



**RCRA**  
**E.P. Section**  
**On Road**  
**GENERAL & TECHNICAL**  
**RULES**

**1<sup>st</sup> January 2019**

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# 1 GENERAL

## 1.1 Introduction

- 1.1.1 This document is the RCRA EP On Road General and Technical Rules, which documents the requirements and procedures to host, or compete in, an RCRA EP On Road State or National Championship.
- 1.1.2 Clubs hosting an RCRA EP On Road Championship must be able to meet the requirements and guidelines within this document.
- 1.1.3 Competitors in an RCRA EP On Road Championship must follow and abide by the rules and guidelines within this document.
- 1.1.4 This document must be read in conjunction with the following RCRA documents;
  - RCRA Constitution
  - RCRA Event Application Form
  - RCRA EP On Road Sample Event Schedules
- 1.1.5 The purpose of an RCRA EP On Road State or National Championship is to obtain a Championship result to recognise State and National Champions.
- 1.1.6 This document is not a substitute or replacement for relevant local, state or national government or legal regulations.

## 1.2 Rule Changes

- 1.2.1 Proposals for changes to RCRA EP On Road General Rules and Technical Rules can be submitted to RCRA by affiliated RCRA EP On Road Clubs. The proposal must include an explanation or rationale and the justification for the change(s).
- 1.2.2 The RCRA Executive may submit rule change proposals for affiliated clubs to vote on. These proposals should include, but are not limited to, those corresponding to changes made to relevant IFMAR and ROAR rules. Such proposals must follow the same procedures as those made by Affiliated RCRA On Road Clubs.
- 1.2.3 RCRA reserves the right to review any proposal to ensure its intent, legitimacy and applicability. In these cases RCRA will consult with the proposing club before deciding to proceed with the proposal.
- 1.2.4 Eligible Clubs will be notified of proposed changes and a voting notice will be sent to the nominated email address as submitted on their RCRA affiliation form. Clubs not using email will have voting papers sent to the nominated affiliation contact postal address.
- 1.2.5 Clubs will be given a minimum 1 month to return vote material, either by mail or email.
- 1.2.6 Changes are approved by a majority favourable vote of all eligible Clubs. Clubs not responding to the vote, or abstaining, will not be counted.
- 1.2.7 General and Technical rule changes come into effect on 1st January and 1st July, each calendar year. Other rule changes that are critical or important, such as safety matters, may be introduced as required.

## 1.3 National Ranking

- 1.3.1 Results from all RCRA EP On-Road sanctioned events are used to award points to competitors for providing a National ranking.
- 1.3.2 Competitors shall be ranked per their six best results over the past 2 years.
- 1.3.3 The rankings shall be updated on a rolling monthly basis to cover events being on different dates year to year.
- 1.3.4 RCRA sanctioned classes will be considered for IFMAR world championship event selection.
- 1.3.5 Ranking shall be updated by individual class raced.
- 1.3.6 Event points will be awarded by the following calculation;

$$\textit{Drivers Event Points} = (101 - F) \times Em$$

The factors are defined as follows;

**F** – ‘Finishing position’ The drivers finishing position as determined by the official event results

**Em** – ‘Event Multiplier’: This multiplier is used to help distinguish between the level of prestige between event types. See 1.3.9 for values

1.3.7 Event and Class Multipliers shall be applied as per the table below.

Event Multiplier	
Event Type	Value
Sanctioned Event	2
State Championship	4
National Championship	8

1.3.8 Ranking Example – A driver has the following event results over two years;

Result (F)	Event	Em	Class	Points
1 <sup>st</sup>	VIC States '15	4	ISTC 21.5t	(101-1) x 4 = 400
2 <sup>nd</sup>	NSW States '15	4	ISTC 21.5t	(101-2) x 4 = 396
6 <sup>th</sup>	Club Cup '15	2	ISTC 13.5t	(101-6) x 2 = 190
2 <sup>nd</sup>	Nationals '15	8	ISTC 13.5t	(101-2) x 8 = 792
1 <sup>st</sup>	VIC State '16	4	ISTC 13.5t	(101-1) x 4 = 400
2 <sup>nd</sup>	QLD States '16	4	ISTC 13.5t	(101-2) x 4 = 396
8 <sup>th</sup>	Nationals '16	8	ISTC Mod	(101-8) x 8 = 744

This driver would get the following points (6 counting per class) across;

$$R1 \text{ ISTC } 21.5t \text{ Ranking points} = 400 + 396 + 0 + 0 + 0 + 0 = \mathbf{796}$$

$$\text{ISTC } 13.5t \text{ Ranking Points} = 190 + 792 + 400 + 396 + 0 + 0 = \mathbf{1778}$$

$$\text{ISTC Modified Ranking Points} = 744 + 0 + 0 + 0 + 0 + 0 = \mathbf{744}$$

## 2 PRE-CHAMPIONSHIP CONSIDERATIONS & RESPONSIBILITIES

### 2.1 Event Application General

- 2.1.1 An application to host an RCRA EP On-Road Sanctioned event must be submitted to RCRA on the ARCMCC Event Application Form as available on the RCRA website.
- 2.1.2 A copy of the host's Public Liability Insurance Certificate of Currency must be enclosed with the Event Application Form if the club is not a fully affiliated AARCCMCC member.
- 2.1.3 Once a host club has been sanctioned to host an RCRA EP On-Road National or State Championship, that host is fully responsible for the promotion, organisation and management of that Championship.
- 2.1.4 When hosting a National Championship, the host club must have held an RCRA state championship in the corresponding section (EP ONR) in the 18 months prior to start of the National Championship. A state that does not run an RCRA EP ONR State Championship within this time will miss their turn in the cycle.
- 2.1.5 When hosting a State Championship, the host club must have held a successful significant event, run to RCRA rules, to the satisfaction of the EP Committee in the 36 months prior to the start of the State Championship.
- 2.1.6 The purpose of the clause 2.1.4 and 2.1.5 is to test that the host club is ready to host an RCRA Championship, and to ensure that the appropriate RCRA rules and procedures are adhered to.

## 2.2 RCRA EP On-Road National Championship Application

- 2.2.1 Each State in turn can apply to host the annual RCRA EP On-Road National Championship.
- 2.2.2 The rotation order through each State is Victoria, Western Australia, Queensland, South Australia, ACT, and New South Wales.
- 2.2.3 A State choosing to miss their turn must wait a full cycle before having another opportunity.

<i>Year</i>	<i>State</i>	<i>Previous Event</i>
2018	QLD	Logan 2012
2019	SA	Littlehampton 2013
2020	ACT	Kambah 2014
2021	NSW	Whalan 2015
2022	VIC	TFTR 2016
2021	WA	West Coast 2017
2022	TAS	

- 2.2.4 Applications to host National championships must be received no later than 1 July of the previous year.
- 2.2.5 The RCRA EP committee will undertake a 4 week assessment and 4 week negotiation period (if required) with potential host club(s). Successful applicants will be notified in writing by RCRA.
- 2.2.6 EP On-Road National Championships must be minimum 4 weeks after any EP On-Road Sanctioned Event and should not be on the same weekend as any other RCRA Sanction event where possible.

## 2.3 RCRA EP On-Road State Championship Application

- 2.3.1 Each State may host an RCRA EP On-Road State Championship once per calendar year.
- 2.3.2 Applications to host state championships must be received no later than 30 September of the previous year, and confirmed when providing RCRA affiliation at 30 October.
- 2.3.3 A club bidding for a sanctioned event may apply for a special circumstances exception to any requirement given in Section 3 (Track Specifications) other than Section 3.1 (Safety). Such an exception will be reviewed by the RCRA EP On-Road Committee and granted only if the Club cannot reasonably comply with the specification, the exception itself is reasonable, and the venue is otherwise fit to host the Championship.
- 2.3.4 The application for any such special circumstances exceptions must be received with the bid for the event, and shall form part of the criteria on which competing venues are assessed.
- 2.3.5 The RCRA EP committee will undertake a 2 week assessment and 2 week negotiation period (if required) with potential host clubs. Successful applicants will be notified in writing by RCRA.
- 2.3.6 EP On-Road State Championships must be a minimum of 3 week apart.

## 2.4 RCRA EP On-Road Sanctioned Event Application

- 2.4.1 Clubs are invited to host Sanctioned non-championship events run to RCRA (Technical) rules.
- 2.4.2 Meeting format, classes run, track specification, Prizes and scheduling are at the host club discretion.
- 2.4.3 Any EP On-Road Sanctioned Non-Championship event must be a minimum of 2 weeks apart from any other type of EP On-Road Sanctioned event, including Championships.

## 2.5 EP On-Road Events Calendar

- 2.5.1 Calendar of events will be published on a publicly accessible online calendar from November 1 of the previous year.
- 2.5.2 Event dates are considered preliminary and subject to change up to 90days prior to the event. No event date is to move to an earlier date unless more than 90days notice can be maintained.

- 2.5.3 As an example, the RCRA EP On-Road Championship calendar should be as follows or similar to avoid conflicting EP On-Road RCRA Championships.
- 2.5.4 When submitting applications, clubs must provide a primary and secondary date for events. The primary date should be within the same month(s) as the examples provided.

<b>Sample Event</b>	<b>Example Approximate Date</b>
<i>FEMCA EP On-Road Championship</i>	<i>2nd Week January</i>
<i>A.C.T.</i>	<i>3rd Week of February</i>
<i>TASMANIA</i>	<i>2nd Week of March</i>
<i>VICTORIA</i>	<i>2nd Week of April</i>
<i>NEW SOUTH WALES</i>	<i>4th Week of May</i>
<i>RCRA EP Indoor Championships</i>	<i>1st Week of July</i>
<i>QUEENSLAND</i>	<i>3rd Week of August</i>
<i>SOUTH AUSTRALIA</i>	<i>2nd Week of September</i>
<i>WESTERN AUSTRALIA</i>	<i>1st Week of October</i>
<i>NATIONALS</i>	<i>2<sup>nd</sup> or 3<sup>rd</sup> Week of November</i>

## 2.6 Host Responsibilities

- 2.6.1 The host fully accepts responsibility for the organisation and management of any RCRA sanctioned event that they hold.
- 2.6.2 The host fully accepts the financial responsibility of any RCRA sanctioned event that they hold.
- 2.6.3 The host fully accepts the insurance requirements and responsibility of any RCRA sanctioned event that they hold.

## 2.7 Finances

- 2.7.1 The host club must price the entry fee appropriately.
- 2.7.2 The host club, once selected, is fully and totally responsible for all finances and funding for the Championship.
- 2.7.3 The entry fee for subsequent classes should be less than the initial entry fee.

## 2.8 National Championship Schedule

- 2.8.1 National Championships should be run over a period of 4 Days, comprising 2 days of practice and 2 days of racing.
- 2.8.2 Refer to Section 6 for event schedule details.

## 2.9 State Championship Schedule

- 2.9.1 State Championships should be run over a period of 3 Days, comprising 1 day of practice and 2 days of racing.
- 2.9.2 Refer to Section 6 for event schedule details.

## 2.10 Championship Classes

- 2.10.1 The following RCRA defined classes must be available for RCRA EP On Road State and National Championships;
- ISTC Junior Sportsman      6 Minute duration
  - R1 ISTC 21.5t                      6 Minute duration

- ISTC 13.5t 6 Minute duration
- ISTC Modified 5 Minute duration
- 1:12th Modified 8 Minute duration
- 1:12<sup>th</sup> 13.5t 8 Minute duration

- 2.10.2 The minimum number of entries for a class to run at a championship event is five (5)
- 2.10.3 Cross entries between chassis types allowed (TC, 12th scale), cross entry within chassis types prohibited.
- 2.10.4 Sanctioned events must be a minimum of 4 weeks apart.
- 2.10.5 The host club of a sanctioned event can apply for Provisional and Demonstration classes to be run in conjunction with the sanctioned event. These classes do not warrant National or State Championship status.
- 2.10.6 Sanctioned classes will always have priority over Provisional and Demonstration classes, and must yield to the sanctioned classes, should there be time delays.
- 2.10.7 It is the clubs responsibility that drivers from Provisional or Demonstration classes are capable to marshal a following sanctioned class to a high standard. If not, the club must supply marshals that are capable to carry out the duties of marshalling.

## 2.11 ISTC Junior Sportsman Class

- 2.11.1 Junior Sportsman is a class for junior drivers to develop their skills and build confidence within a controlled environment at sanctioned events.
- 2.11.2 The following drivers shall be prohibited from entering the Junior Sportsman class;
- a. Any driver over the age of 14 as of the 1st of January that year
  - b. Any driver who has finished top 3 in any sanctioned class at a previous national championship
- 2.11.3 The RCRA executive and relevant State delegate shall have the final decision on allowing a racer to participate in the Juniors class
- 2.11.4 ISTC Junior Sportsman entrants will be exempt from entry fees
- 2.11.5 ISTC Junior Sportsman entrants are to use controlled equipment as detailed in section 10.4

## 2.12 Championship Entry

- 2.12.1 Entry into an RCRA EP On Road Championship is open to current financial members of RCRA EP affiliated clubs.
- 2.12.2 International competitors are welcome to enter into RCRA Championships, however they must be members of organisations who are ultimately affiliated with IFMAR.
- 2.12.3 Draft entry forms need to be submitted and approved by RCRA a minimum of 4 months before the start of the Championship.
- 2.12.4 All RCRA EP On Road sanctioned championships are to be promoted as per the following; 20xx RCRA EP On Road Australian Championships OR 20xx RCRA, State, EP On Road Championships.  
Sponsors Names may be included.
- 2.12.5 Entry forms need to include information about the event such as Championship dates, practice dates, rain day, location, host club, entry fees, classes offered, control tyres, accommodation, specific venue rules, etc. It also needs to include a competitor entry nomination page for information such as name, sponsor, contact details, classes entered, transponder number and nominated frequencies.
- 2.12.6 Entry forms for State Championships need to be publicly available at least 3 months prior to the Championship.
- 2.12.7 Entry forms for National Championships need to be publicly available at least 4 months prior to the Championship.
- 2.12.8 The closing date for State Championships is the third Sunday prior to the start of the Championship.

