



Chapter 11

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Updated 1/2016



Dear New QMA Family,

Welcome to the incredible sport of quarter midget racing! Your family is now a part of one of the “best kept secrets” in all of youth sports. As a member of your local QMA club you are also part of Quarter Midgets of America. As 1 of thousands of QMA drivers across the country your child will now have the opportunity to experience things that no other sport can offer.

First and foremost is the fun, racing side by side lap after lap with their soon to be friends will be a blast. More importantly though will be the lessons in sportsmanship and teamwork. The best part of all is that your team is your family; no other sport can bring families together like quarter midget racing.

As we get started with your experience in the next few weeks please remember that every one of us in this sport started exactly where you are now, at the beginning. Some families that start have a background in racing, for others this is their very first experience. Some have incredible mechanical abilities and others are just learning. Our clubs exist for all of those families and you will soon see that your club is about helping each other every step of the way.

Getting started you will have lots of questions but you will also have lots of time to have them answered. Session after session we will add more and more that you need to know but feel free to ask any questions you have as we go along as well. The only bad question will be those that don't get asked. We very much look forward to working with your drivers and yourselves over the next several weeks. Welcome to QMA!!



Novice Guidelines

We would like to take this opportunity to welcome you and your family and to thank you for becoming a part of the QMA family. We hope you will embrace this time as a chance to spend quality time together as a family. QMA strives to teach our children about coordination, self-reliance, alertness, and the ability to handle motor-driven vehicles. We also aim to impress upon drivers the importance of fairness, generosity, and above all good sportsmanship.

This document is to help guide you through the novice process in QMA. This is only a guide and does not include every detail, which is why we encourage all members to become familiar with QMA rulebook and procedures which can be found on the national website www.quartermidgets.org.

The following is an outline of our current novice procedures:

- New member registers with club and club verifies that they are novice. Meeting the appropriate age requirements, etc...
- National Office sends membership packet to new member. Packet includes: handler ID cards, welcome letter and coloring book. Novice log book and novice orange card are sent to the club President.
- The club will submit to the Regional Director, a list of all novice as they begin their novice training.
- Upon completion of the novice school, the novice logbook and orange novice card are given to the driver.
- The logbook and driver's card are to be presented to the sign-in booth when signing in on race day.
- Entries will be in novice logbook: qualifying time, main or semi race, start and finish position in the race. The logbook will be returned to handler by the novice committee after comments have been made and initialed.
- The orange novice card is good until the driver is 6 years of age plus 3 months or if the driver is already over 6 it will be good for a period of three months.
- The Regional Director will be notified by local club with the novice move up form via email when a driver graduates from novice. The Regional Director will then notify the national Office of the novice's graduation.

- The national office will mark the graduation date (novice end date) under the driver's name and issue a purple driver's card that will be mailed to the handler. The purple driver's cards are valid for one year from the date of novice graduation.
- If upon the expiration of the driver's novice card, he/she is not, in the opinion of the home club's novice committee ready to graduate, a request for an extension will be completed by the handler and Novice Director. QMA Novice Extension form must be used. It will then be submitted to the Regional Director for approval who will forward it to the National Office. (Extensions will be for no more than 2 months at a time).
- Any driver requiring an extension will not receive a purple card until the national office is notified by the Regional Director that they have graduated.
- Upon graduation from the novice class by the driver's home club novice committee/President, a driver will move into a competitive QMA class as permitted by the QMA rulebook. It is encouraged that each club should hold a small ceremony in recognition of this achievement by the driver.
- A driver that receives a purple card will automatically at the end of the 12 month period be issued a white driver's card by the national Office.
- If a handler requests to participate in 160, Sr. Animal, Hvy Animal, Mod, B, AA, or WF prior to the expiration of their purple card they will need to complete a "Driver Move Up" form. This requires approval from the novice committee and regional director per current rules. The regional director will forward the form to the national office and a Pink driver's card will be issued and mailed to the handler.
- All forms mentioned above are available in the club's procedure manual(in the tower) and on the quartermidgets.org site under forms

We realize that this is a lot of information to take in but it is provided for your benefit. Please take the time to visit our website and familiarize yourself with all the rules of QMA. If you have any questions or concerns please feel free to contact your Club President.

Sincerely,

QMA National Board of Directors



Novice Training Schedule

Session 1

- QMA Introduction
- Local Club Description
- The Facility & Track Rules
- Driver's Gear
- Basic Car Safety
- Basic track safety equipment, vests, fire extinguishers, ect
- Buckling in the car
- Basic car operation
- Flags & Hand Signals
- On track basics
- Track Walk

Session 2

- Review car safety & basic operation
- Review Flags & Hand Signals
- Review on track Basic
- Single car laps with cones
- Corner Worker Basics
- 2 Car laps
- Rules for independent practice

Session 3

- Review of flags 7 hand signals
- Review on track basics
- 1 round of single car laps
- Multi-caps laps, 2 then 3, then 4
- Paper numbering system
- Line up basic
 - + Rolling Over
 - + When a car goes through the wall
 - + Accidents with other cars
- Off Track : Car maintenance basics

- Off Track: Volunteer Opportunities (club and race day)
- Review rules for independent practice
- Importance of sportsmanship

Session 4

- Review previous lessons
- Detailed line up procedures
- Multi car practice up to 4, then 6, then 8 cars
- Basics of passing
- Judging from driver's perspective
- Off Track : Car Setup Basics
- Off Track: Tire Mounting
- Off Track: Race Day Procedures
- Off Track: Race Day Officials
- Off Track: Gear Charts and gearing

Session 5

- Review of previous lessons
- Multi car practice with line up
- Simulated racing by division
- Off Track : Judges Training
- Off Track: Technical Inspection
- Off Track : QMA Rules

Session 6

- Review of all previous lessons
- Multi Car Practice with line Ups
- Simulated racing by division
- Off Track: Race Day Review
- Novice Evaluations



