



RE-ENGINEERING AUSTRALIA
FOUNDATION



National Sponsor

Australian Government
Department of Defence



COMPETITION REGULATIONS

2017/2018
Season
Version 1.2



*ZERO - Australia
Barker College, Sydney, NSW
2016 World Finals - 8th Outright*

www.rea.org.au

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ACKNOWLEDGEMENT

In preparing the F1 in Schools™ Australian Competition Rules, certain wording and images have been adopted from the World Final Competition Regulations.

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ALTERATIONS

Re-Engineering Australia Foundation Ltd. reserves the right to alter any specifications and documentation associated with the 'Challenge' without prior notice.



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PREFACE – SUMMARY OF MAIN REVISIONS FROM REVIEW OF 2016/2017 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 2016/2017 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 are identified within the document by using red underlined text. All changes made since the release of V1.0 will be in green underlined text.

These regulations will be valid for all 2017 State Finals and the 2018 National Final. Some changes may only be valid for National Finals.

ARTICLE C1 – DEFINITIONS

C1.19 Launch Energy Recovery System (LERS): Abolition of LERS device from the Australian National Competition at all levels.

ARTICLE C2 – GENERAL PRINCIPLES

C2.1.4 Returning World Final Teams: Updated wording to clarify eligibility pathway via Australian competition.

C2.1.4.5 Car Finishing Declaration Form: Updated wording to clarify required evidence.

C2.4.3.1 Team Uniforms – Development & Professional Class Teams: Updated wording to clarify permitted wearing of.

C2.6.5 Attending Judging Sessions: Updated wording for teachers to ensure all team members attending all judging activities.

C2.8 REA Corporate Logos, Word Marks & National Sponsorship: Minor change to heading title.

C2.8.1 REA Corporate Logos: Minor change to heading title.

C2.8.2 New F1 in Schools In Country Logo: New logo that teams **MUST** use in their project.

C2.8.3 Formula One® Word Mark Restrictions: Updated to include email in the list of restrictions.

C2.8.4 F1 in Schools™ Logo Restrictions: **New** clause regulating restricted use of F1 in Schools™ logo.

C2.8.5 F1 in Schools™ Word Mark: New clause regulating the permitted use of the F1 in Schools™ Word Mark.

C2.8.6 F1® Word Mark Permitted Use: **New** clause regulating the permitted use of the F1® Word Mark.

C2.9.2 Mandatory Project Elements Submitted at Event Check-in: Updated wording, reduction of number submitted and inclusion of tether line guides as part of Optional Replacement Components.

C2.10.1 Project Elements Detailed Information – Race Cars: Updated wording to reflect new identification of cars and explanation of new method of numbered sticker decals.

C2.10.6 Trade Display: Minor updated wording.

C2.10.8 Laptops for Judging: Minor word updating.

C2.11 Project elements to be retained by REA Foundation Ltd.: Minor updated wording.

ARTICLE C3 – COMPETITION AND JUDGING FORMAT

C3.10.1 Non-Compliance: Minor wording update

ARTICLE C4 – SPECIFICATIONS JUDGING

C4.1.2 What will be Assessed?: Minor wording update.

C4.1.3 Team Preparation: Minor wording update.

C4.2 Optional Replacement Components: Inclusion of Tether Line Guides as optional components and update to numbers submitted.

ARTICLE C5 – ENGINEERING JUDGING

No changes

ARTICLE C6 – POSTER JUDGING

No changes

ARTICLE C7 – PORTFOLIO JUDGING

No changes

ARTICLE C8 – MARKETING JUDGING

C8.1.4 Trade Display Shell Scheme Information: Reinforcement that NO Trestle Table provided to Development Class teams at the National Final.

ARTICLE C9 – VERBAL PRESENTATION JUDGING

No changes

ARTICLE C10 – RACING

- C10.1.7 Time Penalties: Minor word update to reflect identification of cars.
- C10.1.8 DNS Penalties: Formerly **Points** Penalties. Updated wording to reflect new conditions for repairs to cars during Car Servicing.
- C10.1.10 Safety Checks: Updated wording and DNS penalties for cars not meeting safety requirements.
- C10.1.13 False Start (FS): Updated wording to clarify False Starts procedure during Knockout Racing.
- C10.1.15 Car Mass Checks: Minor update to heading. Updated wording reflecting new arrangements for car mass loss of ≥ 0.1 grams.
- C10.3.1 Manual/Driver Launch: Updating wording clarifying shared driver arrangements.
- C10.3.3 Finish Line Management: Updated wording to clarify new finish line management.
- C10.3.4 Automatic Launch Race Procedure: **New** arrangements to automatic racing procedures.
- C10.3.5 Manual Launch Race Procedure: **New** arrangements to manual racing procedures.
- C10.3.6 Knockout Competition Procedure: **New** arrangements to knockout competition and racing procedures.
- C10.4.3 Knockout Racing: Minor wording update.

ARTICLE C11 – CAR SERVICING & REPAIRS

- C11.1 Car Servicing: **New** arrangements for Car Servicing.
- C11.1.5 Car Servicing Form: Updated wording to reflect new Car Servicing and mass loss (≥ 0.1 grams) arrangements.
- C11.2.1 Repairs After Racing: Formerly ‘Repairs During Racing’. Updated wording for new repair arrangements.
- C11.2.2 Penalty Free Repairs: Updated wording to reflect new repair arrangements.
- C11.2.3 Car Repair Penalties: **New** and updated wording to reflect DNS and ballast penalties during racing.
- C11.2.4 Repairs Deemed Unsafe: Update wording to reflect DNS penalties for repaired cars deemed to be unsafe.
- C11.3 Car Servicing Penalties: Clarification of ‘Lighter Configuration’ mass loss.

ARTICLE C12 – GRIEVANCES

- C12.1.1 Grievances – Specifications Compliance Related: Change of word from ‘will’ to ‘MAY’.

ARTICLE C13 – JUDGES

- C13.3.1 Specifications Judges: Minor wording update.

ARTICLE C14 – AWARDS

No changes

ARTICLE C15 - APPENDICES

- Appendix 1 - Awards Matrix: No Changes
- Appendix 2 - Development Class Trade Displays: Minor wording update.
- Appendix 3 - Development Class Portfolio Content Page Plan: No changes
- Appendix 4 - Professional Class Portfolio Content Page Plan: No changes
- Criteria 1 – Specifications Compliance Score Card: Updates reflecting changes to Technical Regulations
- Criteria 2 – Engineering: Computer Aided Design Score Card: No changes
- Criteria 3 – Engineering: Manufacturing Score Card: No changes
- Criteria 3 – Engineering: Manufacturing Score Card (Cadet Class): No changes
- Criteria 4 – Engineering: Design Process Score Card: No changes
- Criteria 4 – Engineering: Design Process Score Card (Cadet Class): No changes
- Criteria 5 – Portfolio: Team & Project Management Score Card: No changes
- Criteria 6 – Portfolio: Portfolio Design – Clarity & Quality Score Card: No changes
- Criteria 7 – Marketing: Branding Score Card: No changes
- Criteria 8 – Marketing: Trade Display Score Card: No changes
- Criteria 9 – Verbal Presentation: Presentation Technique Score Card: No changes
- Criteria 10 – Verbal Presentation: Content Score Card: No changes
- Criteria 11.1 & 11.2 – Grand Prix & Reaction Time Score Card Sample: No changes
- Criteria 11.3 – Knockout Race Score Card Sample: No changes

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 **Finals Information** 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 /Competition Documents 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™ **Teacher's Guide** and 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 ARTICLE 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 an international 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

[Eligibility]

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 '**Finals Information**' 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

[Eligibility]

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

[Eligibility]

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 an **international collaboration** with the maximum number of team members allowable being three (3). No affiliate or supporting team members will be permitted. The Australian In-Country Coordinator (ICC) will be responsible for identifying the overseas 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 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 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]

The level of funding awarded to World Final teams is subject to sponsorship obtained by REA and the division of this sponsorship will depend on the number of students and teams participating at this level. World Final teams **WILL** be required to provide and/or raise any additional sponsorship / funding required for travelling to and/or participating in the World Finals. Participation Fees are levied by the organisers of a World Final.

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.

C2.3.2.1 Cadet Class: 1 to 3 team members.

C2.3.2.2 Development: 3 to 5 team members.

C2.3.2.3 Professional: 3 to 5 team members.

C2.3.2.4 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 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**[Eligibility]**

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.

C2.3.10 Team Registration Conditions**[Eligibility]**

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.

C2.3.11 Team Membership Changes**[Eligibility]**

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.

C2.3.12 Changes to Team Classification**[Eligibility]**

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.

C2.3.13 Entered Cars**[Eligibility]**

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.)

C2.4 Competition Procedural Regulations**C2.4.1 Submitting Documentation****[Eligibility]**

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**[Eligibility]**

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)**[Eligibility]**

- One per student.
- Valid for the entire Australian Competition Season.
- Parent/Guardian signature required if student under 16 years.
- Must be printed, signed and emailed or faxed to REA one month prior to event start date

C2.4.1.3 Cadet Class Declaration Form**[Eligibility]**

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**[Eligibility]**

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]
	<ul style="list-style-type: none"> • 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 or video evidence <u>of team members finishing and assembling the car product throughout each step of the post manufacturing process</u>, otherwise penalties apply. See ARTICLE T3.2.2 in the Australian Technical Regulations. 	
C2.4.1.6	Grievance Form (all classes)	[Advice]
	<ul style="list-style-type: none"> • Provided to teams at Event Check-in. • Completed only if teams have a judging grievance. • MUST be submitted by the published deadline to the Event Director. • 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]
	<p>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.</p>	
C2.4.2.2	Submitting Project Elements	[Eligibility]
	<p>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.</p>	
C2.4.3	Team Uniforms	
C2.4.3.1	Development & Professional Class Teams	[Eligibility]
	<p>At State and National Finals, ONLY members of the official competing team are permitted to wear the team's uniform. <u>No teacher, relative or supporter of a team or team member is permitted to wear a Team Uniform at State or National Finals.</u></p>	
C2.4.3.2	Cadet Class Teams	[Eligibility]
	<p>Cadet Class teams MUST wear an official School Uniform.</p>	
C2.4.4	Collaboration Team Awards	[Advice]
	<p>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.</p>	
C2.5	Team responsibilities	
C2.5.1	Australian Technical Regulations	[Advice]
	<p>Teams MUST read the Australian Technical Regulations carefully to ensure their cars comply with those regulations.</p>	
C2.5.2	Australian Competition Regulations	[Advice]
	<p>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.</p>	
C2.5.3	Attendance at Schedule Activities	
C2.5.3.1	Team Representation Only	[Eligibility]
	<p>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 fix, racing and any direct communication with the Chair of Judges or Event/Competition Director concerning judging matters.</p>	

C2.5.3.2 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.