- 2.12.9 The closing date for National Championships is the fourth Sunday prior to the start of the Championship.
- 2.12.10 Championship places are limited and will be filled as received with full payment of entry fees until the championship is full. Entry after the advertised closing date or competitors who have not paid the entry fee in full will not be guaranteed entry into the Championship.
- 2.12.11 Late entries may be offered by the host club; however they are subject to availability and will be subject to an additional late fee.
- 2.12.12 Entry may be received by both mail and electronic means.
- 2.12.13 All entry forms and monies are to be returnable to the hosting club of the event.
- 2.12.14 Where a competitor withdraws from the Championship before the entry closing date, or the Championship has no remaining places, the competitor will be entitled to a full refund of any paid entry fee.
- 2.12.15 Competitors who withdraw from the championship after the closing date or who do not show up will not be entitled to a refund. It is at the host clubs discretion to apply a refund in this situation.
- 2.12.16 A confirmation of entry must be made available at least one week before the Championship starting date, by listing on a website, forum or via email.
- 2.12.17 A preliminary Qualifying Heat list showing Competitor, Sponsor and Transponder number, must be sent to, and approved by, RCRA once entries have closed and before it is publicly announced. The purpose of this is, where possible, to grade competitors into heats of similar abilities.

## **2.13 Competitor Responsibilities**

- 2.13.1 The Competitor fully accepts that they will act responsibly, in a sportsmanlike manner and within the rules of the Championship.
- 2.13.2 The competitor fully accepts that penalties, including disqualification and possible sanctioning from future State, National and International Championships may arise from breaches of the rules.
- 2.13.3 The competitor is responsible for ensuring that they are a current financial member of an RCRA EP affiliated club.
- 2.13.4 The Competitor fully accepts that they are responsible for their equipment, and that it is in a safe and useable condition, and meets any Local, State and National regulation required for that equipment (i.e. electrical equipment).

# **3 TRACK SPECIFICATIONS – EP ON ROAD**

## **3.1 Safety**

- 3.1.1 Motor sport has inherent risks and potential dangers, including within scale model radio controlled car racing. The safety of visitors, spectators, officials, volunteers and competitors is of prime importance and must be considered when laying out track, competitor and spectator areas.
- 3.1.2 Spectators, competitors and officials must be efficiently protected against the cars by adequate safety barriers. Track barricades and markers must be shaped and placed in a way that prevents cars from being projected into public areas.
- 3.1.3 **FIRST AID**
  - 3.1.3.1 It is recommended that a qualified First-aid Officer is present throughout the Championship including practice.
  - 3.1.3.2 A current and suitable first aid kit must be available and its location clearly marked throughout the Championship including practice.
- 3.1.4 **MARSHALS**
  - 3.1.4.1 Marshals must be adequately protected from being hit by cars whilst at their marshalling location.
  - 3.1.4.2 Marshals should be provided with a fluorescent safety vest or similar item to aid being seen whilst in the track area.
  - 3.1.4.3 Marshals must always put their safety first.



- 3.1.4.4 In the event that a marshal is incapacitated, or falls onto the track surface placing themselves in danger, the heat or final in progress must immediately be stopped. All cars must stop where they are and follow the instructions of the Race Director.
- 3.1.5 Access for emergency services must be available to all areas at all times.
- 3.1.6 Suitable fire extinguishers must be available at all times in areas around the track such as pit lane, the pits, technical inspection and other areas identified by the host club.
- 3.1.7 Technical inspection must always include the safety aspects of the cars. No sharp edges or other protruding parts of the cars that may cause serious injuries in case of an accident are permitted.
- 3.1.8 The only people authorised to be within the enclosed track area are officials, marshals and competitors. All other people must be removed from the enclosed track area whilst the Championship is in progress.
- 3.1.9 All personnel within the enclosed track area must wear fully enclosed shoes. Thongs, sandals, slippers etc are not allowed.
- 3.1.10 Proper care and handling of Li-Po Batteries must be observed.
- 3.1.11 Where extension leads are used, the host club must follow relevant electrical safety procedures as applicable in that State.
- 3.1.12 Host clubs must be adequately insured. Host clubs must have public liability insurance of not less than \$A10 million or a higher amount as determined by individual club requirements. Clubs should obtain expert advice to determine their insurance requirements.
- 3.1.13 Smoking is not allowed within the enclosed track area, driver's stand, race control, pit lane, nor any other areas identified by the host club. Any designated smoking areas must comply with relevant state government legislation.
- 3.1.14 Whilst the racing is progress, the consumption of alcohol or illegal substances by competitors, mechanics and officials will not be tolerated.
- 3.1.15 In the event of an electrical storm in the immediate area, the racing will be suspended. Racing will resume once the storm has passed. During this time, the drivers stand will be closed.

## **3.2 Track Design**

- 3.2.1 Track design must include both left and right turns with one or more straights.
- 3.2.2 The track design should employ the basic components that are found on real on-road circuits from which 1:10 scale racing has been modelled after.
- 3.2.3 Maximum distance from the middle of the driver's stand to the furthest point of the track is 50m.
- 3.2.4 Corner cutting must be discouraged. For purpose built tracks a kerbing and/or grass infields is necessary. Barriers should be firmly anchored onto the racing surface.
- 3.2.5 Direction of travel shall be at the discretion of the host.

## **3.3 Track Surface**

- 3.3.1 Surface should be clean and free of excessive debris. Preferably asphalt, in the event of a painted surface the condition should not be degraded; the old surface must not be visible on any part of the racing surface.
- 3.3.2 Track repairs should be made between heats as needed. If a schedule is set up for regular maintenance it should be staggered so that all drivers enjoy any advantage or disadvantage such maintenance may offer.

## **3.4 Track Length**

- 3.4.1 Track design and length should be such that lap times are kept in excess of 12 seconds per lap.
- 3.4.2 The recommended track length is 250 m.
- 3.4.3 Course length shall be the length of the infield boundary line.

### **3.5 Track Width**

- 3.5.1 The minimum width of the track is 3.0 metres between marking lines.
- 3.5.2 The maximum width of the track is 6.5m between marking lines.
- 3.5.3 On very open circuits that meet IC ONR regulations the addition of chicanes to create a circuit with suitable technicality for all sanctioned EP classes is recommended. Such features should be used sparingly, should be close to the stand where possible and anchored securely; it is recommended that they be used on the entrance of straights to shorten them. Where used, such chicanes constitute an exception to 3.5.1, and in these locations the circuit may be as narrow as 2m.

### **3.6 Driver's Stand**

- 3.6.1 Minimum height of the driver's stand is 1.5m from track level.
- 3.6.2 No obstacles may interrupt the vision from the drivers' stand to all parts of the track.
- 3.6.3 The driver's stand must suitably provide for 10 drivers standing side by side. As a guide, 70-100cm should be provided for each driver.
- 3.6.4 The drivers stand should provide competitors with overhead protection from weather.
- 3.6.5 The drivers stand must be a minimum of 1.5m from the edge of the racing surface.
- 3.6.6 The drivers stand must be a maximum of 50 metres from the furthest part of the racing surface.

### **3.7 Pit Lane (optional)**

- 3.7.1 The pit lane area (if provided) should be clearly distinct and separated from the main track and located as close as possible to the drivers' stand.
- 3.7.2 Entry and exit to pit lane is advised to be on a slow section of the track.
- 3.7.3 The width of the Pit Lane should be at least 2 Car widths wide (0.6 metre).

### **3.8 Outer Barriers**

- 3.8.1 Outer barriers must provide a positive means of stopping a car when missing a corner or out of the driver's control.
- 3.8.2 The consideration for selection of the outer barriers shall be the safety and protection of the public and not the cars, although, if both can be obtained, it is ideal.
- 3.8.3 The outer barriers should be at least 40cm away from the outer marking lines of the track.

### **3.9 Marshal Locations**

- 3.9.1 Marshal locations must be available for every 30m of the track length.
- 3.9.2 Marshal locations may not obstruct the vision of the drivers.
- 3.9.3 Marshal locations must be clearly numbered 1 through 10 and spread such that less than 10 marshals can adequately marshal the entire track.
- 3.9.4 When a marshal location is at a less safe part of the track, such as a straight or a fast corner, the location must provide safe protection for the marshal.

### **3.10 Starting and Finishing Lines**

- 3.10.1 A starting line for heats must be painted across the track, preferably close to race control/time keeping.
- 3.10.2 A starting grid (either staggered or in-line) for finals must be painted on the track. It must have 10 rows with a minimum of 2.5m spacing between the cars front. Grid positions must be clearly marked.
- 3.10.3 A finishing line must be painted across the track at the same location of the lap counting sensing wire.

- 3.10.4 A Stop/Go penalty box must be painted on the track. It must be located near the finish line, away from the racing line, be in clear view of the drivers stand, and be 0.5 x 0.4 metres with an 'X' painted inside.
- 3.10.5 The pit lane (if available) is not to be used for carrying out any penalties.
- 3.10.6 The driver's view of the starting line/grid must not be obstructed.
- 3.10.7 No chalk is to be used on the track racing surface.

Example - Grid Spacing

Metres - 2.5m spacing	0.00	2.50	5.00	7.50	10.00	12.50	15.00	17.50	20.00	22.50
Metres - 3.0m spacing (preferred)	0.00	3.00	6.00	9.00	12.00	15.00	18.00	21.00	24.00	27.00
Car#	1		3		5		7		9	
Car#		2		4		6		8		10

Minimum spacing 2.5m, but use as a guide only, if track permits spread grid further apart

### 3.11 Race Control

- 3.11.1 A designated area or building with suitable electrical supply and weather protection should be located adjacent to the drivers stand.
- 3.11.2 Race control needs to provide sufficient space to house the electronic timing system and the necessary staff to manage and observe the event.
- 3.11.3 Race control must have an unobstructed view of the starting and finishing lines.

### 3.12 Pit Area

- 3.12.1 A covered pit area should be provided for the use of all competitors.
- 3.12.2 The pit area should provide adequate weather protection, lighting and power.
- 3.12.3 Temporary pit areas must be level and well drained.
- 3.12.4 For larger Championships, the host club may allocate pit space. Places should be grouped by State and Club.

### 3.13 Technical Inspection

- 3.13.1 A designated area or building with suitable electrical supply and weather protection should be located adjacent to the drivers stand for Technical Inspection.
- 3.13.2 Technical Inspection must have the appropriate documentation for the Championship to make decisions on the technical details of the classes being run.
- 3.13.3 Technical inspection must have the correct test equipment for the Championship. Weight scales must be set up on a solid flat surface and have a windbreak around them.
- 3.13.4 RCRA test equipment is available for correct application of scrutineering. A body height gauge and scales can be supplied by RCRA.

### 3.14 Track Preparation

- 3.14.1 For open practice the track surface must be prepared the same as it would for the start of a championship so that good quality practice will be obtained when practice commences.
- 3.14.2 The track surface must be prepared to a consistent, clean state before the start of a championship.
- 3.14.3 The track surface may be blown clean before the commencement of each days racing throughout the championship.

- 3.14.4 Unless extreme conditions exist, practices such as blowing/sweeping down the surface during a championship day should be discouraged as this generally degrades the clean racing line.
- 3.14.5 For tracks using spray-on additives on the track surface, this can be done once only each day of the championship when the track is closed. This occurrence can either be;
- A) At the end of the day once all racing is complete, or alternatively;
  - B) Before the start of any on track running for that day.
- 3.14.6 The timeslot for spraying must be consistent throughout the event. Any morning spraying should allow for sufficient drying time prior to track opening.
- 3.14.7 In the event of a weather delay, the host club must provide suitable tools to return the track to a useable condition in a reasonable time.

### 3.15 Other Areas

- 3.15.1 Amenities - Male and Female toilet facilities must be provided for the duration of the event from the start of open practice.
- 3.15.2 Water - Running water should be available.
- 3.15.3 Results Board - A suitably sized board or display area must be available to display result sheets and other information.
- 3.15.4 Power – A suitable Power distribution board within a suitable distance of the pit area, with adequate power for all the competitors, Race Control, Scrutineering etc.

## 4 OFFICIALS

### 4.1 Official Positions

- 4.1.1 The following Race Officials are required for each Championship. The names of these officials must be included on the Event Application Form.

- Referee
- Race Director
- Time Keeper
- Technical Director

The position of Race Director is non-racing i.e. cannot be filled by a competitor in the Championship.

The positions of Referee, Time Keeper and Technical Director may be filled by more than one person. The holders of these positions cannot officiate over a class they are racing in during the Championships. If an individual person is appointed to hold any of these roles for all race classes then the role will be non-racing.

