teams receiving wildcard invitations will be notified in writing within 7 days of the conclusion of the State Final.

C2.1.3 World Final

The Development Class and overall Professional Class National Champions and their supervising teachers (2 minimum) will be invited to represent Australia at the next World Final which is normally held within 8 months of the Australian National Final.

The Development Class National Champions will be required to form either an international or internal collaboration. The type of collaboration team formed will be determined by the Australian In-Country Coordinator (ICC). The maximum number of core team members allowable will be three (3) from each team participating in the Collaboration. The Australian In-Country Coordinator (ICC) will be responsible for identifying the overseas or Australian team with whom the Development Class Champions will partner.

The overall Professional Class National Champions will represent Australia as a ‘stand-alone’ team of up to six (6) team members.

The ICC MAY offer up to two (2) ‘wildcard’ invitations to selected National Final teams. The number of wildcard positions available is determined by the World Final organisers but the criteria for selection is at the discretion of REA Foundation Ltd. and is NOT necessarily based on final rankings. Teams receiving wildcard invitations will be notified in writing within 7 days of the conclusion of the National Final. The structure of these teams MAY include internal or international collaboration arrangements.

ALL teams accepting selection for World Finals MUST sign an MOU prepared by REA. This is NOT negotiable.
C2.1.4 Returning World Final Teams
ANY World Final representative team wishing to return to the Australian Competition will be provided with automatic entry to the National Final immediately following the World Final so long as least 50% of the team membership remains in place. ARTICLE C2.3.11 does NOT apply. Team Registrations MUST be submitted by the due date and fees still apply.

C2.2 Cost of Participation
C2.2.1 State and National Finals [Advice]
In addition to ARTICLE C2.3.10 and the Team Registration fees outlined on the REA Foundation Ltd. website, teams and teachers are responsible for all costs associated with participating in the competition. This includes but is NOT limited to project costs, travel and accommodation and meals. Some meals MAY be provided to teams and teachers at National Finals.

C2.2.2 World Final [Advice]
World Final teams WILL be required to raise all sponsorship / funding required for travelling to and participating in the World Finals. Participation Fees are levied by the organisers of a World Final. Some government funding MAY be available to teams but it is the teams’ responsibility to source and apply for this funding.

C2.3 Team & Project Entry Conditions
C2.3.1 Varying the Conditions [Advice]
REA Foundation Ltd. reserves the right to vary the Team & Project Entry Conditions where special circumstances exist.

C2.3.2 Team Membership [Eligibility]
Each team registered in the Australian competition MUST consist of the following minimum and maximum number of students. Mixed gender teams are encouraged.

- **Cadet Class**: 1 to 3 team members.
- **Development**: 3 to 5 team members.
- **Professional**: 3 to 5 team members.
- **Collaboration Teams**: 4 to 6 team members.

C2.3.3 Collaboration Teams [Eligibility]
These teams will ONLY be formed from State Final teams at the invitation of REA Foundation Ltd. for National Final events and will NOT include Cadet Class teams. A maximum of 2 schools can participate with balanced representation from each school.

C2.3.4 Supporting or Affiliate Team Members [Eligibility]
Supporting or affiliate team members are NOT permitted for ANY class or level of the Australian competition.

C2.3.5 Cadet Class Entry Requirements
A student MAY ONLY compete in the Cadet Class if they have NOT competed in the competition previously.

C2.3.6 Development Class Entry Requirements [Eligibility]
A student MAY ONLY compete in the Development Class if they have competed in the Cadet Class previously or are competing in the competition for the very first time. Age limits apply.

C2.3.7 Professional Class Entry Requirements [Eligibility]
- **C2.3.7.1** A team MUST be classified as a Professional Class Team (Senior or Junior) if it has ANY member who has participated in F1 in Schools™ previously in the Development or Professional Classes.
- **C2.3.7.2** A team MUST be classified as a Senior Professional Class Team if it contains ANY member who is in Year 10 or above.

C2.3.8 Multiple Class Entry Restrictions [Eligibility]
Individual students can ONLY compete in one competition class per event.
**C2.3.9  Enrolled Full-time Students**

All team members **MUST** be enrolled as full-time primary/secondary students studying at school or TAFE or home schooled (at the time of the event) to be eligible to participate in National and World Final competitions. Note: There is no direct pathway for a Cadet Class team to compete at a World Final.

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**C2.3.10  Team Registration Conditions**

Each student team **MUST** be registered by their teacher for their first competition event by the prescribed date advertised on the F1 in Schools™ web site. The REA Foundation Ltd. registration process **SHALL** be followed and the entry fee received by REA Foundation Ltd before the competition date. Entry fees are non-refundable once processed. Fees **ONLY** apply to State and National Finals.

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**C2.3.11  Team Membership Changes**

Each team **MAY** only make one change (i.e. add, subtract or substitute) to its membership when progressing to the next level of competition. REA Foundation Ltd will consider up to two team membership changes between a State and National Final when extenuating circumstances exist and upon written request to the Rules Committee.

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**C2.3.12  Changes to Team Classification**

When progressing from State to National Finals, teams **MUST** remain in the class in which they qualified. This includes the effects of changes to team membership. Teams **MAY** present a compelling case in writing to REA Foundation Ltd. for transfer to another class which will be considered and adjudicated on by the Rules Committee. Age eligibility criteria applies.

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**C2.3.13  Entered Cars**

Entered cars **MUST** be designed and produced during the current Challenge Season and the same car design **MUST NOT** be entered in more than one Challenge Season. (Teams developing cars for a World Final event **MUST NOT** enter these cars in Australian competitions.)

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**C2.4  Competition Procedural Regulations**

**C2.4.1  Submitting Documentation**

Each team **MUST** complete and submit ALL the relevant competition documentation as required by REA Foundation Ltd. within the stated timeframes. Some forms are signed electronically when teachers register teams. Others **MUST** be printed, signed and forwarded to REA prior to the event. All forms are downloadable from the Resources/Competition Documents tab of the F1 in Schools menu on the REA Foundation Ltd website. The following documents apply:

- **C2.4.1.1 Terms and Conditions Form**
  - This form constitutes an agreement between REA Foundation Ltd. and supervising teachers regarding participation by teams in State and National finals. The form is **electronically signed** by teachers when registering their teams on-line via the REA Foundation Ltd website. It is very important that teachers read this form before registering their teams.

- **C2.4.1.2 Media Consent Form (all classes)**
  - One per student.
  - Valid for the entire Australian Competition Season.
  - Parent/Guardian signature required if student under 18 years.
  - **MUST** be printed, signed and emailed or faxed to REA one month prior to event start date. Students failing to submit a signed Media Consent form by Day 1 of the event will **NOT** be permitted to attend or participate at an REA managed final.

- **C2.4.1.3 Cadet Class Declaration Form**
  - This form is **electronically signed** by teachers when they register their Cadet Class team on-line. Teachers **MUST** be aware of and agree to the special conditions for Cadet Class teams before enabling the check box in the on-line registration form.

- **C2.4.1.4 Development Class Declaration Form**
  - This form is **electronically signed** by teachers when they register their Development Class team on-line. Teachers **MUST** be aware of and agree to the special conditions for Development Class teams before enabling the check box in the on-line registration form.
C2.4.1.5  Car Finishing Declaration Form (all classes) [Eligibility]
• One per team.
• New form MUST be signed and submitted for EACH event at event check-in.
• Team Manager and Teacher signature required.
• MUST be accompanied by photographic evidence (within a team's Engineering Compliance Booklet) of team members finishing and assembling the car product throughout each step of the post machining process, otherwise penalties apply. See ARTICLE T3.3.2 in the Australian Technical Regulations & C2.9 in the Australian Competition Regulations.

C2.4.1.6  Grievance Form (all classes) [Advice]
• Submission is via an on-line form, a link to which will be provided.
• Completed ONLY if teams have a judging grievance.
• MUST be submitted by the published deadline.
• MUST be completed by the Team Manager ONLY.
• The Chair of Judges decision is FINAL.

C2.4.2  Event Check-in
C2.4.2.1  Team Attendance [Eligibility]
All teams MUST attend a team Event Check-in process, the timing of which will be published by REA Foundation Ltd. no less than one month prior to the State or National Final. At this check-in, teams will be issued with State or National Final accreditation, event programs and detailed welcome pack.

C2.4.2.2  Submitting Project Elements [Eligibility]
When checking in at State Finals and National Finals, each team MUST provide REA Foundation Ltd with minimum mandatory project elements as outlined in ARTICLE C2.9. Failure to provide the listed items MAY impact on a team's eligibility to compete and judging outcomes.

C2.4.3  Team Uniforms
C2.4.3.1  Development & Professional Class Teams [Eligibility]
At State and National Finals, ONLY members of the official competing team are permitted to wear the team's uniform. No teacher, relative or supporter of a team or team member is permitted to wear a Team Uniform at State or National Finals.

C2.4.3.2  Cadet Class Teams [Eligibility]
Cadet Class teams MUST wear an official School Uniform.

C2.4.4  Collaboration Team Awards [Advice]
If a collaboration team wins an award at a National Final which involves a perpetual trophy, this MUST be shared between the team for the 12 months following the event. Award certificates will be duplicated for awards won by collaboration teams.

C2.5  Team responsibilities
C2.5.1  Australian Technical Regulations [Advice]
Teams MUST read the Australian Technical Regulations carefully to ensure their cars comply with those regulations.

C2.5.2  Australian Competition Regulations [Advice]
Teams MUST read the Australian 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.
C2.5.3 Attendance at Schedule Activities

C2.5.3.1 Team Representation Only [Eligibility]
During the competition, ONLY the official team members can represent the team at event check-in, trade display set up, verbal presentation, portfolio, marketing and engineering judging, specifications compliance feedback, critical rule rectification, racing and ANY direct communication with the Chair of Judges or Event/Competition Director concerning judging matters.

C2.5.4 All Team Members Required [Eligibility]
During the competition, it is the team’s responsibility to ensure that ALL team members are present at the correct time and location for ALL scheduled activities.

C2.5.5 Trade Display Security [Advice]
Security of a team’s Trade Display and its elements is the team’s responsibility during competition. Teams are strongly advised to remove and secure any marketing or other items when they are away from their booth attending judging or other activities.

C2.6 Role and responsibility of supervising teacher.

C2.6.1 Terms and Conditions Form [Advice]
All supervising teachers MUST carefully read and understand the terms and conditions for entry to the F1 in Schools™ State & National Finals events, and must have explained all relevant information within this agreement to their team/s.

C2.6.2 Other Documentation [Advice]
All supervising teachers MUST ensure ALL declaration and media consent forms are completed and sent to REA Foundation Ltd. by the stated deadline at ARTICLE C2.4.1, otherwise teams MAY be ineligible to participate.

C2.6.3 Duty of Care by Schools & Teachers [Advice]
It is the primary responsibility of ANY event accredited supervising teacher to administer their school’s duty of care / well-being, relevant to their education system’s guidelines, for all their student team members, throughout the entirety of REA Foundation Ltd. managed events. ANY concerns arising during the event in relation to this SHOULD be brought to the attention of the F1 in Schools™ Event Director immediately. A school’s Duty of Care cannot be transferred to a 3rd party such as REA Foundation Ltd.

C2.6.4 Standard of Care by REA [Advice]
REA Foundation Ltd. will do its utmost to administer a high ‘Standard of Care’ for teachers, students and members of the public through adherence with requirements of Workplace Health & Safety, Risk Management and Child Protection procedures. It will always strive to ensure the judging process is applied fairly and equally to each and every team attending our managed events.

C2.6.5 Attending Judging Sessions [Advice]
Where space permits and at the discretion of the Chair of Judges, ONE approved supervising teacher is permitted to observe (in the background) 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. Teachers are to ensure ALL team members attend every judging session scheduled for their team.

C2.7 Team partnerships/collaborations

C2.7.1 Mentoring [Advice]
F1 in Schools™ teams are encouraged to develop mentoring partnerships/collaborations with businesses, industry or higher education organisations throughout their project.

C2.7.2 Student Work Only [Advice]
ALL design work, text and scripting for ALL project elements presented for assessment MUST be wholly undertaken and created by the team members. This includes ALL CAD and CAM data, Portfolio, Trade Display and graphical content.
The process of assembling the cars from manufactured components, purchased components and purchased sub-assemblies MUST be wholly undertaken by the team. The process of ‘finishing’ the cars MUST be wholly undertaken by the team.
C2.7.3 Documenting Partnerships in Portfolio
Aspects of ANY partnerships with external individuals or organisations including ANY mentoring and provision of services, MUST 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 and services used.

C2.7.4 Purchased Project Elements
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.

C2.8 REA Corporate Partner Logos, Word Marks & National Support

C2.8.1 REA Corporate Partner Logos
Teams MUST include the REA Foundation Ltd. Corporate Partner logos in their project and failure to use some or all of the logos as required will be reflected in a team’s marks in the relevant judging criteria. The logos and branding guidelines (where they exist) are available to download from the Resources tab within the F1 in Schools menu of the REA Foundation Ltd website and teams MUST be fully aware of the conditions outlined in these documents. The two levels of Corporate Partners are clearly identified within the downloadable file.

C2.8.1.1 Level 1 Corporate Partner Logos
These MUST be applied to a team’s cars, portfolio, trade display and uniform. Car decals for Level 1 REA Corporate Partners are supplied to teams immediately prior to the Submission process and MUST be applied to both Cars A & B and optionally, on identical display cars. Teams are NOT permitted to produce their own corporate partner decals. Refer to ARTICLES T1.23 and T3.4 of the Technical Regulations.

C2.8.1.2 Level 2 Corporate Partner Logos
These MUST be applied to a team’s portfolio and trade display as a minimum.

C2.8.2 F1 in Schools™ In Country Logo
Teams MUST use the F1 in Schools Logo with the IN-COUNTRY indicator. No other version of the logo is permitted.

C2.8.3 Formula One® Word Mark Restrictions
No teams participating in the challenge are permitted to use Formula One Word Marks in their team name, logo, email address, domain name, and/or ANY social media handle. These Word Marks include: F1, Formula One, Formula 1, Grand Prix and F1 in Schools. Registered team names including ANY of these marks will be rejected.

C2.8.4 F1 in Schools™ & Department of Defence Logo Permitted Use
Use of the F1 in Schools™ and Department of Defence logos outside of the STEM Challenge is NOT permitted and use of these logos within the ‘Challenge’ is NOT permitted on ANY social media pages. Use is restricted to project elements such as cars, portfolios, trade displays and team uniform. If using the F1 in Schools logo on Marketing or Sponsorship documents, the following statement MUST be included in those documents:

The F1 IN SCHOOLS Logo, F1, FORMULA 1, FIA FORMULA ONE WORLD CHAMPIONSHIP, GRAND PRIX and related marks are trademarks of Formula One Licensing BV, a Formula One group company. All rights reserved

C2.8.5 F1 in Schools™ Word Mark Permitted Use
ANY team using the F1 in Schools Word Mark anywhere within their project MUST include the Trade Mark symbol in superscript form if using as a heading or sub-heading. This symbol is NOT required if used as body text.

1 Car B not applicable to Cadet Class
C2.8.6 F1® Word Mark Permitted Use
When using the Word Marks F1®, Formula 1® and Formula One® they MUST be accompanied by the registered symbol in superscript form as indicated if used as a heading or sub-heading. This symbol is NOT required if used as body text.

C2.8.7 Department of Defence National Support
The Australian Government’s Department of Defence has provided REA with financial support for F1 in Schools™ since 2008 and more recently SUBS in Schools since 2014. As the largest financial supporter of REA activities, the Department of Defence is already a supporter of your team, so please DO NOT approach them for ANY further financial support.

