

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

January 1, 2019

RCRA EP
Off-Road General & Technical Rules

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1 GENERAL

1.1 Introduction

- 1.1.1 This document is the RCRA EP Off Road General Rules and Technical Rules, which documents the requirements and procedures to host, or compete in, an RCRA EP Off Road State or National Championship.
- 1.1.2 Clubs hosting an RCRA EP Off Road Championship must be able to meet the requirements and guidelines within this document.
- 1.1.3 Competitors in an RCRA EP Off 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 Off Road Sample Event Schedules
- 1.1.5 The purpose of an RCRA EP Off 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 Off Road General and Technical Rules can be submitted to RCRA by affiliated RCRA EP Off Road Clubs. The proposal must include an explanation or rationale and the justification for the change(s). Multiple proposals may be submitted (and voted on) concurrently, but only related changes may be bundled together into a single proposal.
- 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 Off 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 Any proposal submitted to affiliated clubs for voting must be in the form of a Yes/No question, where No supports the status quo. Competing proposals may be sent to clubs for discussion before a final proposal is drafted for vote.
- 1.2.5 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.
- 1.2.6 Clubs will be given a minimum 1 month to return vote material, either by mail or email.
- 1.2.7 Changes are approved by a majority favourable vote of all eligible Clubs. Clubs not responding to the vote, or abstaining, will not be counted.
- 1.2.8 General and Technical rule changes come into effect on 1st January and 1st July, of each calendar year, and will remain in force for a minimum period of 12 months. Other rule changes that are critical or important, such as safety matters, may be introduced as required.

1.3 National Ranking

- 1.3.1 The RCRA EP Off Road State and National Championships are used to award points to competitors for National ranking for Championship qualifying grid seeding and for nominations for IFMAR World Championship events.
- 1.3.2 Competitors in the 2 Wheel Drive & 4 Wheel Drive Modified Buggy classes will be nationally ranked according to how many points they have been allocated following a State or National Championship.
- 1.3.3 Ranking of competitors will be the lowest amount of points accumulated over four lowest points Championships over a two-year period.
- 1.3.4 For competitor nominations to IFMAR World Championship events, the cut-off date for competitor ranking will be the end of the preceding year for which the IFMAR World Championship event is being held.
- 1.3.5 Qualifying Points are awarded based on the competitor's final qualifying position divided by two.

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| Qualifying Position Points Allocation | | | | | | | |
|---------------------------------------|--------|---------------------|--------|---------------------|--------|---------------------|--------|
| Qualifying Position | Points | Qualifying Position | Points | Qualifying Position | Points | Qualifying Position | Points |
| 1 | 0.5 | 11 | 5.5 | 21 | 10.5 | 31 | 15.5 |
| 2 | 1.0 | 12 | 6.0 | 22 | 11.0 | 32 | 16.0 |
| 3 | 1.5 | 13 | 6.5 | 23 | 11.5 | 33 | 16.5 |
| 4 | 2.0 | 14 | 7.0 | 24 | 12.0 | 34 | 17.0 |
| 5 | 2.5 | 15 | 7.5 | 25 | 12.5 | 35 | 17.5 |
| 6 | 3.0 | 16 | 8.0 | 26 | 13.0 | 36 | 18.0 |
| 7 | 3.5 | 17 | 8.5 | 27 | 13.5 | 37 | 18.5 |
| 8 | 4.0 | 18 | 9.0 | 28 | 14.0 | 38 | 19.0 |
| 9 | 4.5 | 19 | 9.5 | 29 | 14.5 | 39 | 19.5 |
| 10 | 5.0 | 20 | 10.0 | 30 | 15.0 | etc | etc |

1.3.6 Final Points are awarded based on the competitor's final finishing position.

| Final Points Allocation | | | | | | | |
|-------------------------|--------|----------------|--------|----------------|--------|----------------|--------|
| Final Position | Points | Final Position | Points | Final Position | Points | Final Position | Points |
| 1 | 1 | 11 | 11 | 21 | 21 | 31 | 31 |
| 2 | 2 | 12 | 12 | 22 | 22 | 32 | 32 |
| 3 | 3 | 13 | 13 | 23 | 23 | 33 | 33 |
| 4 | 4 | 14 | 14 | 24 | 24 | 34 | 34 |
| 5 | 5 | 15 | 15 | 25 | 25 | 35 | 35 |
| 6 | 6 | 16 | 16 | 26 | 26 | 36 | 36 |
| 7 | 7 | 17 | 17 | 27 | 27 | 37 | 37 |
| 8 | 8 | 18 | 18 | 28 | 28 | 38 | 38 |
| 9 | 9 | 19 | 19 | 29 | 29 | 39 | 39 |
| 10 | 10 | 20 | 20 | 30 | 30 | etc | etc |

- 1.3.7 Points will not be reallocated to lower placed competitors when international competitors compete in the same championship.
- 1.3.8 Championship classes with less than 6 competitors posting a counted qualifying and final result will not be counted.
- 1.3.9 Points awarded for a State Championship class with 10 or more competitors, or a National Championship class with less than 16 competitors, will be based on the competitors total points. Points awarded = (Qualifying Position / 2) + Final Position
- 1.3.10 National Championship classes with 16 or more competitors will have the total points divided by two. Points awarded = [(Qualifying Position / 2) + Final Position] / 2
- 1.3.11 State Championship classes with less than 10 competitors will have the points multiplied by two. Points awarded = [(Qualifying Position / 2) + Final Position] x 2

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2 PRE-CHAMPIONSHIP CONSIDERATIONS & RESPONSIBILITIES

2.1 Championship Application

- 2.1.1 An application to host an RCRA EP Off Road National Championship must be submitted to RCRA on the ARCMCC Event Application Form by 1st July in the preceding year. Successful applicants will be notified in writing and the RCRA National Calendar updated.
- 2.1.2 Each State may host an RCRA EP Off Road State Championship once per calendar year.
- 2.1.3 Each State in turn can apply to host the annual RCRA EP Off Road National Championship. The rotation order through each State is Western Australia, New South Wales, South Australia, Victoria, ACT, Queensland.

A State choosing to miss their turn must wait a full cycle before having another opportunity.

| | | |
|------|-----|------------|
| 2010 | Qld | Townsville |
| 2011 | WA | West Coast |
| 2012 | NSW | St Ives |
| 2013 | Vic | Mildura |
| 2014 | ACT | Canberra |
| 2015 | Qld | Brisbane |
| 2016 | WA | West Coast |
| 2017 | NSW | |
| 2018 | SA | |
| 2019 | VIC | |
| 2020 | ACT | |

- 2.1.4 A copy of the host's Public Liability Insurance Certificate of Currency must be enclosed with the Event Application Form.
- 2.1.5 Once a host club has been sanctioned to host an RCRA EP Off Road National or State Championship, that host is fully responsible for the promotion, organisation and management of that Championship.
- 2.1.6 When hosting a National Championship, the host club should have held an RCRA sanctioned championship in the twelve months prior to start of the National Championship. The purpose of this is to test that the host club is ready to host a National Championship. This Championship does not need to be the same classes or section. The host club cannot assume that sanctioning of a National Championship automatically guarantees sanctioning of a similar State Championship in the proceeding twelve months.

2.2 Championship Calendar

- 2.2.1 The RCRA EP Off Road Championship calendar is a guide for dates as follows to avoid conflicting with other RCRA Championships.

| | |
|------------------------------|--------------------|
| Tasmania | TBC |
| Queensland | TBC |
| Victoria | August |
| New South Wales | Mid September |
| Western Australia | Late March |
| South Australia | Late February |
| Australian Capital Territory | TBC |
| Northern Territory | TBC |
| NATIONALS | October - November |

- 2.2.2 EP Sanctioned events must be a minimum of 4 weeks apart.
- 2.2.3 A club can apply to move the dates of the Championship due to issues that may impede the smooth running of the event (i.e. climate etc). This application must be approved 6 months in advance.
- 2.2.4 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 executive and granted only if the Club cannot reasonably comply with the

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specification, the exception itself is reasonable, and the venue is otherwise fit to host the Championship. 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 Host Responsibilities

- 2.3.1 The host fully accepts responsibility for the organisation and management of any RCRA sanctioned event that they hold.
- 2.3.2 The host fully accepts the financial responsibility of any RCRA sanctioned event that they hold.
- 2.3.3 The host fully accepts the insurance requirements and responsibility of any RCRA sanctioned event that they hold.

2.4 Finances

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

2.5 National Championship Schedule

- 2.5.1 National Championships should be run over a period of 3 to 5 racing days, dependant on the number of competitors.
- 2.5.2 The host club may choose to make allowances for a rain day, such decision should be announced when the event schedule is made public.
- 2.5.3 The rain day may be scheduled for either a Sunday or a Monday. A Monday rain day is preferable.
- 2.5.4 There will be no practice once the Championship has commenced.

2.6 State Championship Schedule

- 2.6.1 State Championships should be run over a period of 2 to 3 racing days dependant on the number of competitors.
- 2.6.2 No allowance will be made for an additional rain day.
- 2.6.3 There will be no practice once the event has commenced.

2.7 Championship Classes

- 2.7.1 The following RCRA defined classes must be available for RCRA EP Off Road State and National Championships:
 - Two Wheel Drive Modified (Open - Modified Class Motors)
 - Two Wheel Drive Junior Stock (17.5 BL Motors & Approved ESCs)
 - Two Wheel Drive Stock (17.5 BL Motors & Approved ESCs)
 - Four Wheel Drive Modified (Open - Modified Class Motors)
 - Four Wheel Drive Stock (13.5 BL Motors & Approved ESCs)
 - Two Wheel Drive Stadium Truck (Open - Modified Class Motors)
 - Two Wheel Drive Short Course Truck (10.5 BL Motors & Approved ESCs)
- 2.7.2 All classes are to run races of 5 minutes + final lap in all Heats and Finals.
- 2.7.3 The minimum number of entries in a class is 8 to be recognised as a Championship class. Classes with less than 8 entries may be run at the discretion of the host club.
- 2.7.4 There is NO cross-entering between buggy motor classes. A competitor may enter in any Stock Classes or in any Modified Classes but not both (see 2.7.4a). Only one car per driver per class is allowed. Cross-entering into Stadium Truck or 10.5 BL Short Course Truck classes is allowed.
- 2.7.4a There is NO cross-entering between 2WD Junior Stock and 2WD Stock, cross-entry between 2WD Junior Stock and 4WD Stock is allowed
- 2.7.5 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.
- 2.7.6 Sanctioned classes will always have priority over Provisional and Demonstration classes, and must yield to the sanctioned classes, should there be time delays.
- 2.7.7 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.