C2.5.4 Trade Display Security**[Advice]**

Security of a team's Trade Display and its elements is the team's responsibility during competition.

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.

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. This includes all CAD and CAM data, electronic Portfolio, Trade Display and graphical content.

C2.7.3 Documenting in Portfolio**[Advice]**

Aspects of any partnerships/collaborations **SHOULD** 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**[Advice]**

'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 Logos, Word Marks & National Sponsorship

C2.8.1 REA Corporate Logos

[Advice]

As indicated in the ARTICLES T1.24 and T3.4 of the Technical Regulations, teams must include the REA Foundation Ltd. corporate sponsor logos as a minimum on their race cars and optionally on identical display cars. There are strict conditions around using the F1 in Schools™ and Department of Defence logos. Branding guidelines for use of all corporate logos are available to download from the REA Foundation Ltd website and teams **MUST** be fully aware of the conditions outlined in these documents.

C2.8.2 New F1 in Schools™ In Country Logo

[Eligibility]

From 2017, teams **MUST** use the updated F1 in Schools™ Formula 1® STEM Challenge Logo with the IN-COUNTRY indicator. No other version of the logo is permitted. See below.



C2.8.3 Formula One® Word Mark Restrictions

[Eligibility]

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™ Logo Permitted Use

[Eligibility]

Use of the F1 in Schools™ 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 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

[Advice]

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 or text.

C2.8.6 F1® Word Mark Permitted Use

[Advice]

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 using as a heading or sub-heading. This symbol is NOT required if used as body or text.

C2.8.7 Department of Defence National Sponsorship

[Advice]

The Australian Government's Department of Defence has been the National Sponsor of F1 in Schools™ since 2008 and more recently SUBS in Schools since 2014. As the "National Sponsor of F1 in Schools™ and SUBS in Schools, the Department of Defence is already a sponsor of your team, so please **DO NOT** approach them for any further funding.

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

[Eligibility]

- 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

C2.9.2 Development and Professional Class Teams

[Eligibility]

- Two (2) complete and identical F1 in Schools™ cars.
- Optional Replacement Components that meet the criteria at C4.2.

- rear wing / support structure – maximum of one (1) (Professional Class only)
- front wing / support structure and / or nose cone – maximum of one (1)
- wheel / wheel support system – maximum of two (2) wheels and components
- tether line guides – maximum of one (1) car set (2 front and 2 rear if different)
- Four (4) printed A3 Portfolios containing a 3D render (front cover/1st page) and orthographic drawing (last page), bound or in presentation folders.
- Engineering Compliance Booklet containing separate A3 size printed engineering compliance drawing/s for specification & CAD judging and A3 size render (same render as on the Portfolio front cover) for CAD judging. Booklet must be bound when submitted.

C2.10 Project Judging Elements Detailed Information

C2.10.1 Race Car/s

C2.10.1.1 Cadet Class

[Advice]

Each Cadet Class team must produce one (1) F1 in Schools™ Car A complete with all corporate 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

[Advice]

Each Development and Professional Class team must produce a minimum three (3) identical F1 in Schools™ cars - Cars A & B complete with all corporate 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 C2.11.

C2.10.1.3 Checking Weight of Cars

[Advice]

Prior to submission, each team will be given the opportunity to check the weight of their cars on the official State or National Final scales. If either car being submitted is under legal weight, the team will be permitted to fix any issue in order that both cars can be submitted at a legal weight.

C2.10.1.4 Car Identification

[Advice]

The team will be required to identify Car A & B through the use of F1 in Schools™ sticker decals provided at Event Check-in. At this time, small 'dot' stickers (approximately 5mm in diameter) supplied by REA Foundation Ltd, will be adhered to the underside of each car by event staff. These stickers will be colour coded according to the class of competition and numbered for the identification of individual teams.

C2.10.1.5 Parc Ferme

[Advice]

Once cars have been submitted, they are considered as being in parc fermé and will not be released to teams for any reason other than for Critical Rule Rectification or Car Servicing, the timing of which will be strictly monitored.

C2.10.2 Portfolio

[Advice]

Each Development and Professional Class team must submit **four** (4) A3 sized, well written and presented 'hard copy' 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.

The Portfolio is limited to **12 PRINTED** pages for Development Class teams and **20 PRINTED** pages for Professional Class teams which includes the front cover. This can be presented as single or double sided printed sheets. If a Portfolio comprises more than the maximum allowable **PRINTED** pages, the Judges will only review the first 12/20 printed pages.

C2.10.3 Poster

[Advice]

Each Cadet Class team must submit one (1) A2 or two (2) A3 well written and presented 'hard copy' poster/s summarising the key elements of the Engineering Design Process. Note that the option of submitting 2 x A3 size pages does **NOT** mean one A3 poster duplicated.

C2.10.4 Orthographic Drawing/s**[Advice]**

A 3rd angle orthographic projection drawing, including plan, side and end elevations of the fully assembled car must be included as the last page in the Portfolio. These elements must be produced using CAD. The orthographic technical drawing should include dimensions and corresponding regulation numbers in order to illustrate regulation compliance. The team name and author must also be included in a title block.

At event check-in, teams must submit (as a minimum) a separate duplicate hard copy of the Orthographic Drawing appearing on the last page of their portfolio. Additional engineering drawings of their car assembly and parts may also be submitted if they wish these to be referenced by the engineering and specification Judges. These drawings must be on pages no larger than A3 in size and be bound or in a presentation folder clearly identified with the team name.

C2.10.5 3D Realistic Render

A separate, duplicate, hard copy of the 3D realistic render of the final car design appearing on the cover page of a team's portfolio must also be submitted at event check-in. This is to be bound with or included in the presentation folder of engineering drawings. Refer ARTICLE C2.10.4.

C2.10.6 Trade Display**[Advice]**

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.

C2.10.7 Verbal Presentation**[Advice]**

Teams will be required to deliver a verbal presentation in relation to their project to the Judges. The presentation must not last longer than eight (8) 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.

C2.10.8 Laptops for Judging**[Advice]**

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.

C2.10.8.1 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.

C2.10.8.2 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.

C2.10.9 Access to the Internet**[Advice]**

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.**[Eligibility]**

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 12/20-page printed 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

[Advice]

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

[Advice]

Teams will rotate around judging activities as per this judging schedule, with each rotation usually of between 20 – 30 minutes in duration.

C3.2.2 Judging Streams

[Advice]

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

[Advice]

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?

[Eligibility]

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

[Eligibility]

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

[Advice]

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
- Portfolio - Design
- Marketing – Branding and Trade Display
- Verbal Presentation
- Racing

C3.7 Point allocations

[Advice]

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.

State & National Final Points Allocation Table		
Specification	Dev. & Pro. Class	Cadet Class
Specification	80 points	80 points
Engineering	Dev. & Pro. Class	Cadet Class
CAD	65 points	N/A
Manufacturing	65 points	20 points
Design Process	70 points	40 points
Portfolio	Dev. & Pro. Class	Cadet Class
Project Management	60 points	N/A
Design	50 points	N/A
Marketing	Dev. & Pro. Class	Cadet Class
Branding	55 points	N/A
Trade Display	25 points	N/A
Verbal Presentation	Dev. & Pro. Class	Cadet Class
Technique	70 points	N/A
Content	100 points	N/A
Racing	Dev. & Pro. Class	Cadet Class
Grand Prix	150 points	60 points
Reaction Time	20 points	N/A
Knock-Out Racing	30 points	N/A
TOTAL	840 points	200 points

C3.8 Judging score cards

[Advice]

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

[Advice]

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 C3.6). 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

[Advice]

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 B** 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:

T3.4 / T3.5 / T3.6 / T3.7 / T3.10.1 / T4.1 / T4.2 / T4.5 / T4.7 / T6.3 / T6.9 / T6.14 /
T6.15 / T6.16 / T7.1 / T7.2.1 / T7.3 / T7.4 / T7.7 / T7.8 / T7.9 / T10.4 / T10.7

Note well: Article numbers are from the 2017 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 plus the optional replacement components 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**¹ and any optional replacement components 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 an electronic copy of all specified project data, specifications compliance engineering drawings which may all be referenced. Refer ARTICLE C2.9.

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 and optional replacement components 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 and optional replacement components are submitted at event check-in.

¹ Not applicable to the Cadet Class

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 C4.3.

C4.2 Optional Replacement Components²

Replacement components **MUST** be designed to be interchanged with existing components within 30 seconds. These replacement components are optional spares that have the ability to be switched with the equivalent fitted part. Teams will be required to prove the capability of the replacement components at the point of Project Element Submission.

They are limited to:

- rear wing / support structure – maximum of one (1) (Professional Class only)
- front wing / support structure and / or nose cone – maximum of one (1)
- wheel / wheel support system – maximum of two (2) wheels and components
- tether line guides – maximum of one (1) car set (2 front and 2 rear if different)

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

C4.3 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 12.

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.

² Not applicable for the Cadet Class

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 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 Section B of their 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 Portfolio. The assessment of the geometry and surface finish of the final product will be judged during a separate 'closed to teams' session.

C5.1.3.2 Engineering Design Process

Engineering Design Process will be judged from the information documented in the Cadet Class **Poster** or **Section B** of the Development and Professional Class teams' **Portfolio**. 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 (Portfolio last page – separate A3 copy)
- Rendering (Portfolio front cover – separate A3 copy)

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 when manufacturing their car body and other components, the technical merit as well as comparing the geometry and surface finish quality of the final product. 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/Form³

³ Cadet Class teams ONLY assessed for these KPIs

- Quality of Finished Product - Surface finish³

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
- Ideas³
- Development
- Analysis³
- Physical Testing
- Evaluation³
- Overall Design Technical Merit³

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 (110 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 a Portfolio as per ARTICLE 2.10.2. A team's Portfolio tells 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 Portfolio.

C7.1.3 Portfolio Structure

To streamline the judging of team Portfolios, teams **MUST** structure this as **ONE** document containing two distinct Sections with content as follows.

C7.1.3.1 Section A

- Project Management
- Marketing

C7.1.3.2 Section B

- Engineering Design Process

Section A and B **MUST** be clearly identifiable, perhaps discreetly via a header or footer. The section identification method is at the discretion of the team, as is the number of pages allocated to each section.

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

C7.1.4 Judging process / procedure

The Portfolio 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 Portfolio on their Trade Display at all times. Teams are required to submit several copies of their Portfolio 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]

C7.2 Key Criteria

C7.2.1 Project Management (60 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 criteria.