- 4.1.2 The following Race Officials are delivered by the host club during the Championship. These positions may be filled by a competitor and does not need to be the same person for the duration of the Championship.
- Technical Assistants
  - Concourse Judge
- 4.1.3 A representative of the host club must be available should the Race Director need to engage the host for event organisation matters, for example;
- Spare Marshals
  - Track preparation
- 4.1.4 Non-racing Race Officials may be financially subsidised at the discretion of the host club.

## 4.2 Referee

- 4.2.1 One or more referees must be present for the Championship. The Referee must be experienced and unbiased, with a good knowledge of the current RCRA rules.
- 4.2.2 The main task of the Referee is to observe the racing, and in particular, good sportsmanship during the racing. The Referee will ensure that the current rules are observed by everyone.
- 4.2.3 The Referee may be called for information by the State Jury.
- 4.2.4 Referees must be provided with an area from where all parts of the track, the drivers stand, and pit lane can be observed.
- 4.2.5 At all times during qualifying heats and finals, the Referee present will be watching and observing the racing from start to finish.
- 4.2.6 The Referee will keep a record of the instructions, warnings, and penalties issued. Warnings and penalties will be posted on the result sheet.

## 4.3 Referee's Authority

- 4.3.1 The Referee on duty is authorised to make decisions about the Championship, and to issue and announce instructions, warnings, penalties and disqualifications.
- 4.3.2 The Referee has the right to use their discretion to issue a penalty instead of a warning for any serious infringement of the rules.
- 4.3.3 The Referee has the right to issue penalties for racing infringements. The penalties will range from Stop/Go + time in seconds, to a one-lap penalty.
- 4.3.4 A Referee may take action after an initial warning, but in all cases, three warnings or penalties means automatic disqualification.
- 4.3.5 The Referee has the authority to instruct other Race Officials to take remedial action in any situation, which might compromise the well running of the race meeting. Any serious situation will be referred to either the State Jury, RCRA EP representative or the Host Club representative before taking any action.
- 4.3.6 Under no circumstances may an instruction, warning or penalty issued by the Referees lead to the interruption of the whole race after the first car has completed the first lap.
- 4.3.7 Instructions issued by the Referee must be observed immediately.
- 4.3.8 Reasons for warning or instruction will be announced at the time of issue. Further explanation, if necessary, will be given to the competitor or the State Delegate at the end of the race.
- 4.3.9 During the event, if the Race Director and Referee agree, they will have the authority to disqualify a competitor and/or a whole team, if one member of that team is positively interfering with the racing of another car in the event.
- 4.3.10 Appeals to the decision of the Referee must be addressed to RCRA in writing. RCRA is not obliged to act on such a complaint.

## 4.4 Race Director

- 4.4.1 The Race Director is responsible to follow the schedule of the Championship and liaise with the host club as required. The Race Director ensures that the various tasks under their responsibility are well done, including, but not limited to;
  - Time keeping
  - Start procedures
  - Marshalling
  - Display of results
  - Comments to the public
  - Comments to the drivers

- Technical inspection
- Frequency control

4.4.2 The Race Director receives and processes protests, and decides if the State Jury has to meet. They take urgent decisions or stop a race for safety, rain or any other unforeseen situation. They are under the authority of RCRA.

#### **4.5 Time Keeper**

4.5.1 The Time Keeper is responsible for recording all the individual lap times and total laps plus finishing time of all drivers during all qualification heats and finals. They are responsible for the classification of the results and for selecting of the finals. The Race Director must verify this classification and selection.

4.5.2 After the finish of any heat or final, the results of the first and second time keeping systems are compared by the Time Keeper. Should there be a difference in the result, the Time Keeper will investigate both results and make a decision of the final result.

4.5.3 In case of a request for checking of the results, the Time Keeper, together with the Race Director, will check on the questioned result and will make the decision. The Race Director will authorise any change of results.

#### **4.6 Technical Director**

4.6.1 A Technical Director will be appointed by the host club to supervise all technical inspection matters.

4.6.2 The Technical Director is responsible for overseeing the Technical Inspection of all cars throughout the Championship and ensuring that cars meet the technical rules.

4.6.3 The Technical Director has the authority to technically disqualify any car or item that does not meet the relevant technical rules.

4.6.4 The Technical Director may delegate inspection duties to Technical Assistants. The Technical Director must ensure that the Technical Assistants are consistent in their application of the rules.

4.6.5 The Technical Director must delegate their duty to another suitable Race Official where a direct conflict of interest with a technical inspection or technical decision occurs.

4.6.6 All technical issues will be referred to the Technical Director.

4.6.7 Technical Inspection is always the responsibility of the Technical Director. It is not the duty or the responsibility of the Race Director or Referee to check if cars conform to the technical rules.

#### **4.7 Technical Assistant**

4.7.1 Technical Assistants need to be appointed by the host club to assist the Technical Inspector to inspect competitor's cars.

4.7.2 Where a Technical Assistant is a competitor or mechanic, they cannot inspect any car in the same entered class once qualifying heats have commenced.

4.7.3 Technical Assistants must refer any question, technical detail they are unsure of, or any item that breaches the technical rules to the Technical Inspector.

#### **4.8 Concourse Judge**

4.8.1 A concourse judge is used to decide the best presented car at the start of a Championship.

4.8.2 The concourse judge must be familiar with the concourse judging criteria.

4.8.3 If the concourse judge is a competitor, their own car is ineligible to be judged.

#### **4.9 State Delegate**

4.9.1 The responsibilities of the State Delegate are:

- To look after the welfare and behaviour of their State's competitors.
- To attend State Jury Meetings and any driver's briefing that the host may call.
- The State Delegate is the link between their state team and race officials by receiving all information referring to timetable changes, frequency change requests, results of qualification heats and finals, and all other information referring to the race.
- The State Delegate is allowed to stay in the pit lane area when a qualification heat or final has a competitor from their state competing.
- The State Delegate investigates lap counting check requests.
- The State Delegate is responsible to pass on complaints, protests or suggestions from their State's competitors to the Race Director.

4.9.2 The State Delegate, or a nominated deputy, must be present during all official racing.

4.9.3 The State Delegate and a deputy are elected by nominations and a simple show of hands by their State's competitors at a short state meeting at the start of the Championship.

4.9.4 State Delegates may be participants in the event but must allow deputy jury representatives to serve and vote in any protest involving the said State Delegate as a participant in the protest.

#### **4.10 State Jury**

4.10.1 The State Jury consists of State Delegates of each State competing in the Championship. Each State will have a total of one vote, regardless of the number of representatives at the Championship.

4.10.2 The responsibilities of the State Jury are;

- To decide in unforeseen situations.
- To handle protests unable to be covered by the Race Director's responsibility.
- To make official by announcement any decision voted on by the State Jury.
- To monitor that the race is run according to the official rules.

4.10.3 The Race Director will decide whether a State Jury meeting should be called to discuss and vote on the matters raised. If the Race Director does call such a meeting and the majority of the State Delegates support the matter raised, the Race Director must then refer to the Referee for final decision.

4.10.4 The Race Director is a member of the Jury but does not normally vote in the decisions. The Referees may be called by the Jury for opinions and explanations as deemed necessary. All decisions are taken by simple majority vote. The Race Director may cast a deciding vote where a decision is tied.

4.10.5 The State Jury may request evidence and/or presence of drivers involved or Team Managers.

#### **4.11 RCRA Officials**

4.11.1 Every attempt will be made to have an RCRA Official present at each event.

4.11.2 In the event that no member of the RCRA Committee is present, the responsibility of this role shall fall to the RCRA state delegate, of the host state.

4.11.3 A list of all members of the RCRA Committee and each state delegate is available on the RCRA website.

## 5 CHAMPIONSHIP TECHNICAL DETAILS

### 5.1 Numbering of Cars

- 5.1.1 Only the numbers supplied by the host will be used on the cars.
- 5.1.2 The number on each decal to measure not less than 60mm high x 40mm wide with a stroke of 6mm.
- 5.1.3 Cars will be numbered 1 to 10 in each qualifying heat or final.
- 5.1.4 Touring Cars must have 3 numbers: - one on the front (windscreen), and one on each side, placed on a vertical plane so that it is visible from ground level. With 1/12th to use one number, placed in a prominent position on the rear deck of the bodyshell, so as to be visible to race control whilst on track.
- 5.1.5 Car numbers may change during the qualifying heats should a driver re-grade be necessary. The host will provide replacement numbers for altered heats and finals.
- 5.1.6 Competitors are responsible for the correct numbering of their car.
- 5.1.7 Car numbers may not be trimmed to eliminate the background.
- 5.1.8 Under no circumstances will a heat or a final be re-run due to a car not having the correct numbers or placement of these numbers.
- 5.1.9 Incorrect numbering of a car in a heat will incur a warning, upon the second warning the competitor will incur a one lap penalty in that race.
- 5.1.10 Incorrect numbering of a car in a Final will incur a 1 lap penalty in that race.

### 5.2 Transmitters

- 5.2.1 Transmitters do not need to be numbered.
- 5.2.2 External transmitter battery packs are not permitted.
- 5.2.3 Transmitters must be placed in scrutineering as soon as possible after completion of that drivers heat, along with cars, before proceeding straight to marshalling.

### 5.3 Transmitter Frequencies

- 5.3.1 Drivers that utilise 27Mhz, 29Mhz and 40MHz radio systems are responsible to organise amongst themselves to ensure there are no crystal clashes.
- 5.3.2 36MHz and 70-72Mhz are forbidden to be used in Australia for Radio Control vehicles.
- 5.3.3 No race will be delayed for a frequency issue.

### 5.4 Lap Counting and Timing

- 5.4.1 An AMB lap counting system or RCRA approved equivalent must be used in duplicate. Suitable working computers with proper race proven software and hardware must be provided to sort lap times, print results from heats and sort final positions from each round of heats within 15 minutes of the completion of each round of qualifying heats or finals.
- 5.4.2 Significant stops (crashes etc.) may be noted by the Time Keeper, Referee or Race Director, with times of stop and restart. This record may not include every incident, however, its intent is to verify incidents, whenever possible.
- 5.4.3 Chronometers must give time to 1/1000th of a second. In all cases, the thousands will be utilised.
- 5.4.4 If both the primary and support lap counting systems fail during a qualifying heat, that heat will be rerun at the conclusion of that round of qualifying heats.
- 5.4.5 If both the primary and support lap counting systems fail during a final, should no result be known, that final will be rerun once the timing system is operational and a suitable allowance given to competitors to prepare their cars. In all other cases, the wet weather finals procedure will be used.



- 5.4.6 Under no circumstances will any lap score or time, other than those from the official time keeping equipment, be accepted for any purpose to do with the running of an RCRA Championship.
- 5.4.7 Timing and Scoring will be as per current IFMAR regulations.

## 5.5 Transponders

- 5.5.1 Competitors are required to install a small transponder into their cars according to the manufacturers and host club's instructions.
- 5.5.2 Every competitor must provide their own AMB compatible personal transponder or AMB compatible club transponder.
- 5.5.3 At the discretion of the host club, a limited number of club transponders may be provided for those competitors who do not have a personal transponder. For competitors using this service it is solely the competitor's responsibility to collect, install and return the transponder without interrupting any race official. Neither the host club, nor any race official has any responsibility to that competitor should that competitor fail to return their transponder for charging. Where these transponders are provided, the host club must provide them free of charge. A deposit of the replacement value for the transponder may be demanded. If a competitor by any reason damages, destroys or does not return a loan transponder, they forfeit all of their deposit.
- 5.5.4 If the host is using a non-AMB compatible transponder system, they must provide to all competitors a transponder for every heat and final.
- 5.5.5 Each competitor is responsible for attaching the lap counting transponder to their car.
- 5.5.6 During qualifying, any car starting without a lap counting transponder will not be counted.
- 5.5.7 If a personal transponder fails during racing, the race director at their discretion, may choose to manually count the car for the first instance only. Following this failure, it is the competitor's responsibility to ensure their personal timing equipment is performing correctly. If the same competitor has a further failure in later races, they will not be counted.
- 5.5.8 If a club supplied transponder fails during racing, the Race Director should count the car manually and all efforts should be made to ensure the supplied transponder is working correctly for future races.
- 5.5.9 If a lap counting transponder fails or falls off during a heat or final, under no circumstances will that heat or a final be re-run due to the car not having laps counted.
- 5.5.10 Where two competitors have the same transponder number, the competitor who has the original manufactured transponder will be required to change to a different transponder number. When neither competitor has an original manufactured transponder, the competitor with a later Championship entry must change to a different transponder number.
- 5.5.11 Refer to section 8.6 for the process to deal with lap counting checking.

## 5.6 Display and Distribution of Results

- 5.6.1 The results of each specific heat or final must be displayed in or nearby to the pits.
- 5.6.2 At the end of each qualification heat or final, a copy of results of all cars will be displayed with the result within 15 minutes of the end of that heat or final. At the end of each qualification round, the provisional qualifying order for each class will be made available.
- 5.6.3 Electronic means of displaying live race and other data should be available in the technical inspection and pit areas.
- 5.6.4 The time of display of the result will be written on the result sheet.
- 5.6.5 Results of the Championship must be forwarded to the RCRA EP ONR section within two (2) weeks of the conclusion of the Championship, along with the Race Directors report.