C2.9 Mandatory Project Elements Submitted at Event Check-in
Following is a summary of the mandatory elements to be submitted for judging at State and National Finals:

C2.9.1 Cadet Class Teams
• One (1) complete F1 in Schools car.
• One (1) x A2 poster OR two (2) x A3 posters outlining the Engineering Design process printed in hardcopy.
• Separate A3 size printed engineering compliance drawing/s for specification judging printed in hardcopy and bound with Car Finishing & Assembly Photographic evidence.
• Car finishing and assembly evidence as per C2.4.1.5 presented as hard copy photographs ONLY and bound with the engineering compliance drawing/s.
• All required forms as per ARTICLE C2.4.1

C2.9.2 Development and Professional Class Teams
• Two (2) complete and identical F1 in Schools cars with local decals as per ARTICLE C2.8.
• Two (2) identical printed A3 Enterprise Portfolios, bound or in presentation folders.
• Three (3) identical printed A3 Engineering Portfolios bound or in presentation folders.
• One (1) bound Engineering Compliance Booklet containing separate A3 size printed engineering compliance drawing/s for specification, CAD judging and A3 size Photorealistic 3D render/s of car for CAD judging AND car finishing and assembly evidence as per C2.4.1.5 presented as hard copy photographs ONLY. Booklet MUST be bound when submitted.
• One (USB) containing electronic PDF files of a team’s Enterprise and Engineering Portfolios AND Engineering Compliance Booklet.
• All required forms as per ARTICLE C2.4.1

Note: Optional Replacement Components are no longer collected for Scrutineering.

C2.10 Project Judging Elements Detailed Information

C2.10.1 Race Car/s

C2.10.1.1 Cadet Class
Each Cadet Class team MUST produce one (1) F1 in Schools Car A complete with all corporate partner decals. The race car once submitted will be placed into Parc Ferme and NOT released for ANY other judging. It will be returned to the team at the conclusion of the event.

C2.10.1.2 Development and Professional Class
Each Development and Professional Class team MUST produce a minimum three (3) identical F1 in Schools cars - Cars A & B complete with all corporate partner decals as well as a display car for exhibiting within the Trade Display and for other judging. Cars A & B once submitted will be placed into Parc Ferme and NOT released for ANY other judging. The cars will be returned to the team at the conclusion of the event unless REA Foundation Ltd exercises the right to retain a car as per ARTICLE C2.9.2.

C2.10.1.3 Checking the Mass of Cars
A Car with a mass that is below the minimum legal mass WILL NOT be accepted at submission - refer Technical Regulations for minimum legal mass. Prior to submission, each team will be given the opportunity to check the mass of their cars on the official State or National Final REA scales. If the mass of either car being submitted is below the minimum legal mass, then the team will withdraw from the submission process to increase the mass of the car/s to at least the minimum legal mass by using ONLY the legal ballasting procedure – refer ARTICLE C10.1.9 ‘Legal Ballasting of Race Cars, in this document.
C2.10.1.4 Submission of Dry Cars
Cars at submission MUST have a surface finish which is dry to touch.

C2.10.2 3D Photorealistic Render/s
A hard copy of the 3D photorealistic render/s of the final car design MUST be submitted at event check-in. This is to be included in the bound Engineering Compliance Booklet of engineering drawings and clearly identified with the team name. Refer ARTICLE C2.9.2.

C2.10.3 Portfolios
Each Development and Professional Class team MUST submit two (2) A3 sized, well written and presented ‘hard copy’ Enterprise Portfolios and three (3) Engineering Portfolios which should clearly summarise the team’s key activities and key messages for assessment, evaluation, and event promotion. Teams SHOULD produce additional copies for exhibiting within the team’s Trade Booth and for Verbal Presentation if desired.

Each Portfolio is limited to 7 PRINTED pages for Development Class teams and 11 PRINTED pages for Professional Class teams which includes the front cover. If a Portfolio comprises more than the maximum allowable PRINTED pages, the Judges will only review the first 7/11 printed pages.

C2.10.4 Trade Display
Each team WILL be provided with a dedicated exhibition style space for set-up of their Display elements. Refer to ARTICLE C8 for further trade booth specifications, content requirements and information on what is provided for each class of competition.

C2.10.5 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 ten (10) minutes. Teams MUST bring their own laptop with ANY slide show or other multimedia files that need to be shown as part of their verbal presentation. Teams SHOULD also have available their own VGA and HDMI cables to connect to a data projector/TV monitor. ANY team who needs a laptop for verbal presentation judging and is unable to bring one to a State or National Final MUST contact REA Foundation Ltd. (contact@rea.org.au) at least one month prior to the event. Refer to ARTICLE C9 of these regulations for details regarding presentation content and other requirements.

C2.10.6 Laptops for Judging
Teams MUST bring fully charged laptops for identified judging elements as follows. If multiple teams from the same school are participating, more than one laptop SHOULD be brought to deal with situations where teams are being judged in the same time block. ANY team unable to bring a laptop to a State and National Finals event with CAD software installed MUST contact REA Foundation Ltd. (contact@rea.org.au) at least one month prior to the event in an effort to assist in finding a solution.

C2.10.6.1 Engineering Judging
A laptop with the CAD software used by the team and with all CAD part and assembly data MUST be brought to State and National Finals events. This will be needed during the engineering judging session so that the team can demonstrate their CAD work and better explain how they engineered their car design.

C2.10.6.2 Verbal Presentation
Teams wishing to run a slideshow or video as part of their Verbal Presentation MUST ensure they bring this on a laptop with their own VGA and HDMI cables available for connection to a data projector/TV monitor. Teams SHOULD ensure they are familiar with and adept at managing communication between their laptops and data projectors and TV monitors which will be provided by the organisers.

C2.10.7 Access to the Internet
At Australian State and National Finals, every effort is made but no guarantee given, for teams to have access to the internet at their Trade Display and rooms where other judging is conducted. Teams are strongly advised to organise their own internet access via a portable wireless device.

C2.11 Project elements to be retained by REA Foundation Ltd.
It is a condition of entry to Australian State and National Finals that each team permits REA Foundation Ltd. to retain 1 x race car, usually a nominated race car and a 7/11 page printed Enterprise and Engineering Portfolio. Teams also permit REA Foundation Ltd. to use these project elements for marketing purposes and/or publication as exemplar projects for reference by others.
ARTICLE C3 - COMPETITION AND JUDGING FORMAT

C3.1 Event Programme
An Event Programme outlining the timing and venue for all judging and competition activities will be formulated by REA Foundation Ltd. and provided to all teams at event check-in as well as being uploaded to the REA Foundation Ltd website.

C3.2 Judging Schedule
Each team will be judged as per the Judging Schedule. The Judging Schedule will be formulated by REA Foundation Ltd. to best and fairly accommodate all judging and other competition activities.

C3.2.1 Judging Session Timings
Teams will rotate around judging activities as per this judging schedule, with each rotation usually of between 10 – 30 minutes in duration.

C3.2.2 Judging Streams
The judging schedule will normally be divided into two or three parallel judging streams (Stream A, Stream B and Stream C), with each judging stream responsible for a class of competition. 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, particularly where parallel streams exist within a class.

C3.3 Judging Panels
REA Foundation Ltd. always makes every effort to select judges from industry and higher education institutions who have knowledge and experience relevant to the panel they will be judging on. All judging panels are fully briefed by the Event Director and/or the Chair of Judges prior to the start of the competition.

C3.4 Who attends Judging?
ALL team members MUST attend every scheduled judging session as per the Judging Schedule except for Specifications Compliance Feedback. At Specifications Compliance Feedback, the Team Manager, Design Engineer and Manufacturing Engineer MUST attend as a minimum. One supervising teacher MAY observe judging sessions as per the conditions set out in ARTICLE C2.6.5. This teacher MUST NOT directly approach or discuss ANY judging matters with the judges at ANY time unless invited to do so.

C3.5 Students with Special Needs
In circumstances where a student has special needs and upon written application to REA Foundation Ltd. by the supervising teacher at least one month prior to a State or National Final, every effort will be made to accommodate the needs of the student.

C3.6 Judging categories
There are nine (9) main judging categories, each with its own team of judges – where possible - and specified judging activities as detailed in further articles.

- Specifications
- Engineering - CAD
- Engineering - Manufacturing
- Engineering - Design Process
- Portfolio – Project Management & Future Careers
- Portfolio - Design Clarity & Quality
- Marketing – Branding & Trade Display
- Verbal Presentation - Technique & Content
- Racing
C3.7 Point allocations

At State and National Finals, points will be awarded to teams across six (6) categories with maximum possible scores as detailed in the following table. Cadet Class is NOT relevant to the National Final.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Dev. &amp; Pro. Class</th>
<th>Cadet Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specification</td>
<td>80 points</td>
<td>80 points</td>
</tr>
<tr>
<td>Engineering</td>
<td>Dev. &amp; Pro. Class</td>
<td>Cadet Class</td>
</tr>
<tr>
<td>CAD</td>
<td>65 points</td>
<td>N/A</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>65 points</td>
<td>20 points</td>
</tr>
<tr>
<td>Design Process</td>
<td>70 points</td>
<td>40 points</td>
</tr>
<tr>
<td>Portfolio</td>
<td>Dev. &amp; Pro. Class</td>
<td>Cadet Class</td>
</tr>
<tr>
<td>Project Management</td>
<td>80 points</td>
<td>N/A</td>
</tr>
<tr>
<td>Design</td>
<td>50 points</td>
<td>N/A</td>
</tr>
<tr>
<td>Marketing</td>
<td>Dev. &amp; Pro. Class</td>
<td>Cadet Class</td>
</tr>
<tr>
<td>Branding</td>
<td>60 points</td>
<td>N/A</td>
</tr>
<tr>
<td>Trade Display</td>
<td>65 points</td>
<td>N/A</td>
</tr>
<tr>
<td>Verbal Presentation</td>
<td>Dev. &amp; Pro. Class</td>
<td>Cadet Class</td>
</tr>
<tr>
<td>Technique</td>
<td>70 points</td>
<td>N/A</td>
</tr>
<tr>
<td>Content</td>
<td>95 points</td>
<td>N/A</td>
</tr>
<tr>
<td>Racing</td>
<td>Dev. &amp; Pro. Class</td>
<td>Cadet Class</td>
</tr>
<tr>
<td>Grand Prix</td>
<td>150 points</td>
<td>60 points</td>
</tr>
<tr>
<td>Reaction Time</td>
<td>20 points</td>
<td>N/A</td>
</tr>
<tr>
<td>Knockout Racing</td>
<td>30 points</td>
<td>N/A</td>
</tr>
<tr>
<td>Total</td>
<td>900 points</td>
<td>200 points</td>
</tr>
</tbody>
</table>

C3.8 Judging Score Cards

The REA Foundation Ltd State and National Finals judging score cards 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. These can be found in the Appendices at the end of this document. Reading the score cards carefully is important as they provide critical information for teams as to what needs to be presented for each judging category.

C3.9 National Champions – Professional Class

The Cummins Golden Turbo F1 in Schools™ National Champions perpetual trophy will be awarded to the Professional Class team with the highest total score - sum of all judging categories (ARTICLE C3.7). In the case of a tied points score, the team with the highest Grand Prix score will be determined the winner. The Chair of Judge’s decision is final.

C3.10 Critical Regulations

C3.10.1 Non Compliance

Technical Regulations attracting time penalties have been identified as being critical regulations. If following specifications compliance AND time given to rectify ANY infringement (Refer ARTICLE C4.1.4.2), a team's Car A or B1 is judged as being NON-COMPLIANT with ANY critical technical regulation, they will be INELIGIBLE for the following awards:

- Best Engineered
- Best Engineering CAD
- Best Manufactured Car

C3.10.2 The critical Technical Regulation articles are:


Note well: Article numbers are from the 2019 Australian Technical Regulations. Please take extra time to check your cars don’t break ANY of the above critical Technical Regulations.
ARTICLE C4 - SPECIFICATIONS JUDGING (80 points)

C4.1 General Information

C4.1.1 Competition Class Provisions
Specifications judging is conducted for ALL competition classes.

C4.1.2 What will be Assessed?
Specification judging is a detailed inspection process where BOTH Car A & B race cars are assessed for compliance with the F1 in Schools™ Australian Technical Regulations. Refer to the specification judging score card for scoring details.

C4.1.3 Team Preparation
Teams MUST ensure that their Car A & B are complete and ready for specification judging before they are submitted. Notice is also drawn to the critical technical regulations, refer ARTICLE C3.10. Teams MUST have also submitted a bound, hard copy of their Engineering Compliance Booklet. Refer ARTICLES C2.9. and C2.10.

C4.1.4 Judging Process / Procedure
Teams begin specifications judging with a full allocation of 80 points. ANY infringements of the Technical Regulation articles, on either car, will result in point’s being deducted as detailed in the Technical Regulations. There are two parts to the specification judging process.

C4.1.4.1 Specifications Compliance Judging
This is conducted within the confines of parc fermé, where the Scrutineers will check both cars for compliance to the Technical Regulations. A series of specially manufactured gauges will be used to broadly check compliance. Accurate measuring tools, such as Vernier callipers will then be used to closely inspect ANY dimensions found to be near to dimensional limits per the initial gauge inspection. Specifications compliance checking MAY commence as cars are submitted at event check-in.

C4.1.4.2 Rectifying Critical Regulation Failure
Teams that have been judged during initial specifications compliance to have incurred a critical regulation failure through non-compliance with a Technical Rule attracting a Time Penalty, WILL be provided with a special 20-minute car service time, prior to the commencement of racing. If during this service time the car can be modified so as to comply with the failed regulation/s, the Time Penalty/ies WILL be removed without being classified as having incurred a critical regulation infringement. However, the points’ penalty WILL still apply.

C4.1.4.3 Specifications Compliance Feedback
Where time permits, each team WILL be scheduled a period of time for a review of ANY specification infringements ruled. This will generally be conducted at a team’s Trade Display or in the case of Cadet Class teams, other area identified in pre-competition event documentation. The Lead Scrutineer will highlight to the team ANY technical regulation infringements and provide necessary explanations.

The team is then given an opportunity to explain to the Judges why they feel ANY identified infringements SHOULD be considered as permissible. Following the team’s explanation, the Lead Scrutineer MAY choose to reverse the original decision or uphold it. No further discussion will then be permitted at that point. Teams MAY lodge a Grievance as per ARTICLE C2.4.1.6.

C4.2 Specification Judging Decision Appeals
Teams MAY ONLY appeal the specification judges’ decision if they believe their justification for regulation compliance SHOULD be accepted. The procedure for submitting technical regulation infringements is outlined in ARTICLE C12.

2 Car B not applicable to Cadet Class
ARTICLE C5 - ENGINEERING JUDGING (200 points)

C5.1 General Information

C5.1.1 Competition Class Provisions

- **Engineering CAD** and the full range of **Manufacturing** judging is conducted for the Development and Professional competition classes **ONLY**.
- **Quality of Finished Product** are the **ONLY** elements of **Manufacturing** judging conducted for the Cadet Class.
- **Engineering Design Process** judging is conducted for ALL competition classes.

C5.1.2 Team Preparation

C5.1.2.1 CAD & Manufacturing Judging

A laptop with the CAD & CAM/CNC software used by the team and with all CAD part and assembly data **MUST** to be taken to engineering judging. (Refer ARTICLE C2.10.9.1). Other items **MAY** also be taken to help the team explain **ANY** engineering or concepts. The engineering judges will **NOT** have access to the team Trade Display for judging purposes. Preparation **SHOULD** include careful reading of the score card. The key performance indicators describe what the judges will be looking for.

C5.1.2.2 Engineering Design Process Judging

- **Cadet Class** teams **SHOULD** succinctly document their Design Process on one (1) A2 poster or two (2) A3 posters.
- **Development and Professional Class** teams **SHOULD** thoroughly document their Design Process in the Engineering Portfolio.

C5.1.3 Judging Process / Procedure

C5.1.3.1 CAD & Manufacturing Judging

**CAD & Manufacturing** will be judged via scheduled judging interview sessions that will focus on the Key Criteria. These are informal interviews where Judges will ask teams to **demonstrate** their CAD and CAM/CNC work and query them on what they have done. This will be supported by secondary evidence contained within a team’s Engineering Portfolio.

C5.1.3.2 Engineering Design Process

**Engineering Design Process** will be judged from the information documented in the **Cadet Class Poster** or **Engineering Portfolio** of the Development and Professional Class teams’. Teams will be awarded points as per the key performance indicators shown on the Engineering Design Process score card/s.

C5.2 Key Criteria

C5.2.1 CAD (65 points)

Refer to the Engineering CAD judging score card for key performance indicator information.

C5.2.1.1 What will be Assessed?

The engineering judges will assess the team’s use of CAD technologies, analysis, rendering, technical merit as well as comparing the CAD model with the finished product. Specific areas to be assessed are:

- Application of CAD
- CAD Organisation
- CAD Based Analysis
- Overall Design Technical Merit
- CAD Model vs Finished Product
- Orthographic (A3 bound Engineering Compliance Booklet)
- Rendering (A3 bound Engineering Compliance Booklet)
C5.2.2 Manufacturing (65 points)
Refer to the Engineering Manufacturing judging score card/s for key performance indicator information.