C7.2.1.1 What will be Assessed?

Project Management **MUST** be contained within **Section A** of each team's 12 page (Development Class) or 20 page (Professional Class) Portfolio in order to assess the following specific areas.

- Team Roles & Tasks
- Scope & Time Management
- Resource & Risk Management
- Internal Communication
- Stakeholder Engagement
- Evaluation

C7.2.2 Portfolio Design (50 points)

Refer to the Portfolio score card for detailed point scoring and key performance indicator information.

C7.2.2.1 What will be Assessed?

Judges will review each team's **entire** 12 page (Development Class) or 20 page (Professional Class) Portfolio 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 (80 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 a Portfolio as per ARTICLE 2.10.2 and a Trade Display as per ARTICLE 2.10.5. Some **Branding** elements **MUST** be contained within **Section A** of each team's 12 page (Development Class) or 20 page (Professional Class) 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 **Section A** of a team's 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 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.

C8.1.4 Trade Display Shell Scheme Information

At State and National Finals, REA Foundation Ltd. will provide each Professional Class team with a self-contained shell scheme exhibition style display space.

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**.

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 fascias.

C8.1.4.1 Nominal External Dimensions

- Shell Schemes: Nominally 2000mm long x 1000mm wide x 2400m high.
- Backboards: Nominally 2000mm long x 2400mm high.

C8.1.4.2 Internal Build Dimensions

Internal 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.

As such REA Foundation Ltd. strongly advise teams to build to maximum internal dimensions of:

- Shell Schemes: 1940mm long x 960mm wide x 2360mm high.

At State Finals, the maximum build for Development Class teams is:

- Backboards/Trestle Tables: 1800mm long x 750mm wide x 2400mm high.

C8.1.4.3 Trestle Tables

Approximately 1800mm long x 730mm high x 750mm wide and supplied to Development Class teams at State Final events **ONLY. NO** trestle tables will be supplied to teams at National Final events.

C8.1.5 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.

C8.1.6 Conditions

Teams must comply with the following conditions:

- Development Class Teams **MUST** adhere to restrictions regarding Trade Displays for State Finals. See APPENDIX 1.
- 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 sized 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 provided⁴. 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.

⁴ Not applicable to Development Class teams at State Finals

- 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.

C8.1.7 Trade Display Penalties

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

- DO NOT comply with Development Class restrictions [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]

Key Criteria

C8.1.8 Branding (55 points)

Refer to the Marketing score card for detailed point scoring and key performance indicator information.

C8.1.8.1 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
- Sponsorship ROI
- Team Uniform
- Team Presence
- Team Knowledge

C8.1.9 Trade Display (25 points)

Refer to the Marketing score card for detailed point scoring and key performance indicator information.

C8.1.9.1 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.

C8.1.9.2 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
- Structural Visual Design
- Structural Materials Design

C8.1.9.3 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 REA website at:
<http://rea.org.au/f1-in-schools/for-teams/competition-documents/>

ARTICLE C9 - VERBAL PRESENTATION JUDGING (170 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 8-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 8-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 C2.10.6. 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 (100 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
- 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 F1 in Schools™ Race System 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 this Race System.

C10.1.3 Official REA Foundation Ltd Race Track

At State and National Finals, REA Foundation Ltd. will use the official REA Foundation Ltd Elevated Race Track, the length of which is approximately 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 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 is unable to be repaired during the scheduled 10 minute car servicing allocated to each team, it will DNS any following races until it can be repaired in a subsequent scheduled car servicing session.

C10.1.9 Ballast

Cars presented underweight at event check-in will have ballast added for all runs at the rate of 2 grams applied for every gram underweight or part there-of. Ballast will also be added to cars that lose weight as per ARTICLE C10.1.15.

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 scheduled Car Servicing 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.

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 CO₂ 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 a race event. This is done to ensure each car remains within 0.1 gram of the registered check-in or critical regulation rectification adjusted mass for all races. If a car is judged to have gone under weight by more than 0.1 gram whilst stored in parc fermé, the judges in consultation with the team will add ballast in the form of one or more 0.1 gram stickers to return the car to the initial submitted or critical rectification adjusted 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.

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 C10.1.5). Once the race session is complete, a race marshall shall remove and inspect each car before it is released to the team member for car servicing.

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. The total time displayed on the start gate for each race is recorded for scoring purposes. The time trial 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 B WILL be used for Automatic Racing.
- iv Teams will decide which lanes Car A & B will race on.
- v All cars are weighed and ballast applied as per C10.1.15.
- vi 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.
- 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 places them at the designated Car Servicing location. At the conclusion of Car Servicing, cars are returned to track start for Race 3 & 4.
- xv Race 3 and Race 4 conducted as per above with cars placed in lanes opposite to the configuration used in Races 1 and 2.
- xvi At the conclusion of the second Car Servicing Session, cars are returned to Parc Ferme.

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. 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 WILL be used for Reaction Racing.
- iv Teams will decide which lanes Car A & B will race on.
- v All cars are weighed and ballast applied as per C10.1.15.
- vi 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.
- 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.
 - i Race Marshall presses the start system reset button – lights come on
 - ii When lights extinguish, driver presses trigger and car is launched.
- x Judge records TOTAL RACE TIME and REACTION 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 vii – xi.
- xiv Race Marshall at finish line removes cars from tether line and places them at the designated Car Servicing location. At the conclusion of Car Servicing, cars are returned to track start for Race 3 & 4.
- xv Race 3 & 4 driver can be inter-changed at this point.

- xvi Race 3 and Race 4 conducted as per above with cars placed in lanes opposite to the configuration used in Races 1 and 2.
- xvii At the conclusion of the second Car Servicing Session, cars are returned to Parc Ferme.

C10.3.6 Knock-out competition procedure

Teams will be issued the race seeding prior 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. 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 Teams will decide which lanes Car A & B will race on.
- iv All cars are weighed and ballast applied as per C10.1.15.
- 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
- iv When lights extinguish, driver presses trigger and car is launched.
- ix Judge records TOTAL RACE TIME displayed on start gate.
- x Race Marshall at finish line removes and disposes of used CO₂ cylinder.
- xi 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.
- xii Race 2, driver can be inter-changed at this point.
- xiii Race 2 conducted in opposing lane using same process as per vi – xi.
- xiv Race Marshall at finish line removes cars from tether line and places them at the designated Car Servicing location. At the conclusion of Car Servicing, cars are returned to track start and placed into Parc Ferme.
- xv In case of a tied result, a further 'sudden death' race will be conducted and teams will toss a coin for lane allocation.

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:

C10.4.1.1 Professional & Development Classes (150 points)

- **Regional Final Race Points** = $50 + (100 / (\text{Fastest Car Race Time} \times 0.30)) \times (\text{Fastest Car Race Time} \times 1.30 - \text{Team's Race Time})$
- **State Final Race Points** = $50 + (100 / (\text{Fastest Car Race Time} \times 0.20)) \times (\text{Fastest Car Race Time} \times 1.20 - \text{Team's Race Time})$
- **National Final Race Points** = $50 + (100 / (\text{Fastest Car Race Time} \times 0.15)) \times (\text{Fastest Car Race Time} \times 1.15 - \text{Team's Race Time})$

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)

- **Regional Final Race Points** = $20 + (40 / (\text{Fastest Car Race Time} \times 0.30)) \times (\text{Fastest Car Race Time} \times 1.30 - \text{Team's Race Time})$
- **State Final Race Points** = $20 + (40 / (\text{Fastest Car Race Time} \times 0.20)) \times (\text{Fastest Car Race Time} \times 1.20 - \text{Team's Race Time})$

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 Time⁵ (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:

Fastest Reaction Time	Points/Marks Awarded
< 0.141	20 points
0.140 ≤ time < 0.150	17 points
0.151 ≤ time < 0.160	15 points
0.161 ≤ time < 0.170	13 points
0.171 ≤ time < 0.180	11 points
0.181 ≤ time < 0.190	9 points
0.190 ≤ time < 0.200	7 points
>0.200	5 points

C10.4.3 Knockout Racing⁵ (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

⁵ Excludes Cadet Class teams

- 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 Draw for a field of 16 – State Finals

Round of 16	Quarter Final	Semi Final	Final	Winner
Rank 1				
16	..			
8		..		
12	..			
4			..	
13	..			
9		..		
5	..			
6				..
10	..			
14		..		
3	..			
7			..	
11	..			
15		..		
2	..			

C10.4.3.4 Sample Knockout Draw for a field of 8 – State or National Final

Round of 8	Semi Final	Final	Winner
Rank 1			
8	..		
5		..	
4	..		
6			..
3	..		
7		..	
2	..		

C10.4.3.5 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.

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

C10.4.3.6 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 SERVICING & REPAIRS

C11.1 Car Servicing

C11.1.1 Scheduled Servicing⁶

At State and National Final events, **Professional and Development Class** teams will be allocated **10 minutes** to perform penalty free maintenance on cars in the dedicated Car Servicing/Repair area. This will be permitted to occur immediately after the two sessions of automatic launch (time trial) racing and manual launch (reaction) racing as per the judging schedule.

C11.1.2 Dedicated Area

Car Servicing must only take place at the dedicated Car Servicing/Repair area. A maximum of two (2) team members and Judges are allowed to enter the car service area. Repairs will be managed and monitored by a designated Track Marshall. Teams **MUST** keep the area clean of glue, graphite powder, lubricants and rubbish.

C11.1.3 Team Tool Kits

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

C11.1.4 No Car Body Servicing

Maintenance and alterations can only be made to the front and rear wings, nose cone, tether line guides, wheels and wheel support systems. The car body **MUST NOT** be modified or substituted. Teams may only replace parts using the **approved** replacement components provided by teams at event check-in.

C11.1.5 Car Servicing Form

Teams are required to complete a Car Servicing form for each Car Servicing session which will be handed to the team at the commencement of servicing as per the judging schedule. Teams **MUST** declare all maintenance performed before signing the form and returning it and the car to the Track Marshall within the scheduled **10 minute** service time.

All serviced cars will be weighed and must be within 0.1 gram of its identified mass at the time of event check-in or Critical Regulation Rectification adjusted mass. Ballast in the form of 0.1 gram stickers will be applied by Track Marshalls where required.

C11.2 Car Repairs

C11.2.1 Repairs After Racing

Team members will be permitted to make repairs to a damaged car during car servicing immediately after each scheduled session of racing. These repairs will be managed and monitored by a designated Track Marshall.