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2.8 Championship Entry

- 2.8.1 Entry into an RCRA EP Off Road Championship is open to current financial members of RCRA EP affiliated clubs.
- 2.8.2 International competitors are welcome to enter into RCRA Championships, however they must be members of organisations who are ultimately affiliated with IFMAR.
- 2.8.3 Draft entry forms need to be submitted and approved by RCRA a minimum of 4 months before the start of the Championship.
- 2.8.4 All RCRA EP Off Road sanctioned championships are to be promoted as per the following; 20xx RCRA EP Off Road Australian Championships OR 20xx RCRA, State, EP Off Road Championships. Sponsors Names may be included.
- 2.8.5 Entry forms need to include information about the event such as Championship dates, practice dates, 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, Date of Birth (for juniors and seniors), classes entered, transponder number and nominated frequencies. They must also include Competitor vehicle details such as such as Make & Model of Motor, Batteries,ESC & RF System.
- 2.8.6 Entry forms for State Championships need to be publicly available at least 3 months prior to the Championship.
- 2.8.7 Entry forms for National Championships need to be publicly available at least 4 months prior to the Championship.
- 2.8.8 The closing date for State Championships is the third Sunday prior to the start of the Championship.
- 2.8.9 The closing date for National Championships is the fourth Sunday prior to the start of the Championship.
- 2.8.10 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.
- 2.8.11 Late entries may be offered by the host club, however they are subject to availability and will be subject to an additional late fee.
- 2.8.12 Entry may be received by both mail and electronic means.
- 2.8.13 All entry forms and monies are to be returnable to the hosting club of the event.
- 2.8.14 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.
- 2.8.15 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.
- 2.8.16 A confirmation of entry must be sent, using mail or electronic means, to each competitor at least one week before the Championship starting date.
- 2.8.17 A proposed Championship Schedule must be sent to, and approved by, RCRA once entries have closed. Changes to this approved schedule prior to the start of the Championship must be reapproved by RCRA.
- 2.8.18 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, based on the competitors National Ranking or past State / National results.

2.9 Competitor Responsibilities

- 2.9.1 The Competitor fully accepts that they will act responsibly, in a sportsmanlike manner and within the rules of the Championship and the RCRA Code of conduct.
- 2.9.2 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.
- 2.9.3 The competitor is responsible for ensuring that they are a current financial member of an RCRA EP affiliated club.
- 2.9.4 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 – EP10 OFF 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 Access for emergency services must be available to all areas at all times.
- 3.1.4 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.
- 3.1.5 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.
- 3.1.6 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.
- 3.1.7 All personnel within the enclosed track area must wear fully enclosed shoes. Thongs, sandals, slippers etc are not allowed.
- 3.1.8 Proper care and handling of Li-Po Batteries must be observed. Li-Po charging 'sacks' must be used at all times whilst the Championship is in progress.
- 3.1.9 Where extension leads are used, the host club must follow relevant electrical safety procedures as applicable in that State.
- 3.1.10 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.
- 3.1.11 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.
- 3.1.12 Whilst the event is progress, the consumption of alcohol or illegal substances by competitors, mechanics and officials will not be tolerated.
- 3.1.13 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.
- 3.1.14 **FIRST AID**
- 3.1.14.1 It is recommended that a qualified First-aid Officer is present throughout the Championship including practice.
- 3.1.14.2 A current and suitable first aid kit must be available and its location clearly marked throughout the Championship including practice.
- 3.1.15 **MARSHALS**
- 3.1.15.1 Marshals must be adequately protected from being hit by cars whilst at their marshalling location.
- 3.1.15.2 Marshals should be provided with a fluorescent safety vest or similar item to aid being seen whilst in the track area.
- 3.1.15.3 Marshals must always put their safety first.
- 3.1.15.4 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.

3.2 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 following basic components that are found on real off-road circuits from which 1:10 scale racing has been modelled after.
- a: Main straight should be between 20 and 30 metres.
 - b: Jumps should be liberally used throughout the circuit. These jumps should include single, double as well as triple jump sections.
 - c: Bumps, either a series of "stutter bumps" or moguls should be employed to enhance the overall personality and challenge of the circuit.

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- d: Additional aspects such as drop-offs, elevation changes, berms etc. may also be utilised to further enhance the personality of the circuit.

3.2.3 Maximum distance from the middle of the driver's stand to the furthest point of the track is 60m.

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 The track surface must be predominantly a natural 'non-made' surface. However, the use of short (< 10 m) sections of appropriate made surfaces (i.e. Astroturf) that create an additional challenge shall be allowed, so long as the use of such sections does make up the majority of the circuit and does not increase the likelihood of damage to a vehicle.

Packable rock free dirt comprising sifted top soil or clay with minimum amounts of sand is considered an ideal track surface because of the way it evolves slowly throughout a meeting. The surface should be able to maintain a fair level of consistency across a round of qualifying, but otherwise a surface that "develops" gradually over the course of the meeting is not discouraged.

3.3.2 Track repairs should be made between heats as needed. This should prevent "extreme" deterioration of the racing surface throughout the event. Once again, 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. Attention to jumps as well as turns and straight sections, is equally important.

3.3.3 A multi-surface or artificial surface track may be approved for sanctioned events on the following conditions:

- a. All other track requirements must still be met (such as dimensions, inclusion of jumps, bumps and other 'off-road' obstacles for example)
- b. AARMCC Executive are satisfied that the host club, track and venue is suitable for the staging of the event as a genuine "Off-road" event
- c. At least 50% of other clubs in the host state agree to the use of the multi-surface or artificial surface track being used for the event in question
- d. In the event that no other club within the host state is willing to host the event, the condition (c) above is void

3.4 Track Length

3.4.1 Track design and length should be such that lap times are kept in excess of 15 seconds per lap.

3.4.2 The minimum track length is 150m. The recommended track length is 150-200m.

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.

3.5.2 The maximum width of the track is 6.0m between marking lines.

3.6 Drivers' Stand

3.6.1 Minimum height of the drivers' stand should be 2m 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 drivers' 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 2 metres from the edge of the racing surface.

3.6.6 The drivers' stand must be a maximum of 60 metres from the furthest part of the racing surface.

3.6.7 WHEELCHAIR ACCESS

3.6.7.1 A drivers' stand that comfortably accommodates wheelchair-bound drivers is desirable. Care should be taken to ensure no railings on the stand obstruct the drivers' views.

3.6.7.2 In the event that no wheelchair access to the drivers' stand is possible, best efforts must be made to provide the greatest possible safe elevation for wheelchair-bound drivers, up to the height of other drivers.

3.6.7.3 Under no circumstances should elevation rely on manpower to lift a wheelchair-bound driver.

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3.6.7.4 In the case of a separate elevating structure being used for wheelchair-bound drivers, it is preferred that it be located near the existing stand. However, if another location provides fewer viewing obstructions it may be substituted.

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 may not obstruct the vision of the drivers.

3.9.2 Marshal locations must be numbered 1 through 10 and spread such that less than 10 marshals can adequately marshal the entire track.

3.9.3 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 1.5m spacing between the front of each car. Two (2) metre maximum spacing is recommended, if possible. Grid positions must be clearly marked.

EXAMPLE

| | | | | | | | | | | |
|--------------|----------|------------|----------|------------|----------|------------|-----------|-------------|-----------|-------------|
| Meter | 0 | 1,5 | 3 | 4,5 | 6 | 7,5 | 9 | 10,5 | 12 | 13,5 |
| Meter | 0 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 |
| Car # | 1 | | 3 | | 5 | | 7 | | 9 | |
| Car # | | 2 | | 4 | | 6 | | 8 | | 10 |

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 drivers' view of the starting line/grid must not be obstructed.

3.10.6 No chalk is to be used on the track-racing surface.

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 can be grouped by State and Club.

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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.

3.14 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 racing throughout the championship.
- 3.14.4 For tracks using spray-on additives on the track surface, this can only be done before the start of open practice. Spray-on additives cannot be reapplied each day nor after a weather delay.
- 3.14.5 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 Championship 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, Transmitter impound, Scrutineering etc.

4 OFFICIALS

4.1 Official Positions

4.1.1 The following Race Officials are required for each Championship. These positions are non-racing, i.e. they cannot be filled by a competitor in the Championship. The names of these officials must be included on the Event Application Form.