C5.2.2.1 What will be Assessed?
The engineering judges will assess the team’s use of CNC and other technologies and the overall technical merit when manufacturing their car body and other components. Specific areas to be assessed are:
- Application of CAM/CNC
- Manufacturing process car body
- Manufacturing process other components
- Tolerancing / Quality Control
- Overall Manufacturing Technical Merit
- Quality of Finished Product - Geometry/Form
- Quality of Finished Product - Surface finish

C5.2.3 Design Process (70 points)
Refer to the Engineering Design Process judging score card/s for key performance indicator information.

C5.2.3.1 What will be Assessed?
The engineering judges will assess the team’s Design Process which includes all stages from identifying the requirements of the brief through to the final design. Specific areas to be assessed are:
- Requirements Analysis
- Ideas
- Development
- Analysis
- Physical Testing
- Evaluation
- Overall Design Technical Merit

3 Cadet Class teams ONLY assessed for these KPI's
ARTICLE C6 - POSTER JUDGING (40 points) – Cadet Class only

C6.1 General Information

C6.1.1 Competition Class Provisions
Applies to Cadet Class teams ONLY

C6.1.2 Who Should Attend?
The presence of Cadet Class team members at State Finals is optional. If attending these events, team members SHOULD make themselves available for discussion if called upon by the judges.

C6.1.3 Team Preparation
Teams SHOULD succinctly document their Engineering Design Process on one (1) A2 poster or two (2) A3 posters. Preparation SHOULD include careful reading of the score card. The key performance indicators describe what the judges will be looking for. Lamination of posters is recommended.

C6.1.4 Judging Process / Procedure
The Engineering Design Process will be judged from the information documented in the poster. This MAY be supported by a verification interview of team members adjacent to the area where posters are displayed. Teams will be awarded points as per the key performance indicators shown on the Engineering Design Process score card for this class.

This is an informal interview where Judges will ask the team to clarify and/or verify the information presented in the Poster. Note that Cadet Class teams do NOT have a pathway to the Australian National Final.

C6.2 Key Criteria

C6.2.1 Engineering Design Process (40 points)
Refer to the Engineering Design Process judging score card for key performance indicator information.

C6.2.1.1 What will be assessed?
The engineering judges will assess the CADET team's Design Process which includes all stages from identifying the requirements of the brief through to the final design. Specific areas to be assessed are:

- Ideas
- Analysis
- Evaluation
- Overall Design Technical Merit
ARTICLE C7 - PORTFOLIO JUDGING (130 points)

C7.1 General Information

C7.1.1 Competition Class Provisions
Applies to the Development and Professional Class teams ONLY.

C7.1.2 Team preparation
Each team MUST prepare an Enterprise and Engineering Portfolio as per ARTICLE 2.9.2. A team's Portfolios tell the story of the team's journey including the knowledge and skills they have acquired along the way. It is considered a professional business document so attention to detail is paramount. Most importantly, teams need to read the Portfolio judging score cards carefully to ensure that all areas to be assessed are included within the context of their Portfolios.

C7.1.3 Portfolio Structure
To streamline the judging of team Portfolios, teams MUST structure this as TWO separate documents containing content as follows.

C7.1.3.1 Enterprise Portfolio
• Project Management
• Marketing, Skill Development & Linking Skills with Careers

C7.1.3.2 Engineering Portfolio
• Engineering Design Process
Each Portfolio MUST be clearly labelled as either Enterprise or Engineering with the team name and each contain a maximum:
• 7 pages including the front cover for Development Class Teams
• 11 pages including the front cover for Professional Class Teams

Portfolio Design elements will be assessed throughout the teams' entire two Portfolios. For more information on the suggested page content of the Portfolios, refer to APPENDIX 2 and 3.

C7.1.4 Judging process / procedure
The Portfolios will be assessed initially behind closed doors and conducted before the commencement of scheduled judging sessions. For some key criterion, this will be supported by a verification interview of team members at the Trade Display or other area identified in pre-competition event documentation. Teams SHOULD have a copy of their Portfolios on their Trade Display at all times. Teams are required to submit several copies of their Portfolios for pre-assessment at Event Check-in. Failure to submit the required number and correct Portfolio size will result in penalties being applied.

C7.1.5 Portfolio Penalties
The Chair of Judges reserves the right to apply penalties for teams who:
• DO NOT submit the correct number of copies required for judging [10pt Penalty]
• DO NOT provide copies in the mandated A3 size [10pt Penalty]
• DO NOT structure their Portfolio as per C7.1.3 [10pt Penalty]
• DO NOT submit electronic copies as per C2.9.2 [10pt Penalty]
C7.2 Key Criteria

C7.2.1 Project Management & Linking Skills with Careers (80 points)
Refer to the Portfolio score card for detailed point scoring and key performance indicator information. There will be NO verification interview required for this key criterion.

C7.2.1.1 What will be Assessed?
Project Management MUST be contained within each team’s 7 page (Development Class) or 11 page (Professional Class) Enterprise Portfolio in order to assess the following specific areas.

- Team Roles & Tasks
- Scope & Time Management
- Resource & Risk Management
- Internal Communication
- Stakeholder Engagement
- Skill Development for Future Careers
- Evaluation

C7.2.2 Portfolio Design (50 points)
Refer to the Portfolio score card for detailed point scoring and key performance indicator information. There will be NO verification interview required for this key criterion.

C7.2.2.1 What will be Assessed?
Judges will review each team’s two 7 page (Development Class) or 11 page (Professional Class) Enterprise and Engineering Portfolios in order to assess the following specific areas.

- Production Quality of Materials
- Production Quality of Content
- Content Organisation
- Layout Design
- Typography
- Photos & Images
- Creative Graphics (Visual effects and infographics)
- Editing/Proofreading
- Referencing/Plagiarism
- Writing & Readability
ARTICLE C8 - MARKETING JUDGING (110 / 125 points)

C8.1 General Information

C8.1.1 Competition Class Provisions
Applies to the Development and Professional Class teams ONLY.

C8.1.2 Team Preparation
Each team MUST prepare an Enterprise Portfolio as per ARTICLE C2.9.2 and a Trade Display as per ARTICLE C2.10.3. Some Branding elements MUST be contained within each team’s 7 page (Development Class) or 11 page (Professional Class) Enterprise Portfolio. Others will be assessed within a team’s Trade Booth. Read the Marketing Score Cards carefully to ensure that all areas to be assessed are included within the context of their Portfolio and Trade Display.

C8.1.3 Judging Process / Procedure
The Branding and Trade Display criteria from the Marketing Score Card will be assessed primarily within the Trade Display with secondary evidence on logo development assessed from within a team’s Enterprise Portfolio. The Judges will introduce themselves then ask questions to help them find certain content and/or seek further explanation. Teams SHOULD have a copy of their Enterprise Portfolio on their Trade Display at all times. Teams MAY be asked to step away from the Trade Display so judges can gain first impressions and concur before asking them to return to their Display.

C8.2 Key Criteria

C8.2.1 Branding (60 points)
Refer to the Marketing score card for detailed point scoring and key performance indicator information.

C8.2.1.1 What will be assessed?
The Marketing judges will assess a team’s branding primarily within their Trade Display. As a secondary source of evidence, the judges will also access a team’s Portfolio to assess logo development. Specific areas to be assessed are:

- Team Name
- Logo Development
- Final Logo Design
- Logo Application
- Team Branding
- Media Exposure
- Team Sponsors & REA Corporate Partner ROI
- Team Uniform
- Team Presence
- Team Knowledge

C8.2.2 Trade Display (50 / 65 points)
Refer to the Marketing score card for detailed point scoring and key performance indicator information.

C8.2.2.1 Competition Class Restrictions
In addition to the general regulations governing Trade Displays, Development Class teams MUST also comply with class restrictions as defined in Appendix 1.

C8.2.2.2 What will be assessed?
A Trade Display is to visually ‘sell’ the team’s most important key messages in snapshot form for assessment and event promotion. The Marketing judges will assess a team’s trade display content and structure. Specific areas to be assessed are:

- Car Display
- Information Design
- Use of ICTs
- Visual Design & Impact
C8.3 Trade Display Arrangements

C8.3.1 Recommended Design Considerations

1. **Costs:** Determine a budget and stick to it. Seek sponsorship of cash or donations of booth elements.

2. **Research:** Innovative ideas and current trends online and/or seek a mentor in this space.

3. **Criteria:** Read carefully the Trade Display scorecard and conditions (C7.7) within this document.

4. **Design:** Use 3D CAD to create a digital mock-up.

5. **Consider:**
   - Dimensions: Recommended maximum internal build dimensions of provided booths/backboards
   - Portability: Think flat-pack, modular, lightweight, pop-up, for ease of set-up and transportation
   - Materials: Consider fabric/textile options which are easier to transport, less prone to damage and more environmentally friendly as opposed to corflute/ vinyl equivalents.
   - Sustainability: Reuse and recycle, particularly frameworks that can be reconfigured with new stretch or re-attachable banner materials.
   - Lighting: Incorporate lighting to accentuate design features and brighten key areas of your exhibit such as product displays and promotional materials.
   - Storage: Design options for storage of top-up Marketing material. Use shelves to attractively organise products.

6. **Develop:** An optional document that charts your team’s creative approach, design considerations (space, purpose), transport limitations (cost and, assembly constraints) and environmental impact to inform judges and justify your decisions.

C8.3.2 Jetta Express Sponsorship

Jetta Express – an Australian excess baggage company – generously offer National Final teams **FREE** shipping of Trade Display assets from a team’s home state capital city to the event venue and return. Teams wishing to take advantage of this offer **MUST** adhere to strict guidelines including maximum weights and dimensions. When designing Trade Displays, teams **SHOULD** give thoughtful consideration to the construction material used which will impact portability and transportation costs.

A copy of these guidelines can be downloaded from the Resources/Competition Documents Tab of the F1 in Schools menu of the REA website.

C8.3.3 Trade Display Shell Scheme Information

All team display systems will include 1 x 240-volt power supply but teams will need to provide their own power boards, if required, which **MUST** have a valid electrical safety test tag. At National Finals ONLY, Trade Displays will also contain integrated lighting and fascia’s.

C8.3.3.1 Professional Class

At State and National Finals, REA Foundation Ltd. will provide each Professional Class team with a self-contained shell scheme exhibition style display space. Dimensions vary depending on the type of shell scheme provided and the quality of build supplied. In addition, the dimensions can vary between end displays sharing one side wall and internal displays sharing two side walls. **See Appendix 3.**

- **Nominal External Dimensions**
  - Walling: Nominally 2000mm long x 1000mm wide x 2400m high.
- **Maximum Internal Display Dimensions**
  - 1940mm long x 960mm wide x 2360mm high.

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5 Not applicable to the Development Class at State Finals

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C8.3.3.2 Development Class

At State Finals, Development Class teams will be provided with back boards ONLY, along with a trestle style table. Use of the trestle table by Development Class teams is compulsory and teams are required to provide their own tablecloth.

At National Finals, Development Class teams will be provided with a full, self-contained shell scheme exhibition style display space but NO trestle table.

- Nominal External Dimensions
  Nominally 2000mm long x 2400mm high.

- Maximum Internal Display Dimensions
  Backboards: 1800mm long x 750mm wide x 2400mm high.
  Trestle Tables: Approximately 1800mm long x 730mm high x 750mm wide

C8.3.4 Set up

A time period will be scheduled for teams to set-up their Trade Displays, usually after event check-in and prior to the commencement of judging. Setup will be conducted simultaneously by all teams. A time limit of 2hrs maximum will be enforced to avoid penalties.

C8.3.5 Conditions

Teams MUST comply with the following conditions:

- Development Class Teams MUST adhere to restrictions regarding Trade Displays for State Finals. See APPENDIX 2.
- Trade Displays SHOULD be fully fitted out for judging at the end of the 2hr setup whereupon photos will be taken.
- NO other items can be added to the display (excluding top-up marketing items) from this point forward and penalties will be applied for teams breaching this rule.
- REA Foundation Ltd. will instruct teams to remove or alter ANY display inclusions considered to be a safety hazard or inappropriate, including rubbish, bags etc. which are NOT part of the display.
- NO part of the team's completed trade display is allowed to protrude beyond the physical dimensions of their allocated space. This includes anything that might protrude above the display space highest point e.g. flags, banner, balloons. Teams WILL be required to remove items infringing this rule and penalties will apply.
- Teachers or adults are NOT permitted to assist teams with the set-up of Trade Displays. All displays MUST be designed so that adult assistance is NOT required for setting up. This includes power, lighting and height issues. Step or full size ladders will NOT be provided, therefore teams need to factor this in to their set-up requirements if they cannot supply their own. All adults (excluding officials and judges) WILL be required to remain out of the venue where Trade Displays are located until the setup is complete.
- Teams MAY provide their own display internal walls and tables/cabinets so long as they strictly fit within the display system provided. NO part of a team's substitute internal walling system can encroach beyond or above the walls of the display system provided by the competition organisers and systems MUST be designed so that NO part of the provided display system (including the fascia framework) requires dismantling.
- Teams MUST NOT play sounds or music at their Trade Display at a loud volume. ANY sound or music played MUST be strictly relevant to the project such as commentary on a video produced by the team and NOT just for 'entertainment' value.
- Chairs are NOT permitted in or near the displays unless it is a chair/stool specially designed for the display, and this MUST sit within the volume of the display's external dimensions.
- Display space will be pre-allocated to teams by the event organisers. Teams MUST use the space allocated and displays cannot be repositioned by ANY team unless there is an obstruction to the display or an issue of WHS and this MUST first be approved by the Competition Director or Chair of Judges.
- At National Finals teams MUST design their displays to fit within the supplied booth without requiring the removal of the booth fascia. Removal of the fascia will incur a penalty. See ARTICLE C8.3.6.
- From arrival at the competition venue until the official Trade Display Assembly Period, teams are NOT permitted to pre-construct nor assemble ANY part of their Trade Display anywhere within the premises of the competition venue including ANY venue car park.
• Displays **MUST** be manned by at least one team member at all times excluding judging sessions. When a team is undertaking a judging session, the teacher or a supporting adult **SHOULD** supervise the display to ensure security. Note that competitions are generally open to the public.

• Trestle tables are **NOT** to be sat upon as they are **NOT** built for this. **ANY** damage to display systems or provided trestle tables **MUST** be paid for by the team or their school.

• Workplace health and safety measures **MUST** be considered when teams are working at heights on their Trade Display.

• **ANY** electrical appliance (including power boards and extension cords) connected to the power supply **MUST** have a valid electrical safety test tag.

### C8.3.6 Trade Display Penalties

The Chair of Judges reserves the right to apply penalties for teams who:

• **DO NOT** comply with Development Class restrictions at State Finals [10pt Penalty]

• **DO NOT** complete their set-up within the 2hr time limit [10pt Penalty]

• **DO NOT** leave their stand in a safe state [10pt Penalty]

• **DO NOT** clear their pit and surrounding area of all rubbish [10pt Penalty]

• **DO NOT** contain their display within the display volume [10pt Penalty]

• **DO NOT** comply with added content restrictions [10pt Penalty]

• **DO NOT** design their display to enable fit-out without removal of fascia [10pt Penalty]

• Construct **ANY** part of their display at the venue prior to scheduled build [10pt Penalty]

### ARTICLE C9 - VERBAL PRESENTATION JUDGING (165 points)

#### C9.1 General Information

##### C9.1.1 Competition Class Provisions

Applies to Development and Professional Class teams **ONLY**.

##### C9.1.2 Who Needs to Attend?

All team members **MUST** be present at and contribute to the Verbal Presentation.

##### C9.1.3 Judging Process / Procedure

Verbal presentation judging is scheduled for the same duration as other judging sessions, usually 20 – 30 minutes. Teams will be given 5 minutes 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 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 team’s presentation time, the judges **MAY** choose to provide some feedback and / or ask **ANY** clarifying questions they feel necessary. However, assessment can **ONLY** be based on the team’s 10-minute presentation. Verbal presentations **MAY** be filmed for judge’s review or promotional and future resource purposes.