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

C11.2.2 Penalty Free Repairs

All repairs **MUST** be completed within the dedicated Car Servicing/Repair Area with the car ready to race and handed to the Car Servicing Judge within **10 minutes**.

C11.2.3 Car Repair Penalties

- If a car is NOT repaired during the 10-minute car servicing, it will DNS the following scheduled race/s until it can be repaired in a subsequent scheduled car service.
- A repaired car will be weighed and must be within 0.1 gram of its identified mass at the time of event check-in or Critical Regulation Rectification adjusted mass. Ballast in the form of 0.1 gram stickers will be applied by Track Marshalls where required.

C11.2.4 Repairs Deemed Unsafe

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 scheduled car service.

⁶ Excludes Cadet Class teams

C11.3 Car Servicing Penalties

- Car Body Servicing/Non approved replacement parts
- Lighter Configuration **≥ 0.1 gram**

[Eligibility]
[Ballast]

ARTICLE C12 - GRIEVANCES

C12.1 Procedure

C12.1.1 Specifications Compliance Related

1. Following the Specifications Compliance judging and prior to the commencement of racing, teams found to have failed any **critical regulations** will be handed a form listing all infringements.
 - a. This form **MAY 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.
2. 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**. Students will need to complete the form provided and hand it back to the supervising Scrutineer within the allocated 20 minutes.
3. Scrutineers will then recheck the car for compliance and advise team of outcome before or during their Specifications Compliance Feedback interview.
4. During the scheduled Specifications Compliance Feedback interviews, teams will be notified of ALL non-compliance issues for both critical and non-critical regulations as per ARTICLE C4.1.4.3.
5. Should a team be dissatisfied with the decision of the Lead Scrutineer, an appeal **MAY** be submitted in writing within two (2) hours of the conclusion of Specifications Compliance Feedback interviews using the official Grievance Form provided to teams in their Check-in pack. Refer ARTICLE C2.4.1.6. The grievance is to be handed to the Event Director, whereupon it will be registered and handed to the Chair of Judges.
6. 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 time and date stated in the event supplementary regulations using the form provided in the team check-in pack.

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 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 servicing Judges

Car Servicing 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 Dinner 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 as well as 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.

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. 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 AWARD⁷

The team with fastest race time and scoring 150pts in:
Criteria 11.1: Racing/Grand Prix Racing.

FASTEAST LAP AWARD

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

BEST REACTION TIME AWARD⁷

The team with the quickest reaction launch time from:
Criteria 11.2: Racing/Grand Prix Racing

KNOCKOUT CHAMPIONS AWARD⁷

The team with the fastest gross time in the last round of:
Criteria 11.3: Racing/Knockout Racing

BEST ENGINEERED AWARD⁸

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

⁷ No perpetual trophy exists for these awards at a National Final.

⁸ Winner of these awards must comply with all Critical Regulations as outlined in C310.1

BEST ENGINEERING CAD AWARD⁸***Team with highest score for:****Criteria 2: Engineering/Computer Aided Design (CAD)***BEST MANUFACTURED CAR AWARD⁷⁸*****Team with highest score for:****Criteria 3: Engineering/Manufacturing***BEST TEAM PORTFOLIO AWARD⁷*****Team with highest combined score for:****Criteria 4: Engineering Design Process**Criteria 5: Portfolio/Project Management**Criteria 6: Portfolio/Portfolio Design***BEST MANAGED ENTERPRISE AWARD⁷*****Team with highest score for:****Criteria 5: Portfolio/Project Management***BEST GRAPHIC DESIGN AWARD⁷*****Team with highest combined score for:****Criteria 6: Portfolio/Portfolio Design**Criteria 7: Marketing/Branding**Criteria 8.1, 8.2, 8.3 & 8.4: Marketing/Trade Display***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 PRESENTATION⁷*****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 AWARD⁷*****Team with highest score for:****Criteria 10.3 & 10.4: Verbal Presentation/Content***MOST ENERGY EFFICIENT DESIGN AWARD⁷***Team with best result from Aerodynamic Testing of Car
(National Final only)***ENCOURAGEMENT AWARD⁷***Discretion of the Chair of Judges***3RD PLACE⁷***Team with the third highest scoring sum of all marking criteria
(National Final only)***2ND PLACE⁷***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

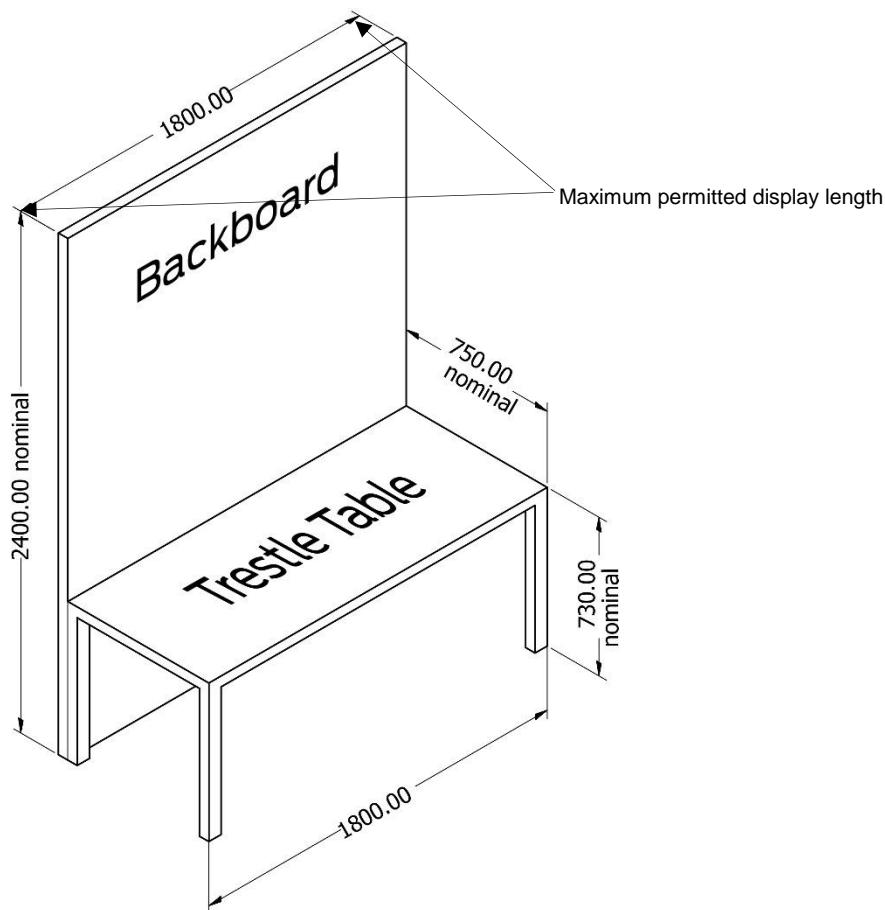
ARTICLE C15 - APPENDICES...

1. Awards Matrix
2. Development Class Trade Displays
3. Portfolio Content Plan
4. Score Cards

1. AWARDS MATRIX

Judging Category	Judging Category	Criteria	Professional & Development Class Awards								Cadet Class Awards										
			Champions	2nd Place	3rd Place	Best Engineered	Best Engineering CAD	Best Manufactured Car	Fastest Lap	Grand Prix Race	Best Reaction Time	Knockout Champions	Best Managed Enterprise	Best Team Portfolio	Best Graphic Design	Best Team Marketing	Best Team Verbal Presentation	Outstanding Industry Collaboration	Innovation	Champions	Best Engineered Car
Engineering	Specifications	1 Specifications																			
Engineering	Computer Aided Design	2.1 Application of CAD																			
		2.2 CAD Organisation																			
		2.3 CAD Based Analysis																			
		2.4 Overall CAD Technical Merit																			
		2.5 CAD Model v's Finished Product																			
		2.6 Orthographic																			
		2.7 Rendering																			
Engineering	Manufacturing	3.1 Application of CAD/CAM																			
		3.2 Manufacturing Process Car Body																			
		3.3 Manufacturing Process Other Components																			
		3.4 Tolerancing/Quality Control																			
		3.5 Manufacturing Technical Merit																			
		3.6 Quality of Finished Product - Geometry/Form																			
		3.7 Quality of Finished Product - Surface Finish																			
Engineering	Design Process	4.1 Requirements Analysis																			
		4.2 Ideas																			
		4.3 Development																			
		4.4 Analysis																			
		4.5 Physical Testing																			
		4.6 Evaluation																			
		4.7 Overall Design Technical Merit																			
Portfolio	Project Management	5.1 Team Roles & Tasks																			
		5.2 Scope & Time Management																			
		5.3 Resource & Risk Management																			
		5.4 Internal Communications																			
		5.5 Stakeholder Engagement																			
		5.6 Evaluation																			
		6.1 Production Quality of Materials																			
Portfolio	Portfolio Design	6.2 Production Quality of Content																			
		6.3 Content Organisation																			
		6.4 Layout Design																			
		6.5 Typography																			
		6.6 Photos & Images																			
		6.7 Creative Graphics																			
		6.8 Editing/Proofreading																			
Marketing	Branding	6.9 Referencing/Plagiarism																			
		6.10 Writing & Readability																			
		7.1 Team Name																			
		7.2 Logo Development																			
		7.3 Final Logo Design																			
		7.4 Logo Application																			
		7.5 Team Branding																			
Marketing	Trade Display	7.6 Media Exposure																			
		7.7 Sponsorship ROI																			
		7.8 Team Uniform																			
		7.9 Team Presence																			
		7.1 Team Knowledge																			
		8.1 Car Display																			
		8.2 Information Design																			
Verbal Presentation	Technique	8.3 Use of ICT's																			
		8.4 Structural Visual Design																			
		8.5 Structural Materials Design																			
		9.1 Presentation Energy																			
		9.2 Team Contribution																			
		9.3 Visual Aids																			
		9.4 Audience Engagement																			
Verbal Presentation	Content	9.5 Articulation																			
		9.6 Structure																			
		9.7 Use of Time																			
		10.1 Team Objectives																			
		10.2 Description of Car Product																			
		10.3 Innovation																			
		10.4 Refinement																			
Racing	Racing	10.5 Collaboration																			
		10.6 Learning Outcomes																			
		10.6 Overall Clarity																			
		11.1 Automatic Launch																			
		11.2 Manual Launch																			
		11.3 Reaction Time																			
		11.4 Knockout Race																			

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 an REA supplied trestle table at **State Final** events with nominal dimensions of 1800mm (L) x 750m (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 should **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. DEVELOPMENT CLASS PORTFOLIO CONTENT PAGE PLAN

Development Portfolio Page Content Plan *A sample of content organisation of required assessment*

Section A

Cover:*
Rendering (B), Name & Logo (A)

Project Management

Team Mgt: Roles, Responsibilities, Scope	Time, Finance, Risk Comms, Mgt Tools / Methods
**	*

Marketing & Skill Development

Stakeholder ROI Plan & Community Activity / PR
**

Team Logo and Branding, Uniform and Display

Collaboration/ Mentoring Innovation
**

Section B

Engineering Design Process & Engineering Drawings

Car Design Requirements & Research	Car Design Ideas
***	***

Car Design Development & Analysis	Car Manufacturing
***	***

Car Design Physical Testing and Evaluation	Ortho Drawing
***	**

This page content plan is a guide. Students are to prioritise and organise their content to best reflect and communicate their unique message, ensuring it is complete and meets all criteria. Teams must comply with C7.1.3.

