



SARDA Off Road Electric Rules 2017

**VERSION 1
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**This Document supersedes all previous Rules documents prior to
this release**

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1. AIMS

- 1.1 The aim of these rules and guidelines, which are compiled by the South African Radio Drivers Association (SARDA) Off-Road, is to promote and encourage competitive 1/10th scale electric off road auto racing in a fair and friendly manner.
- 1.2 The Rules are a set of requirements to enable SARDA Off-Road sanctioned events to be run to uniform standards and are to act as a set of guidelines for new clubs to assist them with setting up their venue and organising racing events.
- 1.3 It is the duty of every SARDA Off-Road member to familiarise him/her with these rules. Should any query arise, the member should discuss it with a SARDA Off-Road Committee member or his club chairman.**

2. AWARDS

- 2.1 No cash prizes (including cheques, bank deposits or cash gift vouchers) will be given. The winners may receive merchandise prizes, trophies or certificates as the SARDA Off-Road Committee sees fit. The value of any one prize may not exceed US\$250.00 (two hundred and fifty American Dollars).

3. TRACK CONSTRUCTION

3.1 TRACK LOCATION

- 3.1.1 Except by sanction of the South African Radio Control Hobby Association (SARCHA), a new track may not be formed within 5 (five) kilometre radius of any existing radio controlled venue, unless by the same club.

3.2 SAFETY

- 3.2.1 The safety of spectators is of prime importance and must be considered when marking out the track and spectator areas. No spectator area should be marked out within 2 (two) metres of the track.
- 3.2.2 The safety of the Race Officials, drivers, marshals and mechanics is of equal importance but it is assumed that they are aware of any potential dangers.
- 3.2.3 Clubs should ensure that they have the necessary public liability insurance cover for non-SARDA Off-Road sanctioned events.
- 3.2.4 The host club should ensure that all facilities are freely accessible to either the drivers or the public and comply in all respects with the relevant safety by-laws. This is particularly applicable to electrical and structural standards.
- 3.2.5 All clubs must have a fully equipped first aid box, a fire extinguisher and have the addresses and telephone numbers of the nearest doctor, hospital, fire station and police station on hand.
- 3.2.6 All clubs must display 2 (two) indemnity notices disclaiming any

liability for accidental injury, damage or loss.

3.3 TRACK LAYOUT

- 3.3.1 The inner and outer boundaries of the track surface must be distinctly defined. The material used to form these boundaries must be of such a nature that it will prevent the cars from going onto other sections of the track, but will not hinder the progress of the cars, e.g. grass verges must be cut at an angle.
- 3.3.2 Corners must be clearly identifiable and the extremities thereof demarcated. These must be of such a nature that they will slow down, but not hinder, the progress of the cars, e.g. tyres used for corner demarcations can stop cars, causing unacceptable delays.
- 3.3.3 The track shall not include such obstacles or obstructions that could cause undue damage to cars, e.g. boulders, poles, bricks, etc.
- 3.3.4 All tracks must have a clearly marked START/FINISH line. The START/FINISH line must be marked on the surface of the track by means of a white or yellow line, with a minimum width of 5 (five) centimetres, and shall cover the total width of the track. The scoring area should be at the FINISH line. If the START line is on a different part of the track to the FINISH line, all drivers must be made aware of the relative positions before racing commences. The grid and finish line must be laid out in such a way to allow a 10 car grid start and scoring area at the finish line in either direction for a race. Example, The AMB pick up lines must be so installed to allow a full grid behind it.
- 3.3.5 The STARTING GRID should be able to accommodate at least ten (10) cars, in staggered configuration (see ANNEXURE A), plus a DEFAULT LINE located 1 (one) metre behind the last starting position. The GRID surface must be of the same material as the track. The GRID layout must be as agreed upon by the Race Officials, depending on track conditions. The STARTING GRID must be a minimum of 3 (three) metres wide, with a minimum of 2 (two) metres between following cars set in a staggered configuration. STARTING BOXES, 300 (three hundred) millimetres wide, should be located in the middle of the track, 1350mm (one thousand three hundred and fifty) millimetres in from the edge of the track.(See sketch on ANNEXURE A.)
- 3.3.6 The JUMP-START LINE shall be deemed to be 1 (one) metre ahead of the starting line of the car in question. A marker will be provided for each position.
- 3.3.7 Cars must be prevented from going into other portions of the track.
- 3.3.8 Provision shall be made for cars to run off the track into a safe area on completion of the race, where they will be unable to cause hindrance to other cars still racing. This POST-RACE PADDOCK must be within the first 25% (twenty five percent) to 50% (fifty percent) of the track, after the finishing line, subject to the approval of

the Race Director. The post-race paddock must be clearly demarcated.

- 3.3.9 Provision must be made for a HOLDING AREA where cars that have incurred a stop/go penalty (see section 13.3) may pull into without causing hindrance to other cars still racing. This may be the same area as the post-race paddock, provided that the latter is not in the middle of the track.
- 3.3.10 If the AMB LAP SCORING SYSTEM is in use provision must be made for the installation of the AMB timing loop as follows:
 - 3.3.10.1 2 (two) tubes of non-metallic material should be buried, 1 (one) on either side of the start/finish line, 45 (forty five) centimetres apart, approximately 2 (two) centimetres below the surface, across the entire width of the track. Some provision should be made for threading the loop wire through the tubes. The ends of the tubes should be protected from damage by passing cars after the loop is installed.

3.4 TRACK DIMENSIONS

- 3.4.1 The track shall be a minimum of 100 (one hundred) metres in length, but it is preferable to design a track with a minimum lap count of 12 (twelve) laps in 6 (six) minutes. This reduces the margin of error in lap scoring.
- 3.4.2 At no point should the width of the track be less than 3 (three) metres.
- 3.4.3 The main straight shall be a minimum of 25 (twenty five) metres in length and can be on a gradient but with no obstacles.

3.5 DRIVERS STAND

- 3.5.1 A DRIVERS STAND shall be provided and arranged so as to give all drivers a clear view of the track at all times. It must be of stable construction and raised above the track. Both the staircase and the STAND must have railings. The DRIVERS' STAND must be able to accommodate 10 (ten) drivers. Ideally 800 (eight hundred) millimetres per driver should be allowed, giving a total length, excluding Referee accommodation, of 8 (eight) metres.
- 3.5.2 Wherever possible, the DRIVERS STAND shall be constructed in such a way that wheelchairs can be accommodated on the stand.
- 3.5.3 The DRIVERS STAND should be located not closer than 2 (two) metres from the track at any point.

4. SARDA OFF ROAD EVENTS – GENERAL

4.1 CONCOURS D'ELEGANCE

- 4.1.1 All cars entered for CONCOURS D'ELEGANCE judging will be judged before the first race by a panel of judges, representing various clubs, nominated by the host club. A prescribed

CONCOURSE checklist (see ANNEXURE B) must be completed by each judge and submitted to the Race Director after completion of the judging.

- 4.1.2 All cars entered for CONCOURSE must compete in at least the first round of the event as presented for CONCOURSE judging. Failure to comply with this requirement will result in the car being disqualified from the CONCOURS D'ELEGANCE results.

4.2 RACES

- 4.2.1 In South Africa 8 (eight) main classes are run in 1/10th scale off road, namely:

4.2.1.1 TWO WHEEL DRIVE STOCK

Only 1 (one) ROAR Approved Brushless 17.5 Motor or 27T ROAR Approved Brushed stock motor and (1) one 2S 7.4V LiPo or 7.2V 6cell NiMh, per car, per race, allowed.

4.2.1.2 TWO WHEEL DRIVE STADIUM STOCK

Only 1 (one) ROAR Approved Brushless 17.5 Motor or 27T ROAR Approved Brushed stock motor and (1) one 2S 7.4V LiPo or 7.2V 6cell NiMh, per car, per race, allowed.

4.2.1.3 FOUR WHEEL DRIVE STOCK

Only 1 (one) ROAR Approved Brushless 13.5 Motor or 19T ROAR Approved Brushed stock motor and (1) one 2S 7.4V LiPo or 7.2V 6cell NiMh, per car, per race, allowed.

4.2.1.4 TWO WHEEL DRIVE MODIFIED

Only 1 (one) unlimited motor and only 1 (one) 2S 7.4V LiPo or 7.2V 6cell NiMh, per car, per race, allowed.

4.2.1.5 TWO WHEEL DRIVE STADIUM MODIFIED

The Stadium Truck Modified Class is no longer being run as an official class. The rules for this class are being left in this document as a reference.

Only 1 (one) unlimited motor and only 1 (one) 2S 7.4V LiPo or 7.2V 6cell NiMh, per car, per race, allowed.

4.2.1.6 FOUR WHEEL DRIVE MODIFIED

Only 1 (one) unlimited motor and only 1 (one) 2S 7.4V LiPo or 7.2V 6cell NiMh, per car, per race, allowed.

4.2.1.7 SHORT COURSE TRUCK (SCT) 2WD

Only 1 (one) ROAR Approved Brushless 13.5 Motor or 19T Brushed motor and (1) one 2S 7.4V LiPo or 7.2V 6cell NiMh, per car, per race, allowed. (Annexure I)

4.2.1.8 SHORT COURSE TRUCK (SCT) 4WD

Only 1 (one) motor (size 550) and (1) one 2S 7.4V LiPo or 7.2V 6cell NiMh, per car, per race, allowed.

- 4.2.2 A driver may enter only 1 (one) car per class.
- 4.2.3 All races will be 6 (six) minutes and 1 (one) lap (or portion thereof) in duration. No car, motor or battery may be replaced or charged by external means during a race and will be disqualified from that race if found doing so.
- 4.2.4 The car to complete the most number of laps in 6 (six) minutes and with the shortest time penalty, inclusive of penalties, will be the winner. Each car must complete the lap it is on, when the 6 (six) minute signal is sounded, in order to obtain the final placing. This last lap is the “timed lap”, which is added to the number of laps scored in the 6 (six) minutes. The result for each car in each race will therefore be a number of laps and a time, e.g. 10 laps in 6 minutes and 23 seconds.
- 4.2.5 To qualify for a lap or a “timed lap” a car must cross the finish line under its own power within the allocated time of start time. A car may not be assisted by another car or be pushed throughout the entire race. This will result in the disabled car being disqualified from that race.

4.3 RACING NUMBERS

- 4.3.1 Each car shall have identification numbers in at least 3 (three) prominent positions, so that they are visible from the left, right and front sides of the body of the car during the race. Numbers will be black numerals on a white background, at least 25 (twenty five) millimetres high and with a minimum stroke of 3 (three) millimetres.
- 4.3.2 These numbers will be issued by SARDA Off-Road and may not be trimmed or reduced in size in any way whatsoever.

4.4 RACING PROCEDURE

- 4.4.1 All cars must be presented for pre-race scrutinising, as from the start of any round of qualifying or finals and remain in “parc ferme” with the scrutiner until to be removed to race, be that before the start of the first race of a round or during the preceding races, but before the signalling of the all clear signal of the preceding race wherein the particular car shall race. Cars not presented within this period will be disqualified from that race (see section 14.1.2.1).
 - 4.4.1.1 Cars entered for the first race of a round must be presented at least 3 (three) minutes before the start of the race. Cars not presented within this period will be disqualified from that race (see section 14.1.2.2).
 - 4.4.1.2 Cars must be presented for scrutinising in full racing format.
- 4.4.2 Radios will be allowed in the pit area, with the understanding that

SARDA Off-Road Committee can revoke this decision at any time at their discretion and implement the use of the “World’s box” method. Furthermore, if there are two drivers on the same frequency, one of them must change to a different frequency. Drivers must also note that no driving will be allowed in the pit area. When the “Worlds Box” system is used, where TX’s are placed in boxes on driver’s stand, then all TX’s shall be impounded 30(thirty) minutes before first race. At no time should a TX be removed from this area during racing. At no time should a TX be brought within 5 (five) metres of the starting grid.