##### C9.1.4 Team Preparation

Each team is required to prepare a verbal presentation as per the requirements at ARTICLE C2.10.4. **ANY** multimedia content, slides etc. **MUST** be saved on and shown using the team’s own laptop along with VGA and HDMI cables. Teams need to have all presentation resources tested and ready for verbal presentation judging. Most importantly, teams **SHOULD** read the verbal presentation judging score card carefully to ensure their presentation features all elements and content that the verbal presentation judges will be looking for.

##### C9.1.5 Verbal Presentation Judging Provisions

REA Foundation Ltd. 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 large TV monitor. Multimedia sound systems **MAY NOT** always be available and teams **MAY** have to bring their own portable speakers. If available 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.
C9.1.6 **Verbal Presentation Video Recordings**
The verbal presentations of all teams **MAY** be video recorded by the REA Foundation Ltd. for the purpose of judging review and / or post event publicity and promotional purposes for F1 in Schools.

C9.2 **Key Criteria**

**C9.2.1 Technique (70 points)**
Refer to the Verbal Presentation score card for detailed point scoring and key performance indicator information.

**C9.2.1.1 What will be assessed?**
• Presentation Energy
• Team Contribution
• Visual Aids
• Audience Engagement
• Articulation
• Structure
• Use of Time

**C9.2.2 Content (95 points)**
Refer to the Verbal Presentation score card for detailed point scoring and key performance indicator information.

**C9.2.2.1 What will be assessed?**
• Team Objectives
• Description of Car Product
• Innovation
• Refinement
• Collaboration
• Learning Outcomes
• Future Career Aspirations and Research
• Overall Clarity

**ARTICLE C10 - RACING (200 points)**

**C10.1 General Information**

**C10.1.1 Competition Class Provisions**
Racing applies to ALL competition classes.

**C10.1.2 Launch / Timing System**
At State and National Finals, the official Denford or Pitsco F1 in Schools™ Race System (whichever is available), will be used for launching cars, timing races and driver reaction times to 1/1000th of a second. Where possible, teams **SHOULD** be familiar with the operation of these Race Systems.

**C10.1.3 Official REA Foundation Ltd Race Track**
At State and National Finals, REA Foundation Ltd. Will use the official REA Foundation Ltd or Denford Elevated Race Track (whichever is available), the length of which is approximately 24 -25 metres. A ‘thermally fused braid’ tether line of diameter 0.2 mm and fixed at the track end, passes down the centre of each lane. At the start of the track, the line passes through 90 degrees over a single pulley and is then attached to a 2.0kg mass suspended above the floor. The official **distance** that cars are raced from start to finish is 20 metres.

**C10.1.4 Car Design Considerations**
The design of the car **SHOULD** be undertaken with an understanding of the car’s journey on the track. The most damaging loads are imparted to the car during the retardation phase after the car crosses the finish line. Cars are typically retarded by running into a buffer comprised of towels. This can be as much as a -20g collision. To avoid engineering deficiency penalties, cars are to be robust enough to withstand this loading as part of the defined use and operational cycle.
C10.1.5 Retardation Devices
Standard track environments provide a buffer of towels positioned behind the finish line. However teams are permitted to provide their own retardation environment and the team will be responsible for its management. Such an environment **MUST** be approved by a Race Marshall. It shall **NOT** be attached to the track and it shall be restricted to be fully within their lane. Retardation systems **MUST** be located a minimum of 100mm after the finish line and be in place when the track marshall is ready to launch the cars. No further time delays will be allowed.

C10.1.6 Who needs to attend?
All Development and Professional Class team members **MUST** be present during their scheduled racing sessions and **SHOULD** assemble at the track start for briefing by the race track judges 5 minutes prior to their scheduled time. Cadet Class teams who cannot attend State Finals will have their car raced in Automatic Launch mode by the track marshalls and the results recorded.

C10.1.7 Time Penalties
If following specifications compliance AND time given to rectify **ANY** infringement (Refer C4.1.4.2), a team’s Car A or B\(^6\) is judged as being NON-COMPLIANT with **ANY** critical technical regulation, a Time Penalty of 0.05 seconds per infringement will be applied to every run/lap (up to a maximum of 0.5 second) for ALL forms of racing.

C10.1.8 DNS Penalties
If a car incurs a breakage during racing and is unable to be repaired during a 10 minute Car Repair session immediately following a team’s scheduled racing, it will DNS **ANY** following races until it can be repaired in a subsequent Car Repair session.

C10.1.9 Legal Ballasting of Race Cars
Once a team arrives at the event venue, the team **MAY** increase the mass of a car (ballasting) using **ONLY** the methods stated in ARTICLE C10.1.9.1. A car that has had its mass increased by **ANY** method other than those stated in ARTICLE C10.1.9.1 **WILL NOT** be accepted at Submission.

At the Event venue, REA **WILL** provide a set of scales by which teams **MAY** check the mass of the cars prior to Submission. If the team sees that a car is below the minimum mass, then the team **MUST** increase the car mass to at least the minimum mass prior to Submission using **ONLY** the method stated in ARTICLE C10.1.9.1. During Submission all cars will be weighed. If during Submission a car is below the minimum mass, then the team **WILL** withdraw from Submission and increase the car mass to at least the minimum mass using **ONLY** the method stated in ARTICLE C10.1.9.1, whereupon the team will resume the Submission process.

Teams **MUST** consider carefully the method by which the mass of a car is increased, as a car **MUST** comply with the Technical Regulations after its mass is increased. When adding mass, teams are advised to pay particular attention to issues such as effect on ground clearance and the reliability of stickers adhering to curved or sharp surfaces.

C10.1.9.1 Methods of increasing mass that **MAY NOT** infringe Technical Regulations
- Addition of 0.1 gram stickers supplied by REA at submission
- Addition of screws that are supplied by REA at submission and such that:
  - Screws **MUST** be screwed in fully up to the screw head
  - Screws **MUST NOT** be screwed into that part of the Body that surrounds the canister
  - Screws **MUST NOT** obstruct the tether line.

C10.1.9.2 Methods of increasing mass that **WILL** infringe Technical Regulations
- Addition of BluTack, putty or other pressure-sensitive adhesive material to the Body
- Attaching pieces of solid material to the Body except those in ARTICLE C10.9.1.

C10.1.10 Safety Checks
Race Officials will routinely inspect cars for safety during scheduled races - in particular, to ensure that the tether line guides are secure. If the Officials rule a car to be unsafe, **ANY** remaining races leading up to a Car Repair session **WILL** be deemed DNS. Unresolved safety concerns **WILL** prohibit cars from racing on the track and **WILL** result in zero points being awarded for racing.

\(^6\) Car B not applicable to Cadet Class teams
C10.1.11 Did Not Start (DNS)
Cars deemed unsafe or ineligible to race by Scrutineers WILL be classified as Did Not Start (DNS) in racing events.

C10.1.12 Did Not Finish (DNF)
Damage incurred during a run, before the car crosses the finish line, (e.g. wheel, wing, tether line guide or ANY other part of the car product separating) WILL result in a Did Not Finish (DNF) race result. The Judges MAY refer to video evidence where available to verify a DNF result.

C10.1.13 False Start (FS)
A false start (jump start) occurs during Manual Launch (Reaction) Racing when the driver depresses the trigger button before the 5 start gate lights have extinguished. This will be signalled with the outer red light above a lane illuminating.

In the event of a reaction False Start (FS) in Manual Launch (Reaction) Racing, the car will subsequently be run using automatic launch mode to record a net “lap time” but a reaction FS will also be recorded.

Teams NOT recording a Reaction run time (i.e. four False Starts) will be excluded from Knock-out Racing as well as the marks associated with this and Fastest Reaction Time.

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 an FS, and the other team’s time is recorded.

If both teams false start the first race, the race will be forfeited. If both teams subsequently false start the second race, the race will be re-run until a winner is determined.

If both teams false start the second race ONLY, the race will be forfeited and the winner determined from the first race results.

C10.1.14 C02 Cylinders
CO2 cylinders MUST be inserted so that they are situated firmly against the base of the cartridge chamber. Refer to ARTICLE T10.3.

All cylinders for State and National Finals contain 8 grams of CO2. They are provided by REA Foundation Ltd. and are weighed as follows:

- State Finals: Within 0.50 grams, with random allocation
- National Finals: Within 0.25 grams, with random allocation

C10.1.15 Car Mass Checks
Cars will have their mass checked at the race track prior to commencing each race event. This is done to ensure each car remains at or above the legal minimum mass. If the mass of a car is judged to have gone below the legal minimum mass whilst stored in parc fermé, then the judges in consultation with the team will add ballast in the form of one or more REA supplied 0.1 gram stickers or screws until the mass of the car is at least the required minimum mass.

C10.1.16 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.

C10.2 Types of Racing
The F1 in Schools State and National Final racing points will be awarded through the staging of three types of racing modes.

C10.2.1 Automatic Launch (Time Trial) Racing
Automatic launch mode, consisting of two races in each lane which will be conducted first as per the judging schedule and results contribute towards the overall Grand Prix Race event.

C10.2.2 Manual Launch (Reaction) Racing
Manual / driver launch mode, commonly referred to as ‘reaction racing’ consisting of two races in each lane and follows Automatic Launch (Time Trial) Racing as per the judging schedule. These races make up the final contribution towards the overall Grand Prix Race event results. ‘Drivers’ will NOT be permitted to practise during the official race time.

C10.2.3 Manual Launch (Reaction) Knock-out Racing
Manual / driver launch mode, one race in each lane per round of competition. The knock-out competition is the last of the scheduled racing and is NOT conducted for Cadet Class teams.
C10.3 Racing Procedures

C10.3.1 Manual / driver launch
A maximum of two (2) team members (driver/s) can be appointed for launching the team’s car using the manual launch method. **ONLY** one driver per scheduled session of Reaction Racing is permitted. **ONLY** the driver can stand within the dedicated starting area.

C10.3.2 Start line car adjustments
A Race Marshall will initially stage the car on the track but teams are permitted to make **ANY** adjustments approved by the Race Marshall after the car has been staged so long as this does **NOT** take more than 30 seconds. The use of ‘positioning blocks’ to align the car in the centre of the lane is permitted however these **MUST** be removed prior to launch. Teams **MUST NOT** use devices which interface with the starting mechanism and teams are **NOT** permitted to attach signage or other materials to the track or timing system.

C10.3.3 Finish line management
At least one member of the team **MUST** be appointed as responsible for managing the finish line retardation device. I.e., standard deceleration towels or teams’ own system (refer ARTICLE C10.1.5). Once the race session is complete, a race marshall shall remove and inspect each car before it is returned to Parc Ferme or released to the team member for Car Repairs.

C10.3.4 Automatic launch race procedure
Cars are launched in automatic mode with four (4) races total per team, two (2) races in each lane. These races **MAY** be run over two separate sessions. Teams are advised to check the Judging Schedule. The total time displayed on the start gate for each race is recorded for scoring purposes. The automatic launch race events will be conducted using the following procedure:

i Teams race in order as shown in the competition program.

ii One team member to track finish for deceleration system control – maximum of 30 seconds.

iii Both Car A and Car B⁷ **WILL** be used for Automatic Racing.

iv All cars are weighed and ballast applied as per C10.1.15.

v Teams will decide which lanes Car A & B⁷ will race on.

vi Race 1 – Race Marshalls will load both Car A & B⁷ onto the track at the same time, in opposite lanes along with a competitor’s cars in accordance with the team’s requirements.

vii Race Marshalls set cars at track start line, inserts CO2 cylinder and engages car with launch pod.

viii A team member is then allowed 30 seconds to ‘fine tune’ the staging of their first car.

ix Judge presses the start system reset button – car is launched.

x Judge records TOTAL RACE TIME displayed on start gate.

xi Race Marshall at finish line removes and disposes of used CO2 cylinder.

xii Team member at finish line lifts the retardation device and rolls car to the end of the tether line, then swaps lanes and adjusts the retardation device for the second race. All care **MUST** be taken to ensure no damage is occasioned to the competitor’s car sitting at the end of the tether line.

xiii Race 2 conducted in opposing lane using same process as per vi - x.

xiv Race Marshall at finish line removes cars from tether line and returns them to Parc Ferme, or places them at the designated Car Repair location if damage has occurred. At the conclusion of Car Repair, cars are returned to Parc Ferme.

xv This process is repeated for Race 3 and Race 4 at the next race session as per the Judging Schedule with cars placed in lanes opposite to the configuration used in Races 1 and 2.

⁷ Car B not applicable to Cadet Class teams
C10.3.5 Manual launch race procedure

Cars are launched in manual / driver reaction mode with four (4) races total per team, two (2) races in each lane. These races MAY be run over two separate sessions. Teams are advised to check the Judging Schedule. The TOTAL RACE TIME displayed and the REACTION TIME displayed for each race is recorded. The manual launch reaction races will be conducted as follows:

i. Teams race in order as shown in the competition program.
ii. One team member to track finish for deceleration system control – maximum of 30 seconds.
iii. Both Car A and Car B\(^8\) WILL be used for Reaction Racing.
iv. All cars are weighed and ballast applied as per C10.1.15.
v. Teams will decide which lanes Car A & B\(^8\) will race on.
vi. Race 1 – Race Marshalls will load both Car A & B\(^8\) onto the track at the same time, in opposite lanes along with a competitor’s cars in accordance with the team’s requirements.
vii. Race Marshalls set cars at track start line, inserts CO2 cylinder and engages car with launch pod.
viii. A team member is then allowed 30 seconds to ‘fine tune’ the staging of their first car.
ix. Driver stands trackside with corresponding lane start trigger. Remaining team members stand behind driver.
x. Race Marshall presses the start system reset button – lights come on
xi. When lights extinguish, driver presses trigger and car is launched.
xii. Judge records TOTAL RACE TIME and REACTION TIME displayed on start gate.
xiii. Race Marshall at finish line removes and disposes of used CO2 cylinder.
xiv. Team member at finish line lifts the retardation device and rolls car to the end of the tether line, then swaps lanes and adjusts the retardation device for the second race. All care MUST be taken to ensure no damage is occasioned to the competitor’s car sitting at the end of the tether line.
xv. Race 2 conducted in opposing lane using same process as per vii – xi.
xvi. Race Marshall at finish line removes cars from tether line and returns them to Parc Ferme, or places them at the designated Car Repair location if damage has occurred. At the conclusion of Car Repair, cars are returned to Parc Ferme.
xvii. This process is repeated for Race 3 and Race 4 at the next race session as per the Judging Schedule with cars placed in lanes opposite to the configuration used in Races 1 and 2
xviii. Race 3 & 4 driver can be inter-changed at this point.

\(^8\) Car B not applicable to the Cadet Class
C10.3.6 Knock-out competition procedure

Development and Professional Class teams will be issued the race seeding prior to knock-out racing commencing. The seeding order for the first knock-out round is determined through seeding all teams using the fastest ‘gross race time’ they achieved from the manual racing for the Grand Prix Race event including ANY relevant Time Penalties. In the event that two or more teams achieve the same Best Gross Lap, rankings will be based on a team’s second fastest Gross Lap. Some teams MAY draw a ‘bye’ in round 1. 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. The knock-out competition will be conducted as follows:

Teams race in order of the competition seeded draw.

i One team member to track finish for deceleration system control – maximum of 30 seconds.

ii Both Car A and Car B WILL be used for Knockout Racing.

iii All cars are weighed and ballast applied as per C10.1.15.

iv Teams will decide which lanes Car A & B will race on.

v Race 1 – Race Marshalls will load both Car A & B onto the track at the same time, in opposite lanes along with a competitor’s cars in accordance with the team’s requirements.

vi Race Marshalls set cars at track start line, inserts CO2 cylinder and engages car with launch pod.

vii A team member is then allowed 30 seconds to ‘fine tune’ the staging of their first car.

viii Driver stands trackside with corresponding lane start trigger. Remaining team members stand behind driver.

ix Race Marshall presses the start system reset button – lights come on

x When lights extinguish, driver presses trigger and car is launched.

xi Judge records TOTAL RACE TIME displayed on start gate.

xii Race Marshall at finish line removes and disposes of used CO2 cylinder.

xiii Team member at finish line lifts the retardation device and rolls car to the end of the tether line, then swaps lanes and adjusts the retardation device for the second race. All care MUST be taken to ensure no damage is occasioned to the competitor’s car sitting at the end of the tether line.

xiv Race 2, driver can be inter-changed at this point.

xv Race 2 conducted in opposing lane using same process as per vi – xi.

xvi Race Marshall at finish line removes cars from tether line and returns them to Parc Ferme, or places them at the designated Car Repair location if damage has occurred. At the conclusion of Car Repair, cars are returned to Parc Ferme.

xvii In case of a tied result, a further ‘sudden death’ race will be conducted and teams will toss a coin for lane allocation.