Novice Evaluation

Driver: _____ Date: _____

Item	Pass	Fail
1 Car Safety Passes Inspection	<input type="checkbox"/>	<input type="checkbox"/>
2 Safety Gear meets Specifications	<input type="checkbox"/>	<input type="checkbox"/>
3 Secured Seat Belts Properly	<input type="checkbox"/>	<input type="checkbox"/>
4 Arm Restraints On Properly	<input type="checkbox"/>	<input type="checkbox"/>
5 Neck Collar/Hanes Device worn Correctly	<input type="checkbox"/>	<input type="checkbox"/>
6 Use of on/ off switch	<input type="checkbox"/>	<input type="checkbox"/>
7 Enters track properly (speed and above line)	<input type="checkbox"/>	<input type="checkbox"/>
8 Proper pattern on track	<input type="checkbox"/>	<input type="checkbox"/>
9 Knows and obeys all flags	<input type="checkbox"/>	<input type="checkbox"/>
10 knows and obeys common hand signals	<input type="checkbox"/>	<input type="checkbox"/>
11 Exits track properly(against wall and hand signal)	<input type="checkbox"/>	<input type="checkbox"/>
12 Pulls into hot chute properly (slow speed and stops in box)	<input type="checkbox"/>	<input type="checkbox"/>
13 Exits track to scales properly(slow and avoids other cars and people)	<input type="checkbox"/>	<input type="checkbox"/>
14 Lines up in double file starts properly	<input type="checkbox"/>	<input type="checkbox"/>
15 Finds spot and lines up in single file restarts	<input type="checkbox"/>	<input type="checkbox"/>
16 Proper passing techniques	<input type="checkbox"/>	<input type="checkbox"/>
17 Understands judging rules	<input type="checkbox"/>	<input type="checkbox"/>
18 Removes belts and out of car quickly	<input type="checkbox"/>	<input type="checkbox"/>

Driver Signature: _____

Handler Signature: _____

Trainer Signature: _____



QMA Introduction

ARTICLE 1

NATIONAL MISSION STATEMENT

INTRODUCTION

The purpose of Quarter Midgets of America (QMA) is to create and maintain a clean, safe, healthy sport, which may be enjoyed by all family members in a close relationship with good sportsmanship toward all.

To teach the younger generation about the proper handling of mechanical devices, coordination, self-reliance, alertness, and ability to handle motor-driven vehicles.

To impress upon the younger generation the idea of fairness, generosity, good sportsmanship, and a sense of responsibility, without envy of others.

To develop, direct, and promote the objectives of associated Quarter Midget Clubs and their members on a National basis.

The objectives are:

- Uniform engine, car, racing and safety rules
- Coordination of racing events
- Maintain records of member addresses, track locations and capabilities
- Publish a QMA Rules & Procedures Book, and send one copy to each member
- Make available insurance for drivers and tracks
- Communications, for information and interpretations through Regional Directors
- Publish and release a newsletter covering areas of interest to QMA membership
- Preside at an annual meeting of QMA
- The Board of Directors, Regional Directors, and Representatives will coordinate QMA Activities

THE GOAL

The goal of QMA is to build and strengthen the Association through unification by conforming to rules and regulations under one jurisdiction.

The Organization

QMA is organized at three (3) different levels: National, Regional, and Club. Your local club belongs to one of the 13 different regions that make up the national organization. Each of these levels has its own set of officers and its own set of by-laws.

When you join a club you automatically become a member of the region and national organizations. The dues that you pay are split between the national and club levels. The biggest benefit of all to belonging to national organization is the set of uniform rules that are used by every QMA club in the country. While a few "race format" variances may exist, the racing classes, car construction rules, and race procedures are the same everywhere you may go.

Other big benefits include the group insurance policy which is something most people never use organized special racing events such as the "Grand's", and shared knowledge. For a club to belong to QMA they must adhere to certain conditions. These include minimum and maximum track specifications, safety requirements, club structure, and particular race day procedures. Some race day procedures will vary from track to track but they all follow the same minimum requirements.

Communication between the different levels of QMA is handled through prescribed channels called the QMA Chain of Command. Since all QMA members belong to a club, their first branch of communication is with their club officers. Club officers communicate with the regional board members who in turn communicate with the national officers.

The Club

Local racing seasons usually start sometime in the spring and run through the fall each year based on local climate conditions. Our racing schedule is comprised of club races, region races, and "Grand's" or national races. The races for each of these levels are independent of each other, but usually scheduled around the others so that a family can participate in as many levels as they would like.

Almost all families compete at the club race level. Many of those same families also races at the regional level and some also compete at the Grand's. Most clubs string together their club races into a "point series" where drivers are awarded points at each event for their finishing or qualifying positions and compete for season long championships and awards.

Being a member of a club has many benefits, but as with any volunteer organization, it also bears some responsibility. Each member has the right to participate in the running of the club and is expected to contribute time and effort to the club as well. This includes both race day and non-race day opportunities. This can be done by volunteering for different

fundraising projects, helping with track clean up days or construction tasks, and working with others to promote the club and the sport.

The race day it self requires many different volunteers to make it happen. The flagger, pit stewards, scale operators, scorers, judges, and merchandise sellers are all club members pitching in to make the event go smoothly.

Away from the track club holds schedule "Club Meetings" and board meetings that are open to all members. Many clubs hold regular meetings on a monthly basis. This is where all non-race day business is conducted, financial reports are given, and annual elections are held, and so on.

Each club's Board of Directors is made up of officers that are elected at the end of each year for the following season. While each club is different, most will have a President, Vice President, Secretary, Treasurer, Tech Director, Safety Director and so on. This will be determined by the club by-laws which vary from club to club. The President will lead the club meetings, the Treasurer and Secretary will handle the administrative and financial duties of the club. The Race Director is responsible for putting together the schedule and race format and in charge of the racing day. The Safety Director is elected to oversee the safety of the track, the drivers and their cars. The Tech Director's job is to make sure that everybody is following the same rules. And the final position is the Drivers Trainer who oversees novice training and the novice program.

The Region

A region is clubs grouped together by proximity. Some regions also have their own point series that consists of a number of "Region Races", usually held one at each of the tracks in the region. While club races are single day events, the region race events can often be two days of racing over a weekend.