## **5.7 Public Address System**

- 5.7.1 A public address (PA) system must be available for use by the Race Director and Referee for announcements. It is preferable to have a PA system that supports two independent channels, one channel for Competitors and Mechanics in the pit lane and driver's stand, and a second channel for the pit and general areas.
- 5.7.2 Announcements must be audible in the driver's stand, pit lane and pit areas.
- 5.7.3 Where a single PA system is used, announcements for non competitors must be restricted to times when drivers are not competing on the track.

## 6 CHAMPIONSHIP SCHEDULE

### 6.1 Meeting Format

#### 6.1.1 State Championships

All State Championship Events are advised to follow the following format for all Sanctioned Classes

- Open Practice
- 1 Heat of Controlled Practice Immediately prior to Qualifying (for Grading Purposes)
- Five (5) Rounds of Qualifying
- Three (3) Finals Heats

6.1.1.1 Deviations from the above schedule may be proposed by the host club and agreed by the RCRA EP On-Road Committee. Any deviation must form part of the event application and should not contravene further regulations herein.

#### 6.1.2 National Championships

All National Championship Events are advised to follow the following format for all Sanctioned Classes

- Open Practice
- 2 Heats of Controlled Practice Immediately prior to Qualifying (for Grading Purposes)
- Five (5) Rounds of Qualifying
- Three (3) Finals Heats

6.1.2.1 Deviations from the above schedule may be proposed by the host club and agreed by the RCRA EP On-Road Committee, however are strongly advised against. Any deviation must form part of the event application and be provided with written justification and must not contravene further regulations herein.

#### 6.1.3 Other Sanctioned Events

All other event formats are at the discretion of the host club in consultation with the RCRA EP Committee.

#### 6.1.4 Definitions

6.1.4.1 Event - Describes when the track is first available for open practice.

6.1.4.2 Championship - Commences immediately prior to the start of controlled practice, and should mark the time for the Drivers briefing, and concourse.

### 6.2 Track Opening and closure

6.2.1 The track shall be closed from the Monday before the start of the event.

6.2.2 The track shall be open prior to the start of open practice, open practice should be completed by 10pm at the latest, after which the track should be closed.

6.2.3 The track shall officially open immediately prior to the start of scheduled running each day of the championship, and close immediately after the last scheduled running of each day of the championship.

6.2.4 The track will be signified to be closed by blocking off the entrance to the drivers stand, along with an announcement over the P.A. System.

6.2.5 Any competitor found to be practicing on the closed track from any position, will be immediately disqualified from the event, and forfeit any entry fees paid.

### 6.3 Practice

6.3.1 Practice for State Championships must be available for competitors for a minimum of one (1) full day immediately prior to the start of the championship

- 6.3.2 Practice for National Championships must be available for competitors for a minimum of two (2) full days immediately prior to the start of the championship.
- 6.3.3 Open Practice – defined as unheated practice. The host club will impose track time limits for each class as required, to avoid large speed differences on track. No more than 15 cars allowed on track at one time.
- 6.3.4 Controlled Practice – Defined as heated practice. Competitors given a practice session of their class race time and in seeded heat order.
- 6.3.5 A frequency board or similar must be used and available for competitors using non 2.4GHz radio systems. The transmitter impound is not used during practice.
- 6.3.6 It is optional for the host club to provide electronic timing of open practice.
- 6.3.7 Marshals are not provided or used during open practice.
- 6.3.8 Competitors, Time Keeper and Race Director should use controlled practice as a final test that the electronic timing system, radio frequencies, transponders and car numbers are ready to begin qualifying heats.
- 6.3.9 Results from controlled practice should be displayed on the results board.
- 6.3.10 Controlled practice should be used to provide a seeding for qualifying, using a competitors three best consecutive laps during any controlled practice heat.

## **6.4 Competitor Registration**

- 6.4.1 Each competitor must register their attendance and sign a registration form which states that they accept, and will abide by, the published rules of the Championship.
- 6.4.2 Registration for competitors may be done at the same time as initial technical inspection.
- 6.4.3 Competitors must be registered before the start of the Championship
- 6.4.4 Competitors unable to meet this deadline may use a proxy to complete their registration.
- 6.4.5 The host club may authorise late competitor registration at its discretion.

## **6.5 Initial Technical Inspection (pre-Scrutineering)**

- 6.5.1 All cars must be presented for initial technical inspection prior to the commencement of the championship. No car will be permitted on the track surface without undergoing technical inspection. The purpose of this inspection is to determine whether the vehicle meets the RCRA technical rules for this event.
- 6.5.2 Competitors or mechanics must present their car(s) and transmitters race ready before the start of the event.
  - 6.5.2.1 For Sportsman and Stock classes, motors for all competitors must be inspected prior to commencement of the championship. Competitors may put forward a maximum of two (2) motors at initial technical inspection.
  - 6.5.2.2 Motors that pass technical inspection shall be marked in a manner to ensure that opening the motor results in the marking being affected.
  - 6.5.2.3 Bodyshell and wing assemblies shall also be marked once they have passed technical inspection. Competitors may put forward a maximum of two (2) bodyshell and wing assemblies at initial technical inspection.
  - 6.5.2.4 Additional motors and/or body and wing assemblies may be inspected throughout the championship in consultation with the Chief scrutineer at times that do not effect scrutineering priorities.
- 6.5.3 Technical Inspection must be open with sufficient time before the start of the Championship to have all competitors' cars inspected to ensure they comply with the class Technical Rules in effect at the time of the Championship.
- 6.5.4 Once the first qualifying heat has started, no car can be pre checked, exceptional circumstances, and at the Chief Scrutineers discretion.
- 6.5.5 Only one car per class per driver will be accepted.

## **6.6 Drivers' Briefing**

- 6.6.1 A drivers briefing marks the start of the championship. It will welcome all participants to the Championship, introduce the Officials and State Delegates, and brief participants on any important matters.
- 6.6.2 Additional drivers' briefings are to be held at the Race Directors and State Jury's discretion.
- 6.6.3 All drivers' must attend the driver's briefing.
- 6.6.4 Drivers' meetings must be conducted so that competitors or officials are not occupying the racing surface, to prevent damage or tracking of dirt onto the racing surface.

## **6.7 Concourse**

- 6.7.1 Concourse is to be held immediately following the drivers briefing.
- 6.7.2 Concourse is judged in one category per chassis type (i.e. TC and 12th). There will be a minimum of one trophy awarded for each chassis type.
- 6.7.3 Cars and their body shell entered for concourse must be complete and ready to race, excluding car numbers. Body shells only are not eligible for concourse selection.
- 6.7.4 Cars and their body shell entered for concourse must participate and complete at least one recorded lap of a qualifying heat or final. When racing, the body entered for concourse must be correctly numbered.
- 6.7.5 Concourse judging is based upon the realism, presentation and workmanship of the presented chassis and body combination. The Concourse Judge should pay particular attention to the colour scheme, effects such as shading and blending, detail, accuracy and authenticity of the body shell. A car, which is fully painted, should be judged ahead of pre-painted or stickered bodies.
- 6.7.6 Drivers may enter one vehicle in concourse for each class in which they are racing.

## **6.8 Competitors and Members' Meeting**

- 6.8.1 A meeting of all competitors and financial members of all attending Clubs will be held prior to the start of the Championship.
- 6.8.2 The meeting will be broken into State divisions who will then nominate and vote, by a show of hands, for meeting attendees to be the State Delegate and deputy State Delegate for the duration of the Championship.
- 6.8.3 The State Delegate may be a competitor, or a financial member of a Club represented at the Championship.

## **6.9 Qualifying Heats**

- 6.9.1 Maximum number of 10 cars in each heat.
- 6.9.2 There should be a minimum 2 minute gap between the end of one heat and the start of the next. This gap must allow for drivers in the previous heat to exit the drivers stand, transmitters to be returned to the transmitter impound or scrutineering, issuing of transmitters to the drivers in the next heat, drivers in the next heat to take their places on the drivers stand.
- 6.9.3 An audible warning will be given in English language at one minute to the start of the race.
- 6.9.4 During qualifications the "staggered or IFMAR start" system will be used. Each car will start separately within one second of its number being called. Starting before its number is called will be classified as a jump-start. If for any reason a car did not start prior to the completion of the first lap by any car, the time for that car will automatically begin the moment the first car has completed a lap.
- 6.9.5 Each individual official time will start when the car passes the timing system for the first time.
- 6.9.6 When the first car completes the first lap, all official timing not yet activated will be started.
- 6.9.7 During the first round of qualifying, heat starting order will be determined by heat listing. During further rounds, heat-starting order will be determined by their finishing order in their previous heat.

**6.9.8 GRADING**

- 6.9.8.1 Heats should be graded before the commencement of qualifying using a driver's best three consecutive laps from controlled practice.
- 6.9.8.2 Re-grading of drivers should be carried out on the basis of the provisional qualifying order after the third round of qualifying, counting the two best scores. The Race Director may use their discretion to cancel a regrade in the event of significant or imminent schedule interruption.
- 6.9.9 Qualifying heats shall be ordered from the slowest to fastest heats.
- 6.9.10 At the completion of qualifying the provisional qualifying order becomes the final qualifying order.
- 6.9.11 The format for counted rounds to determine a driver's provisional qualifying position will be based on dropping their worst two (2) scores out of the qualifying rounds
- 6.9.12 Qualifying order will be determined as per current IFMAR Electric track regulations (section 1.5.4). See Appendix A.

**6.10 Finals**

- 6.10.1 Drivers will qualify for finals in groups of 10, i.e. the top ten (10) drivers qualify for the A-Final, qualifiers 11-20 qualify for the B-Final, etc. All finals will be of a maximum of ten (10) drivers, and have a minimum of three (3) drivers.
- 6.10.2 All final legs will be of standard duration (2.10.1) plus last lap races. All finals for sanctioned classes shall consist of three (3) legs. Finals for demonstration classes shall be decided at the club's discretion, but shall not impact on the scheduling of finals for the sanctioned classes.
- 6.10.3 Final positions will be determined as per IFMAR Electric track regulations (section 1.7.3 – See Appendix A).
- 6.10.4 During finals, positions on the driver's stand will be selected by drivers in order of qualifying position, i.e. No. 1 qualifier has first choice, No. 2 qualifier has second choice, etc. Preferably the Race Director should introduce each driver onto the stand in Qualifying order, stand positions to remain same for each final.
- 6.10.5 An audible warning will be given in English language at 1 minute to the start of the final.
- 6.10.6 At the thirty second warning all cars must be placed on the track and the mechanics must leave the racing surface. After the thirty second warning no other cars will be allowed entrance to the racing surface until after the start of the race, at which time the car may be placed on the starting grid after all the cars have left.
- 6.10.7 A ten second warning will be issued followed by the start, which will be by an audible signal.
- 6.10.8 From 10 seconds until three 1 second, time is audibly counted down, second by second.
- 6.10.9 After a suitable pause, an audible start signal will sound to commence the race.
- 6.10.10 The official starting signal will be audible by means of a horn or similar. This signal will also start the timing systems.
- 6.10.11 In event of a jumped start, see section 7.1.
- 6.10.12 Only the Race Director may interrupt the race and order a restart in the event that they consider the starting procedures or the start were not carried out correctly, or in the event of a timing failure.
- 6.10.13 A video record will be made of all starts for review by the referees as necessary.
- 6.10.14 Cars will be positioned within 25mm behind their respective grid start line. Any car crossing the line from the final count down to the start signal will receive a 1-lap penalty.
- 6.10.15 If for any reason a car did not start prior to the completion of the first lap by any car, the time for that car will automatically begin the moment the first car has completed a lap.
- 6.10.16 All finals must use a staggered or inline grid start of 10 rows (see Section 3.10.2).
- 6.10.17 Any race stopped due to race equipment malfunction or official's error will be re-run after a suitable delay.

## 6.11 Technical Inspection

6.11.1 Prior to the start and at the completion of each qualifying heat or final all cars in that heat or final, whether they finished or not, must be presented for technical inspection. Cars which are not presented for technical inspection or have a technical infringement will be disqualified from that round. Race damage to the body, wing or spoiler will be taken into account and marked on the competitor's scrutineering sheet.

### 6.11.2 Pre Race Check

All cars shall be presented immediately before their race for the following checks;

- Bodysell markings (all)
- Tyre markings (All TC Classes)
- Battery voltage (All TC Classes)

6.11.2.1 Once checked, cars shall not be permitted to return to the pit area, and must proceed directly to the nominated set down area for the track.

### 6.11.3 Post Race Check

All cars shall be presented immediately after their heat for the following checks;

- Weight (all)
- Binky Mode (TC Sportsman and Stock)

6.11.3.1 At any time, the Race Director may ask any competitor to present their cars to Technical Inspection. Additionally, at the Chief Scrutineer's discretion, any or all cars, may be checked for any regulation post race.

6.11.3.2 All cars will be impounded at the end of the finals for potential further technical inspection.

6.11.4 All cars will have motors, and batteries inspected as necessary during heats with mandatory inspections at the end of each final.

6.11.5 At any time, the Race Director may ask any competitor to present their cars to Technical Inspection.

6.11.6 Random inspection can occur in pit lane for car numbers, tyres, wings, and chassis.

6.11.7 No race will be delayed because of non-compliance by a competitor.

## 6.12 Trophy Presentation

6.12.1 A trophy presentation will be held at the conclusion of the Championship, after official final results have been posted and any protest time has passed.