- Referee
- Race Director
- Time Keeper
- Technical Director

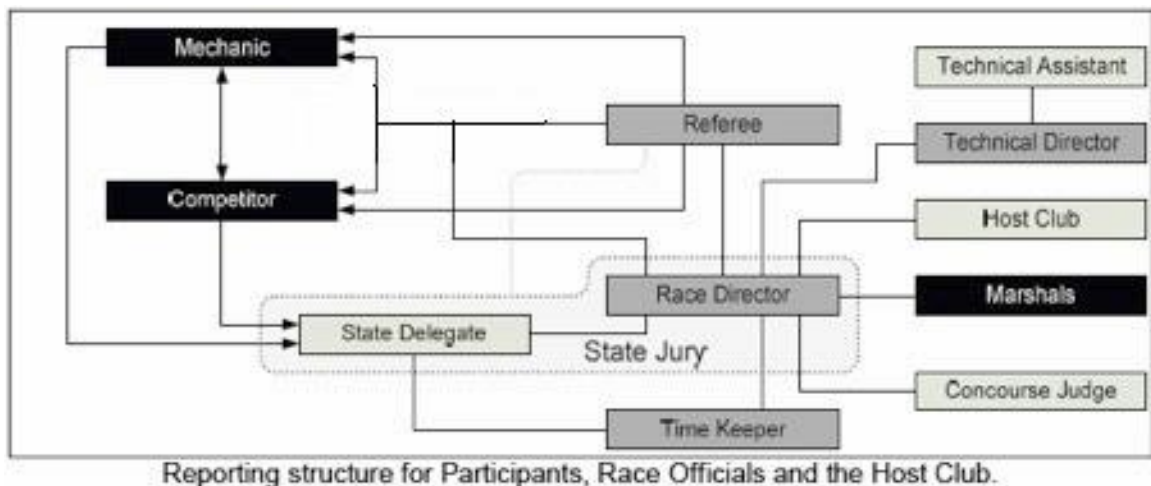
4.1.2 The following Race Officials are delivered by the host club during the Championship. These positions may be filled by a competitor and does not need to be the same person for the duration of the Championship.

- 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, the good sportsmanship during the racing. The Referee will ensure that everyone observes the current rules.

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.

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- 4.3.4 A Referee may take action after an initial warning, but in all cases, three warnings or penalties means automatic disqualification (See Section 8.1.6 and 8.1.7).
- 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.
- 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.

4.4 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 stops 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 Director to inspect competitor's cars.

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- 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 Director.

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 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 At a National Championship the State Jury consists of State Delegates of each State competing in the Championship. At a State Championship the Club Jury consists of Club Delegates of each Club competing. Each State/Club will have a total of one vote regardless of the number of representatives at the Championship. International Competitors shall be represented by the previous host State/Club.
- 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 (or 0) in each qualifying heat or final.
- 5.1.4 Each car must have 3 numbers: - one on the front (Windscreen), and one on each side (Window).
- 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 (includes all of the above) in a heat or final will result in a Black Flag being issued (See Section 8.3).

5.2 Transmitters

- 5.2.1 Transmitters do not need to be numbered.
- 5.2.2 External transmitter battery packs are not permitted.

5.3 Transmitter Impound (optional)

- 5.3.1 A transmitter impound will start on the same day as the start of the Championship.
- 5.3.2 All transmitters must be switched off and placed in the transmitter impound upon arrival at the track and may not be removed until the completion of that days racing.
- 5.3.3 Competitors can remove their transmitter from the transmitter impound immediately prior to their practice session, qualifying heat or final, once all competitors in the previous race have switched off and returned their transmitters to the transmitter impound.
- 5.3.4 Transmitters without the approval of the Race Director, in the pit area, or areas other than the driver's stand and transmitter impound, during official competition hours, will cause disqualification.
- 5.3.5 With the approval of the Race Director, a competitor's transmitter may be removed for the purpose of realigning a replacement steering or throttle servo. This may only be done when no racing is in progress

5.4 Transmitter Frequencies

- 5.4.1 The following are valid frequencies for use in Australia. Other frequencies are not allowed. 36MHz and 70-72MHz are forbidden to be used in Australia for Radio Control vehicles.

| | | | | | | | | | |
|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|
| 27MHz | 26.995 | 26.975 | 27.025 | 27.045 | 27.075 | 27.095 | 27.125 | 27.145 | 27.175 |
| | 27.125 | 27.145 | 27.175 | 27.195 | 27.225 | 27.255 | | | |
| 29MHz | 29.725 | 29.745 | 29.765 | 29.785 | 29.805 | 29.825 | 29.845 | 29.865 | 29.885 |
| 40MHz | 40.665 | 40.670 | 40.675 | 40.680 | 40.685 | 40.690 | 40.695 | 40.700 | 40.705 |
| | 40.710 | 40.715 | 40.720 | 40.725 | 40.730 | 40.735 | 40.740 | 40.745 | 40.750 |
| | 40.755 | 40.760 | 40.765 | 40.770 | 40.775 | 40.780 | 40.785 | 40.790 | 40.795 |
| | 40.800 | 40.805 | 40.810 | 40.815 | 40.820 | 40.825 | 40.830 | 40.835 | 40.840 |
| | 40.845 | 40.850 | 40.855 | 40.860 | 40.865 | 40.870 | 40.875 | 40.880 | 40.885 |
| | 40.890 | 40.895 | 40.900 | 40.905 | 40.910 | 40.915 | 40.920 | 40.925 | 40.930 |
| | 40.935 | 40.940 | 40.945 | 40.950 | 40.955 | 40.960 | 40.965 | 40.970 | 40.975 |
| 40.980 | 40.985 | 40.990 | 40.995 | | | | | | |
| 2.4GHz | DSM/DSS. Eg Nomadio, Spektrum, Futaba FASST | | | | | | | | |

- 5.4.2 In the case of two drivers using the same frequency and qualifying for the same final, the higher placed driver may keep their frequency and the lower placed driver must change. The time allowed for frequency change will be ten (10) minutes. The lower placed driver who cannot or will not change their frequency may not take part in the final for which they qualified.
- 5.4.3 If a driver must change their frequency before the start of a semi-final or a final due to an organiser's error, they will be allowed ten (10) minutes.
- 5.4.4 If a driver finds their radio defective or has made an error in the selection of their frequency at the start of a final, the race will not be delayed.

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- 5.4.5 For the entire duration of the event, the frequencies in use by all drivers will be known only by the Race Director, Time Keeper and each individual driver. The organiser shall not display any driver's transmitter frequency on any heat sheets, result sheet or race schedule to preserve the security of the frequency control systems.
- 5.4.6 All frequency changes must be authorised by the Race Director before the change is made.
- 5.4.7 Each driver in the main final, on approval from the Race Director, shall be permitted to change their frequency before the start of the race.

5.5 Lap Counting and Timing

- 5.5.1 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.
- 5.5.2 Significant stops (tyre changes, 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.
- 5.5.3 Chronometers must give time to 1/1000th of a second. In all cases, the thousands will be utilised.
- 5.5.4 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.
- 5.5.5 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 (Sect 7.3).
- 5.5.6 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 In all events, a minimum of 1.5 times the 'average' race lap time must be allowed for drivers to complete the final lap of their qualifying race and/or final. The minimum time must be based off prior track knowledge and/or event practice times.

5.6 Transponders

- 5.6.1 Competitors are required to install a small transponder into their cars according to the manufacturers and host club's instructions.
- 5.6.2 Every competitor must provide their own AMB compatible personal transponder or AMB compatible club transponder.
- 5.6.3 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.
- 5.6.4 If the host is using a non-AMB compatible transponder system, they must provide to all competitors a transponder for every heat and final.
- 5.6.5 The competitor must ensure that their transponder belongs to the marked chassis.
- 5.6.6 Each competitor is responsible for attaching the lap counting transponder to their car.
- 5.6.7 During qualifying, any car starting without a lap counting transponder will not be counted.
- 5.6.8 If a lap counting transponder fails or falls off during the a heat or final, any car without a lap counting transponder may be counted manually by a manual back-up system. In this case, the Race Director will verify the results and their decision will be final.
- 5.6.9 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.
- 5.6.10 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.

5.7 Display and Distribution of Results

- 5.7.1 The results of each specific heat or final must be displayed in or nearby to the pits.

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- 5.7.2 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.
- 5.7.3 Electronic means of displaying live race and other data should be available in the technical inspection and pit areas.
- 5.7.4 The time of display of the result will be written on the result sheet.
- 5.7.5 Results of the Championship must be forwarded to the RCRA EP OFR section within 2 weeks of the conclusion of the Championship, along with the Race Directors report.

5.8 Public Address System

- 5.8.1 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 on the driver's stand, and a second channel for the pit and general areas.
- 5.8.2 Announcements must be audible in the driver's stand, track, and pit areas.
- 5.8.3 Where a single PA system is used, announcements for non competitors must be restricted to times when drivers are not competing on the track. Race Commentary may be excepted if it is not distracting to the competitors.

6 CHAMPIONSHIP SCHEDULE & PROCEDURES

6.1 Practice

- 6.1.1 Practice for State Championships must be available for competitors for a minimum of 1 full day (7 – 8 hours) immediately prior to the start of the event.
- 6.1.2 Practice for National Championships must be available for competitors for a minimum of 2 full days (7– 8 hours per day) immediately prior to the start of the event.
- 6.1.3 Classes should be separated and given equivalent track time.
- 6.1.4 Where excessive numbers of competitors are present, practice sessions should be limited to a suitable number of heat groupings, or a suitable number of cars on the track, or competitor positions available on the driver's stand. A Maximum of 15 cars are permitted on the track at any time.
- 6.1.5 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.
- 6.1.6 It is optional for the host club to provide electronic timing of open practice.
- 6.1.7 Marshals are not provided or used during open practice.
- 6.1.8 A controlled practice can be run in the second half of the allotted practice schedule, should it be deemed necessary due to the high number of competitors.
- 6.1.9 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.
- 6.1.10 Results from controlled practice should be displayed on the results board.

6.2 Competitor Registration

- 6.2.1 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.
- 6.2.2 Registration for competitors may be done at the same time as Initial Technical Inspection.
- 6.2.3 Competitors must be registered before the start of the Championship.
- 6.2.4 Competitors unable to meet this deadline may use a proxy to complete their registration.
- 6.2.5 The host club may authorise late competitor registration at its discretion.