Each region also has a complete set of officers that are elected to 2 year terms. Odd numbered regions have elections every odd calendar year and even numbered regions the other.

QMA Classes and Divisions

QMA divides racing into classes and divisions so that drivers compete against similarly experienced and aged drivers as well as by engine type. In QMA there are 7 different engine classes plus the novice divisions.

When your driver first graduates from Novice Training they will then race in the Novice class which is divided into two divisions, Junior and Senior which are distinguished by age. All junior divisions are for driver's age 5 to 8, while senior divisions are for drivers age 9 to 17. The Novice divisions are considered noncompetitive and are there for drivers to learn and understand the basics of quarter midget racing. Junior Novices use the Honda GX120 motor with a QMA red restrictor plate while Senior Novices use the QMA blue restrictor plate.

When your driver is ready to move out of the Novice divisions and into the competitive classes the next level is called "Honda". These classes are based on the Honda GX120 motor, the same one that almost all novices use as well. There are three divisions in this class, Junior Honda, Senior Honda, and Heavy Honda. While Junior Honda entrants use the blue restrictor plate, the other two divisions are unrestricted. The Heavy Honda division is for drivers age 8 and above who weigh by themselves over 100 lbs.: this class has a higher required weight as well.

Honda motors are also used for the Light and Heavy 160 divisions as well. This class is based on the Honda GX160 motor. Instead of dividing this class by age, it is separated by driver's size and is available to all drivers age 8 and above that moved out of the novice classes for at least a year.

The next 4 classes are based on a completely different engine platform called the "Deco". The Deco engine has been in quarter midget racing for many decades and is made from parts that are no longer in general production. Because of this the cost of Deco engines is quite a bit different than that of the Honda engines, but do provide additional opportunities for drivers to get track time in multiple classes and experience a different kind of horsepower. The 4 Deco classes are Super Stock, Modified, B, and AA. The stock class is divided into Junior Stock and Senior Stock based on age.

QMA added 2 new engine platforms called the Briggs World Formula and Animal. These higher horsepower engine classes were added to provide a higher horsepower option for families without the cost of the Deco engines. The Briggs Animal class is broken down into three divisions: Jr Animal, Sr. Animal and Hvy Animal. To compete in the Sr. or Hvy. Animal class you must have competed in one of the Honda 120 classes for one year. The Briggs World Formula class offers two divisions: a light and a heavy class. The same one year experience out of novice restriction as well as age requirements apply to these classes.

In addition to all the quarter midgets classes QMA also offers a "Junior Half" class that are slightly (inches) bigger cars and aimed at older drivers. This is for children ages 11 to 17 and must weigh 350 lbs combined. The engine rule for this class is pretty open and allows many different configurations.

ARTICLE 7

NOVICE RULES AND PROCEDURE

SEC..1 PURPOSE

1. The fundamental purpose of the Novice Class is to train new drivers so that they understand the basic racing rules and so that they are able to handle themselves and their cars in a safe manner on the track. It is not intended that the Novice Class be utilized to perfect racing abilities or techniques. Extended competitive racing in the Novice Class once the fundamentals are attained is not to be allowed.
2. To regulate and unify the novice training and racing program, these rules and regulations, as approved by the Regional Director, will be adhered to by all drivers, handlers, and member Clubs of Quarter Midgets of America.
3. Any changes, additions and deletions to these rules and regulations will be enacted by the Regional Directors. Any temporary deviations from established rules must be approved by the Regional Director concerned before implementation of such changes by any Club.
4. The Regional Director will supervise the novice training and racing program in his/her region.

Sec.. 2 NOVICE CLASS - DRIVERS AND HANDLERS

1. The minimum age for novice students shall be five years for racing and four and one half years for practice and training only. (4 1/2 year olds may not practice or train during an event)
2. Each Novice handler, upon joining a club shall present the drivers birth certificate to the Secretary of the club and the "official age" of the driver shall be entered in the permanent records of the club. Copies of these records shall be forwarded to the QMA National Office and the Regional Director.
3. In an effort to obtain the greatest benefit from participation in organized Quarter Midget racing, Novice handlers should read Article 3, Sec. 2 of this rule book, entitled "Novice Program Committee".
4. The Club President will receive from the National Office an orange novice driver's card and a log book. The President will issue the log book and an orange Novice Driver's Card good for a period of three months, only for drivers six years old or older. Once they graduate from novice, they will be mailed from the National Office their drivers purple card.
4. A Drivers not yet six will be issued a Novice Card good until their sixth birthday plus three months.
4. B The driver's age will be entered on the Novice Card.
4. C Extensions of the Novice Card shall only be granted when the handler has completed a Novice Extension Form and it has been approved by a signature from their Novice Director, their Club President and their Regional Director. Any novice extension forms that are approved must be forwarded to the National Office by the Regional Director.
4. C (1) Extensions will be for no more than two months at a time, if needed.
4. D Novice parents will receive from the National office, their picture ID badges, a rule book and a novice procedure guideline. The novice drivers will receive a welcome coloring book.
5. A driver may be moved out of the Novice class at any time if in the opinion of the Novice Committee the driver is qualified.
6. It is required that all Novice Drivers have a QMA official Driver's logbook.
6. A The logbook and Novice Driver's card are to be presented to sign-in booth when signing in on race day.
6. B Entries will be made in the Novice logbook, such as qualifying time, main or semi race, start and finish position in race. The logbook will be returned to the Handler by the Novice Committee after comments have been made and initialed.
6. C False or unauthorized entries in the logbook or on the Novice Card will be cause for a 90-day suspension from all QMA tracks.
7. A duplicate of any lost logbook must be obtained from the Club Secretary. Record of past races to be reconstructed in replacement logbooks from Club Master Records.

Sec.. 3 NOVICE TRAINING

- 1 Completion of Novice Training, given by a competent instructor, is mandatory for all new drivers of member Associations of Quarter Midgets of America. Minor changes may be made to training outline to conform to local conditions; however, the reason for all changes must be submitted to the Regional Director

without delay.