6.12.2 The trophy presentation may take place at an alternative location.

6.12.3 As a minimum, the following trophies must be awarded for State Championships;

- Concourse for each chassis type.
- Top Qualifier for each qualifying class
- Top 10 finishing positions for each class

6.12.4 As a minimum, the following trophies must be awarded for National Championships

- Concourse for each chassis type.
- Top Qualifier for each qualifying class
- Top 10 finishing positions for each class

6.12.5 Drivers in the main final must receive trophies larger than those in the lower finals.

6.12.6 Prizes and trophies are allowed to be presented. Cash prizes are not permitted.

## 7 RACE PROCEDURES

### 7.1 Jumped Start

- 7.1.1 A jumped start (i.e. any movement of a vehicle between the time the Starter announces 10 seconds to the start time and the starting signal.) will be penalized.
- 7.1.2 A jump start that is called by the Race Referee before the first lap is completed will incur a 1 lap penalty.
- 7.1.3 If a jumped start is not called by the officials immediately at the start of a race but can be verified afterwards by at least two race officials using any recording device, a one lap penalty will be added in a Final.
- 7.1.4 Under no circumstances will the race be stopped or restarted due to a jumped start.

### 7.2 Marshalling

- 7.2.1 Marshals must not place themselves in danger of being hit by a car on the track.
- 7.2.2 Where a heat or final has been stopped due to a Marshal being incapacitated or at risk of further injury, the qualifying heat or final will be rerun as if it were interrupted by Wet Weather.
- 7.2.3 Competitors will marshal the heat following their racing heat. Competitors in the final heat of a qualifying round will marshal the first heat of that qualifying round.
- 7.2.4 Competitors, or their designated substitute, must perform marshalling duties for qualifying heats and finals. It is the competitors' responsibility to ensure substitutes marshal from the correct marshalling location. Physically disabled drivers are not required to marshal.
- 7.2.5 Competitors, or their designated substitute, must marshal at the correct marshalling location, as per their corresponding car number. Failure to marshal at the correct location will incur a penalty.
- 7.2.6 The host club must provide marshals for vacant positions for which there are no available competitors.
- 7.2.7 All marshals must wear enclosed shoes and use the provided fluorescent jacket.
- 7.2.8 Marshals must return cars to as close as possible to where they left the track.
- 7.2.9 Where multiple cars require marshalling, it is to be done on a first come first go basis.
- 7.2.10 Where multiple cars require marshalling that was caused by another car; the car that caused the problem will be marshalled last.
- 7.2.11 Cars that are no longer able to return to the pit lane on their own are to be placed upside down outside the track perimeter until the completion of the race.
- 7.2.12 A marshal is responsible for the section of track designated by the track officials through a marker or number. Their responsibility is to return a vehicle that has overturned or tangled (with another vehicle or object) to the race surface in a manner that does not affect another approaching vehicle. Broken or Dead vehicles must be removed from the racing surface, and placed upside down in a safe position away from the racing surface. It is not the Marshals job to fix a broken vehicle (removing a tucked body shell is allowed). Pit crews will be permitted to fix simple problems, as long as it does not affect Drivers, Marshals and Race Officials carrying out their duties

### 7.3 Wet Weather

- 7.3.1 In the event of any of the rules in this section being invoked these rules shall take precedent over any other rules which they may contradict.
- 7.3.2 All efforts must be made to complete as many rounds of qualification and finals as possible. In the event of a weather delay, the host club may schedule an open practise session to help return the track to a raceable condition. Event tyres are not required to be used for such a session.
- 7.3.3 To assist in efforts to be able run a full set of finals, qualification rounds may be reduced to a minimum of three (3) rounds, with the best two (2) rounds counting.



- 7.3.4 National and State championship events can only be abandoned by a majority vote of the state Jury after consultation with the Race Director. In the event of a National meeting being abandoned the following will be applied to determine the meeting results:
- If less than three (3) rounds of qualification have been completed, no result for the event will be declared.
  - After three (3) rounds of qualification the meeting results would be declared using round by round points with 2 rounds counting.
  - After four (4) or five (5) rounds of qualification (and no finals run) the meeting results would be declared using round by round points with three (3) rounds counting
  - After one (1) round of finals, then the points will be awarded as normal for this round of finals, and a second set of scores for finals will be awarded based on the qualification positions. The final positions will be determined using both of these scores, with tie breaks resolved in favour of the driver with the highest qualifying position.
  - After two (2) rounds of finals, the scores from these two (2) rounds will be taken, and a third (3<sup>rd</sup>) set of scores will be awarded based on qualification positions. These three (3) scores will then be evaluated in the normal way. Tie breaks will be resolved in favour of the driver with the higher qualifying position.
- 7.3.5 In the event of the meeting being abandoned mid-way through a round of qualification, the points for that entire round will be scrapped and results declared from the previous completed round as described above. If the meeting is abandoned part way through a round of finals, points will be awarded to finals that have been completed with any subsequent finals not run in that round will have points awarded as per qualification results.

## 7.4 Drivers Stand Access

- 7.4.1 Only drivers and race officials are allowed to access the driver's stand.
- 7.4.2 Drivers from a following qualifying heat or final are not permitted to access the driver's stand until all the drivers have left the drivers stand.
- 7.4.3 Drivers in a finished qualifying heat or final must vacate the driver's stand in a timely manner at the completion of their qualifying heat or final.
- 7.4.4 Drivers with mobility problems may access the driver stand before their heat or final providing they do not interfere in any way with the qualifying heat or final in progress.
- 7.4.5 Drivers are not allowed to exit the drivers stand until all cars have completed the race.

## 7.5 Official Race Announcements

- 7.5.1 All official announcements concerning the race must be audible in the English language in the pit area, drivers' stand and track areas.

## 8 RACING REGULATIONS

### 8.1 Offences

- 8.1.1 Participants in the Championship must strictly observe instructions given by the Race Director, State Jury, Referee and other designated Race Officials.
- 8.1.2 An instruction is a direction issued by a Race Official to a particular competitor. All instructions will be announced in the English language with the words: "Car <Number> <Instruction>". For example; "Car 3. Faster Car behind you".
- 8.1.3 The Race Director and/or Referee will determine the issuing of warnings and the issuing of, and severity of, a penalty.
- 8.1.4 A warning will be given against a competitor when they have not followed an instruction, or the unsportsmanlike behaviour of competitors or marshals involved in the racing. For competitors who continue to ignore instructions, subsequent warnings may include a penalty. For example; Instruction "Car 4. Faster Car behind you". Car 4 has not given way within a reasonable distance to the faster car. Warning "Car 4. Warning. Faster car behind you".
- 8.1.5 A penalty is given against a competitor when there has been a breach of the rules. All penalties will be announced in the English language with the words: "Car <Number> <Penalty><Reason>". For example, "Car 7. Stop and go. Failing to yield to a faster Car."
- 8.1.6 A combination any three penalties or warnings during a single qualification heat or final will cause the competitor to be disqualified from that qualification heat or final.
- 8.1.7 A combination of any three technical or qualification heat or final disqualifications will cause the competitor to be disqualified from the Championship. A competitor who has been disqualified from a Championship will have their entire result removed from the record and will be placed last. (if this occurs after the commencement of the finals, neither the qualifying order nor the make up of the Finals will be changed). The competitor involved may be subject to further State, National or International sanctions being imposed.
- 8.1.8 Physical violence against any other person or object at a Championship, or any form of professional fouling by competitors or marshals will result in the disqualification and ejection from the Championship of that person and/or team. The person(s) and teams(s) involved may be subject to further State, National or International sanctions being imposed.
- 8.1.9 The bad sportsmanship and behaviour of any competitor, even outside the official race meeting, which could injure the image and promotion of the sport, may become the object of an official State, National or International sanction.

### 8.2 Penalties

- 8.2.1 The Race Director and/or Referee may impose penalties in addition to the guidance provided in these rules.
- 8.2.2 The stop and go penalty will be applied for minor racing breaches of the rules. Additional time in seconds may be added depending on the severity or repetition of the breach.
- 8.2.3 The penalised competitor must complete the penalty on the next possible lap after the penalty has been issued.
- 8.2.4 Where the penalty is applied on the last lap of a qualifying heat or final, additional time equivalent to the penalty will be added to that competitor's result.
- 8.2.5 The penalised car must come to a complete stop within the marked penalty box. The penalised car may leave the penalty box only after a Race Official has released the car. Failure to do so will result in further penalties.
- 8.2.6 Penalised cars are not allowed to be repaired during a stop and go penalty.

### 8.2.7 **MARSHALING PENALTIES**

- 8.2.7.1 Competitors, including their designated substitute, who are not in their marked marshalling location 30 seconds prior to the start of the heat will be penalised by the loss of their best qualifying result for the Championship and the issuing of an official warning to that competitor.
- 8.2.7.2 Competitors, including their designated substitute, who perform repair or maintenance on a car whilst marshalling, will be penalised by the loss of their best qualifying result for the Championship and the issuing of an official warning to that competitor.

### 8.2.8 **DRIVER PENALTIES**

Penalties may be applied to the competitor as follows;

- 8.2.8.1 Bad sportsmanship during racing, for example; impeding progress of other competitors, deliberate slowing down or walling of another car, deliberate short-cutting of corners, distraction of other competitors on the driver's stand.
- 8.2.8.2 Reckless driving.
- 8.2.8.3 Verbal abuse of Competitors, Marshals or Race Officials.
- 8.2.8.4 Incorrect use of entry and exit of the track, or driving in the wrong direction.
- 8.2.8.5 Lapped cars must give way to the faster cars at the next reasonable opportunity.
- 8.2.8.6 Faster cars must exercise due care when overtaking to avoid hitting slower cars, ie pushing.
- 8.2.8.7 Competitors who drive another competitor's car in any qualifying heat or final either as a substitute driver or as a substitute car will be disqualified from the Championship.
- 8.2.8.8 A competitor who starts in the wrong qualification heat will be black flagged and penalised by the loss of their best qualifying result for the Championship.
- 8.2.8.9 A competitor who starts in the wrong final will be black flagged and disqualified from their allocated final. Additional penalties including disqualification from the Championship may be applied.

### 8.2.9 **START PENALTIES**

- 8.2.9.1 Any car that has not started a qualifying heat or final using the official starting procedure must join the race from pit lane after the field has passed. Where no pit lane exists, the penalty box must be used.
- 8.2.9.2 A jumped start will incur a penalty (See section 7.1 Jump Starts).

## 8.3 **Black Flag**

- 8.3.1 When a Black Flag has been issued to a competitor, the competitor must return their car immediately to pit lane or pull off the track near the drivers stand.
- 8.3.2 A competitor who has been black flagged and not allowed to return to the track will be officially disqualified from that qualification heat or final. The competitor will have their result removed from the record and will be placed last in that qualification heat or final. The result sheet will be marked to show the competitor as being disqualified.
- 8.3.3 A Black Flag, may be issued by the Race Director or Referee, for:
- Competitors who continually impede the progress of other participants.
  - Competitors who have three penalties or warnings issued in a qualification heat or final.
  - Unsportsmanlike racing.
  - Competitors driving in a manner deemed to be dangerous by the Race Director or Referee.
  - Competitors starting in the wrong qualification heat or final.
  - Competitors driving in the wrong direction on the track.
  - Competitors that do not observe the instructions and warnings by the Race Director and Referees.
  - The bad behaviour and/or deportment of any competitor, even outside an official race meeting, which could injure the promotion of the sport.

- Vehicles judged to be in undriveable or dangerous condition by the Race Director. These vehicles, after being repaired, may be allowed to re-enter the track after permission by Race Officials.
  - Cars judged by the Race Director to be in an undriveable or dangerous condition.
- 8.3.4 Any damage incurred during a qualifying heat or final will not entail a forced stop or black flag of the competitor except in the following cases:
- Loss of a body excluding the spoiler or wing.
  - A car which becomes dangerous or undriveable.
  - Cars which lose their bodies must immediately stop and carry out the necessary repairs after which they may rejoin the race.

## 8.4 Technical Disqualification

- 8.4.1 Any breach, including illegal modifications or changes made to the car, of the Technical Rules in force at the time of the Championship, before the start of, during, or after a qualifying heat or final, as identified by technical inspection, will result in the technical disqualification of the competitor from that qualifying heat or final.
- 8.4.2 Where a car's body dimensions breach the technical rules, the body will be inspected and an allowance will be made for identified minor race damage. The race damage will be recorded on the competitor's scrutineering checklist. The competitor is responsible for ensuring that their car meets the required specifications prior to starting their next qualification heat or final.
- 8.4.3 Additions to the chassis and/or body shell, such as screws, stickers, etc, which inhibit or prevent the scrutineering of a car may need to be removed whilst the car is being scrutineered.
- 8.4.4 The Technical Director will recheck any car that has failed technical inspection. The car will be impounded at Technical Inspection until the competitor has been informed of and the reason for the technical disqualification. The competitor may request a recheck for their car that has failed technical inspection prior to removing the car from technical inspection.
- 8.4.5 A disqualified driver's position will be shown as the last position in that heat or final.