9 Excludes the Cadet Class teams
C10.4 Race Scoring for Awards

C10.4.1 Grand Prix Race
Due to variability in track conditions, the ‘Grand Prix Race’ award marks will be awarded based on multiple runs, similar to a multiple lap race. The ‘Race Time’ will be the sum of the recorded net lap times from Automatic (Time Trial) Racing and Manual Launch (Reaction) Racing where the single fastest and slowest laps recorded are excluded. One lap DNF can be considered the “slowest lap” and excluded. A second lap DNF will lead to the car being deemed as failing to complete the race. Teams will be awarded points that match the performance of their car when compared to the fastest car in the competition. The scaling system uses the following formula to calculate points:

\[ \text{Regional Final Race Points} = 50 + \frac{100}{(\text{Fastest Car Race Time} \times 0.30)} \times (\text{Fastest Car Race Time} \times 1.30 - \text{Team's Race Time}) \]

\[ \text{State Final Race Points} = 50 + \frac{100}{(\text{Fastest Car Race Time} \times 0.20)} \times (\text{Fastest Car Race Time} \times 1.20 - \text{Team's Race Time}) \]

\[ \text{National Final Race Points} = 50 + \frac{100}{(\text{Fastest Car Race Time} \times 0.15)} \times (\text{Fastest Car Race Time} \times 1.15 - \text{Team's Race Time}) \]

The minimum score awarded for a team completing the race is 50 marks and requires 7 legal runs.
The minimum score awarded for a team starting but failing to complete the race is 30 marks plus 2 marks for each lap completed up to a maximum of 6 laps.

Teams NOT starting the race (DNS) will receive 0 points.

C10.4.1.2 Cadet Class (60 points)

\[ \text{Regional Final Race Points} = 20 + \frac{40}{(\text{Fastest Car Race Time} \times 0.30)} \times (\text{Fastest Car Race Time} \times 1.30 - \text{Team's Race Time}) \]

\[ \text{State Final Race Points} = 20 + \frac{40}{(\text{Fastest Car Race Time} \times 0.20)} \times (\text{Fastest Car Race Time} \times 1.20 - \text{Team's Race Time}) \]

The minimum score awarded for a team completing the race is 20 marks and requires 3 legal runs.
The minimum score awarded for a team starting but failing to complete the race is 10 marks plus 2 marks for each lap completed up to a maximum of 2 laps.

Teams NOT starting the race (DNS) will receive 0 points.

C10.4.2 Fastest Reaction Time\(^{10}\) (20 points)
At State and National Finals, Development and Professional Class teams ONLY will be awarded points based on their fastest driver Reaction Time as per the following table:

<table>
<thead>
<tr>
<th>Fastest Reaction Time</th>
<th>Points/Marks Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0.141</td>
<td>20 points</td>
</tr>
<tr>
<td>0.140 ≤ time &lt; 0.150</td>
<td>17 points</td>
</tr>
<tr>
<td>0.151 ≤ time &lt; 0.160</td>
<td>15 points</td>
</tr>
<tr>
<td>0.161 ≤ time &lt; 0.170</td>
<td>13 points</td>
</tr>
<tr>
<td>0.171 ≤ time &lt; 0.180</td>
<td>11 points</td>
</tr>
<tr>
<td>0.181 ≤ time &lt; 0.190</td>
<td>9 points</td>
</tr>
<tr>
<td>0.190 ≤ time &lt; 0.200</td>
<td>7 points</td>
</tr>
<tr>
<td>&gt;0.200</td>
<td>5 points</td>
</tr>
</tbody>
</table>

\(^{10}\) Excludes Cadet Class teams
C10.4.3 Knockout Racing\(^{11}\) (30 points)
State and National Final events WILL include knock-out Manual Launch (Reaction) Racing for Professional and Development Class teams where time permits. The knockout draw is seeded based on team rankings from the Manual Launch (Reaction) Racing of the Grand Prix racing event (qualifying).

C10.4.3.1 State Final Arrangements
- Where time permits, all teams will participate in Knockout Racing. This decision will be at the discretion of the Chair of Judges.
- If either the Junior or Senior Professional Classes have 5 or less competing teams, both will be combined into an overall Professional Class for the purpose of Knockout Racing.
- Where time does NOT permit, ONLY the top 8 seeded teams in each of the Development and overall Professional Classes will participate in the knock-out competition.

C10.4.3.2 National Final Arrangements
- ONLY the top 8 seeded teams in each of the Development and overall Professional Classes will participate in the knock-out competition.

An example draw for a field of 8 and 16 teams is shown on the following page.

C10.4.3.3 Sample Knockout Draws

Field of 16 – State Finals

<table>
<thead>
<tr>
<th>Round of 16</th>
<th>Quarter Final</th>
<th>Semi Final</th>
<th>Final</th>
<th>Winner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank 1 16</td>
<td>' '</td>
<td>' '</td>
<td>' '</td>
<td>' '</td>
</tr>
<tr>
<td>Rank 2 8</td>
<td>' '</td>
<td>' '</td>
<td>' '</td>
<td>' '</td>
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<tr>
<td>Rank 3 12</td>
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<tr>
<td>Rank 4 4</td>
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<tr>
<td>Rank 5 13</td>
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<tr>
<td>Rank 6 9</td>
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<tr>
<td>Rank 7 5</td>
<td>' '</td>
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</tr>
<tr>
<td>Rank 8 16</td>
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</tbody>
</table>

Field of 8 – State or National Final

<table>
<thead>
<tr>
<th>Round of 8</th>
<th>Semi Final</th>
<th>Final</th>
<th>Winner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank 1 8</td>
<td></td>
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<td></td>
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<tr>
<td>Rank 2 5</td>
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<tr>
<td>Rank 3 4</td>
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<tr>
<td>Rank 4 6</td>
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<tr>
<td>Rank 5 3</td>
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<td></td>
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<tr>
<td>Rank 6 7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rank 7 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^{11}\) Excludes Cadet Class teams
C10.4.3.4 Marks awarded for final positions

The marks to be awarded from actual Knock-out racing outcomes or direct rankings from the reaction launch racing are shown in the following table.

<table>
<thead>
<tr>
<th>Final Position in Knock-out Racing</th>
<th>Marks Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winner – Knock-out Champion (1st)</td>
<td>30 marks</td>
</tr>
<tr>
<td>Knocked out in Final (2nd)</td>
<td>27 marks</td>
</tr>
<tr>
<td>Knocked out in Semi-Final (3rd or 4th)</td>
<td>24 marks</td>
</tr>
<tr>
<td>Knocked-out in Quarter Final (5th to 8th place)</td>
<td>18 marks</td>
</tr>
<tr>
<td>Knocked out in a preliminary round (9th to last place)</td>
<td>12 marks</td>
</tr>
<tr>
<td>Teams excluded from Knock-out racing</td>
<td>0 marks</td>
</tr>
</tbody>
</table>

C10.4.3.5 Knock-out Racing Not Conducted

Where knock-out races are NOT specifically conducted due to time constraints or unforeseen circumstances, then the knock-out marks will be awarded based directly upon the manual reaction launch run time rankings.

ARTICLE C11 - CAR REPAIRS

C11.1 Car Servicing

- There will be NO car ‘servicing’ sessions.
- Once a car is submitted at event check in, NO servicing including lubrication of ANY component SHALL be permitted at ANY time including car repair sessions.

C11.2 Car Repairs

- At State and National Final events, teams will be allocated 10 minutes to perform penalty free repairs on cars in the dedicated Car Repair area if the team can satisfy a Track Marshall or Race Director that the car has suffered damage during racing or handling.
- This will be permitted to occur immediately after a team’s racing session for automatic launch (time trial) racing, manual launch (reaction) racing and knockout racing as per the judging schedule.
- Evidence of damage MUST be either a cracked component, a component separated from the car, or some other change of condition of the car so as to be considered a safety issue by a Track Marshall.
- The repair MAY ONLY return the car to its state prior to receiving the damage for which it is being repaired.
- Design or assembly issues such as wheels NOT rotating satisfactorily SHALL NOT be accepted as damage.
- Repair SHALL NOT be permitted for the purpose of improving the performance of the car.
- All damage issues and related repair work during racing is at the Judge’s discretion and MAY be referred to the Lead Scrutineer and/or Chair of Judges for a final decision.
- All repairs WILL be managed and monitored by a designated Track Marshall.
- The allocated 10 minutes for car repairs commences as soon as the Track Marshall places the damaged car within the Car Repair area. Timing will NOT be stopped for ANY reason, including the retrieval of tools to effect repairs.
- Teams are NOT required to complete ANY Car Repair forms.

C11.3 Car Repair Penalties

- A car NOT returned within the 10 minutes SHALL be deemed DNS for the following races until it can be repaired in subsequent Car Repair sessions.
- A repaired car WILL be weighed and MUST meet the minimum mass, otherwise, ballast in the form of 0.1 gram stickers or screws will be applied by Track Marshalls where required.
- ANY repaired car deemed unsafe to race by the Lead Track Judge, will result in a DNS for the following scheduled race/s until it can be repaired in a subsequent Car Repair session.

C11.4 Dedicated Area

Car Repair MUST ONLY take place at the dedicated Car Repair area. A maximum of two (2) team members and Judges are allowed to enter the car repair area. Repairs will be managed and monitored by a designated Track Marshall. Teams MUST keep the area clean of glue and rubbish.

C11.5 Team Tool Kits

Tool kits are allowed to be taken into car repair. 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.
ARTICLE C12 - GRIEVANCES

C12.1 Procedure

C12.1.1 Specifications Compliance Related

7. Following the Specifications Compliance judging and prior to the commencement of racing, teams found to have failed ANY critical regulations will be handed a document listing all infringements.
   a. This document WILL NOT contain infringements of non-critical regulations.
   b. It is the responsibility of team members to read, identify and respond to all of the infringements relating to failed critical regulations.

8. As per ARTICLE C4.1.4.2, teams will be given a special 20-minute car servicing time to modify the car so as to comply with the failed critical regulation/s.

9. Scrutineers will then recheck the car for compliance and teams will be advised of the outcome as soon as possible thereafter.

10. SHOULD a team be dissatisfied with the decision of the Lead Scrutineer, an appeal MAY be submitted in writing by the advertised deadline using the official on-line Grievance Form. Refer ARTICLE C2.4.1.6.

11. The Chair of Judges WILL discuss the appeal with the scrutineers and MAY seek additional advice from REA Foundation Ltd. regulation authorities. The Chair of Judges will then meet with the team, to discuss the appeal and explain the final decision.

C12.1.2 Non Specifications Related

Submitted by the advertised deadline using the official on-line Grievance Form.

C12.2 Judge’s Decision

The Chair of Judges decision related to ANY grievance is final and no further discussion will be entered into.

ARTICLE C13 - JUDGES

C13.1 Overview

There will be several teams of judges that form the entire judging panel.

Judges are generally higher education and industry experts invited by REA Foundation Ltd. They are selected and appointed to teams based on their qualifications and experience.

All judges undertake a comprehensive briefing prior to the competition and are required to declare ANY conflicts of interest with respect to the teams they are judging. Where a conflict of interest MAY occur, the judge is required to step back from judging the relevant team/s.

Some judges MAY perform a dual role. For example, undertake the specifications compliance of cars AND Engineering judging.

Each judging category will have one judge appointed as the Lead Judge.

C13.2 Chair of Judges

An independent authority appointed by REA Foundation Ltd. to oversee all judging procedures. The Chair of Judges will determine the final judging decision where a grievance 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 and work with the Competition Director to ensure all scores are entered correctly into a spread sheet to identify awards winners.
C13.3 The judging teams

C13.3.1 Specifications Judges
Will scrutinise each Car A & B\(^\text{12}\) with respect to the Australian Technical Regulations.

C13.3.2 Engineering Judges
Will assess each team’s use of CAD/CAM, CNC technologies, quality of manufacture and the engineering design process.

C13.3.3 Portfolio Judges
Portfolio Judges will assess each team’s portfolio design and project management as per the Portfolio score card.

C13.3.4 Marketing Judges
Marketing Judges will assess each team’s branding and trade display as per the Marketing score card.

C13.3.5 Verbal Presentation Judges
Verbal presentation Judges will assess each team’s presentation technique and content as per the verbal presentation score card.

C13.3.6 Race Judges
Will oversee and rule on all race events and ANY incidents.

C13.3.7 Car Repair Judges
Car Repair Judges will oversee all car service activities and rule on ANY infringements that MAY occur.

C13.4 Judging Decisions
THE DECISION OF THE JUDGES IS FINAL.

ARTICLE C14 - AWARDS

C14.1 Awards Celebration
At each State and National Final, an Awards Presentation is conducted, the timing of which is included in the Event Programme which is released closer to the event.

At some National Finals, the Awards Presentation is combined with a Gala Celebration.

C14.2 Participation recognition
At State and National Finals, all students, supervising teachers and judges will receive official participation/recognition certificates. These will be provided in the team and judge information packs.

Students participating at a National Final will also receive participation medallions presented at the Awards Presentation ceremony.

C14.3 Prizes and Trophies

C14.3.1 State Finals
At State Finals, teams winning an award will be presented with an A4 certificate ONLY.

C14.3.2 National Finals
At National Finals, winning teams will be presented with an A3 framed certificate and for most but NOT all awards, individual award medallions. Post event, all team members will be sent individual A4 certificates.

C14.3.3 Perpetual Trophies
Perpetual Trophies are presented for some but NOT all awards at National Finals ONLY. Teams receiving these trophies are responsible for having their team details engraved upon the trophy using identical material/engraving plates to maintain consistency of appearance. The teacher/school is responsible for returning the trophy to REA Foundation Ltd. prior to the following National Final.

\(^{12}\) Car B is not applicable to Cadet Class teams
C14.4 List of awards to be presented

Notes:

1. Eligibility for winning awards, requires teams to achieve at least 60% of the overall mark used to calculate overall 1st, 2nd and 3rd placings and Category Awards

2. Teams incurring Time Penalties will **NOT** be eligible to win Engineering related awards
   Refer ARTICLE C3.10.1

3. In situations where there are five or less teams representing a competition class, overall 2nd and 3rd place, along with some category awards **MAY NOT** be presented. This will be at the discretion of the Chair of Judges.

C14.4.1 Development and Professional Class Teams

**GRAND PRIX RACE AWARD**¹³

*The team with fastest race time and scoring 150pts in:*

- **Criteria 11.1:** Racing/Grand Prix Racing

**FASTEST LAP AWARD**

*The team with fastest individual net run time from:*

- **Criteria 11.1:** Racing/Grand Prix Racing

**BEST REACTION TIME AWARD**¹³

*The team with the quickest reaction launch time from:*

- **Criteria 11.2:** Racing/Grand Prix Racing

**KNOCKOUT CHAMPIONS AWARD**¹³

*The team with the fastest gross time in the last round of:*

- **Criteria 11.3:** Racing/Knockout Racing

**BEST ENGINEERED AWARD**¹⁴

*Team with highest combined score for:*

- **Criteria 1:** Engineering/Specifications
- **Criteria 2:** Engineering/Computer Aided Design (CAD)
- **Criteria 3:** Engineering/Manufacturing
- **Criteria 4:** Engineering/Design Process

**BEST ENGINEERING CAD AWARD**¹³,¹⁴

*Team with highest score for:*

- **Criteria 2:** Engineering/Computer Aided Design (CAD)

**BEST MANUFACTURED CAR AWARD**¹³,¹⁴

*Team with highest score for:*

- **Criteria 3:** Engineering/Manufacturing

**BEST TEAM PORTFOLIO AWARD**¹³

*Team with highest combined score for:*

- **Criteria 4:** Engineering Design Process
- **Criteria 5:** Portfolio/Project Management
- **Criteria 6:** Portfolio/Portfolio Design

**BEST MANAGED ENTERPRISE AWARD**

*Team with highest score for:*

- **Criteria 5:** Portfolio/Project Management

**BEST GRAPHIC DESIGN AWARD**¹³

*Team with highest combined score for:*

- **Criteria 6:** Portfolio/Portfolio Design
- **Criteria 7:** Marketing/Branding

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¹³ No Perpetual Trophy exists for these awards at a National Final
¹⁴ Not awarded to teams with time penalties
BEST TEAM MARKETING AWARD
Team with highest combined score for:
Criteria 7: Marketing/Branding
Criteria 8: Marketing/Trade Display
Criteria 5.5: Portfolio/Project Management

BEST TEAM VERBAL PRESENTATION AWARD
Team with highest combined score for:
Criteria 9: Verbal Presentation/Presentation Technique
Criteria 10: Verbal Presentation/Content

OUTSTANDING INDUSTRY COLLABORATION AWARD
Team with highest score for:
Criteria 10.5: Verbal Presentation/Content

INNOVATION AWARD
Team with highest score for:
Criteria 10.3 & 10.4: Verbal Presentation/Content

CHAIR OF JUDGES RECOGNITION OF ACHIEVEMENT AWARD
Discretion of the Chair of Judges

ENGINEERS AUSTRALIA WOMEN IN STEM AWARD
Interview by Engineers Australia representative/s

CONFEDERATION OF AUSTRALIAN MOTOR SPORT AWARD
Interview by CAMS representative/s

BEST NEWCOMER AWARD
Highest scoring team from school attending the National Final for the first time

3RD PLACE
Team with the third highest scoring sum of all marking criteria

2ND PLACE
Team with the second highest scoring sum of all marking criteria

CHAMPIONS
Team with the highest scoring sum of all marking criteria

C14.4.2 Cadet Class Teams (State Finals only)

FASTEST LAP AWARD
The team with fastest individual net run time from:
Criteria 11.1: Racing/Grand Prix Racing.