1. A Any driver not trained by a Club-designated trainer must pass a test given by his local Club novice instructor before he enters into the Novice Class.
- 2 The Novice driver must be covered by QMA insurance during training periods.

Sec.. 4 RACING

- 1 The Novice Class will be a recognized class by QMA and will run under the Honda 120 engine rules at all QMA races.
- 2 The Novice Class shall be divided into the Junior and Senior divisions only, which may be combined if necessary to make a class and will use a Honda 120 engine only.
- 3 The Novice program and its implementation fall under the Regional Director's authority. Therefore, illegal engine parts will be confiscated but the suspension will not be levied against handlers or drivers for the first offense only. The second offense requires 30 day suspension from Novice.
3. A Any alteration to Jr. or Sr. Novice Restrictor Plates – 1st offense, 30 day suspension. 2nd offense, 1 year suspension.
3. B All other QMA rules and penalties apply to the novice class.
4. Novice Class participants will be required to install a restrictor plate on their carburetor per Article 10, "restrictor plate program".
4. A A Club may have the option to remove the restrictor plate, to create a Honda 120 special novice division, for non-qualifying events only, for transitional period of two to three events prior to moving the drivers to the Super Stock/Honda 120/ Animal class. Junior Novice to Junior Honda/ Junior Animal restrictor, and Senior Novice to unrestricted Honda 120 or Senior Stock. Unrestricted Senior Novice must weigh 275 lbs. combined. See Table 5-1 **Page 27**.
5. No more than eight cars may be entered in any Novice race.
6. One Safety Man shall be present on each corner for every Novice race.
7. During the Novice race, if a driver makes an infraction of a racing rule and the judges determine they were 100 percent at fault for the incident, the race will be stopped. The driver will receive a Charged Yellow and if it is not their third Charged Yellow they will be put to the back of the restart line up. If it is their third Charged Yellow then they will be given the black flag and scored with a DNF. An explanation will be given to the driver of what he or she did wrong and why it should not be done.
8. On the first day of Novice competition, the driver shall be entered in all races at the back of the lineup of the race for which he has qualified regardless of qualifying position.
9. Infractions such as liberating fluids, dropping safety parts (as per judging rules), etc., are not driving infractions and drivers should not be given a second chance before disqualification. These infractions would result in immediate disqualification. The third time violation for disqualification relates only to driving offenses, such as chopping, charging, and racing room violations.

Sec.. 5 NOVICE GRAND'S

- 1 A Novice driver may run the Grand's exhibition events for one year only (i.e., East, West, and Dirt).
2. In order to participate at the National Championship Exhibition a Novice must meet all of the qualification requirements specified for all other classes. These requirements are specified in this rule book.
- 2.A Novices who want to race in the Novice Class at a Grand National Event **MUST** qualify at a State Race event as a novice.
- 2.B A driver graduating from Novice must race one club race in Honda 120 class before competing at a Grand's National Event in that class.
- 2.C **EXCEPTION:** If a new Novice family joins the Club after the State Race Event, the driver(s) will be allowed to participate at the National Grand's as an Exhibition only. A Novice Driver may not race as a Novice at the National Exhibition level for more than one season.
- 3 Novices at the Grand's:
 3. A Exhibition events only.
 3. B Minimum one practice session.
 3. C Racing format to be decided by QMA.

- 3. D Line up established by qualifying time.
- 3. E All participants to receive equal awards, preferably trophies.
- 3. F Practice and racing to be designated on each Grand's schedule.
- 3. G Registration fee for Novices at Grand's is \$30.00.

Sec.. 6 GRADUATION OF NOVICE DRIVERS

- 1. The Novice Class is the "learning" class and, as soon as possible the Novice driver shall be moved to the Stock/Honda/Jr. Animal classes in order to avoid "professional" Novice drivers.
- 2. A Novice driver must participate in at least three events before graduating to a competitive (Stock/Honda/Jr. Animal) class.
- 3. It is suggested that the Novice Committee (to be discussed on the next subject) hold a small ceremony to make the advancement of a driver into the Stock/Honda/Jr. Animal Classes.
- 4. At graduation (QMA Home Club) the driver's logbook shall be validated and the Novice Card shall have written on it (in ink) the date of graduation.
- 4. A The Regional Director shall be notified of all graduating Novices by their Club President. The Regional Director will then notify the National Office within 30 days, and a Purple Driver's Card will be issued by the National Office to the driver and sent to the family.
- 4. B The validated Novice Card will be accepted in Stock /Honda /Jr. Animal classes until a new purple card is sent by the National Office to the driver.
- 5. On the first day of competition in the Super Stock/Honda 120 /Jr. Animal class, the new driver shall be entered in all races at the back of the pack for which they qualified, regardless of qualifying position.
- 6. All graduating novice drivers shall be on probation for three events.
- 6. A A Novice must race one club race in Super Stock/Honda 120/ Jr. Animal class before competing at a Grand National Event in the Stock/Honda/Animal Class.
- 7. Once a Novice is graduated to Super Stock/Honda 120/ Jr. Animal and completes his/her probationary period, they may not be returned to the Novice class for any reason.
- 7. A If there is a lapse in the participation of a driver, they may be moved back to Novice for a trial period, at the discretion of the Club Novice Committee.



Official Drivers

Quarter Midgets of America



Good Luck!

Good Racing!

NO. _____

Quarter Midgets of America, Inc.