6.3 Initial Technical Inspection (Pre-Scrutineering)

- 6.3.1 All cars must be presented for technical inspection prior to the commencement of the event. 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. When the car passes the initial inspection, the cars chassis shall be marked in a manner, not to permanently scar the chassis or remove chassis material. Once the chassis is marked, the chassis cannot be changed without the approval of the Race Director, and can only be approved for change if it is damaged beyond reasonable repair. Drivers must race the car that has been passed by Technical Inspection.
- 6.3.2 Competitors or mechanics must present their car(s) with Body, Battery, Transponders and radio transmitters before the start of the Championships, (i.e. prior to Concourse and the Drivers' Briefing).
- 6.3.3 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.
- 6.3.4 Only one car per class per driver will be accepted.
- 6.3.5 Tyre assemblies will be presented to Technical Inspection and to be marked by the Technical Inspector immediately.
- 6.3.6 All Transmitters must be inspected and approved prior to the event. A maximum of two channels for control devices may be used (i.e. Servo and Speed Control).

6.4 Concourse

- 6.4.1 Concourse marks the start of the Championship and is held first.
- 6.4.2 Concourse is judged in one category per Chassis type (2WD, 4WD & Truck), i.e. best presented. There will be a minimum of one trophy awarded for each of the 3 Chassis Types.
- 6.4.3 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.

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- 6.4.4 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.
- 6.4.5 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.
- 6.4.6 Cars must be complete and ready to race to be eligible for concourse judging.
- 6.4.7 Drivers may enter one vehicle in Concourse for each class in which they are racing.

6.5 Drivers' Briefing

- 6.5.1 A Drivers' briefing will be held immediately after Concourse. It will welcome all participants to the Championship, introduce the Officials and State Delegates, and brief participants on procedure, and any other important matters.
- 6.5.2 Additional Drivers' briefings are to be held at the Race Directors and State Jury's discretion.
- 6.5.3 All Drivers must attend the drivers' briefing.

6.6 Competitors and Members Meeting

- 6.6.1 A meeting of all competitors and financial members of all attending Clubs will be held prior to the start of the Championship, immediately after the Drivers' Briefing.
- 6.6.2 At a National/State Championship the meeting will be broken into State/Club divisions who will then nominate and vote, by show of hands if necessary, for meeting attendees to be the State/Club Delegate and deputy State/Club Delegate for the duration of the Championship. The Delegates must then make themselves know to the Race Director.
- 6.6.3 The State Delegate may be a competitor, or a financial member of a Club represented at the Championship.

6.7 Qualifying Heats

- 6.7.1 Races will be 5 minutes plus the completion of the last lap. There is to be a maximum number of 10 cars in each heat.
- 6.7.2 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, issuing of transmitters to the drivers in the next heat, drivers in the next heat to take their places on the drivers stand.
- 6.7.3 An audible warning will be given in English, one minute prior to the start of the race.
- 6.7.4 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 last car has completed a lap.
- 6.7.5 Each individual official time will start when the car passes the timing system for the first time.
- 6.7.6 When the first car completes the first lap, all official timing not yet activated will be started.
- 6.7.7 During the first round of qualifying, heat starting order will be determined randomly. During further rounds, heat-starting order will be determined by their finishing order in their previous heat.

6.7.8 GRADING

- 6.7.8.1 Heats should be graded before the commencement of qualifying so that drivers of similar ability are placed in the same heat (as per 2.8.18).
- 6.7.8.2 Re-grading of drivers should be carried out on the basis of the provisional qualifying order after every second round of qualifying. The Race Director may use their discretion to cancel a regrade in the event of significant or imminent schedule interruption.
- 6.7.8.3 The number and timing of regrades is to be announced by the race director prior to the start of the meeting.
- 6.7.9 Ordinarily there will be a minimum of four (4) maximum six (6) rounds of heats at State and National Championships.

Note: The minimum number of qualifying heats at a State or National event can be reduced to three (3), due to bad weather or time issues with the agreement of the State Jury.

- 6.7.10 At the completion of qualifying the provisional qualifying order becomes the final qualifying order.

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6.7.11 PROVISIONAL QUALIFYING ORDER

Drivers will accumulate points over the qualifying rounds. A driver's best rounds (or round) will determine their provisional qualifying position, all other rounds will be discarded.

Discarded rounds will not be used for tie breaks.

The format for counted rounds to determine a driver's provisional qualifying position will be based on their best *50% of completed heats*, i.e.:

- 1 round of qualifying, 1 round counts, 0 discarded
- 2 rounds of qualifying, 1 round counts, 1 discarded
- 3 rounds of qualifying, 2 rounds count, 1 discarded
- 4 rounds of qualifying, 2 rounds count, 2 discarded

6.7.12 In each round, drivers will score points based on the distance and time achieved in relation to all other drivers. Points will be distributed so the fastest driver will accumulate zero points for the round, with the points increasing gradually. DNS and DQ drivers will receive NO points (not 0 points) for that particular round.

Example:

- 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 etc.

If drivers tie for time and distance in a round, they will share the points for the same position. The following drivers point score will be relative to their positions.

Example:

- Fastest 10 laps 5.10.00 will score 0 points
- 2nd 10 laps 5.12.00 will score 2 points
- 3rd 10 laps 5.13.05 will score 3 points TIED
- 4th 10 laps 5.13.05 will score 3 points TIED
- 5th 10 laps 5.14.05 will score 5 points

6.7.13 In the case of a tie in the final accumulated qualifying points, the tiebreak method will be as follows: the first tiebreak will examine the lowest points scored, second tiebreak will examine the laps and time from the drivers lowest scoring heat will be examined. In the extremely unlikely event that such methods are insufficient to break a tie, the driver who set their fastest heat time first will be the higher qualifier, note that this may come down to starting order in a heat

6.8 Finals

6.8.1 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 five (5) drivers.

6.8.2 All final legs will be 5-minute plus last lap races. The A-Final shall consist of 3 legs. Up to 2 legs of lower finals should be run if time permits.

6.8.3 Final positions will be decided on a point system based on ten (10) points for the winner down to one (1) point for the tenth placed finisher in each separate final.

If more than one (1) final is run then each competitor will discard their worst result, i.e.:

- 3 final legs, 2 count, 1 discarded
- 2 final legs, 1 counts, 1 discarded
- 1 final leg, 1 counts, 0 discarded

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6.8.3.1 Tie Breaks

i. In the event of a tie, the driver with the highest score amongst their counted finals will be awarded the tie, in the event of a continuing tie the next best counted final for each competitor will be compared, etc.

ii. In the event of a still continuing tie then the laps and times from the best finishing position will be compared and the one with the most laps in the quickest time will be awarded the tie. If still continuing, then times from the second best counted position will be compared, etc.

iii. If all counted finals are exhausted in this fashion without resolution the result will be declared a tie.

Example: 3 final legs.

| Pos | Dr | Leg 1 | Pt | Leg 2 | Pt | Leg 3 | Pt | 2/3 | Comments |
|-----|----|---------|----|---------|----|---------|----|-----|---|
| 1 | A | 9/5'20" | 10 | 9/5'23" | 8 | 1/0'32" | 1 | 18 | Tie broken by win to A; B has best of 2nd (i). |
| 2 | B | 9/5'22" | 9 | 9/5'22" | 9 | 8/5'02" | 5 | 18 | |
| 3 | C | 8/5'11" | 5 | 9/5'30" | 7 | 9/5'18" | 10 | 17 | Pts and pos'ns equal. C has faster time than D (ii). |
| 4 | D | 8/5'01" | 7 | 9/5'21" | 10 | 8/5'01" | 6 | 17 | |
| 5 | E | 8/5'12" | 4 | 8/4'59" | 5 | 9/5'31" | 9 | 14 | E has a 2nd, F and G have best of 3rd (i). F has faster time than G (ii). |
| 6 | F | 9/5'30" | 8 | 9/5'31" | 6 | 8/5'18" | 3 | 14 | |
| 7 | G | 8/5'02" | 6 | 8/5'18" | 2 | 9/5'32" | 8 | 14 | |
| 8 | H | 8/5'20" | 3 | 8/5'05" | 3 | 9/5'33" | 7 | 10 | |
| 9 | I | 3/2'05" | 1 | 8/5'03" | 4 | 8/5'28" | 2 | 6 | Pts, pos'ns and best time equal, I has faster 2nd best leg than J (ii)*. |
| 10 | J | 8/5'29" | 2 | 8/5'26" | 1 | 8/5'03" | 4 | 6 | |

* If both times had been the same the result would be a tie for 9th between I and J (iii).

Note: example shows results in seconds rather than thousandths of seconds for clarity only.

- 6.8.4 There should be a minimum 2 minute gap between the end of one final and the start of the next. This gap must allow for drivers in the previous heat to exit the drivers stand, and the drivers in the next final to take their places on the drivers stand. A two-minute warning will be given before the start.
- 6.8.5 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.
- 6.8.6 An audible warning will be given in English, one minute prior to the start of the final.
- 6.8.7 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 at the back of the starting grid after all the cars have left.
- 6.8.8 A ten second warning will be issued followed by the start, which will be by an audible signal.
- 6.8.9 From 10 seconds until 1 second, time is audibly counted down, second by second.
- 6.8.10 After a suitable pause, an audible start signal will sound to commence the race.
- 6.8.11 The official starting signal will be audible by means of a horn or similar. This signal will also start the timing systems.
- 6.8.12 There will be no restarts due to jump starts.
- 6.8.13 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.
- 6.8.14 A video record will be made of all starts for review by the referees as necessary.
- 6.8.15 Cars will be positioned within 25mm of, and 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.
- 6.8.16 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.
- 6.8.17 All finals must use a staggered or inline grid start of 10 rows (Sect. 3.10.2).
- 6.8.18 Any race stopped due to race equipment malfunction or official's error will be re-run after a suitable delay.
- 6.8.19 For Inclement Weather procedure, see Section 7.3.