BEST TEAM POSTER AWARD
Team with highest score for Poster Criteria
Criteria 4: Engineering/Design Process

BEST ENGINEERED CAR AWARD
Team with highest score for:
Criteria 1: Engineering/Specifications
Criteria 3.6 & 3.7: Engineering/Manufacturing

CHAMPIONS
Team with the highest scoring sum of all marking criteria.

Note: For Cadet Class teams there is no pathway to the World Finals
### 1. AWARDS MATRIX

<table>
<thead>
<tr>
<th>Judging Category</th>
<th>Judging Category</th>
<th>Criteria</th>
<th>Professional &amp; Development Class Awards</th>
<th>Cadet Class Awards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>Specifications</td>
<td>1.1</td>
<td>Application of CAD</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>1.2</td>
<td>CAD Organisation</td>
<td></td>
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<td></td>
<td></td>
<td>1.3</td>
<td>CAD Based Analysis</td>
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<td>1.4</td>
<td>Overall CAD Technical Merit</td>
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<td>1.5</td>
<td>CAD Model vs Finished Product</td>
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<td>1.6</td>
<td>Orthographic</td>
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<td>2.2</td>
<td>CAD Organisation</td>
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<td>Overall CAD Technical Merit</td>
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<td>Manufacturing Process Car Body</td>
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<td>Manufacturing Process Other Components</td>
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<td>Tolerancing/Quality Control</td>
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<td>Quality of Finished Product - Geom/Func</td>
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<td>Skill Development for Future Careers</td>
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<td>Knockout Noise</td>
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2. DEVELOPMENT CLASS TRADE DISPLAYS

The intent of these amended regulations is to reduce the cost and complexity for Development Class teams participating in the competition. These restrictions ONLY apply to State Final competitions.

At National Final events NO restrictions will be placed upon Development Class teams.

State Final Arrangements
At State Final events, REA Foundation Ltd will supply Development Class teams with fabric covered backboards with nominal dimensions of 2000mm (L) x 2400mm (H). Development Class teams MAY ONLY use 1800mm of the provided length situated immediately behind a supplied Trestle Table of the same length.

Development Class teams MUST use a REA supplied trestle table at State Final events with nominal dimensions of 1800mm (L) x 750mm (W) x 730mm (H). REA do NOT supply table cloths.

Within the provided display, Development Class teams will ONLY be permitted to:

1. Display upon the backboard of the display within the identified 1800mm length, using ANY material no thicker than 10mm.
2. Display upon the trestle table within the identified area with no separate or combined display item/s being higher than 500mm.
3. Display at the front of the trestle table within the identified 1800mm length using ANY material no thicker than 10mm affixed or resting against the Trestle Table at 90° to the floor.

No other areas/surfaces within the display space provided can be used. The volume underneath the table can be used for storage ONLY but stored contents MUST NOT be visible from front or side view at ANY time throughout the event.

National Final Arrangements
At National Finals, Development Class teams will be provided with a full shell scheme Trade Display with fascia. No restrictions other than those general conditions listed at ARTICLE C.8.1.6 will apply.

NO Trestle Tables will be supplied to ANY team at a National Final. Teams MUST construct their own display furniture to meet the maximum internal dimensions and fit within the volume of the display space provided.
3. SHELL SCHEME TRADE DISPLAY
The diagrams below shows the nominal external dimensions and maximum internal build dimensions of the shell scheme trade display used for Professional Class teams at state finals and all teams at the National Final.
### Development Portfolio Page Content Plan: Suggested content organisation for assessment

#### Enterprise Portfolio:

- **Cover:** Name & Logo
  - 

  - 

- **Team Mgt:** Roles, Responsibilities & Interaction
  - 

  - 

- **Time, Finance, Risk Comms, Mgt Tools & Methods
  - 

- **Linking Skills with Future Careers**
  - 

- **Stakeholder ROI Plan & Community Activity / PR**
  - 

#### Engineering Portfolio:

- **Cover:** Rendering Name & Logo
  - 

  - 

- **Car Design Requirements & Research**
  - 

  - 

- **Car Design Development & Analysis**
  - 

- **Car Manufacturing**
  - 

- **Free for teams to decide content**
  - 

To streamline the judging process, teams are to arrange the content of their Enterprise and Engineering Portfolios in accordance with this Content Plan. However, the number of pages allocated to the suggested criteria above is at the discretion of each team.

* Components of the Cover are critical to both the Enterprise & Engineering Portfolios

- **Pink** – Portfolio content assessed in Portfolio criteria
- **Blue** – Portfolio content assessed in Booth criteria
- **Red** – Portfolio content assessed in Engineering criteria
- **Green** – Assessed in Marketing criteria
5. PROFESSIONAL CLASS PORTFOLIO CONTENT PAGE PLAN

Professional Portfolio Page Content Plan: *Suggested content organisation for assessment*

**Enterprise Portfolio:** Project Management & Career Development

- **Cover:**
  - Name & Logo
  - Team Mgt: Roles, Responsibilities & Interaction
  - Project Scope & Time Management Tools / Methods
  - Team Finances, Risk Management Tools & Methods
  - Communication Tools & Methods
  - Linking Skills with Future Careers

- Team Stakeholder
  - ROI Plan & Activity

- Team Community Activity / PR & Social Media

**Marketing & Partnerships**

- Team Name, Logo & Branding
- Uniform & Booth Design
- Partnerships with External Individuals & Collaborations

**Engineering Portfolio:** Engineering Design Process

- **Cover:**
  - Rendering Name & Logo

- Car Design Requirements & Research
- Car Design Ideas
- Innovation
- Car Design Development
- Car Design Analysis

- Car Manufacturing
- Car Design Physical Testing
- Car Process Evaluation
- Free for teams to decide content

*To streamline the judging process, teams are to arrange the content of their Enterprise and Engineering Portfolios in accordance with this Content Plan. However the number of pages allocated to the suggested criteria above is at the discretion of each team.*

* Components of the Cover are critical to both the Enterprise & Engineering Portfolios

**Notes:**
- Pink – Portfolio content assessed in Portfolio criteria
- Blue – Portfolio content assessed in Booth criteria
- Red – Portfolio content assessed in Engineering criteria
- Green – Assessed in Marketing criteria
## CRITERIA 1 - SPECIFICATION SCORE CARD (1 OF 4)

For clarification on individual regulations, refer to the 2019/2020 Australian Technical Regulations.

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Regulation Overview</th>
<th>Min/Max Quick Guide</th>
<th>Penalty</th>
<th>Car A</th>
<th>Car B</th>
<th>Judge 1</th>
<th>Judge 2</th>
<th>Deduction</th>
<th>Remarks</th>
<th>Rectification</th>
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**LEGEND**

- Eligibility Regulations/Possible Disqualification
- Critical Regulations/Time Penalty
- CC = Cadet Class
- DC = Development Class
- PC = Professional Class
### CRITERIA 1 - SPECIFICATION SCORE CARD (2 OF 4)

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<td>Min 3mm</td>
<td>-4</td>
<td></td>
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<tr>
<td>T6.2.2</td>
<td>Rear wing clear airspace</td>
<td>Min 3mm</td>
<td>-4</td>
<td></td>
<td></td>
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<tr>
<td>T6.3</td>
<td>Front wing/support structure in front of centre line of axle</td>
<td>Visual Check</td>
<td>-1</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>T6.4</td>
<td>Wing construction must remain rigid during racing</td>
<td>Visual Check</td>
<td>-2</td>
<td></td>
<td></td>
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<tr>
<td>T6.5</td>
<td>Front wing/support structure-no-metallic material</td>
<td>Visual &amp; Drawing Check</td>
<td>-10</td>
<td></td>
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<td></td>
<td>PC &amp; DC Only</td>
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<tr>
<td>T6.6</td>
<td>Front wing/support structure-connect with nosecone only</td>
<td>Visual &amp; Drawing Check</td>
<td>-1</td>
<td></td>
<td></td>
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<tr>
<td>T6.7.1</td>
<td>Front wing span</td>
<td>Balsa/Foam: Min 34mm Other: Min 40mm</td>
<td>-4</td>
<td></td>
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<tr>
<td>T6.7.2</td>
<td>Rear wing span</td>
<td>Balsa/Foam: Min 34mm Other: Min 40mm</td>
<td>-4</td>
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**LEGEND**
- Eligibility Regulations/Possible Disqualification
- Critical Regulations/Time Penalty
  - CC = Cadet Class
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### CRITERIA 1 - SPECIFICATION SCORE CARD (3 OF 4)

For clarification on individual regulations, refer to the 2019/2020 Australian Technical Regulations.

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Regulation Overview</th>
<th>Min/Max Quick Guide</th>
<th>Penalty</th>
<th>Car A</th>
<th>Car B</th>
<th>Judge 1</th>
<th>Judge 2</th>
<th>Deduction</th>
<th>Remarks</th>
<th>Rectification</th>
</tr>
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<tbody>
<tr>
<td><strong>ARTICLE T6 – WING RULES continued</strong></td>
<td></td>
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<td></td>
<td></td>
<td>Pass/Fail</td>
</tr>
<tr>
<td>T6.9.1</td>
<td>Front wing chord</td>
<td>Min 15mm</td>
<td>-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T6.9.2</td>
<td>Rear wing chord</td>
<td>Min 15mm</td>
<td>-2</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>T6.10.1</td>
<td>Front wing thickness</td>
<td>Balsa: Min 3.5mm Max 9mm</td>
<td>-2</td>
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<tr>
<td>T6.10.2</td>
<td>Rear wing thickness</td>
<td>Balsa: Min 3.5mm Max 9mm</td>
<td>-2</td>
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<td>T6.11</td>
<td>Rear wing positioning behind centre line of rear axle</td>
<td>Visual Check</td>
<td>-1</td>
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<tr>
<td>T6.12</td>
<td>Rear wing height measured normal to bottom surface</td>
<td>&gt; 34mm</td>
<td>-4</td>
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<tr>
<td>T6.13</td>
<td>Rear wing must be made of balsa</td>
<td>Visual &amp; Drawing Check</td>
<td>-4</td>
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<td>T6.14</td>
<td>Rear wing non-metallic support structure behind rear axle centre line</td>
<td>Check Drawings</td>
<td>-4</td>
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</tbody>
</table>

| **ARTICLE T7 – WHEEL RULES** | | | | | | | | | | Pass/Fail | Pass/Fail |
|----------------------------|--------------------------|---------|---------|-------|---------|---------|---------|-----------|---------|---------------|
| T7.1                      | Number and location, common shared centreline | 4, 2 x 2 | -4 | | | | | | | |
| T7.2.1                    | Combination of four unmodified REA standard wheels | Visual Check | -4 | | | | | | | |
| T7.3                      | Team manufactured wheels – front & rear wheel diameter | Min 26mm | -4 | | | | | | | |
| T7.4                      | Track contact width – front & rear wheels | Min 15mm | -4 | | | | | | | |
| T7.5                      | Full contact width with race track – no camber | 80gsm paper | -2 | | | | | | | |
| T7.6                      | No tyre tread – consistent diameter & circumference | Visual Check | -2 | | | | | | | |
| T7.7                      | Freely rotating wheels – forward rolling motion | Reasonably minimal effort | -4 | | | | | | | |
| T7.8                      | Visibility in front view – permitted height of obstruction | Max 15mm | -4 | | | | | | | |
| T7.9                      | Visibility from top, bottom & side. No obstruction | Min 1mm exclusion zone | -4 | | | | | | | |

**LEGEND**
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<th>Judge 2</th>
<th>Deduction</th>
<th>Remarks</th>
<th>Rectification</th>
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</thead>
<tbody>
<tr>
<td><strong>ARTICLE T8 – WHEEL SUPPORT RULES</strong></td>
<td></td>
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<tr>
<td>T8.1</td>
<td>Contained with projected cylinder volume</td>
<td>Visual Check</td>
<td>-2</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>T8.2</td>
<td>Not integrated with wing support systems</td>
<td>Visual Check</td>
<td>-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>T8.3</td>
<td>Four unmodified REA axle grommets</td>
<td>Visual Check</td>
<td>CC &amp; DC Only</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>T8.4.1</td>
<td>2 standard REA axles or modified axles of same diameter</td>
<td>Visual Check/Min 3mm</td>
<td>-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>DC Only</td>
</tr>
<tr>
<td>T8.4.2</td>
<td>2 standard REA axles. No other material to be used.</td>
<td>Visual Check</td>
<td>-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CC Only</td>
</tr>
<tr>
<td>T8.5.1</td>
<td>No added parts or modifications to wheel systems</td>
<td>Visual Check</td>
<td>CC &amp; DC Only</td>
<td></td>
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<tr>
<td><strong>ARTICLE T9 – TETHER LINE GUIDE RULES</strong></td>
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<tr>
<td>T9.1</td>
<td>2 guides firmly secured, front and rear underside of car</td>
<td>Visual Check</td>
<td>-1</td>
<td></td>
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<tr>
<td>T9.2</td>
<td>Longitudinal separation measured inside edges of guides</td>
<td>Min 120mm</td>
<td>-1</td>
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<tr>
<td>T9.3</td>
<td>Inside diameter of guide (hole size)</td>
<td>Min 3mm</td>
<td>-2</td>
<td></td>
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<tr>
<td>T9.4.1</td>
<td>Guides must be closed for racing</td>
<td>Visual Check</td>
<td>-4</td>
<td></td>
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</tr>
<tr>
<td>T9.4.2</td>
<td>No sharp edges</td>
<td>Visual Check</td>
<td>-4</td>
<td></td>
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<tr>
<td>T9.4.3</td>
<td>Adequate strength &amp; fixing</td>
<td>200g mass</td>
<td>-4</td>
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<tr>
<td>T9.5.1</td>
<td>2 Standard REA Tether Line Guides</td>
<td>Visual Check</td>
<td>CC Only</td>
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<tr>
<td>T9.5.2</td>
<td>Placement must be within the 6mm x 6mm tether slot feature</td>
<td>Visual Check</td>
<td>CC Only</td>
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<tr>
<td><strong>ARTICLE T10 – POWER PLANT PROVISION RULES</strong></td>
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<tr>
<td>T10.1</td>
<td>Cylinder must interface with launch pod</td>
<td>Visual Check</td>
<td>-20</td>
<td></td>
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<tr>
<td>T10.2</td>
<td>CO2 cylinder chamber diameter</td>
<td>19mm</td>
<td></td>
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<tr>
<td>T10.3</td>
<td>Depth of chamber</td>
<td>Min 50mm Max 60mm</td>
<td>-1</td>
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<tr>
<td>T10.4</td>
<td>Height of lowest point of chamber above track surface</td>
<td>CC: 22mm</td>
<td>DC &amp; PC: 20mm</td>
<td>-4</td>
<td></td>
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<tr>
<td>T10.5</td>
<td>CO2 cylinder chamber completely surrounded by balsa</td>
<td>Min 3mm</td>
<td>-4</td>
<td></td>
<td></td>
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<tr>
<td>T10.6</td>
<td>Paint &amp; other materials not present in CO2 cylinder chamber</td>
<td>Visual Check</td>
<td>-1</td>
<td></td>
<td></td>
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<tr>
<td>T10.7</td>
<td>CO2 cylinder inserted &amp; withdrawn – no removal of car parts</td>
<td>Visual Check</td>
<td>-4</td>
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**LEGEND**

