

2004



RULES

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GENERAL RULES

1-1: Any separation of rules into categories is strictly for the convenience of ROAR. All General rules and procedures (rules 1-1 through 4-XX) in this book apply to all classes. There is always the possibility of a contradiction within these rules by another rule in the type, class or scale specific sections also found in this rule book or National Guidelines. In that case; a rule found under a specific class, vehicle type, scale rule set or rules found in our National Guidelines (when a National event), will take precedence over or further clarify the General rule in question. For a Level 3 or 4 event, the final interpretation of any questioned ROAR rule is the responsibility of the Designated ROAR Official.

1-2: Any rule listing an Official indicates the lowest ranking Official given authority by ROAR to take action on the rule. This does not limit or restrict a higher ROAR Official from imposing a similar, overriding, or more immediate action.

1-3: In addition to the rules and technical specifications mentioned herein, ROAR issues and maintains specific procedures for adherence by promoters, track owners, manufacturers, and affiliated clubs at ROAR sanctioned events, and procedures governing products submitted to ROAR for approval.

1-4: It is the responsibility of members, track owners, and race sponsors to meet all rules and specifications contained herein, the National Guidelines for the current year, by ROAR in our Rev-Up Newsletter, issued in letter form, or posted on the www.roarracing.com website.

1-5: Special rulings or changes in technical specifications will not take effect until such rulings or changes are issued by ROAR in Rev-Up, a newsletter, a letter, or posted on the www.roarracing.com website. These rulings will be considered as official amendments to this list of rules, procedures and/or specifications.

1-6: Special rulings may be made by ROAR or ROAR's Designated Official at an event, to amend, suspend, or modify existing rules to account for conditions due to the location of the event, the condition of the course, weather conditions, or other circumstance requiring such a ruling.

1-7: ROAR assumes no responsibility for delays, postponements or cancellations of all or part of an event because of inclement weather, equipment failure, or other valid reasons.

1-8: No driver, pit crew member, or sponsor will have any claim for damages, expenses, lawsuits, or otherwise against a promoter, track operator, or ROAR, its officials, agents, or employees, arising from damage to any car, personal injury, or monetary loss of any kind whatsoever. Drivers, pit crew members, and sponsors waive any claim they may have against a promoter, track operator, or ROAR, when they participate in any racing activity conducted under these rules.

1-9: Only the Executive Committee can issue sanctions for a ROAR National Championship. The term "ROAR XXXX National" cannot be used in conjunction with any event that has not been so sanctioned by the Executive Committee.

1-10: ROAR sanctioned races are defined as follows: Level 1–local track races; Level 2–State Championships and other regional races; Level 3–Regional Championships and other major races; and Level 4–National Championships. Member tracks are eligible to run any of these races. It is recommended that a track run a Level 2 event before a Level 3, and a Level 3 event before a Level 4.

Note: Underlining of a rule number indicates that the rule has been added, moved, or substantially changed or modified since the last rule book was published. Car dimensions

and specifications that have been changed are indicated by underlining. For IFMAR classes specifications are given in inches and millimeters.

OFFICIALS

ROAR wants to assure a fair, by the rules, game is played at all levels. The number of officials required to conduct an event change depending on the event level. As the number of entries or the outcome (bragging rights) for an event raises, so does the need to increase the number of officials to handle the required duties. The Race Director will need to have large staff coordination and delegation experience to hold a ROAR Level 4 event.

Level 1 races have the minimum requirements for officials. That level will only need a Race Director, Technical Inspector and Scorekeeper. The list of officials below will give you an idea of the duties to be handled at the different levels. Having quality, knowledgeable personnel and the racer's respect of the host's ability to apply ROAR rules is paramount in having an event go well. When each player (racer, official, organizer, etc...) is aware of their position and corresponding responsibilities, the event will go smoothly. These persons must all be ROAR members.

There must be refreshments and necessary relief time provided for the Referee and/or any other official or personnel that, because of their race duties, may have difficulty getting time for these necessities on their own. Complementing members on your work force with refreshments is highly appreciated.

1-11: - **OFFICIALS:** - Required at Levels (Rule 1-10)

Designated ROAR Official	3, 4
Race Director	All
Referee	4 (Suggested for level 3)
Finish Line Judge	4
Technical Inspectors	All
Scorekeepers	All
Registration Controller	2, 3, 4
* Radio Impound Deputies	3, 4

Non-official personnel

* Track maintenance	All
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Personnel not requiring a ROAR membership

Snack sales	All
Sanitary and off-track site maintenance	All
Crowd control	3, 4
Announcers	2, 3, 4 (May be the Scorekeeper)

* These people must have a ROAR membership, it may be a single event ROAR membership.

Suggested additional attendees:

Local Hobby shop or your Hobby shop, on site, with parts and accessories,
Snack bar by charity or volunteer organizations if you do not provide refreshments,
Related community sports groups; soccer, hockey, skate, or even other R/C related clubs,
Youth activities coordinators, Boys and Girls clubs, Any Elks club or other community or business clubs, The Mayor, Does your organization belong to the Chamber of Commerce?
The National Guard to present the colors during opening festivities.
Newspapers, Radio and Cable/TV stations. When charities are involved, media reporters usually come free.

Authorities/responsibilities:

1. The Race Director and Referee are responsible for making immediate official judgments and/or penalties using ROAR rules through the course of an event.
2. For disagreements among Officials, the final decision is made by the Official who is highest on the chain of command (listed in 1-15), who witnessed the incident and was assigned to that event.

3. The Designated ROAR Official, Race Director and Referee may not hold any other duties.
4. The Designated ROAR Official, Race Director and Referee cannot race in level 3 or level 4 events.
5. The Designated ROAR Official at level 3 and level 4 events represents ROAR and therefore has taken the responsibility to interpret and apply ROAR rules correctly. This person is the Senior Official at the event.
6. The actual number of official (bodies) will vary with each event's needs. One official for each duty is ideal, but (except as noted above) one individual, other than the Race Director, may perform multiple official duties.

1-12: The Race Director will have the authority to penalize or disqualify any driver for the violation of these rules, including any of the special rulings described in 1-5 and 1-6. The Designated ROAR Official and/or Referee (when required) will also have this authority. If scorekeepers or others are given this authority, it must be disclosed at a driver's meeting.

1-13: The Designated ROAR Official will have overall responsibility for the conduct of an event run under these rules.

1-14: Race personnel will be directly responsible to the Race Director. The Race Director is responsible to the highest ranking ROAR Official at the event and the ROAR Executive Committee. Any finding, penalty, or disqualification assessed by the highest ranking ROAR Official at the event is final.

1-15: For procedural and technical rulings and policies at an event, the chain of command and authority, from lowest to highest, is: (1) Race Official; (2) Race Director; (3) ROAR Official; (4) ROAR Executive Committee.

SAFETY

Note: The use of tobacco products has been proven to be a health hazard as well as obnoxious to many others. It is ROAR's wish that all our tracks and clubs provide adequate smoking or chewing facilities that would keep this practice separate (or at least down wind) from those with children or those wishing to not be confronted with tobacco smoke and wastes. As actual laws vary over North America we cannot make something illegal that lies outside of our jurisdiction. Otherwise, ROAR would outlaw the use of tobacco products at all ROAR events.

1-16: The safety of spectators is of prime importance and must be considered when laying out tracks and spectator areas. A positive means of stopping a car must be provided between the track area and any area accessible to spectators, drivers, officials, or pit crews. The main consideration for selecting this barrier will be the protection of the individual and not protection of the cars or convenience of operation. Barriers will be supported in such a manner that sharp contact will not cause them to fall over or become ineffective, thus allowing cars to pass through an opening. All barriers must be in good condition, not deteriorated by weather or other causes. No device may be used on a high speed portion of the track or at the end of a high speed straight-away which may cause a car to be launched upward if struck. Plow discs, or similar devices, may only be used at low speed turns and not at the end of high speed straights. Permanent features of the race site, such as curbs or grassy areas, may be utilized. In addition, spectator control will be established at least five feet outside the barriers. For fuel on-road courses, control should be established at least ten feet outside the barriers. Minimum barrier specifications are listed in Type or Class Specific Rules.

1-17: The safety of officials, drivers, and pit crews is of equal importance, but it is assumed that they are more aware of any potential danger. Barriers similar to those in the Type or Class Specific Rules shall be provided between the racing surface and the areas used for the pits and drivers' stand. Sufficient barriers will also be provided for those officials who must occupy relatively fixed positions near the racing surface.

1-18: Everyone, to include spectators, in the racing area and pits must wear closed-toe shoes while at the race site. Anyone behind the spectator control barrier is not included in this requirement, provided there is a positive means of preventing entry to the racing area.

1-19: Disabled cars will be taken off the track. No repair work will be allowed on the track or the infield while a race is taking place.

1-20: A driver may not operate a car while outside the designated driving area or drivers' stand.

1-21: The Race Director must ensure that all drivers, pit crew members, and spectators are in a safe position while the cars are on the track.

1-22: Prior to operating a car, all drivers must sign in and give officials the radio frequencies that will be used. Any change in these frequencies must be approved by race officials.

1-23: A driver practicing, or working on a car in the pits with his radio on, must have the appropriate frequency clip, openly displayed, preferably attached to the radio antenna, or have approval from a race official. (See Rule 1-60 for exceptions)

1-24: Drivers must turn their radios on before turning their car on or starting their engine. Drivers must also turn their car off or stop their engine before turning their radios off. All fuel-powered cars on the track or in the pits must be controlled by a working radio, be on a test stand, or be in the hot pit area.

1-25: Race Officials may inspect the steering system, or any other component of a car at any time if a safety hazard is suspected.

1-26: Racing activities vary, but they must always provide for the maximum safety of all individuals including spectators, drivers, pit crews, and officials.

1-27: In addition to the barriers mentioned below and in the Type or Class Specific Rules, the following should be used to protect any spectator areas: On high speed oval tracks, the outside wall should be at least 24" high; the bottom 12" should be at least 3/4" plywood; and the upper portion should be lexan or wire fence, but plywood may be used. On high speed road courses, it is recommended that spectator areas be protected by a catch fence. This should be wire fence or construction netting at least 24" high, placed 5' or more from the outer retaining wall.

1-28: Off-road cars with exposed gears must be equipped with gear covers.

1-29: **At all ROAR races**, functioning portable UL approved 2-1/2 pound minimum, ABC rated dry chemical or halon fire extinguishers, equipped with capacity gauges, must be in the pits and at trackside. Provisions for the proper disposal of waste fuel must also be in place.

1-30: A suitable, weatherproof first aid kit, composed of individual packaged supplies, must be available at the track, and the number for medical assistance should be posted near all phones.

TRACK BARRIER SPECIFICATIONS

1-31: All barriers, portable or permanent, should be linked in such a manner that they present a surface toward the track that will not damage a car if it makes contact in a grazing manner while proceeding around the track. Overlapping of barriers is always away from the direction of travel.

1-32: A positive means of stopping a car that leaves the racing surface must be provided as specified in the safety rules and the Type or Class Specific Rules.

1-33: Supplemental barriers sufficient to stop a car will be placed in any area where swinging wide or loss of control could result in a car going beyond the outer retaining wall. Such barriers should be no closer than 18" to any portion of the racing surface.

1-34: The outer limits of the track must have barriers that will prevent cars from leaving the racing surface under normal racing conditions. These barriers must be readily distinguishable to the drivers. Lanes will be sufficiently separated by either natural or artificial barriers to prevent cars from crossing into oncoming traffic.

1-35: Corner cutting may be discouraged by placing tapered boards, highway dots, or similar deterrents approximately 6" inside the inner-boundary turn markings. Such devices will not be higher than 2" and will be tapered to allow cars to ride over them. They should be firmly secured to prevent movement onto the racing surface.

1-36: A working pit area for fuel cars will be provided outside the main racing surface, where repairs may be made. It must be separated from the race track by a safety wall as noted in the scale specifications. A hot pit area, where fuel engines can be started and tested, should be provided that is separate from the working pit area.

1-37: A drivers' area will be provided that gives all drivers essentially an equal view of the track during practice and competition. Two and one-half feet (2.5') of space per driver is the recommended minimum. Elevated drivers' stands are recommended provided they are constructed in such a manner as to afford safety to each driver. Flooring material will be secured and capable of holding all drivers. A railing or other safety device is recommended for any stand over 18" above the ground. If stairways are required, they will be constructed to meet local safety codes.

1-38: An area on the drivers stand for handicapped drivers must be provided. All areas and facilities of the track must be accessible to drivers with physical handicaps. Every effort should be made to provide these same facilities at temporary parking lot tracks.

SURFACES

1-39: Water hazards of any type are strictly prohibited.

1-39.1 Surface (track) widths are given for each class/scale in Appendix A.

1-40: On-road track surfaces will be asphalt, carpet, or finished concrete with smooth expansion joints. Race direction will be clockwise for road courses and counter-clockwise for oval tracks. A change in race direction is permitted if notification is included in the race flyer.

1-41: Off-road courses may be kept damp or left dry. When qualifying, an Off-Road track's surface condition (damp or dry) must be maintained through the entire round as necessary to help provide equal conditions for each racer. Race direction is optional, but clockwise is recommended.

Dirt oval courses should be hard packed, whether damp or dry. Race direction will be counter-clockwise.

1-42: Off-road jumps should be designed so that they minimize damage to cars in the normal course of racing, do not pose a hazard to turn marshals, and do not interfere with timing.

DRIVERS

1-43: ROAR membership is required to participate in a ROAR sanctioned event. Only ROAR members having current full year memberships can participate in ROAR National Championships, as drivers or pit crew members. Drivers entering these events must present proof of current annual membership or join prior to participating. Single event memberships may be offered at all other events.

1-44: The Race Director has the right to refuse any entry application for valid reason. ROAR Executive Committee or designated ROAR Official approval is needed for entry refusal of a ROAR member at Level 3 or Level 4 sanctioned events.

1-45: All drivers must attend the drivers' meeting. Racing rules, approved deviations and event specific rule interpretations/procedures will be covered during this meeting. Pertinent executive decisions and temporary necessary rule changes must be disclosed during Driver's Meetings. The Race Director may give a one lap penalty on the best qualifier or best A main of drivers that do not attend or cause unnecessary delay of a drivers meeting.

1-46: A driver will not permit another driver to compete for him in a race, and no non-driver will be allowed to operate a car on the track during a ROAR sanctioned event.

1-47: No person under suspension by the Executive Committee will be permitted to participate or be allowed to enter the working pits or race area.

1-48: A driver is responsible for the actions and conduct of his pit crew. Pit crews must be, at the minimum, single event ROAR members if they are to be in the working pit, hot pit or race area.

1-49: The Radio Impound and timing/scoring areas are off limits to all drivers unless otherwise directed.

1-50: When Junior and Masters class are run, the following rules will apply:

A. Juniors must be 15 years old or younger on the final day of the event.

B. Masters must be at least 40 years old on the first day of qualifying.

At level 4 events, proof of age is required for entry in Juniors or Masters classes. In Level 4 events, Juniors and Masters may enter other classes but not in the same type vehicle.

RADIO EQUIPMENT

1-51: Radios used in ROAR competition are limited to the following channels: 27 MHz—Channels specifically, 26.995, 27.045, 27.095, 27.145, 27.195, 27.255.; 75 MHz—Channels 61 through 90, to include odd and even numbered channels; 50 MHz—Channels 00, 02, 06, and 08; and 53 MHz—Channels 100 through 800. Radio Shack Frequency Counter (Part # 22-305) or similar device is recommended for testing for legal frequencies.

1-52: All radio equipment must conform to FCC rules. Only narrow band (20 MHz spacing) radios will be allowed to use the 75 MHz frequencies in ROAR competition.

1-53: A driver must use his assigned frequency. All frequency changes must be approved by the Race Director. The use of reversed crystals is prohibited.

1-54: Drivers using 50 MHz and 53 MHz radios must have an FCC Amateur Radio license issued for that radio in their possession. The use of radios operating on 29 MHz, 40 MHz, or CB (split) channels is prohibited.

1-55: Radios will display the clip for the frequency used during practice. **Participants must be able to legally change frequencies.** At Level 3 and 4 events, two alternate frequencies are required.

1-56: Transmitters are limited to the manufacturer's recommended voltage. External transmitter battery packs are not permitted.

For safety reasons: It is NOT recommended that the auxiliary battery (used in any vehicle) have a higher voltage than the voltage listed in the manufacturer's specifications for the radio receiver or servos being used.

1-57: Radios are limited to the use of two channels, operating two servos, or a combination of one servo and one electronic speed control. More than one function is allowed per device, but a servo is limited to one output shaft. Control is limited to forward, brake, and steering. The use of reverse in competition is not allowed. Three channels may be used on 1/5 scale vehicles, but control is limited to forward, brake and steering.

RADIO IMPOUND

1-58: Level 3 and Level 4 events require a Radio Impound. It is suggested lower level events establish a Radio Impound area if possible. Radios will be impounded prior to the start of the first qualifier, and prior to start of racing on subsequent days. It is recommended that radios be disarmed by the driver at the time of impound and when returned after a race by removing the battery pack, module, or crystal. Radios will be released at the end of the day's activities, or when a driver is leaving the race site. If release is prior to the end of the day's activities, the radio must be disarmed.

1-59: The Race Director will provide: (1) protected and secured storage for impounded radios; (2) procedures to ensure that impounded radios are turned off; (3) procedures to ensure an orderly dispersal of radios for racing use; and (4) procedures to ensure that no more than one radio on any one frequency is released from impound in any race.

1-60: Radios designed to tune servos without the module being in place may be used in the pits if approved by the Race Director. In such cases, all the racer's modules for that radio system must be impounded.

1-61: If drivers are allowed to impound their own radios, they should be reminded frequently to ensure that their radios are off and disarmed when impounded.

FREQUENCY CONFLICTS

1-62: In cases of frequency conflict, the higher qualified driver will have first choice of frequency. Second highest qualifying driver will have second choice of frequency, etc. For example, driver A is on Red and is qualified for the A main. Driver B is also on Red and is also qualified for the A main. Driver A is qualified first, and as such, would get first choice of frequency. Driver A can elect to retain Red, in which case driver B would have to change; or he can choose any other legal frequency, which could cause another driver to change. The Race Director may require driver A to retain Red if an unsportsmanlike act is judged to be transpiring.

1-63: If there are seven drivers on 27 MHz in a main event, the slowest driver will have to change to an approved frequency in the 75mhz range. If the slowest driver cannot or will not change to an open, approved 75mhz frequency, the driver will be disqualified. (Courtesy and fair play should be called for by the Race Director to see if another driver in the main can change frequency if the slowest driver cannot change to 75 MHz.)

COMPETITION RULES

2-1: Any reference to cars or vehicles in these rules includes both cars and trucks.

2-2: All cars must comply with dimensional requirements for each ROAR approved class found in this rule book. Updates and corrections to rules and requirements must be checked for regularly. Rule updates will be found in the current year's National Guidelines, the ROAR Rev-Up Newsletter or on our www.roarracing.com web site. There are no other "Official" rule publications or Internet sites.

2-3: For Level 3 and 4 sanctioned events, any deviation from ROAR rules will be subject to written approval of ROAR in advance of the event and must be prominent on entry forms and all advertisements. Deviations at Level 1 and 2 events must be prominent on all entry forms and advertisements but do not need written ROAR approval.

2-4: Unless the class requirement or safety rules specifically state that a modification or optional equipment is permitted, it will not be allowed. It is ROAR's intent when prescribing specifications for safety equipment for cars that will compete under these rules, to provide adequate protection to all drivers and spectators. ROAR does not intend to restrict the general or specific design of any car or the development of competitive cars, but does want to encourage all drivers to give full attention to the specification in these rules and to the safety requirements.

2-5: It is the intention of ROAR to promote family-oriented racing. With this in mind, unruly or unsportsmanlike conduct will not be tolerated. Individuals judged by the Designated ROAR Official (with the designated ROAR Official being the highest authority) or Race Director to be in violation will be disqualified and requested to leave the race area.

2-6: Vehicle batteries must be securely mounted. ROAR recommends limiting the radio receiver battery pack in all vehicles to 6 volts. This is usually five (5) (1.2 volt) NiCad cells. Slightly higher voltages (Maximum 6 NiCd/NiMh cells) can be used for direct receiver power but increase the odds of receiver failure by over voltage. Receiver power for electric vehicles may come from an electronic speed control having Battery Elimination Circuitry (BEC).

2-7: The use of traction control sensing devices, active suspension devices, and steering control devices aided by gyroscopes or G-force sensors of any kind is strictly prohibited. Sensors may be used for the purpose of passive data recording but not for adjusting the performance of the car while in motion.

2-8: No roll-over antennas allowed unless noted in the scale rules.

2-9: Multiple speed transmissions are not allowed unless noted in the scale rules.

2-10: Any material used to add to car weight to make it legal must be securely attached to the car chassis. If such ballast falls off the car during a race for any reason, and the car is under weight at the post race tech inspection, the car will be disqualified for that qual or main. For all fuel classes, chassis weights must be securely mounted with solid mechanical fasteners such as bolts or screws.

2-11: No hazardous bumpers, nerf bars, chassis extensions, or other objects protruding from the car are allowed.

2-12: The race lengths specified for each class are mandatory for Level 3 and 4 events. At lower level races, race length is optional, but must be announced in advance.

CLASSES

2-13: For the purpose of establishing specific rules, ROAR competition is divided into various classes as follows: (1) type of drive; (2) type of power; (3) type of track; (4) type of body; and (5) scale.

2-14: Two methods of drive are authorized. These are two wheel drive, with power transmitted to the rear wheels only; and four wheel drive, with power transmitted to all four wheels. Cars that are driven by the front wheels only are classified as four wheel drive.

2-15: Cars may be powered by electric motors or fuel engines. Electric motors are further classified as stock or modified. Fuel engines are primarily classified by cubic inch displacement.

2-16: Tracks are classified by the type of surface and configuration. Authorized surfaces include carpet, dirt, and pavement. Configurations include ovals and road courses. Surface and configuration can be combined in many ways to provide a variety of racing venues.

2-17: A wide variety of bodies are authorized for use in ROAR competition. These are covered in detail in the Body Section.

2-18: ROAR reserves the right to specify what classes of drive, power, and body style can be used on the various track surfaces and configurations.

2-19: Drivers entered in a novice or beginner class will not be eligible to enter any other class.

2-20: A provisional or demonstration class is one that is being raced at some ROAR tracks, but does not have the interest or participation at this time to warrant National Championship status. Rules may be provided for these classes, and they may be run at all levels, unless specifically prohibited. Juniors and Masters as well as cost controlled classes are authorized and encouraged. See Cost Control Rules.

2-21: The number of classes that may be entered at Level 4 events will be as specified in the Nationals Guidelines. A maximum of six classes is allowed at Level 3 and 4 events. At any single Level 4 event, a driver may not enter stock and another class in the same type vehicle.

TECHNICAL INSPECTION

2-22: Each car must satisfactorily pass technical inspection before being allowed to compete.

2-23: Technical inspection will be held prior to every race. All rules must be strictly adhered to. No car will be allowed to race until it has been cleared to do so by the Technical Director. Any violation will be corrected before the car is raced.

2-24 Handout motors and components (such as armatures) will be permanently marked with a number that identifies the driver. Rebuildable stock motors or Non-rebuildable stock motors may be selected as handouts, not both at the same event. Regardless of which handout is selected, only one model from one manufacturer or distributor may be used. If Rebuildable stock motors are used, the term "handout motor" includes these components: cans, endbells, brush hoods, bushings and armatures. When a Rebuildable stock motor is used as the handout at a ROAR Level 4 event, armatures may not be swapped between cans. A Level 4 event's handout motor's armature must always have the same number as the can. It is up to the event host to ensure the proper marking of the motors. If the host is not willing to put in the extra effort to mark the Rebuildable stock motor components as described, they must use the Non-rebuildable stock motors for their event's handouts. When Non-rebuildable stock motors are used as handouts, the motor should be sealed with epoxy or similar material, such as SCCA tech tape, that would chip, rip or come off if the can and endbell were separated. Bushings MAY NOT be cut or modified in any type of stock motor. Drivers MAY NOT use their own stock motors or stock motor components when the event requires handouts.

2-25: Pre-race technical inspections include but are not limited to checking the cars height, length, width, and minimum weight (with personal or handout transponder installed). Tech will insure that the driver's radio is on the proper frequency. Cars must roll freely in the tech box at ride height. Bodies must remain as originally approved. Flaring front fenders or other aerodynamic modifications are not permitted. Minimum weight(s) listed in Appendix A. include transponders. All vehicles must have the correct numbers as described in rule 2-38.

2-26: The Designated ROAR Official, Technical Inspectors and the Race Director have the right to subject any car to mechanical or visual inspection at any time. It is the driver's responsibility to tear down a car for inspection if required to do so.

2-27: The Race Director has the right to limit admittance of personnel to any area in which inspections are being made.

2-28: The Race Director can impound cars at any time during an event and will be responsible for the security of any impounded cars.

2-29: During post race inspection, normal wear, race distortion or damage should be considered.

TURN MARSHALING

2-30: Drivers must marshal for their designated race. Another qualified ROAR member may substitute with the approval of the Race Director. It is the driver's responsibility to find a substitute marshal. The original marshal is responsible for the actions of the substitute.

2-31: Turn marshals are not permitted to repair cars, and must not abandon their post to get a car to a pit man for repairs. Marshals will take disabled vehicles to the closest outer edge of the race track as soon as possible. Vehicles still racing have priority over handling of disabled vehicles.

2-32: A car running on the track has the right-of-way over a car that has gone off the track, turned over, or otherwise had problems. Turn marshals will treat all corrective matters equally.

2-33: When marshaling a car, it should be returned to the point where it left the racing surface. Care must be exercised not to interfere with on-coming cars.

2-34: Only the designated marshals are permitted to handle cars on the race course during a race. No one else may enter the race course to repair or retrieve a car.

2-34.1 Marshals for 5th scale classes can be a pit crew member. No one, Marshal or otherwise may enter the race track area until a Yellow Flag condition is called and all cars have slowed to a controlled pace.

SCORING

2-35: For Level 2, 3, and 4 events, a computer scoring program capable of sorting information, creating standings from qualifiers, setting up the heats and mains, and running the races is required. The program must be capable of working with existing transponder systems. At Level 4 events, this program must be pre-approved by ROAR.

2-36: Personal digital transponders are here. Personal transponders must be fastened in a permanent manner. Mounting in a protected RFI free area with servo tape or a screw mount (if it needs to be moved from vehicle to vehicle) is suggested. All host provided transponders must be mounted in a position that will ensure reliable reception by the computer system. The race director can direct the placement of transponders, and can require a change of position in the event of bad reception. If a transponder fails the Scorekeeper must make an effort to hand count an accurate lap record. If a transponder is not installed, is lost or falls out during a race, the driver may be disqualified and not scored in that race. The driver is responsible for fastening the correct

transponder to the vehicle. Fastening a Transponder in a location that may damage the transponder is prohibited.

2-37: The timing loop/bridge (finish line) should be located where reliable hits will be obtained, and where it is unlikely that a car can miss being counted. If a car does miss the loop due to a racing accident which is obvious on the race print out or is verified on video tape, the driver will get credit for the lap. No driver involved in a racing accident, who misses being counted, will be required to reenter the racing surface at sharp angle or reverse direction in order to be counted.

2-38: For scoring purposes, all cars must have three identifying numbers in three positions so that the number can be seen from the right, left, and front of the car. Numbers must be black numerals on a white background. Minimum number size is 1.5" high with .25" stroke. Numbers may not be trimmed to eliminate the white background. The Race Director has the right to require a specific location for car numbers. At a level 3 or 4 event the Race Director can Black Flag a vehicle for illegal, wrong or lack of proper numbers.

2-39: Race lengths, not including the final lap, are as specified in the class requirements. The procedure will be the same regardless of the length of the race. At the X minute mark of the race, the end of the race will be announced via PA system, horn, or other audio method. The driver will be credited with the time and lap of the final lap. In cases where two drivers have the same number of laps in the same round, the driver with the lower elapsed time is positioned higher.

2-40: A driver's official time will be the total laps completed by his car and the total time elapsed from the starting time, as determined by the method of qualifying, until the car crosses the finish line on the final lap. If the final lap is not completed, the driver will be credited with the number of full laps finished and the time for those laps. A driver who completes 20 laps in 3:50.00 beats a driver with 20 laps in 4:02.00 in the same round.

2-41: When IFMAR qualifying is used, each car is running against its own clock, and not against the other cars. Cars will be started individually, or rows of two or three if lap times are short. The interval between cars or rows must be such that all cars cross the starting line before the first car crosses for the second time. At the conclusion of the designated race time, drivers will be instructed to continue racing until their name or number is called. Qualifying positions for any one round will be determined based on laps and time.

2-42: Qualifying positions for main events at Level 1, 2, 3 events, and at Level 4 events for oval and 1/5 scale, will be determined by using the driver's single fastest qualifying heat, in descending order, until the field is completed, unless otherwise specified by the Race Director or ROAR. At level 4 events for all classes except oval and 1/5 scale, qualifying positions will be determined using the ROAR Qual-Points system described in rule 8-19.

2-43: The winner of each class will be the driver in the A main who finishes with the most laps in the least elapsed time, and whose car is found to be legal on post race inspection. A triple A main system will be used at electric Level 4 events (except for Oval Racing) and may be used at lower level races. A driver who wins the first two A mains must sit out the final main. Refer to Rule 8-20 for description of our triple A-Main procedure.

2-44: Cars may not be pushed across the finish line. Cars must cross the line under their own power. Non-operating cars will be removed from the track.

2-45: For purposes of qualifying and racing, the driver is scored, and not the car. A driver must race the car teched. Unless supplemented by event rules, a driver or a car may not be changed during a qualifying run or during a main event. The racing begins with the timing tone or green flag.

2-46: The standard format for Level 4 events, except fuel on-road, is four qualifying rounds. Fuel on-road will run six rounds of qualifying. At Level 3 events, a minimum of three qualifying rounds

is required. A minimum of two qualifying rounds is required at Level 2 events, and is recommended for all other ROAR sanctioned races.

EVENT ELIGIBILITY

2-47: Except as provided herein and below, any ROAR member is eligible to enter any ROAR sanctioned event. Drivers who are currently qualified for or have participated in the previous two IFMAR World Championship are not eligible to enter stock classes at Level 3 or Level 4 events. Other restrictions may be imposed on entering the Stock and Modified Off-road Nationals.

2-48: To be eligible to enter a Level 3 or 4 event, or a specific class or classes at a Level 3 or 4 event, a driver may be required to meet qualifying and pre-entry requirements established by the Race Director or ROAR.

2-49: Drivers in Regional Championships must have resided in the Region for a minimum of three months. Exceptions to the residency requirement are permissible if authorized by the affected Region Directors. Regardless of current regional residency, members are limited to one Regional Championship event per class, per year.

2-50: For promotional purposes, the Region Director may authorize any invitation to an out of Region driver to participate in a Regional Championship provided that the driver is a ROAR member and that they understand they will not be eligible to compete for a Regional title, and will be excluded from the mains in all but Provisional or Demonstration classes.

2-51: Drivers in National Championships must have resided in the United States or Canada for a minimum of six months. There will be no exceptions to this rule.

BLACK FLAG

2-52: A black flag will be given to a driver whose driving, car operation, or performance constitutes a hazard to the other cars in the race. This includes insufficient skills to compete in the class, unsportsmanlike driving, intentional hitting of other cars, intentional short coursing, intentional corner cutting, intentional blocking when being overtaken, illegal or improper vehicle numbers and other such acts.

2-53: When a driver is given the Black Flag, it means that driver must pull their vehicle off the track immediately. The driver will remain on the drivers stand until that heat or race is over.

2-54: A black flag ruling may be used at any time for unsportsmanlike conduct or abusive language to other drivers or race officials.

2-55: A driver who receives three warnings in an event from a referee or race official will be black-flagged.

2-56: Any car that loses its body, or that cannot be controlled properly due to radio problems, race damage, or missing parts will be black-flagged.

DISQUALIFICATION

2-57: Failure to comply with any of these rules, not limited to items covered in this section, may result in disqualification by the Race Director. Disqualification may be for a single class or for the entire event.

2-58: Disqualification means that the driver will not be allowed to race or continue racing. Any driver who is disqualified for the entire event, may be required to leave the racing facility. There will be no refund of entry fees to a disqualified driver.

2-59: Any of the following actions on the part of a driver or member of his crew will result in mandatory disqualification from the event.

- 1: Not having a current ROAR membership, failing to complete or sign required registration forms, or having an application, registration, or other ROAR form with a falsified signature.
- 2: Using other than an authorized FCC frequency.
- 3: Not taking a vehicle or radio to the inspection area when directed to do so.
- 4: Operating a car near the track that could endanger others in the area.
- 5: Drinking intoxicating beverages, use of illegal substances, or showing evidence of being under the influence of an intoxicating beverage or illegal substance in the pits or the race area.
- 6: Taking part in a protest demonstration in the pits, on the track, or in the surrounding area before, during, or after a race.
- 7: Entering restricted areas or event scoring areas without proper authorization.
- 8: Assaulting another individual. This will also result in suspension of ROAR membership for a minimum of 90 days.
- 9: Turning on a radio during a race to affect another driver's car.

2-60: The following offenses by a driver or member of his crew may result in disqualification if deemed appropriate by the Race Director. If not deemed appropriate, the minimum penalty will be no score for the race in question. A second offense of the same type may result in immediate disqualification.

- 1: Using an engine, motor, or part that does not comply with the rules.
- 2: Subjecting a Race Official to improper language or other demeaning actions.
- 3: Having a transmitter in the race or pit area without permission (Level 3).
- 4: Using other than an assigned frequency.
- 5: Allowing another individual to substitute for them in a race.
- 6: Ignoring a black flag.
- 7: Deliberate abusive nerfing, bumping, or blocking.
- 8: Not going through tech inspection prior to racing.
- 9: Loss of ballast used to make the car meet legal weight.

2-61: Infractions must be witnessed by a Race Official and brought to the attention of the driver before a penalty or sanction is assessed. Track infractions will be announced during the race. However, it is the responsibility of the driver to observe track rules even if the infraction is not announced at the exact time it took place.

2-62: A driver disqualified or penalized can protest the decision of the Race Director to the highest ranking ROAR Official assigned to the event. The decision of the highest ranking ROAR Official will be final.

PENALTIES

2-63: Failure to comply with any ROAR rules, not limited to those items covered in this section, may result in a penalty being assessed by the Race Director. The penalties listed here are the maximum allowable, and may not be appropriate for some tracks or events. This section covers the common penalties for infractions taking place in both qualifiers and main events. Penalty descriptions may also be included within the class specific rules or in other official ROAR publications or guidelines.

2-64: Jump starts: A jump start is any movement of a car between the time the Starter announces the start time and the starting signal. If one or more cars move, a false start will be declared and the cars will be re-gridded (electric classes only). If the same car moves a second time, it will be moved back the length of the grid from its original starting position.

For fuel classes a ten second penalty will be assessed in a qualifier using a heads up start or a one lap penalty will be assessed in the main. For IFMAR starts, when a driver starts out of turn, a stop and go penalty will be assessed. If the driver pulls over and allows the other cars to pass before continuing, no penalty is applicable.

For any class, if a jump start is missed by the officials and it can be verified by any recording device by at least two race officials a ten second penalty will be assessed in a qualifier or a one lap penalty will be assessed in a main.

2-65: Corner cutting: A ten second penalty in a qualifier, or a one lap penalty in a main. If the driver stops in the area of the infraction and allows the car that was immediately behind him when the corner was cut to pass, no penalty is applicable.

2-66: Refueling or repairing a car in the pit lane or on the racing surface: **A stop and go penalty will be assessed. There will be no refueling during the stop and go penalty. (See rule 6-22)**

2-67: Short-coursing: A one lap penalty in a qualifier or a main for each incident. If the car is returned to the point where the infraction took place, no penalty is applicable.

2-68: Driving in reverse of the traffic: A one lap penalty in that qualifier or main.

2-69: A radio in the pits without permission: A minimum of a one lap penalty from the best qualifier or the main may be assessed at Race Director's discretion in a Level 1 or 2 event. See rule 2-60, 3 for level 3 events and the ROAR National Guidelines (Radio Frequencies & Impound) for Level 4 events.

2-70: Failure to turn marshal: A one lap penalty from the best qualifier or the main.

2-71: Hitting the throttle while his car is in the hands of a marshal: A ten second penalty in that qualifier or main.

2-72: Improper reentry to the racing surface: A ten second penalty in that qualifier or main.

2-73: Repairing a car while marshaling at Level 3 and 4 events: A ten second penalty in the marshal's previous qualifier or main.

2-74: Failing to respond in a timely way to an Official directive: A ten second penalty in the best qualifier or main.

2-75: The Race Director may assess stop and go penalties, with or without delay, in lieu of ten second penalties.

PROTESTS

2-76: During qualifying, vehicle or technical protests can only be made by another driver in the same class. In the main events, vehicle or technical protests can only be made by another driver in the same main. A protest must be in writing and must be accompanied by a \$20 fee per item protested, plus the retail replacement cost for each item protested. Protests must be delivered to the Race Director within fifteen minutes of the posting of results of the protested qualifying round or main. Protests considered by the Race Director to be frivolous or unsportsmanlike will not be accepted. A sample protest form may be found in Appendix C. Written protests against results, procedure or policy (organizational protests) may also be filed accompanied by a \$ 20 fee.

2-77: Any engine or motor that is protested may only be torn down for internal inspection at the end of the event. The engine or motor will be marked at the time of protest in such a manner that it can be identified at the end of the event.

2-78: A driver who has a protest lodged against his car is required to make the car available for inspection. Failure to do so will result in disqualification.

2-79: **Vehicle or Technical protests:**

The driver lodging the protest must deliver the written protest and protest fees to the Race Director prior to the initiation of the inspection of the protested car. Those allowed to attend the inspection will be as follows: (1) the protester; (2) the protested driver; (3) the protested driver's mechanic; (4) the Technical Director; (5) the Race Director; and (6) the Designated ROAR Official who will oversee the required inspection. Designated representatives may replace any of the above. The driver or mechanic may be required to dismantle the car under the supervision of the Race Officials. If the protested car or item is found to comply with the sections of the rules for which it was protested, the protest fees including the item's retail replacement cost if the item was destroyed by the exam, will be given to the protested driver. If the protested car or item is found not to comply with the sections of the rules for which it was protested, the protest fees will be returned to the protesting driver, and the protested driver disqualified.

Organizational protests:

Only ROAR member taking part in the event may make this type of protest. They must personally deliver a written protest along with a \$20 protest fee to the Race Director. The protest must be filed within 15 minutes of the associated development that defines the results, procedures or policies being protested. The protest must explain the problem and have a solution. If ROAR rules are referred to in the arguments, they must be quoted or referred to by rule #. If the Race Director determines the protest is valid, the protest fee will be returned. For level 3 and level 4 events, if the Race Director determines the protest to be valid, he will meet with the Designated ROAR Official for discussion of a possible solution for this event. If changes are made to any rules or procedures for this event because of a valid organizational protest, the ROAR President must receive a report of the protest and the action(s) taken. If the Race Director determines the protest to be invalid, the fee will be kept and the protest refused.

AWARDS

2-80: Awards for Level 2, 3, and 4 events should be plaques or trophies appropriate to the event being conducted. Awards at Level 1 events are at the discretion of the Race Director, and are not required when points are awarded leading to end of series or season awards. If awards are given at this level, ribbons, small plaques, or small trophies are recommended.

2-81: At Level 2 and 3 events, it is recommended that a minimum of 15% of the entry fees be spent on awards. At level 4 events, 15% of the total entry fees is the required minimum budget for awards and will be determined using the total entry fee amount collected by the registration deadline date, thirty days before the event. The style and quality of awards will be the same throughout all classes.

2-82: No cash prizes are allowed at ROAR 'Sanctioned' events. Any ROAR driver participating in such an event will have his membership revoked, and will not be eligible for reinstatement for a

period of one year. Any ROAR Club conducting such an event will have its annual club membership voided and will be barred from holding a ROAR 'Sanctioned' event for a period of one year from the violating event.

2-83: Merchandise, whether donated or purchased, may not be given as race awards. The use of merchandise certificates as race awards by a club is permitted, but the cash value cannot exceed the cost of an appropriate award. Door prizes donated by manufacturers must be given away using a random selection process. Selling raffle tickets for donated door prizes is prohibited. Selling raffle tickets for organizer purchased prizes is allowed.

BODY RULES

3-1: The following rules pertain to the bodies, bumpers, side dams, spoilers, and wings that can be used in competition.

3-2: Bodies used in ROAR competition must resemble bodies used in full scale racing for the type of event being conducted. The ROAR Executive Committee will specify which body styles may be used in competition at sanctioned events.

3-3: Except for off road classes, only ROAR approved bodies may be used in sanctioned events. For off-road bodies see rule 3-16. To be approved, samples of the body must conform to the specifications of rules 3-17 and 3-18 below and must be submitted to the ROAR Body Committee, along with the required fee. Contact the ROAR Administrator for details of the submission process. Contact the ROAR Technical Director, ROAR Administrator or www.roarracing.com for current approved body list. If a body is not on the approved body list, it is not legal.

3-4: When originally entered in an event, the body must be complete, neatly finished, painted, and trimmed. No clear areas except windshields and windows are allowed. (Review rule 3-8.) No clear areas or stripes through body colors are permitted. No objectionable or suggestive lettering or decals will be permitted. There will be NO sharp or otherwise dangerous parts on the body.

3-5: All cars must have a readily removable body. Rubber bands are not allowed. Body and chassis must be securely joined at all times while the car is on the track. If a body comes off, the car must be taken off the track and have the body replaced before resuming the race.

3-6: A realistic driver figure consisting of head, shoulders, and arms will be mounted/molded in all open cockpit cars. The cockpit area must be completely covered.

3-7: Spoiler and side dam dimensions include that which is molded into the body.

3-8: Except at a level 4 event, Novice and Junior classes may run bodies having non-transparent windshields and side windows only if supplied with an RTR kit. Otherwise, all bodies must have a clear windshield, and side and rear windows must be clear or cut out unless otherwise stated in class rules or specifications. Open windshields are not allowed, except as stated in class rules or specifications. A sunshade band at the top of the windshield is permitted if it is transparent. Side and rear windows must be clear, or open. The side and rear window may be cut out, unless otherwise stated in class rules or specifications.

3-9: For closed-wheel bodies, no portion of the chassis, wheel, tire, or equipment may extend beyond the body except to the rear. Openings in the body other than those appropriate to full-size car openings such as grill, scoops, air vents, etc., will be kept to a minimum. Antenna opening in the body is the only permitted unless otherwise permitted specified within class rules. Openings for the antenna will have no more than .375" clearance. Specifically servos, receivers, batteries, and servo savers are not allowed to protrude through the original body shell. No sharp, protruding objects are allowed. Wheel cutouts are allowed on the side plane of the body, they may not extend into the horizontal plane of the body. Wheel cutouts may be no more than dimension given in each scale rule. Wheel wells must be cut out if the original car ran that way.

3-10: The maximum width (Specifications – Appendix A) listed for most classes is the distance between the outer edge of the tires, wheels, or body whichever applies.

3-11: For cooling purposes, on-road fuel-powered cars (except touring cars) may have up to 1/3 of the windshield cut out. Off-road fuel-powered cars may have up to 1/2 the windshield cut out. For touring car windshields, one cooling opening is permitted, limited to a maximum of 50mm in any direction. **A refueling hole is permitted directly over the filler neck of the fuel tank to a maximum of 30mm in any direction. This refueling hole cannot intersect with any other hole in the body**

3-12: Bodies cannot be trimmed higher than the lower body trim line. Unless otherwise stated in Appendix-A, the rear section of a body may be cut out as long as the rear sides and quarter panels, including the tail lights and side portion of the rear bumper remain intact. It is recommended that some portion of the cut line remain visible to help speed technical inspection. If the body has no lower body trim line, then the fold line is considered the cut line.

3-13: Body components must remain on the car, except for accidental damage during a race.

3-14: All bodies submitted for approval or renewal will be required to have the manufacturer's ID and Body number molded into the lower portion of the windshield or on the body below the point where a windshield would have been on the full scale counterpart.

3-15: The following body types are authorized for use in competition on the track specified.

OFF-ROAD BODIES

3-16: Because actual off-road racing buggy and truck bodies are sometimes just sheets of material attached to a framework, we cannot expect ROAR off-road bodies to resemble something specific. Buggy and truck bodies used in ROAR events should resemble those used in full scale off-road and stadium racing. Refer to off-road buggy and truck body diagrams and dimensions listed in the Appendix of this rule book for details. Body rules 3-4 through 3-14 apply. Sedans, out-of-scale truck, and van bodies are prohibited.

ON-ROAD BODIES

3-17: These include four general categories: (1) closed wheel cars designed specifically for racing such as CanAm, GTP, and WSC; (2) modified versions of two door street cars such as GT, GT-1, TransAm, and T-1 Touring Cars; (3) racing versions of **two and four door** sedans **that have competed in a full-size Touring Car series**; and (4) open wheel cars that compete in CART, Formula 1, and the IRL.

OVAL BODIES

3-18: These include American-style Modified Stock Car (includes Outlaw Wedge and super modified), Truck, Sprint Car, and Stock Car bodies.

BUMPERS

3-19: Bumpers are not required in all classes, but when used, they must be shock absorbing and non-metallic, with no sharp edges. For safety, rigid bumpers, such as fiberglass and composites, are not permitted.

3-20: Front bumpers must be of at least 1/8" material (3/32" for 1/12). Bumpers will not extend forward of the body except on off-road cars. The bumper may not extend to the side beyond the outer edge of the tires.

3-21: Rear bumpers must be made of a solid material with rounded edges and may not extend to the side beyond the outer edges of the tires, and may not extend beyond the rearmost part of the body except in off-road vehicles.

SPOILERS

3-22: A spoiler is an aerodynamic device to increase down force and traction when a car is traveling at speed. Except for F1/Indy Cars and Sprint Cars with front and rear wings, it is always located at the upper rear portion of the body.

3-23: Many R/C racing bodies have molded-in-spoilers. In some classes, additional material may be added to increase the height of the spoiler. Where this is permitted, the dimension specified includes the molded in spoiler. Spoilers may not extend beyond the width of the body. When cutting out the rear of a body, the rear of the spoiler may be removed as long as the face of the spoiler is not changed.

3-24: Add-on spoiler material must be securely fastened to the body.

3-25: Spoiler dimensions are described in class drawings.

3-26: Spoiler side plates may only be used if they were sold as a part of the body kit. When used, they may not exceed the length of the molded in side dam or the height of the spoiler.

SIDE DAMS

3-27: The use of side dams is permitted in some classes, as indicated in scale specifications.

3-28: Side dams are normally used as a part of a wing set. **Two side dams must be used for all Oval car racing.**

WINGS

3-29: Wings are used to increase downforce and traction in some classes. The dimensions of wings vary depending on the class of racing, and are described in class drawings. (Appendix B.)

3-30: When allowed, only one and two element wings may be used. See Appendix 'B'. Wings should be mounted using wire and a secure mounting system, and be no closer than 1/4" from the body except as provided below. **For Oval racing bodies the distance from the wing to the oval car is to be the distance between the rear deck and the flat portion of the wing cord. Side dams may extend below the chord, but not touch the car body or spoiler.**

3-31: Off-road wings may be mounted using wire or fastened directly to the chassis. There is no minimum clearance for off-road wings. Front wings are allowed if utilized on the body's full scale counterpart. If allowed, front wing dimensions can be found in class specifications. (Appendix B.)

3-32: On-road wings, when permitted, may be mounted directly to the body without clearance. Front wings are allowed if utilized on the body's full scale counterpart. Driver must show proof of full scale utilization.

3-33: Oval wings may be mounted to or through the rear window.

3-34: In some classes, wings and spoilers may be used in combination. When so used, separate specifications are provided. (Appendix B.)

3-35: **Rule Deleted**

WHEEL AND TIRE RULES

4-1: All cars used in ROAR competition must be designed to have four wheels that support it while in motion. No three-wheeled cars or cars with dual wheels in any position are permitted.

4-2: Any wheel manufactured for R/C car competition may be used as long as it meets the class specifications. Wheels will be secured to the axles by means of lock nuts or quick-release axle ends. Nuts or axles will not protrude more than 1/16" beyond the outer edge of the tire. When nuts and/or axles extend beyond the wheel or tire, they will be included when measuring the vehicle's overall width.

4-3: Any tire produced for R/C competition may be used as long as it meets the definitions below and the specifications for the class. Tires must be securely fastened to the wheels.

4-4: The elements of wheel measurement are as follows: Mounting bead, this dimension is measured at the point where the tire bead meets the wheel; maximum wheel diameter, this does not include the molded in ridges of on-road wheels to keep the tire in place; and wheel width, this is measured at the widest portion of the wheel. Internal locking rings may only be used to retain the tire. Rings cannot be used to increase wheel size or to stiffen the sidewall.

4-5: Tires used in R/C competition are defined as follows:

- 1: Rubber: A tire molded using rubber or similar synthetic material. Tires may be smooth, spiked, or treaded. Foam inserts are allowed but may not be bonded or glued to the tire. Pre-built rubber tire/insert/wheel combinations are allowed as long as inserts are not be bonded or glued to the tire.
- 2: Foam: A tire composed solely of foam rubber. Tires may be bonded to the wheel. No coating or additional laminate material of any kind allowed.
- 3: Capped: A tire molded with rubber or similar synthetic material with a core of foam rubber bonded or laminated to the tire.

Note: Use of traction compounds at any ROAR event is at the discretion of the Race Director and any/all bans or special requirements must be disclosed in advertising and on race entry forms.

4-6: Tires that may be used in the various classes are described in the type or class rules.

4-7: Silicone capped or coated tires are not permitted in any class.

4-8: Tires will be black except for sidewall lettering. No metal, rigid plastic, or synthetic spikes or sections may be added to the tires. No more than 1/16" of wheel rim may be exposed on the outside of the wheels. Foam tires may have an identifying foam stripe.

4-9: At carpet races, tire cleaners and traction compounds that can coat the track are not allowed. Many chemicals are available to us, such as diesel, are carcinogens and have been proven to be a health hazard. For safety reasons, diesel, personally developed traction chemicals and/or tire cleaners are not allowed at any ROAR event. Using open flame to heat tires and/or burn tires is not allowed at any ROAR event. The actual use of commercially available products is at the discretion of the Race Director. If any traction product is banned, it should be noted on the entry form, in race flyers and in track rules. A racer can be disqualified for use of illegal or banned chemicals or compounds.

4-10: Tire width cannot exceed wheel width unless specifically allowed in class specifications.

4-11: Stick on wheel disks are not allowed. Unless other means are authorized by the Race Director, the disks must be secured to the wheel by the axle nut or screws.

4-12: Handout tires and inserts are required for certain classes that must use 'rubber tires' at Level 4 events: Any business agreement is between the host and the tire's provider, not ROAR. If necessary, the host should make sure returns will be taken by the tire provider for unsold tires.

Handout classes:

1. All electric Off-Road classes except Provisional or Demonstration classes
2. All T-2 **pavement** classes.
3. All electric paved oval classes at tracks requiring capped tires.

Procedure:

A. The Host picks the tires to handout. Tires must have a permanent visible stamp or manufacturer mold mark identifying them as handouts.

B. For control purposes; the tire provider will ship the handout tires selected with inserts (not applicable to oval) or the tire/insert/wheel combination (if pre-builts are used) directly to the host track.

C. If not required to use a pre-built tire assembly (not applicable to oval), a driver will mount their handout tires and the completed assembly must be returned to technical inspection. Tech will permanently mark the wheel with the driver's entry ID # and tire set #. eg. (108-2) or (108/2) would be acceptable for entry 108 and the 2nd set of tires for that entry. If the handout tire assembly is pre-built, Tech will mark the wheel with the driver's entry ID # and tire set # before the set is given to the driver. Tech will keep the handout registration records and will control or handle further handout purchases.

D. One set of (free) Handouts will be included for each entry fee. Drivers may have up to two tire sets for qualifying per entry. Entry is defined as the class entered in.

E. Drivers may purchase one more complete set for each class entered before the mains. A set of tires consists of all four (2 pair) tires. The minimum purchase allowed is 1 tire pair (1/2 set) as long as the driver is within his 'number of sets' limit. No substitutes or exchanges can be made for an unused pair of a set. Drivers may purchase a single replacement tire at the discretion of the Race Director and ROAR Official that was damaged by an on-track incident. The driver shall notify the Race Director immediately after their completion of corner marshalling responsibilities. Actions causing deliberate tire breakage will result in the tire not being replaced.

F. Tire sets or pairs may not be exchanged between a driver's entries or other drivers. Each vehicle entered is allocated the tires, not the driver.

G. For B-Mains or lower, drivers may purchase one additional set of tires. Up to two additional sets may be purchased by drivers qualified for the A-Main.

H. Technical inspectors will check each vehicle for proper driver ID/Tire number(s). Inserts do not need to be checked. Vehicles without proper handout tires will not be allowed to run.

I. Use of an illegal, unmarked or otherwise improper tire will result in that qualifier or main's result being disqualified.

TYPE OR CLASS SPECIFIC RULES

The following rules are additional rules for a particular type of vehicle or a specific class. In most cases, the rules in this section are designed to further define the General Rules. At no time are these type or class specific rules to be used without regard to the General Rules, which apply to all vehicle types and classes. If a rule in this section differs from a General Rule, this section's rule takes precedence.

ELECTRIC RULES

5-1: The minimum accepted outer barrier for on-road courses, off-road courses, and dirt ovals is 1/2" x 3 1/2" plywood on edge with the ends linked together. Barriers such as fire hose or PVC

pipe may be used (3 1/2" minimum outer diameter). For carpet oval and paved oval tracks, the minimum accepted barrier is 1/2" x 11 7/8" plywood on edge with the ends linked together. On high speed oval tracks, the outside wall should be at least 24" high; the bottom 12" should be at least 3/4" plywood; and the upper portion should be lexan or wire fence, but plywood may be used. On high speed road courses, it is recommended that spectator areas be protected by a catch fence. This should be wire fence or construction netting at least 24" high, placed 5' or more from the outer retaining wall.

5-2: Restarts are permitted if the Race Director believes an unfair advantage has been gained by one or more drivers. (See Rule 2-64 regarding jump starts)

5-3: Roll-over antennas are allowed on on-road courses. If used, they must terminate with a button or ball having a diameter of at least 5/16". They are not allowed on any oval course.

5-4: Straight axle design: Motor, gears or sprockets, and differential must be included in the unsprung weight of the car. Rear suspension must be a straight axle with a fixed relationship between the axle and the motor while allowing no relative transition or rotation between the rear axle bearings and the motor case.

STARTING

5-5: The purpose of a starting procedure is to give each car a fair start from its assigned grid position. Two methods are authorized for electric racing. These are the full-field start and the IFMAR, or staggered start. All mains will use a full-field start. Qualifying heats may use either method.

5-6: The starting grid should be on the longest straight-away and/or far enough from the first corner to allow cars to be under control before reaching it. The grid should be in a staggered pattern with 2 or 3 cars per row, and 3 to 4.5 feet between cars from front to rear.

5-7: For full-field starts, all cars should start on the computer tone or other signal given by the Race Director or Starter.

5-8: For IFMAR starts, cars are started at 1 to 3 second intervals by the starter calling car numbers. On tracks with short lap times, cars should be started by rows at 1 second intervals. On tracks with longer lap times, cars may be started from a single line on the track. This line should be far enough from the timing loop to allow cars to reach normal speed.

5-9: If a grace period is going to be allowed, it must be announced at the drivers' meeting before racing begins. Only one grace period is allowed and it should not exceed two minutes.

BATTERIES

5-10: Only sub-C size rechargeable batteries rated at 1.2 volts or less will be used for the main power in electric car racing. Sub-C dimensions are: 23mm diameter, 43mm length. A 0.0 plus (+) and up to 1.5 mm minus (-) tolerance will be allowed.

5-11: Batteries must be submitted to ROAR for approval, and must have been listed in a ROAR publication to be legal. The Executive Committee has final approval over battery legality. Considerations for legality will include availability and retail cost. Ni-Cad batteries must bear the RBRC recycling logo in order to be approved. Batteries may only be submitted for competition approval once per year. All cells must be submitted to the ROAR Technical Director by September first (1st) to be considered for approval the following year's sanctioned events. Approvals will be made (or not) on or before October first (1st).

5-12: To be approved by ROAR, batteries must be available through hobby distributors and hobby dealers nationwide at a competitive retail price.

5-13: Batteries must be readily identifiable as to their origin. In the case of a secondary, or distributor label being available and applied by the original manufacturer at the factory, a Statement of Origin/ Manufacture must be provided to ROAR from the original manufacturer via the reseller for any individualized cell. This label must state the country of manufacture and have the voltage and milliampere-hour rating printed on it. All individualized cells must be presented to ROAR for approval. Any indication that the original manufacturer applied label has been changed or tampered with will make the battery illegal. If the cells have an identifying mark on the negative end, the mark must be visible after the battery has been soldered together. If protested, it is up to the driver to prove the legality of his batteries. It is recommended that when cells are assembled into a pack that the cells be arranged so all pertinent information on the cells is clearly visible. If gluing cells together, use a glue that can be cut without damaging the cell's shrink wrap, such as Shoe-Goo.

5-14: Batteries may not be charged or changed during a standard length race. Batteries may be changed during an Enduro race.

5-15: Unless a lower number is specified in the class requirements, a maximum of six cells is permitted in ROAR competition.

5-16: Drivers are responsible for the proper disposal of batteries that are no longer useable. No batteries will be discarded in ordinary trash containers, or abandoned at race sites. Where required, tracks should provide an approved disposal container.

ELECTRIC MOTORS

5-17: All motors must meet ROAR specifications, as verified by an independent laboratory, before they will be approved by the ROAR Executive Committee. Newly approved motors must be published in Rev-Up or posted on the www.roarracing.com website prior to being legal for use in competition.

5-18: Only industry standard .05 motors may be used. Overall maximum diameter is 36.02mm measured at whatever point yields the maximum dimension. Maximum length is 53mm measured from the mounting face of the motor to the furthest most point of the endbell, not including solder tabs or lead wires. Shaft diameter must be .125". Motor mounting holes must be on 1.00" centers. Only ceramic magnets are permitted, cobalt and rare earth magnets are specifically prohibited. Maximum stack length is 22.6mm. Maximum stack diameter 23.2mm. Only three pole armatures are permitted. All motors must have the original manufacturer's logo or name molded into the endbell.

5-19: Samples of new motors should be submitted to the ROAR Technical Administrator and motor laboratory for approval prior to actual production. Once passed by the laboratory, approval will be granted when proof is submitted that a minimum of 5,000 stock motors, or 2,000 modified motors have been produced and are available for sale in the USA and Canada. Contact the ROAR Technical Administrator or ROAR Administrator for more information on the approval process and fees.

5-20: If an approved motor is changed in a substantial way, such as: can color, orientation of the brushes, endbell color or configuration, or date stamp; it must be resubmitted for approval. This includes any internal changes to the armature or commutator.

5-21: All approved motors are subject to spot checking at any time by the ROAR Technical Administrator to verify that they are still in compliance with ROAR specifications.

5-22: All electric motors are subject to inspection, and may be torn down at the discretion of the Race Director. At Level 3 events, the motors used in the first, second, and third place cars in the A main will be inspected and may be torn down. At Level 4 events, all A main motors will be inspected and if the Race Director suspects any foul play, the top three finishing motors will be torn down, to include unwinding at least one pole of stock motors. If a stock motor is torn down and it is legal, it will be replaced if requested. If it is illegal, the driver will be disqualified.

Electric Touring Cars, running Modified, are limited to a ten (10) turn armature. See Modified Motors.

STOCK MOTORS

5-23: Motors submitted for approval for use in the stock classes must have "ROAR XX" permanently stamped into the mounting face of the motor can (XX is the year of initial manufacture). Use of the "ROAR XX" or "R/N 5° STK" stamp on any motor that has not been submitted for approval is strictly prohibited. Any deliberate violation of this rule will be cause to remove all motors of that manufacturer from the approved list for a minimum of one year.

5-24: All ROAR stock motors must be bushing type with a fixed endbell, and non adjustable construction. Timing advance is limited to a maximum of 24 degrees measured mechanically. The space between the magnets must be centered on one set of mounting holes which will be marked on one side of the can to indicate zero degrees. The brush hoods will be aligned at 90 degrees from this mark, plus the allowed timing. The commutator slots must be aligned with the center of the individual poles. A two degree tolerance will be allowed on the commutator but not on the overall timing. Only two, single piece ceramic magnets are allowed.

5-25: Stock motors will be wound using a "Mabuchi" cross wrap technique, and a process that locks commutator and the armature stacks, so that the timing cannot be changed without disassembling the motor. The legal stock wind is a minimum of 64 inches of round 22 AWG (American Wire Gauge) wire, having a maximum wire diameter (including insulation) of .67mm, resulting in no less than 27 continuous turns of wire on each pole. A production tolerance of one turn on one pole is allowed. There is no tolerance on the minimum length of wire or a plus tolerance on wire diameter.

5-26: No modifications are allowed that require disassembly or internal work on a stock motor. This includes re-balancing, re-forming the can, re-epoxying, adding ball bearings, modification of the brush hood system, removing the endbell, and adding or removal of material or parts. The use of any device or attachment that allows the output shaft of a stock motor to ride in a ball bearing is strictly prohibited.

5-27: Motor brushes and brush springs may be modified or replaced on external brush system motors. Commutators may be lathe trued. This may only be done by removal of the brush hoods. The original brush hoods must be replaced in the original factory position. Any further disassembly or modification of a stock motor is prohibited.

5-28: A stock motor that shows any signs of tampering will be disqualified. If a motor shows signs of tampering during post race inspection, the driver will receive no score for that qual or main. At events where stock motors are provided, the driver is responsible for any signs of tampering.

5-29: Approved stock motors must be commercially available through hobby distributors and hobby dealers nationwide for a maximum retail price of \$40, including any after market tuning and preparation.

REBUILDABLE STOCK MOTORS

5-30: Motors submitted for approval as rebuildable stock motors must have the manufacturer's name in the form of "XXXX 27" (e.g. EPIC 27, YOK 27, etc.) permanently stamped into the mounting face of the motor can. "XXXX 27" designates the use of the can for Stock class racing. The manufacturer name on the can will make hybrid motors easy to identify. Any deliberate violation of this rule will be cause to remove all motors of that manufacturer from the approved motor list for a minimum of one year.

5-31: All ROAR rebuildable stock motors must be bushing-type with an endbell that locks the timing at 24 degrees. The space between the magnets must be centered on one set of mounting holes, which will be marked on one side of the can to indicate zero degrees. The brush hoods will be aligned at 90 degrees from this mark, plus the allowed timing. The commutator slots must be

aligned with the center of the individual poles. A two-degree tolerance will be allowed on the commutator, but not on the overall timing. Endbell must include a mark indicating 24-degree timing adjustment when motor is assembled. Only two, single piece ceramic magnets are allowed.

5-32: Endbell and can must be designed with a method of locking the timing at 24 degrees. This feature is in addition to any method which secures the endbell to the can (e.g., screws running through the side of the can). The endbell must incorporate a molded tab that keys into a slot on the can — locking the timing at 24 degrees. Endbell timing may only be set at 24 degrees. Extra locking devices (e.g., extra notches in the motor can that allow timing to be changed to 36 degrees or 5 degrees) are not allowed.

5-33: Endbell may have inspection/cooling holes on each side between the negative and positive terminals. These holes would facilitate inspection of commutator tabs. Endbells must be marked with manufacturer's name.

5-34: The hole for the bushing in both the endbell and the motor can must be no smaller than .210" diameter. This will allow easy verification that the motor bushings have not been replaced with ball bearings and inspection will not require disassembly of the motor.

5-35: Motor can must have inspection holes/slots between magnet tips so that the armature may be viewed for inspection of armature tag (see 5-39). These holes/slots may be no closer than .220" from the top or bottom edge of the motor can. View through inspection holes/slots must not be obstructed by anything covering the holes/slots (e.g. motor label).

5-36: Magnets must be permanently glued to the motor can and may not be removed. No magnet shims are allowed (e.g., an extra shim that could be added on the end of the magnet or between the tips to change performance). Flux collector/timing rings are allowed as long as their only purpose is to secure the endbell to the motor can. Rings may not extend between magnet tips.

5-37: All rebuildable stock motor armatures must be wound using a "Mabuchi" cross wrap technique, and a process that locks the commutator and the armature stacks so that the timing cannot be changed without disassembling the motor. The legal stock wind is a minimum of 64 inches of round 22 AWG (American Wire Gauge) wire, having a maximum wire diameter (including insulation) of .67mm, resulting in no less than 27 continuous turns of wire on each pole. A production tolerance of one turn on one pole only is allowed. There is no tolerance, however, on the minimum length of wire, nor is there a plus tolerance allowed on the wire diameter.

5-38: Tabs on the armature's commutator may only be "compression welded". No after-market welding or silver brazing will be permitted.

5-39: Armature must be tagged in a way that it is easy to identify both in and out of the motor. The tag must be permanently affixed to the armature and made of a material that will not self destruct from the heat of the motor or standard motor cleaning agents. The tag should be positioned between two poles of the armature and must be a minimum of .500" in length. The tag must be printed with the OEM manufacturer's name and "27" (e.g., "EPIC 27", "YOK 27", etc.).

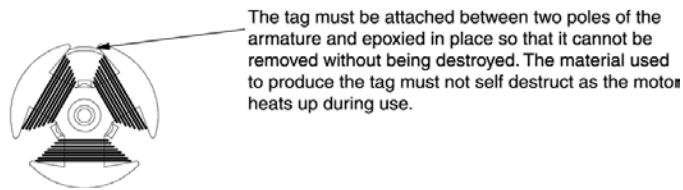
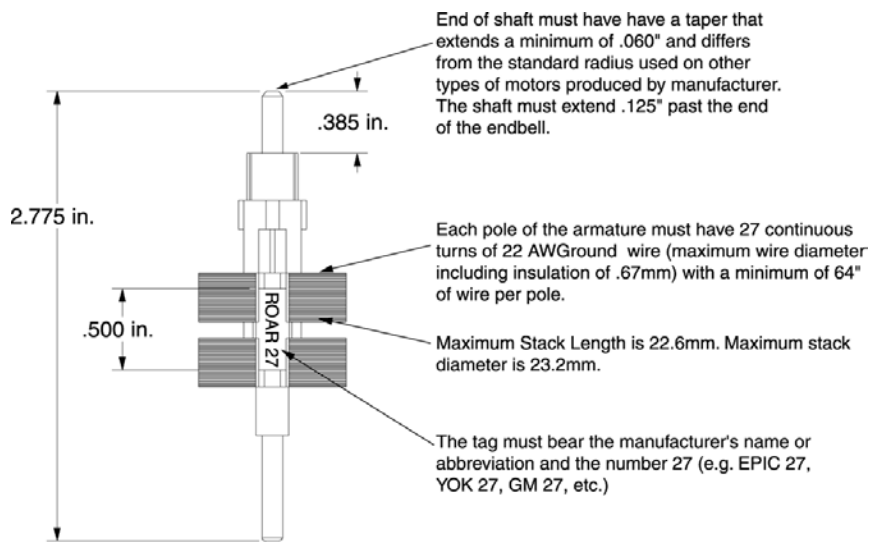
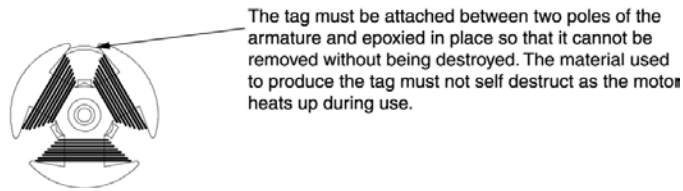
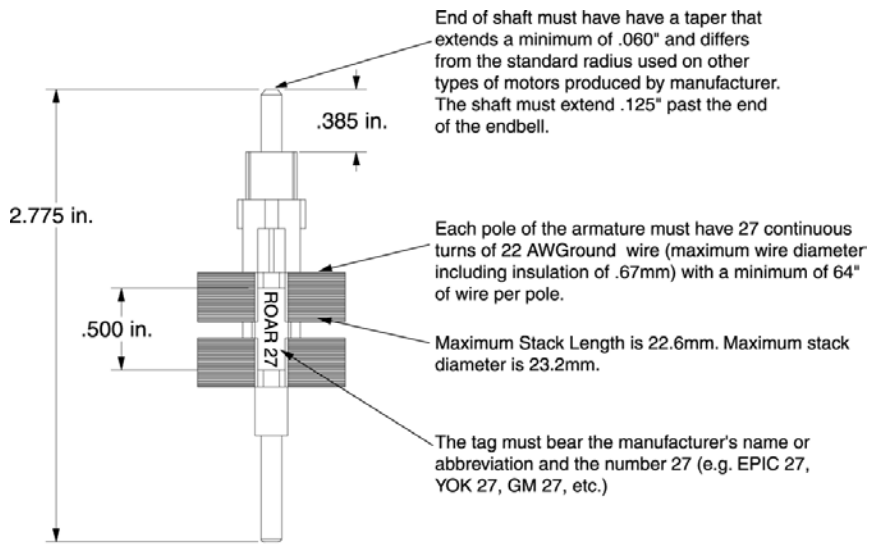
5-40: Armature shaft must extend .125" beyond the endbell bushing when motor is assembled. The overall length of the armature shaft should be 2.775" with .385" extending beyond the end of the commutator. The commutator end of armature shaft must be coned (tapered) and must differ from the standard radius currently used by OEM manufacturers in production of other motors. The taper should continue for a minimum of .060" from the end of the shaft.

5-41: No modifications to the physical construction of the motor can, endbell, or armature will be permitted (e.g. adding or removing material from the armature stack, changing the brush hoods from stand up to lay-down and visa-versa, relocating spring posts). If a motor shows signs of tampering during post race inspection, the driver will receive no score for that qual or main.

5-42: Epoxy balancing of armatures for rebuildable stock motors will not be permitted.

5-43: The armature, motor can, and endbell of a rebuildable stock motor must all be from the same motor manufacturer and can contain only components from the same model. No hybrid motors or mixing of parts from different models will be permitted.

STOCK MOTOR ARMATURE



MODIFIED MOTORS

5-44: All motors must conform to technical specifications in Rule 5-18. For all ROAR sanctioned events, modified Touring Cars will use an armature wind resulting in no less than 10 continuous turns of wire(s) on each pole. See rule 5-46.

5-45: The base motor may be modified by re-winding, epoxying, and balancing; and adding cooling holes, ball bearings, and custom brush systems. The original armature, commutator, magnets, motor can, and endbell must be used, but may be modified. No mixing of parts from different base motors is allowed.

5-46: For Touring Cars, at Level 3 events, the motors used in the first, second, and third place cars in the A main will be inspected and may be torn down or tested with an inductance meter at the discretion of the Race Director. Lower level events may inspect motors, but it is not required.

Touring Cars at Level 4 events, setting top qualifying positions and all A main cars will have their motors inspected. An Inductance Meter will be used to test each motor. The Inductance Meter will be available in the Tech area to each driver prior to qualifying for testing purposes. The minimum microHenry reading (value) allowed must be determined before using inductance meter(s) for approval purposes. The Race Director must determine the legal microHenry value by selecting and testing three known ten turn armatures with the meter(s) for the event. For each inductance meter, the minimum microHenry value allowed shall be the lowest of the three armatures tested. Expected is a value between 11.6 and 12.6 microHenry. The minimum inductance allowed for each meter must be posted.

If an armature is found illegal during a post-grid inspection, immediately after a qualifier or main, that driver will be disqualified from that class.

5-47: Approved modified motors must be commercially available through hobby distributors and hobby dealers nationwide for a maximum retail price of \$95.

REBUILDABLE 19T "Super Stock" MOTORS (for all electric except Oval Classes)

5-48: Motors submitted for approval as rebuildable 19T "Super Stock" motors must have the manufacturer's name in the form of "XXXX 19" (e.g. EPIC 19, YOK 19, etc.) permanently stamped into the mounting face of the motor can. "XXXX 19" designates the use of the can for 19T "Super Stock" class racing. The manufacturer name on the can will make hybrid motors easy to identify. Any deliberate violation of this rule will be cause to remove all motors of that manufacturer from the approved motor list for a minimum of one year. All motors submitted for approval shall be freely commercially available at a retail price of less than \$50.

5-49: All ROAR rebuildable 19T "Super Stock" motors may be either bearing- or bushing-type with an endbell that locks the timing at 24 degrees. The space between the magnets must be centered on one set of mounting holes, which will be marked on one side of the can to indicate zero degrees. The brush hoods will be aligned at 90 degrees from this mark, plus up to 24 degrees of timing. Only single piece (2 magnets in a can) ceramic magnets are allowed. No Rare Earth or Cobalt magnets permitted. The center of each magnet must be 90 degrees from the 0 degree timing mark on the can. Offsetting magnets with the intent of increasing motor performance/timing is not allowed. Any deliberate violation of this rule will be cause to remove all motors of that manufacturer from the approved motor list for a minimum of one year.

5-50: Endbell and can must be designed with a method of locking the timing at 24 degrees. This feature is in addition to any method which secures the endbell to the can (e.g., screws running through the side of the can). The endbell must incorporate a molded tab that keys into a slot on the can — locking the timing at 24 degrees. Endbell timing may only be set at 24 degrees. Extra locking devices (e.g., extra notches in the motor can that allow timing to be changed to 36 degrees or 5 degrees) are not allowed.

5-51: Endbell may have inspection/cooling holes on each side between the negative and positive terminals. These holes would facilitate inspection of commutator tabs. Endbells must be marked with manufacturer's name.

5-52: The brush configuration can be of any type as long as that configuration appears on a ROAR approved modified or stock motor.

5-53: Motor can must have inspection holes/slots between magnet tips so that the armature may be viewed for inspection of armature tag (see 5-57). These holes/slots may be no closer than .220" from the top or bottom edge of the motor can. View through inspection holes/slots must not be obstructed by anything covering the holes/slots (e.g. motor label).

5-54: Magnets must be permanently glued to the motor can and may not be removed. No magnet shims are allowed (e.g., an extra shim that could be added on the end of the magnet or between the tips to change performance). Flux collector/timing rings are allowed as long as their only purpose is to secure the endbell to the motor can.

5-55: Rebuildable 19T "Super Stock" motor armatures must be machine-wound using a cross wrap technique. The legal 19T "Super Stock" wind is a minimum of 1170mm of round 19 AWG (American Wire Gauge) wire, having a maximum wire diameter (including insulation) of .914mm, resulting in no less than 19 continuous turns of wire on each pole. There is no tolerance on the minimum length of wire, nor is there a plus tolerance allowed on the wire diameter.

5-56: Tabs on the armature's commutator may only be "compression welded". No after-market welding or silver brazing will be permitted. All Commutators must be locked to the armature laminations to prevent timing changes.

5-57: Commutator slots must be aligned with the center of the individual poles. Full stack armatures made only of magnetizable material. No modifications to the stacks will be allowed other than the normal drill balance holes. Any modifications to the original OEM Importer/Manufacturer configurations, including but not limited to, excessive drill holes/milling/turning to lighten and/or enhance the performance from that of the full stack will not be allowed. No linear separations of the stack segments will be allowed.

5-58: No split, skewed or tri-rotor armatures will be allowed. Minimum armature stack length is 21.3 mm. Vertical slots will not be allowed on any armature manufactured by the original OEM Importer after January 1, 2002. Vertical slots on all armatures manufactured prior to January 1, 2002 will not be modified from the original configuration as manufactured by the original OEM Importer. At no time will any material be removed from the armature, whether hidden or visible, except those from normal balance holes.

5-59: The crowns on armature pole segments must be symmetrical with a constant radius. They may not have any steps on them or longitudinal holes through them.

5-60: Armature must be tagged in a way that it is easy to identify both in and out of the motor. The tag must be permanently affixed to the armature and made of materials that will not self destruct from the heat of the motor or standard motor cleaning agents. The tag should be positioned between two poles of the armature and must be a minimum of .500" in length. The tag must be printed with the OEM manufacturer's name and "19" (e.g., "EPIC 19", "YOK 19", etc.).

5-61: Armature shaft must extend .125" beyond the endbell bushing when motor is assembled. The overall length of the armature shaft should be 2.775" with .385" extending beyond the end of the commutator. The commutator end of armature shaft must have a machined "step" that differs from the standard radius or taper currently used by OEM manufacturers in production of other stock or modified motors. The step should continue for a minimum of .060" from the end of the shaft.

5-62: No modifications to the physical construction of the motor can, endbell, or armature will be permitted (e.g. adding or removing material from the armature stack, changing the brush hoods from the original manufacturer's configuration, relocating spring posts). If a motor shows signs of tampering during post race inspection, the driver will receive no score for that qual or main.

5-63: Epoxy balancing of armatures for rebuildable 19T "Super Stock" motors will not be

permitted. No more than 2 holes on any 2 poles of the armature are allowed, i.e. no more than one hole on the third pole.

5-64: The armature, motor can, and endbell of a rebuildable 19T "Super Stock" motor must all be from the same motor manufacturer and can contain only components from the same model. No hybrid motors or mixing of parts from different models will be permitted.

19T Modified Class Rules (Oval Racing only)

5-65: 19-turn modified oval motors shall be based upon any ROAR approved modified motor combination (arm and can) with an armature wound with 19 turns of 19-AWG round wire per pole.

Components from different approved combinations may not be mixed.

Quad magnet set-ups are permitted.

Any brush type is allowed.

Both drill-balanced and epoxy-balanced armatures are permitted.

A maximum of 36 degrees of timing is allowed.

5-66: Armatures may be hand or machine wound, and must bear a mark or tab identifying the armature and winder. Example: NAME 19X1, NAME 19T. Marks may include etching or engraving on the armature stacks, and/or tags epoxied between the stack spacing and must be permanent, as to see any tampering. If it is found that these markings/tabs/tags are not legible, or tampered with, the armatures may be deemed illegal.

5-67: Commutator slots must be aligned with the center of the individual poles.

5-68: Suggested retail price for a complete motor shall not exceed \$65. Armature may not exceed a suggest retail price of \$30. Can and endbell combination may not exceed a suggested retail price of \$30.

The following rules are additional rules for our nitro fueled vehicles. In most cases, the rules in this section are designed to further define the General Rules. At no time are these rules to be used without regard to the General Rules which apply to all vehicle types and classes.

NITRO FUEL RULES

6-1: The minimum acceptable outer barrier for 1/10 off-road is 1/2" x 4" plywood. For 1/10 on-road and 1/8 off and on-road, the minimum is 3/4" x 8" plywood. The minimum for any scale oval track is 3/4" x 11 7/8" plywood (see Rule 1-27 for additional information). The ends of the barrier must be linked so that no sharp edges or overlaps face the direction of travel.

6-2: Interior lane markers should be 2" x 4" boards, or similar material, on edge, and should be anchored to the race surface. On off-road courses, 3" smooth PVC pipe is acceptable.

6-3: Fuels will contain only methanol, nitromethane, and a lubricant. The following additives are specifically prohibited: hydrazine, hydrogen peroxide, propolene oxide, and toluene. Old fuel, not stored in the original container, can become unstable and should not be used

6-4: Fuel tanks must be securely mounted. Maximum fuel system capacities are 75cc for .12, 80cc for .15 engines, and 125cc for .21 engines. For measurement purposes, 1cc is equal to 1ml.

6-5: Any carburetor may be used as long as the bore does not exceed the maximum allowable for the engine size. Restrictors may be used to achieve the legal diameter, but must be securely fastened in place.

6-6: There are two approved ways to determine the fuel capacity of a vehicle. The first way is by pouring the correct amount into the vehicle's system, and the second way pumps the fuel out of

the vehicle's system into a measurement container. The Race Director must insure that all waste fuel is disposed of properly. To check a tank capacity the first way, drain all fuel from the system including fuel and pressure lines. Pinch off the pressure line at the tank, and disconnect the fuel line from the carburetor. Using a graduated cylinder, measure the proper amount of the driver's fuel and pour it into the tank, allowing fuel line and filter to fill. The fuel should fill the tank to the top of the filler neck, or to a point where fuel overflows or is forced out when the lid is closed. If it does not, the tank is oversized and must have an insert added to bring it down to legal capacity. The graduated cylinder is read at the bottom of the center of the curve when viewed from the side of the cylinder at eye level.

To check the tank capacity the second way, fill the tank to the top of the filler neck. Make sure all fuel lines are full. Attach a fuel pump or large capacity syringe to the end of the tank-to-engine fuel line. Transfer the fuel completely out of the vehicle's system into a graduated cylinder or another accurate liquid measuring device. (Reading a graduated cylinder is described above, in this rule.) If there is more fuel retrieved than allowed, the tank is too big and an insert must be used to reduce the tank capacity.

6-7: Any type of bearings are allowed. Connecting rods may not be ceramic.

6-8: Engines must be of single cylinder, two stroke, air cooled, glow plug design. Only one single throat carburetor is permitted. No supercharging or turbo charging is allowed. Only standard glow plugs with 1/4-32 thread, using a .25" gasket, will be allowed in .12 and .15 engines. Turbo style plugs are permitted only in .15 Open and .21 Open engines.

6-9: Cars must have brakes in working condition capable of stopping and holding them motionless with the engine running. Cars must also have an operational de-clutching device.

6-10: Increasing the displacement of a .12 engine to .15 by changing or modifying the piston, sleeve, and head is illegal unless the new displacement is permanently indicated on the head.

6-11: Exhaust port height is the distance from the top of the piston, at bottom dead center, to the highest point of the exhaust port on the piston side of the sleeve. Shims may be used to adjust exhaust port height.

6-12: To determine the displacement of an engine measure the diameter of the bore, divide this number by 2, square the number, and multiply the result by Pi (3.1416). This result is then multiplied by the stroke. To calculate the stroke measure the distance from the top of the sleeve to the top of the piston at its bottom most position in the engine (bottom dead center) and subtract the distance from the top of the sleeve to the top of the piston at its upper most position (top dead center). As an example, if the bore measures .55" and the calculated stroke is .543" Then: $.55/2 = .275$, $.275 \times .275 = .075625$, $.075625 \times 3.1416 = .2376$, $.2376 \times .543 = .1290\text{cu.in.}$.1290 is the maximum legal size of a .12 engine. An engine with the same stroke but measuring .595" in bore would yield a displacement of .151cu.in., legal for a .15 engine but not legal as a .12.

6-13: All cars are required to use a muffler or tuned pipe through which the exhaust gas must pass. Exhaust discharge must be parallel to the ground or lower. The maximum allowable sound level is 85 decibels, measured at a ninety degree angle to the side of the car from a distance of 33 feet, 3 feet above the ground, with the car at maximum throttle and at all speeds. A Radio Shack sound meter (Part #33-2055) or equivalent should be used to check the sound level.

6-14: Muffler outlet pipe must be a round, constant diameter tube, with the end cut at 90 degrees to its centerline.

6-15: An industrial quality dial or digital caliper or go/no-go gauges should be used to check engine specifications.

6-16: A car that loses its muffler will be black-flagged and not scored until repairs are made.

6-17: Variable exhaust timing, porting, or exhaust pipes with moveable parts are not allowed.

6-18: All gearboxes must be on a single shaft. Multiple-speed transmissions are allowed for some on-road classes (see vehicle specifications), but not for off-road racing. Automatic or variable overdrive systems are not allowed.

6-19: Hydraulic drive systems are not allowed.

6-20: Antennas must be the flexible type. Roll-over antennas are not permitted in any class.

6-21: In case of servo or linkage failure, cars must incorporate a positive action return spring attached directly to the carburetor throttle arm to provide positive closure. Use of "fail safe" radio systems is highly recommended.

6-22: A pit lane that has a convenient and safe exit from, and entrance back to the racing surface will be provided. This area is to be used for refueling and repair of cars. There must be a safety wall between the pit lane and the working pits. All refueling and repairs to the cars will be accomplished in the working pits, and not in the pit lane. During qualifying, one pit member per car will be allowed in the working pits. During the mains, two are allowed.

6-23: Engines, fuel tank capacities, carburetors, and other specifications may be checked at any time by any event official.

6-24: Open flame or smoking is prohibited within 50 feet of areas where fuel is present.

STARTING

6-25: Vehicles will be called to the track three minutes prior to the start of a race. They will be given 2-1/2 minutes for warm up and practice. Thirty seconds before the start, they will be called to the starting line for refueling, final preparation, and lineup. Five seconds before the start, the starter will signal the car mechanics with five fingers raised as notification that the race is about to start. He will then count downward, showing four fingers, then three fingers. At the three second mark, the flag will be touched to the ground and all mechanics will place their cars on the ground and release them. Within the next three seconds, and after all cars are released, the starter will lift the flag and the race will begin. As an alternate to using a starter, the race may be called over the PA system provided all drivers and car mechanics can easily hear the system.

6-26: For qualifying races, it is recommended that IFMAR starts be used, with the cars starting from the staging area at one to two second intervals. For main events and full field start qualifiers, a LeMans start is recommended. For main events the cars should be lined up diagonally, at least ten (10) feet apart, on the longest straight by qualifying time, fastest qualifier at the front. For LeMans starts, car mechanics must be clear of the racing surface to prevent injury and all drivers must have clear visibility of their cars.

6-27: The Race Director will make every effort not to delay the start of a race. Cars will not be allowed on the track before the three (3) minute warm up period. After the three minute period is announced, the start will be as close to three minutes as possible. Races should not be delayed for cars that are not ready, or that stall prior to the start.

6-28: If a grace period is going to be allowed during the final three minute practice, it must be announced at the drivers' meeting before racing begins. Only one grace period is allowed and it should not exceed two minutes.

ENGINE SPECIFICATIONS

6-29: Ceramic bearings are allowed no other ceramic parts will be allowed in any engine raced in ROAR events.

6-30: A ROAR or IFMAR approved muffler must be used in all ROAR events. Mufflers must comply with rules; 6-13, 6-14, 6-17, and 6-31.

6-31: Engine dimensions/requirements for ROAR legal engines:

	<u>.12</u>	<u>.12 Open</u>	<u>.15**</u>	<u>.15 Open</u>	<u>.21 Open</u>
Max. disp.:	.129ci/2.11cc	<u>.129ci/2.11cc</u>	.152ci/2.5cc	.152ci/2.5cc	.214ci/3.5cc
Max. Carb. Bore: (Above jet.)	5.5 mm	5.5mm	6.0 mm	7.0 mm	9.0 mm
Max. Exh. P-hgt:	4.5 mm	N/A	4.5 mm	N/A	N/A
Max. # intl ports: (W/ Exhst.)	4	N/A	4	N/A	N/A
Max. outlet pipe (i.d.):	5.0 mm	5.2 mm	5.2 mm	6.5 mm	8.0 mm
Min. outlet pipe length:	15.0 mm	15.0 mm	15.0 mm	15.0 mm	15.0 mm
<u>Turbo Plugs</u>	<u>YES</u>	YES	<u>YES</u>	YES	YES

**Note: For .15/ROAR/IFMAR engines (not .15 Open) the crankshaft bore may not exceed 7.0 mm in diameter as measured at the crank face. The bore shall end at the rear face of the counterweight with no more than a 0.5 mm unbroken chamfered edge. No fluting of the counterweight/crank is permitted.

Rules 6-41 through 6-73 are additional rules for the 5th scale class. In most cases, the rules in this section are designed to further define the General Rules. Unless there is a stated direct override to a General Rule, the General rule applies.

1/5 FUEL RULES

BODIES

6-41: Bodies must be ABS plastic or lexan. All STC Bodies must be ROAR or IFMAR approved. Sports GT and "Sportsman" classes may use any body that is within the written Specifications in Appendix A and complies with (rule 6-43). Bodies must be painted except for window areas which must be clear or removed. No tinting allowed.

6-42: No holes are allowed, unless they existed on the full size car, in which case the openings in the body must be proportional to those in the full-size car. Antenna holes, body mounting holes, and exhaust outlet holes (max. .8 inch (20mm) larger diameter than the outlet pipe diameter) are allowed. The windshield must not be cut out. Side windows and rear window may be cut out for cooling. It is not allowed to mold air channels into the side windows for cooling. When windows are cut out, only one hole may be cut in any window area. Except for the rear window, the entire window area must be cut out if any portion of the window is cut out. If the rear window(s) are cut out, the rear window(s) must be completely cut out unless the cut out is only for access to the "Shut Off Switch". In that case, one hole may be cut out inside a rear window area. Drilling or cutting a series of holes in windows is not allowed. All window cutout(s) must be within the molded lines for the window areas, with the exception of the corners that may have a radius no larger than .75" measured from the corner.

6-43: All cars used in competition must be realistic 1:5 scale models of an existing 1:1 vehicle. No mixing of car designs is allowed. Bodies cannot be reshaped (modified) from their original molding. Bodies must cover the tires above their horizontal centerline when viewed from above. Excessive "crash" damage must be repaired or the body replaced before the body shell will be allowed to compete in Level 3 or 4 events.

BUMPERS

6-44: Front foam bumpers are mandatory. The foam bumper must extend 1.4 inches (35mm) past the hard chassis and/or plastic bumper on all sides. The minimum bumper height is 1.5 inches (40mm). No inflexible material for body shell mounting may protrude from the body more than .4 inches (10mm).

ENGINES

6-45: Single cylinder, two or four stroke, naturally aspirated air cooled engines. Maximum displacement 1.4ci (23cc), pull start. No Wankel, rotary valve, or fuel injected engines allowed.

6-45.1. The cylinder block must be one casting. The engine case must be factory original, no billet machined cases are permitted. The cylinder and cylinder liner must be of one casting, no slip-in or independent liners (sleeves) allowed. The cylinder head may be a separate part machined from billet as long as the head is commercially available. Chrome plating or Nikasil coating of the cylinder bore is allowed.

6-45.2. The maximum number of transfer ports (defined as the ports that allow the fresh air/fuel mixture into the combustion chamber) is limited to four (4).

6-45.3. The transfer ports must be open to the piston along their entire length in the cylinder. (The piston must be used as the inner wall of the transfer port.)

6-45.4. The side walls of the transfer ports must be parallel without change of distance. (No "lost wax casting" methods or other means may be used to provide "sweeping" side walls of the transfer ports.)

6-45.5. The crankshaft must be of split-shaft configuration. No half crankshafts allowed. The connecting rod must be of one-piece construction.

6-45.6. The engine must be air-cooled by a flywheel-mounted fan.

6-45.7. Only passive ignition systems using one sensor (rpm) are allowed.

6-45.8. Ignition timing must be mechanically fixed. No mechanical timing advance/retard mechanisms allowed.

6-45.9. Variable exhaust timing/porting or exhaust pipes with movable parts are not allowed. Sound eliminating fiber or like material is the only excepted soft or movable material.

6-45.10. Resistor type spark plugs must be used. A metal shielded resistor-type plug cap is recommended.

6-45.11. The maximum carburetor venturi diameter is .5 inch (13mm). An air filter must be fitted to the carburetor. An intake noise suppression (INS) air box may be incorporated at a later date for IFMAR class compliance.

6-46: This rule only applies to ROAR level 3 and 4 events. There will only be two engines allowed for each class entered. These two engines will be teched in at the beginning of this event and logged for the class(s) in which they will be run. There will be allowed only the use of one (primary) of these engines (for Qualifying as well as the Mains). Another engine (secondary) will be used only in case of catastrophic failure. Catastrophic failure is defined by the first engine's being unable to operate. If the secondary engine is used, the damaged engine will be stored in technical inspection or other "safe" place until the end of the event. The engine used to set the driver's best qualifying time must be used in their main event. If the qualifying engine is deemed not 'run-able' prior to starting the mains, then the secondary engine will be allowed but the driver must start their main from the pit.

6-47: Maximum noise level allowed is 85 dB (a) measured at a 90 degree angle to the side of the vehicle at a distance of 33 feet, 3 feet above the ground, with the engine at maximum throttle and at all speeds. The Race Director may decide on a different method of noise measurement as long as the results are the same. If there is no noise level equipment available, the Race Director and a Host Facility representative can decide if a car, that produces a noise level much in excess of the other cars, will be allowed to compete.

6-48: The muffler/pipe must be of a multiple chamber design with an internal or external silencer. The muffler stinger may not extend more than .4 inches (10mm) outside of body. The maximum inside dimension of the exhaust outlet pipe is .5 inches (13mm).

FUEL

6-49: Only unleaded 'corner gas station' (street legal) automotive pump gasoline available to the general public may be used. The use of aviation or racing gasoline which is not street legal automotive pump gasoline is specifically prohibited unless the race is to be run with a 'spec. gasoline'. In case of 'Spec. Gas' use, the octane and type of fuel must be disclosed on all advertisements and entry forms. An additional fee may be added to the entry fee to cover 'Spec. Gas' cost. The Race Director or Technical Inspector can require any contestant to use event-provided gasoline at any time prior to racing.

6-50: The only additive allowed in the gasoline is mass-produced two-stroke oil.

6-51: No refueling allowed after the warm-up period for a race has begun. Maximum fuel system capacity is 700cc, including fuel lines. In the case of an unforeseen delay after the warm-up has started for a MAIN event only; the Race Director has an option of impounding the cars at a pre-disclosed location, until such time that the cars can be safely refueled. When the race is ready to be restarted, cars will be allowed another 3 minute warm-up prior to the start.

6-52: The capacity of fuel tanks will be measured using the procedure specified in rule 6-6. During post-main inspection, a tolerance of +1% (7cc) will be allowed in the tank size.

TIRES

6-53: Tires must be black and of semi-pneumatic rubber construction. No foam tires allowed. Foam inserts are allowed. New design, limited availability, or prototype tires may be banned from competition at the event at the discretion of the Race Director. Tire traction compounds, other tire chemicals/additives, or chemical tire cleaners are not allowed.

CLASSES

6-54: Two classes are now defined by ROAR, Super Touring Car (STC) (IFMAR) and Sports GT (GT). All classes may run together if there aren't enough cars to split into separate classes. Cars should not be split into separate classes if this will result in three or less cars running in a separate class. At Nationals, STC will run as a separate class. A stock Sportsman class is not definable as there is not an agreed on "stock engine" specifications. Organizers may initiate their own parameters to define a 'stock engine environment' for a Sportsman class, such as 40 minute A-Mains. These parameters must be stated on the event's entry form and available to each entrant at the track.

6-55: Only the Super Touring Car (STC) results can be used for the purposes of qualifying drivers for the IFMAR World Championships at qualifying events. Review World Team Rules (7-1 thru 7-7)

6-56: Additional classes may be added in the future. A F1 class is being run in Europe. To keep their F1 class from extreme engines, some countries have set the time of A-Mains to 40 minutes and they can only register one engine per event in that class.

QUALIFYING

6-57: Qualifiers will be 5 to 10 minutes in length with a 3-minute warm-up period. The number of qualifying rounds will be up to the Race Director, but a minimum of 3 rounds is suggested. When an event is not a ROAR Level 3 or Level 4 event, a suggested method for qualifying would be: Begin the clock as an IFMAR style run. After a 3 minute warm-up period, sound a starting horn. At the end of the run sound a finish tone or horn. Highest number of laps in the shortest time will set the mains. The actual method of qualifying must be announced before qualifying begins. If the event is a ROAR Level 3 or Level 4, the IFMAR qualifying method will be used. The best two of three (3) qual rounds using the ROAR Qual-Points-System will be used to set the mains. The mains will be set with two (2) bump ups. Qualifiers will be 5 to 10 minutes in length with a 3-minute warm-up period.

For other scoring system protocols, like single lap, scorekeeping deviations must be requested from ROAR. The main consideration at level 3 or 4 events is the capability of the scorekeeping system to handle the type of qualifying desired. The (approved) scorekeeping system will be disclosed on all racing flyers and entry forms.

6-58: At Level 4 events, the first place finisher in sub-mains will bump up to the next level.

6-59: At Level 4 events, the top 9 qualifiers will automatically be placed in the A-Main.

6-60: A maximum of 10 cars per heat and main are allowed.

RACING

6-61: For ROAR required classes, Regional and National Championship's A-mains will be 30 minutes in length with a minimum 3-minute warm-up period. Otherwise, all mains will normally be from 15 to 30 minutes in duration with a 3-minute warm-up period. No refueling will be allowed once the warm-up period begins. A staggered standing start or rolling start in qualifying formation may be used at the discretion of the Race Director. For unforeseen delays during warm-ups; review rule (6-51)

6-62: Races will be run using air horns, loudspeakers and/or flags to alert drivers of a caution situation.

CAUTIONS:

1. A Single two second blast -All clear - GREEN Flag
2. Two one second blasts CAUTION - YELLOW Flag Condition - Slow!
3. Three one second blasts -Quit - RED Flag Condition – HALT WHERE YOU ARE!
This signal Immediately stops the qual or main!

6-63: Under a Caution #2 (Yellow flag condition), racers must bring their cars to a slow controllable speed and are **not allowed to pass**.

6-64: A Caution #2 or #3 (Yellow or RED Flag) condition must be called prior to anyone going onto the race track. No corner marshals or mechanics are allowed on the track during practice or racing without a caution being called. Marshals will wait until race vehicles come to a slower, controlled pace before entering racing area. Track maintenance must be done under a caution condition.

PENALTIES

6-65: Rough driving or passing under a Caution #2 (Yellow Flag): A ten (10) second stop-and-go. A second offense may result in disqualification at the discretion of the Race Director.

6-66: Failure to obey a Caution #3 (Red Flag) will result in disqualification.

6-67: All other ROAR rules regarding penalties and disqualification apply.

SAFETY

6-68: A ten (10) inch supported outside barrier is **required**. A three-foot high secondary barrier (a catch fence), capable of retaining a vehicle at speed, must be placed in all areas where the cars are traveling in excess of 25mph. It must be positioned either behind the recommended 10 inch outside barrier or placed at a minimum of 16 inches from the marking lines of the track if no other outside barrier is used. This barrier must be made of a material capable of stopping a 22 pound vehicle at speeds over 60 mph. Effective crowd control must be used at all times while cars are on the track. Spectators should NOT be allowed within 25 feet of high-speed areas of the track.

6-69: A shut-off switch is to be used and must be marked by a white 20mm circle, bordered by a red ring and centered within, is the letter 'E'. This 'E' mark must be next to the switch and kept free of grime. The location of the switch will be either in the rear window area or accessible through the rear window if the rear window is cut out.

6-70: Unless adequate explosion/fire protection is worked out to ROAR's satisfaction, there will be NO REFUELING during quals or mains. For unforeseen delays during warm-ups for mains; review rule (6-51).

6-71: Transmitters are limited to the manufacturer's recommended voltage. External transmitter battery packs are not permitted.

The following is highly suggested:

1. Vehicles should have a fail-safe system that will positively return the vehicle's throttle to an idle position if the vehicle has lost all electrical power or it's radio signal.
2. For safety reasons: It is NOT recommended that the auxiliary battery (used in any vehicle) have a higher voltage than the voltage listed in the manufacturer's specifications for the radio receiver or servos being used.

6-72: Cars must have brakes in good working condition. Brakes must be capable of stopping a car from racing speeds and must be able to hold the car motionless with the engine running.

RADIOS AND SERVOS

6-73: Three channel radios are permitted, the only functions allowed are steering, throttle, and brake. No onboard traction control or other electronic aids other than fail-safe(s) to stop the car in the event of a radio/battery failure are allowed. A fail-safe radio/servo system is highly recommended. It is highly suggested that separate battery systems be used; one for the radio receiver and a separate pack to power the control servos.

(IFMAR) WORLD TEAM RULES

7-1: The International Federation of Model Auto Racing (IFMAR) is the sanctioning body for all World Championships (WC). ROAR is one of four voting member Blocs of IFMAR. The others are the European Federation of Radio Controlled Automobiles (EFRA), the Far East Model Car Association (FEMCA) and as of 2003, the Fourth Association of Model Auto Racing (FAMAR). ROAR is the only organization in Canada and the United States entitled to send drivers to a WC.

7-2: IFMAR WC are held for electric and fuel cars on off-road and on-road tracks. Individual events are held every other year, and normally rotate between EFRA, FAMAR, FEMCA, and ROAR.

7-3: Entries are limited to 150 drivers or less. ROAR is normally allocated **30** entries for each WC, and may receive additional entries if they are not used by the other blocs. Entries not used by ROAR are returned to IFMAR for reallocation.

7-4: ROAR has adopted a general policy for selecting the members of a WC team. Those eligible for the team include; the A main drivers from the previous WC in that class, and the top finishers (the exact number depends on the number of pre-qualified drivers from the prior WC) in that class from the previous year's ROAR Nationals. If ROAR events other than ROAR Nationals are to be

used to qualify drivers for the ROAR WC Team, those events will have secondary priority to ROAR National events.

7-5: If more than one class is run at a WC, as is the case with 2WD and 4WD off-road, the team will consist of the A main drivers in both classes from the previous WC and the top finishers in those classes at the previous year's ROAR Nationals. These positions will be allocated based on the number of entries in the two classes at the ROAR Nationals.

7-6: Drivers qualified for a WC must keep their membership current or they will lose their eligibility.

7-7: Since there are normally some drivers who are eligible, but not able to attend the WC, a system for selecting alternates has been established. Any driver wanting to be an alternate can send a resume of racing experience to the appropriate IFMAR representative (Fuel or Electric) as announced in our Rev-Up newsletter or posted on our ROAR web site. Selection of alternates will be based on racing experience, and will take place after the deadline for primary entries has expired. Primary consideration will be given applicants seeking alternate status on our World Championship Team that have won first place in the appropriate class at their Regional event.

NATIONALS POLICIES

8-1: The Nationals are ROAR's premier events. As such, they are governed by the rules contained in this book and specific rules contained in the current year's "National Guidelines". Only ROAR National Events are allowed to use the term "ROAR Nationals" in their promotional efforts. All advertising must state "**ROAR 2004** XXX Nationals" and cannot be referred to as, or in conjunction with, any manufacturer, or another event.

8-2: The importance of these events makes site selection critical to their success. The process begins with each Class Committee's solicitation for bids. The Class Committee(s) will select the site and Organizer and submit their choice to the ROAR Executive Committee for final approval. The Organizer must be a current ROAR club or track with experience in holding large racing events under ROAR rules.

8-3: The Executive Committee will meet in early Fall to make the final site selections. Selections will be based on the recommendations of our Class Committees.

8-4: To provide the widest possible exposure and opportunity to compete, the location of the individual National events will be rotated as much as possible.

8-5: In selecting Nationals sites, our Class Committees will make every effort to avoid having the same Nationals, or any other Nationals, at the same location two years in a row. ROAR will try to avoid using the same location on a repetitive basis. If it appears that a National has become more of a regional event, that National will be considered for elimination.

8-6: ROAR will designate the classes and scales which will receive the National Championship designation. IFMAR world championship classes will be the main basis for selecting required classes. Other classes or scales may be offered in support of the event, but will not receive National Championship designation unless pre-approved by ROAR.

8-7: Only ROAR approved motors, batteries, mufflers and bodies may be used in National Championship events. These products must have been listed in a Rev-Up, a newsletter, or on www.roarracing.com fourteen (14) days prior to the event to be eligible for use. .12 and .15 legal mufflers are described by rules 6-13, 6-14 and 6-17, and only IFMAR approved Mufflers are to be used for .21cc engines. If deemed necessary by the Executive Committee, support classes or scales may be excluded from the fourteen day requirement.

8-8: All ROAR Nationals will be governed by special National Guidelines which must be strictly followed. Any deviations from the National Guidelines or ROAR Rules must be approved by the ROAR Executive Committee. The ROAR National Guidelines are available from the ROAR

Administrator or may be downloaded from the www.roarracing.com website, and may be used by any member track wanting to conduct races using the National's format. National Policies (in this rule book) and/or the current year's ROAR National Guidelines may supersede other rules in this rule book.

8-9: Nationals entries will be limited as indicated in the National Guidelines. Classes offered are limited to six. Junior, Masters, Demonstration and Provisional classes may be included as long as they do not exceed the six class limit. Juniors are drivers age 15 and under on the final day of the race. Masters are drivers age 40 and over on the first day of qualifying. Proof of age is required. Juniors and Masters may enter other classes, but not in the same type vehicle. Drivers will be limited to a maximum of three classes at all Nationals unless otherwise indicated in the National Guidelines.

8-10: Entries may not be transferred from one driver to another without the express permission of the Race Director.

8-11: Handout motors will be used in all stock electric classes. There is no requirement to impound stock motors overnight. If this is done, drivers must be informed when they pick up their motors for the first time.

8-12: Vehicles, parts and accessories used in Stock electric classes must be readily available through retail outlets at least 14 days prior to the event.

8-13: All cars must cross the timing loop prior to the start of every race to verify correct transponder operation and proper car numbers.

8-14: All cars must pass tech inspection prior to or after every race or both. Cars identified as illegal during pre-race inspection will not be allowed to run. A minimum tech inspection consists of but is not limited to: vehicle weight, proper engine/motor, legal body, assigned frequency and vehicle number. Inspections may be called for by the Race Director, Technical Inspectors or the Designated ROAR Official at any time. Cars identified as illegal during post race inspection will be disqualified.

8-15: Local procedures and rules that conflict with ROAR rules are not allowed.

8-16: Tire traction chemicals or other chemicals that emit odors that could be offensive or are labeled as hazardous should not be permitted at indoor events or in pits that are indoors. Use of traction compounds at any ROAR event is at the discretion of the Race Director and any/all bans or special requirements must be disclosed in advertising and on race entry forms.

8-17: The specific Nationals track layout will not be run on prior to the race except for a minimum of two and a maximum of four days prior to the event. The exception to this would be a permanent (not adjustable) on-road course or a dirt/concrete/asphalt/carpet oval track.

8-18: Qualifying will use IFMAR Starts. On a track with low lap times, starting will be by rows.

8-19: Except for oval and 1:5 scale events, qualifying will be based on the ROAR Qual-Points System. Under this system, the TQ in each round gets zero points, second best two points, third gets three points, etc. Qualifying order will be determined by the sum of the points from each driver's best two Qual Points rounds. Any resulting ties will be broken by the next best Qual Points until the tie is resolved.

Oval Nationals will use each racer's one fastest run, their Top Qualifying Run (TQR), to determine their grid position for the mains.

8-20: There will be a minimum of 10 drivers in the A Mains. There will be three A mains for all electric classes, to include Juniors and Masters classes, and one main for all other mains. If a driver wins the first two mains, he must sit out the third. Any deviation from this format must be approved by ROAR in advance. Triple A-Main results will be decided by a point system based on ten (10) points for the winner of each separate Main on down to one (1) point for the tenth placed

finisher in each separate Main. The best two (2) out of three (3) Mains will count with the first tie breaker being the finishing position of the third best (remaining) Main. In the event of a need for a second tie breaker, the laps and times of the best two (2) out of three (3) Mains will be used.

8-21: The finishing order of the race will be determined by the order in which the cars reach the finish line. This will take precedence in the event there is a conflict with the results reported by the computer. The fact that a car crosses the finish line outside the limits of the racing line will not be cause for a penalty unless it results in an advantage over another car. A finish line Video camera capable of high speed action is required for all electric Mains. In fuel classes, it is required for recording the C, B and A-Mains where 'bump-ups' are utilized. A Finish line Judge is required to observe and record the order of the finish of all A-Mains.

8-22: At Stock Off-road Nationals, Juniors and Masters may enter other classes, but not in the same type vehicle. If the Stock Nationals precede the Modified Nationals, any driver who finishes in the top 10% (rounded up) of a regular class will be barred from entering the Modified Nationals (Juniors and Masters not included). Drivers who are currently qualified for an IFMAR WC or have participated in either of the two previous off-road WC may not enter this event.

8-23: If the Modified Nationals precede the Stock Nationals, any driver who finishes in the top 20% (rounded up) of any class will be barred from entering the Stock Off-Road Nationals.

CONCOURS RULES

9-1: These rules establish a consistent basis for judging cars entered in a Concours.

9-2: Concours may be divided into two divisions; Best Appearing and Most Authentic. The Best Appearing category is for original designs and workmanship, not copies of full-size cars. The Most Authentic category is for scale representation of full-size race cars. The number of categories and awards is at the discretion of the Race Director.

9-3: A committee of three judges should be used to determine the winners. A judge may not have a car entered in the Concours. Each judge shall independently score each car. Each category shall be awarded a maximum of ten points. A perfect car would receive ten points in each category. The cars are scored based upon comparative judging from among all the cars entered. Judges should take into consideration the difficulty of hand painted and hand crafted parts versus store bought decals, stickers, tape, or other items. The highest scoring entry will be the winner, the second highest scoring entry will be awarded second place and so on.

9-4: To qualify for an award, trophy winners must race their cars in a main or qualifier following the judging. Any item attached to the body, that was used in the determination of a score, must remain on the car. Wings, drivers, and bodies cannot be changed. Motors, tires, rims, and batteries can be changed.

9-5: Winning cars are not allowed to compete in another ROAR Concours event regardless of event level.

9-6: Suggested Concours scoring sheets are included in Appendix C, on pages C-1 and C-2.

9-7: Ties should be broken by choosing the car with the highest point total in a category. The order of selection is: (1) Overall Effect; (2) Detail; (3) Paint; and (4) Body Preparation. For the Most Authentic division, authenticity should be the tie breaker.

CATEGORIES FOR BEST APPEARING

9-8: Overall Effect: Does the package blend together well? Is it visually appealing or gaudy? Does the paint scheme fit the body style?

9-9: Detail: Are decals neatly trimmed? Are decals hand painted? Are decals on straight? Are decals appropriate to the class? Is the driver's cockpit fully detailed? Is the interior painted?

9-10: Paint: Does the paint bleed through in any areas? Are multiple colors used? Is it a simple or complicated paint scheme? Is striping straight?

9-11: Body Preparation: Is it neatly trimmed? Are the edges sanded and radiused? Are the wheel openings centered? Are the modifications made to the body inventive and well done?

CATEGORIES FOR MOST AUTHENTIC

9-12: These are the same as the Best Appearing criteria with the addition of one element, Authenticity. Are photographic documents included? How does the entry compare to the documents? Does the overall package blend well together? Are there items included, such as wheels, motor, mirrors, antennas, driver, lights, etc., that add to the authenticity?

9-13: Cars entered in this category must be operational, but are not required to be raced.

COST CONTROL

10-1: ROAR is dedicated to controlling the cost of racing and making it affordable for entry level drivers to become involved in the sport.

10-2: Members are encouraged to submit suggestions to the President, Class Chairperson or ROAR Administrator that will help in controlling or lowering the costs while maintaining a fair playing field.

10-3: Tracks are encouraged to offer cost controlled classes that will allow new drivers to enter the sport with a minimum investment and others to participate at a reasonable cost.

10-4: In offering cost controlled classes, tracks may specify which batteries, bodies, chassis, gear ratios, motors, and tires may be used. Care should be taken not to restrict usage of any of the above items to a single manufacturer.

REVISION POLICY

11-1: It is ROAR's intention to revise these rules, as needed and on an annual basis. Members, ROAR Officials, Track Operators, and Industry Affiliates are encouraged to send suggested changes to the ROAR Administrator or the ROAR President.

11-2: Suggestions should be in writing and may be sent by E-mail, Fax, or Letter. To the extent possible, a response will be provided for each suggestion. Addresses of key ROAR Officials are listed in Rev-Up.

11-3: Changes to the rules between editions of the rule book will be effective upon publication in the Rev-Up newsletter, a special bulletin, or posting on www.roarracing.com.

APPENDIX – A – SPECIFICATIONS

1/10 ELECTRIC OFF-ROAD (IFMAR 1/10 Off-Road Classes)

Minimum track width -----	Continuous 8 feet
Maximum length - -----	475 mm
Maximum width - -----	250.0 mm
Maximum height - -----	203 mm
Wheel base - -----	Minimum -- 229 mm Maximum -- 292 mm
Min. weight W / transponder -----	2WD 1499 g. (IFMAR)
Min. weight W / transponder -----	4WD 1613 g. (IFMAR)
Wheel dia. - 1.625" Min. mounting bead	41.275 mm
2.2" Max. mounting bead	55.88 mm
2.42" Max. overall -----	61.468 mm
Maximum wheel width - 1.5" -----	38.1 mm
Maximum tire diameter - 3.543" -----	90 mm
Maximum tire width - 1.75" -----	44.45 mm
Batteries -----	6 cells maximum
Transmission -----	1 speed only
Rear suspension -----	Independent
Race lengths -----	Stock 5 minutes Modified 5 minutes

Bodies - Buggy or other off-road style body that resembles an actual off-road racing vehicle.

Tires - Rubber only – (See 'Note' below.)

Note: Handout tires must be used in all ROAR level 4 electric Off-Road events.

(More specifications with diagrams on pages B-1 and B-2 (Appendix B.))

1/10 ELECTRIC OFF-ROAD 2WD TRUCK

Minimum track width -----	Continuous 8 feet
Maximum length -----	18"
Maximum width -----	13"
Wheel base -----	Minimum - 9" Maximum - 11.5"
Minimum weight -----	60 ounces
Wheel diameter -----	Minimum mounting bead -- 2.175" Maximum mounting bead - 2.25" Maximum overall ----- 2.46"
Maximum wheel width -----	2"
Tire width -----	Minimum - 2" Maximum - 2.125"
Minimum tire diameter -----	3.6"
Wheel cut out -----	Use body 'cut lines'
Batteries -----	- 6 cells maximum
Transmission -----	1 speed only
Rear suspension -----	Independent
Race lengths -----	Stock 5 minutes Modified 5 minutes
Bodies -----	Off-road Truck
Tires -----	Rubber only - See Note below.

Note: Handout tires must be used in all level 4 electric Off-Road events.

1/12 ELECTRIC ON-ROAD

(IFMAR 1/12 On-Road Class)

Minimum track width - - - - -	4 cell; continuous 6 feet 6 cell; continuous 8 feet
Maximum length - - - - -	380 mm
Minimum length - - - - -	320 mm
Maximum width - - - - -	172 mm
Minimum height - - - - -	69.85 mm
Wheel base - - - - -	Minimum 184 mm Maximum 222 mm
Minimum weight - - - - -	4-cell 795.2 g 6-cell 880.0 g (IFMAR Min.)
<u>Wheel diameter</u> - - - - -	Minimum - 29 mm Maximum - 38 mm
<u>Wheel width</u> - - - - -	Minimum - 13 mm Maximum - 38 mm
Tire diameter - - - - -	Maximum - 53.34 mm
Tire width - - - - -	Minimum - 13 mm Maximum - 38 mm
Wheel cut out - - - - -	9.5 mm - maximum over tire diameter
Batteries - - - - -	Carpet - 4 cells maximum Paved - 6 cells maximum
Transmission - - - - -	1 speed only
Rear drive/suspension - - - - -	Single one-piece drive axle only;
Independent rear suspension is not allowed	
Race lengths - - - - -	Qualifiers 8 minutes Main events 8 minutes
Bodies - - - - -	CanAm, GTP, and WSC
Tires - - - - -	Foam only

Note - Minimum carpet ground clearance excluding spur gear is 3mm.

An IFMAR (not ROAR) rule note:

The wing must clear all parts of the body shell by a minimum 6.5 mm.

1/10 ELECTRIC ON-ROAD

(No longer an IFMAR Class)

Minimum track width -----	Carpet	continuous 8 feet
	Paved	continuous 10 feet
Maximum length -----	22.05"	
Maximum width -----	9.875"	
Minimum height -----	3" (See Note below)	
Wheel base -----	Minimum -	9.0"
	Maximum -	11.0"
Minimum weight -----	42.3 ounces (conversion of IFMAR's 1200gr Wt.)	
Wheel diameter -----	Minimum -	1.625"
	Maximum -	2.0"
Wheel width -----	Minimum -	0.75"
	Maximum -	2.0"
Tire diameter -----	Maximum -	2.6"
Tire width -----	Minimum -	0.75"
	Maximum -	2.0"
Wheel cut out -----	.375" - maximum over tire diameter	
Batteries -----	6 cells maximum	
Transmission -----	1 speed only	
Rear <u>drive</u> /suspension -----	Single one-piece drive axle only; Independent rear suspension is not allowed	
Race lengths -----	Stock -	5 minutes
	Modified -	5 minutes
Bodies -----	CanAm, GT, GT-1, GTP, TransAm, and WSC	
Tires -----	Foam only	

Notes - Minimum carpet ground clearance excluding spur gear is - 4mm.
Minimum vehicle height for GT, GT-1, and TransAm is - 4"

1/10 ELECTRIC T-2 TOURING CAR

(IFMAR 10th ISTC Class)*

Minimum track width	-----	Carpet - continuous 8 feet Paved - continuous 10 feet
Maximum length	- -----	460 mm
<u>Maximum width</u>	- With body - --- Without body - -	195 mm 190 mm
<u>Height</u>	Minimum - --- Maximum - ---	130mm with 20mm blocks under the chassis 190mm with 20mm blocks under the chassis
<u>Wheel base</u>	Minimum - --- Maximum - ---	250 mm 270 mm
<u>Minimum weight</u>	-	1525 gr. (IFMAR min.)
<u>Wheel diameter</u>	- Minimum - ---	47 mm
<u>Wheel width</u>	Minimum - ---- Maximum - ----	24 mm 31 mm
<u>Tire diameter</u>	Minimum - --- Maximum - ---	<u>55 mm Foam - 63 mm Rubber</u> 67 mm
<u>Tire width</u>	Minimum - ---- Maximum - ----	24 mm 31 mm
Wheel cut outs	-----	.375" maximum over tire diameter
Batteries	-----	6 cells maximum
Motor	-----	Approved Modified (10 turn minimum limit)
Transmission	-----	1 speed only
<u>Front & Rear suspension</u>	-----	Independent
Race lengths	-----	Stock - 5 minutes Modified - 5 minutes
Bodies	-----	2 and 4-door cars sedan Touring Cars and must be ROAR approved
Tires	-----	Rubber only on paved tracks. Rubber only or Foam only on carpet tracks. No capped tires.

- Notes -
1. One wing allowed; fitted in the same place as the wing on the original car.
 2. Wing must be fastened to the rear deck.
 3. Rear edge of the wing may not overhang the rear of the body by more than .4".
 4. No part of the wing may extend above the roof line
 5. Rear of body to include rear bumper and may not be cut out above **55mm with 20mm blocks under the chassis.**
 6. Only four wheel drive (4wd) allowed.
 7. Minimum ground clearance for carpet racing is **4mm.**

* (ISTC – International Scale Touring Car)

1/10 ELECTRIC CART/F1/IRL

Minimum track width -----	Continuous 8 feet
Maximum length -----	22"
Maximum width -----	8.4"
Height - Maximum -----	5.5"
Wheel base -----	Minimum - 9.0" Maximum - 11.0"
Minimum weight -----	36 ounces
Wheel diameter -----	Minimum - 1.25" Maximum - 1.42"
Wheel width -----	Minimum - .75" Maximum - 1.75"
Tire diameter -----	Minimum - 1.5" Maximum - 2.5"
Tire width -----	Minimum - .75" Maximum - 1.75"
Batteries -----	6 cells maximum
Transmission -----	1 speed only
Rear drive/suspension -----	Single one-piece drive axle only; Independent rear suspension is not allowed
Race lengths -----	Qualifiers - 5 minutes Main events - 5 minutes
Bodies -----	CART, F1, and IRL
Tires -----	Foam only

Notes - No after market chassis allowed. Graphite axles are permitted.
Stick or side-by-side batteries only. Saddle packs are not allowed.

1/12 ELECTRIC OVAL

Minimum track width -----	Continuous 10 feet
Maximum length -----	16.0"
Maximum width -----	6.75"
Minimum height -----	Foam tires - 3.375" Capped tires - 3.50"
<u>Wheel base</u> -----	Minimum - 7.25" Maximum - 9.25"
Minimum weight -----	31 ounces - foam tires 33 ounces - capped tires
Wheel diameter -----	Minimum - 1.3" Maximum - 1.5"
Wheel width -----	Minimum - .5" Maximum - 1.5"
Tire diameter -----	Maximum - 2.1"
Tire width -----	Minimum - .5" Maximum - 1.5"
Wheel cut outs -----	.375" maximum over tire diameter
Batteries -----	4 cell maximum
Transmission -----	1 speed only
Rear drive/suspension -----	Single one-piece drive axle only; Independent rear suspension is not allowed
Race lengths -----	Qualifiers - 4 minutes Main events - 4 minutes
Bodies -----	Stock car
Tires -----	Foam or capped

Note - Minimum ground clearance - .125".

1/10 ELECTRIC OVAL

Minimum track width -----	Continuous 10 feet
Maximum length -----	20"
Width -----	Minimum - 7.25" Maximum - 9.875"
Minimum height -----	Car - Foam tires - 4.25" Capped tires - 4.5" Truck - Foam tires - 4.5" Capped tires - 4.75"
Wheel base -----	Minimum - 9.0" Maximum - 11.0"
Minimum weight ---- Using 6 cells ----	42 ounces foam tires 44 ounces capped tires
Minimum weight ---- Using 4 cells ----	<u>40 ounces</u> foam tires <u>42 ounces</u> capped tires
Wheel diameter -----	Minimum - 1.625" Maximum - 2.0"
Wheel width -----	Minimum - .75" Maximum - 2.0"
Tire diameter -----	Maximum - 2.6 "
Tire width -----	Minimum - .75" Maximum - 2.0"
Wheel cut outs -----	.50" maximum over tire diameter
Batteries -----	6 cells maximum
Transmission -----	1 speed only
Rear drive/suspension -----	Single one-piece drive axle only; Independent rear suspension is not allowed
Race lengths -----	Qualifiers - 4 minutes Main events - 4 minutes
Bodies -----	Stock car and Truck
Tires -----	Foam or capped

Notes - Minimum pre-race ground clearance - .1875".

On truck bodies the tailgate section may be removed, side panels must be intact.

Truck box must be covered, flush with the top of the box, and must be painted.

Wings or side dams can NOT be used on trucks.

1/10 ELECTRIC DIRT OVAL

Minimum track width -----	Continuous 10 feet
Maximum length -----	22"
Maximum width -----	9.875"
Maximum height -----	11" - Sprint Car to top of wing 11" - Modified Stock with side dam
Wheel base -----	Minimum - 9.0" Maximum - 11.5"
Minimum weight -----	2WD - 50 ounces 4WD - 52 ounces Truck - 50 ounces
Wheel diameter -----	Minimum - 1.5" Maximum - 2.15"
Maximum wheel width -----	2.0"
Maximum tire diameter -----	3.544"
Maximum tire width -----	2.0"
Wheel cut outs -----	.5" maximum over tire diameter
Batteries -----	6 cells maximum
Transmission -----	1 speed only
Rear suspension -----	Independent
Race lengths -----	Qualifiers - 4 minutes Main events - 4 minutes
Bodies -----	Stock Car, Modified Stock Car, Sprint Car, Off-road Truck, and Stock Truck
Tires -----	Foam, rubber, or capped

Note - Sprint cars must have headers, nerf bars, rear tail section, and roll cage.

1/10 FUEL OFF-ROAD

Minimum track width -----	Continuous 8 feet
Maximum length -----	18"
Maximum width -----	9.875"
Wheel base -----	Minimum - 9.0" Maximum - 11.5"
Minimum weight -----	2WD - 56 ounces 4WD - 60 ounces
Wheel diameter -----	Min. mounting bead - 1.625" Max. mounting bead - 2.2" Max. overall - 2.42"
Maximum wheel width -----	1.5"
Maximum tire diameter -----	3.544"
Maximum tire width -----	1.75"
Engine -----	.12 only
Transmission -----	1 speed only
Rear suspension -----	Independent
Race lengths -----	Qualifiers - 5 minutes Main events - 5 to 60 minutes
Bodies -----	Buggy or other off-road style body that resembles an actual off-road racing vehicle.
Tires -----	Rubber only

1/10 FUEL 2WD OFF-ROAD TRUCK

Minimum track width -----	Continuous 8 feet
Maximum length -----	18"
Maximum width -----	13"
Wheel base -----	Minimum - 9.0" Maximum - 11.5"
Minimum weight -----	60 ounces
Wheel diameter -----	Minimum mounting bead - 2.175" Maximum mounting bead - 2.25" Maximum overall - 2.46"
Maximum wheel width -----	2.0"
Tire width -----	Minimum - 2.0" Maximum - 2.125"
Minimum tire diameter -----	3.6"
Wheel cut outs -----	Use body cut lines
Engine -----	.12 only
Transmission -----	1 speed only – viscous or slipper drivers are allowed
Rear suspension -----	Independent
Race lengths -----	Qualifiers - 5 minutes Main events - 5 to 60 minutes
Bodies -----	Off-road Truck
Tires -----	Rubber only

1/8 FUEL OFF-ROAD

(IFMAR 8th Off-Road Class)

Minimum track width	-----	Continuous 10 feet
Maximum length	- -----	730 mm
Maximum width	- -----	310 mm
Maximum height	- -----	250 mm
<u>Wheel base</u>	-----	Minimum - --- 270 mm Maximum - --- 330 mm
<u>Minimum weight</u>	- -----	3,200 grams
Wheel diameter	-----	Minimum - 3.2" Maximum - 3.4"
Maximum wheel width - 1.75"	-----	44.45 mm
Tire diameter	-----	Minimum - 4.3" Maximum - 4.7"
Maximum tire width - 1.85"	-----	46.99 mm
Engine	-----	.21 only
Transmission	-----	1 speed only
Rear suspension	-----	Independent
Race lengths	-----	Qualifiers - 5 minutes Main events - 5 to 60 minutes
Bodies	----	Buggy or other off-road style body that resembles an actual off-road racing vehicle
Tires	-----	Rubber only

Notes - Maximum height is measured with suspension fully compressed.
Two or four wheel drive allowed.

1/10 .15 FUEL ON-ROAD 2WD

Minimum track width -----	Continuous 10 feet
Maximum length -----	19.3"
Maximum width -----	9.875"
Height - Minimum -----	4.625"
Wheel base -----	Minimum - 9" Maximum - 11"
Minimum weight -----	Suspension - 1,814g Pan --- 1,474g
Wheel diameter -----	Minimum - 1.625" Maximum - 2.125"
Maximum wheel width -----	Front - 30mm Rear - 51mm
Maximum tire diameter -----	Front - 76mm Rear - 81mm
Maximum tire width -----	Front - 30mm Rear - 51mm
Wheel cut outs -----	.5" maximum over tire diameter
Engine -----	.15
Transmission -----	1 or 2 speed only
Rear suspension -----	Independent
Race lengths -----	Qualifiers - 5 minutes Main events - 5 to 60 minutes
Bodies -----	CanAm, GTP, and WSC
Tires -----	Foam only

Notes - Rear wheel drive only.

1/10 FUEL 4WD OPEN

	235MM	200MM
Engine -----	.15 open	.12 open
Maximum length -----	490 mm	460 mm
Maximum width -----	250 mm	200 mm (no body) 205 mm (w/ body)
Maximum height -----	150 mm	125 mm
Wheel base -----	Min.- 230 mm Max.- 280 mm	230 mm 270 mm
Minimum weight -----	2000 g	1725 g
Wheel diameter -----	Min.- 49 mm Max.- 54 mm	47 mm 51 mm
<u>Maximum tire/wheel width</u> -----	Front- 30 mm Rear- 51 mm	31 mm 31 mm
Wheel cut outs max over tire dia. -----	10 mm	7 mm
Fuel tank capacity maximum -----	80 cc	75 cc

Bodies - Any ROAR approved on-road body.

Tires - Foam only

Tire diameter - no restrictions

Transmission - 1 or 2 speed only

Suspension/Drive - Independent or straight axle, 4WD only

Minimum track / lane width -Continuous 10 feet

Race lengths - Qualifiers - 5 minutes
Main events - 5 to 60 minutes

Note: Body style may be specific at Level 3 or 4 events.

.12 FUEL TOURING CAR 4WD

(IFMAR 200 mm ICTC Class)

Minimum track width	-----	Continuous 10 feet
Maximum length	- 18.1" -----	460 mm
Maximum width	-----	WO/ body -- 200 mm With body -- 205 mm
Height - Minimum	- -----	130mm with 20mm blocks under the chassis
Wheel base	-----	Minimum - 249mm Maximum - 270mm
Minimum weight	- - -	1725 g
Wheel diameter	-----	Minimum - 47.0 mm
Wheel width	-----	Minimum - 24.0 mm Maximum - 31.0 mm
Tire diameter	-----	Minimum - 55 mm Maximum - 67 mm
Tire width	-----	Minimum - 24 mm Maximum - 31 mm (no tolerances allowed)
Wheel cut outs	-----	.4" maximum over tire diameter
Engine	-----	.12 only
Transmission	-----	1 or 2 speed only
Rear suspension	-----	Independent
Race lengths	-----	Qualifiers - 5 minutes Main events - 5 to 60 minutes
Bodies	-----	2 and 4-door cars sedan Touring Cars and must be ROAR approved
Tires	-----	Foam or rubber only, no capped tires

- Notes -
1. One wing allowed; fitted in the same place as the wing on the original car.
 2. Wing must be fastened to the rear deck.
 3. No part of the wing may extend above the roof line.
 4. Rear of body to include rear bumper and may not be cut out above **55mm with 20mm blocks under the chassis.**
 5. Front side windows and rear window may be cut out for cooling.
 6. One cooling hole, not to exceed **50mm** in any dimension, may be cut in the windshield **and may not intersect with any other holes in the body.**
 7. Four wheel drive only.

.15 FUEL TOURING CAR

(Discontinued IFMAR Class)

Minimum track width - - - - -	Continuous 10 feet
Maximum length - 19.3" - - - - -	490 mm
<u>Maximum width</u> - 9.84" - - - - -	250 mm
<u>Height</u> - - - - -	Minimum - 114 mm
Wheel base - - - - -	Minimum - 260 mm Maximum - 280 mm
Minimum weight - - - - -	1,800 grams
Wheel diameter - - - - -	Minimum - 41.2 mm Maximum - 51.0 mm
Maximum wheel width - - - - -	Front - 30.0 mm Rear - 51.0 mm
Maximum tire diameter - - - - -	Front - 75.0 mm Rear - 80.0 mm
Maximum tire width - - - - -	Front - 75.0 mm Rear - 80.0 mm
Wheel cut outs - - - - -	.394" (10mm) maximum over tire diameter
Engine - - - - -	.152 ci (2.5cc)
Transmission - - - - -	1 or 2 speed only
Rear suspension - - - - -	Independent
Race lengths - - - - -	Qualifiers - 5 minutes Main events - 5 to 60 minutes
Bodies - - - - -	<u>2 and 4-door cars sedan Touring Cars and must be ROAR approved</u>
Tires - - - - -	Foam only

- Notes -
1. One wing allowed; fitted in the same place as the wing on the original car.
 2. Wing must be fastened to the rear deck.
 3. No part of the wing may extend above the roof line.
 4. Rear of body to include rear bumper and may not be cut out.
 5. Front side windows and rear window may be cut out for cooling.
 6. One cooling hole, not to exceed 50mm in any dimension, may be cut in the windshield not to intersect with other holes.
 7. Rear wheel drive only.

1/8 FUEL ON-ROAD

(IFMAR IC 8th Circuit Class)

Minimum track width	-----	Continuous 12 feet
Maximum length	- -----	637 mm
Maximum width	- -----	267 mm
<u>Maximum height</u>	- -----	190 mm - to top of wing
Wheel base	-----	Minimum - 270 mm Maximum - 330 mm
<u>Minimum weight</u>	-----	2WD - 2,400g 4WD - 2525g Pan 2WD - 2,270g
Wheel diameter	-----	Minimum - 44.45 mm Maximum - 54.00 mm
Maximum wheel width	-----	Front - 37.0 mm Rear - 64.0 mm
Tire diameter	-----	No restrictions
Maximum tire width	-----	Front - 37.0 mm Rear - 64.0 mm
<u>Wheel cut outs</u>	- -----	13mm maximum over tire diameter
Engine	-----	.214ci (3.5cc) only
Transmission	-----	1, 2, or 3 speed only
Rear suspension	-----	Independent, - except Pan car. Pan 2WD car must use a single one-piece drive axle.
Race lengths	-----	Qualifiers - 5 minutes Main events - 5 to 60 minutes
Bodies	-----	CanAm, GTP, and WSC
Tires	-----	Foam only

1/5 SPECIFICATIONS

Super Touring Car (STC)

IFMAR class, FIA Class 2 or Class N, four door cars only

4 door only with a minimum full scale length of 165.4 inches (4200mm)

All dimensions must be within scale +/- 5% of full scale vehicle represented.

Minimum race track width	-----	12 feet (15 feet for IFMAR events)
Minimum weight, without fuel	<u>23.4</u> lbs -	9.5 kg
Minimum vehicle length	--- 31.4 " ---	798 mm
Minimum ground clearance		
at ride height	----- .236 " -	6.0 mm
w/+10 kg weight (IFMAR only)	--	2.0 mm
Maximum vehicle width	----- 15.6 " -	395 mm (widest point of body, excluding side mirrors)
Minimum vehicle width	---- 14.25 " --	362.0 mm
Minimum vehicle height	---- 9.76 " --	248.0 mm (Measured at .236 " (6mm) ground clearance)
Maximum wheel diameter	--- 4.2 " --	107.0 mm
Maximum tire diameter	---- 5.35 " --	136.0 mm
Maximum mounted tire/wheel width	---	Front - 2.95 " 75.0 mm Rear - 3.15 " 80.0 mm
Tires	-----	Semi pneumatic rubber only.
Engine displacement	-----	1.4 ci -- 23 cc
Maximum fuel tank capacity	-----	23.7 fluid ounces (700cc) including all hoses.
Transmission	-----	Single speed only. (No variable ratios)
Rear suspension	-----	Independent. - Rear wheel drive only.
Race lengths	-----	Qualifiers - 5 to 10 minutes Sub Main events - 15 to 30 minutes Main events - 15 - 30 minutes. National A-Mains will be 30 minutes long.
Bodies	-----	Approved Touring Car Bodies (STC) only.

Wings:

1. All wings must be painted.
2. Only one, single element rear wing is permitted. Maximum width - 300.0 mm
3. No dihedral or 'Plan shape' allowed, front and rear edge must be parallel.
4. Wing's side profile maximum, including side dams, is - 2.36 " by 2.36 " - (60 mm by 60 mm)
5. Highest point of wing cannot exceed 60.0 mm from deck at centerline of vehicle.

Notes:

1. Cars must have brakes in good working condition.
2. Brakes must be capable of stopping a car from racing speeds and must be able to hold the car motionless with the engine running.
3. A mechanical fail-safe must be fitted to the carburetor that will return the throttle to a closed position in case of a throttle failure.
4. A radio system "fail-safe" is HIGHLY recommended.
5. The body must cover the outer edge of the tires at the center of the axle when viewed from

the top.

1/5 Sports GT class

Dimensions must be within scale +/- 5% of the full scale vehicle represented. If there is a question, it is the responsibility of the racer to prove full-scale use and dimensions of the vehicle.

Minimum race track width	-----	12 feet
<u>Minimum weight</u> , without fuel	-----	<u>23.4</u> pounds.
Minimum ground clearance at ride height		.236 " -- 6.0 mm
Maximum vehicle width	----- 16.59 " -	420 mm (widest point of body, excluding side mirrors)
Maximum wheel diameter	----- 4.2 " -	106.7 mm
Maximum tire diameter	----- 5.35 " -	136 mm
Maximum mounted tire/wheel width	---	Front - 2.95 " 74.9 mm Rear - 3.15 " 80.0 mm
Engine displacement	-----	1.4 ci - 23 cc
Maximum fuel tank capacity	-----	23.7 fluid oz - 700cc including all hoses.
Transmission	-----	Single speed only. (No variable ratios)
Drive	-----	Rear wheel drive only.
Race lengths	-----	Qualifiers - 5 to 10 minutes Sub Main events - 15 to 30 minutes Main races - 15 - 30 minutes. National A-Mains are 30 minutes
<u>Bodies</u>	-----	<u>GT1, GT2, TA, US GT, or similar style.</u>

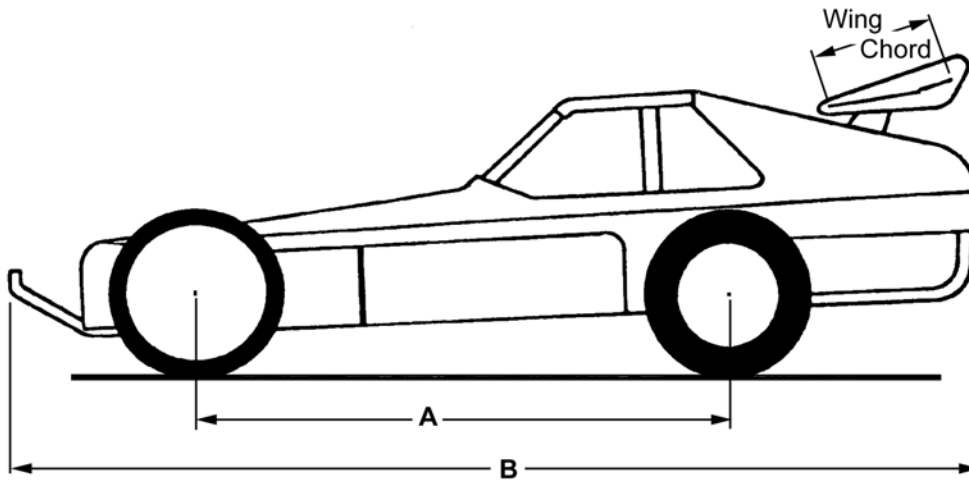
Wings:

1. Wings must look like the wing/spoiler of the original full scale car.
2. Wing may not exceed the roof line.
3. Wing may not extend beyond the side (max. Width) of vehicle.
4. Wing must be single element and separate from the body.
5. Wing - Maximum cord = 85.0 mm
6. Wing will be rectangular and non-dihedral.
(except where proof of Delta or 'Plan' shapes exist on 'full-scale' vehicles.)
7. Wing end plate dimensions are 85.0 mm wide by 60.0 mm high.
8. Wings must be painted.

Notes:

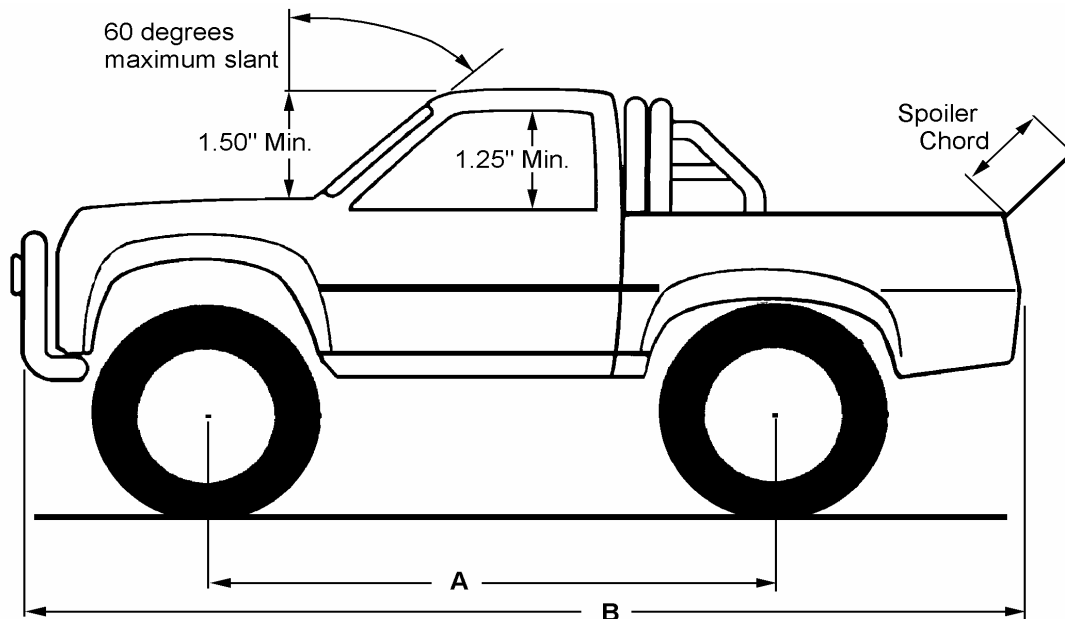
1. Cars must have brakes in good working condition.
2. Brakes must be capable of stopping a car from racing speeds and must be able to hold the car motionless with the engine running.
3. A mechanical fail-safe must be fitted to the carburetor that will return the throttle to an idle or off position in case of a throttle failure.
4. A radio system "fail-safe" is HIGHLY recommended.
5. The body must cover the outer edge of the tires at the center of the axle when viewed from the top.

APPENDIX – B – DIAGRAMS



OFF-ROAD BUGGY

	A Max	A Min	B Max	Width Max
1/10	11.50" 292.1mm	9.00" 228.6mm	18.00" 457.2mm	9.875" 250mm
1/8	13.20" 330mm	10.80" 270mm	28.74" 730mm	12.20" 310mm
	Wing Chord Max	Wing & Side Dam Length Max	Wing & Side Dam Height Max	Wing Width Max
FRONT 1/10	2.50" 63.5mm	2.75" 69.85mm	.75" 19.05mm	5.00" 127mm
REAR 1/10	3.00" 76.2mm	3.937" 100mm	2.00" 50mm	7.00" 177mm
REAR 1/8	3.03" 77mm	3.625" 92.07mm	2.375" 60.325mm	8.54" 217mm



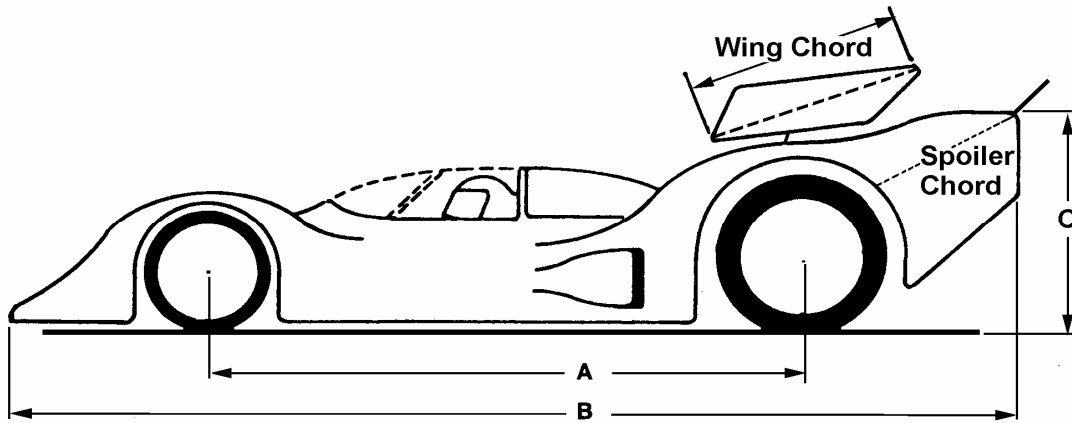
1/10 OFF-ROAD TRUCK

A Max	A Min	B Max	B Min	Width Max	
11.50"	9.00"	18.00"	15.25"	13.00"	
Spoiler Chord Max	Spoiler Width Max	Spoiler Edge Turn-Up Max	Spoiler Height Max	Cab Height Min	Window Height Min
2.00"	Body	0.25"	NA	1.50"	1.25"
Body Width Min	Cab Width Min	Body Height Min	Window Slant Max	Frontal Area Min	
5.75"	3.875"	4.25"	60 deg	23.03 sq in	

Formula for calculating the frontal area is as follows:

Cab width + body width / 2 x cab height + body width x body height.

Example: $3.875 + 5.75 / 2 \times 1.5 + 5.75 \times 2.75 = 23.03125$ sq in.

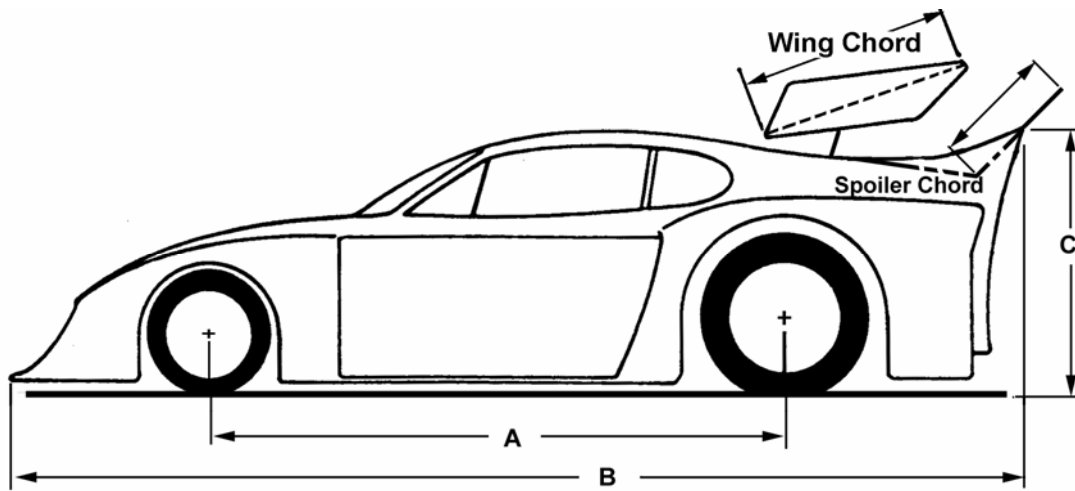


CanAm/GTP/WSC

A **B**
 Wheelbase Overall Length
 * See Appendix A for Specific Class Rules

	Spoiler Chord Max	Spoiler Dam Width Max	Spoiler Angle Max
1/12	38mm	172mm	N/A
1/10	51mm	250mm	45°
1/8	77mm	267mm	45°

Notes: Wings are not allowed on electric cars using this body style.



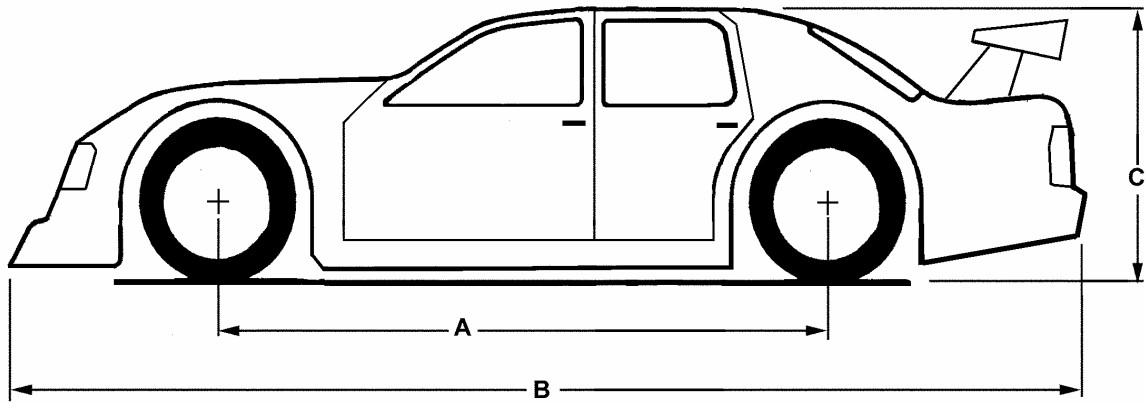
GT/GT-1/TransAm

	A Max	A Min	B Max	C Min
1/10	11.00"	9.00"	20.00"	4.25"
1/8	13.00"	11.00"	25.00"	N/A

	Wing Chord Max	Wing & Side Dam Length Max	Wing & Side Dam Height Max	Wing Width Max
1/10	3.00"	3.75"	2.00"	9.00"
1/8	3.10"	3.00"	1.50"	10.50"

	Spoiler Chord Max	Spoiler Dam Width Max	Spoiler Angle Max
1/10	2.00"	9.875"	N/A
1/8	2.00"	10.50"	45°

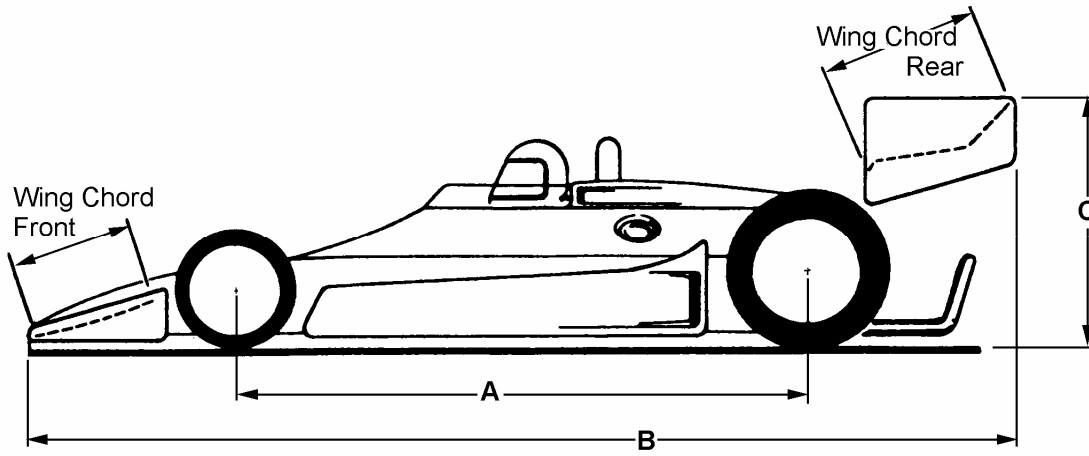
Notes: Maximum height for 1/8 is 7.60" to the top of the wing.
 Wings are not allowed on electric cars unless fitted to the actual car.



TOURING CAR

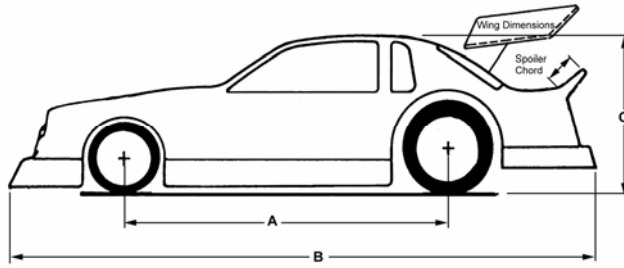
	A Max	A Min	B Max	C Min
Electric				
T-2	270mm	250mm	460mm	117mm
Fuel				
<u>.12</u>	270mm	230mm	460mm	114mm
.15	280mm	260mm	490mm	117mm
	Wing Chord Max	Wing & Side Dam Length Max	Wing & Side Dam Height Max	Wing Width Max
Electric				
T-2	40mm	40mm	20mm	190mm
Fuel				
<u>.12</u>	50mm	50mm	35mm	200mm
.15	55mm	55mm	35mm	250mm

Note: No part of the wing may extend above the roof line.



CART/F1/IRL

	A Max	A Min	B Max	C Max	Width Max
1/10	11.00"	9.00"	22.00"	5.50"	9.875"
	Wing Chord Max	Wing & Side Dam Length Max	Wing & Side Dam Height Max	Wing Width Max	
1/10 Front	2.00"	2.50"	1.50"	9.00"	
1/10 Rear	3.00"	3.75"	2.00"	9.00"	



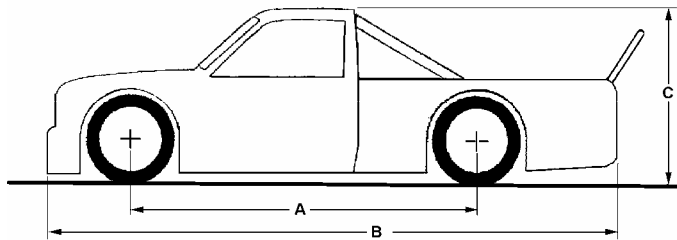
STOCK CAR

	A Max	A Min	B Max	C Min	Width Max
1/12	8.75"	7.25"	16.00"	3.50"	6.75"
1/10	11.00"	9.00"	20.00"	4.50"	9.875"

	Wing Chord Max	Wing & Side Dam Length Max	Wing & Side Dam Height Max	Wing Width Max
1/12	2.00"	2.50"	1.75"	6.75"
1/10	3.00"	3.75"	2.00"	9.00"

	Spoiler Chord With Wing Max	Spoiler Chord W/O Wing Max	Spoiler Width Max
1/12	.50"	1.50"	6.75"
1/10	.75"	2.00"	9.875"

Note - Minimum height with foam tires - 1/12 - 3.375"
1/10 - 4.25"

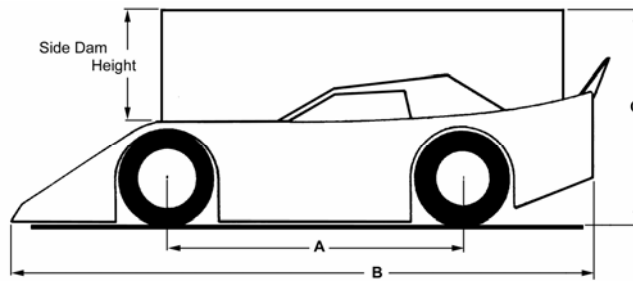


STOCK TRUCK

	A Max	A Min	B Max	C Min	Width Max
1/10	11.00"	9.00"	22.00"	4.75"	9.875"

	Spoiler Chord Max	Spoiler Width Max
1/10	2.00"	9.875"

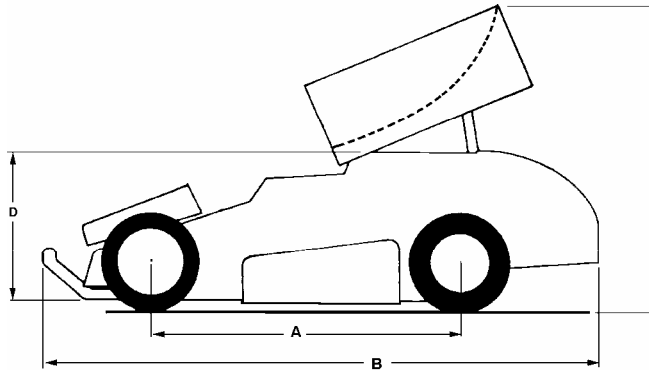
Note - Minimum height with foam tire - 4.5"



MODIFIED STOCK CAR

1/10	A Max 11.50"	A Min 9.00"	B Max 22.00"	C Max 11.00"	Width Max 9.875"
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1/10	Spoiler Chord Max 1.50"	Side Dam Length Max 14.00"	Side Dam Height Max 5.50"	Spoiler Width Max 9.875"
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SPRINT CAR

1/10	A Max 11.50"	A Min 10.00"	B Max 18.00"	C Max 11.00"	D Min 5.00"	Width Max 9.875"
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	Wing Chord Max	Wing & Side Dam Length Max	Side Dam Height Above Wing Surface Max	Wing Width Max
1/10 Front	2.00"	2.00"	1.00"	4.00"
1/10 Rear	7.00"	7.00"	4.00"	6.00"

Notes: Maximum side dam height on the right side is 3.25".
Front bumpers and front wings are optional.

APPENDIX – C – FORMS

CONCOURS SCORE SHEET

Race: _____ Date: _____
 Judge's Name: _____ Category/Class: _____

Car # _____	Score (1-10)	Car # _____	Score (1-10)
Overall Effect	_____	Overall Effect	_____
Detail	_____	Detail	_____
Paint	_____	Paint	_____
Body Preparation	_____	Body Preparation	_____
Authenticity	_____	Authenticity	_____
Total	_____	Total	_____

Car # _____	Score (1-10)	Car # _____	Score (1-10)
Overall Effect	_____	Overall Effect	_____
Detail	_____	Detail	_____
Paint	_____	Paint	_____
Body Preparation	_____	Body Preparation	_____
Authenticity	_____	Authenticity	_____
Total	_____	Total	_____

Car # _____	Score (1-10)	Car # _____	Score (1-10)
Overall Effect	_____	Overall Effect	_____
Detail	_____	Detail	_____
Paint	_____	Paint	_____
Body Preparation	_____	Body Preparation	_____
Authenticity	_____	Authenticity	_____
Total	_____	Total	_____

Car # _____	Score (1-10)	Car # _____	Score (1-10)
Overall Effect	_____	Overall Effect	_____
Detail	_____	Detail	_____
Paint	_____	Paint	_____
Body Preparation	_____	Body Preparation	_____
Authenticity	_____	Authenticity	_____
Total	_____	Total	_____

Authenticity is an element in determining the Most Authentic winner, and must be backed up with a photograph of an actual race car. Other categories are judged on the first four elements.

ROAR PROTEST FORM

Event: _____ Date: _____

Class: _____ Race Number: _____

Protesting: Scoring: _____ Procedure: _____ Rule: _____ Equipment: _____

Statement: _____

Driver's Name: _____ ROAR Number: _____

Driver's Signature: _____ Fee Included: \$ _____

Race Director: _____ Time: _____

Ruling: Protest Allowed: _____ Protest Rejected: _____

Reason: _____

Race Director's Signature: _____

Protested to ROAR: Yes: _____ No: _____

Ruling: Protest Allowed: _____ Protest Rejected: _____

Reason: _____

ROAR Official's Title: _____

ROAR Official's Signature: _____