** Components of the Cover are critical to both A & B sections.*

Pink – Portfolio content assessed in Portfolio criteria

Blue – Portfolio content assessed in Booth criteria

Red – Portfolio content assessed in Engineering criteria

White – Assessed in Marketing criteria

Green - Not Assessed in portfolio, but this content documents the project breadth, and may be used as evidence to support other awards such as the Innovation Award (WF, National) Collaboration Award (National) and potentially others.

4. PROFESSIONAL CLASS PORTFOLIO CONTENT PAGE PLAN:

Professional Portfolio Page Content Plan *A sample of content organisation of required assessment*

Section A

Project Management

Cover:*	Team Mgt: Roles, Responsibilities, Interaction	Project Scope & Time Management Tools / Methods	Team Finances/ Risk Management Tools/Methods	Communication Tools/Methods
Rendering (B), Name & Logo (A) ***	**	*	*	*

Marketing & Skill Development

Team Stakeholder ROI Plan & Activity **	Team Community Activity/ PR and Social Media *	Team Logo and Branding **	Uniform and Display Design *	Industry Collaboration/ Mentoring **	Innovation **
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Section B

Engineering Design Process & Engineering Drawings

Car Design Requirements & Research ***	Car Design Ideas ***	Car Design Development ***	Car Design Analysis ***	Car Manufacturing ***	Car Manufacturing ***
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Car Design Physical Testing ***	Car Process Evaluation ***	Ortho Drawing **
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This page content plan is a guide. Students are to prioritise and organise their content to best reflect and communicate their unique message, ensuring it is complete and meets all criteria. Teams must comply with C7.1.3.

** Components of the Cover are critical to both A & B sections.*

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Red – Portfolio content assessed in Engineering criteria

White – Assessed in Marketing criteria

Green – Aspects not assessed in portfolio, but this content documents the project breadth, and may be used as evidence to support other awards such as the Innovation Award (WF, National) Collaboration Award (National) and potentially others.

CRITERIA 1 - SPECIFICATION SCORE CARD (1 OF 4)

For clarification on individual regulations, refer to the 2017 Australian Technical Regulations.

Regulation	Regulation Overview	Min/Max Quick Guide	Penalty	Car A	Car B	Judge 1	Judge 2	Deduction	Remarks	Rectification
ARTICLE T2 – GENERAL PRINCIPLES									Pass/Fail	
T2.4	Safe Construction	Visual Check	-10							
ARTICLE T3 – GENERAL CAR REGULATIONS									Pass/Fail	
T3.1.1	Designed and engineered using CAD / CAM	Check Portfolio	-10							
T3.1.2	Body manufactured using CNC only.	Check Portfolio	-10							
T3.1.3	Car A & B - Identical Components	Visual Check	-10							
T3.1.4	Mirrored Side or Top/Bottom Machining with 6mm cutter	Visual Check	-10						DC Only	
T3.1.5	Mirrored Side Machining with 6mm cutter	Visual Check	-10						CC Only	
T3.1.7	No separately formed balsa/foam parts	Check Drawings	-10						CC Only	
T3.1.8	Balsa/Foam default material for all non-rotating parts	Visual Check	-10						CC Only	
T3.2.1	Leading Features Min Width – Foremost Extremity (FE)	3mm or R1.5mm	-4							
T3.2.2	Leading Features Min Width – 6mm back from FE	6mm	-4							
T3.3.3	Hand Finishing permitted. Max variation to CAD Model.	3mm	-10							
T3.3.4	Hand Created Features – not permitted	Visual Check	10							
T3.4.2	REA Corporate Logo Decals (REA, F1, Autodesk, Jetta)	Visual Check	-2 ea							
T3.4.3.1	REA Corporate Logo Decals Minimum Dimensions	30mm x 15mm	-2 ea							
T3.4.3.2	Positioning of F1iS A & B Decals on Side Pods	Visual Check	-2 ea							
T3.4.3.2	Positioning of other Corp. Decals visible in top or side view	Visual Check	-2 ea							
T3.5	Undefined features	Check T1.6	-4							
T3.6	Centre of gravity remains between the axles	Visual Check	-4							
T3.7	Overall length	Min:170mm Max:210mm	-4							
T3.8	Width	Min: 60mm	-4							
T3.9	Total mass (Pro & Dev / Cad)	Min: 52g / 55g	-4							
T3.10	Track clearance	Min: 2mm	-4							
T3.11.1	Balsa or foam for all non-rotating components	Visual & Drawing Check	-4							
T3.11.2	Balsa/Foam Thickness	Min 3mm	-1							
T3.12	Status during racing – no parts removed/added for racing	Visual check	-2							
T3.13	Replacement Components – identical to those fitted	Visual check	N/A							

CRITERIA 1 - SPECIFICATION SCORE CARD (2 OF 4)

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

Regulation	Regulation Overview	Min/Max Quick Guide	Penalty	Car A	Car B	Judge 1	Judge 2	Deduction	Remarks	Rectification
ARTICLE T4 – BODY & SIDE POD RULES									Pass/Fail	Pass/Fail
T4.1	Body construction – single continuous balsa/foam between axles	Visual & Drawing Check	-4							
T4.2	Implants, foreign objects & voids not permitted	Visual & Drawing Check	-4							
T4.3	Width of side pod	Min 50mm	-1							
T4.4	Side pod projected surface	Min 30mm x 15mm	-1							
T4.5	Virtual cargo – between centre line of front & rear axles	T4.5	-4							
T4.6	Virtual cargo identification on Engineering Drawings	Check Drawings	-2							
T4.7	Exclusion zones behind front wheels	Min 15mm	-4							
ARTICLE T5 – NOSECONE RULES									Pass/Fail	Pass/Fail
T5.1	Nosecone/parts metallic material prohibited	Visual & Drawing Check	-10						PC & DC Only	
T5.2	Nose cone non-metallic material not behind front axle centre line	Visual & Drawing Check	-1							
ARTICLE T6 – WING RULES									Pass/Fail	Pass/Fail
T6.1	Top surfaces must be 100% visible	Visual Check	-1							
T6.2	Wing surfaces clearly identified in Engineering Drawings	Drawing Check	-1							
T6.3.1	Front wing clear airspace	Min 3mm	-4							
T6.3.2	Rear wing clear airspace	Min 3mm	-4							
T6.4	Front wing/support structure in front of centre line of axle	Visual Check	-1							
T6.5	Wing construction must remain rigid during racing	Visual Check	-2							
T6.6	Visibility of front wing unobstructed viewed from front	Visual Check	-1							
T6.7	Front wing/support structure-no-metallic material	Visual & Drawing Check	-10						PC & DC Only	
T6.8	Front wing/support structure-connect with nosecone only	Visual & Drawing Check	-1							
T6.9.1	Front wing span	Balsa/Foam: Min 34mm Other: Min 40mm	-4							
T6.9.2	Rear wing span	Balsa/Foam: Min 34mm Other: Min 40mm	-4							

CRITERIA 1 - SPECIFICATION SCORE CARD (3 OF 4)

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

Regulation	Regulation Overview	Min/Max Quick Guide	Penalty	Car A	Car B	Judge 1	Judge 2	Deduction	Remarks	Rectification
ARTICLE T6 – WING RULES continued									Pass/Fail	Pass/Fail
T6.11.1	Front wing chord	Min 15mm	-2							
T6.11.2	Rear wing chord	Min 15mm	-2							
T6.12.1	Front wing thickness	Balsa/Foam: Min 3.5mm Max: 9mm Other: Min 1.5mm Max 9mm	-2							
T6.12.2	Rear wing thickness	Balsa/Foam: Min 3.5mm Max: 9mm Other: Min 1.5mm Max 9mm	-2							
T6.13	Rear wing positioning behind centre line of rear axle	Visual Check	-1							
T6.14	Rear wing height measured normal to bottom surface	> 34mm	-4							
T6.15	Rear wing must be made of balsa	Visual & Drawing Check	-4						DC Only	
T6.16	Rear wing non-metallic support structure behind rear axle centre line	Check Drawings	-4						PC Only	
ARTICLE T7 – WHEEL RULES									Pass/Fail	Pass/Fail
T7.1	Number and location, common shared centreline	4, 2 x2	-4							
T7.2.1	Combination of four unmodified REA standard wheels	Visual Check	-4						CC & DC Only	
T7.3.1	Team manufactured wheels – front wheel diameter	Min 26mm	-4						PC Only	
T7.3.2	Team manufactured wheels – rear wheel diameter	Min 26mm	-4						PC Only	
T7.4.1	Track contact width – front wheel	Min 15mm	-4							
T4.4.2	Track contact width – rear wheel	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							

CRITERIA 1 - SPECIFICATION SCORE CARD (4 OF 4)

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

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

LEGEND Eligibility Regulations/Possible Disqualification Critical Regulations/Time Penalty

CC = Cadet Class

DC = Development Class

PC = Professional Class

CRITERIA 2 - ENGINEERING: COMPUTER AIDED DESIGN SCORE CARD

JUDGING SUB CATEGORY	COMPUTER AIDED DESIGN	TEAM ID	[TEAM ID]
PRIMARY EVIDENCE	TEAM INTERVIEW	TEAM NAME	[TEAM NAME]
SECONDARY EVIDENCE	MODELLING ON TEAM COMPUTER	SCHOOL	[SCHOOL NAME]
CRITERIA	2	COMPETITION CLASS	[COMPETITION CLASS]