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6.9 Technical Inspection

- 6.9.1 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. Race damage to the body, wing or spoiler will be taken into account and marked on the competitor's scrutineering sheet.
- 6.9.2 All cars will have motors, electronic speed controllers (Stock), and batteries inspected as necessary during heats with mandatory inspections at the end of each final.
- 6.9.3 At any time, the Race Director may ask any competitor to present their cars to Technical Inspection.
- 6.9.4 Random inspection can occur in pit lane for car numbers, tyres, wings, and chassis.
- 6.9.5 No race will be delayed because of non-compliance by a competitor.
- 6.9.6 The chassis plate of each car may be checked at any time.
- 6.9.7 Only one chassis may be used for all qualifying heats and finals. The only exception to this rule will be in the case of a broken or bent chassis, which may be changed with the Race Director's approval. The new chassis must be presented to technical inspection for marking before re-building the car.
- 6.9.8 At the completion of the Stock finals, the top three (3) finishers must have their motors checked internally to ensure the correct rotor specifications and inductance tests are met. If the Stock title is determined after the second final, that car must have its motor removed and checked internally. A breach will result in a disqualification from the event.

6.10 Trophy Presentation

- 6.10.1 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.
- 6.10.2 The trophy presentation may take place at an alternative location.
- 6.10.3 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
- 6.10.4 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
- 6.10.5 Competitors that do not receive a trophy should receive a participation plaque, medallion or similar.
- 6.10.6 Drivers in the main final must receive trophies larger than those in the lower finals.
- 6.10.7 Prizes and trophies are allowed to be presented. Cash prizes are not permitted.

7 ANCILLARY 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 penalised.
- 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 for that heat or 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 once a suitable time allowance given to competitors to prepare their cars. In all other cases, the wet weather finals procedure will be used (Sect 7.3).
- 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 where applicable.
- 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 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 Marshal's job to fix a broken vehicle. 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 Inclement Weather and Time Delays

- 7.3.1 Definition of Inclement Weather: will be defined as
 - (i) Where there is standing water on the surface of the track.
 - (ii) Where visibility is reduced to the point where cars are no longer clearly visible from the drivers' stand.
 - (iii) Where the surface of the track is deemed unsafe for Marshals to safely carry out their duties.
 - (iv) Where the lives of drivers or marshals might be imperilled (e.g. lightning).
- 7.3.2 For National Championships a rain day must be set aside. The Race Director must take reasonable steps to complete the championship on the final scheduled day. The rain day should only be considered for use when substantial delays prevent a final result from being achieved. If sufficient racing has not been completed for a result in all sanctioned classes to be declared the rain day must be used.
- 7.3.3 In the event that inclement weather or other *force majeure* causes a Championship to delay the start of qualifying rounds, the Race Director, in consultation with the State Jury, may shorten the number of qualifying heats. Other times between heats may also be reduced.
- 7.3.4 During qualifying rounds, in the event that inclement weather, *force majeure*, or a weather forecast, is going to cause a Championship to not achieve a qualifying or final result, the Race Director, in consultation with the State Jury, may reduce the number of qualifying heats to obtain a qualifying result before moving into the final rounds. The Race Director must intend to obtain a qualifying result with sufficient time remaining to run all final rounds and obtain a final result.

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- 7.3.5 A-Main Finals will have priority and may be moved in an attempt to have them completed if rain is imminent. Time must be allowed to charge batteries.
- 7.3.6 If weather and time permit and there is no time restriction on track use, every endeavour should be made by the Race Director to run as many of the originally scheduled rounds of qualifying heats as possible.
- 7.3.7 **FINAL RESULT**
- 7.3.7.1 In the event of weather causing the Championship to fail to complete all scheduled qualifying rounds and finals, final results will be calculated as follows:
- 7.3.7.2 Where any finals have been completed without being curtailed by weather, those final results will stand, and be used in accordance with previous rules (6.8.3) to determine the final results, e.g.:
- If three (3) finals are completed, the best two (2) of three (3) will count.
 - If two (2) finals are completed, the best one (1) of two (2) will count.
 - If one (1) final is completed that final will count.
- 7.3.7.3 If no finals have been completed final results will fall to completed rounds of qualifying results, provided that at least three (3) rounds of qualifying have been completed. Note that if rain interrupts qualifying half-way through a round this will count as a completed round for a class if, and only if, all groups in that class have completed that round. (e.g. If there are 8 races in a round four of 2WD Stock and then four of 2WD Modified, and rain interrupts race 6 then this counts as a completed round for 2WD Stock, but not of 2WD Modified.)

7.4 Drivers' Stand Access

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

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 of 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 **MARSHALLING 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;

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- 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, and failing to yield to a faster car in qualifying.
- 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 not yielding to the faster cars at the earliest reasonable opportunity.
- 8.2.8.6 Faster cars not exercising 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 who 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 Jump Starts – Sec 7.1).

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 using reverse.
 - 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.
- 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.
 - A car which is numbered incorrectly.

Cars which lose their bodies must immediately stop and carry out the necessary repairs after which they may rejoin the race with permission from the Race Director.

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 (excluding pre-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.

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- 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 \$50.
- 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 10 minutes to process the protest. During this suspension all cars competing in the suspended final must be present and turned off. The deposit is forfeited if the protest is not upheld and the deposit is returned if the protest is justified or upheld.
- 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 Off-Road Electric Classes

9.1.1 The RCRA Championship classes which are mandated in Section 2.7, must be available for RCRA EP Off Road State and National Championships:

- Two Wheel Drive Modified (Modified Class Motors)
- Two Wheel Drive Junior Stock (17.5 BL Motors & Approved ESCs)
- Two Wheel Drive Stock (17.5 BL Motors & Approved ESCs)
- Four Wheel Drive Modified (Modified Class Motors)
- Four Wheel Drive Stock (13.5 BL Motors & Approved ESCs)
- Two Wheel Drive Stadium Truck (Open - Modified Class Motors)
- Two Wheel Drive Short Course Truck (10.5 BL Motors & Approved ESCs)

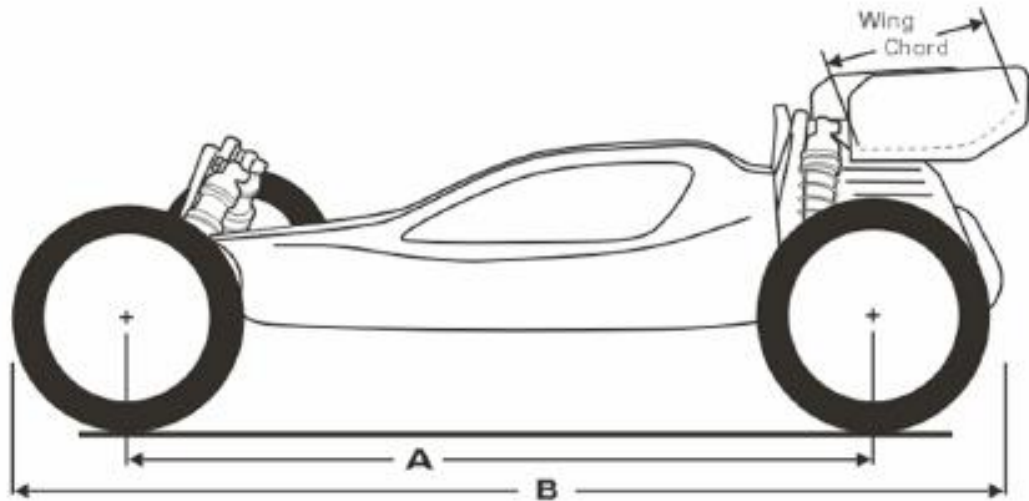
Technical regulations pertaining to these classes follow in this section, and in Sections 10, 11 and 12.

9.2 Driver Aids

- 9.2.1 It is the objective of this rule to ensure that sanctioned Electric Circuit Events, be a test of driver skill. RCRA seeks to limit the type of driver aids to a minimum to achieve this objective. Traction control, active suspension and steering control by gyroscopes are not allowed. Sensors fitted to the car for the purpose of measuring suspension movement, wheel speed, or tyre slip whilst the car is in motion, is not allowed.
- 9.2.2 Unless an electronic or mechanical driver aid is listed below in rule 9.2.3, it is not allowed for use in RCRA Events.
- 9.2.3 The fixed single ratio transmission may include a mechanical device/s between the drive motor output and the gearbox input for the purpose of controlling torque (e.g. 'slipper' clutch/fluid clutch). This device must only be capable of setting or adjustment manually whilst the car is stationary. A differential may include a mechanism for apportioning torque over the axle/s (e.g. limited slip differential). This mechanism must only be capable of setting or adjustment manually whilst the car is stationary. An electronic speed controller may include an electronic device to limit the current/voltage passed from the batteries to the drive motor (e.g. timed delay, current limiter, keyboard programs). Setting or programming of such a device must only be possible whilst the car is stationary. Changes to the setting or program during a race are not allowed.
- 9.2.4 Radio control receivers carried in the car may only have two devices (normally the steering servo and speed controller) connected, plus an optional separate battery supply for powering of the radio control equipment/devices. The use of any further channels to receive electrical signals from sensors carried in the car is prohibited.
- 9.2.5 Motor cooling fans must be powered by the main battery pack which powers the cars drive motor. Fans cannot be connected to any alternative power source
- 9.2.6 The vehicle battery pack is for powering motors, fans, transponders, and steering servos only in all car classes, and must conform to the battery section rules. No other devices will be powered from the vehicle battery pack.
- 9.2.7 Any competitor found in contravention of the spirit or fact of rule 9.2.3, will be disqualified from event.
- 9.2.8 Battery Packs may not be charged or changed during races.
- 9.2.9 ESCs fitted with reverse must have this function disabled. Use of reverse is strictly prohibited.