- 4.4.3 60 (sixty) seconds prior to the start of the countdown the “1 (one) minute” signal will be sounded, at which time all cars should be placed in position on the starting grid. All drivers for that race must be on the drivers’ stand and all marshals must have reported to the Chief Marshal.
- 4.4.4 30 (thirty) seconds before the start of the race countdown the “30 (thirty) second” signal is sounded. At this time all persons, except Race Officials, must be off the starting grid. Cars not ready to race at this point must be placed behind the default line from where they will start the race (see section 3.3.5). All marshals must be in their allocated positions before the “30 (thirty) second” signal.
- 4.4.5 Cars may only be driven from the drivers’ stand. No driver may leave the drivers’ stand until the “all clear” signal has been sounded. Failure to comply with this requirement will result in the disqualification of the driver from that race (see section 14.1.2.3).
- 4.4.6 The Qualifying rounds will be started with the second procedure (4.4.6.2). The Mains will always be started with the first procedure (4.4.6.1).
 - 4.4.6.1 Cars will be placed on the grid as per section 3.3.4. The countdown to the start of the race will begin at the end of the 30 (thirty) second period. The countdown will start at “10 (ten)” and end at “5 (five)”, then a silence of between 3 (three) to 8 (eight) seconds, then the start signal will be sounded, e.g. “Drivers ready ... 10, 9, 8, 7, 6, 5, ... pause ... Go!” This procedure discourages jump starts.
 - 4.4.6.2 The staggered start may be used to start the Qualifying heats. Cars will be placed on the starting grid in a straight line across the track. Cars must start as and when directed by the Time Keeper, at approximately 1 (one) second intervals. Cars not starting when directed must start after the last car has crossed the start line. The Time Keeper will allow each car a full 6 (six) minute race period, subject to section 4.4.6.2.1 below.
 - 4.4.6.2.1 All cars should cross the start line before the first completed lap or within the minimum lap time period allowed (approximately 20

(twenty) seconds) for the first starter crossing, whichever is the shortest. Cars starting after this time will have their race time reduced by the late start time.

- 4.4.6.2.2 All cars that started the race within the rules of section 4.4.6.2.1 above will be allowed 6 (six) minutes of race time plus the time to complete their "timed lap" to a maximum of twice the minimum lap time.

When the AMB Lap Scoring System is in operation the complete start procedure shall be in control of the Operator of the AMB System.

- 4.4.7 In the event of a false start, drivers will be informed that the race has been aborted by means of the sounding of a signal for a period of 5 (five) seconds and a red flag will be displayed. Only the Race Director/Race Referee is empowered to abort a race that is in progress and the Race Director/Race Referee decision shall be final. However, in the event of computer failure, the AMB Controller may abort the race. Any aborted race shall be declared null and void, and the race shall be re-run at the end of the round or at the Race Directors' discretion.

4.4.8 BLACK FLAG

Any driver "black flagged" must immediately stop in the holding area and await instructions from the Race Referee. Any driver who does not respond by pulling off within 2 (two) laps will automatically be disqualified from that race.

The Grid Marshal, who receives his/her instructions from the Race Director/Race Referee only, operates the black flag. The black flag may be used for the following reasons:

- 4.4.8.1 Any car that constitutes a hazard to other cars in the race.
- 4.4.8.2 Unsporting behaviour.
- 4.4.8.3 Bad driving.
- 4.4.8.4 Participants driving in a manner deemed to be dangerous.
- 4.4.8.5 Repetitive cutting corners.
- 4.4.8.6 The use of foul language within the entire confines of the venue and for the duration of the event.
- 4.4.8.7 Cars judged to be in a non-driveable or dangerous condition - after repairs have been carried out, and after the Race Referee has approved the repair, they may continue their race.
- 4.4.8.8 A car that is racing without its body (or other part) firmly attached to the chassis - The car must be stopped immediately to carry out the necessary repairs, after which it may continue the race.

- 4.4.9 After 6 (six) minutes have elapsed; the "timed lap" will begin. Each car must continue racing until it has crossed the finish line. A car must only cross the finish line ONCE during the "timed lap".
- 4.4.10 After completing the race, all cars must proceed to the post-race paddock and remain stationary until the "all clear" is given. Failure to comply will result in a penalty (refer to section 13.2).
- 4.4.11 After the "all clear" signal has been given, all TX's from that race must be switched off. It is the responsibility of the driver to ensure that his/her TX is switched off. If the "World's box" system is used, the TX's must be put back in the boxes/containers provided on the drivers stand.
- 4.4.12 If the "World's box" system is used, TX's will be released at the end of the day's racing or when the driver leaves the event. In the event of a driver leaving before the end of the day's racing, the driver must get the permission of the Race Director and the TX will only be handed to him/her during the break between races, with the crystals removed. The driver must then leave the track before the commencement of the next race.

5. MARSHALLING

- 5.1 Marshalling positions will be allocated at strategic points around the track. There shall be a minimum of 7 (seven) marshalling positions. Each position will be clearly numbered, i.e. 1, 2, 3, etc.
- 5.2 Every driver will marshal directly after he/she has raced. Before the 1 (one) minute warning for the next race, he/she must have reported to the Chief Marshal and be on the marshalling position corresponding to his/her car number before the 30 (thirty) second signal. Tables will be provided for cars at scrutineering for safe keeping, until marshalling duty is completed. (See "Guidelines for Marshalling" – ANNEXURE C)
- 5.3 A driver, who has entered a class, must marshal regardless of whether he/she raced in that race or not.
- 5.4 Failure to marshal, and/or to report to the Chief Marshal, and/or to be on his/her marshalling position within the allotted times, will incur a penalty (refer to section 13.1.7).
- 5.5 A driver may only nominate a substitute marshal who is a participating driver in that SARDA Off-Road sanctioned event.
- 5.6 A physical unable person may nominate a substitute marshal, or request an easier marshalling position.
- 5.7 The onus of organising a substitute shall, at all times, rest with the driver, regardless of the reason for the substitution.

5.8 Hybrid Marshaling

- 5.8.1 A hybrid marshal system may be used, but can be stopped at any time if the marshalling is not up to standard or there are complaints from

drivers. This shall be the decision of the Race Director in consultation the Committee.

5.8.2 The fees for the hybrid marshal system shall be determined by the Host Club. The cost shall be calculated on a per-entry basis, with the total cost of the hybrid marshals being divided by the total number of entries. The hybrid marshal fee shall be communicated to members in the stage report for the event.

5.8.3 The Host Club shall ensure that hybrid marshals are given training in how to marshal to bring them to an acceptable competence level.

6. OFFICIALS

6.1 The following Officials are the minimum required at any SARDA Off- Road sanctioned event, and should be nominated by the host club, except where a SARDA Off Road Official is required:

6.1.1 Race Director – SARDA

6.1.2 Registration Secretary – Host Club

6.1.3 Scrutinisers/Transponder Controller - Host Club

6.1.4 Referee/Referees – To be appointed by SARDA Committee at each event or an appointed SARDA referee

6.1.5 Chief Marshal - Host Club

6.1.6 Grid Marshal - Host Club

6.1.7 Time Keeper (only required if AMB System is not in use)

6.1.8 Lap Caller/Lap Recorder (only required if AMB System is not in use)

6.1.9 Lap Counters/AMB Controller - Host Club

6.1.10 Public Address Announcer - Host Club

6.1.11 Concourse Judges - Host Club

6.1.12 Protest Committee – SARDA

7. DUTIES OF RACE OFFICIALS

7.1 RACE DIRECTOR

7.1.1 At all SARDA Off-Road sanctioned events the SARDA Off- Road Race Director will fulfill this function.

7.1.2 The Race Director shall ensure the smooth and fair running of the event, liaise between all Officials, liaise between drivers and Race Control when necessary, and be chairman on the Protest Committee.

7.1.3 In the event of the Race Director being unable to attend a SARDA Off-Road event, the SARDA Off-Road Committee shall nominate a fully qualified person as Race Director for that event.

7.1.4 The Race Director shall liaise with the club chairman of the host club to determine the extent and frequency of track maintenance and watering.

7.2 REGISTRATION SECRETARY

7.2.1 The Registration Secretary shall check that each driver is qualified to enter, i.e. registered as an entrant, correct class, etc., and ensure

that full entry fee has been paid. He/she must ensure that each driver receives a programme of events, car numbers (refer to section 4.3.1) and numbers to be adhered to the driver's TX and liaise with SARDA secretary to confirm that each entrant is a paid up SARDA Off Road member.

7.3 PRE-RACE SCRUTINISERS/TRANSPONDER CONTROLLER

7.3.1 A Chief Scrutiniser, assisted by at least 1 (one) knowledgeable Assistant and 1 (one) Transponder Controller, must be appointed.

7.3.2 A car may be scrutinised at any time during the event at the discretion of the Race Director or Race Referee. Race distortions or damage must be taken into consideration during these inspections.

7.3.3 The Transponder Controller is responsible for the issuing of transponders to drivers before each race, and ensuring their return after each race.

7.4 RACE REFEREE

7.4.1 The main task of the Race Referee is to observe the racing and, in particular, good sportsmanship during racing. He/she will ensure that everybody adheres to current SARDA Off-Road Rules.

7.4.2 The Race Referee is a non-voting member on the Protest Committee when the Race Director calls a protest meeting.

7.4.3 During all races, the Race Referee must observe the racing from start to finish. He/she takes decisions, issue warnings, penalties or instructions to drivers, as he/she deems necessary according to the rules. He/she may take action after an initial instruction, but, in all cases, a maximum of 3 (three) similar instructions for any type of infringement by the same driver mean an automatic black flag.

7.4.4 Reasons for warnings, penalties or instructions will be announced at the time of issue to the drivers.

7.4.5 POINTS OF OBSERVATION

7.4.5.1 Unsporting behaviour during racing, i.e. impeding the progress of other drivers, deliberate slowing down or waiting for another car, deliberate crashing into another car, and deliberate cutting of corners and reckless driving in general.

7.4.5.2 Unsporting behaviour of drivers and mechanics involved in the racing, including the use of foul language.

7.4.5.3 Cars that do not conform to the regulations during the racing, i.e. loss of the body shell, race damage, etc.

7.4.5.4 Cars that are in a non-driveable or dangerous condition owing to damage or malfunctioning of the car.

7.4.5.5 Starting procedure and issuing penalties for start line infringements.

7.4.5.6 It is not the duty or the responsibility of the Race Referee to check that the cars conform to the technical rules. This is always the responsibility of the Scrutiniser. The Race Referee/Race Director checks the method used for technical inspection.

7.4.6 RACE REFEREES' AUTHORITY

7.4.6.1 The Race Referee issues instructions in the event of any infringements of the points as described under section 7.5.5.1 to 7.5.5.6 and ultimately may even call for the use of the black flag when his/her instructions are not effective.

7.4.6.2 Instructions are announced by the Race Referee himself/herself and he/she keeps a record of the instructions issued (see ANNEXURE D). 3 (three) successive instructions lead to a black flag. Instructions issued by the Race Referee must be observed immediately.