THIS IS TO CERTIFY THAT

IS A NOVICE DRIVER

BIRTH DATE

Issued: _____

Expires: _____

Region No. _____

Regional Director: _____

OFFICIAL DRIVERS LOG BOOK FOR THE YEAR _____

DRIVER'S NAME _____ BIRTH DATE _____

ISSUED BY _____ ISSUE DATE _____

CAR OWNER _____ QMA NO. _____ INSURANCE NO. _____

NOVICE

GRADUATION

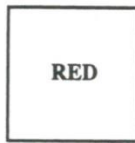
Date _____

Track or Club

Novice Evaluation Signature

[illegible]

FLAGS



STOP
Right Now



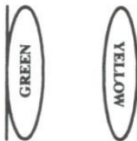
SLOW DOWN
Hold your position
No passing



GO
Race is Started



DISQUALIFIED
Go to the pits



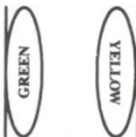
RESTART
Form up and restart
the race



ONE MORE LAP
To end of race



END OF RACE



FORM UP
Line up in your
qualifying position



**ONE MORE LAP
AND STOP**



NOVICE EXTENSION APPROVAL

DRIVER NAME: _____

DRIVER AGE: _____ DRIVER QMA #: _____

HANDLER NAME: _____

HANDLER QMA #: _____ CLUB: _____

Date of First Race: _____ Extension Period Requested: _____
(2 months at a time)

It has been requested that the above driver obtain an extension to continue to participate in the Novice Division of QMA for the reason stated below (use the back if you need more space and attach a copy of the request letter from handler/parent):

PARENT/HANDLER (print)

PARENT/HANDLER (signature)

NOVICE DIRECTOR (print)

NOVICE DIRECTOR (signature)

CLUB PRESIDENT (print)

CLUB PRESIDENT (signature)

REGION DIRECTOR (print)

REGION DIRECTOR (signature)



(1) Copy kept at club level, (1) copy sent to the Regional Director, (1) copy sent to the National Office with the application

PURPLE CARD PROCEDURE

- New Member registers with a club and checks off that they are a Novice. Any age, any time of the year.
- National sends a welcome letter and coloring book to the driver. Novice Log Book and Novice Orange Card are sent to the Club President.
- Following Novice School, the Novice Log Book and orange novice card are given to the driver.
- Upon Graduation from the Novice Class by the Home Club Novice Committee/President, a driver will either move onto a competitive QMA class as permitted by the rulebook or will be granted an extension if needed and the proper form is filled out and sent to the National Office.
- The club will send to the RD, a list of all Novices and mark whether they have graduated or if they have permission for an extension of up to two months at a time using the QMA Novice Extension form.
- The RD will send this list to the National Office via email and any extension forms via US postal service.
- The National Office will mark the graduation date (novice end date) under the driver's name. The next column will have a date field for 12 months from the graduation date.
- The National Office will issue purple cards to all those who are marked graduated and mail them to the handler.
- Any driver requiring the extension will not receive a purple card until the National Office is notified that they have graduated. Please remember that extensions are requested for two month periods at a time.
- Each month the National Office could run a report showing drivers entering the 12th month of their purple card period. (This new report would have to be created by Flytrap). During this month, the National Office would send the handler the white driver card so that it arrives by the 12th month anniversary of their graduation (end date) from novice.
- If a novice handler requests that they be moved up prior to their one year purple card period expires, they would be required to get unanimous approval from the Novice Committee.
- If they receive unanimous approval from the Novice Committee to move up during their purple card period, they will need final approval from the RD.
- If RD approves, then the "Novice Move Up" form will be completed and sent to the National Office so that a pink Driver Card can be issued and sent to the handler.



QUARTER MIDGETS OF AMERICA

P.O. Box 150150-Tulsa, Oklahoma 74115-0150

Phone: 918-371-9519

Toll Free: 1-877-QMA-9519

E-mail: memberservices@quartermidgets.org

We are pleased to welcome you to Quarter Midgets of America!

Your purple driver's card has been processed. Enclosed please find your driver's card. You will need this card at sign-ins for every QMA race you attend.

If you have any questions regarding your membership, please do not hesitate to contact your Club Officials, Regional Director or the QMA National Office at 1-877-QMA-9519 or via e-mail at memberservices@quartermidgets.org

Once again, welcome to North America's largest association of quarter midget racers.

Happy Racing!

Sincerely,
QMA National Office
on behalf of QMA National Board of Directors





QUARTER MIDGETS OF AMERICA

P.O. Box 150150-Tulsa, Oklahoma 74115-0150

Phone: 918-371-9519

Toll Free: 1-877-QMA-9519

E-mail: memberservices@quartermidgets.org

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DRIVER CLASS MOVE-UP APPROVAL

DRIVER NAME: _____

DRIVER AGE: _____ DRIVER QMA #: _____

HANDLER NAME: _____

CLUB: _____ HANDLER QMA #: _____

Date of Graduation: _____

The above driver has been reviewed by the undersigned as being experienced and capable enough to run an upper class motor as long as this driver also fits within the age bracket. The Class, this handler is requesting for his driver to run is (please circle):

_____	Honda	GX160	B	AA	WF	_____
PARENT/HANDLER (print)						PARENT/HANDLER (signature)
_____						_____
NOVICE DIRECTOR (print)						NOVICE DIRECTOR (signature)
_____						_____
CLUB PRESIDENT (print)						CLUB PRESIDENT (signature)
_____						_____
REGION DIRECTOR (print)						REGION DIRECTOR (signature)

(1) Copy - club level, (1) copy - Regional Director, (1) copy National Office with purple card to receive pink card.

ARTICLE 10

RESTRICTOR PLATE/ SLIDE PROGRAM

Sec.. 1 GENERAL

1. Restrictor plates shall be utilized in the following divisions:
 1. (A) Junior Novice Honda
 1. (B) Senior Novice
 1. (C) Junior Animal - See chart in Sec. 4 for plate
 1. (D) Senior Animal - See chart in Sec. 4 for plate
 1. (E) Junior Honda
 1. (F) Junior Stock - Slide style Pumper Carb
 1. (G) Junior and Senior Stock – Tillotson carb.
2. Restrictor plates are mandatory.
3. Restrictor plates will be supplied by QMA to Clubs at a nominal cost. All QMA Restrictor plates must have the QMA logo on them. Blue restrictor plates must be dated 06/09 or newer.
 3. (A) Only QMA approved restrictor plates may be used.
 3. (B) Clubs must purchase restrictor plates from QMA National Office unless otherwise notified by QMA.
4. Restrictor plates may be removed during non-race events for practice only.
5. The identification tab must be visible at all times.
6. Alterations of any kind will be disqualified.
 6. (A) Alterations to Novice Restrictor plates require the following penalties:
1st offense: day suspension, 2nd offense: 1 year suspension.
- 7.(B) Failure to use proper restrictor plate in any designated classes or any alteration of restrictor plate is cause for immediate DQ and applicable suspension.