ELECTRIC VEHICLE CLASS SPECIFICATIONS

9.3 1/10th Scale Electric Off-Road Buggy



9.3.1 Dimensional Specifications:

| Item | | Limit | Specification |
|---------------|------------------------|---------|---------------------------------|
| Length (B) | | Maximum | 458mm |
| Width | | Maximum | 250mm |
| Height | | Maximum | 204mm |
| Wheelbase (A) | | Maximum | 292mm |
| | | Minimum | 229mm |
| Weight | 2WD | Minimum | 1500g |
| | 4WD | Minimum | 1600g |
| Wheels 2.2" | Mounting Bead Diameter | | 2.20" (55.88mm) ±0.13" (0.30mm) |
| | Overall Diameter | Maximum | 2.42" (61.468mm) |
| | Width | Maximum | 1.513" (38.43mm) |
| Wheels 2.4" | Mounting Bead Diameter | | 2.380"-2.427" (60.4mm-61.65mm) |
| | Overall Diameter | Maximum | 2.571" (65.3mm) |
| | Width | Maximum | 1.513" (38.43mm) |
| Tyes | Diameter | Maximum | 90mm |
| | Width | Maximum | 45mm |
| Rear Wing | Chord | Maximum | 76mm |
| | Side Dam | Maximum | 100x50mm |
| | Width | Maximum | 177mm |
| Front Wing | Chord | Maximum | 64mm |
| | Side Dam | Maximum | 70x20mm |
| | Width | Maximum | 127mm |

9.3.2 Two wheel drive/rear wheel drive cars only will be allowed for 2WD.

9.3.3 Four wheel drive and 2 wheel/front wheel drive cars will be allowed for 4WD.

9.3.4 Cars must conform to all the technical specifications in Section 9.

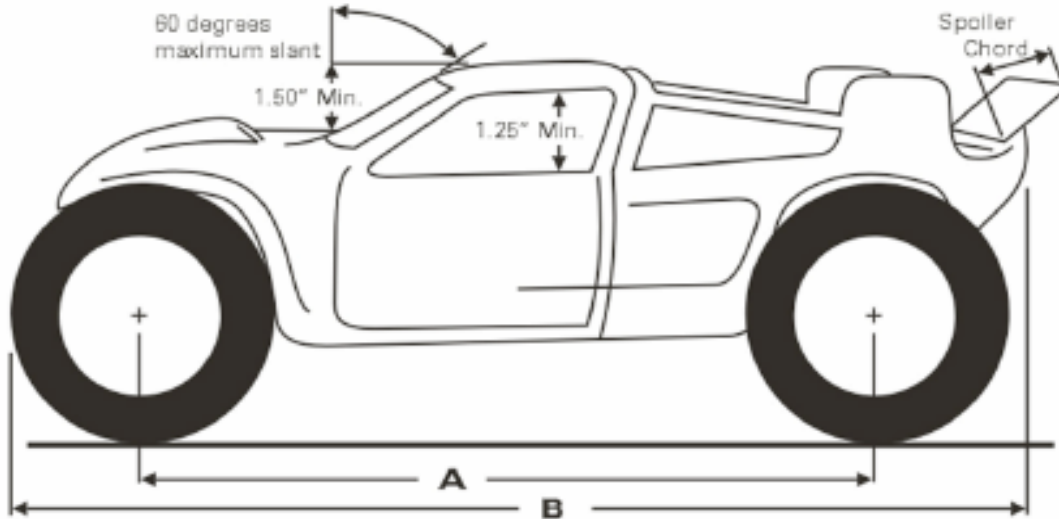
9.3.5 Legal Batteries are those as described in the batteries section (Sect 12).

9.3.6 Transmission: Single speed transmissions only

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- 9.3.7 Body Style: Buggy or other off-road style body that resembles an actual off-road racing non-truck type vehicle.
- 9.3.8 Minimum weights are including transponder.

9.4 1/10th Scale Electric Off-Road Stadium Truck.



9.4.1 Dimensional Specifications

| 9.4.1.1 Item | | Limit | Specification |
|---------------|------------------------|---------|---------------|
| Length (B) | | Maximum | 458mm |
| Width | | Maximum | 330mm |
| Wheelbase (A) | | Maximum | 292mm |
| | | Minimum | 229mm |
| Weight | | Minimum | 1725g |
| Wheels | Mounting Bead Diameter | Maximum | 57mm |
| | | Minimum | 55mm |
| | Overall Diameter | Maximum | 62mm |
| | Width | Maximum | 51mm |
| Tyres | Diameter | Minimum | 95mm |
| | Width | Maximum | 60mm |
| | | Minimum | 51mm |
| Spoiler | Chord | Maximum | 51mm |
| | Edge Turn up | Maximum | 6mm |
| | Width | Maximum | Body Width |
| Body | Width | Minimum | 146mm |
| | Height | Minimum | 108mm |
| Cam | Width | Minimum | 98mm |
| | Height | Minimum | 38mm |

- 9.4.2 Formula for Frontal area calculation: Cab width + body width / 2 x cab height + body width x body height.
- 9.4.3 Two wheel drive/rear wheel drive trucks only will be allowed.
- 9.4.4 Trucks must conform to all the technical specifications in Section 9.
- 9.4.5 Legal Batteries are those as described in the batteries section (Sect 12).
- 9.4.6 Transmission: Single speed transmissions only
- 9.4.7 Body Style: Off-road Truck

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- 9.4.8 Wheel arch cut-outs: To moulded body line
- 9.4.9 Minimum weight is including transponder

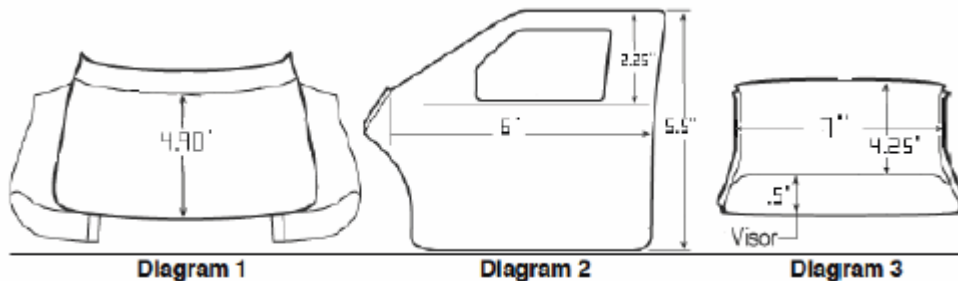
9.5 1/10th Scale Electric Off-Road Short Course Truck.

- 9.5.1 Two wheel rear wheel drive with geared or ball differential only.
- 9.5.2 Dimensional Specifications:

| Item | | Limit | Specification |
|----------------|------------------------------|---------|---------------|
| Overall Length | | Maximum | 568mm |
| | | Minimum | 540mm |
| Width | | Maximum | 296mm |
| | | Minimum | 290mm |
| | Front Bumper | Minimum | 171mm |
| Wheelbase | | Maximum | 335mm |
| | | Minimum | 320mm |
| Weight | | Minimum | 2100g |
| | | | |
| Wheels | Inner Mounting Bead Diameter | Maximum | 55.9mm |
| | Outer Mounting Bead Diameter | Maximum | 76,2mm |
| | Width | Maximum | 39.4mm |
| Tyres | Diameter (mounted) | Minimum | 106mm |

9.5.3 Body Specifications:

- 9.5.3.1 Full fender truck body. Body must completely cover tyres when viewed from above.
- 9.5.3.2 Windshield minimum setback centreline front of body to begin windshield. See diagram 1.
- 9.5.3.3 Cab roof minimum width and depth. See Diagram 2.
- 9.5.3.4 Cab minimum height and depth. See Diagram 3.
- 9.5.3.5 Cab Setback: Minimum setback is measured from a point equal to the Front (centerline) of the body to the beginning of the windshield/lower rock guard.
- 9.5.3.6 Cab Profile: Minimum depth of the cab is measured from the beginning point (centerline) of the windshield/lower rock guard to the rear reference point of the cab
- 9.5.3.7 Roof Panel: Minimum width is measured from outer most points of the roof section to the upper side window reference line. Depth of the roof panel is measured from the centreline.
- 9.5.3.8 No add on or integrated spoilers/wings allowed.



- 9.5.4 No tyre tread cutting, or custom cut tyres allowed.
- 9.5.5 No Ribbed Tyres allowed.
- 9.5.6 Tyre Mounted: Minimum Diameter of the tyre (mounted) is established to limit extremely low profile designs. The target dimension (new tyre) is established at 109mm. To compensate for wear, molding tolerances, degradation of foam inserts, the pre-race minimum allowable diameter of a mounted tyre is 106mm. Tracks and Promoters are encouraged to select a "Stated" tyre that works best for their particular location.

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- 9.5.7 Race vehicles must have front and rear bumpers. Made from non-Metal material nor contain sharp edges.
- 9.5.8 Front bumper must be minimum 171 mm in width. Front Bumper can be no wider than the inner sidewall of the front tire when straight.

9.6 Control Tyres

- 9.6.1 Tyre type: Rubber only with foam inserts.
- 9.6.2 Control tyres must be used for all classes.
- 9.6.3 Specified control tyres must be fitted on the correct axle.
- 9.6.4 All tyres must be black. Foam tyres are not allowed. Foam/cap tyres are not allowed but internal foam inserts are permitted. Tyres will not be modified in any way that will affect their original dimensions, tyre beads can be trimmed to fit into bead mount areas of rims. Control tyres using an approved closed cell foam insert only may be modified by way of no more than two external vent holes of a diameter no greater than 4mm each.
- 9.6.5 2.4" Wheels and Tires for Buggy classes are not to be selected as control tires for sanctioned events. Use of 2.4" Wheels and tires for 2WD Front is permitted at sanctioned events
- 9.6.6 The use of any oil or petroleum based compound for the purpose of treating the tire is prohibited. Only regularly available detergent based cleaners and water can be used to clean the tires. The use of solvents to clean the tire bead before glue application is permitted.
- For sanctioned events, if the host club believes that a tire additive is required. An application must be made to the RCRA EP Off Road Section for special conditions.