Criteria	Low	Developing	Advanced	Score
	0 1 0 1 2	2 3 3 4 5 6	4 5 7 8 9 10	/5 /10
<u>2.1</u> Application of CAD	Basic understanding and application of CAD	Good understanding and application of CAD	Advanced understanding and application of CAD throughout.	/10
<u>2.2</u> CAD Organisation	Generally disorganised	Satisfactory organisation of data and models	Data & parts highly ordered & linked. Full CAD product assembly	/10
<u>2.3</u> CAD Based Analysis	Minimal analysis shown	Good analysis. Results applied to development	Variety of advanced and relevant analysis techniques conducted	/10
<u>2.4</u> Overall CAD Technical Merit	Basic CAD design with little technical merit	Developed CAD design with some technical merit	Original & clever developed CAD design with excellent technical merit	/5
<u>2.5</u> CAD Model vs Finished Product	Basic Similarity	Good Similarity	Excellent Similarity	/10
<u>2.6</u> Orthographic (last page of portfolio)	Basic drawing	Good technical drawing	High detail & includes spec dimensions.	/10
<u>2.7</u> Rendering (on portfolio cover)	Basic rendering on cover	Realistic rendering on cover	Photorealistic render on cover	/10
GRAND TOTAL				/65

CRITERIA 3 - ENGINEERING: MANUFACTURING SCORE CARD

JUDGING SUB CATEGORY	MANUFACTURING	TEAM ID	[TEAM ID]
PRIMARY EVIDENCE	TEAM INTERVIEW	TEAM NAME	[TEAM NAME]
SECONDARY EVIDENCE	TEAM PORTFOLIO: SECTION B	SCHOOL	[SCHOOL NAME]
CRITERIA	3	COMPETITION CLASS	[COMPETITION CLASS]

Criteria	Low	Developing	Advanced	Score
	0 1 0 1 2	2 3 3 4 5 6	4 5 7 8 9 10	/5 /10
3.1 Application of CAM / CNC	Minimal evidence of CNC understanding	Effective use and understanding of CNC machining processes used	High level of CNC machining competence. Appropriately complex techniques and processes used to achieve manufacturing goal	/10
3.2 Manufacturing process car body	Little manufacturing details	Manufacturing processes and some issues presented	Detailed assessment of all manufacturing, stages, materials & issues	/10
3.3 Manufacturing process other components	Little manufacturing details	Manufacturing processes and some issues presented	Detailed assessment of all manufacturing, stages, materials & issues	/10
3.4 Tolerancing / Quality Control	Little consideration of tolerancing and quality control	Good consideration of tolerancing and quality control	Excellent consideration of tolerancing and quality control	/10
3.5 Overall Manufacturing Technical Merit	Basic manufacturing with little technical merit	Good manufacturing with technical merit	Original & clever manufacturing processes with excellent technical merit	/5
3.6 Quality of Finished Product - Geometry/Form	Reasonable form with some inconsistencies	Good overall form and assembly with attention to detail	Exceptional attention to detail across all aspects of form. Two cars are identical.	/10
3.7 Quality of Finished Product - Surface finish	Reasonable finish with some inconsistencies	Good overall finish quality with attention to detail	Showcase finish quality. Exceptional attention to detail. Two cars are identical.	/10
GRAND TOTAL				/65

CRITERIA 3 - ENGINEERING: MANUFACTURING SCORE CARD (CADET CLASS)

JUDGING SUB CATEGORY	MANUFACTURING	TEAM ID	[TEAM ID]
PRIMARY EVIDENCE	EXAMINATION OF CAR IN PARC FERME	TEAM NAME	[TEAM NAME]
SECONDARY EVIDENCE	NIL	SCHOOL	[SCHOOL NAME]
CRITERIA	3	COMPETITION CLASS	[COMPETITION CLASS]

	Low	Developing	Advanced	Score
Criteria	0 1 2	3 4 5 6	7 8 9 10	/10
<u>3.8</u> Quality of Finished Product - Geometry/Form	Reasonable form with some inconsistencies	Good overall form and assembly with attention to detail	Exceptional attention to detail across all aspects of form.	/10
<u>3.9</u> Quality of Finished Product - Surface finish	Reasonable finish with some inconsistencies	Good overall finish quality with attention to detail	Showcase finish quality. Exceptional attention to detail.	/10
GRAND TOTAL				/20

CRITERIA 4 - ENGINEERING: DESIGN PROCESS SCORE CARD

JUDGING SUB CATEGORY	ENGINEERING DESIGN PROCESS	TEAM ID	[TEAM ID]
PRIMARY EVIDENCE	TEAM PORTFOLIO: SECTION B	TEAM NAME	[TEAM NAME]
SECONDARY EVIDENCE		SCHOOL	[SCHOOL NAME]
CRITERIA	4	COMPETITION CLASS	[COMPETITION CLASS]

	Low	Developing	Advanced	Score
Criteria	0 1 2	3 4 5 6	7 8 9 10	/10
4.1 Requirements Analysis	Limited development of objectives	Good development of objectives	Excellent statement of objectives supported by research	/10
4.2 Ideas	Single or basic concepts	Multiple concepts with links to research.	Several technically inspired ideas for different car features/functions	/10
4.3 Development	Limited development shown	Logical design developments explained	Clearly justified developments based around research and testing	/10
4.4 Analysis	Little evidence of analysis	Analysis which is relevant and results documented	Quality analysis methodologies. Accurate results and data linked to design revisions. Advanced use of CFD and other design tools.	/10
4.5 Physical Testing	Little evidence of testing	Tests which are relevant with results documented	Quality experimental methodologies. Accurate results linked to design revisions.	/10
4.6 Evaluation	No or limited evaluation	Evaluations at different stages	Excellent ongoing evaluations linked to improvement actions	/10
4.7 Overall Design Technical Merit	Basic design process with little technical merit	Developed design process with some technical merit	Original & clever developed design process with excellent technical merit	/10
GRAND TOTAL				/70

CRITERIA 4 - ENGINEERING: DESIGN PROCESS SCORE CARD (CADET CLASS)

JUDGING SUB CATEGORY	ENGINEERING DESIGN PROCESS	TEAM ID	[TEAM ID]
PRIMARY EVIDENCE	TEAM POSTER	TEAM NAME	[TEAM NAME]
SECONDARY EVIDENCE		SCHOOL	[SCHOOL NAME]
CRITERIA	4	COMPETITION CLASS	[COMPETITION CLASS]

	Low	Developing	Advanced	Score
Criteria	0 1 2	3 4 5 6	7 8 9 10	/10
4.2 Ideas	Single or basic concepts	Multiple concepts with links to research.	Several technically inspired ideas for different car features/functions	/10
4.4 Analysis	Little evidence of analysis	Analysis which is relevant and results documented	Quality analysis methodologies. Accurate results and data linked to design revisions. Advanced use of CFD and other design tools.	/10
4.6 Evaluation	No or limited evaluation	Evaluations at different stages	Excellent ongoing evaluations linked to improvement actions	/10
4.7 Overall Design Technical Merit	Basic design process with little technical merit	Developed design process with some technical merit	Original & clever developed design process with excellent technical merit	/10
			GRAND TOTAL	/40

CRITERIA 5 - PORTFOLIO: TEAM & PROJECT MANAGEMENT SCORE CARD

JUDGING SUB CATEGORY	TEAM & PROJECT MANAGEMENT	TEAM ID	[TEAM ID]
PRIMARY EVIDENCE	TEAM PORTFOLIO: SECTION A	TEAM NAME	[TEAM NAME]
SECONDARY EVIDENCE		SCHOOL	[SCHOOL NAME]
CRITERIA	5	COMPETITION CLASS	[COMPETITION CLASS]

	Low	Developing	Advanced	Score
Criteria	0 1 2	3 4 5 6	7 8 9 10	/10
5.1 Team Roles & Tasks	Limited understanding of roles and responsibilities	Team roles and responsibilities identified	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	/10
5.2 Scope & Time Management	Limited understanding of scope or evidence of time management	Some planning used to guide progress of project goals and stay on task.	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	/10
5.3 Resource & Risk Management	Limited budgeting or risk awareness	Some resources identified, budgeting and contingency plans	Excellent resource management, understanding of budget control and evidence of financial accounting methods. Reasonable contingency plan and risk assessment prepared and/or undertaken.	/10
5.4 Internal Communication	Limited team communication	Basic team communication processes discussed.	Excellent use of multiple communication tools and methods for effective team planning and accountability.	/10
5.5 Stakeholder Engagement	Limited stakeholder engagement	Basic understanding and application of stakeholder engagement	Excellent understanding and application of initiating and maintaining stakeholder engagement with collaborators, sponsors, mentors and supporters using multiple tools and methods.	/10
5.6 Evaluation	Limited evaluation	Some evaluation applied	Evaluation processes applied throughout the management of key deliverables.	/10
				GRAND TOTAL /60

CRITERIA 6 - PORTFOLIO: PORTFOLIO DESIGN - CLARITY & QUALITY SCORE CARD

JUDGING SUB CATEGORY	CLARITY & QUALITY	TEAM ID	[TEAM ID]
PRIMARY EVIDENCE	TEAM PORTFOLIO: SECTION A & B	TEAM NAME	[TEAM NAME]
SECONDARY EVIDENCE		SCHOOL	[SCHOOL NAME]
CRITERIA	6	COMPETITION CLASS	[COMPETITION CLASS]

Criteria	Low	Developing	Advanced	Score
6.1 Production Quality of Materials	0 1	2 3	4 5	/5
6.2 Production Quality of Content	Poor quality	Basic printing and binding.	Quality printed document on quality paper in appropriately durable binding	/5
6.3 Content Organisation	Missing documentation	Basic documentation provided.	Correct number of pages. All required documentation included and professionally presented. Car rendering and team logo on cover page in keeping with branding.	/5
6.4 Layout Design	Disorganised content	Some content organisation	Highly organised and managed portfolio content with logical structure and flow of information.	/5
6.5 Typography	Distracting imperfections weaken the work	Some layout design format attempted.	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.	/5
6.6 Photos & Images	Font choices distracting or weaken the work	Some consideration for type treatment.	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.	/5
6.7 Creative Graphics (Visual effects and infographics)	Poor quality or use of images. No captioning.	Basic quality and use of images. Some reasonably concise captioning.	Justified use of excellent, un-pixelated, clear, undistorted photos and images that are concisely and accurately captioned. Properly sized, coloured and integrated with text to illustrate key messages. Considers branding.	/5
6.8 Editing/Proofreading	Poor graphics and/or execution. No captioning.	Graphics attempted with some success. Some reasonably concise captioning.	Justified, well executed and placed, un-pixelated, undistorted graphics that are concisely and accurately captioned. Consistent use of colour/ tones/ shapes, without visual overload, in keeping with branding.	/5
6.9 Referencing/Plagiarism	Error ridden. Poor attempt at proofreading.	Good attempt with additional editing required for clarity.	No errors detected in text and graphics	/5
6.10 Writing & Readability	Obvious failures in referencing.	Some attempt at referencing. Some errors evident.	No detected plagiarism with excellent use of referencing for author's written word, graphics/photos and video sources etc.	/5
C7.1.5 Portfolio Penalties: 10-point penalty each (✓ all that apply)			Design Clarity & Quality SUB TOTAL	/50