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### CRITERIA 2 - ENGINEERING: COMPUTER AIDED DESIGN SCORE CARD

<table>
<thead>
<tr>
<th>JUDGING SUB CATEGORY</th>
<th>COMPUTER AIDED DESIGN</th>
<th>TEAM ID</th>
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</thead>
<tbody>
<tr>
<td><strong>PRIMARY EVIDENCE</strong></td>
<td>TEAM INTERVIEW</td>
<td>TEAM NAME</td>
</tr>
<tr>
<td><strong>SECONDARY EVIDENCE</strong></td>
<td>MODELLING ON TEAM COMPUTER &amp; ENGINEERING COMPLIANCE BOOKLET</td>
<td>SCHOOL</td>
</tr>
<tr>
<td><strong>CRITERIA</strong></td>
<td>2</td>
<td><strong>COMPETITION CLASS</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Low</th>
<th>Developing</th>
<th>Advanced</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Application of CAD</td>
<td>0 1 0 1 2</td>
<td>2 3 4 5 6</td>
<td>4 5 7 8 9 10</td>
<td>5 10</td>
</tr>
<tr>
<td>2.2 CAD Organisation</td>
<td>Generally disorganised</td>
<td>Satisfactory organisation of data and models</td>
<td>Data &amp; parts highly ordered &amp; linked. Full CAD product assembly</td>
<td>10</td>
</tr>
<tr>
<td>2.3 CAD Based Analysis</td>
<td>Minimal analysis shown</td>
<td>Good analysis. Results applied to development</td>
<td>Variety of advanced and relevant analysis techniques conducted</td>
<td>10</td>
</tr>
<tr>
<td>2.4 Overall CAD Technical Merit</td>
<td>Basic CAD design with little technical merit</td>
<td>Developed CAD design with some technical merit</td>
<td>Original &amp; clever developed CAD design with excellent technical merit</td>
<td>5</td>
</tr>
<tr>
<td>2.5 CAD Model v’s Finished Product</td>
<td>Basic Similarity</td>
<td>Good Similarity</td>
<td>Excellent Similarity</td>
<td>10</td>
</tr>
<tr>
<td>2.6 Orthographic (Engineering Compliance Booklet)</td>
<td>Basic drawing</td>
<td>Good technical drawing</td>
<td>High detail &amp; includes spec dimensions.</td>
<td>10</td>
</tr>
<tr>
<td>2.7 Rendering (on Engineering Portfolio cover)</td>
<td>Basic rendering on cover</td>
<td>Realistic rendering on cover</td>
<td>Photorealistic render on cover</td>
<td>10</td>
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</tbody>
</table>

**Computer Aided Design GRAND TOTAL** /65
<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>LOW</th>
<th>DEVELOPING</th>
<th>ADVANCED</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Application of CAM / CNC</td>
<td>0 1 0 1 2</td>
<td>2 3 4 5 6</td>
<td>4 5 6 7 8 9 10</td>
<td>/5 /10</td>
</tr>
<tr>
<td>3.2 Manufacturing Process: Car Body</td>
<td>Little manufacturing details</td>
<td>Manufacturing processes and some issues presented</td>
<td>Detailed assessment of all manufacturing, stages, materials &amp; issues</td>
<td>/10</td>
</tr>
<tr>
<td>3.3 Manufacturing Process: Other Components</td>
<td>Little manufacturing details</td>
<td>Manufacturing processes and some issues presented</td>
<td>Detailed assessment of all manufacturing, stages, materials &amp; issues</td>
<td>/10</td>
</tr>
<tr>
<td>3.4 Tolerancing / Quality Control</td>
<td>Little consideration of tolerancing and quality control</td>
<td>Good consideration of tolerancing and quality control</td>
<td>Excellent consideration of tolerancing and quality control</td>
<td>/10</td>
</tr>
<tr>
<td>3.5 Overall Manufacturing Technical Merit</td>
<td>Basic manufacturing with little technical merit</td>
<td>Good manufacturing with technical merit</td>
<td>Original &amp; clever manufacturing processes with excellent technical merit</td>
<td>/5</td>
</tr>
<tr>
<td>3.6 Quality of Finished Product - Geometry/Form¹</td>
<td>Reasonable form with some inconsistencies</td>
<td>Good overall form and assembly with attention to detail</td>
<td>Exceptional attention to detail across all aspects of form. Two cars are identical.</td>
<td>/10</td>
</tr>
<tr>
<td>3.7 Quality of Finished Product - Surface finish¹</td>
<td>Reasonable finish with some inconsistencies</td>
<td>Good overall finish quality with attention to detail</td>
<td>Showcase finish quality. Exceptional attention to detail. Two cars are identical.</td>
<td>/10</td>
</tr>
</tbody>
</table>

Manufacturing GRAND TOTAL /65

¹ These criteria are judged by the Specifications Judges during the scrutineering process and results entered on-line.
### CRITERIA 3 - ENGINEERING: MANUFACTURING SCORE CARD (CADET CLASS)

<table>
<thead>
<tr>
<th>Judging Sub Category</th>
<th>Manufacturing</th>
<th>Team ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIMARY EVIDENCE</td>
<td>EXAMINATION OF CAR A IN PARC FERME</td>
<td>TEAM NAME</td>
</tr>
<tr>
<td>SECONDARY EVIDENCE</td>
<td>NIL</td>
<td>SCHOOL</td>
</tr>
<tr>
<td>CRITERIA</td>
<td>3</td>
<td>COMPETITION CLASS</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Low</th>
<th>Developing</th>
<th>Advanced</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6</td>
<td>0 1 2</td>
<td>3 4 5 6</td>
<td>7 8 9 10</td>
<td>/10</td>
</tr>
<tr>
<td>Quality of Finished Product - Geometry/Form¹</td>
<td>Reasonable form with some inconsistencies</td>
<td>Good overall form and assembly with attention to detail</td>
<td>Exceptional attention to detail across all aspects of form.</td>
<td>/10</td>
</tr>
<tr>
<td>3.7</td>
<td>Reasonable finish with some inconsistencies</td>
<td>Good overall finish quality with attention to detail</td>
<td>Showcase finish quality. Exceptional attention to detail.</td>
<td>/10</td>
</tr>
</tbody>
</table>

**Manufacturing GRAND TOTAL** /20

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¹ These criteria are judged by the Specifications Judges during the scrutineering process and results entered on-line.
### CRITERIA 4 - ENGINEERING: DESIGN PROCESS SCORE CARD

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>LOW</th>
<th>DEVELOPING</th>
<th>ADVANCED</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Requirements Analysis</td>
<td>Limited development of objectives</td>
<td>Good development of objectives</td>
<td>Excellent statement of objectives supported by research</td>
<td>10</td>
</tr>
<tr>
<td>4.2 Ideas</td>
<td>Single or basic concepts</td>
<td>Multiple concepts with links to research</td>
<td>Several technically inspired ideas for different car features/functions</td>
<td>10</td>
</tr>
<tr>
<td>4.3 Development</td>
<td>Limited development shown</td>
<td>Logical design developments explained</td>
<td>Clearly justified developments based around research and testing</td>
<td>10</td>
</tr>
<tr>
<td>4.4 Analysis</td>
<td>Little evidence of analysis</td>
<td>Analysis which is relevant and results documented</td>
<td>Quality analysis methodologies. Accurate results and data linked to design revisions. Advanced use of CFD and other design tools.</td>
<td>10</td>
</tr>
<tr>
<td>4.5 Physical Testing</td>
<td>Little evidence of testing</td>
<td>Tests which are relevant with results documented</td>
<td>Quality experimental methodologies. Accurate results linked to design revisions.</td>
<td>10</td>
</tr>
<tr>
<td>4.6 Evaluation</td>
<td>No or limited evaluation</td>
<td>Evaluations at different stages</td>
<td>Excellent ongoing evaluations linked to improvement actions</td>
<td>10</td>
</tr>
<tr>
<td>4.7 Overall Design Technical Merit</td>
<td>Basic design process with little technical merit</td>
<td>Developed design process with some technical merit</td>
<td>Original &amp; clever developed design process with excellent technical merit</td>
<td>10</td>
</tr>
</tbody>
</table>

**Design Process GRAND TOTAL** 70
### CRITERIA 4 - ENGINEERING: DESIGN PROCESS SCORE CARD (CADET CLASS)

<table>
<thead>
<tr>
<th>JUDGING SUB CATEGORY</th>
<th>ENGINEERING DESIGN PROCESS</th>
<th>TEAM ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIMARY EVIDENCE</td>
<td>Team Poster</td>
<td>Team Name</td>
</tr>
<tr>
<td>SECONDARY EVIDENCE</td>
<td>School</td>
<td></td>
</tr>
<tr>
<td>CRITERIA</td>
<td>4</td>
<td>Competition Class</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>LOW</th>
<th>DEVELOPING</th>
<th>ADVANCED</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2 Ideas</td>
<td>0 1 2</td>
<td>3 4 5 6</td>
<td>7 8 9 10</td>
<td>/10</td>
</tr>
<tr>
<td>4.4 Analysis</td>
<td>Single or basic concepts</td>
<td>Multiple concepts with links to research.</td>
<td>Several technically inspired ideas for different car features/functions</td>
<td>/10</td>
</tr>
<tr>
<td>4.6 Evaluation</td>
<td>Little evidence of analysis</td>
<td>Analysis which is relevant and results documented</td>
<td>Quality analysis methodologies. Accurate results and data linked to design revisions. Advanced use of CFD and other design tools.</td>
<td>/10</td>
</tr>
<tr>
<td>4.7 Overall Design Technical Merit</td>
<td>No or limited evaluation</td>
<td>Evaluations at different stages</td>
<td>Excellent ongoing evaluations linked to improvement actions</td>
<td>/10</td>
</tr>
</tbody>
</table>

**Design Process GRAND TOTAL /40**
### CRITERIA 5 - PORTFOLIO: PROJECT MANAGEMENT & CAREER DEVELOPMENT SCORE CARD

<table>
<thead>
<tr>
<th>JUDGING SUB CATEGORY</th>
<th>PROJECT MANAGEMENT &amp; CAREER DEVELOPMENT</th>
<th>TEAM ID</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRIMARY EVIDENCE</strong></td>
<td><strong>TEAM ENTERPRISE PORTFOLIO:</strong></td>
<td><strong>TEAM NAME</strong></td>
</tr>
<tr>
<td><strong>SECONDARY EVIDENCE</strong></td>
<td></td>
<td><strong>SCHOOL</strong></td>
</tr>
<tr>
<td><strong>CRITERIA</strong></td>
<td><strong>5</strong></td>
<td><strong>COMPETITION CLASS</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>LOW</th>
<th>DEVELOPING</th>
<th>ADVANCED</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5.1 Team Roles &amp; Tasks</strong></td>
<td>Limited understanding of roles and responsibilities</td>
<td>Team roles and responsibilities identified</td>
<td>Highly structured team with clear roles and responsibilities. All team members provide critical contributions with evidence of supportive/overlapping interactions. Relevant skill development/mentoring undertaken. Plan Changes discussed</td>
<td>/10</td>
</tr>
<tr>
<td><strong>5.2 Scope &amp; Time Management</strong></td>
<td>Limited understanding of scope or evidence of time management</td>
<td>Some planning used to guide progress of project goals and stay on task.</td>
<td>Excellent control of all project deliverables understanding requirements and setting goals to maintain focus and evidence of using effective management methods and tools to stay on task and meet deadlines. Plan Changes discussed</td>
<td>/10</td>
</tr>
<tr>
<td><strong>5.3 Finance &amp; Risk Management</strong></td>
<td>Limited budgeting or risk awareness</td>
<td>Some resources identified, budgeting and contingency plans</td>
<td>Excellent resource management, understanding of budget control and evidence of financial accounting methods. Reasonable contingency plan and risk assessment prepared and/or undertaken.</td>
<td>/10</td>
</tr>
<tr>
<td><strong>5.4 Internal Communication</strong></td>
<td>Limited team communication</td>
<td>Basic team communication processes discussed.</td>
<td>Excellent use of multiple communication tools and methods for effective team planning and accountability.</td>
<td>/10</td>
</tr>
<tr>
<td><strong>5.5 Stakeholder Engagement</strong></td>
<td>Limited stakeholder engagement</td>
<td>Basic understanding and application of stakeholder engagement</td>
<td>Excellent understanding and application of initiating and maintaining stakeholder engagement with collaborators, sponsors, mentors and supporters using multiple tools and methods.</td>
<td>/10</td>
</tr>
<tr>
<td><strong>5.6 Skill Development for Future Careers</strong></td>
<td>No or little effort to identify skills and link them to Defence Industry Careers</td>
<td>A good effort by the team to identify individual skills developed but more work needed to link these with Defence Industry careers.</td>
<td>Demonstrable evidence in portfolio by team to identify and record several industry specific and employability skills developed through their participation in F1 in Schools and how these can link to future careers within Defence Industries.</td>
<td>/20</td>
</tr>
<tr>
<td><strong>5.7 Evaluation</strong></td>
<td>Limited evaluation</td>
<td>Some evaluation applied</td>
<td>Evaluation processes applied throughout the management of key deliverables.</td>
<td>/10</td>
</tr>
</tbody>
</table>

**Project Management & Career Dev. GRAND TOTAL** /80
## CRITERIA 6 - PORTFOLIO: PORTFOLIO DESIGN - CLARITY & QUALITY SCORE CARD

<table>
<thead>
<tr>
<th>Judging Sub Category</th>
<th>Design: Clarity &amp; Quality</th>
<th>Team ID</th>
<th>Primary Evidence</th>
<th>Team Enterprise &amp; Engineering Portfolios</th>
<th>Team Name</th>
<th>Secondary Evidence</th>
<th>Nil</th>
<th>School</th>
<th>Competition Class</th>
</tr>
</thead>
</table>

### Low | Developing | Advanced | Score |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criteria</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6.1 Production Quality of Materials</td>
<td>Poor quality</td>
<td>Basic printing and binding.</td>
<td>Quality printed document on quality paper in appropriately durable binding</td>
</tr>
<tr>
<td>6.2 Production Quality of Content</td>
<td>Missing documentation</td>
<td>Basic documentation provided.</td>
<td>Correct number of pages. All required documentation included and professionally presented. Car rendering and team logo on cover page in keeping with branding.</td>
</tr>
<tr>
<td>6.3 Content Organisation</td>
<td>Disorganised content</td>
<td>Some content organisation</td>
<td>Highly organised and managed portfolio content with logical structure and flow of information.</td>
</tr>
<tr>
<td>6.4 Layout Design</td>
<td>Distracting imperfections weaken the work</td>
<td>Some layout design format attempted.</td>
<td>Well formatted layout design consistently applying margins, alignment, spacing, graphics and design elements with consideration of visual balance and flow. All pages optimally used and uncluttered. Creative style realised.</td>
</tr>
<tr>
<td>6.5 Typography</td>
<td>Font choices distracting or weaken the work</td>
<td>Some consideration for type treatment.</td>
<td>Consistent use of typography with appropriate choices and limited number of text and headline font sizes, styles, colours and hierarchy. In keeping with branding. Easy to read.</td>
</tr>
<tr>
<td>6.6 Photos &amp; Images</td>
<td>Poor quality or use of images. No captioning.</td>
<td>Basic quality and use of images. Some reasonably concise captioning.</td>
<td>Justified use of excellent, un-pixellated, clear, undistorted photos and images that are concisely and accurately captioned. Properly sized, coloured and integrated with text to illustrate key messages. Considers branding.</td>
</tr>
<tr>
<td>6.7 Creative Graphics (Visual effects and infographics)</td>
<td>Poor graphics and/or execution. No captioning.</td>
<td>Graphics attempted with some success. Some reasonably concise captioning.</td>
<td>Justified, well executed and placed, un-pixellated, undistorted graphics that are concisely and accurately captioned. Consistent use of colour/ tones/ shapes, without visual overload, in keeping with branding.</td>
</tr>
<tr>
<td>6.8 Editing/Proofreading</td>
<td>Error ridden. Poor attempt at proofreading.</td>
<td>Good attempt with additional editing required for clarity.</td>
<td>No errors detected in text and graphics</td>
</tr>
<tr>
<td>6.9 Referencing/Plagiarism</td>
<td>Obvious failures in referencing.</td>
<td>Some attempt at referencing. Some errors evident.</td>
<td>No detected plagiarism with excellent use of referencing for author’s written word, graphics/photos and video sources etc</td>
</tr>
<tr>
<td>6.10 Writing &amp; Readability</td>
<td>Difficult to understand. Unable to read.</td>
<td>Does not sustain reading or interest. Does not flow.</td>
<td>Concise, appropriate, grammatically correct text, captions, and headlines. Inviting and engaging. Sustains the reader’s interest.</td>
</tr>
</tbody>
</table>