## 8.5 Protests

- 8.5.1 Protests must be submitted by individual competitors, in writing (English), to the Race Director via their State Delegate, with a deposit of \$100.
- 8.5.2 Where a protest occurs during a qualifying heat, the protest must be submitted within the latter of;
- i) 20 minutes of the completion of the following qualifying heat.
  - ii) 20 Minutes after the official posting of the race results.
- The deposit is forfeited if the protest is not upheld and the deposit is returned if the protest is justified or upheld.
- 8.5.3 Where a protest occurs during a final, the protest must be submitted within the latter of;
- i) 20 minutes of the completion of the following final.
  - ii) 20 Minutes after the official posting of the race results.
- The Race Director may suspend the proceedings at the completion of the final in progress by no more than 20 minutes to process the protest.
- 8.5.4 Where a protest occurs involving a technical disqualification, the car and any batteries, must remain in, and not be removed from Technical Inspection until the protest has been resolved. Any protest involving a technical disqualification will be void if the car has been removed from Technical Inspection.
- 8.5.5 Protests are processed by the Race Director. If the outcome of the protest is not able to be determined, the Race Director will elevate the protest to the State Jury in consultation with the Referee. If the outcome of the protest is not able to be determined by the State Jury, further consultation with RCRA may be sought.

- 8.5.6 No frivolous or vexatious protests will be entertained. If the Race Director determines that a protest is frivolous or vexatious or that the protester has acted in bad faith they may impose a penalty.
- 8.5.7 Appeals against any protest decision made by the Race Director during the championship may be submitted by the protesting competitor to their State Delegate. Such appeal is to be handled by the State Jury in consultation with the Referee. After discussion, the State Jury, by majority vote, will decide the issue in question. The decision and findings of the State Jury will be binding on all parties to the dispute.

## **8.6 Requests for lap count checking**

- 8.6.1 Requests for lap count checking do not need to be written and need no deposit. They are submitted to the relevant State Delegate by the competitor. The competitor will show the State Delegate the result sheet in question and indicate where the competitor believes a mistake has been made.
- 8.6.2 The State Delegate will show to the Race Director or Time Keeper the result sheet in question and will indicate where they think an error has been made. The Race Director or Time Keeper will resolve the problem by checking with the second lap counter, and if necessary, with the manual record of stops. If the request is justified, the Race Director will approve the correction, and the result will be modified immediately. The Race Director or Time Keeper will advise the State Delegate of the result who will in turn advise the competitor. If the competitor persists with their request, they will have to present a written protest as per a normal protest.

## 9 TECHNICAL SPECIFICATIONS

### 9.1 ON ROAD ELECTRIC CLASSES

9.1.1 Electric On-Road sanctioned classes are as follows;

- ISTC Junior Sportsman
- R1 ISTC 21.5t
- ISTC 13.5t
- ISTC Modified
- 1:12<sup>th</sup> Modified
- 1:12<sup>th</sup> 13.5t

### 9.2 GENERAL SPECIFICATIONS

9.2.1 It is each competitor's responsibility to ensure that their car meets all technical and eligibility requirements.

9.2.2 No car shall be constructed or presented for racing so as to be dangerous to persons or cause damage to competitor's cars or the track surface.

9.2.3 Tyre treatments that can coat or damage the racing surface are specifically banned.

### 9.3 TYRE TREATMENTS

9.3.1 Tyre treatments (additives and/or cleaners) will be controlled for all National and State sanctioned events. It is the responsibility of the host club to ensure sufficient availability of additive for the duration of the event.

9.3.2 The type of additives and/or cleaners is to be decided by the RCRA Electric Executive together with the race organisers, taking into consideration the chosen control tyre(s).

9.3.3 For safety, additives that are non-flammable, non-toxic and of low odor should be considered for use as control additives.

9.3.4 Separate additives may be selected for ISTC and 1/12th vehicles, if it is felt there is a requirement to do so. If separate additives are used, the control station(s) must be in separate locations to avoid accidental use of the wrong additive (i.e. a TC station and a 12<sup>th</sup> station cannot be in the same location)

9.3.5 The selected type of additive is to be announced not less than 2 months prior to the event.

9.3.6 The use of the control additive by demonstration classes is at race organisers discretion. No other additives may be used by the demonstration classes

9.3.7 The use of a separate cleaner is at race organisers discretion and is to either be supplied by the club or the supplier name and part number nominated at the same time as control additive.

9.3.8 Clubs should endeavor to either supply as part of entry fees or provide for sale (at RRP or less) the nominated cleaner at the event.

9.3.9 Any additives or non-allowed cleaners discovered in the pits will be confiscated by race organisers and returned at the end of the event, this includes those within pit bags and boxes.

9.3.10 Racers suspected to have prohibited items within their pit area must present all bags and boxes for inspection by race organisers.

9.3.11 Any racer found to be using prohibited treatments will be disqualified from the event.

9.3.12 Control Additives are to be applied only at control station(s). The timing of application is at the race organisers discretion. In the case of high entry numbers, organisers retain the right to restrict access to the control station(s) to specific times for each heat.

9.3.13 Cleaners (if approved) can be freely used in the pit area.

## 9.4 DRIVERS' AIDS

- 9.4.1 Traction control, Active suspension, Gyroscopes, Slipper clutches, Variable Drive Transmissions and automatically adjusting differentials are not allowed.
- 9.4.2 Telemetry including Sensors for Wheel Speed, Tyre Slips or Suspension Position is not allowed
- 9.4.3 Setting or programming of speed control devices must only be possible whilst the car is stationary. Changes to the setting or program during a race are not allowed
- 9.4.4 A maximum of two fans of up to 40mm each for the purpose of cooling electronics (ESC, Motor, etc) may be fitted to the car. No other form of cooling is allowed. Fans must be powered by the main battery pack
- 9.4.5 Ducting is allowed, provided it does not require any disassembly to remove the motor from the car for scrutineering purposes, i.e. no enclosures, or attachment to the motor. For this purpose, a duct that overlaps across the endbell is considered an enclosure.
- 9.4.6 The use of tyre warmers is allowed but they may not be used/brought into the defined race/track area.

## 9.5 1/10th ISTC Technical Rules

The essence of the ISTC class is competition between realistic models of full scale saloon/sedan cars raced in Touring Car classes worldwide.

Note: All ISTC classes have the same technical rules excepting motor rules (refer to Section 10).

### 9.5.1 CHASSIS AND DRIVE TRAIN

- 9.5.1.1 Single drive motor, single speed Transmission, four wheel drive (4WD) vehicles are allowed only.
- 9.5.1.2 Chassis must have independent suspension to all four wheels.
- 9.5.1.3 No part of the chassis assembly, including wheels/tyres/axles, may protrude outside the body shell when viewed from above.
- 9.5.1.4 Foam bumpers must be fitted. No part of the bumper may extend outside the body-shell when viewed from any direction, nor be lower than the chassis.
- 9.5.1.5 Under body/chassis aerodynamic aids of any nature are not allowed.

### 9.5.2 DIMENSIONS

Description (mm)	Min	Max
Wheelbase	250	270
Width (without body)	170	190
Width (with body)	175	195
Length (inc body and wing)	360	460
Wheel Diameter	46	50
Wheel width (including tyre bead)	18	26
Tyre Width	-	27
Tyre Diameter	52	67
Ground clearance (at race ride height)	5*	-

\* Ground Clearance for use on carpet or other surfaces that could be damaged to be specified on the entry form.

- 9.5.2.1 Weight: All Touring Car minimum weight: 1320 grams ready to race including transponder, at all times during the race:

**9.5.3 BODY-SHELLS**

- 9.5.3.1 Bodies are only allowed if on current IFMAR, EFRA, ROAR or BRCA bodysell listings, and comply with the Global Body Specifications (GBS) for electric touring cars. Refer to Appendix E for GBS Dimensions
- 9.5.3.2 Overall Wing size Inc endplates (WxDxH) 190x40x20 Max (mm)
- 9.5.3.3 Wings (excluding endplates) are to be of single moulded construction (no flat-packs/bend your own) and must be mounted directly to the body (no spacer between shell and wing), on the mounts provided at the back of the approved shell.
- 9.5.3.4 The bodysell must be trimmed to retain, in some form, moulded features such as front splitter, side skirt and rear bumper.
- 9.5.3.5 No holes or slots are allowed on the body or wing, except for body post, aerial and transponder holes.
- 9.5.3.6 Details of all front and rear lights plus the main front grill must be clearly contrasted from the surrounding paintwork. Windows are to be transparent.
- 9.5.3.7 All cars must have a minimum of two identifying numbers, one on the front windscreen, and one on the side presented to race control whilst on track.

**9.5.4 TOURING CAR CONTROL TYRES**

- 9.5.4.1 A controlled tyre, insert and wheel combination must be used for all Sanctioned Events
- 9.5.4.2 Moulded rubber tyres only allowed. Tyres must be black except for technical inspection marks.
- 9.5.4.3 The type of tyres and combinations are decided by the RCRA Electric Executive together with the race organiser (from race organiser recommendations).
- 9.5.4.4 The Host Club must present three (3) viable currently commercially available tyre options to the EP Committee for endorsement not less than four (4) months prior to the event.
- 9.5.4.5 The final decision will be made three (3) months before the event, between the RCRA Electric Executive and the race organiser and must be announced on the entry forms
- 9.5.4.6 The selected tyre, insert and rim combination and supplier must be announced not less than three (3) months prior to the event.
- 9.5.4.7 The Supplier must set aside 300 sets of tyres at least two (2) months before the event to ensure supply.
- 9.5.4.8 Tyre assemblies are preferred to be pre-glued – submissions to nominate for a control tyre indicate if pre-glued or un-glued are to be used.
- 9.5.4.9 The rim must utilise a standard 12mm hex mount. Modification to the rims is not allowed
- 9.5.4.10 The host club has a duty to ensure that, as part of its selection process, the preferred tyre will be readily available from a minimum of three (3) Australian based businesses for the duration of the period from their announcement until the meeting.
- 9.5.4.11 The host club must list on the entry form a minimum three (3) locations that tyres can be purchased from with contact details (website, phone number or address)
- 9.5.4.12 All tyres used for the event should be supplied from the same manufactured batch wherever possible. Competitors must purchase event tyres through the host club at the race meeting.
- 9.5.4.13 Tyre sets (four (4) tyres, inserts and wheels) shall be sold to racers at the event under the following conditions.
  - 1) Maximum price limit of \$40.00 AUD per set
  - 2) Must be sold at less than RRP
- 9.5.4.14 Any driver using any other type of tyre, insert, or rim will immediately be disqualified from the event.
- 9.5.4.15 Tyre set quantities are limited for the event;
  - *ISTC Modified – A maximum of 4 sets of 4 wheels and tyres*
  - *ISTC 13.5t – A maximum of 3 sets of 4 wheels and tyres*
  - *ISTC 21.5t – A maximum of 2 sets of wheels and tyres*
  - *Junior Sportsman – A maximum of 1 set of wheels and tyres*



- 9.5.4.16 Any tyre set or combination of may be used at any time during the event from controlled practice onwards. There is not a requirement to run event tyres during controlled practice.
- 9.5.4.17 If unglued tyres are used, assembly must be performed in front of a Technical Inspector and be presented to the technical inspector prior to returning to the pits. This marking will take place before the start of the event
- 9.5.4.18 A driver cannot re-use any part of the tyre assembly (i.e. inserts) in the assembly of another set. All tyre assemblies must be made from new tyres/inserts/rims
- 9.5.4.19 Unmarked tyre sets cannot be used at any stage of the event.
- 9.5.4.20 Technical inspection marks must identify the following
- Each tyre set uniquely identifies the driver and class for the driver
  - Technical inspection is to leave its own unique mark on the tyre set
  - Technical inspection shall be responsible for recording the number of tyres used by each driver.
- 9.5.4.21 It is the driver's responsibility to ensure that inspection marks are identifiable and clearly visible. If this is not the case, this set cannot be used, until it can be re-inspected by the Technical Inspector.
- 9.5.4.22 Tyres will be issued to drivers at the beginning of each race day, and it is the responsibilities of the drivers to return to Technical Inspection all tyres at the completion of each day. Tyres must not be removed from the pit or race track area at any time. Failure to surrender the tyres at the end of the day or removal of the tyres from the pit area except for racing will result in the driver being disqualified from the event.

## 9.6 1/12th Scale

- 9.6.1 Only bodysHELLs on the approved body lists provided by IFMAR, EFRA, ROAR or BRCA may be used. Australian suppliers or Manufacturers may apply to have bodies added to an RCRA approved body list. For such a body to be approved it must conform to the dimensions given in the IFMAR global body specifications for the 1/12 Class. Contact RCRA for further details.
- 9.6.2 Only one rear wing, moulded into the bodysHELL, may be used.
- 9.6.3 Additional side dams may not be fitted. Only side dams moulded into the original body-shell are allowed.
- 9.6.4 An additional adjustable gurney flap may be fitted, provided it does not exceed the height of the originally moulded side dams as per 9.5.3.
- 9.6.5 The body and chassis must be securely joined at all times when the car is on the track. If a body comes loose or falls off during a race, the car must be removed from the track until the body-shell is securely reattached.
- 9.6.6 Wheel arches must be cut out.
- 9.6.7 The body-shell may not be trimmed higher than the lower body trims lines.
- 9.6.8 No part of the chassis, wheels, tyres, suspension or mechanical/electrical equipment may be visible Outside the body-shell when viewed in any plane, except for directly from the rear of the chassis.
- 9.6.9 No holes or slots are allowed on the body or wing, except for body post, aerial and transponder holes.
- 9.6.10 Rollover antenna may be fitted. If fitted, it must have a blunt end for safety reasons. The antenna must be part of the mast along its length. Maximum height from ground 350mm.
- 9.6.11 **DIMENSIONS**

Description (mm)	Min	Max
Overall Width	155	176
Track Width	-	172
Overall Length	320	380
Wheel Diameter	29	38
Rear Tyre Width	-	40

RCRA EP On-Road General & Technical Rules

Front Tyre Width	-	28
Ground clearance (at race ride height)	3*	-

\* Ground Clearance for use on carpet or other surfaces that could be damaged to be specified on the entry form.