DO NOT submit the correct number of copies required for judging	<input type="checkbox"/>	Design Clarity & Quality GRAND TOTAL (with penalties deducted)	/50
DO NOT structure their Portfolio as per C7.1.3	<input type="checkbox"/>		
DO NOT provide copies in the mandated A3 size	<input type="checkbox"/>		

CRITERIA 7 - MARKETING: BRANDING SCORE CARD

JUDGING SUB CATEGORY	BRANDING	TEAM ID	[TEAM ID]
PRIMARY EVIDENCE	TEAM INTERVIEW AT TRADE DISPLAY	TEAM NAME	[TEAM NAME]
SECONDARY EVIDENCE	TEAM PORTFOLIO: SECTION A	SCHOOL	[SCHOOL NAME]
CRITERIA	7	COMPETITION CLASS	[COMPETITION CLASS]

Criteria	Low 0 1 1 2	Developing 2 3 4 5 6	Advanced 4.5 7 8 9 10	Score /5 /10
<u>7.1</u> Team Name	Irrelevant choice	Limited consideration of meaning	Well considered, meaningful team name appropriate to goals and image projection.	/5
<u>7.2</u> Logo Development	Limited ideas & development. No original work evident	Some logo idea progression & creative logo modification of type or graphics noted.	A number of logo ideas considered with attention to team goals and identity. Creative & original logo development clearly relates to the team's chosen name, identity and purpose.	/5
<u>7.3</u> Final Logo Design	Team logo is absent or confusing.	Logo message is simple and obvious.	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.	/5
<u>7.4</u> Logo Application	Poor quality reproduction, limited team logo badging.	Most items are badged with team logo. Team logo quality diminished when enlarged or reduced across applications.	Team logo scales well to large and small badging applications. All applications are of high quality and appropriately positioned for strong impact.	/5
<u>7.5</u> Team Branding	Branding message is weak with inconsistent application across the project.	Effective team branding consistently applied across project components.	Excellent and highly effective messaging of team image. Quality and consistent branding of team name, logo, typography, & colours applied across all project elements: portfolio, uniforms, car, display, social media and collateral. Icon, tagline or mascot added to strengthen branding	/10
<u>7.6</u> Media Exposure	Limited or ineffective.	Some development, some impact, some consideration of audience and platforms.	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.	/5
<u>7.7</u> Sponsorship ROI	Little or no ROI.	Sponsorship acknowledged.	Clear and appropriate visibility of sponsors. Quality reproduction of appropriate sponsorship logos across all project collateral.	/5
<u>7.8</u> Team Uniform	Ineffective or inconsistent, same or similar to supporters.	Basic and consistent across the team, distinct from supporters.	Creative and considered use of branding and appropriate styling for all members. Team member names and roles clearly identified. Clearly distinct from supporters.	/5
<u>7.9</u> Team Presence	Not all present / Poor energy.	Generally enthusiastic.	All team members are appropriately engaging and enthusiastic about their work.	/5
<u>7.10</u> Team Knowledge	Limited engagement.	Some members knowledgeable.	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.	/5
				GRAND TOTAL /55

CRITERIA 8 - MARKETING: TRADE DISPLAY SCORE CARD

JUDGING SUB CATEGORY	TRADE DISPLAY	TEAM ID	[TEAM ID]
PRIMARY EVIDENCE	TRADE DISPLAY	TEAM NAME	[TEAM NAME]
SECONDARY EVIDENCE		SCHOOL	[SCHOOL NAME]
CRITERIA	8	COMPETITION CLASS	[COMPETITION CLASS]

	Low	Developing	Advanced	Score
Criteria	0 1	2 3	4 5	/5
8.1 Car Display	Little consideration given to presentation of car	Some attempt to display car as key feature	Excellent display materials and methods used to effectively display the physical car and its key components.	/5
8.2 Information Design	Limited or repeat of folio	Project message is expanded beyond folio	Clean, well organised layout of written and visual information with sharp professional appeal. Conclusive snapshot of team's key messages. Uncluttered, engaging, and easy to read. Consistent branding style.	/5
8.3 Use of ICTs	Limited ICTs	ICTs used to enhance presentation.	Excellent integration of appropriate technology and ICTs to engage and inform.	/5
8.4 Structural Visual Design	Limited or irrelevant	Some relevant creative messaging evident with consideration for some factors	Creative and justified structural design with excellent use of space for primary display components and team message. Evidence of development considering factors, eg: branding, materials, budget, sustainability, transport and assembly constraints.	/5
8.5 Structural Materials Design	Choice of materials problematic/ limited/ irrelevant to branding	Generally effective and relevant choice of materials considering some factors	Highly effective choice of materials. Evidence of development considering factors, eg: branding, materials, budget, sustainability, transport and assembly constraints.	/5

C8.1.7 Trade Booth Penalties: 10-point penalty each (✓ all that apply)

DO NOT comply with Development Class restrictions
 DO NOT complete their set-up within the 2hr time limit
 DO NOT leave their stand in a safe state

- DO NOT clear their pit and surrounding area of all rubbish
 DO NOT contain their display within the booth volume
 DO NOT comply with added content restrictions

Trade Booth SUB TOTAL	/25
GRAND TOTAL (with penalties deducted)	/25

CRITERIA 9 – VERBAL PRESENTATION: PRESENTATION TECHNIQUE SCORE CARD

JUDGING SUB CATEGORY	PRESENTATION TECHNIQUE	TEAM ID	[TEAM ID]
PRIMARY EVIDENCE	TEAM PRESENTATION	TEAM NAME	[TEAM NAME]
SECONDARY EVIDENCE		SCHOOL	[SCHOOL NAME]
CRITERIA	9	COMPETITION CLASS	[COMPETITION CLASS]

	Low	Developing	Advanced	Score
Criteria	0 1 2	3 4 5 6	7 8 9 10	/10
<u>9.1</u> Presentation Energy	Artificial and/or low energy	Speakers generally enthusiastic with lively delivery	Passionate with effective and appropriate levels of liveliness	/10
<u>9.2</u> Team Contribution	Minimal team participation	Good contributions from most team members	Excellent team work with all members participating effectively	/10
<u>9.3</u> Visual Aids	Little use of aids	Some aids used effectively	Well produced, highly relevant and integrated aids effectively improve communication	/10
<u>9.4</u> Audience Engagement	Minimal engagement	Some audience connection at times	Audience fully engaged and excited throughout presentation	/10
<u>9.5</u> Articulation	Difficult to understand and/or hear most presenters	Inconsistent speaking ability	Excellent articulation, use of language and voice projection by all members throughout the assessment	/10
<u>9.6</u> Structure	No structure presented, difficult to follow	A basic structure / outline provided and could be followed by audience	Clear presentation outline / overview. Excellent connections between topics and easy for audience to follow	/10
<u>9.7</u> Use of Time	Too fast or ran out of time	Good timing. Balanced topic depth and pace	Ran on time or just under. Excellent balance of depth for each topic	/10
GRAND TOTAL				/70

CRITERIA 10 – VERBAL PRESENTATION: CONTENT SCORE CARD

JUDGING SUB CATEGORY	CONTENT	TEAM ID	[TEAM ID]
PRIMARY EVIDENCE	TEAM PRESENTATION	TEAM NAME	[TEAM NAME]
SECONDARY EVIDENCE		SCHOOL	[SCHOOL NAME]
CRITERIA	10	COMPETITION CLASS	[COMPETITION CLASS]

	Low	Developing	Advanced	Score
Criteria	0 1 0 1 2 0 1 2 3 4 5	2 3 3 4 5 6 6 7 8 9 10 11 12	4 5 7 8 9 10 13 14 15 16 17 18 19 20	/5 /10 /20
<u>10.1</u> Team objectives	Limited statement of objectives	Good statement of objectives	Excellent statement of objectives supported by sound reasoning	/5
<u>10.2</u> Description of Car Product	Basic description of car only	Good description of car, components and features	Excellent description of car, components and features including design decisions.	/5
<u>10.3</u> Innovation	Little innovation presented	Innovations described and justified	Originality. Clever innovations with high positive project impact	/20
<u>10.4</u> Refinement	Little refinement presented	Refinement described and justified	Clever refinement with high positive project impact	/20
<u>10.5</u> Collaboration	Little collaboration discussed	Links with industry or higher education described	Collaborations justified with links to learning and project outcomes	/20
<u>10.6</u> Learning outcomes	No real reflections discussed	Good explanation of some learning outcomes	A range of personal, life-long learning and career skills acquired and identified as project outcomes for a range of team members	/20
<u>10.7</u> Overall clarity	Several concepts lacked clarification	Clear and appropriate concept explanations	Everything presented was understood through excellent explanations	/10
GRAND TOTAL				/100