7.4.6.3 Instructions for unsporting behaviour (sections 7.5.5.1 and 7.5.5.2) are announced with the words: "First instruction to car No . . . for bad driving, etc."

7.4.6.4 Instructions for repairs (sections 7.5.5.3 and 7.5.5.4) are announced with the words: "Car No . . . repair body, car, etc."

7.4.6.5 The instructions issued by the Race Referee are indisputable and final and may only be censured by Protest Committee. Under no circumstances may an instruction from the Race Referee lead to the interruption of the whole race.

7.4.7 RACE REFEREE FACILITIES

7.4.7.1 The Race Referee together with the Assistant Race Referee must be allocated a position on the drivers' stand or close to the Time Keeper/AMB Controller, from where all parts of the track and the drivers' stand can be observed.

7.4.7.2 This section must be equipped with 2 (two) chairs and microphone (if not on the drivers' stand). The Race Referee must be able to announce his/her warnings and instructions at any time during the race to the drivers on the stand.

7.5 GRID MARSHAL

7.5.1 The Grid Marshal shall ensure that the cars are positioned on the starting grid by the sound of the "1 (one) minute" signal, in the order that they finished their previous race, e.g., the winner of Race 4, Round 1, starts from grid position 1 in Race 4, Round 2, or as per the official list issued by Race Control. The starting position on the grid for the first round of a SARDA Off-Road National event will

be determined by the relative position of the competitor on the latest SARDA Off-Road National Points Log.

- 7.5.2 The Grid Marshal shall ensure that the starting grid is cleared of people at the sound of the "30 (thirty) second" signal. Any cars not ready to race at this point (including late arrivals) must be placed behind the default line by him/her, from where they will start the race last (see section 3.3.5).
- 7.5.3 The Grid Marshal shall ensure that no TX's are brought within 5 (five) metres of the starting grid.
- 7.5.4 The Grid Marshal shall monitor jump starts and advise any infringement on the starting grid to the Race Referee.
- 7.5.5 The Grid Marshal shall assist the Race Referee and Chief Marshal in monitoring infringements during the course of the race.
- 7.5.6 The Grid Marshal may not issue a penalty, but must report infringements to the Race Referee as soon as possible.
- 7.5.7 The black flag shall be operated by the Grid Marshal, who, on receiving his/her instructions only from the Race Referee, shall turn to face the drivers' stand, raise the black flag and announce the number of the car that has been black flagged.

7.6 CHIEF MARSHAL

- 7.6.1 The Chief Marshal shall ensure that all marshals have reported to him/her before the 1 (one) minute signal for the next race and that all marshals are on their positions before the 30 (thirty) second signal. All marshalling positions must be manned before the start of the next race.
- 7.6.2 Chief Marshal shall be responsible for monitoring the marshalling standards during the course of the race. Any marshalling infringements must be reported to the Race Referee as soon as possible.
- 7.6.3 Chief Marshal shall assist the Race Referee and Grid Marshal in monitoring infringements during the course of the race.
- 7.6.4 Chief Marshal may not issue a penalty, but must report infringements to the Race Referee as soon as possible.

7.7 TIME KEEPER

- 7.7.1 The Time Keeper shall be responsible for sounding the various time signals and shall keep accurate time for each race (6 (six) minutes exactly) when the AMB system is not in use.

7.8 LAP CALLER/LAP RECORDER

- 7.8.1 The Lap Caller/Lap Recorder shall call and record each cars' number clearly every time it crosses the finish line to the Lap Counters and shall record the lapsed time for each car for the "timed lap" (when the AMB system is not in use).

7.9 LAP COUNTERS/AMB CONTROLLER

7.9.1 The Lap Counters shall record the number of laps completed by all cars taking part in the race (when the AMB System is not in use). "Tick Sheets" shall be issued for recording the number of laps completed by all cars and each completed lap shall be clearly marked on the sheet by a number.

7.9.2 AMB Controller is responsible for operating the AMB Lap Scoring System on the computer.

7.10 PUBLIC ADDRESS ANNOUNCER

7.10.1 A Public Address Announcer is required to liaise via a public address (PA) system between the Race Officials and the drivers, and to give a brief commentary during the racing.

7.10.2 Penalties incurred, and the reasons therefore, must be announced over the PA system on the written instruction of the Race Referee/Race Director only.

8. FINAL SCORING

8.1 The racing format and scoring system shall be as described in section 11.1 for SARDA Off Road National events.

9. CAR SPECIFICATION

9.1 DIMENSIONS FOR 2 (TWO) AND 4 (FOUR) WHEEL DRIVE STOCK AND 2 (TWO) AND 4 (FOUR) WHEEL DRIVE MODIFIED CLASSES

Maximum overall length	460 mm
Maximum overall width	250 mm
Maximum height (with suspension fully compressed, excluding aerial)	200 mm
Maximum wing	177 x 76 mm
Maximum wing side dam height	50 mm
Maximum wing side dam length	100 mm
Maximum tyre width	44,5 mm
Maximum tyre	90 mm
Wheel size (Was 55,9mm (2,2")) (maximum bead mounting diameter on wheel)	61 mm (2,4")
Maximum wheel	61,5 mm
Maximum wheel width	38,1 mm

9.1.1 Spiked tyres are allowed, but spikes must be of a pliable material. No metal or hard plastic spikes will be allowed. Foam tyres are not allowed, but internal foam inserts are permitted.

9.1.2 Bead mounting dimensions are measured at the point where the internal tyre bead meets the wheel. An internal locking ring may be used for the purpose of retaining the tyre only. The ring cannot be used to increase the wheel's original size and/or the stiffness of the sidewall.

9.1.3 Measurements of the car are to be taken with the car in full race trim and the car must fit into a box with internal dimensions of

460 (four hundred and sixty) millimetres by 250 (two hundred and fifty) millimetres, without any force being applied.

9.2 DIMENSIONS FOR STADIUM TRUCK STOCK AND MODIFIED CLASSES

Maximum overall length	460 mm
Maximum overall width	330 mm
Maximum overall tyre size (measured at the base of spike)	92 mm
Maximum tyre width	66 mm
Maximum rear spoiler	51 mm

No side dams or wings shall be allowed.

9.2.1 Spiked tyres are allowed, but spikes must be of a pliable material. No metal or hard plastic spikes will be allowed. Foam tyres are not allowed, but internal foam inserts are permitted.

9.2.2 Bead mounting dimensions are measured at the point where the internal tyre bead meets the wheel. An internal locking ring may be used for the purpose of retaining the tyre only. The ring cannot be used to increase the wheel's original size and/or the stiffness of the sidewall.

9.2.3 Measurements of the truck are to be taken with the truck in full race trim and the truck must fit into a box with internal dimensions of 460 (four hundred and sixty) millimetres by 330 (three hundred and thirty) millimetres, without any force being applied.

9.3 SPEED CONTROLLERS

9.3.1 Whilst cars may be fitted with reverse control, no car shall be allowed to reverse during the course of a race. If any car is seen to reverse during a race, that car shall be disqualified from the race immediately (see section 14.1.2.6).

9.3.2 Electronic Traction Control Systems will not be permitted. If any car is found fitted with this type of system, it will be disqualified from the entire event.

9.3.3 2wd & 4wd Stock must run speed controllers that have zero timing or can be run in "blinky"/zero timing mode. Approved list for zero timing speed controllers will be issued by SARDA Off-Road Electric.

9.3.4 Stadium Truck Stock may run speed controllers with boost/timing functions. Approved list for boost/timing speed controllers will be issued by SARDA Off-Road Electric.

9.4 CAR APPEARANCE

9.4.1 The essence of the sport of radio controlled auto racing is competition between realistic models of racing automobiles.

9.4.1.1 All cars must have a 1/10th scale off road body. Pipe type (roll cage) bodies may be utilised. All Stadium Truck

bodies must resemble race type truck or saloon bodies.

- 9.4.1.2 A driver figure of at least head and shoulders must be secured in a proper position on cars using open cockpit bodies and pipe type bodies. The driver figure shall be realistic in appearance, colour and dress. A driver figure is not required in enclosed body cars, but is recommended.
- 9.4.1.3 Openings in the body or cockpit floor other than appropriate to full size cars (scoops, vents etc.), shall be kept to a minimum. Openings for wing mounts, antennas and the battery on/off switch shall provide no more than 5 (five) millimetres clearance, i.e. there must be less than 5 (five) millimetres between the protruding object and the bodywork at the point where the object protrudes through the body. Servos, receivers, speed controllers and servo-savers specifically, are not allowed to protrude through the original body shell. This includes shock absorbers on Stadium Trucks.
- 9.4.1.4 No sharp object may protrude beyond the width of the wheels or length of the car.
- 9.4.1.5 Rollover antennas are not allowed. Antennas must be of a flexible, non-metallic material. All antennas shall have blunt tips so as to minimise the chance of injury to any person.

9.5 BATTERIES

ROAR Rules to be used as guideline.

- 9.5.1 Sub-C sized nickel cadmium (NiCd) and nickel metal hydride batteries (NiMh) & lithium type batteries are approved. The size of the individual cell, rated at 1.2 volts nominal, is 23 (twenty three) millimetres in diameter and 43 (forty three) millimetres in length, plus manufacturing tolerance. Unless a lower number is specified in the class requirements, a maximum of six NiMh, NiCd producing 7.2 (seven point two) volts nominal when wired in series and 2 (two) Lithium type cells producing 7.4 (seven point four) volts is permitted in any vehicle motor used in competition. **If Lithium batteries are used they must be on the approved SARDA Off-Road Electric Equipment List and users must adhere to general information and safety rules in Annexure H.** Batteries may not be replaced, nor may they be charged, by external means, during a race. It is the drivers' responsibility to prove the legality of his/her cells when called upon to do so.

9.6 RADIO FREQUENCIES

- 9.6.1 All radio equipment shall, as far as possible, conform to applicable Telkom regulations, specifically the Government Notice, Department of Posts and Telecommunications, Act No. 103 of 1996. The current

allocated frequencies are (measured in MHz):

26.995; 27.045; 27.095; 27.145; 27.195;
53.100; 53.200; 53.300; 53.400; 53.500;
53.600; 53.700; 53.800; 53.900; 54.450;
54.550; 54.650.

Above-mentioned frequencies are the only approved frequencies by ICASA and all other frequencies are used at own risk.

- 9.6.2 In the instance of a frequency clash, the slower qualifier must change frequency or forfeit the race, e.g., if Driver A, on a given frequency, has qualified for a main event and Driver D, on the same frequency, has also qualified for the same mains, but with a faster time, then Driver D has first choice of frequency. Driver A would then have to change to another frequency. If Driver A does not change frequency, then he shall be disqualified from that main event (see section 14.1.2.7).
- 9.6.3 It is NOT the responsibility of the host club or SARDA Off-Road to supply crystals.
- 9.6.4 At no time shall 2 (two) transmitters, with a transmitting frequency closer than 20 (twenty) kHz be allowed to be used during one race.
- 9.6.5 Drivers must race with the declared frequency, as per his/her entry form or confirmation. If his/her frequency is found to be incorrect, immediate disqualification from that race will result (see section 14.1.2.8)

9.7 TRANSMITTERS

- 9.7.1 Control of the car is limited to 1 (one) channel for steering and 1 (one) channel for throttle/brakes.

9.8 "SPEC" TIRES

- 9.8.1 "Spec" tires will be used for 2WD Stock, 2WD Mod, 4WD Stock and 4WD Mod classes at national events in 2017. More information will be communicated to the members in due course in the stage report for each event.