Sec.. 2 DECO

1. Gaskets must not have an inside diameter of less than 0.750" and not be tapered to alter the airflow in any way.
 1. (A) Airflow must pass through restrictor hole only.
 1. (B) If the restrictor plate is removed for racing Super-Stock class, two gaskets may be used on a temporary basis.
2. Jr. Stock must run a restrictor plate on the exhaust side. If restrictor plate is missing or if tampered with, the car will be disqualified.

Sec.. 3 ANIMAL

- 1 Animal divisions will run the following plates at all times.
 1. (A) Junior plate will be blue.
 1. (B) Senior plate will gold.
2. Airflow must pass through the restrictor plate hole only.

Sec.. 4 HONDA

- 1 The Novice Honda and Junior Honda division will run the following restrictions at all times.
1. (A) Junior Novice = 0.3125" (5/16"), Senior Novice = 0.4375" (7/16)
2. (B) Junior Honda = 0.4375" (7/16")
3. The restrictor will be installed between the carburetor and plastic insulator, with a stock gasket on each side of restrictor.
- 3 Airflow must pass through the restrictor hole only.
3. (A) If the restrictor plate is removed for racing Sr. Honda 120 division, two stock gaskets may be used on a temporary basis.

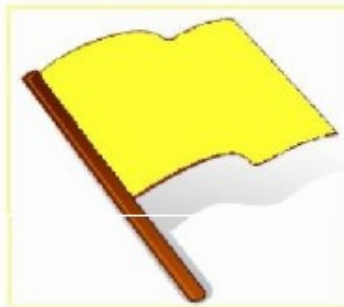
QMA Restrictor Dimensions

Division	Color	Restrictor
Jr. Animal	Blue	0.521
Sr. Animal	Gold	0.5725
Jr. Novice (Honda)	Red	0.3125" (5/16") R
Sr. Novice (Honda)	Blue	0.4375" (7/16") R
Jr. Honda	Blue	0.4375" (7/16") R
Jr./Sr. Stock w/Tillotson – Model HL357	Black	0.660 R
Jr. DECO Exhaust No QMA logo	Silver	0.500" (1/2") R



GREEN

Go Now!



YELLOW

Caution, Slow Down!



CHECKERED

Race Finished



RED

Stop Safely now!



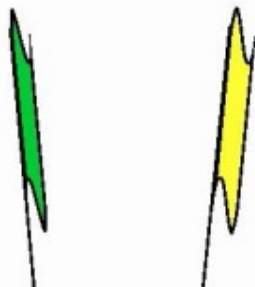
WHITE

**One more lap,
keep going!**



BLACK

Leave the track



**Rolled up Green &
Yellow in 2 hands**
Line up double file



**Rolled up Green &
Yellow in 1 Hand**
Line up single file

Hand Signals

It is against the rules to communicate with a driver while they are on the track racing under green flag conditions. It is very important, however, to communicate with the drivers while they are not under green flag race conditions. The following signals are the common ones used by the driver trainer, race officials, and parents to give instructions to the drivers while they are in the car.

Turn Switch Off and Stop Right Away Pull your cupped fingers across your throat in a slashing motion. This signals the driver to "cut off" the power and stop.

Slow Down Hand or hands held in a flat position, palms down extended from your body moved in an up and down, patting motion.

Give it More Throttle Thumb and index finger in and continuously open and close motion, like pinching and un-pinching your fingers.

Spread Apart from Other Cars Arms extended to the front in an opening and closing motion with palms facing out and motion mainly to the outside.

Get Closer To Car In Front of Your Arm extended to the front in an opening and closing motion with palms facing inward. Motion almost like clapping without hands touching each other.

Move To The Back of the Pack Hand or flag pointing to your rear end.

Think About What You Are Doing Finger pointing to top of your head.

Look And Pay Attention Finger pointing to your eye.

Full Throttle Slap and hold hands together with arms extended in front of you with the right hand on top and left hand on the bottom.

This Flag in 1 Lap Any flag held in a furled position, with one or more fingers held above it. Take the number of laps indicated by fingers, then take action required by the flag.

Car Entering The Track When the flagger or handler point to the high side of turn 1 that means that another car is about to pull onto the track and all drivers on the track should be cautious and pay attention.

Basic Car Operation

Driving a quarter midget race car is a very exciting thing for any child to do, but it is important that once they are strapped into the car they are focused on the task at hand. As a driver your child needs to concentrate the machine they are in and what they are doing entering, driving on, and exiting the track. The most dangerous part of the car is the driver when they are not paying attention.

After getting in, buckling up, and putting on all the safety gear the next step is to get the car started. This is done by the handler telling the driver they are going then starting to push the car. Once the car is rolling tap the driver on the helmet to let them know it is time to turn the switch on. Within a couple of revolutions of turning the switch on the engine will fire as long as everything is going as planned.

As soon as the engine has fired the handler should let the car go by itself and turn to the outside or inside depending on where they are and get out of the way of the next car going out. If starting from the hot chute or staging area and your driver is following another car out make sure not to signal them to turn the engine on until the car in front of them is under their own power as well. If pushing off from the track, always make sure the cars behind you know which direction you will turn after you start your car. Starting cars on the track while other cars are out there is about the most dangerous thing in quarter midgets and where the majority of any possible injuries will occur.

Once the car is started the driver needs to steer, use the gas pedal, and the brake pedal. While under green the driver should always have two hands on the steering wheel with the 4 fingers of each hand curled around the wheel in approximately the 10 and 2 o'clock positions. Their thumbs should NOT be curled around the inside, but instead pointing towards the top of the steering wheel laying flat on the top of the wheel. This is to make sure that if there is any wheel contact with the wall or another car their thumbs are not caught in a steering wheel that snaps to the left or right.