- 9.6.12 Bumpers are not required. If fitted, bumpers must be constructed so as to minimise injury that may result from being hit by the car. Bumpers made from sheet type material shall be not less than 2.5mm thick or more than 6.5mm thick, with all exposed edges smooth and well rounded. Rigid blade-like bumpers made of hard, non-resilient material such as metal, brittle plastic, plywood, masonite, etc., will not be allowed. All cars may run a rear bumper, which must be behind the rear tyres. Bumpers may extend 6.5mm beyond the sides of the body, or to 176mm, whichever is less.
- 9.6.13 Tyres must be black, except sidewall detailing. Tyres shall be of closed-cell foam constructions, and shall not damage the track surface.
- 9.6.14 Cars are not permitted to race with a reverse facility.
- 9.6.15 The minimum weight limit, ready to run, is **730** grams cars including automatic timing equipment. The weight of the car must not be below the weight limit at any time during the race. Race distortion or damage must be disregarded.
- 9.6.16 Drive to the rear wheels must be through the use of a solid rear axle, no independent rear suspension allowed. Independent front suspension allowed.

## 10 MOTOR SPECIFICATIONS

- ISTC and 1:12<sup>th</sup> Modified Classes – Only Brushless motors approved by IFMAR, ROAR, EFRA or BRCA may be used
- ISTC and 1:12<sup>th</sup> 13.5t Class – Refer to Section 10.2
- ISTC 21.5t Class – Refer to Section 10.3
- ISTC Junior Sportsman – Refer to Section 10.4

### 10.1 General Definition of a brushless motor:

10.1.1 Sensored or sensorless (modified only) motors allowed

10.1.2 The motor has to be rebuildable. Ball Bearings are allowed

10.1.3 If the motor is sensored: It Must use a six position JST ZH connector model number ZHR-6 or equivalent connector with 6 JST part number SZH-002T-P0.5 26-28 awg contacts or equivalent.

Wire sequence must be as follows:

Pin #1 - ground potential

Pin #2 - phase C

Pin #3 - phase B

Pin #4 - phase A

Pin #5 - temp control, 10 k Ohm Thermistor referenced to ground potential

Pin #6 - + 5.0 volts DC +/- 10%.

Compatible speed control must use the 6 position JST header part number X-6B-ZR-SMX-TF (where the X denotes the style of the header), or equivalent.

The power connector has to be clearly marked A, B, C.

A for phase A

B for phase B

C for phase C

10.1.4 "540" Size specifications:

**Motor Can:** Overall maximum diameter is 36.02mm measured at whatever point yields the maximum dimension, excluding solder tabs or lead wires. Overall minimum diameter is 34.00mm measured at whatever point yields the minimum dimension, excluding solder tabs or lead wires. Maximum length is 53.00mm measured from the mounting face of the motor to the furthest most point of the end bell, not including solder tabs, lead wires or original manufacturer's logo or name.

Minimum length is 50.00mm measured from the mounting face of the motor to the furthest most point of the end bell, not including solder tabs, lead wires or original manufacturer's logo or name.

Motor mounting holes must be on 25.40mm centres.

**Stack/Stator:** Stack minimum length 19.30mm, maximum 21.00mm. Stack inside diameter minimum 14.50mm, maximum 16.00mm. If a stack is used then it must be continuous. The laminations have to be one after the other without anything in between. The thickness of the stack plates is 0.35 +/- 0.05mm. All laminations must be of the same material.

**Winding For Modified:** Three slot (phase) "Y" wound stators, delta wound or slot-less stators allowed. Only circular (round) pure copper wire permitted.

**Rotor:** Shaft diameter must be 3.175mm. Only one piece, 2 pole bonded Neodymium or Ferrite (ceramic) magnetic rotors are permitted. The shaft outside diameter, where the magnet is mounted, shall be minimum 7.25 +/- 0.150mm for spec classes and minimum 5.00mm +/- 0.150mm for modified classes. This dimension must be measurable without destroying the rotor.

Magnet minimum length - 23.00mm, maximum 27.00mm.

Magnet minimum diameter 12.00mm, maximum 12.51mm, to be applied to spec classes only. Modified open to all option rotors.

All motors must have the original manufacturer's logo or name moulded into the end bell.

No hybrid (mixing of parts from approved brushless motors) allowed.

- 10.1.5 Exchange of rotors from within the same manufacturer allowed, as long as they comply with the class restrictions.

## 10.2 13.5t Brushless Motors:

A Motor list will be compiled on a separate motor list, but will comprise those motors listed on either ROAR, BRCA or RCRA approved motor lists. Local distributors can apply to RCRA for Australian certification under specific conditions only

- 10.2.1 For the purposes of local approval, a local distributor is considered to be a body with an existing supply network within Australia. i.e. More than one point of sale locally. Additionally local distributors must provide proof of having available to purchase a minimum of 30 motors at the time of approval. Two samples motors must also be supplied for reference checks to meet existing measurements as performed by BRCA and ROAR.

- 10.2.2 All brushless motors for the Stock class will be wind rating of 13.5 turns, clearly indicated by the manufacture on the external casing.

**Stator, Stock Motor:** Only three slot "Y" wound stators are permitted. No delta wound or slot less stators are allowed. Only circular (round) pure copper magnet wire permitted. The three slotted stator must be wound with 13.5 turns of 2 strands of a maximum diameter 0.724 mm and two strands of a maximum diameter of 0.574 mm per slot.

## 10.3 R1 ISTC 21.5t Brushless Motor

- 10.3.1 Only the following motor is approved for use in the ISTC 21.5t class

- R1 21.5t Control Motor – Part Number R1-215-125-V16-AU (Supplied by RC Maker)

- 10.3.2 No motor modifications are allowed

- 10.3.3 Motor timing shall be adjusted at sanctioned events, to set the Kv of all motors within the same range. Motors shall be set using RCRA supplied equipment.

- 10.3.4 Kv rating shall be  $2400 \pm 5$  Kv. Motors that require extreme timing adjustments to achieve this Kv will be removed from competition and replaced.

- 10.3.5 Once the Kv is set, motors shall be marked and sealed so that no adjustment of the timing is possible.

- 10.3.6 Motors with an approved seal already in place will not be required to be re-set when presented at events.

## 10.4 ISTC Junior Sportsman

- 10.4.1 Approved Brushless Motors for the Junior Sportsman class are to be approved by the RCRA EP ONR Committee in consultation with State Delegates. Motors may be removed from this list with a minimum 6 month notice period.sec

- 10.4.2 ISTC Junior Sportsman are to use a controlled Motor and ESC (Electronic Speed Controller)

- 10.4.3 Approved Motor;

Hobbywing Xerun Justock G2 21.5t. P/N HWA30408007 or XY309960 (XRS version)

- 10.4.4 No motor modifications are allowed.

- 10.4.5 Approved ESC;

Hobbywing Xerun XR10 Justock P/N HW30112000

- 10.4.6 A gear ratio limit is to be run. This is to protect the motors from excess heat caused by over gearing and keep performance equal. Gear ratio checks may be requested at any time by the technical inspector. See Section 10.5 for specified limit.

**10.5 Gear Ratio Limits**

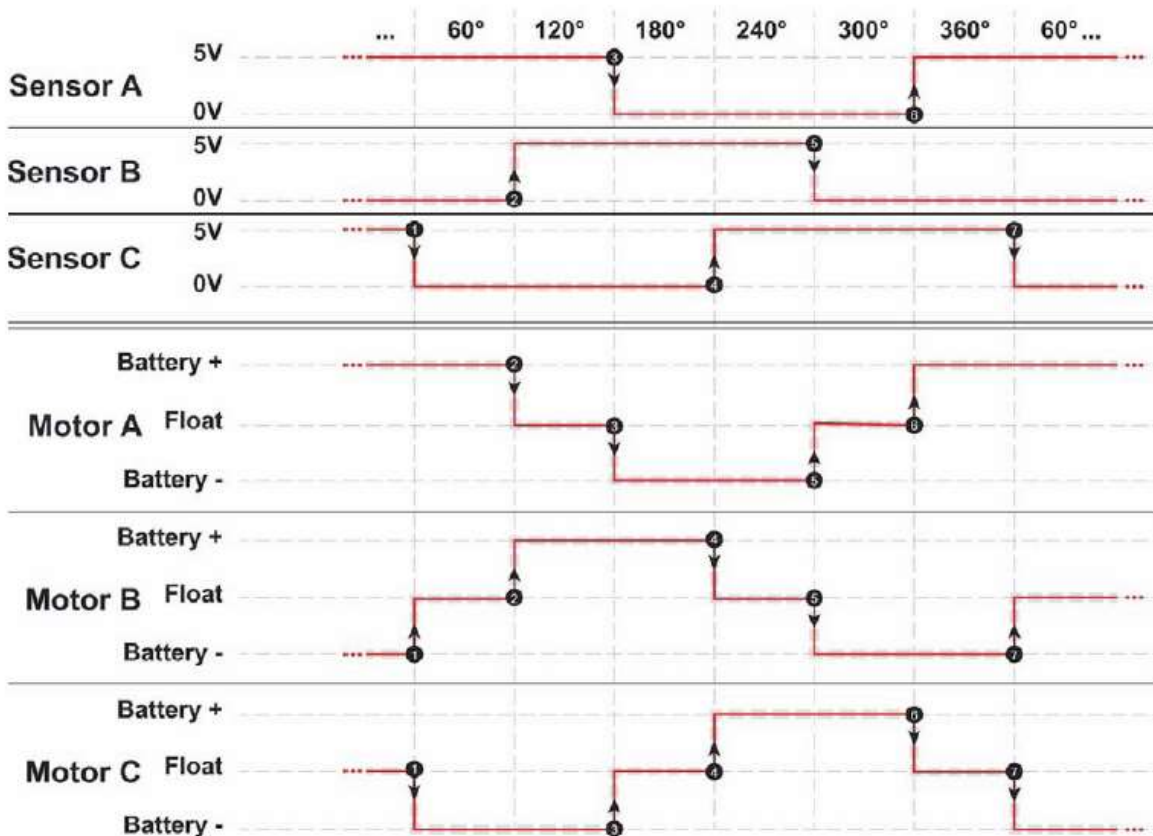
<b>Class</b>	<b>Motor</b>	<b>Min. FDR</b>
ISTC Junior Sportsman	Hobbywing Xerun Justock G2 21.5t	3.8
R1 ISTC 21.5t	R1-215-125-V16-AU – 21.5t	Unrestricted
ISTC 13.5t	Any 13.5t as per 10.2	Unrestricted
ISTC Modified	Unrestricted	Unrestricted
1:12 <sup>th</sup> Modified	Unrestricted	Unrestricted

# 11 NON-BOOSTED ELECTRONIC SPEED CONTROLLERS (ESCS) FOR SPEC CLASSES

The RCRA Approved EP ESC List automatically includes those ESCs appearing on the ROAR Approved Non-Timing ESC List [[http://www.roarracing.com/?page\\_id=737](http://www.roarracing.com/?page_id=737)] and the BRCA Approved Zero-Timing 'Blinky' ESCs List [<http://www.brca.org>] approved 30 days prior to the sanctioned event, as well as those on the RCRA Approved ESC List – separate to this document [<http://www.RCRA.org/docs/RCRA Stock Spec ESC List - EP OFR.pdf>] – which includes extra locally approved ESCs.

Local distributors can apply to RCRA for Australian certification under specific conditions.

11.1.1 Speed controllers eligible for Stock classes must provide zero timing advance, along with disabling advanced motor control functions (i.e. Boost, Cheat Mode, Turbo, etc). When the "0 Boost" profile is enabled, it shall be indicated by a blinking LED while the ESC is armed and in neutral position. The commutation sequence is limited to "6-step" type and commutation of the speed control must follow the motors hall sensor signals 1:1, e.g. no shifted timing (no matter if advanced or retarded) is allowed at any RPM.



11.1.2 Approved ESCs that meets the "0 Boost" parameters set out above, and appear on the RCRA approved list, are eligible for use.

11.1.3 The Organiser and RCRA Officials may check the legality of a competitor's ESC at any time during a sanctioned event.

## 12 BATTERY SPECIFICATIONS

12.1.1 Only Batteries that appear on the ROAR, BRCA or RCRA approved battery lists may be used.

- 1/12th scale classes to be driven by only 1S LiPo batteries with a maximum nominal voltage of 3.8v LiPo
- ISTC Classes to be driven by only 2S LiPo batteries with a maximum nominal voltage of 7.6v

12.1.2 Local distributors can apply to RCRA for Australian certification under specific conditions only

12.1.3 Batteries must be factory sealed in a hard case that can withstand impacts as per ROAR testing procedures.

12.1.4 No soft cased batteries allowed, for primary battery source.

12.1.5 No modifications are allowed to the case and/or the battery, any physical distortion, denting, split seams, puncturing or other damage to the hard case of the LiPo battery will deem the battery to be ineligible for use.