10. CLASSES AND MODIFICATIONS

- 10.1 Modifications to a car are allowed provided they fall within the framework of these rules, with the exception of motor modifications that are specified under the motor rules.

10.2 TWO WHEEL DRIVE STOCK CLASS

- 10.2.1 Only 2 (two) wheel drive cars, driven by the rear wheels, are allowed.

10.2.2 MOTORS

ROAR Rules to be used as guideline. Binary motors are allowed.

Motors must be a 27 (twenty seven)-turn wind using 22 (twenty two) gauge wire. The armature must have a tag of 27 (twenty seven)-turn spec as per ROAR specification and 24 (twenty four) degree timing. {It is illegal to use a motor that has lost its armature identification tag.} A production tolerance of one turn on one pole is allowed. Only '.05' sized motors may be used. Overall dimensions of the motor are 36.02 (thirty six point zero two) millimetres in diameter and 53 (fifty three) millimetres in length, excluding bushing housing and shaft. Maximum armature stack length is 22.6 (twenty two point six) millimetres and maximum stack diameter is 23.2 (twenty three point two) millimetres. A manufacturing tolerance will be allowed on all dimensions. No modifications are allowed, such as re-timing, re-balancing, epoxying. Re-magnetising is allowed. Replacing bushes with bearings is allowed.

10.2.2.1 Should a driver be found using a motor in Stock class that does not conform to the above rules and specifications, then he/she will be disqualified from the entire event. (See section 14.1.3.2)

10.2.2.2 SEALED MOTORS

All sealed motors must have the same specification as above. The motor may not be opened or have the tabs tampered with. All sealed motors must bear the ROAR Stamp plus last two digits of year on the front face of the can. Brushes may be replaced.

10.2.2.3 Brushless motors and their speed controls are permitted, for stock racing. Brushless motors must comply with ROAR specifications and must be ROAR approved. Only sensed type motors are allowed for stock.

10.2.2.3.1 CAN

Overall maximum diameter is 36.02 (thirty six point zero two) mm measured at whatever point yields the maximum dimension, excluding solder tabs or lead wires. Overall minimum diameter 34.00 (thirty four point zero) mm measured at whatever point yields the minimum dimension, excluding solder tabs or lead wires. Maximum length is 53.00 (fifty three point zero) mm measured from the mounting face of the motor to the furthest most point of the end bell, not including solder tabs, lead wires or original manufacturer's logo or name. Minimum length is 50.00 (fifty point zero) mm measured from the mounting face of the motor to the furthest most point of the end bell, not including solder tabs, leadwires or original manufacturer's logo or name. Motor mounting holes must be on 1.00 (one point zero) inch (25.40 (twenty five point

four zero) mm) centres.

10.2.2.3.2 **STACK/STATOR**

FOR STOCK BRUSHLESS MOTORS

The stator construction must be continuous laminations having the same overall shape, 1 (one) after the other without anything in between. The laminations must be of 1 (one) homogeneous material without cut outs, holes or hollow sections other than for the 3 (three) slots for the round copper coil wires and the 3 (three) slots for the screws used to hold the entire can together. The overall stator length parallel to the motor shaft shall be minimum 19.3 (nineteen point three) mm and maximum

21.0 (twenty one point zero) mm. The thickness of the laminations shall be 0.35 (zero point three five) +/- 0.05 (zero point zero five) mm. A 'go-no-go' gauge

14.500 (fourteen point five zero, zero) +0.000 (zero point zero) /-0.005 (zero point zero, zero five) mm diameter shall pass into the stator, clearing the stator plus its windings and the electrical collection ring at the end of the stator.

10.2.2.3.3 **WINDING**

STOCK MOTORS

Only 3 (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 3 (three) slotted stators must be wound with

17.5 (seventeen point five) turns of 2 (two) strands of 20 (twenty) AWG or 2 (two) strands of 0.80 (zero point eight zero) mm IEC per slot. The inductance for each slot of the stator shall be 102.00 (one hundred and two point zero) Micro Henries minimum and 108.00 (one hundred and eight point zero) Micro Henries maximum, measured with the rotor removed from the motor.

10.2.2.3.4 **ROTOR**

STOCK MOTORS

External shaft diameter must be 0.125 (zero point one two five) inches (3.175 (three point one seven five) mm). Only 1 (one) piece, 2 (two) pole Neodymium sintered or bonded, or Ferrite (Ceramic) magnetic rotors are

permitted. The magnet length shall be 25.0 (twenty five point zero) +/- 1.00 (one point zero) mm not including any non-magnetic balancing material. The magnet outside diameter shall be a minimum/maximum of 12.2 (twelve point two) - 12.51 (twelve point five one) mm, no tolerances, for the entire length of the magnet. The shaft outside diameter, where the magnet is mounted, shall be 7.25 (seven point two five) +/-0.150 (zero point one five zero) mm. This dimension must be measurable without destroying the rotor. All motors must have the original manufacturer's logo or name moulded 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.

10.2.3 SPEED CONTROLLERS: Specifications as per section 9.3.3 above.

10.2.4 BATTERIES: Specifications as per section 9.5 above.

10.3 TWO WHEEL DRIVE MODIFIED CLASS

10.3.1 Only 2 (two) wheel drive cars, driven by the rear wheels, are allowed.

10.3.2 MOTORS

10.3.2.1. Any electric brushed motors manufactured for model racing cars may be used, with ceramic magnets only (cobalt and rare earth magnets are specifically not permitted).

10.3.2.2 Brushless motors and their speed controls are permitted for modified racing. Brushless motors must comply with ROAR specifications and must be ROAR approved. sensorless or sensorless motors are allowed in modified motor classes.

10.3.2.2.1 CAN

Overall maximum diameter is 36.02 (thirty six point zero two) mm measured at whatever point yields the maximum dimension, excluding solder tabs or lead wires. Overall minimum diameter is 34.00 (thirty four point zero) mm measured at whatever point yields the minimum dimension, excluding solder tabs or lead wires. Maximum length is 53.00 (fifty three point zero) mm measured from the mounting face of the motor to the furthest most point of the end bell, not including solder tabs, lead wires or original manufacturer's logo or name. Minimum

length is 50.00 (fifty point zero) mm 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 1.00 (one point zero) - inch (25.40 (twenty five point four zero) mm) centres.

10.3.2.2.2 **STACK/STATOR**

MODIFIED BRUSHLESS MOTORS

Stack minimum length 19.30 (nineteen point three zero) mm, maximum 21.00 (twenty one point zero) mm. Stack inside diameter minimum 12.50 (twelve point five zero) mm, maximum 16.00 (sixteen point zero) mm. If a continuous stack is used then the laminations have to be adjacent to one another without any insertions. The thickness of the stack plates is 0.35 (zero point three five) +/-0.05 (zero point zero five) mm. All laminations must be of the same material.

10.3.2.2.3 **WINDING**

MODIFIED BRUSHLESS MOTORS

Only 3 (three) slot (phase) "Y" wound stators are permitted. No delta wound stators allowed. Only circular (round) pure copper wire permitted. No turn limit.

10.3.2.2.4 **ROTOR**

MODIFIED MOTOR

Shaft diameter must be 0.125 (zero point one two five) inches (3.175 (three point one seven five) mm). Only 1 (one) piece, 2 (two) pole Neodymium or Ferrite magnetic rotors are permitted. Magnet minimum length 23.00 (twenty three point zero) mm, maximum 27.00 (twenty seven point zero) mm. Magnet minimum diameter 12.00 (twelve point zero) mm, maximum 15.50 (fifteen point five zero) mm mounted, shall be 7.25 (seven point two five) ± 0.150 (zero point one five zero) mm. This dimension must be measurable without destroying the rotor. All motors must have the original manufacturer's logo or name moulded into the end bell.

10.3.3 **BATTERIES:** Specifications as per section 9.5 above.

10.4 **STADIUM TRUCK STOCK CLASS**

10.4.1 Only 2 (two) wheel drive trucks, driven by the rear wheel, are

allowed.

10.4.2 MOTORS: As for Stock class (see section 10.2.2 above).

10.4.3 SPEED CONTROLLERS: Specifications as per section 9.3.4 above.

10.4.4 BATTERIES: Specifications as per section 9.5 above.

10.5 STADIUM TRUCK MODIFIED CLASS

The Stadium Truck Modified Class is no longer being run as an official class. The rules for this class are being left in this document as a reference.

10.5.1 Only 2 (two) wheel drive trucks, driven by the rear wheel, are allowed.

10.5.2 MOTORS: As for Modified class (see section 10.3.2. above).

10.5.3 BATTERIES: Specifications as per section 9.5 above.

10.6 FOUR WHEEL DRIVE STOCK CLASS

10.6.1 Only 4 (four) wheel drive cars are allowed.

10.6.2 MOTORS: As for Stock class (see section 10.2.2 above).

10.4.5 SPEED CONTROLLERS: Specifications as per section 9.3.3 above.

10.6.3 BATTERIES: Specifications as per section 9.5 above.

10.7 FOUR WHEEL DRIVE MODIFIED CLASS

10.7.1 Only 4 (four) wheel drive cars are allowed.

10.7.2 MOTORS: As for Modified class (see section 10.3.2 above).

10.7.3 BATTERIES: Specifications as per section 9.5 above.

10.8 SHORT COURSE TRUCK (SCT 2WD)

10.8.1 Only 2 (two) wheel drive trucks, driven by the rear wheel, are allowed.

10.8.2 MOTORS: 19 turn brushed motors that comply with ROAR specifications and are ROAR approved may be used. 13.5 turn brushless motors and their speed controls are permitted. Brushless motors must comply with ROAR specifications and must be ROAR approved.

10.8.3 BATTERIES: Specifications as per section 9.5 above.

10.9 SHORT COURSE TRUCK (SCT 4WD)

10.9.1 Only 4 (four) wheel drive trucks, driven by all four wheels, are allowed.

10.9.2 MOTORS: One 550 size motor will be allowed. Brushless motors must comply with ROAR specifications and must be ROAR approved.

10.9.3 BATTERIES: Specifications as per section 9.5 above.

11. SARDA OFF ROAD NATIONAL EVENTS

11.1 RACING FORMAT

The following format will apply to all SARDA Off-Road National events. There will always be one (1) throw away during one National calendar. In the event of only one event being run during one National calendar then there will be no throw away score. These events will be run over two (2) consecutive days, usually a Saturday and Sunday.

11.1.1 CLASSES

The following 8 (eight) classes will be run at any SARDA sanctioned event providing there is a minimum entry of (5) five cars within the class, namely:

Two Wheel Drive Stock
Two Wheel Drive Stadium Truck Stock Four
Wheel Drive Stock
Two Wheel Drive Modified
Four Wheel Drive Modified
Short Course Truck (SCT 2WD) Short
Course Truck (SCT 4WD)

11.1.2 QUALIFYING ROUNDS

Except for the provisions as detailed in section 11.2 (Inclement Weather Rule), a maximum of 3 (three) Qualifying Rounds shall be run in each class before the Mains are run. An entire round in all classes must be completed before the next round can be started. Only the best result from the completed rounds will be recorded. Qualifying rounds shall be raced with 8 (eight) cars where possible. Squadding may well result in a race comprising less than 8 (eight) cars or to a maximum of 10 (ten) cars.

Qualifying will be staggered starts. For the first qualifying round, a person's position in the current championship table (log points) will determine the starting position, or with the first event, the previous year finishing. For the second qualifying round, the drivers starting position will be determined by the drivers previous heat result.