The gas pedal is the one on the right and should not really be used until your driver is on the track. The engine idle itself will be enough to get the car from the hot chute or staging area to the track in a safe manner. Under green flag conditions, most cars will be at full throttle in an open pattern.

The brake pedal is the one on the left and is often times the most important piece of the car. This is the piece that will get the driver out of trouble. With the types of motors in these cars stepping hard on the brake pedal will not only slow the car, but it will stop it quickly and kill the engine all in one step.

Drivers should always tell their mother before a race begins if their brakes are not working or something about the brakes does not feel right.

Just like we use the switch to turn the car on, we also use it to turn the car off. Flipping the switch to the down position will shut the engine off, pressing the brake at the same time will make it happen even faster.

Note: Effective April 1, 2009 all Novice cars must be equipped with a Switch on the top of the roll cage. This is for the flagger or corner men to switch the car off with a pole or flag.

On Track Basics

While the last section described how to operate the car, this section will describe the basics of getting on and around the track. When you push your driver off from the hot chute or staging areas make sure to let them know they barely need to use the gas pedal if even at all. Just the engines idle speed should be strong enough to get them onto the track. When driving onto the track the driver needs to pay attention to other cars pulling on at the same time and two other cars that are already on the track.

From staging or the hot chute the driver pulls onto the track by driving down the "on_chute" lane that is behind the flag stand and then stay above the entry line that continues from the on chute to the middle of turns 1 and 2. It is very important to stay above this line before blending in with the other cars. As a matter of fact dropping below the line while coming onto the track is reason for automatic disqualification or a black flag to return to the pits.

When a car first pulls onto the track the tires will be colder than their peak operating temperature and not have nearly the same amount of traction as they will after a few laps of warm up. That is why it is important for the driver to take it easy and be cautious for a few laps until the tires come up to temp and start sticking to the track.

Once it's time to hit the gas it's time for the driver to start driving the car in their racing "pattern".

HERE IS THE BIGGEST SPEED SECRET IN ALL OF QUARTER MIDGET RACING: PATTERN. PATTERN. PATTERN.

The pattern is the line that your driver navigates around the track. Every track has a slightly different pattern, but they all have the following in common: go high on the straightaway and low in the corner. When the driver is on the gas at full throttle the difference in their pattern will make a **HUGE** difference in how fast the car makes it around the track. Smooth hands and easy transitions from the corners to the straightaways are very, very important.

By high on the straightaway we mean out to the wall without touching it. By low in the corner we mean down to the bumps in the center of the corner without touching them. It is also important that the driver stays high on the straights for longer than would seem natural. When a driver turns too early towards the corner that is called "pinching" the corner and will usually result in a car that either turns too much or not enough coming out of the corner.

So after a few laps of running absolutely beautiful and perfect pattern laps it will be time for your driver to pull into the hot chute or exit to the off chute of the track. The latter is done only when the off_chute gate is open. Exiting the track is another process that has a specific procedure for the driver to follow. Before exiting, first the driver needs to slow down from full speed, then when on the back straightaway move to the most outside lane and wave your left hand up and down to the left so that it is visible to every other driver on the track. No coasting into the pits, slow down with the brake, and turn left towards the hot_chute and pull into a numbered pit stall.

As a handler when your driver is entering the hot_chute make sure you meet them and point to the pit stall you would like them to pull into. Both you AND your driver need to be very aware of the other people and cars around you as to avoid a collision. When your car is in the hot_chute the driver should remain in the car and stay buckled in. If you are done and do not need to go back onto the track, then push your car/ driver outside of the hot_chute into the off_chute or staging area before you have them climb out of the car.

An excellent way to practice and review all the on track stuff, including the above, but also lining up and passing is to practice at home in small scale with matchbox type cars. Many a quarter midget family have spent many hours with a homemade track and matchbox cars. Doing this you can show your driver how to get on the track, how to exit the track, their pattern and so on.

The Quarter Midget Racing Day

Once you have your car ready to go, all your safety gear, and your family has gone through novice training, the next step is to race! This is where the real fun begins. The following paragraphs are intended to help walk you through all the steps of a typical racing day.

The first step, of course, is to arrive at the track and find a parking space. Most club facilities have open trailer parking available on a first come first serve basis. There are often exceptions for reserved vendor spaces or a few spaces for some particular volunteers.

Each racing day you must have your car inspected for safety by the club Safety Director or their designee. This is done by bringing your car, driver, and safety gear to a designated area or in some case the Safety Director and some helpers will go from trailer to trailer. The Safety

Director will check your car to make sure the brakes work, the driver's gear meets specs, and all other QMA safety requirements are met. For each car he or she will complete and sign a QMA Safety Sheet and then give that to you.

The next step is to sign in. This is done by completing the bottom portion of your safety sheet with your driver's information and QMA number and taking it to your club's sign in area, usually at or near the track tower. Here you turn in your sheet, sign the appropriate insurance waivers, pay your entry fee and make your "pill draw".

Most race days are comprised of either heat races with main events OR qualifying with main events. Heat races are shorter races used to determine your main event positioning while qualifying is single car runs to record a lap time to position your driver for the main. The pill draw is where you reach into a bucket and blindly draw a chip with a number on it that then determines your heat race line up or qualifying order.

Prior to every race day most clubs will host a Pit Meeting, sometimes called a handler's meeting. This mandatory meeting is usually mandatory and is conducted by the Club President and / or Race Director. Here they will go over all pertinent information for the race day and talk about things that they have seen in recent races that need to be brought to everybody's attention.

After the pit meeting the race director will often have a driver's meeting where they meet with the kids to remind them about how to line up and start the race and to make them aware of any special things the officials will be paying attention to.

Sometime between sign in's closing and the first race, the tower staff will complete and post the line ups for the heat races or qualifying order. Once this is done, you should check which race number you are in and the number that has been assigned to your driver. This number determines where they will start in the race and you are required to put this number on your car before you stage to race. Paper copies of the numbers are available near where the line ups are posted, grab 3 of copies of your driver's number and then affix them to the car so that there is one on each side of the tail cone and one on the left side of the car in front of the driver's compartment. Most people do this by using blue "painters" tape because it's easy to take off after the race.