9.7 Control Tyre Selection

- 9.7.1 The type of tyres and combinations are decided by the RCRA Electric Executive together with the race organiser (from race organiser recommendations). The race organiser will forward the recommendations to the RCRA Electric Section four (4) months before the event. The final decision will be made Three (3) months before the event, between the RCRA Electric Executive and the race organiser.
- 9.7.2 The selected controlled tyre for all classes must continue to be commercially available in all Australian states for six (6) months prior to the event and up until the commencement of the event.
- 9.7.3 The host club has a duty to ensure that, as part of its selection process, the preferred tyre will be readily commercially available from Australian hobby shops for the duration of the period from their announcement until the meeting. The tyre combination should also be suitable for expected weather and track conditions.
- 2WD and Truck: Rear tyres controlled only, front tyre is open.
 - 4WD: Front and Rear tyres are controlled, different types maybe selected for the front and the rear axles.

9.8 Bodies and Wings

- 9.8.1 Bodies: All vehicles must use a 1:10th size body and have the appearance of full-size off-road racing vehicle. Pipe type bodies may be utilised on vehicles originally supplied in that configuration. A driver figure (minimum: head, shoulders, arms) must be firmly secured in proper position on cars using pipe type bodies. A driver figure is not required on enclosed body vehicles.
- 9.8.2 Bodies must be cut to the mould lines wherever possible. No extra air scopes or vent holes are to be cut into the body unless moulded into the body from the manufacturer. (Usage note: the side windows are considered cut-outs for Short Course Trucks, but not for Buggies or Stadium Trucks.)
- 9.8.3 Side dams and spoilers: No add on side dams or spoilers allowed. Those moulded into the body as on the original vehicles are allowed. Exception is truck class where a spoiler with a maximum chord of 50.8mm may be added at the rear of the body. The width of this spoiler will not exceed the width of the body at the mounting point.
- 9.8.4 The body must be securely attached to vehicle at all times while racing. If the body becomes loose and a track hazard or falls off during a race, the vehicle must pull off the track until the body is reattached.
- 9.8.5 Openings in the body or cockpit floor other than appropriate to full size vehicles (scoops, vents, etc.) shall be kept to a minimum. Openings for wing mounts, antennas, and battery on-off switch shall provide no more than 5 mm in clearance. Specifically, servos, receivers, batteries, and servo savers are not allowed to protrude through original shell.

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9.8.6 Wings (2wd & 4wd only)

A maximum of two wings may be used. One on the front and one on the rear of the vehicle.

Max size of wings:

- Front - 127 mm Wide x 64 mm Chord.
- Rear - 177 mm Wide x 76 mm Chord.
- Max wing side dam sizes: Height 50mm x Length 100mm.
- Rear bi-level wings are permitted



9.8.7 Rollover antennas are not allowed. Antennas must be of a flexible non-metallic material.

10 MOTORS

Modified – Open, no turn limit.

10.5 BL: Please refer to the Motors on the ROAR list [<http://www.roarracing.com>], and the Motors on the BRCA list [<http://www.brca.org>] that were approved 30 days prior to the date of the sanctioned event.

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

10.1 Modified and 10.5 Brushless Motors: General definition of a Brushless Motor:

10.1.1 Sensored or sensorless motors are 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

10.1.4 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

10.1.5 05' SIZE SPECIFICATIONS

10.1.5.1 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.

10.1.5.2 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.

10.1.5.3 Stack/Stator: Stack/Backiron minimum length 19.30mm, maximum 21.00mm.

10.1.5.4 Stack inside diameter minimum 12.50mm, 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.

10.1.5.5 Winding: Three slot (phase) "Y" wound stators, delta wound or slot-less stators allowed. Only circular (round) pure copper wire permitted. No turn limit.

10.1.5.6 Rotor: Shaft diameter must be 3.175mm. Only one piece, two pole bonded Neodymium or Ferrite magnetic rotors are permitted. Magnet minimum length - 23.00mm, maximum - 27.00mm. Magnet minimum diameter - 12.00mm, maximum - 15.50mm.

10.1.6 All motors must have the original manufacturer's logo or name imprinted into the end bell. Stickers are not permitted.

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

10.1.8 Exchange of rotors from within the same manufacturer allowed, as long as they stay within the above dimension restrictions (Sect 10.1.4).

10.1.9 Motors to be used in 10.5 BL specific classes must be "Y" wound with 10.5 turns of wire, and be clearly indicated as such by the manufacturer on the external casing.

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2WD 17.5 Turn Class: Please refer to the 17.5 Turn motors on the ROAR list [<http://www.roarracing.com>], and the Stock motors on the BRCA list [<http://www.brca.org/>] that were approved 30 days prior to the date of the sanctioned event.

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

10.2 2WD 17.5 Class Brushless Motors: General definition of a Brushless Motor:

10.2.1 2WD 17.5 Turn Class – Brushless 17.5T, “Y” wound, sensed only.

10.2.2 No hybrid allowed. (mixing of parts of brushless motors)

All brushless motors for the Stock class will be wind rating of 17.5 turns, clearly indicated by the manufacturer on the external casing. Motors will be inductance tested and all motors will read above the recommended inductance reading. If a motor fails this test, the rotor should be removed and a further inductance test be carried out to ensure if the motor will be classified to pass or fail, and the rotor measured. UNI-T, model # UT602 inductance meter has been used to carry out testing Minimum Readings (See separate document – Motor Inductance Testing 09):

- Assembled = 60 μ H
- Rotor removed = 90 μ H

10.2.3 The motor has to be re-buildable. Ball bearings are allowed.

10.2.4 The motor 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

10.2.5 05 SIZE SPECIFICATIONS

10.2.5.1 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.

10.2.5.2 Rotor: Stock Motors: External shaft diameter must be 3.175mm. Only one piece, two pole Neodymium sintered or bonded, or Ferrite (Ceramic) magnetic rotors are permitted. The magnet length shall be 25.0 +/- 1.00mm not including any non-magnetic balancing material. The magnet outside diameter shall be a minimum of 12.00mm and a maximum of 12.51 mm, no tolerances, for the entire length of the magnet. The shaft outside diameter, where the magnet is mounted, shall be 7.25 +/- 0.150mm. This dimension must be measurable without destroying the rotor.

10.2.5.3 Stack/Stator: For Stock: The stator construction must be continuous laminations having the same overall shape, one after the other without anything in between. The laminations must be of one homogeneous material without cut-outs, holes or hollow sections other than the three slots for the round copper coil wires and three slots for the screws used to hold the entire can together. The overall stator length parallel to the motor shaft shall be a maximum 21.0 mm. The thickness of the laminations shall be 0.35 +/- 0.05mm. A 'go-no-go' gauge 14.500 +0.000/-0.005 mm diameter shall pass into the stator, clearing the stator plus its windings and the electrical collection ring at the end of the stator.

10.2.5.4 Winding: 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 17.5 turns of 2 strands of 20 AWG or 2 strands of 0.81 mm IEC per slot. The inductance for each slot of the stator shall be 100.00 Micro Henries minimum and 110.00 Micro Henries maximum, measured with the rotor removed from the motor.

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10.2.6 All motors must have the original manufacturer's logo or name imprinted into the end bell. A marking or unique feature that is difficult to remove must be integrated into the Stock motor to signify that it is for stock competition.

4WD 13.5 Turn Motor Class: Please refer to the Stock motors on the ROAR list [<http://www.roarracing.com>], and the Stock motors on the BRCA list [<http://www.brca.org>] that were approved 30 days prior to the date of the sanctioned event.

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

10.3 4WD 13.5 Turn Class Brushless Motors: General definition of a Brushless Motor:

10.3.1 4WD 13.5 – Brushless 13.5T, “Y” wound, sensed only.

10.3.2 No hybrid allowed. (mixing of parts of brushless motors)

All brushless motors for the Stock class will be wind rating of 13.5 turns, clearly indicated by the manufacturer on the external casing. Motors will be inductance tested and all motors will read above the recommended inductance reading. If a motor fails this test, the rotor should be removed and a further inductance test be carried out to ensure if the motor will be classified to pass or fail, and the rotor measured. UNI-T, model # UT602 inductance meter has been used to carry out testing Minimum Readings (See separate document – Motor Inductance Testing 09):

- Assembled = 60 μ H
- Rotor removed = 90 μ H

10.3.3 The motor has to be re-buildable. Ball bearings are allowed.

10.3.4 The motor 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

10.3.5 05' SIZE SPECIFICATIONS

10.3.5.1 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.

10.3.5.2 Rotor: Stock Motors: External shaft diameter must be 3.175mm. Only one piece, two pole Neodymium sintered or bonded, or Ferrite (Ceramic) magnetic rotors are permitted. The magnet length shall be 25.0 +/- 1.00mm not including any non-magnetic balancing material. The magnet outside diameter shall be a minimum of 12.00mm and a maximum of 12.51 mm, no tolerances, for the entire length of the magnet. The shaft outside diameter, where the magnet is mounted, shall be 7.25 +/- 0.150mm. This dimension must be measurable without destroying the rotor.

10.3.5.3 Stack/Stator: For Stock: The stator construction must be continuous laminations having the same overall shape, one after the other without anything in between. The laminations must be of one homogeneous material without cut-outs, holes or hollow sections other than the three slots for the round copper coil wires and three slots for the screws used to hold the entire can together. The overall stator length parallel to the motor shaft shall be a maximum 21.0 mm. The thickness of the laminations shall be 0.35 +/- 0.05mm. A 'go-no-go' gauge 14.500 +0.000/-0.005 mm diameter shall pass into the stator, clearing the stator plus its windings and the electrical collection ring at the end of the stator.

10.3.5.4 Winding: 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

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wound with 17.5 turns of 2 strands of 20 AWG or 2 strands of 0.81 mm IEC per slot. The inductance for each slot of the stator shall be 100.00 Micro Henries minimum and 110.00 Micro Henries maximum, measured with the rotor removed from the motor.

10.3.6 All motors must have the original manufacturer's logo or name imprinted into the end bell. A marking or unique feature that is difficult to remove must be integrated into the Stock motor to signify that it is for stock competition.