CRITERIA 11.1 & 11.2 –GRAND PRIX RACE & REACTION TIME SCORE CARD SAMPLE

SAMPLE GRAND PRIX RACE SCORE CARD

Team	REACTION LAUNCH RACING				Breakage Penalty	AUTOMATIC LAUNCH RACING				REACTION TIME	BEST GROSS LAP	GRAND PRIX	Laps	Finished	Time	Rank		
	Lane 1 Run 1	Lane 1 Run 2	Lane 2 Run 3	Lane 2 Run 4		Lane 1 Run 1	Lane 1 Run 2	Lane 2 Run 3	Lane 2 Run 4		Best	Rank	Corrected	Rank				
Team 1	Total School 1	1.300 0.219	1.345 0.202	1.276 0.189	0.223	1.122 1.122	1.144 1.144	1.060 1.060	1.075 1.075	25	1.060	0.000	1.060	2	8	TRUE	6.613	2
Team ID 1	Net Lap	1.081	1.143	1.087	1.105	1.077 1.077	1.087 1.073	1.073 1.079	1.079		1.073	0.100	1.173	9	8	TRUE	7.138	8
Team 2	Total School 2	1.261 0.153	1.323 0.179	1.275 0.179	1.235 0.144	0.153 1.077	1.144 1.087	1.060 1.073	1.075 1.079		1.086	0.000	1.086	4	8	TRUE	6.913	7
Team ID 2	Net Lap	1.108	1.144	1.096	1.091	1.077 1.162	1.087 1.219	1.073 1.119	1.079 1.103		1.090	0.150	1.240	11	8	TRUE	7.674	10
Team 3	Total School 3	1.298 0.098	1.370 0.173	1.356 0.270	1.296 0.164	0.098 1.200	1.197 1.086	1.086 1.132	1.132		1.104	0.300	1.404	15	8	TRUE	8.655	15
Team ID 3	Net Lap	1.200	1.197	1.086	1.132	1.162 1.169	1.219 1.117	1.119 1.100	1.103 1.090		1.060	0.150	1.210	10	8	TRUE	7.728	11
Team 4	Total School 4	1.176 0.172	1.317 0.306	1.417 0.175	1.307	0.176 1.176	1.145 1.111	1.111 1.132	1.132		1.049	0.000	1.049	1	8	TRUE	6.473	1
Team ID 4	Net Lap	1.176	1.145	1.111	1.132	1.162 1.169	1.175 1.117	1.141 1.100	1.135 1.090		1.172	0.150	1.326	9	8	TRUE	8.115	12
Team 5	Total School 5	1.104 0.267	1.451 0.241	1.353 0.216	1.346	0.267 1.104	1.184 1.112	1.141 1.130	1.130		1.104	0.300	1.404	15	8	TRUE	6.894	6
Team ID 5	React	0.267	0.241	0.216	0.216	1.162 1.165	1.175 0.166	1.141 0.220	1.135 1.090		1.060	0.150	1.210	10	8	TRUE	8.538	13
Team 6	Total School 6	1.335 0.165	1.385 0.166	1.112 0.200	1.382	0.165 1.170	1.219 1.219	1.112 1.112	1.162 1.162		1.049	0.000	1.049	1	8	TRUE	7.487	9
Team ID 6	Net Lap	1.170	1.219	1.112	1.162	1.083 1.155	1.116 1.144	1.055 1.060	1.056 1.085		1.174	0.150	1.324	12	8	TRUE	8.559	14
Team 7	Total School 7	1.241 0.142	1.278 0.156	1.451 0.387	1.252 0.203	0.142 1.099	1.122 1.122	1.064 1.064	1.049 1.049		1.130	0.000	1.130	7	7	TRUE	6.763	4
Team ID 7	Net Lap	1.099	1.122	1.064	1.049	1.083 1.208	1.116 1.263	1.055 1.182	1.056 1.174		1.071	0.25	1.377	14	8	TRUE	6.632	3
Team 8	Total School 8	1.392 0.194	1.504 0.229	1.358 0.175	1.374 0.193	0.194 1.198	1.275 1.183	1.343 1.181	1.367		1.071	0.050	1.157	8	8	TRUE	6.874	5
Team ID 8	React	0.194	0.229	0.175	0.193	1.198 1.198	1.275 1.183	1.183 1.181	1.367		1.096	0.00	1.096	5	8	TRUE	6.613	2
Team 9	Total School 9	1.373 0.170	1.350 0.195	1.306 0.176	1.458 0.314	0.170 1.203	1.155 1.155	1.149 1.130	1.144		1.104	0.250	1.429	13	8	TRUE	7.138	8
Team ID 9	Net Lap	1.203	1.155	1.130	1.144	1.159 1.159	1.156 1.156	1.149 1.149	1.131		1.068	0.000	1.130	7	8	TRUE	6.473	1
Team 10	Total School 10	1.427 0.159	1.198 0.167	1.311 0.171	1.318	0.159 1.268	1.198 1.198	1.144 1.144	1.147		1.107	0.050	1.157	8	8	TRUE	7.487	9
Team ID 10	Net Lap	1.268	1.198	1.144	1.147	1.193 1.193	1.199 1.199	1.157 1.157	1.127 1.127		1.168	0.250	1.276	3	8	TRUE	6.632	3
Team 11	Total School 11	1.226 0.187	1.438 0.177	1.343 0.177	1.367 0.168	0.187 1.226	1.251 1.251	1.166 1.166	1.199 1.199		1.111	0.250	1.361	13	8	TRUE	6.894	6
Team ID 11	Net Lap	1.226	1.251	1.166	1.199	1.166 1.166	1.207 1.207	1.223 1.223	1.107 1.107		1.130	0.00	1.096	5	7	TRUE	6.763	4
Team 12	Total School 12	1.423 0.208	1.365 0.171	1.179 0.216	1.406	0.208 1.215	1.194 1.194	1.179 1.179	1.190		1.104	0.086	1.109	10	8	TRUE	6.874	5
Team ID 12	Net Lap	1.215	1.194	1.179	1.190	1.094 1.127	1.138 1.138	1.096 1.096	1.119 1.119		1.103	0.00	1.085	3	8	TRUE	6.632	3
Team 13	Total School 13	1.298 0.165	1.295 0.155	1.385 0.279	DNS	0.165 1.133	1.140 1.140	1.106 1.106			1.096	0.00	1.096	5	8	TRUE	6.613	2
Team ID 13	Net Lap	1.133	1.140	1.106		1.127 1.127	1.138 1.138	1.096 1.096	1.119 1.119		1.103	0.00	1.103	6	8	TRUE	6.874	5
Team 14	Total School ID 14	1.430 0.269	1.335 0.200	1.335 0.239	1.362 0.250	0.269 1.161	1.135 1.135	1.096 1.096	1.112 1.112		1.085	0.000	1.085	3	8	TRUE	6.632	3
PJW06	Net Lap	1.161	1.135	1.096	1.112	1.094 1.161	1.086 1.184	1.109 1.111	1.085 1.127		1.192	0.00	1.305	7	8	TRUE	6.874	5
Team 15	Total School 15	1.305 0.202	1.332 0.204	1.355 0.192	1.433 0.246	0.202 1.103	1.128 1.128	1.163 1.163	1.187 1.187		1.161	0.000	1.103	6	8	TRUE	6.874	5
Team ID 15	Net Lap	1.103	1.128	1.163	1.187	1.161 1.161	1.184 1.184	1.111 1.111	1.127 1.127		1.192	0.13	1.305	7	8	TRUE	6.874	5

R.A.C.E. 2015 version 1.0

Race Automated Challenge Environment

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CRITERIA 11.3 – KNOCKOUT RACE SCORE CARD SAMPLE

KNOCKOUT RACE SAMPLE SCORE CARD

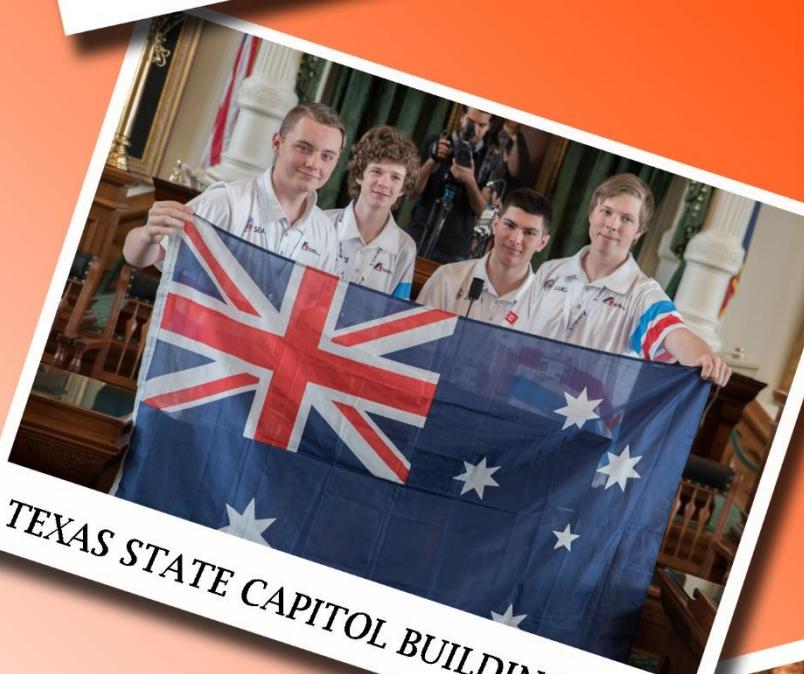
Gross Lap Ranking/ Seed	Breakage Penalties	Round of 16					Quarter Final					Semi Final					Final					Winner
		Team	Race 1 Time	Race 2 Time	Time Penalty	Fastest Time	Team	Race 1 Time	Race 2 Time	Time Penalty	Fastest Time	Team	Race 1 Time	Race 2 Time	Time Penalty	Fastest Time	Team	Race 1 Time	Race 2 Time	Time Penalty	Fastest Time	
1		Team 7				0.000	Team 7	1.256	FS		1.256	Team 7	1.268	1.360		1.268	Team 7	1.254	1.224		1.224	Team 7
32						0.000																
16																						
17																						
9		Team 11	1.357	0.002	0.500	0.502	Team 11	1.393	FS	0.050	1.443	Team 3	1.412	1.346		1.346	Team 3	1.386	FS		1.386	
24																						
8		Team 2	DNS	1.311	0.100	1.411																
25																						
4		Team 3	1.425	1.330		1.330	Team 3	1.412	1.346		1.346	Team 13	1.341	1.313		1.313	Team 13	1.100	1.376		1.100	
29																						
13		Team 10	1.357	1.390	0.250	1.607																
20																						
12		Team 8	1.453	1.370	0.150	1.520	Team 15	1.360	1.422		1.360	Team 1	1.312	1.433		1.312	Team 1	FS	1.267		1.267	
21																						
5		Team 15	1.364	1.348		1.348																
28																						
27		Team 9	1.447	1.447		1.447	Team 9	1.443	1.325		1.325	Team 13	1.341	1.313		1.313	Team 13	1.100	1.376		1.100	
6																						
22		Team 6	1.466	1.438	0.150	1.588																
11																						
19		Team 12	1.395	1.393	0.250	1.643	Team 13	1.341	1.313		1.313	Team 1	1.274	1.327		1.274	Team 1	FS	1.267		1.267	
14																						
30		Team 13	1.281	1.326		1.281																
3																						
26		Team 14	1.264	1.343		1.264	Team 14	1.312	1.433		1.312	Team 1	1.274	1.327		1.274	Team 1	FS	1.267		1.267	
7																						
23		Team 4	1.351	1.288	0.150	1.438																
10																						
18		Team 5	1.403	1.390	0.300	1.690	Team 1	1.274	1.327		1.274	Team 1	1.274	1.327		1.274	Team 1	FS	1.267		1.267	
15																						
31																						
2	4	Team 1	1.410	DNS		1.410																

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WHERE WILL REA TAKE YOU?



WORLD FINALISTS - TEXAS USA



TEXAS STATE CAPITOL BUILDING VISIT



NEW WORLD RECORD TIME



ZERO-ING IN ON THE COMPETITION

National Sponsor



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