At least one lap, in any of the three rounds must be completed to qualify for points.

11.1.3 MAINS

A maximum of 3 (three) Mains rounds shall be run in each class and the best 2 (two) round system will count. An entire round must be completed before the next round can be started. The drivers will be ranked according to their qualifying round results.

The 10 (ten) drivers with the best qualifying results will comprise the A-Main.

The next best 10 (ten) drivers will comprise the B-Main and so on.

If it happens that only one (1) or two (2) drivers qualify for a lower Main, then the 10th and 9th qualifier of the Main immediately above the Main with only one (1) or two (2) drivers shall move down to ensure that there are at least three (3) drivers in the lower Main.

If the scoring system software allows it, and all of the drivers concerned UNANIMOUSLY agree, more than ten drivers can be allowed in a given Main and the one (1) or two (2) drivers can then move up to the higher Main, which shall comprise a maximum of 12 drivers.

If there are more than 150 entries, the committee will decide whether the A-Mains will run three (3) main rounds and the rest one (1) or whether all the Mains will run three (3) rounds.

At least one lap, in any of the three rounds, must be completed to qualify for points.

11.1.4 SCORING

11.1.4.1 QUALIFYING ROUNDS

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

Fastest driver in each round will score:	0 points
2 nd fastest driver will score:	2 points
3 rd fastest driver will score:	3 points
4 th fastest driver will score:	4 points

and so on, scoring one point more for each driver down to the last qualifying position. If a driver does not start a heat, he receives no points (**Attention no points is not zero points**)

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

The normal qualifying will be best two (2) rounds out of three (3) rounds to count. If only two (2) rounds are completed, the fastest single result will count. If only one (1) round is completed, that round will count.

The winner of each class is the Top Qualifier and SARDA Off-Road National Log Points will be awarded for qualifying rounds as follows:

Qualifying Position	Points
Top Qualifier	50
2 nd	49
3 rd	48
4 th	47

... and so on, down to the 50th qualifying position in the class, who will receive 1 (one) point. Drivers qualifying lower than 50th will be awarded 1 (one) point.

11.1.4.2 MAINS

A driver's best 2 rounds (positions) will be used to determine his/her final finishing position for the Mains. Ties will be resolved by consideration of the best times. Mains are run to decide the champions for that National event in each class, as well as the trophy winners for all Mains.

SARDA Off-Road National Log Points are scored from the results of the Mains of each class as follows:

Position	Points
1 st A-Mains	50
2 nd A-Mains	49
3 rd A-Mains	48
4 th A-Mains	47
5 th A-Mains	46
6 th A-Mains	45
7 th A-Mains	44
8 th A-Mains	43
9 th A-Mains	42
10 th A-Mains	41
1 st B-Mains	40
2 nd B-Mains	39

... and so on, down to 10th in the E-Mains of that class, who will receive 1 (one) point. Drivers finishing lower than 10th in the E-Mains will be awarded 1 (one) point.

11.1.4.2.1 The points for the event awarded to a driver in a class shall be added to the SARDA Off-Road National Points Log for the current year.

11.1.5 PRIZES

Awards are given for the following categories:

11.1.5.1 CONCOURS D'ELEGANCE

All cars entered for Concourse judging shall be judged in an open class and a trophy will be awarded to the best presented car of the event.

11.1.5.2 QUALIFYING ROUNDS

The Top Qualifier in each class.

11.1.5.3 MAINS

First, second and third places in each Mains (subject to section 11.1.3).

11.2 INCLEMENT WEATHER RULE

11.2.1 An event is only cancelled or postponed owing to inclement weather once so determined by the SARDA Off-Road Race Director.

11.2.2 If it is not possible to race at all on either of the days scheduled for the event, or if it is not possible to complete at least 1 (one) round in its entirety, then the event shall be cancelled.

11.2.3 If it is only possible to complete 1 (one) Qualifying round in all classes prior to the event being cancelled on the above dates, then the results of this single round shall be deemed to be the final result of the event and points will be awarded in accordance with the provisions of section 11.2.8 below.

11.2.4 Should the event be cancelled after completion of the first or second round of Qualifying, then a driver's single best result from the Qualifying rounds completed up to the point of cancellation shall be the final result of the event and points will be awarded in accordance with the provision of section 11.2.8 below. In order for the result of any round to be taken into consideration in determining the best single result for any individual class, it is essential that all races in any given Qualifying round for that particular class must be completed in their entirety.

11.2.5 A minimum of 2 (two) Qualifying rounds must be completed in their entirety before Mains can be run. The decision to abort the third round of Qualifying (because of the effects of inclement weather) and to run the Mains instead, shall be to the sole decision of the SARDA Off-Road Race Director.

11.2.6 In the event that it is necessary to abandon racing during the running of the Mains, then the results achieved in any individual Main completed up to the point of abandonment shall stand and points shall be awarded in accordance with the provisions of section 11.2.8 below.

11.2.7 In the event that it is not possible to run any races in the Mains, or if it is necessary to abandon the Mains, then qualifying points awarded for any uncompleted Mains shall be awarded.

11.2.8 The points earned from the results of the Mains in each class shall be added to the SARDA Off-Road National Points Log.

11.3 RACE RESULTS

11.3.1 The results of a race will be posted on the Notice Boards within 15 (fifteen) minutes of that race having been run. The results sheet shall be clearly marked to show the time at which it was posted.

11.3.1 It is the responsibility of the host club to ensure that a comprehensive set of results (including the "A-Mains Qualifier Data

Sheets" - see ANNEXURE E) reach the SARDA Off-Road Committee within 10 (ten) days of the event.

11.4 OFFICIAL PRACTICE

- 11.4.1 The track shall be open to all entrants for official practice all day on the Sunday prior to the event, as well as from 08h00 the Friday morning to the Friday afternoon (Closing Time as per Stage Report from Host Club) before the event. The Closing time for practice on the Friday afternoon before the event will be determined by the Host Club and will be stated in the Stage Report to be submitted to SARDA Off-Road Electric four weeks before the event.
- 11.4.2 Entrants found practising outside these specified times, will be disqualified from the event (see section 14.1.3.4). Closure to practice prior to official practice, is at the discretion of the host club chairman.
- 11.4.3 Entrants who are unable to attend any of the official practice sessions, will only be allowed to practice for half an hour before Registration on the first day of the event if they have indicated their intentions on the official entry form. Only 10 (ten) entrants may make use of this practice session, and any other entrant found practicing during this allotted time, will be disqualified from the event (see section 14.1.3.5).
- 11.4.4 The host club shall not be allowed to incorporate any amendments, additions or alterations to a track layout once official practice has been completed. The track may be re- surfaced if, in so doing, it will only lead to minor surface changes.

11.5 TRACK MAINTENANCE

- 11.5.1 Track maintenance may only be carried out at the discretion of the chairman of the host club, with the approval of the SARDA Off-Road Race Director. If any maintenance is undertaken, this may only be carried out between completed rounds.
- 11.5.2 In the event that such maintenance includes watering the track surface, or if a decision is taken to wet the track surface, then this must be consistently carried out between every race, throughout an entire round, in an endeavour to maintain a consistent racing surface.

12. PROTEST RULES

12.1 PROTEST COMMITTEE

- 12.1.1 Before the start of an event the Race Director will appoint a Protest Committee. This Committee will consist of 5 (five) representatives from different clubs and the Race Director as Chairman. The Race Referee will be present in an advisory capacity only. The Committee may consult with any other Official it deems necessary.
- 12.1.2 It will be their function to rule on any written protest received by the Race Referee.
- 12.1.3 Only drivers participating in the race in question may enter a

protest.

12.1.4 A protest may only be lodged for the following reasons:

12.1.4.1 The organisers acting against the rules.

12.1.4.2 The Officials acting against the rules.

12.1.4.3 Results deemed to be incorrect, only if proof can be presented showing the result to be wrong.

12.1.4.4 Other competitors acting contrary to the rules, to the disadvantage of the driver lodging the protest.

12.1.5 The Protest committee can upon a successful protest direct a re- run of the race or impose a post-race time penalty, disqualification from race or event against other competitors and/or competitors acting contrary to the rules to the disadvantage of the driver who lodged a successful protest (see section 7.5.6.5).

12.1.6 It may be the Protest Committee's duty to impose penalties for unsporting behavior, verbal abuse and/or general misbehavior not covered by PENALTIES in section 13.

12.2 LODGING A PROTEST

12.2.1 A protest must be submitted within 25 (twenty five) minutes after the results of the race under protest have been posted on the Notice Board.

12.2.2 A protest must be submitted to the Race Director on a fully completed SARDA Off-Road Protest Form (see ANNEXURE F). Should a protest form be incomplete, the Protest Committee may use its discretion whether or not to hear the protest.

12.2.3 A protest must be accompanied by R200.00 (two hundred Rand), which will be refunded if the protest is upheld. Should a protest not be upheld, the protest fee will be paid to SARDA Off-Road.

In the event that a motor is stripped (to check the number of windings, gauge of wire, or to ascertain whether or not it has been tampered with), a motor of the same make and type will be paid for by SARDA Off Road if the motor is found to be legal. If not, no compensation will be paid.

13. PENALTIES

13.1 INFRINGEMENTS

The following penalties may be called by any Race Official, but may only be implemented by the Race Referee and announced by the Public Address Announcer:

13.1.1 START

If, during starting procedure 4.4.6.1, the front wheels of a car move over its grid line after the start of the 10 (ten) second countdown, but before the start signal is given, a 10 (ten) second

penalty will be imposed.

13.1.2 JUMP-START

If the front wheels of a car cross the jump-start line (1 (one) metre ahead of its starting grid line), after the start of the 10 (ten) second countdown, but before the start signal is given, then a 1 (one) lap penalty will be given.

13.1.3 DIFFICULTIES

Any car experiencing difficulties after the sounding of the 30 (thirty) second signal, will automatically be moved to the back of the grid, placed behind the default line and will only be allowed to start after the last car has left its starting grid.

13.1.4 CORNER CUTS

The first infringement will be given a "stop/go" penalty. A second corner cut infringement by the same car in the same race will be given a 1 (one) lap penalty. A third corner cut infringement by the same car in the same race, will result in immediate disqualification from that race. If a driver is guilty of a corner cut infringement, but he/she turns the car around immediately and re-rounds the entire corner without impeding the progress of other cars in the race, such penalties will not be incurred.

13.1.5 BAD DRIVING

The first bad driving offence by a driver in a race will receive a "stop/go", penalty. A second bad-driving offence by the same driver in the same race will receive a 1 (one) lap penalty. The third bad driving offence by the same driver in the same race will be black-flagged.

13.1.6 MECHANICS

A person acting as a mechanic for a driver is subject to the same rules and guidelines as the driver on whose behalf he/she is acting. If a person acting as a mechanic should infringe a rule, the appropriate penalty will be applied to the driver for whom he/she is acting. Additionally, the person acting as a mechanic may be penalised in his/her individual capacity.

13.1.7 MARSHALLING

Marshals shall report to the Chief Marshal before taking up their allotted marshalling positions. Failure to report to the Chief Marshal before the 1 (one) minute signal, or failure to be present at the marshalling position by the 30 (thirty) second signal, will result in a 10 (ten) second penalty to be deducted from that driver's last Qualifying or Mains laps scored. This applies at any time during the event - even if a competitor has raced his/her last race of the day, he/she must marshal before departing. Inattentive marshalling or repairing of other driver's cars on the track will result in a 10 (ten) second penalty, to be added to that driver's last Qualifying or Mains time scored.