### 12.2 General Specifications

12.2.1 Individual cells used in the construction of the battery pack shall be rated at:

- LiPo maximum of 3.8 volts nominal.
- Individual cells may be wired in parallel
- Minimum discharge rating of 20C

12.2.2 Maximum Physical Dimensions:

Below Table to be used for reference only, and will not prevent a listed battery from use

Type	Straight pack 2S	Saddle Pack 2S	Straight Pack 1S
Length (mm):	139	70	93
Width (mm):	47	47	47
Height (mm):	25.1	25.1	18.5

### 12.3 Procedures for Charging and Use

12.3.1 Whilst charging and/or discharging, batteries should be contained in a LiPo sack or other device (fire mitigation device able to withstand and contain a destructive failure without showing a flame)

12.3.2 Electronic speed controls should have either an inbuilt or an external cut-off electronic device installed that will not allow the battery to discharge below 3 volts per cell volts minimum.

12.3.3 LiPo capable chargers are only to be used. Batteries may only be charged at a maximum rate of 10A

12.3.4 Overcharging is not allowed (voltage higher than 4.2v per cell) and can be subject to scrutineering prior to each race. Any battery exceeding the allowed voltage will not be allowed to participate in that race.

12.3.5 Maximum temperature for a charged Li-poly battery pack shall be ambient temperature +/- 5 deg.

12.3.6 The use of any device to heat a battery, to lower the packs internal resistance (such as warming trays or high amp discharge banks) are strictly prohibited

12.3.7 The use of cooling devices and or freeze sprays of any type to cool a Li-poly battery is strictly prohibited.

12.3.8 Batteries that are showing signs of failure from use, should be isolated from the immediate area of human and animal contact, and preferably contained in a LiPo sack or other device that will contain a destructive failure.

12.3.9 The use of "Female connection tubes" to connect the power wires is allowed, but the metal tubes must either be removed when the battery is not use or the tubes must be far enough below the surface so as not to cause a short circuit if the pack is placed on a conductive surface.

## 12.4 Tech Inspection guidelines

12.4.1 Disqualification will result if any of the four charging guidelines is breached:

- Charging the LiPo pack with anything but a charger capable of the standard LiPo CC/CV charging method.
- Charging the LiPo pack at over 10A.
- Charging a LiPo pack outside of a “LiPo sack” or other device proven to contain a destructive failure of a LiPo pack.
- Charging a LiPo pack to a voltage higher than 4.20V per cell, as measured on the event equipment.
  - For voltages presented between 4.20 to 4.22V per cell, drivers may be given the opportunity to run their batteries down to the required voltage of 4.20V per cell at technical inspection, before entering the track area.
  - Batteries presented with voltages from 4.22 to 4.25V per cell may not be run down, and the driver will not be allowed to enter the track area.
  - Any Driver presenting a battery with a voltage of greater than 4.25V per cell will be instantly disqualified from the meeting.



## APPENDIX A – IFMAR TIMING AND SCORING

**NOTE – The below are provided for reference only, as of 1<sup>st</sup> Jan 2018. Please refer to IFMAR rulebook for current regulations.**

### Qualifying

1.5.4 A driver's point score will place the driver in a final according to the following system. In each round, drivers will score points based on the laps and times achieved in relation to all other drivers. and so on:

Fastest driver in each round will score 0 points

2nd Fastest will score 2 points

3rd Fastest will score 3 points

4th Fastest will score 4 points, and so on till the last one.

(So the number of points reflects the ranking)

A driver that does not score a time in any Qualifying Round or a driver that has a time disqualified (fails Tech. etc.) does not score zero points (for that Round) as this is the same as TQ: Drivers in this case will be awarded 500 points.

A driver will discard his worst scores based on the qualifying rounds completed to the following rules:

- Out of six (6) completed rounds, the best three (3) scores will be added to decide the driver's qualifying position
- Out of five (5) completed rounds, the best three (3) scores will be added to decide the driver's qualifying position
- Out of four (4) completed rounds, the best two (2) scores will be added to decide a driver's qualifying position
- Out of three (3) completed rounds, the best two (2) scores will be added to decide a driver's qualifying position
- Out of two (2) completed rounds, the best one (1) score will decide a driver's qualifying position
- If only one (1) round is completed, that round counts.

In the case of a tie in the final qualifying positions when the driver's best scores are added together, only the scores (and the laps and times used to determine those scores) will be used to break the tie.

The discarded scores, laps and times will not be used to separate a tie.

The driver with the lowest single points score from the scores added will be awarded the tied position. In the case of a continuing tie, the next best scores will be considered. All best scores will be considered until the tie is broken. If a comparison of points fails to break the tie, the laps and times from the highest points will be compared.

The driver with the fastest time from their lowest score will be awarded the tied position.

Example: With three (3) from five (5) counting :-

Driver	Points Score					Total	Best Round Time
A	5	9	25	10	28	24	8 laps 5:10.00 (rnd 1.)
B	7	8	19	9	22	24	8 laps 5:14.00 (rnd 1.)
C	11	10	24	8	37	29	8 laps 5:12.00 (rnd 4.)
D	10	24	8	11	29	29	8 laps 5:16.00 (rnd 3.)

Note: Driver A qualifies ahead of Driver B due to a higher single point score Driver C qualifies ahead of Driver D due to a better fastest lap time.

### Finals

1.7.3 The Final positions will be decided by a point system based on one (1) point for the winner of each final on down to ten (10) points for the tenth placed finisher in each separate final. The best two (2) of three (3) finishes will count (the best out of two (2) if lower finals are run only two (2) times).

In the event of a tied position, the driver with the single best finishing position in either of the best two (2) finals that counted will be awarded the tie, in the event of a continuing tie, then the laps and times from the best finishing position will be compared and the one with the fastest laps and time total will be awarded the tie. If still continuing, then times from the second best position will be compared.



# APPENDIX C – SAMPLE COMPETITOR REGISTRATION

Host clubs should modify the Competitor registration form to suit their requirements and local rules, particularly as competitors often register online. The host club must meet any applicable State and National Privacy Regulations for information collected.

## 20xx AARCMCC EP On-Road <State/National> Championships

### Competitor Registration

**ENTRIES DUE BY**  
<date> <month> <year>

**Entrants Particulars:**

Drivers Name: .....  
 Address: .....  
 Phone: ..... Mobile: .....  
 Email: .....  
 Club: ..... D.O.B. (U16).....

<Venue>

Please Complete this form  
and return to:-

THE EVENT COORDINATOR  
<Address>  
<City> <State> <Postcode>



Please tick classes to enter.

- Touring Car Mod 1<sup>st</sup> ..... 2<sup>nd</sup> ..... 3<sup>rd</sup> ..... Transponder .....
- Touring Car S/Stock 1<sup>st</sup> ..... 2<sup>nd</sup> ..... 3<sup>rd</sup> ..... Transponder .....
- Touring Car Stock 1<sup>st</sup> ..... 2<sup>nd</sup> ..... 3<sup>rd</sup> ..... Transponder .....
- 12<sup>th</sup> Scale Modified 1<sup>st</sup> ..... 2<sup>nd</sup> ..... 3<sup>rd</sup> ..... Transponder .....
- Mini (demo) 1<sup>st</sup> ..... 2<sup>nd</sup> ..... 3<sup>rd</sup> ..... Transponder .....

I agree to abide by and be bound by, the local and national rules in force at the time of the Championship. I understand I race at my own risk. I indemnify the host or organising club, and its officials or agents, against any loss, damage or injury arising from my participation in the Championship. I will not behave offensively or use offensive language. I acknowledge that there is a penalty system for breaches of the rules. I will marshal, or provide a substitute marshal for the subsequent race. I acknowledge that the host club may take and use images where I may be readily identified.

Signed: ..... Print Name..... Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

<Sponsored by>

Entry Fees - \$30.00 for 1 Class. \$50.00 for 2 Classes. \$60.00 for 3 Classes.
---------------------------------------------------------------------------------------

## APPENDIX D – SAMPLE TECHNICAL CHECKLIST – TOURING CAR

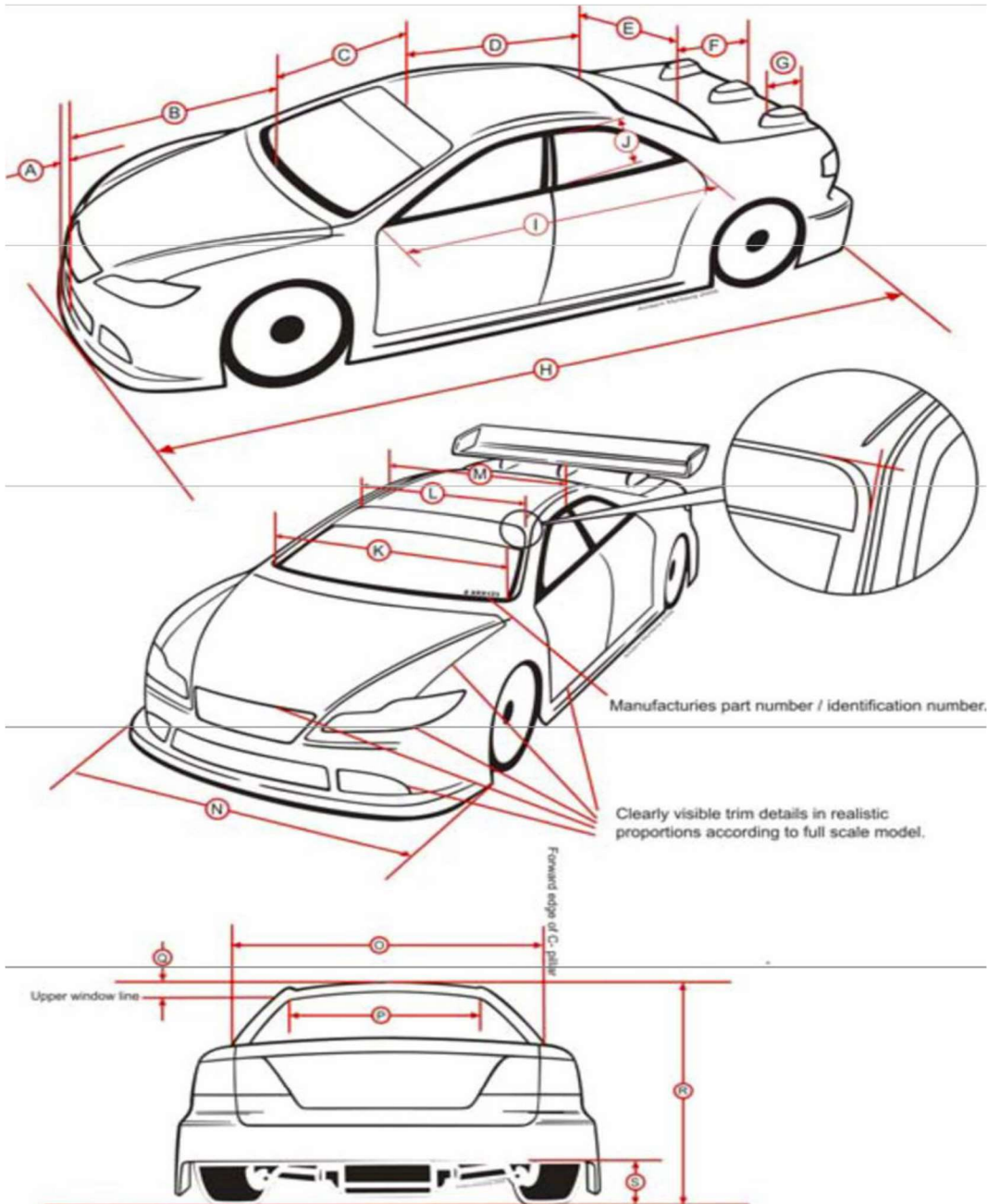
Technical Checklist - Touring Car - Stock / Modified								
							Heat:	Final:
Car No	Weight (1350g)	Width	Wing	Tyres	Motor	Battery	Name:	
1								
2								
3								
4								
5								
6								
7								
8								
9								
0								
							Heat:	Final:
Car No	Weight (1350g)	Width	Wing	Tyres	Motor	Battery	Name:	
1								
2								
3								
4								
5								
6								
7								
8								
9								
0								
							Heat:	Final:
Car No	Weight (1350g)	Width	Wing	Tyres	Motor	Battery	Name:	
1								
2								
3								
4								
5								
6								
7								
8								
9								
0								
Comments:								

## APPENDIX E – SAMPLE TECHNICAL CHECKLIST – 12TH SCALE

Technical Checklist - Touring Car - 12th Scale Modified								
							Heat:	Final:
Car No	Weight (750g)	Width	Wing	Tyres	Motor	Battery	Name:	
1								
2								
3								
4								
5								
6								
7								
8								
9								
0								
							Heat:	Final:
Car No	Weight (750g)	Width	Wing	Tyres	Motor	Battery	Name:	
1								
2								
3								
4								
5								
6								
7								
8								
9								
0								
							Heat:	Final:
Car No	Weight (750g)	Width	Wing	Tyres	Motor	Battery	Name:	
1								
2								
3								
4								
5								
6								
7								
8								
9								
0								
Comments:								

## APPENDIX F – ISTC GBS BODYSHELL DETAILS

A	Max 10mm	H	Min 410mm	N	Max 195mm
B	Min 105mm	I	Min 170mm	O	Min 150mm
C	Max 85mm	J	Min 35mm	P	Min 95mm
D	Min 90mm	K	Min 140mm Max 155mm	Q	Max 10mm
E	Min 65mm	L	Min 110mm Max 125mm	R	Min 115mm
F	Max 65mm	M	Min 115mm	S	Max 35mm
G	Max 25mm (Max 3 posts)				



### NOTES: