



# ***QUARTER SCALE AUTO CLUB***

Website <http://www.qsac.org>

## ***2000 OFFICIAL RULES PACKAGE***

*Quarter Scale Radio Controlled Cars*

### **CONTENTS:**

- Introduction
- I. Safety Requirements
- II. Race Procedure/Format
- III. General Specifications
- IV. Technical Compliance Responsibility
- V. Technical Specifications
  - A. Sprint Car/Super-modified
  - B. Grand National Stock Car
    - 1. Sportsman Stock Car
    - 2. Novice Stock Car
  - C. CRAFTSMAN Super-Truck
  - D. HONDA 4-Stroke Truck (2000 Test Class)
  - E. "EAST-COAST" MODIFIED
  - F. DRAG RACING
- VI. Track Sanction
- VII. Payout Schedule
- VIII. Engine Technical Inspection

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## INTRODUCTION

Welcome to the 2000 QSAC racing season! This is 2000 OFFICIAL RULES PACKAGE.

Once again, this has been a team effort, with participation of the Board, the Rules, Long Range Planning, Competition, and Manufacturers' Advisory Committees, as well as input from many of the membership. Thanks to all those who participated.

Whether you are a manufacturer or a renewing member, you're aware that QSAC made additional progress in 1999. This was possible only because of the spirit of cooperation and effort by all concerned toward making QSAC the Professional Organization it can and should be. The term "Professional" refers only to the manner in which the Organization is run. The true purpose of the Organization is to provide a platform from which to promote Quarter-Scale Racing, and serve the membership by offering a fair-minded, unbiased, sanctioning body dedicated to insuring a maximum amount of enjoyment from the sport.

To accomplish that, the Organization must be run in a businesslike manner, with responsible fiscal policies, guidelines for safety and event formats, promotional planning for the growth of the sport, and a Rules Package, fair to manufacturer and competitor alike, that is strictly and uniformly enforced. We believe we have those elements in place. Regardless of whether you are a renewing member, manufacturer, or are brand new to QSAC, it is in your best interest to be totally familiar with the QSAC Rules Package. It is important for you to know and understand the Rules, not just the ones that pertain to the class of car(s) you plan to run, or are planning to build. You must be familiar with the entire Safety section, General section, and class-specific Technical Specifications. You should also be knowledgeable in the Race Format section.

It is important to read and understand the Statement of Technical Compliance Responsibility (IV). It states that you, as a manufacturer or competitor, are totally responsible to insure that your Race Car complies with ALL the applicable Rules. If not, it is subject to immediate disqualification, with no discussion or appeal. It is especially important to insure that your engine(s) are completely within the published limits. In post-race tech-inspection, QSAC has a "Zero-tolerance" policy. Each of the published limits has a margin or buffer built into it, so if any spec is outside the limit, the engine/car/driver is disqualified. It is highly recommended that a competent inspector, using a calibrated, certified instrument, inspect each engine a member owns. If you, or one of your fellow competitors does not feel competent, or does not have a good quality, calibrated instrument, a quality machine shop can perform the inspection for you. Better safe than sorry.

This year, as we have done in years past when there were few changes to the package, we are publishing an "addendum" to be inserted in your 1999 Official Rules package. We will also be publishing a limited number of full Packages, primarily for NEW members who will come aboard during the new season. However, if you have lost or destroyed your 1999 QSAC Official Rules Package, you may purchase full 2000 QSAC Official Rules Package for the Nominal sum of \$5.00— please contact the QSAC Secretary/Treasurer if you choose to do so.

There are a few Rule Changes for 2000, mostly clarifications or corrections. However, it is advisable to re-read the entire Rules-set, since no matter how good we THINK our memory is, we're sometimes surprised that we thought was there, isn't. Enjoy.



## I. SAFETY REQUIREMENTS

All drivers, Officials, and pit crewmembers must be current members of QSAC, with membership paid. The QSAC membership/insurance card or receipt of application must be displayed at all times during the racing event and must be presented when signing in. Race promoters must be able to show proof of QSAC track site insurance. In addition, there must be at least two readily accessible dry-chemical or Co2 fire extinguishers of not less than 2 ½ lb capacities, located at each end of the hot-pits.

1. The track perimeter will have a minimum 3-foot high retaining wall or barrier capable of stopping the cars without penetration. Spectators will be kept at least 4 feet behind the 3-foot wall. The entrance and exit from the track must be protected to prevent cars from inadvertently leaving the racing surface in the direction of the pit or spectator areas. Tracks must have a pit lane, separated and protected from the racing surface, for car service. It is highly recommended that a catch fence be placed atop the "pit-wall" using fence fabric capable of rejecting a 1/4 scale car and that the "catch-fence" be a total of at least three feet including the pit-wall itself.
2. Tracks may be asphalt, concrete or dirt but must be free of standing water or debris that may be injurious if thrown by the cars. Track configuration may be road course or oval.
3. All drivers must sign in prior to operating a car, giving officials the radio frequency he/she will be using. Any changes in frequency must be reported to officials immediately.
4. No aircraft frequencies will be permitted. A frequency control board will be in use at all events with a removable clip for each available frequency. Any driver racing or working on a car (with his/her radio "on") must have the appropriate frequency clip attached to the radio antenna. No transmitters will be "on" without the clip attached. Failure to comply may result in disqualification. Radio frequencies of each participant will be posted to alert drivers and officials of frequency conflicts. Radio impounds may be implemented at the race organizer's discretion. The impounding of radios will be optional at all Region, District, Championship and National events.
5. No alcohol will be allowed in the race area during racing activities. "Racing activities" are defined to include the awards ceremonies. Spectator areas may allow alcohol only if that area is strictly separated from the track and pit areas. Any driver or pit crew drinking alcohol during racing activities will be disqualified. Repeated offenses will result in loss of membership. There will be no smoking allowed in the "Hot Pit" area. Additionally, firearms are specifically prohibited on any person during any QSAC event.
6. No one will be allowed inside the 3-foot retaining wall while the cars are under the green flag. Pit crew or turn marshals may enter only after the yellow flag is displayed and the cars have slowed to idle or stopped. Any car not slowing for the yellow flag may be placed at the rear of the pack, or in the case of repeat offenses, black flagged and removed from the track for the duration of that race.
7. Disabled cars will be taken off the track for repair. No repair work will be allowed on the track or infield while the cars are running, except for the replacement of a lost wing. QSAC or track official may deem a car or driver a hazard and order the car retired from the race.
8. Only QSAC members may enter the "Hot Pit" or racing areas during race activities. A "Hot Pit" area is any location or area where a car's engine may be started while on ground. The "Hot Pit" must be separated from the "Working Pit" by a 3-foot fence or wall. QSAC card must be carried and displayed.
9. No driver will operate his/her car from within the 3-foot wall. Cars may only be driven from the designated driver area. No driver may leave the driver's stand to retrieve a disabled car from the track surface. Only pit crew or track personnel may retrieve disabled cars.
10. All cars must have an operational clutch and brake that will allow the car to stop with the engine running and proceed when requested by tech officials. Brake and clutch operation will be checked at each race event. QSAC encourages that a carburetor return-spring be utilized to force throttle-closure in the event of certain electrical or electronics failures.
11. No car will race with a leaking fuel system. Refueling containers will be closable and marked to alert others of their contents.
12. All cars shall have adequate (preferably FOAM) bumpers. Any bumper considered being a hazard by tech officials should be corrected before said car shall compete.
13. All races will require a flagman and an assistant who will see that all drivers, pit crew and spectators are safely positioned while the cars are on the track.

The race format, program of events and types of cars must be the race organizer's responsibility. The race activities must always display the maximum safety for spectators, drivers, officials, etc. All QSAC sanctioned and insured events should follow the QSAC format.



## II. RACE PROCEDURE/FORMAT

QSAC sanctioned oval track races should follow the official race format outlined below to insure consistent and safe racing throughout the country. Major deviations from this format must be cleared with QSAC with respect to safety. Local events, that is, non-Championship or Regional events that do not expect to draw competitors from other areas or regions may deviate from format and general rules, but in no case are any deviations from Safety Rules, as defined in section I. acceptable. Failure to comply with the Safety Rules may lead to cancellation of track sanction and insurance.

### Race-day schedule of events

1. Sign In and Registration
2. Practice
3. Driver's Meeting
4. Pre-Race Tech Inspection
5. Pill Draw/Computer "Scramble" or Single Car Qualifying
6. Trophy Dashes (optional)
7. Heat Races
8. Main Events
9. Post Race Tech Inspection
10. Awards

#### 1. Sign in and Registration

All competitors must sign in and register to show proof of QSAC membership and insurance before they are allowed on the track. Membership Card must be worn in plain sight at all times during the event.

#### 2. Practice

"Controlled" practice must be available on race day to all the drivers and cars in the day's program. Each class of cars will be allowed to practice for a specific length of time (approximately 15 - 20 minutes) then alternated with another class. At least 2 rotations of practice is advised and more if time permits. No more than 10 cars on the track at a time. Each driver may return to the track as many times as he or she wish within a session provided they don't prevent others from equal track time. Each car and driver practicing must have signed up and paid their entry fee prior to race day practice.

#### 3. Driver's Meeting

Prior to each day's events, the track officials shall conduct a meeting of drivers and pit crews for explanation and discussion of the day's events, local ground rules, specific event regulations and rules clarifications. All drivers, their pit crews and race officials are required to attend. It is each driver's responsibility to see that he and his crew are present. Failure to comply may result in penalty to the driver.

#### 4. Concourse'

Concourse' is the judging and awarding of the best appearing car in each class. It will be based upon authenticity, beauty and color, cleanliness, design and attention to detail. Judging will be the responsibility of the race promoter or his designate. Concourse' bodies need not be raced, but each body is eligible to win one Concourse' competition only.

#### 5. Pre-race Tech Inspection

At all Region Point-Series, Region Championship, District and National events, all cars must go through a pre-race tech inspection to insure compliance to QSAC rules and technical specifications. Each car will be weighed, measured and visually scrutinized for compliance prior to taking the track. Each car-passing tech will be stickered. No car will race without tech sticker. Any car not in compliance with the rules will be given ample opportunity to correct the problem.

**Note:** It is suggested that pre-race tech inspection be used at local/weekly events on a periodic basis to insure rules compliance.

#### 6. Qualifying

##### Pill-Draw

In the interest of saving time and presenting a fast moving program, the principal method of placement in the qualifying heats shall be pill-draw, with the alternative being single-car qualifying. The track owner/promoter must provide a Pill-Draw capability consisting of a set of "pills" numbering at least 1-50. Draw per class must include only the number of pills to equal the number of cars entered in the class. (i.e.: 20 GN's = pills 1-20 for draw) . In addition, at weekly races, track officials may choose to use the "Computer-Scramble" option available in some computer-scoring systems.

##### Single Car Qualifying

Each car will be given 4 timed laps. The fastest of the four laps will be its qualifying time for the day and will be used to position it for the heat races. Each car will qualify in the order that must be posted by officials. If a car misses its qualifying order either by choice or other wise, it will fall to the rear of the line in its class and will be given only 2 qualifying laps. A driver may "wave off" a qualifying attempt provided his car does not cross the start/finish line on its first timed lap. Only 2 laps will then be allowed on the second attempt after the others in the class have qualified. If a "racing accident" occurs prior to completing one timed lap and the car cannot continue - 2 laps will be allowed. If the accident occurs after the second lap, the qualification is considered completed. At least one warm up lap must be allowed before a car goes on the clock. The qualifier must race the car he/she qualified with.

#### 7. Trophy Dashes

Should the race promoter elect to hold trophy dashes, they will consist of the four fastest cars in each class started inverted - fastest cars in the rear. Race duration may up to 10 laps.



### 8. Heat Races

Heat races will be lined up according to class and by each car's pill draw position or qualifying time as in the following example 24 car field:

**Pill Draw** (24 cars should be run in four 6-car heats)

Start Pos	Heat #1	Heat #2	Heat #3	Heat #4
1	Fastest Qualifier	2nd Qualifier	3 <sup>rd</sup> Qualifier	4 <sup>th</sup> Qualifier
2	5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>
3	9 <sup>th</sup>	10 <sup>th</sup>	11 <sup>th</sup>	12 <sup>th</sup>
4	13 <sup>th</sup>	14 <sup>th</sup>	15 <sup>th</sup>	16 <sup>th</sup>
5	17 <sup>th</sup>	18 <sup>th</sup>	19 <sup>th</sup>	20 <sup>th</sup>
6	21 <sup>st</sup>	22 <sup>nd</sup>	23 <sup>rd</sup>	24 <sup>th</sup>

Each heat race round of a specific class must be run off before the next class's heats. The sequence will be Sprint Cars, Super-Modifieds, Indy cars, Outlaw Late Models, Grand Nationals, Sportsman division. Heat race duration may be:

Open Wheel Cars	12 - 20 laps
Novice Stock-Car	15 - 20 laps
Grand National Stock Car	30 - 50 laps
Sportsman Grand National Stock Car	30 - 50 laps
NASCAR Super-Truck	30 - 50 laps

### 9. Main Event

It is the Promoter's option to run one to three rounds of heat races. However, if the recommended pill draw is utilized, then three rounds should be the norm, time and weather permitting. If only one heat race is used the cars transfer into the mains according to their finish from that heat race. The number of heat race transfers to each main event is dependent on the number of heat races run. Maximum of 20 cars per main event, including 8 "bump up" cars from the lower mains. An example 24 car field with two 12 car heats using a "20-count" computer system (if available) would be set up as follows:

- The top 6 cars from each heat transfer directly to the A main. The top eight finishing cars from the B main will bump up making a 20-car field.
- The 7th thru 12th place cars from the heats transfer to the B main.
- In the case of having more than 24 cars entered, additional heats and lower mains will be required. The heat winners are grouped together, then aligned by qualifying times. Then the second place finishers are grouped together and aligned according to qualifying times, etc. Third place heat finishers follow the same procedure. All others should bump up according to finish in B and lower mains.

**Note:** Use of a "20-count system" is used as an example only, as there is only one such system currently operating in QSAC. Care should be taken to allow only the number of cars the track can safely support; regardless of how many the "system" is capable of counting.

#### Two Round Qualifying

If two round qualifying is used, then a point system will be needed for the heats. Below is a suggested point system:

Finish Position	Points
1 <sup>st</sup>	1
2 <sup>nd</sup>	2
3 <sup>rd</sup>	3
4 <sup>th</sup>	4
5 <sup>th</sup>	5
6 <sup>th</sup>	6
7 <sup>th</sup>	7
8 <sup>th</sup>	8
9 <sup>th</sup>	9
10 <sup>th</sup>	10
Etc	Etc.

The 12 lowest point total cars will make up the A main plus 8 transfers from the B main. The next 12-point total cars make up the B main plus 8 transfers from the C main, etc. Ties in point totals will be broken by the qualifying times.

#### Main Event Duration

	A	B	C-DOWN
Sprint Car	30 Laps	20 Laps	15 Laps
Super-Modifieds	30 Laps	20 Laps	15 Laps
Grand National	*150 Laps	75 Laps	30 Laps
Sportsman Grand National	100 Laps	50 Laps	30 Laps
Novice Stock Car	75 Laps	40 Laps	30 Laps
NASCAR Super-Trucks	2X100 Laps	40 Laps	30 Laps

\* The duration of this main may have to be altered to require at least one pit stop for each car.



**10. Post Race Tech Inspection**

At all Region point series races, Region Championship races, District and National events, the top 4 A Main finishing cars must be impounded and the top three must complete the post race tech inspection before the race results can be made final. The fourth place car will be an alternate should one of the others be disqualified. At the completion of each A Main, all the finishing cars must be stopped and remain on the track until the results are announced. The drivers or pit crew will be allowed to shut off the engines but no other work is allowed. The top four cars will be removed by the officials to a guarded impound where the top three cars will be re-weighed, re-measured, and carefully checked for rules infraction. In addition, each engine will be checked using the properly calibrated and certified instruments. Each engine must be checked in addition for: visible signs of modification, carburetor bore size and carburetor-mounting block bore size. It is optional to have the cylinders removed at Regional, District and National events. At the option of the Tech official, the cylinders may be removed and inspected, the crankcases split and inspected internally. The driver or his designate must perform all disassembly work. Any car found to be illegal would be disqualified from the event relinquishing any prize and/or points awards.

**Note:** It is suggested that post race tech inspection be used at local/weekly races on a periodic basis to ensure rules compliance.

The QSAC Tech Inspection supervisor will impound any part of any engine found to be illegal due to the addition or removal of material.

Examples: Cylinders with polished and/or enlarged and/or repositioned intake, exhaust, or transfer ports, sand or bead-lasted surfaces, or machined base, machined crankcases, altered or lightened flywheels, enlarged carburetor or mounting block bores etc.

**11. Awards**

Following tech inspection, the race results will be declared official and the awards will be given out. Awards may be any or all of the following:

Trophies or Plaques, Cash Awards or Non-Cash Awards Points  
Cash awards will follow the QSAC payout schedule. (See section VI.)

Point's awards will follow the QSAC Point Allocation System:

1st place	200 points	11th place	160 points
2nd place	196 points	12th place	156 points
3rd place	192 points	13th place	152 points
4th place	188 points	14th place	148 points
5th place	184 points	15th place	144 points
6th place	180 points	16th place	140 points
7th place	176 points	17th place	136 points
8th place	172 points	18th place	132 points
9th place	168 points	19th place	128 points
10th place	164 points	20th place	124 points

Local, weekly, and/or series races may award points, cash, trophies, or non-cash prizes but must award points according to the QSAC schedule. Region point series, Region championship races, District and National races must be advised to QSAC and the dates cleared by QSAC. Promoters will not be required to commit to a guaranteed (beyond an entry fee payout) purse.

It will be left up to the promoter if they wish to have trophies/awards and/or a cash purse for Region Championship events. Region Championships are to be promoted primarily for the benefit of the racers who have supported the races at tracks within their respective Region, whether Region Series Races or the weekly events at their local tracks. To qualify as a bona-fide Region Championship, such events should be scheduled near the conclusion of the regular racing season, (i.e.:) the fall of the year.

**12. Standardized Entry Fees**

Following entry fees will apply to QSAC sanctioned races:

\$10 - \$20	Local/Weekly Races
\$40 or less	Region Point Series Races
\$50 or less	Regional Championship or District Event
\$50.min/max	National Championship Series or "Special" National Event

**13. Flagman and Race Starts**

Each race will have a flagman and/or race director who will control the race events. He must have an assistant to help spot problems around the track and assist in car lineups, frequency problems, etc. The flagman and assistant will pre-align the cars for each race in their starting positions and are responsible that no frequency problems exist. The cars will be allowed five warm up laps before each race to warm up tires, engines, etc. After warm up, the flagman will yellow flag the cars to line up single file or in two lines, (promoter option) in the race lineup, at a slow pace. When the cars are properly aligned, the green flag will be flown as the cars come off turn four. The flagman must also use a whistle or horn as an audio signal to the drivers of any change in flag situations.

There will be no inside passing after the green flag is displayed on starts until the cars have crossed the start/finish line. Violation will result in the immediate display of the yellow flag, and the violator will be placed at the back of the field.



#### **14. Yellow Flag**

The flagman will fly the yellow flag and use the audio signal for any car stopped on the track infield or outside perimeter of the track after allowing sufficient time for the car to resume under its own power. He should refrain from yellows if the car can continue. The driver of a car who goes to the infield by choice must indicate to the flagman if he wants a yellow or not. Cars involved in yellow flag situations and who require attention on the track to continue must go to the rear of the field. Cars requiring repair during yellows must be taken to the pit lane for work. No work is allowed on the track except for replacement of wings in which case the car goes to the rear. No car may re-enter the track that is "green" except in the full-body classes.

It can be an option to count all yellow laps and allow cars to enter under a green flag. Yellow flag situations will be a minimum 2 laps or at flagman's discretion starting with first incident, with no passing under yellow. A lap penalty will be assessed for passing under yellow. All cars must hold their position behind the leader as designated by the flagman. Any car causing three (3) yellow-flags in any one race will be black-flagged.

The leader and all cars must slow to a speed that satisfies the flagman. Any car not slowing will go to the rear. When the yellow flag appears, the track is yellow all around -no racing back to the start/finish. The flagman must allow yellow flag cars sufficient time to catch up to the rear of the field. If a car is not able to catch up or wishes to be passed during yellow to prevent danger to other drivers, the driver must indicate to the flagman and fellow drivers his situation. Any car causing 3 yellow flags may be black-flagged. If an incident occurs during slow laps after a yellow, any cars involved are to be returned to the track position they occupied prior to the incident.

#### **Restarts**

Restarts following a yellow-flag will be at the option of the promoter.

Passing may be allowed only on the outside or on either side. The option must be announced at the drivers' meeting, prior to the start of the 1<sup>st</sup> round of heats.

#### **15. Checkered Flag**

A race will be considered completed at the moment the checkered flag is displayed or at the moment the scheduled distance is completed by any car, whichever occurs first. All running cars must cross the start/finish line on their lap following the checkered for the race to be properly scored. Cars not completing the scheduled distance will be ranked in order by total laps completed and the sequence of the finish. When any race finish order cannot be determined, the track officials will determine the finish. Their decision is final.

#### **16. Black Flag**

The flagman will use a black flag only if in his/her opinion a car is creating undue hazard on the track. The black flagged car must go to the pits until the hazard is resolved.

#### **17. Un-sportsmanlike Conduct**

The following actions are considered un-sportsmanlike and will be dealt with in a manner consistent with the policies set forth below.

- A. Deliberate destructive action on the track during a practice session or race.
- B. Physical abuse of another competitor, pit person, or Race Official.
- C. Excessive and continuous verbal abuse of another competitor, pit person, or Race Official.

The District, Region, or Area Director is empowered to disqualify, at his/her discretion, any competitor guilty of one or more of these infractions. The incident shall be reported to the QSAC board, which will determine if further action should be taken. Depending upon the severity of the infraction, remedies including racing eligibility suspension and/or membership revocation could result.

#### **18. Protests**

Participating owners and drivers may only file rules protest. Protests will only be considered if presented in the following manner to the race officials.

##### **Engine Protests**

Must be presented in writing including a \$25 inspection fee. Inspection will be conducted and witnessed by QSAC officials, the protestor, and the protester only. Inspection will be to the extent to satisfy QSAC officials. Infractions will result in disqualification and forfeiture of prizes, including points from said race and may include points from prior races. QSAC may also impose further penalties at its discretion. If the motor is found legal, protest-fee is awarded to the protester, if motor is illegal, the fee is returned to the protester.

##### **Visual Protests**

Must be presented in writing describing the rule infraction and accompanied by a \$10.00 fee. If the protest is judged valid, \$10.00 will be returned. If not, the \$10.00 will be forfeited to the purse.

##### **Scoring Protests**

Must be presented in writing to the Race Director describing the reason for the protest.

Time limit for the protest shall be 15 minutes after the finish of the event in question.



## 19. THE NATIONAL CHAMPIONSHIP SERIES

The National Championship Series (NCS), inaugurated in 1994, is back after a one-year hiatus trying another format. The NCS was designed as a series of events held in differing locations that provide both an attraction for spectators and competitors from around the country, a series of races to which racers of any level of experience can compete with the top racers from around the country.

Locations are chosen by a review of eligible locations with an eye toward suitable facilities and geographical distribution. Event location decisions will be a composite of review by the Co-Chairs and the Chairman of the Competition Committee. Considerable care will be given to the scheduling of the events, and their locations, to insure accessibility to the maximum number of competitors from around the country.

Any deviations from the standard NCS format must be submitted in writing to the Competition Committee for approval. Any and any approved deviations from the std. Format must be advertised on the Race Flyer. (IE: if a choice is made to single-car qualify and it's approved by the CC, it must be stated in the flyer that single-car qualifying, rather than pill-draw will be used).

Any track selected to host an NCS event must provide personnel to man the positions of Race Director, Flagman, Scorer, Track Fuel distribution, pre-Race-Tech and post-Race Tech (assistance) and Race-Spotters.

### FORMAT

The general format of the NCS events follows the standard QSAC event formats except as noted below.

1. Program at each event must include races for each official QSAC class in which 5 or more cars are present. Points will be awarded for each eligible Class in which at least 5 cars compete. Eligible classes include GN, Sportsman, and Super-Truck.
2. A Concourse' for each eligible class with an award (trophy or plaque) for the winner is required. "Concourse' Bodies need NOT be raced, as required in the past.
3. Either Pill-Draw or Single-Car-Qualifying for heat placement is allowed, provided it received prior approval of the QSAC Competition Committee, and potential competitors were notified via a Newsletter published Race Flyer.
4. A minimum of two sets of heats (preferably three) of 50 laps (eligible classes) minimums is required.
5. A standard bump-up format utilizing as many lower mains as needed to accommodate all class entries is required.
6. Maximum cars allowed in mains are dependent on safe track-capacity and computer scoring capability.
7. Awards (plaques or trophies) for 1st, 2nd, and 3rd place in the Novice Stock Car class is required. It is strongly recommended that at least 1st place trophies or plaques be awarded in each of the other classes.
8. Cash payout of at least 50% of the entry-fees in each class (except Novice) for each position in the "A" main is required. (See revised Official QSAC Payout Schedule on page 15.)
9. The following "A-main" minimum format is required at each event:

<b>GN SPORTSMAN</b>	<b>150 LAPS (mandatory refueling stop at 75 Laps)</b>
<b>GRAND NATIONAL STOCK CAR</b>	<b>300 LAPS (mandatory refueling stops at 75 lap intervals.)</b>
<b>NASCAR SUPER-TRUCK</b>	<b>2X100 LAPS (10 minute break between 100 lap segments)</b>

**Note:** " Support Classes" (those not eligible for NCS Points/awards) shall have the opportunity to race, If there are at least Five (5) cars in the class. Heat-races shall be limited to 30 Laps, and A-mains to 100 Laps, (75 laps for Novice Stock-car).
10. **"BACK-UP" Car and/or body---**

In the case of a competitor's car or body becoming irreparably (as judged by QSAC official) damaged during practice, a heat, or lower-main, a "substitute Car or body may be used to finish the event. In either the case of a car and/or body being substituted, it should be understood that should it make the "A"-main, the "substituted" car or body will be subject to a combination pre/post-Race technical inspection to insure its total compliance with the rule following the conclusion of the event. Any "substitute Car and or body shall start at the rear of the next race it has qualified for. The source of the substitute car may be the competitor's spare, borrowed from a friend or purchased on the spot. The purpose of this rule is to allow a racer, who may have traveled a considerable distance, to compete, rather than just pack-up and go home.
11. **"TRACK-FUEL"**

All competitors will be required to use a pre-mixed, host-track provided fuel. The fuel specified is VP (brand) C-16, with a minimum of 2 ounces of AmsOil 100 to1, 2-stroke oil per gallon. A fuel fee, paid at time of sign-up will be \$15. Fuel distribution shall be the responsibility of the host-track/club/promoters. Competitors will be able to fuel their cars only in the hot-pit, using fuel-bottles provided.
12. **"A"-MAIN REFUELING**

In the Grand National and Sportsman Classes, refueling shall be accomplished at 75-lap intervals under a combination red/yellow-flag condition. On the 74<sup>th</sup> lap, a red flag shall be thrown indicating the refueling-stop--- all cars will assemble behind the leader and enter the pits in this order. After a 20 second pause during which all cars are refueled, the cars will exit pit-lane and when all cars are clear, the green flag will be thrown when the leader is exiting turn four. In the Sportsman "A", at 150 laps total, there will be one refueling stop. In GN, at 300 laps, there will be three refueling stops. This procedure will be utilized at all four NCS events, no exceptions.

**Any car-requiring repair during the fuel-stop will be pulled from the order in which it entered the pit-lane and returned at the back of the field.**





### III. GENERAL SPECIFICATIONS (applies to all classes unless otherwise provide for in the class specifications).

1. All engines shall have chambered exhaust systems that effectively reduce noise. No open exhaust or un-chambered open pipes. Any car deemed too loud by officials will not race until the problem is corrected. Maximum noise level is 85 DBA 30 feet from the track surface whenever a noise limit is in effect. Noise limits are imposed by local ordinance or at the discretion of the promoter. Certain classes require stock Zenoah Mufflers only. (See class Tech-specs.)
2. **Engine**
  - a. Modifications - none - no removal or addition of parts or material from engine or from any part of component of engine whether or not performance is enhanced. Media blasting of any portion of the cylinder or internal engine components is not allowed for any purpose. Engines shall use only factory specified gaskets. No gaskets sealers allowed unless otherwise specified. **Note:** Since the Timing Spec has been removed from the rules (due to the advent of the single ring engine) it IS permissible to resize, reshape or remove the Flywheel Key. Further, it continues to be illegal to sand EITHER side of the Phenolic Carburetor block, or to alter the size of the openings in the block.
  - b. Only industrial type, 2-stroke, magneto ignition, 23cc maximum, air cooled, integral starting engines will be allowed. The use of any engine must be approved by the QSAC National Rules Committee 4 weeks before said engine may be raced in any QSAC sanctioned event. No rotary valve, reed valve, or non-integral cylinder head engines allowed. (See Rule #8 this section)
  - c. Carburetors shall have .425-bore maximum. Only the Walbro WY-1 Series, (-1, -16, etc) and the Walbro WYK-32 Carburetors are allowed. (The WYK-32 is restricted to the Grand National and Craftsman Super-Truck Classes only). Carburetor jets may be changed, poppet-valve (needle/seat) may be adjusted, but no other modifications are permitted.
  - d. Ignition modules are limited to those supplied with the engine or two aftermarket modules with markings of SIG-01 or EY850 only. All modules must have the factory applied date code.
  - e. Engine replacement parts other than those supplied by the original engine manufacturer will be considered as not-legal parts.
  - f. The general specs contained herein shall be enforced for each class except where the class Technical Specifications conflict- in such case the class Technical Specifications shall take precedence.
3. Fuel additives are strictly prohibited. Only straight methyl alcohol or pump gasoline is allowed. However, racing gasoline can be used if it is available on a national level. Example: Cam-2, Klotz, VP, etc. The Digitronics Fuel Analyzer will be used to insure the integrity of the fuel. The meter will be calibrated (following a 20 minute warm-up) to minus fifty-five (-55). Fuel reading must read minus twenty-five (-25) or less to be legal.
4. Each car shall be clearly numbered and visible from the scoring stand. Numbers must appear on both sides of the car, except when special scoring numbers are used. Car numbers placed on wings must have additional identification should the wings become detached while racing. Minimum size is 3 inches for open wheel cars, 4 inches for full-bodied cars.
5. All cars must meet the general specifications, the safety requirements and the technical specifications for its class. Modification (except engine) is permitted within the specifications but will be subject to review and approval by QSAC.
6. No shifting or variable speed drive trains on oval track or road racing cars. All cars must have 4-wheel suspension. Engines must be mounted with either the spark plug or crankshaft centerline on the car longitudinal centerline of the chassis' main rails, (main rails are defined as the major symmetrical load carrying longitudinal frame members, and do not include "side pods" used for body mounts) with a tolerance of ½ inch. Differentials permitted in all classes. Two-wheel drive (rear) only.
7. Wheels and tires may be substituted and modified within the specific class requirements. Tires must be rubber like material. No spikes allowed. No tire cleaners or tire traction treatments permitted. Tires may be cleaned with soap and water only. Track preparation to improve traction is permitted. Tire minimum sizes apply at all times. Any tire questionable in size should be cleared with officials.

Effective 1/1/99, competitors in all the Stock-Car classes and the Super Truck class must utilize the QSAC "spec" right front tire-bands on the competitor's choice of host.

Each manufacturer shall have two "spec Compounds available, with different approved "identifiers" molded-in, any of these compounds will be allowed as "Spec".

Approved left-side and right rear compounds as submitted by the Manufacturers are:

**Bishop Racing Products**

L/S: L10, L20- RR: R40, R 44, R45- RF: 66, 96

**Matthews Racing Products**

L/S: RZ-2, ZR - RR: M3, Signature - RF: "A", "B"

The above are the ONLY allowable compounds. (No Go-Kart or "other")

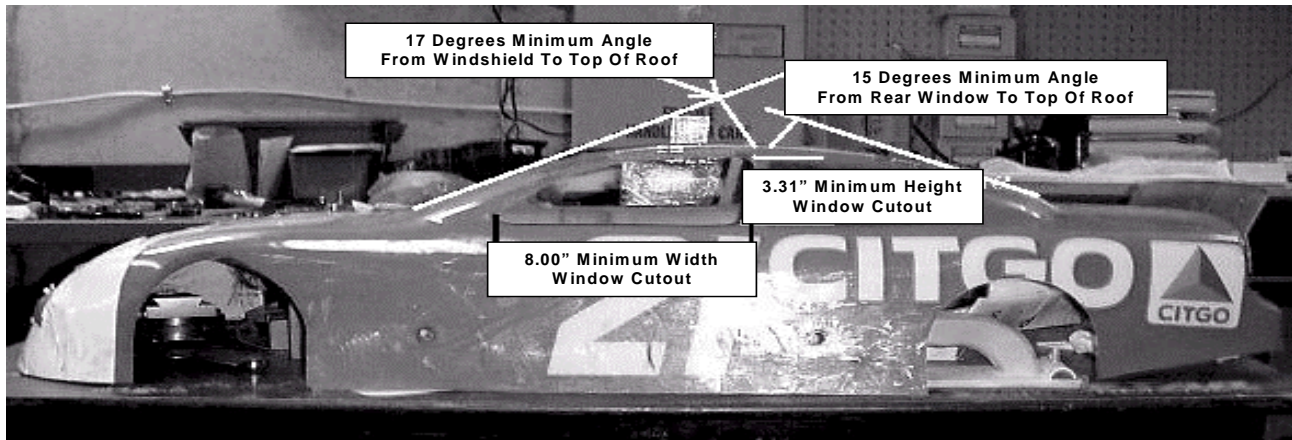


### III. General (continued)

8. Only QSAC approved engines will be allowed. To obtain approval, a minimum of 5 engines must be submitted to QSAC along with factory specifications and technical data pertaining to performance, as well as a supply of gaskets, etc. to facilitate disassembly for inspection and reassembly for testing.  
Approved engines are as follows: Zenoah G2D-44, 57 (Red Max HT230), Zenoah G2D-70, (all versions)  
Kawasaki TF22 (All engines must have factory numbers).
9. There is no engine "Claiming" Rule.
10. Situations may upon occasion arise that are not precisely covered in these rules or procedures. A ruling will be made by the ranking QSAC official present, consistent with previous rulings in situations of similar nature. The ranking QSAC official present shall make interpretations of rules and his/her rulings shall be considered final.
11. All Classes must use Zenoah Mufflers p/n's 1751-15101 or 1148-15112.  
No spacers or extensions between cylinders exhaust port and muffler-- only one exhaust gasket.  
Stingers may not be added to the muffler outlet---- spark arrester screen may be removed.  
Exhaust may be redirected by use of a piece of 1"(ID) or larger hose.
12. Any tuned expansion chamber exhaust systems (Open-Wheel only) regardless of material of construction, must meet the QSAC mandated noise level limits as defined in general section #1, (85db at 30ft.) when a noise limit is required by the track owner, promoter, or by local ordinance.
13. Minimum tire-size measurement methodology is by measuring circumference, (roll-out). The minimum tire size itself shall be no less than 17 inches circumference (average, measured center, and right edge). For open wheel classes, the minimum applies only to the right rear tire. For full body car classes, the minimum is absolute, regardless of wheel/tire location.
14. No electric or electronic device may be used in any class unless specified in the Technical Specifications for that class. Examples: rate gyros, moveable ballast, any electronic or electrical adjustment device other than two steering and one throttle/brake servo.
15. **IMPACT PARTS**--- In early 1993, an Impact Parts Review Committee was empanelled to review new releases of products (parts and accessories, not cars) that might impact Quarter-Scale Racing in a negative way. As such, manufacturers are encouraged to submit new parts to the Impact Parts Committee for review prior to release to the general Quarter-Scale Racing community. Items that have been defined as Impact Parts, at this juncture, are bodies, motors, and now all new tire hosts and bands. It is highly possible however; that any new, innovative part currently under development may, in fact, be defined as an Impact Part, and as such, require review. It behooves the manufacturer to submit any part for review and approval to avoid possible future problems of QSAC legality. As of Feb. 1, 1998, all new products, including tire-hosts and bands must be submitted for review and approval, and subsequent notification in the next issue of the QSAC Newsletter (QMN) prior to being made available for sale to the public.

#### ATTENTION POTENTIAL BODY MANUFACTURERS:

If you intend to manufacture a "new" Quarter Scale Race Body (Car or Truck) it is strongly recommended that You contact the QSAC Impact Parts Committee BEFORE you begin the project, to insure the final product will be within acceptable parameters for approval for QSAC Competition.



16. One battery powered tool per pit-position is permitted for changing of tires, etc., during a race.
17. The ignition-timing specification formerly in use in all classes (except the Outlaw Late-models) is eliminated in all classes and removed from the post-race technical inspection process.



#### IV. TECHNICAL COMPLIANCE RESPONSIBILITY

It is the responsibility of each car owner/driver to insure his/her Quarter-Scale Race car is in total compliance with all applicable QSAC Rules. This means Safety General and Technical Specifications as defined herein. It is important that each competitor read and understands all of the rules as they apply to safety, race format, driver-conduct, and technical specifications. Ignorance of the Rules is not a defense for violation of them.

#### V. TECHNICAL SPECIFICATIONS

NOTE: ALL CLASSES SUBJECT TO FUEL-LINE SPECIFICATIONS— LINE LENGTH MAX'S, RETURN-LINE, AND VENT-SPEC. See GN Specs.

##### A. TECHNICAL SPECIFICATIONS - SPRINT CAR / SUPER-MODIFIED (CLASSES COMBINED)

Overall Length	32 inches - 40 inches
Wheelbase	20 inches - 23 inches
Overall Width	20 ½ inches maximum (outside of tires)
Weight	22 pounds minimum before and after race

##### SPRINT CAR

1. Mean center of frame to outside of any tire not to exceed 10 inches.
2. Wheels must be scale appearing 3 3/4" diameter (at tire bead) + or - 1/4"
3. Right-rear minimum tire circumference of 17 inches before and after race.
4. Exhaust systems outside the perimeter of the basic chassis must be located below the level of the top main chassis rail (not rollage) and within the perimeter of the left or right side nerf bar. The exhaust system may not extend beyond the rear axle. If the pipe IS within the perimeter of the chassis, then it may extend beyond the rear axle, but must be within the confines of the rear body/tank shell.
5. All cars shall be straight axle, front and rear. This is to mean no independent suspensions.
6. Cars must have scale appearing right and left side nerf bars and shall not extend more than 3/4" past outside of tire.
7. Top wing shall not exceed 12 ½ inches wide and 16 inches long. Overall sideboard height, 7 inches, length 18 inches. Front wing 8 inches wide and 6 inches long.
8. Car numbers must appear on both sides of the top wing and tail tank. Minimum 3 inches, and must be clearly visible from scoring stand during race.
9. Engine (Zenoah Model G2D-44, 57, Red Max HT230, Kaw FT-22) restrictions follow general specifications.  
Added: Zenoah G2D-70 with Standard -70 Muffler and gasoline fuel only.

OR

##### SUPER MODIFIED

1. Cars must resemble eastern or western style full size open wheel super-modifieds. Front hoods are mandatory, tail sections optional. No full bodies. Front and rear bumpers required but may not exceed the car's track width.
2. Mean center of frame to outside of rear tire not to exceed 10 1/4 inches.
3. Top wing maximum size (including sideboards) 16 inches long, 12 ½ inches wide maximum. Sideboard height 7 inches overall and 18 inches long. Front wing maximum size, 6 inches long, 8 inches wide. Body parts may be airfoil in design. Any wing material may be used. Sideboards must be flexible with no sharp edges.
4. Exhaust systems may be mounted outside the car's frame but within the length, width and height of the car. Right and left side nerf bars or equivalent are required but may not extend beyond the outside edge of the tires.
5. Minimum right rear tire circumference of 17 inches before and after race.
6. Engine (Zenoah G2D-44,57, Red Max HT230 Kaw FT-22 only) restrictions follow general specifications.
7. Sportsman division cars must use the limited exhaust system. See rule 11 in General Specifications.

**NOTE: DUE TO THE LOW NUMBER OF BOTH THESE CARS, THE CLASSES HAVE BEEN COMBINED AND WILL RACE TOGETHER.**



## B. TECHNICAL SPECIFICATIONS - GRAND NATIONAL STOCK CARS

Minimum Height	10 ½ inches
Overall length	44 inches - 49 inches
Wheelbase	25 inches - 27 inches
Overall width	17.5 inches - 19.5 inches (at the car's widest point)
Track Width**	16.5 inches - 19 1/4 inches
Weight	30 pounds minimum

\*\* Track width is defined as "outside of tires". Track width differential front to rear may not exceed 1 ½ inches at any time.

1. Cars must appear as NASCAR Grand National or Winston Cup cars. Cars must have and maintain a scale appearance. Must have windshields front and rear either as cutouts replaced with another solid plastic material or as outlines painted as windows with a contrasting color. No lightening or ventilating of the body except as in the car's full size counterpart (grill opening, windshield cowl, etc.). No holes in the rear of the body. Wheel openings must be full cutouts. No underbody ground effects. Roof rails, while now allowed as molded-in by body Mfrs., may not exceed 1/4" in height.  
Belly-pans limited to 208 square inches. No full width belly-pan extensions forward of the front wheels or behind the rear wheels. Add on rear spoilers may not extend more than 3" in any direction from the factory deck as measured at the back edge of the rear deck. Spoiler may be of any material, but all edges must be rounded and smooth. The spoiler must be mounted on the rear of the body (just like the full scale version) not on top of the rear deck. No bends or lip son the top or ends of the spoiler allowed. (Also applicable to Sportsman, Novice Stock-car, and Super-Truck). Body's rear bumper flange may not be trimmed to less than 1" from the molded bumper as measured from the inside of the flange. The top surface of the front and rear bumpers must be at or above the wheel centerline.  
Foam bumpers (front or rear) must maintain a minimum of ½" ground clearance during full compression of the suspension and be not less than 1/4" above the bottom of the front air dam. Basic frames must be symmetrical in design. Mainframe rails should be mirror image left to right with minor deviations for component clearance allowed.
2. Cars must have independent A-Arm type front suspension. A-Arm mounting points must be equi-distant from the chassis centerline plus or minus 1/8th inch. Suspension components may be modified in material to achieve lighter weight or greater strength. No cantilever suspension allowed. Lower control arms must be of equal length as measured from the centerline of the inner mounting point to the centerline of the ball-joint.
3. Maximum fuel tank size 8 ounces. Gasoline only. The combined length of all fuel lines entering the fuel tank may not exceed 50 inches including filters, REQUIRED carburetor return, and vent lines. All fuel lines must be 1/8 inch maximum I.D. Only one vent line (1/8" ID max, 8" length max) and one filler line (1/8" ID max) permitted. Up to two 1/8-inch I.D. fuel filters permitted maximum size ½ inch O.D. 1 ½ inch overall length. Fuel filler systems must be 1/8 inch I.D. Maximum their entire length. Refilling bottle 1-quart maximum. Manual pressurizing only during refilling.
4. Engine (Zenoah G2D-70, both 2-ring and single-ring version (must be as manufactured, no mixing of components between versions) or up-rated -44, 57 -cylinder 1148-12111 installed) restrictions follow the general specifications. Exhaust restricted to Zenoah muffler- p/n 1751-15101 or p/n 1148-15112.
5. Cars must be attractively painted with 4" numbers clearly visible to scorers.
6. Maximum wheel width 3 inches, maximum diameter 4 inches (at the bead). Wheels must be scale appearing. Maximum offset 1 inch. Tire circumference 22 inches maximum, 17 inches minimum, 3 1/4 inches maximum tread width, 2 3/4 inches minimum tread width and 3 3/4 inches maximum sidewall width. Tires must fit within the car's body. No knockoffs. All wheels must have minimum 2 lugs.
7. Cars must maintain a 50%-50% weight bias + or - 10% left to right.

### B1. SPORTSMAN STOCK CAR

The Sportsman Stock Car must weigh 30lbs minimum. Only G2d-44 / 57 cylinder on G2d-70 cases, G2d-44/57 Base engine, any air cleaner, (velocity stacks allowed). Sportsman competitors may run only that class if entered as a Sportsman in a NCS, National, District, or Region event.

### B2. SPORTSMAN NOVICE STOCK CAR

Sportsman novice class is an entry-level class for drivers new to Quarter-Scale racing. Technical Specification of Novice class cars are identical to those of the Sportsman class. Trophy/plaque only, no cash awards. *Competitors in the Novice class may not participate in any other class while remaining a novice. Further, once leaving the novice class to progress to a "Pro (cash payout) class", he may not return to Novice unless approved by the QSAC Area,, Region, or District Director, and his "home track" club.*



**C. TECHNICAL SPECIFICATIONS - NASCAR SUPER-TRUCK**

Overall length	44 inches - 49 inches
Wheelbase	25 inches - 27 inches
Overall width	20 ½ inches
Weight	30 lbs
Minimum Height	11 ¾ inches

1. Trucks must appear as current NASCAR Super-Trucks. Trucks must have and maintain a scale appearance. Trucks may use the Raco Stadium Truck Body, the PRC NASCAR Super-Truck Body, or subsequent Super-Truck body approved for use by QSAC. Must have windshields front and rear, either clear or as outlining.
2. Trucks must be attractively painted and have 4" numbers on each side clearly visible to scorers. Maximum spoiler is 3" measured in any direction from top of rear deck, any material, but corners must be rounded and smooth with no sharp edges. No bends or lips at top or sides of spoiler allowed.
3. Engine must conform to the Stock Car specification. That is, G2D-70 (all versions) with Walbro WY-1 or WYK-32 carb, and standard (-44, 57 type) phenolic block, and the Zenoah mufflers p/n's 1751-15101 or 1148-15112.
4. All other specifications pertaining to chassis type, limitations, etc of the Grand National and Sportsman Stock Cars apply.
5. Maximum fuel tank capacity is 16oz. Gasoline Only. Fuel line and filler specifications limited to those as defined in Grand National Stock Car specs.
6. Race format is 100 to 200 laps separated at the halfway point by a 10 minute break (red flag) during which any and all maintenance may be performed, including adjustments, tire changes, repairs and refueling.
7. There is no Sportsman Division of this class.
8. On certain chassis, roll bar and/or spark plug interference prevents seating the Super-Truck body properly on the front and rear bumpers. To alleviate this interference, it is permissible to cut out the body, using Slot-type relief's for roll bars and a rear-window/deck cut-out for the sparkplug. In both cases, such cuts must be kept to an absolute minimum. If, during pre-race tech, cutouts are deemed to be excessive, the competitor may be required to temporarily fill part of the cutout using duct-tape or other material.

**D. TECHNICAL SPECIFICATIONS- HONDA 4-STROKE TRUCK**

**NOTE:** This is a "test" class for 2000--- and will be aimed specifically as a "support class" at the 2000 NCS Events. The purpose of the "test" is to determine the durability and viability of the Honda 31cc 4-stroke engine as an addition to the current Zenoah engine series.

While the NCS is the primary "testing ground", there is no reason that they could not be run locally given enough participants to make up a class. The specifications below are subject to change in certain areas should the "test" yield "positive" results. If you are interested in participating in the "formal or informal" parts of the test, contact Roger Newell, QSAC Competition Committee Chairman, or Mike Schmidt, the Special Projects Chairman.

OVERALL LENGTH	44 - 49 INCHES
WHEELBASE	25 - 27 INCHES
OVERALL WIDTH	20 ½ INCHES
MINIMUM WEIGHT	33LBS
MINIMUM HEIGHT	12 INCHES

All specifications of the normal Zenoah Super-Truck apply except where specified above.

Fuel: Gasoline or Methanol

"Spec" Manifold, Carburetor (WYK-32), and Exhaust Pipe required (and provided with engine)

**E. TECHNICAL SPECIFICATIONS - "EAST-COAST" MODIFIED**

This is an "official class in 2000.

The Rules for this class duplicate the chassis requirements of the Grand National, and will utilize a Body resembling the "DIRT" Modified-Cars as run on the East coast, or the IMCA Modified cars used elsewhere in the country.

A molded body for the class may be available in the near future; in the meantime, hand-fabricated bodies will continue to be acceptable.

**F. TECHNICAL SPECIFICATIONS-- DRAG RACING**

1. Track Sanctioning shall be per QSAC requirements (see VI. [Below] Track Sanctioning Requirements)
2. Contact Ken Jones @ (909) 350-9952 for info on specific classes and class Rules.



**VI. TRACK SANCTIONING REQUIREMENTS**

1. Track must at all times follow safety REQUIREMENTS set forth by QSAC.
2. Track must be operated in a manner that is considered fair and equitable within reason at all times. Track must also operate in a manner that is conducive to a family atmosphere.
3. Track must agree to operate under QSAC rules at all QSAC sanctioned Region, District, or Nat'l events. There is no allowance for rule deviation unless authorized by an Area Director, Region Director, District Director, QSAC Competition Committee Chairman, or QSAC Co-Chair.
4. If more than four written complaints by current QSAC members are received in one year concerning a particular track, then that track will come under review by QSAC Competition committee and may lose sanctioning and forfeit of all fees paid.
5. QSAC reserves the right to cancel sanctioning at any time, but must be by a majority vote from the QSAC Committee Chairmen.
6. Track must submit photos of safety measures to be reviewed by QSAC.
7. For tracks that are built with a temporary retaining wall, (parking lot), if the track is under 200 feet around measured on inside of the track, then 24 inches is sufficient height for the wall. If track is over 200 feet, then 36 inches is required.
8. It is strongly recommended that each track provide a fenced extension to the top of the pit-wall for the protection of the crews in the hot-pit. Such extension should bring the total height of the pit wall to at least 3 ft.

**VII. PAYOUT SCHEDULE**

**QSAC CASH PURSE PAYOUT SCHEDULE (SUGGESTED)**

1. If a promoter elects to have a cash purse at any QSAC sanctioned event, the cash payout should follow the QSAC payout schedule as defined below.
2. Purse per class is determined by the number of entries in that class, i.e., total number of cars (all classes combined) divided into the total purse multiplied by the cars in each class = purse available per class.

**EXAMPLE:**

- A. \$5000 Total Purse  
100 Total Entries  
50 GN, 30 SM, 20 SP
- B. \$5000 divided by 100 = \$50 per car
- C. Purse per class  
50 GN entries x \$50 = \$2500 GN  
30 SM entries x \$50 = \$1500 SM  
20 SP entries x \$50 = \$1000 SP

**PAYOUT PERCENTAGES PER CLASS**

Since only the "A"-Main participates in the payout the following represents the percentage per position in the A-main of each class.

**FINISH POSITION**

1	25%
2	20
3	15
4	10
5	8
6	7
7	5
8	4
9	3
10	3
Total	100%



### VIII. ENGINE TECHNICAL INSPECTION

The QSAC engine rules are written to mean absolutely no engine modification is permitted and includes specifically that the addition or removal of material is not allowed. The rule as written and currently enforced is one of the foundation blocks of QSAC and Quarter Scale Racing. The publication of this procedure is meant as a method for contestants to check their own engines for compliance to the rules. It is not meant as a guide for "blueprinting" an engine within the parameters. An engine found to be altered, even though it may measure legal, will be disqualified.

To perform the procedure, a 2in stroke dial indicator and a spark plug hole adaptor will be needed. The carburetors, carb-mounting block, exhaust system, and flywheel cover must be removed. All the measurements are based on the downward stroke of the piston from the top dead center as the flywheel is rotated counter-clockwise when viewed from the flywheel end of the engine. There are six measurements that, performed as instructed below, will determine:

1. Intake Port Timing - Full Open
2. Ignition Timing (ELIMINATED)
3. Intake Port Timing - Start Open
4. Intake Port Timing - Maximum Port Window Size (height)
5. Exhaust Port Timing - Start Open
6. Crankshaft Stroke

#### PROCEDURE:

##### INTAKE PORT - FULL OPEN

After finding top dead center and setting the dial indicator at zero, rotate the flywheel counter-clockwise until the piston skirt just enters the intake port at the top. Note the measurement and refer to the chart.

**IGNITION TIMING--** (requirement eliminated— following retained for reference only)

Still rotating the flywheel counter-clockwise, align forward leg of the coil with the forward edge of the 2nd or center flywheel magnet-- check alignment carefully-- read dial/refer to the chart.

##### INTAKE PORT - START OPEN

Rotate the flywheel counter clockwise till the piston skirt fully closes the intake port at the bottom. Refer to the chart.

##### INTAKE PORT - MAXIMUM PORT HEIGHT

The maximum intake port height (roof to floor) may not exceed .345, as measured by subtracting the intake port - full open figure (.015 or more) from the intake port - start open figure (.372 or less)

##### EXHAUST PORT - START OPEN

Rotate the flywheel counter clockwise till the piston crown begins to open the exhaust port at the top. Refer to the chart.

##### CRANKSHAFT STROKE

Rotate the flywheel counter clockwise to bottom dead center. Refer to chart.

Specifications	Sportsman (-44)	GN/Super-Truck (2-ring)	GN/Super-Truck (single-ring)
Intake-port, Full-open (IPFO)	.015 or more	.008 or more	.060 or more
Intake-port, Start-open (IPSO)	.372 or less	.415 or less	.465 or less
Maximum port-Window size	.345 or less	.395 or less	.395 or less
Exhaust-port Start-open (EPSO)	.770 or more	.740 or more	.670 or more
Maximum Stroke	1.105 or less	1.105 or less	1.105 or less