13.2 POST-RACE PADDOCK

Any car that does not enter or leaves the post-race paddock before the "all clear" signal is given, shall incur a penalty of 10 (ten) seconds which will be added to that driver's time scored for that race.

13.3 "STOP/GO" PENALTY

When a driver incurs a "stop/go" penalty, he/she must immediately proceed to the holding area on the track where an Official will be waiting to mete out these penalties. The driver must stop his/her car completely and remain stationary until instructed to proceed. Any driver failing to pull off for his/her "stop/go" penalty within 2 (two) laps of incurring the penalty will be disqualified from that race.

13.4 TIME PENALTY

When a driver receives a time penalty (10 (ten) seconds), the time penalty is added to the first lap, then the lap times are added until the total exceeds the race length (5 (five) minutes). The new time is the number of laps completed and the resulting total time. In some cases, the penalised time will be shorter than the overall time, but one lap less than the original time.

13.5 LAP PENALTY

When a driver receives a lap penalty (1 (one) lap), a lap is deducted from the total number of laps scored in his/her last Qualifying or Mains race.

14. DISQUALIFICATION

14.1 Infractions that will result in immediate disqualification are:

14.1.1 DISQUALIFICATION FROM CONCOURSE RESULTS

14.1.1.1 Any car entered for Concours d'Elegance that does not compete in at least the first round of the event as presented for Concourse judging, will be disqualified from the Concours d'Elegance results (see section 4.1.2).

14.1.2 DISQUALIFICATION FROM A RACE

14.1.2.1 Any car not presented for pre-race scrutinising before the start of the first race of a round or during the preceding races, but before the signalling of the all clear signal of the preceding race wherein the particular car shall race (see section 4.4.1).

14.1.2.2 Any car entered for the first race of a round that is not presented at least 3 (three) minutes before the start of that race (see section 4.4.1.1).

14.1.2.3 Any driver leaving the drivers' stand before the "all clear" signal has been sounded for his/her race (see section 4.4.5).

14.1.2.4 Any driver who does not pull off into the holding area within 2 (two) laps of being black-flagged by the Race Referee (see section 4.4.8).

- 14.1.2.5 Any car seen to reverse during the course of a race (see section 9.3).
- 14.1.2.6 Any car found driving in the opposite direction before the "all clear" signal has been sounded.
- 14.1.2.7 In the event of a frequency clash, failure by the lower ranked driver to change frequency in a Main event (see section 9.6.2).
- 14.1.2.8 Any driver found to be using a frequency other than the declared frequency (see section 9.6.5).
- 14.1.2.9 After the third corner cut infringement in a race (see section 13.1.4).
- 14.1.2.10 Any driver who fails to pull off into the holding area for his/her "stop/go" penalty within 2 (two) laps of incurring the penalty (see section 13.3).
- 14.1.2.11 Any driver removing a TX from the driver's stand, if the "World's box" system is used.
- 14.1.2.12 Any driver found in possession of a TX for any reason other than being used in the current race, if the "World's box" system is used.

14.1.3 DISQUALIFICATION FROM THE EVENT

- 14.1.3.1 Any driver found in possession of an electronic traction control system (see section 9.3.2).
- 14.1.3.2 Any driver found in possession of an illegal stock motor (see sections 10.2.2 and 12.2.4).
- 14.1.3.3 Any driver found in possession of an illegal modified motor (see section 10.3.2).
- 14.1.3.4 Any driver found practicing outside official practice sessions (see section 11.4.1).
- 14.1.3.5 Any driver found practicing in the half-hour practice session before Registration, who has not booked 1 (one) of the 10 (ten) available slots (see section 11.4.2).

14.2 Furthermore, the SARDA Committee may exercise their authority at any time to disqualify any competitor from a race or the event, who continually demonstrates blatant disregard for the SARDA Off-Road Rules. Further unsporting behaviour by that competitor, which could bring the sport of radio controlled model racing into disrepute, will result in the withdrawal of current membership to SARDA Off Road and future membership to the Association being barred to that competitor.

15. FEES

15.1 AFFILIATION FEE

The club affiliation fee to SARDA Off-Road Electric shall be R500.00 (five hundred Rand) per club per annum (or part thereof).

15.2 FULL MEMBERSHIP FEE

The annual SARDA Off-Road Electric membership fee shall be R150.00 (one hundred and fifty Rand) per person per annum.

15.3 TEMPORARY MEMBERSHIP FEE

The temporary SARDA Off-Road Electric membership fee shall be R75.00 (seventy five Rand) per person, if that person wishes to only enter 1 (one) SARDA Off-Road National event during a SARDA Off Road Championship Series.

15.4 ENTRY FEE FOR SARDA OFF ROAD NATIONAL EVENTS

The following fees apply to all SARDA Off-Road sanctioned events, unless otherwise determined by SARDA Off-Road:

15.4.1 ENTRY FEE

The entry fee shall be R150.00 (one hundred and fifty rand) for the first class and **R100.00 (one hundred rand)** for each class there after, made payable to SARDA Off-Road.

15.4.2 SARDA OFF ROAD LEVY

A levy of R80.00 (eighty rand) for the first class entry fee received and R60.00 (sixty rand) for each class entry fee there after will be deducted and retained by SARDA Off-Road from entry fees received. SARDA Off-Road Electric will then pay the balance of R65.00 (sixty five Rand) for the first class and R35.00 (thirty five rand) for each class there after to the host club within 10 (ten) days of the event. This levy is not the responsibility of the entrants. R5.00 (five rand) per entry will be ere marked for the website.

15.4.3 LATE ENTRY FEE

A late entry fee of R175.00 (one hundred and seventy five rand) per entry will be payable by entrants if their entries are post marked later than the closing date for entries, up to the "ABF" date. This fee must again be made payable to SARDA Off-Road. A levy of R80.00 (eighty rand) will be retained by SARDA Off- Road from late entry fees received. SARDA Off-Road will then pay the balance of R90.00 (ninety rand) to the host club within 10 (ten) days of the event. R5.00 (five rand) per entry will be ere marked for the website.

16. SARDA OFF ROAD CHAMPIONSHIP SERIES

16.1 FORMAT

16.1.1 In the event that more than 4 (four) applications are received from clubs to host SARDA Off-Road Championship events during any one year, then the SARDA Off-Road Committee shall be empowered to decide which clubs shall be granted permission to host such events. Clubs, whose applications are not successful in one year, will be given preference in the following year.

16.2 SCORING

- 16.2.1 The final SARDA Off-Road Championship Series will comprise of the best 3 (three) out of the 4 (four) events Log Points accumulated in each class.
- 16.2.2 The SARDA Off-Road National Champion in each class will be the driver with the highest total score according to section 16.2.1 above.
- 16.2.3 If two drivers end on the same Log Points the driver with the most full points (100 points for an event) will be the SARDA Off-Road National Champion in the class.

16.3 PRIZES

16.3.1 Prizes are awarded for the SARDA Off-Road National Championship portion at the last event as per section 16.3.2.1 below.

16.3.2 With regard to the SARDA Off Road National Championship result, prizes will be awarded as follows:

16.3.2.1 At the discretion of the SARDA Off Road Committee, trophies, to the maximum of 10 (ten) places in each class, shall be awarded on a percentage basis, i.e. 25% (twenty five percent) of the total entrants that have raced in a minimum of 2 (two) or more SARDA Off Road National events during the series in a class (as per section 16.2.1 above).

16.3.2.2 8 (eight) floating trophies, 1 (one) each for 2 (two) Wheel Drive Stock, Stadium Truck Stock, 4 (four) Wheel Drive Stock, 2 (two) Wheel Drive Modified, Stadium Truck Modified, 4 (four) Wheel Drive Modified, 2WD SCT & 4WD SCT, are awarded to the respective SARDA Off Road National Points Log leaders after each SARDA Off Road National event

16.3.2.3 The trophies, named after their donors, are:

ISHERWOOD (Two Wheel Drive Stock);

ANITA MUNSLOW MEMORIAL (Stadium Truck Stock);

DENKIT HOBBIES (Four Wheel Drive Stock);

B&B IMPORTERS (Two Wheel Drive Modified);

DENKIT HOBBIES (Stadium Truck Modified);

HI-TECH HOBBIES (Four Wheel Drive Modified); Short Course Truck (SCT 2WD)

Short Course Truck (SCT 4WD)

16.3.3 In the event of a tie for the class-floating trophy for the first meeting of the year, the highest qualifier shall be presented with the trophy, unless the current champion is involved in the tie, whereupon he/she shall retain the trophy. For all other meetings, the

holder must be beaten for the trophy to change hands.

17. SELECTION OF NATIONAL REPRESENTATIVES

- 17.1 SARDA Off-Road Committee shall choose national representatives from current paid-up members at the time of selection.
- 17.2 Selection will be on merit as reflected in the final positions for the applicable class on the previous year's SARDA Off-Road National Points Log, at the discretion of the Selection Committee.
- 17.3 The Selection Committee's decision shall be final and binding. No correspondence shall be entered into.