### Clarity & Quality GRAND TOTAL /50
## CRITERIA 7 - MARKETING: BRANDING SCORE CARD

<table>
<thead>
<tr>
<th>Judging Sub Category</th>
<th>Team ID</th>
<th>Primary Evidence</th>
<th>Secondary Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRANDING</td>
<td></td>
<td>TEAM INTERVIEW AT TRADE BOOTH</td>
<td>TEAM ENTERPRISE PORTFOLIO</td>
</tr>
<tr>
<td>Criteria</td>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Low</th>
<th>Developing</th>
<th>Advanced</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 Team Name*</td>
<td>0 1 2 3</td>
<td>2 3 4 5 6</td>
<td>4 5 6 7 8 9 10</td>
<td>/5  /10</td>
</tr>
<tr>
<td>7.2 Logo Development*</td>
<td>Limited ideas &amp; development. No original work evident</td>
<td>Some logo idea progression &amp; creative logo modification of type or graphics noted</td>
<td>A number of logo ideas considered with attention to team goals and identity. Creative &amp; original logo development clearly relates to the team’s chosen name, identity and purpose</td>
<td>/5</td>
</tr>
<tr>
<td>7.3 Final Logo Design*</td>
<td>Team logo is absent or confusing</td>
<td>Logo message is simple and obvious</td>
<td>Strong team logo that grabs attention, generates a positive response, and is easily recognised and recalled. Well considered use of colours, type and shapes enhance meaning. In keeping with branding</td>
<td>/5</td>
</tr>
<tr>
<td>7.4 Logo Application</td>
<td>Poor quality reproduction, limited team logo badging</td>
<td>Most items are badged with team logo. Team logo quality diminished when enlarged or reduced across applications.</td>
<td>Team logo scales well to large and small badging applications. All applications are of high quality and appropriately positioned for strong impact</td>
<td>/5</td>
</tr>
<tr>
<td>7.5 Team Branding</td>
<td>Branding message is weak with inconsistent application across the project</td>
<td>Effective team branding consistently applied across project components</td>
<td>Excellent and highly effective messaging of team image. Quality and consistent branding of team name, logo, typography, &amp; colours applied across all project elements: portfolio, uniforms, car, display, social media and collateral. Icon, tagline or mascot added to strengthen branding</td>
<td>/10</td>
</tr>
<tr>
<td>7.6 Media Exposure</td>
<td>Limited or ineffective</td>
<td>Some development, some impact, some consideration of audience and platforms</td>
<td>Clear, developed, high impact media strategy, including social media. Careful consideration of target audience and suitable platforms. Evidence of attempt to work with media broadcasters/publishers with some documented success</td>
<td>/5</td>
</tr>
<tr>
<td>7.7 Team Sponsors &amp; REA Corporate Partners ROI</td>
<td>Little or no ROI</td>
<td>Sponsorship acknowledged. Some logos included in project collateral</td>
<td>Clear and appropriate visibility of team sponsors and REA Corporate Partners. Quality reproduction of appropriate sponsor and REA Corporate Partner logos across all project collateral as required</td>
<td>/10</td>
</tr>
<tr>
<td>7.8 Team Uniform</td>
<td>Ineffective or inconsistent, same or similar to supporters</td>
<td>Basic and consistent across the team, distinct from supporters</td>
<td>Creative and considered use of branding and appropriate styling for all members. Team member names and roles clearly identified. Clearly distinct from supporters</td>
<td>/5</td>
</tr>
<tr>
<td>7.9 Team Presence</td>
<td>Not all present / Poor energy</td>
<td>Generally enthusiastic</td>
<td>All team members are appropriately engaging and enthusiastic about their work</td>
<td>/5</td>
</tr>
<tr>
<td>7.10 Team Knowledge</td>
<td>Limited engagement</td>
<td>Some members knowledgeable</td>
<td>Each member is highly knowledgeable in their role and also broadly knowledgeable about details of their entry. Able to defer to others with confidence and share project ownership</td>
<td>/5</td>
</tr>
</tbody>
</table>

---

**Branding GRAND TOTAL** /60
## CRITERIA 8 - MARKETING: TRADE DISPLAY SCORE CARD

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>TRADE DISPLAY</th>
<th>PRIMARY EVIDENCE</th>
<th>SECONDARY EVIDENCE</th>
<th>CRITERIA</th>
<th>8</th>
<th>TEAM ID</th>
<th>TRADE DISPLAY</th>
<th>TEAM NAME</th>
<th>SCHOOL</th>
<th>COMPETITION CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Judging Sub Category</strong></td>
<td><strong>Trade Display</strong></td>
<td><strong>Team ID</strong></td>
<td><strong>Team Name</strong></td>
<td><strong>Trade Display</strong></td>
<td><strong>Secondary Evidence</strong></td>
<td><strong>School</strong></td>
<td><strong>Criteria</strong></td>
<td><strong>Competition Class</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JUDGING SUB CATEGORY</td>
<td>TRADE DISPLAY</td>
<td>TEAM ID</td>
<td>TRADE DISPLAY</td>
<td>TEAM NAME</td>
<td>TRADE DISPLAY</td>
<td>SCHOOL</td>
<td>CRITERIA</td>
<td>COMPETITION CLASS</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LOW</strong></td>
<td><strong>DEVELOPING</strong></td>
<td><strong>ADVANCED</strong></td>
<td><strong>SCORE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.1 Car Display</td>
<td>Little consideration given to vehicle representation</td>
<td>Some attempt to represent vehicle as key feature</td>
<td>Excellent design materials and methods used to display the vehicle and its key components to make it a feature of the display</td>
<td>0 1 2</td>
<td>3 4 5 6</td>
<td>7 8 9 10</td>
<td>/10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.2 Information Design</td>
<td>Limited or repeat of folio</td>
<td>Project message is expanded beyond folio</td>
<td>Clean, uncluttered and well organised layout of written and graphical information. Conclusive snapshot of team’s key messages.</td>
<td>/5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.3 Use of ICTs</td>
<td>Limited ICTs</td>
<td>ICTs used to enhance presentation</td>
<td>Excellent integration of multimedia technologies and interactive ICTs to demonstrate, engage and inform.</td>
<td>/10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.4 Visual Design &amp; Impact</td>
<td>Limited or low impact creativity, branding, messaging and recognition of sponsors</td>
<td>Some relevant creative messaging evident with consideration for a range of factors</td>
<td>Creative design which is attractive and impactful. Excellent representation of the team name, brand and brand colours. Team message and/or slogan is clearly evident and sponsors are appropriately recognised. Innovative elements add interest and support team messaging.</td>
<td>/10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.5 Structural Design</td>
<td>No or limited design development evident, nor consideration for constraining factors</td>
<td>Some good evidence of design development and consideration for constraining factors</td>
<td>Creative and justified structural design with excellent use of space for primary display components. Evidence of design development considering functionality at events, branding and team messaging, materials, budget, sustainability, transport and assembly constraints.</td>
<td>/15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.6 Materials Selection &amp; Use</td>
<td>No or limited research into materials with constraining factors in mind. Some problems are evident</td>
<td>Generally effective and relevant choice of materials considering some factors</td>
<td>Highly effective choice of materials. Evidence of development considering factors including appearance, budget, sustainability, transport and assembly constraints. Team understands properties of materials used and is able to justify their choices, achieving an excellent finish with evident attention to detail.</td>
<td>/15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

1 Not applicable to the Development Class at State Finals

Trade Booth GRAND TOTAL - Development Class /50

Trade Booth GRAND TOTAL - Professional Class /65
### CRITERIA 9 – VERBAL PRESENTATION: PRESENTATION TECHNIQUE SCORE CARD

<table>
<thead>
<tr>
<th>JUDGING SUBCATEGORY</th>
<th>PRIMARY EVIDENCE</th>
<th>SECONDARY EVIDENCE</th>
<th>CRITERIA</th>
<th>JUDGING</th>
<th>TEAM ID</th>
<th>TEAM NAME</th>
<th>SCHOOL</th>
<th>COMPETITION CLASS</th>
<th>PRESENTATION TECHNIQUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>9.1</td>
<td>Presentation Energy</td>
<td>Low</td>
<td>Developing</td>
<td>0 1 2</td>
<td>3 4 5 6</td>
<td>7 8 9 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9.2</td>
<td>Team Contribution</td>
<td>Developing</td>
<td>3 4 5 6</td>
<td>Low</td>
<td>Developing</td>
<td>0 1 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9.3</td>
<td>Visual Aids</td>
<td>Developing</td>
<td>3 4 5 6</td>
<td>Low</td>
<td>Developing</td>
<td>0 1 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9.4</td>
<td>Audience Engagement</td>
<td>Developing</td>
<td>3 4 5 6</td>
<td>Low</td>
<td>Developing</td>
<td>0 1 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9.5</td>
<td>Articulation</td>
<td>Low</td>
<td>Developing</td>
<td>0 1 2</td>
<td>3 4 5 6</td>
<td>7 8 9 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9.6</td>
<td>Structure</td>
<td>Low</td>
<td>Developing</td>
<td>0 1 2</td>
<td>3 4 5 6</td>
<td>7 8 9 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9.7</td>
<td>Timing</td>
<td>Low</td>
<td>Developing</td>
<td>0 1 2</td>
<td>3 4 5 6</td>
<td>7 8 9 10</td>
</tr>
</tbody>
</table>

- **CRITERIA 9.1 Presentation Energy**
  - Low: Artificial and/or low energy
  - Developing: Speakers generally enthusiastic with lively delivery
  - Advanced: Passionate with effective and appropriate levels of liveliness

- **CRITERIA 9.2 Team Contribution**
  - Low: Minimal team participation
  - Developing: Good contributions from most team members
  - Advanced: Well produced, highly relevant and integrated aids effectively improve communication

- **CRITERIA 9.3 Visual Aids**
  - Low: Little use of aids
  - Developing: Some aids used effectively
  - Advanced: Well produced, highly relevant and integrated aids effectively improve communication

- **CRITERIA 9.4 Audience Engagement**
  - Low: Difficult to understand and/or hear most presenters
  - Developing: Some audience connection at times
  - Advanced: Excellent articulation, use of language and voice projection by all members throughout the assessment

- **CRITERIA 9.5 Articulation**
  - Low: Difficult to understand and/or hear most presenters
  - Developing: Some audience connection at times
  - Advanced: Excellent articulation, use of language and voice projection by all members throughout the assessment

- **CRITERIA 9.6 Structure**
  - Low: No structure presented, difficult to follow.
  - Developing: A basic structure/outline provided and could be followed by audience
  - Advanced: Clear presentation outline/overview. Excellent connections between topics and easy for audience to follow

- **CRITERIA 9.7 Timing**
  - Low: Too fast or ran out of time.
  - Developing: Good timing. Balanced topic depth and pace
  - Advanced: Ran on time or just under. Excellent balance of depth for each topic.
## CRITERIA 10 – VERBAL PRESENTATION: CONTENT SCORE CARD

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>LOW</th>
<th>DEVELOPING</th>
<th>ADVANCED</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1 Team objectives</td>
<td>Limited statement of objectives</td>
<td>Good statement of objectives</td>
<td>Excellent statement of objectives supported by sound reasoning</td>
<td>/5</td>
</tr>
<tr>
<td>10.2 Description of Car Product</td>
<td>Basic descriptions</td>
<td>Good description of components and features.</td>
<td>Excellent description of components and features including design decisions.</td>
<td>/5</td>
</tr>
<tr>
<td>10.3 Innovation</td>
<td>Little innovation presented</td>
<td>Innovations described and justified</td>
<td>Originality, Clever innovations with high positive project impact</td>
<td>/15</td>
</tr>
<tr>
<td>10.4 Refinement</td>
<td>Little refinement presented</td>
<td>Refinement described and justified</td>
<td>Clever refinement with high positive project impact</td>
<td>/15</td>
</tr>
<tr>
<td>10.5 Collaboration</td>
<td>Little collaboration discussed</td>
<td>Links with industry or higher education described</td>
<td>Collaborations justified with links to learning and project outcomes</td>
<td>/20</td>
</tr>
<tr>
<td>10.6 Learning outcomes</td>
<td>No real reflections discussed</td>
<td>Good explanation of some learning outcomes</td>
<td>A range of personal, life-long learning and career skills acquired and identified as project outcomes for a range of team members</td>
<td>/15</td>
</tr>
<tr>
<td>10.7 Future Career Aspirations &amp; Research</td>
<td>Little or no thought had been given to future career aspirations.</td>
<td>Evidence of some team members researching careers generally but no linkage to opportunities in Defence or Defence Industries.</td>
<td>It is evident that team members had thoughtfully considered their future career aspirations and undertaken research into how these might be linked with opportunities being offered in Defence Industries.</td>
<td>/15</td>
</tr>
<tr>
<td>10.8 Overall clarity</td>
<td>Several concepts lacked clarification</td>
<td>Clear and appropriate concept explanations</td>
<td>Everything presented was understood through excellent explanations</td>
<td>/5</td>
</tr>
</tbody>
</table>

**Content GRAND TOTAL** /95
### CRITERIA 11.1 & 11.2 – GRAND PRIX RACE & REACTION TIME SCORE CARD SAMPLE

#### SAMPLE GRAND PRIX RACE SPREADSHEET

<table>
<thead>
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<th>State and National Finals</th>
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<tbody>
<tr>
<td>REACTION LAUNCH RACING</td>
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<tr>
<td>Lane 1</td>
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<tr>
<td>Run 1</td>
</tr>
<tr>
<td>Team A</td>
</tr>
<tr>
<td>Team B</td>
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<tr>
<td>Team C</td>
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<tr>
<td>Team D</td>
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#### AUTOMATIC LAUNCH RACING

| Lane 1 | Lane 2 | Lane 3 | Lane 4 | Net Lap |
| Run 1 | Run 2 | Run 3 | Run 4 |         |
| Team A | 1.390 | 1.345 | 1.276 | 1.326 | 1.222 |
| Team B | 1.216 | 1.239 | 1.275 | 1.235 | 1.109 |
| Team C | 1.398 | 1.370 | 1.296 | 1.296 | 1.298 |
| Team D | 2.176 | 2.131 | 2.117 | 2.137 | 1.669 |

#### BEST NET LAP

| Team | Lane 1 | Lane 2 | Lane 3 | Lane 4 | Net Lap |
|      | Run 1 | Run 2 | Run 3 | Run 4 |         |
| Team A | 1.390 | 1.345 | 1.276 | 1.326 | 1.222 |
| Team B | 1.216 | 1.239 | 1.275 | 1.235 | 1.109 |
| Team C | 1.398 | 1.370 | 1.296 | 1.296 | 1.298 |
| Team D | 2.176 | 2.131 | 2.117 | 2.137 | 1.669 |

#### REACTION TIME

| Team | Time | Rank |
|      |      |      |
| Team A | 1.960 | 2 |
| Team B | 1.973 | 9 |
| Team C | 1.866 | 4 |
| Team D | 1.880 | 7 |

#### BEST GROSS LAP

| Team | Time | Rank |
|      |      |      |
| Team A | 1.527 | 2 |
| Team B | 1.730 | 8 |
| Team C | 1.296 | 4 |
| Team D | 1.513 | 7 |

#### GRAND PRIX

| Team | Time |
|      |      |
| Team A | 8 |
| Team B | 7 |
| Team C | 4 |
| Team D | 5 |

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**RACE 2018 version 1.0**

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V1.1 May 2019  
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### SAMPLE KNOCKOUT RACE SPREADSHEET

State and National Finals

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Race Automated Challenge Environment
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