10.3.7 Current motors locally approved by RCRA for use in the 17.5t class include:

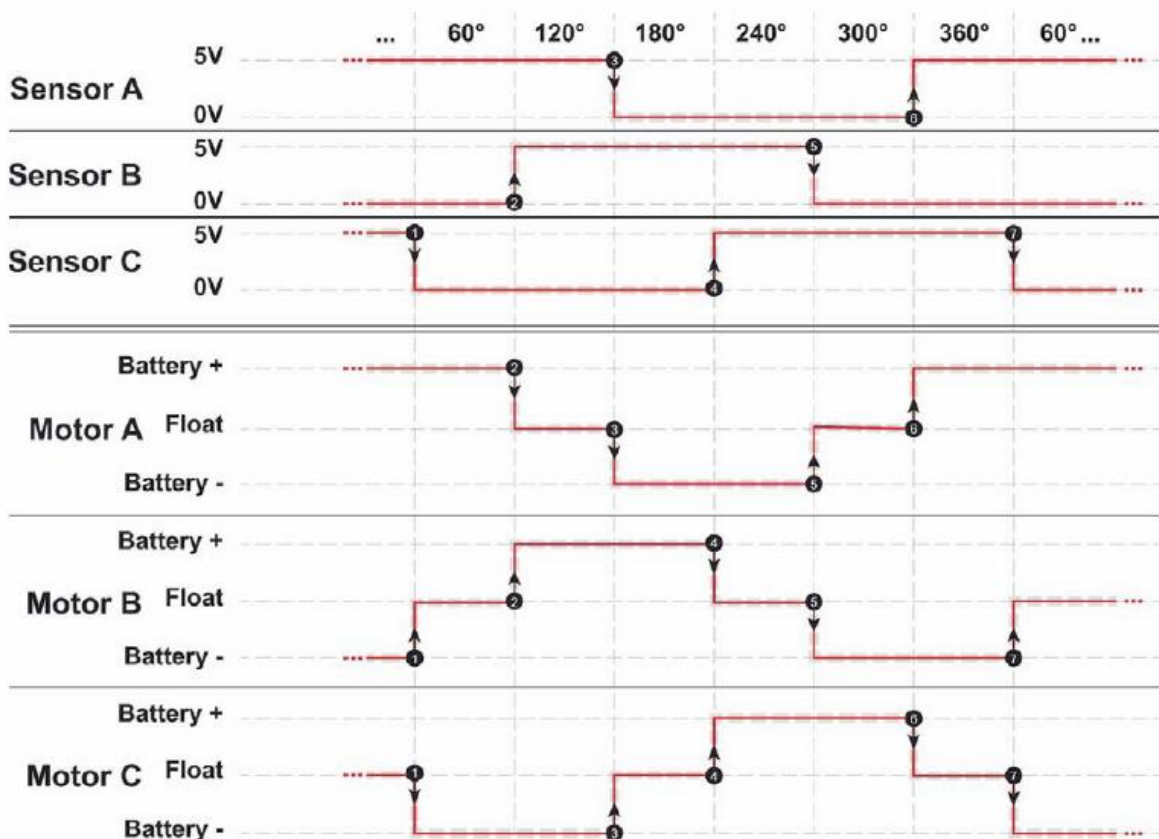
- R-Ace – Blue can, Duo 2 style motor
- Team Orion – Gunmetal Grey 2010 spec
- Team Orion – Grey 2011 spec
- Keyence – Hacker OEM
- Muchmore Fleeta AARCMCC 17.5 turn control motor (fixed or variable timing endbell allowed)

11 ELECTRONIC SPEED CONTROLLERS (ESCS) FOR 2WD 17.5 TURN, 4WD 13.5 TURN AND 10.5 TURN SC BL CLASSES

The RCRA Approved EP Offroad ESC List automatically includes those ESCs appearing on the ROAR Approved Non-Timing ESC List [<http://www.roarracing.com>] 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 BATTERIES

Please refer to the Batteries on the ROAR lists [<http://www.roarracing.com>], and the Batteries on the BRCA lists [<http://www.brca.org/>] that were approved 30 days prior to the date of the sanctioned event.

12.1 General

12.1.1 Only Batteries that appear on the RCRA battery list may be used.

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

12.1.3 **LI-POLY (LITHIUM POLYMER) BATTERIES**

12.1.3.1 Competitors must ensure that Li-Po batteries are handled, stored and transported responsibly and safely, and adhere to manufactures recommendations in regard to handling, charging and transportation.

12.1.3.2 Batteries must be factory sealed in a hard case that can withstand impacts as per ROAR testing procedures. No soft cased batteries allowed, for primary battery source.

12.1.3.3 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 Li-poly battery will deem the battery to be ineligible for use.

12.1.3.4 Lithium Polymer batteries are to be hard cased..

12.2 General Specifications

12.2.1 Nominal capacity must not exceed 3.8V/cell.

12.2.2 Full charge voltage not to exceed 4.2 Volts per cell.

12.2.3 Minimum rating of 20C

12.2.4 Maximum Nominal Dimensions: Li-poly / Li-Fe

2S Brick/Stick Case

2S Saddle Pack Case

- Length: 139 mm
- Width: 47 mm
- Height: 25.1 mm

- Length: 70 mm
- Width: 47 mm
- Height: 25.1 mm

12.3 Procedures for Charging and use

12.3.1 Whilst charging and/or discharging, batteries must be contained in a Li-poly sack or other similar fire mitigation device able to withstand and contain a destructive failure without showing a flame.

12.3.2 Electronic speed controls are to have either an inbuilt or an external cut-off electronic device installed that will not allow the battery to discharge below 6 Volts minimum.

12.3.3 Li-poly capable chargers are only to be used (CC/CV).

12.3.4 Li-Poly battery maximum charge rate shall be according to manufacturers specifications. Where no manufacturers specifications exist, a 1C (C= charge amp rate) is to be used. Charge amp rate = mAh capacity/1000=X Amps. Overcharging is not allowed.

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

12.3.6 The use of heating devices of any type to heat a Li-poly battery is 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 Li-poly sack or other device that will contain a destructive failure.

12.4 Technical Inspection Guidelines

12.4.1 Disqualification will result if any of the following three charging guidelines are breached.

- 1.) Charging the Li-poly pack with anything but a charger capable of the standard Li-poly CC/CV charging method.
- 2.) Charging a Li-poly pack to a Voltage higher than 8.40V.
- 3.) Charging a Li-poly pack outside of a "Li-poly sack" or other device proven to contain a destructive failure of a Li-poly pack

APPENDIX B – 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 Off-Road <State/National> Championships

Competitor Registration

Entrants Particulars:

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

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

<Venue>

Please Complete this form
 and return to:-

THE EVENT COORDINATOR

<Address>

<City> <State> <Postcode>

AARCMCC
rules apply

Please tick classes to enter.

- | | | | | |
|---|-----------------------|-----------------------|-----------------------|-------------------|
| <input type="checkbox"/> 2WD Stock | 1 st | 2 nd | 3 rd | Transponder |
| <input type="checkbox"/> 2WD Modified | 1 st | 2 nd | 3 rd | Transponder |
| <input type="checkbox"/> Truck Stock | 1 st | 2 nd | 3 rd | Transponder |
| <input type="checkbox"/> Truck Modified | 1 st | 2 nd | 3 rd | Transponder |
| <input type="checkbox"/> 4WD Stock | 1 st | 2 nd | 3 rd | Transponder |
| <input type="checkbox"/> 4WD Modified | 1 st | 2 nd | 3 rd | 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.

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APPENDIX C – SAMPLE TECHNICAL CHECKLIST – 2WD

| Technical Checklist - 2WD - Stock / Modified | | | | | | | Heat: | Final: |
|--|----------------|-------|------|---------|-------|---------|-------|--------|
| Car No | Weight (1500g) | Width | Wing | R. Tyre | Motor | Battery | Name: | |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 0 | | | | | | | | |
| | | | | | | | Heat: | Final: |
| Car No | Weight (1500g) | Width | Wing | R. Tyre | Motor | Battery | Name: | |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 0 | | | | | | | | |
| | | | | | | | Heat: | Final: |
| Car No | Weight (1500g) | Width | Wing | R. Tyre | Motor | Battery | Name: | |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 0 | | | | | | | | |
| Comments: | | | | | | | | |

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APPENDIX D – SAMPLE TECHNICAL CHECKLIST – TRUCK

| Technical Checklist - Truck - Stock / Modified | | | | | | | Heat: | Final: |
|---|-----------------------|--------------|-------------|----------------|--------------|----------------|--------------|---------------|
| Car No | Weight (1725g) | Width | Wing | R. Tyre | Motor | Battery | Name: | |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 0 | | | | | | | | |
| | | | | | | | Heat: | Final: |
| Car No | Weight (1725g) | Width | Wing | R. Tyre | Motor | Battery | Name: | |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 0 | | | | | | | | |
| | | | | | | | Heat: | Final: |
| Car No | Weight (1725g) | Width | Wing | R. Tyre | Motor | Battery | Name: | |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 0 | | | | | | | | |
| Comments: | | | | | | | | |
| | | | | | | | | |

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APPENDIX E – SAMPLE TECHNICAL CHECKLIST – 4WD

| Technical Checklist - 4WD - Stock / Modified | | | | | | | | Heat: | Final: |
|---|-----------------------|--------------|-------------|----------------|----------------|--------------|----------------|--------------|---------------|
| Car No | Weight (1600g) | Width | Wing | F. Tyre | R. Tyre | Motor | Battery | Name: | |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 0 | | | | | | | | | |
| | | | | | | | | Heat: | Final: |
| Car No | Weight (1600g) | Width | Wing | F. Tyre | R. Tyre | Motor | Battery | Name: | |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 0 | | | | | | | | | |
| | | | | | | | | Heat: | Final: |
| Car No | Weight (1600g) | Width | Wing | F. Tyre | R. Tyre | Motor | Battery | Name: | |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 0 | | | | | | | | | |
| Comments: | | | | | | | | | |

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