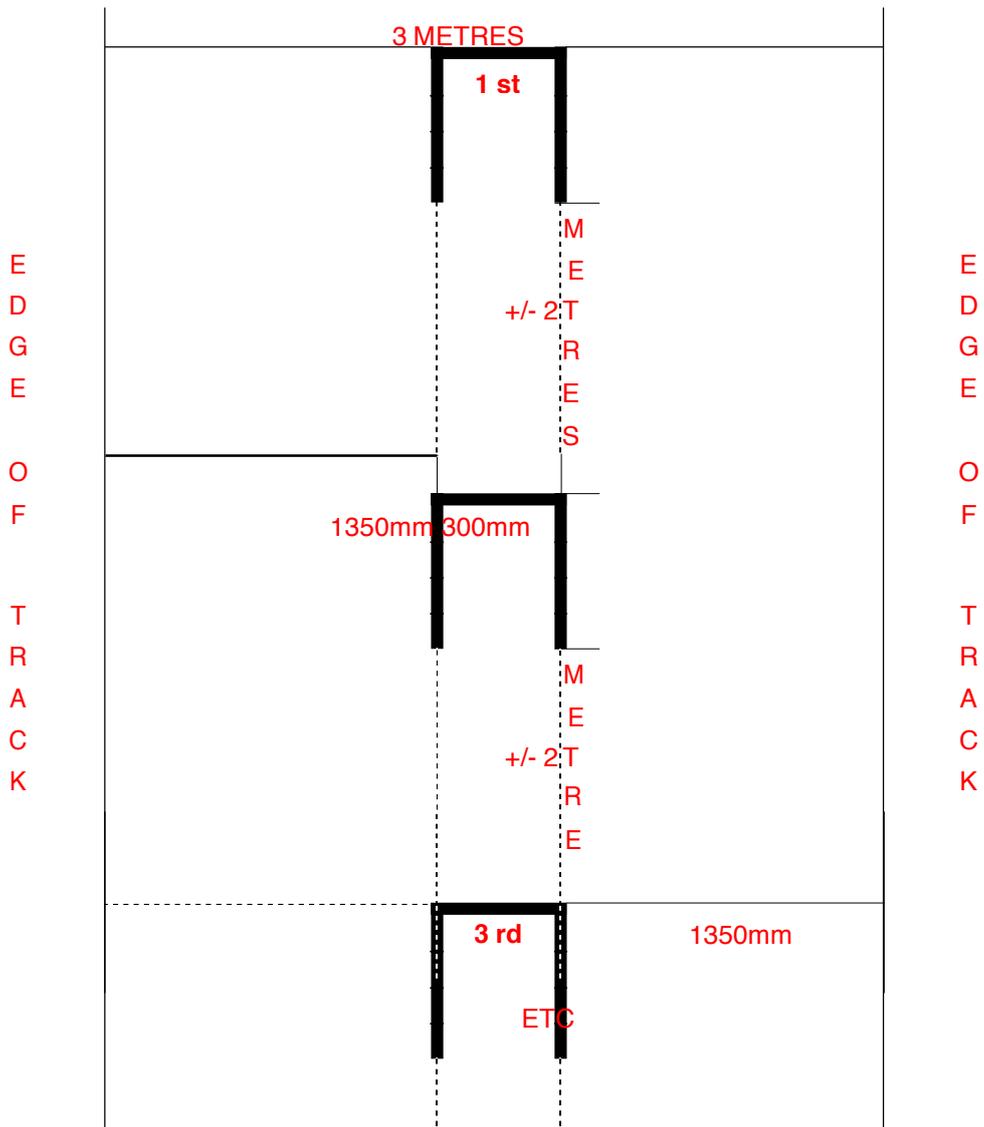
18 RULE CHANGES

- 18.1 Amendments and additions to the Rules and Guidelines may be decided upon at **any time by a quorum of the SARDA Off-Road Committee – such quorum must include the duly elected SARDA Off-Road Race Director.** Such amendments and additions shall become effective immediately upon notification in an official SARDA Off-Road publication.
- 18.2 By a majority (2/3rd) vote at a rules meeting, the rule change may come into effect from that meeting.
- 18.3 A rules meeting may be called at any National event or special general meeting if the need arises.
- 18.4 The scheduled rules meeting will be on the Saturday of the last Nationals of the year.

ANNEXURE A



LAYOUT FOR STAGGERED STARTING GRID



ANNEXURE B



CONCOURS D'ELEGANCE SCORE SHEET

NAME OF EVENT:.....		DATE:.....	
Categories evaluated when scoring:			
• BODY CONSTRUCTION	-	hand-made/commercial; doors; windows; lights; exhausts; other accessories	
• EXTERIOR FINISH	-	paintwork; colors; degree of originality; detail quality; overall quality of workmanship	
• COCKPIT DETAIL	-	driver detail; instrumentation; seatbelts; accessories	
• CHASSIS DETAIL	-	home-built/commercial; quality of finish; neatness of installation; polished and buffed; wheel detail.	
• AUTHENTICITY	-	as per original; true reflection	
• OVERALL DETAIL	-	overall workmanship; cleanliness; general impression	
EACH CATEGORY IS SCORED OUT OF 10 POINTS			
DRIVER			
MAKE			
CLASS			
CAR NUMBER			
1. BODY CONSTRUCTION			
2. EXTERIOR FINISH			
3. COCKPIT DETAIL			
4. CHASSIS DETAIL			
5. AUTHENTICITY			
6. OVERALL DETAIL			
TOTAL (OUT OF 60)			

REMARKS:

.....

.....

ANNEXURE C



RULES AND GUIDELINES FOR MARSHALLING

1. Marshals are to report to the Chief Marshal prior to the sounding of the 1 (one) minute signal ... otherwise, a 1 (one) lap penalty, deducted from their last race, results!
2. Marshals are to be at their marshalling position by the 30 (thirty) second signal otherwise, a 1 (one) lap penalty, deducted from their last race, results!
3. Marshals must arrive in their positions with both hands free, i.e. NOT carrying or holding anything whatsoever.
4. Marshals must face the track and visually monitor their allotted sector of the track at all times.
5. Marshals must re-act immediately to any car, which is obviously in difficulty, without causing a hazard or hindrance to other cars.
6. Marshals are NOT to act as mechanics, i.e. cars are not to be repaired by marshals whilst the race is still in progress ... otherwise, a 10 (ten) second penalty, added on to their last race, results!
7. Cars must be replaced on the track at the exact point at which they left it without any advantage or disadvantage to the driver.
8. Cars are to be carefully replaced on the track with both hands; they may NOT be thrown, kicked, flipped, pushed, deflected or knocked onto the track.
9. Under no circumstances should a car be thrown onto the track in such a manner that it gains momentum. The car must move away under its own power.
10. Cars must be placed at the edge or side of the track facing the correct direction of the race and parallel to the side of the track.
11. Great care must be taken to ensure that when a car is replaced on the track it does NOT cause a hazard or hindrance to approaching traffic. If necessary, wait until the traffic has passed.
12. Do NOT allow yourself to be distracted. Your task is to marshal your allotted section of the track. Pay attention and watch your section. Do not be tempted to

watch the race - this distracts your attention from your job. Watch for mishaps about to happen - this facilitates quicker reaction on your part. Your allotted period of marshalling is NOT the time to hold conversations with bystanders or other marshals ... otherwise, a 10 (ten) second penalty, added on to your last race, results!

13. Be careful to keep your fingers away from exposed gears, wheels, drive shafts, etc.
14. Watch for corner cuts and inform the Chief Marshal immediately should you witness any.
15. Do NOT leave your marshalling position until all cars have completed the final timed lap of the race and the "all clear" has been announced.
16. At all times, strive to marshal others' cars the way you would like to have your own car marshalled!

ANNEXURE D



RACE REFEREE CHECK SHEET

QUALIFYING		MAINS		
ROUND NO		RACE NO		CLASS

CAR NO	INFRINGEMENT	PENALTY	ANNOUNCED ON P A	ENTERED ON COMPUTER

QUALIFYING		MAINS		
ROUND NO		RACE NO		CLASS

CAR NO	INFRINGEMENT	PENALTY	ANNOUNCED ON P A	ENTERED ON COMPUTER

ANNEXURE E



A-MAINS QUALIFIER DATA SHEET

DATE OF EVENT :

NAME OF DRIVER :

CLASS QUALIFIED IN :

A-MAIN GRID POSITION :

DATA REGARDING EQUIPMENT USED TO QUALIFY

SPONSOR :

MAKE OF CAR :

MOTOR USED - MAKE :

- WINDINGS :

BATTERIES USED - MAKE :

- CAPACITY :

SPEED CONTROL :

MAKE OF RADIO :

FRONT TYRES :

REAR TYRES :

**THIS MUST BE COMPLETED AND RETURNED TO RACE CONTROL
AS YOUR CONFIRMATION OF PARTICIPATION IN THE A-MAINS!**

ANNEXURE F



PROTEST FORM

To the Protest Committee of the Nationals.

Protest lodged by: SARDA no:

Race no: Round no:..... Car no:.....

Class:

Protest lodged against: Car no:

Date of incident: Time of incident:

Whereabouts of incident:

Rule/s considered infringed:

Time at which protest was lodged:

.....
SIGNATURE OF PROTESTOR

Member of Club

Address:

.....

Telephone no:

PROTEST FEE OF R200.00 IS ENCLOSED

BRIEF DESCRIPTION OF INCIDENT

.....
.....
.....
.....
.....
.....
.....

FOR PROTEST COMMITTEE USE ONLY

FACTS FOUND

.....
.....
.....
.....

Rule/s judged applicable:

DECISION AND GROUNDS FOR DECISION

.....
.....
.....

.....
SIGNATURE OF PROTEST COMMITTEE CHAIRMAN

.....
DATE

ANNEXURE G



DRIVER'S RULES/GUIDELINES

It was decided that SARDA Committee train their referees. The following guidelines were agreed to in principal:

1. During qualifying drivers must ensure that their driving is such that they do not infringe, hinder the progress or deliberately bump into faster cars/drivers passing them or to be passed.
2. It is the responsibility of the driver initiating the pass to ensure that it is done safely.
3. Deliberate blocking is illegal.
4. If another driver has legitimately placed his or her car beside the side of a car to be passed, the car to be passed must leave room for the other car to carry a line through the corner.
5. Whether a driver is racing for a position or passing a back marker, the driver initiating the pass shall do so off the racing line preferably on the inside. The driver on the point of being passed shall hold the racing line or his/her line.
6. When the referee announces that a faster car is approaching during the race the driver in the slower car to drive such a way that he/she does not hinder that cars progress and he/she must do it in a manner that does not infringe his/her own progress.
7. No driver is allowed to leave the drivers stand before the all-clear signal has been given or the race been cancelled.
8. Drivers to be quiet on the drivers stand; only the referee may give instructions and speak to marshals if needed.

ANNEXURE H



GENERAL INFORMATION AND SAFETY GUIDELINES FOR LIPO BATTERIES

1. Li-Poly battery packs must have a hard, protective case that surrounds the cell(s) in the racing application. A factory encased hard shell pack is mandated for race durability reasons that stem from the vulnerability of Lipo cells to physical damage. Any physical distortion, denting or puncture to the cells will cause either an immediate or long term safety risk. A hard cased pack reduces this risk significantly by protecting the cells from crash damage, battery ejection and general wear and tear at the track.

"Hard case" is defined as a case made of ABS or similar type material. The case shell consist of 2 (two) halves with each half being constructed from a single mold that is not easily pliable and retains its shape without any exterior or interior support. Both the top and bottom sections of the case must be secured together by glue, double-sided tape or heat seal with a label across the seam stating "ROAR approved" in such a manner that separation of the case to remove or replace the cells will destroy the case and/or label and render it unusable in competition. The case must be installed by the manufacturer or value added manufacturer. No end user installed cases are acceptable. The case will protect the cells from damage on all sides and will completely cover all cells having only openings for wire connections. Any modification to the factory approved hard case will make the pack ineligible for participation in SARDA events.

Note: Approved batteries will be required to have a "ROAR Approved" Label across the seam by January 2009. ROAR will have a grandfather clause until January 2009 for all approved cells at competition on the Label rule.

2. The maximum case size shall be as follows:

Length:	139mm + 0mm / -3mm
Width:	47mm + 0mm / -2mm
Height:	25.1mm + 0mm / -3.0mm

The battery pack shall have leads extending from the case for the positive (+) and negative (-) electrical connections using wire of adequate size to handle discharge rates acceptable to racing applications. Alternatively, the case shall have external connection points for these wires clearly marked positive (+) and negative (-) so the user can apply the lead wires. Markings on the case are

required stating the rated voltage and capacity of the battery. The Value Added Manufacturers name and/or logo shall be easily readable on the case. Individual cells used in the construction of the battery shall be rated at 3.7 (three point seven) VDC and the pack shall be 2 (two) cells in series.

3. General information about Li-Poly batteries:

3.1 Lithium Polymer packs must be charged with chargers capable of the industry standard CC/CV (Constant Current/Constant Voltage) charge profile.

3.2 Li-Poly batteries may be charged to a maximum of 8.40V +/- 0.04V. Overcharging is a serious safety hazard and will not be tolerated.

3.3 All Lithium Polymer packs used for motor power must be charged inside a "Lipo Sack" or similar fire mitigation device proven to withstand a minimum of an 8.4 (eight point four) v 5000 (five thousand) mAh Lithium Polymer pack failing destructively without showing external flame.

3.4 Lipo battery pack is damaged when any of the following rules are broken. The damage is cumulative and cannot be reversed. These rules provide the safest operation and longest pack life. Going outside these rules may result in a destructive pack failure.

3.4.1 Do not over discharge Lithium Polymer battery packs and use a proper ESC cut-off voltage. Some newer speed controls give you the option to set a cut-off voltage, and some do not. The cut-off voltage setting is working properly when the ESC does not allow the motor to spin anymore when the pack voltage reaches this set cut-off. A Lithium Polymer battery is damaged when it goes below a set voltage, whether under load or not. The lower the voltage and the longer it stays low, the more damage is occurring to the cells. If your ESC doesn't have a setting for cut-off voltage, we strongly suggest not using any Lipo pack with it unless you have a secondary device to cut off the motor at the correct voltage. By the time the pack "feels soft" at the end of the run or notice any decrease in power, the pack has already been damaged. Consult your Lipo pack manufacturer for the proper low voltage cut-off since this value varies based on manufacturer.

3.4.2 The maximum safe temperature of a Lithium Polymer pack is 140°F. Generally the pack temperature will INCREASE for about 5 – 10 minutes after the run is over, so measure the temperature of the pack immediately after the run and then again about 10 minutes later. The faster the car is geared, the more amps the motor is drawing and the battery is delivering. The less capable of outputting high current (amps) the pack is, the more it will heat up with the same load (think IB4200's vs. NiCad 2400's on a mod motor). Exceeding 140°F pack temperature causes damage and the pack is also less efficient at near critical temperatures.

3.4.3 Only charge Lithium Polymer packs with a charger that uses the industry standard CC/CV charging algorithm for Lithium based

batteries. There are two settings you will need to either set or verify on your charger each and every time before you begin charging a pack. The first is the pack voltage or cell count (each charger uses different nomenclature). If your charger is asking for the voltage of the pack, the choices are 3.7 (three point seven) volt (1 (one) cell), 7.4 (seven point four) volt (2 (two) cells) and 11.1 (eleven point one) volt and beyond (3 (three) + cells). ROAR legal Lithium packs are all 2 (two) cells or 7.4 (seven point four) volt packs, so set your charger accordingly. Some chargers ask for the cell count of the pack (1 (one) cell, 2 (two) cells, etc.) so you would set it for a 2 (two) cell pack. The next setting is the charging rate. Lithium Polymer battery packs not only show no performance benefit from charging at higher than recommended rates, but they can be damaged by charging rates that are too high. The standard charging rate is “1 (one) C” which means the actual capacity of the pack in Milliamp hours. We charge in Amps not Milliamps, so divide the Milliamp Hours (mAh) of your pack by 1,000 (one thousand) to get your proper charging rate. For a 4800 (four thousand eight hundred) mAh pack, 4800 (four thousand eight hundred) mAh divided by 1,000 (one thousand) = 4.8 (four point eight) Amp charge rate. For a 3200 (three thousand two hundred) mAh pack = 3.2 (three point two) Amps and a 5000 (five thousand) mAh pack = 5.0 (five point zero) Amps. Unless specifically recommended by the manufacturer with no loss of cycle life, a maximum of 1 (one) C charge rate should always be used.

3.5 Lithium Polymer packs that will not be run for more than a month or two should be stored approximately ½ (half) charged. Do not store them fully charged and do not store them near fully discharged (down to 6.0 (six point zero) volt) or damage will occur. The best way to know the charge state of a Lipo is to use the mAh displayed on your charger when charging from fully discharged. For a 5000 (five thousand) mAh pack driven all the way to cut-off, charge it until you have 2500 (two thousand five hundred) mAh back into the pack and disconnect it from the charger for storage or use the discharge function on your charger and discharge a fully charged pack to ½ (half) its capacity. So for a fully charged 5000 (five thousand) mAh pack, discharge 2500 (two thousand five hundred) mAh from it before long term storage.

3.6 There are 6 (six) main root causes for lithium ion/polymer battery fires.

3.6.1 External Thermal Damage

External heat will damage Lithium Polymer cells. Most manufacturers recommend keeping the cells under 60°C (sixty) or 176°F (one hundred seventy six). At about 90°C (ninety) (194°F (one hundred and ninety four)), the cell will start to balloon up as the electrolytes start to break down and the internal layers start to delaminate. If the temperature is extremely severe (approx 190°C (one hundred and ninety) or 375°F (three hundred and seventy five)) – the cell will go into thermal runaway and you will have a flaming mess. The thermal volatility is directly

related to the cell chemistry used by the manufacturer.

3.6.2 Overcharge

Lithium Polymer cells is extremely non-tolerant to an overcharge condition. A standard charge profile is CC/CV to 4.200 (four point two zero) Volt. Drastically overcharging a cell just once is a sure way to send a cell into thermal runaway. Overcharging a cell slightly but repeatedly is also extremely detrimental for a cell. For example, if you charge a cell to 4.300 four point three zero) Volt, the lithium ions start plating on the electrodes forming lithium metal. Lithium ions are not flammable, but lithium metal is. Every slight overcharge cycle will plate more and more lithium metal resulting in a battery that is very prone to igniting. The best way to prevent overcharging is to charge through a balancer and to avoid chargers that do not charge with the standard 4.200 (four point two zero) Volt CC/CV charge profile.

3.6.3 Over-discharge

Over-discharging is not dangerous, but it will destroy the cell. Over-discharging below the recommended cut-off voltage will cause the copper to start dissolving in the electrolyte. The dissolved copper will then start plating on the electrodes, which may start an internal short circuit within the cell. The safety of the cell is compromised once the plating action starts and the next charge/discharge cycle will be of concern, since there is now an internal short circuit. Don't store you cells completely discharged. All cells have a small self-discharge when left alone and if the self-discharge takes the cell down below its minimum voltage, then the cell will be destroyed. It is recommended to disconnect the battery from all electronics (remove from speed controls, disconnect lithium polymer receiver packs from regulators, etc) since most electronics have a small current drain even in the "off" position.

3.6.4 External Short Circuit

Lithium Polymer batteries have extreme current capability. When these cells are shorted out, the excessive current drain will cause the battery to overheat and possibly cause the cells to go into thermal runaway, resulting in a possible fire.

3.6.5 Internal Short Circuit

This is mostly caused by contaminants getting into the cell at the cell manufacturing level. Contaminants can poke through the separator over time causing an internal short where 1 (one) of 2 (two) things can happen. An internal short resulting in the cell having a high self-discharge rate or an internal short can cause localized heat build-up and initiate a thermal runaway condition – and thus another possible fire. Another source of internal shorts is the punching process the manufacturer uses to stamp out the anode and cathode electrodes. Some manufacturers use a low cost steel rule die and other manufacturers use a die that costs a

couple orders of magnitude more. The lower cost steel die punches tend to leave burrs on the electrodes, while the higher cost dies do not. Burrs have a tendency to puncture the separator and create micro-shorts. This micro-short will create an area of localized heat. In most cases, this will cause the cell to expand (puff up). In bad cases, this localized heat may be enough to ignite the cell. Every time you charge a cell, the cell will expand about 5 (five) % in the thickness dimension. This expansion/contraction may cause the burr to eventually rub through the separator. The vibrations and shock from RC use also causes the burr to rub against the separator. The infamous Sony recall was largely attributed to burr type contaminants.

3.6.6 External Mechanical Damage

A lithium polymer battery is made up of 20 (twenty) – 30 (thirty) layers of a very thin sheet copper anode, a thin plastic separator and a thin aluminum cathode. The vacuum sealed aluminum pouch keeps even pressure on the anode/cathode pairs. A dent can create a micro-short by making the stiff metal anode or cathode poke through the soft plastic separator. This micro-short will create an area of localized heat. The cell will expand and then becomes a possible fire hazard. Another repercussion of a dent is that some layers of the cell will become delaminated and thus inactive. This means that the working layers will need to work harder to provide current and thus generate more heat in a localized area. It is believed that hard cases will greatly minimize the chance of external mechanical damage to the cells.

ANNEXURE I



1:10TH SHORT COURSE TRUCK **ROAR "Provisional" Rules**

CHASSIS

Wheelbase Min/Max	320mm / 335mm (12.59in / 13.19in)
Overall Length Min/Max	540mm / 568mm (21.25in / 22.36in)
Overall Width Min/Max	290mm / 296mm (11.42in / 11.65in)
Minimum Weight	74 oz / 2098grams
2 Wheel Rear Drive	Geared or Ball Differential
Rear Suspension	Independent or Solid Axle

TIRE/WHEEL SPECS

Wheel Inner Bead Max Diameter	3.0in / 76.20mm
Wheel Outer Bead Max Diameter	2.2in / 55.88mm
Wheel Bead Width Max	1.55in / 39.37mm
Wheel Width Max	1.65in / 41.91mm
Tire Maximum Width (mounted)	1.85in / 46.99mm
Tire Diameter Min (mounted)	4.20in / 106.68mm
Tire Tread	Treaded, NO Cut/Custom

BODY SPECS

Full Fender Truck Body. Body must completely cover tires when viewed from above.
Windshield Minimum Setback Centreline Front of Body to Begin Windshield (see SCT Cab Setback Diagram)
Cab Roof Minimum Width and Depth (see STC Roof Diagram)
Cab Minimum Height and Depth (see STC Cab Side Diagram)
NO add-on or integrated Spoilers/Wings allowed

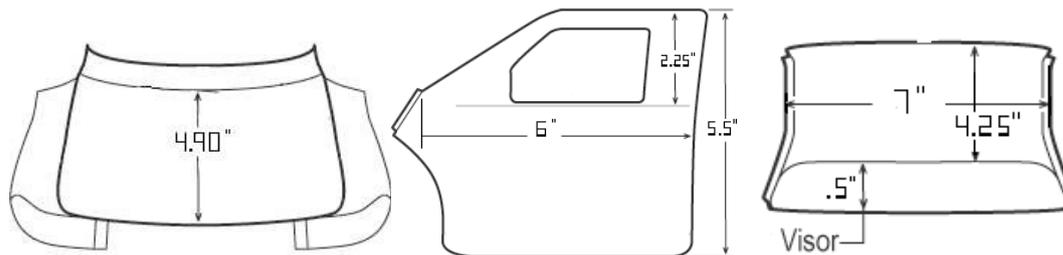
VEHICLE HEIGHT READY TO RACE

Minimum Overall Height	7.835in / 199mm
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MOTOR/BATTERY SPEC

ROAR Approved Brushless 13.5 Motor or 19T Brushed
ROAR Approved 2S 7.4V LiPo or 7.2V 6cell NiMh

Body Dimension Template (all dimensions are minimums)



Dimension and Technical Inspections Practices

Technical Inspection

Tire Minimum Mounted –

Minimum Diameter of the tire (mounted) is established to limit extremely low profile designs. The target dimension (new tire) is established at 4.30 Inches. To compensate for wear, moulding tolerances, degradation of foam inserts, the pre-race minimum allowable diameter of a mounted tire is 4.20 inches.

No Bald or custom cut tires are allowed. Tracks and Promoters are encouraged to select a “Stated” tire that works best for their particular location.

Width and Wheelbase Inspection –

Width and Wheelbase of the vehicles will increase/decrease during the compression/extension of the suspension. Vehicle should be inspected at Static Stance in ready to race condition.

Height –

Minimum Overall Height is measured with vehicle at Static Stance in ready to race condition

Body Inspection

Cab Setback –

Minimum setback is measured from a point equal to the Front (centreline) of the body to the beginning of the windshield/lower rock guard.

Cab Profile –

Minimum depth of the cab is measured from the Beginning Point (centreline) of the Windshield/Lower Rock Guard to the Rear Reference point of the Cab

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 (centreline) from the upper Visor/Rock Guard reference line to the beginning of the Roll Bar/end point of the cab