When you know your race number make sure you have your driver and car in the staging area in plenty of time to be lined up before your race is pushed off. Once your car is in staging there is no more running of the engine so if you would like to warm it up (a very good idea) then do so before you get up there to line up.

When you arrive at staging with your car and driver there will be a volunteer club official called the pit steward there to direct you to which lane you should line up in. Each race that is getting

ready is assigned to a specific lane to help keep it organized. Take your car off its car or stand and put it in line, then have your driver get in the car and begin buckling in. Please have your driver all ready to go when the race before yours is finished. It really helps the Race day go much smoother when we can push one race off right after the other. If you are race number 1 then have your driver ready to push off right at your club's designated starting time.

When the tower staff and all the other officials are ready for your race to enter the track you will be signaled to push your driver off. This is done from the staging area one at a time from the front of the line back. Please make sure the car in front of you is running under its own power before you tap your driver to flip their switch on. This is for safety all the handlers and their ankles!

While the cars are being pushed out the flagger will have the yellow caution flag displayed. Once all the drivers have safely entered the track the green flag will be displayed and the warm up period will begin if your club has warm ups in the format. During the warm up if there are any on track accidents or cars that go Dead On Track ("DOT") the flagger will waive the yellow caution flag. For serious accidents, injuries, or required wall repair the flagger will waive the red stop flag. The warm up timer continues on for any yellow flag and stops for any red flag.

During a timed warm up period, it is completely okay to bring your driver into the hot chute for any repairs, car adjustments, or pep talks. The only requirement is that your driver has their car back on the track or at least past the "out late" line at the end of the hot chute before the arm up time has expired. If they are out after this then they will be required to go to the back in the starting lineup.

When the warm time expires the flagger will waive the yellow caution flag until all the cars have slowed down and then they will call for the initial line up. They signal for the initial line up by holding the rolled up green flag in one hand and the rolled up yellow flag in the other flag and moving them up and down in an alternating fashion. At this time the drivers are expected to pull into double file position based on car number with car number 1 being on the inside of the front row and car number 2 on the outside and so on and maintain a slow pace.

Once the drivers are all in position the flagger can throw the green flag. The QMA rules actually only require the front four cars to be in position, but the flagger will always try to get the hold field together before they opt to start with less than that. During the lineup process it is important that your driver knows where they are supposed to be, maintains a tight proper distance behind the car in front of them, and pays attention to the flagger for any information they may be trying to convey to them.

While not required to, the flagger will usually signal the drivers with a "one to go" signal once the field is line up properly so that the drivers know to expect the green flag the next time by.

This does not mean that the green flag will for sure be thrown the next lap because if the field does not stay together or the leader or other car jumps out early the flagger can elect to wait to throw the green. There may not be another "one to go" signal after the initial one so let your drivers know to always be ready.

When the green is thrown the race begins and the drivers start competing for position on the track. They keep racing until the next flag is thrown which could be yellow, red, or white which would signal one lap to go until the checkered flag. If the caution yellow or red is thrown and the races time limit has not expired, then a single file restart will take place.

The tower staff will determine the restart order and post the numbers in the window of the tower. Once the lineup is ready in the window the flagger will signal to the drivers to look for the window to determine where they are supposed to be and then put themselves in that order. There is no passing allowed under yellow until the lineup is posted and then only to put yourself in the right order. It is never okay to pass the leader under yellow.

Once the race is completed with the checkered flag all drivers are expected to slow down and exit the track safely, including using their left hand wave to let others know they are leaving the track. Because the race is over the off-chute gate will be open so that cars can exit to the scale house. It is important to exit slowly, with caution, and to stop completely before arriving all the way to the scales.

At the scale house you will be required to weigh your driver and car together and be checked for other tech items. Do not leave the scale area until you have been cleared by the scale operator to do so. When they have then you can load your car back into your pit car and return to your pit area or trailer.

For special events such as regional races or Grand's you will also need to have your engine sealed before leaving the scale area as well. This is where a volunteer uses a unique paint color to mark your engine in various places to make sure that no changes are made to it between your heat race and qualifying and the tech inspection process.

When all the heat races (or qualifying) are completed, then the tower will then take all the results and put together the line ups for the main events. When these are completed they will be posted at the bottom of the tower as well. The tower will announce when the main events are to begin. You should then check to see which race you are in, what your number will be, and make sure to be ready in staging the race before yours is completed.

All junior division races have a maximum of 8 cars and senior divisions have a maximum of 10 cars. If there are more than these limits signed into a class for the racing day, then there will be

more than one main event. The feature main will be called the A Main, the next level down will be the B Main, then the C Main and so on.

When there are multiple mains your heat or qualifying results will determine which main event you are slated into. A specific number of cars from each lower main will transfer to the next main up depending on your club's format. Each lower main event will then be run starting with the lowest letter. So every driver still has a chance to make it to the A main event in their division regardless of how they qualify or finish in their heat.

When the A Mains are finished your club will normally have the top 3 or 4 finishers in each division take their car to the "impound area" which is roped off or marked off area. Here the cars remain untouched until they are either called for technical inspection or released from impound by the club's tech director. If selected for inspection the different things that may be checked are fuel, oil, and carburetors, and other engine components.

The engine rules for QMA are very detailed and intended to make sure that all the kids are allowed to compete on a level playing field. Messing around with those rules is considered a very serious offense and will result in severe penalties and suspensions.

While waiting for the tech to be completed it is a good time to look around the facility and help pick up and clean after ourselves. When all cars and engines have been cleared from tech inspection then it is time for the awards ceremony, which will be conducted on the brick awards platform just to the west of the tower. After finishing the awards our racing day is complete and the only thing left to do is talk about all week and make stuff up until we come back the next time.

Race Day Volunteers

A successful race day requires volunteer efforts on the part of all members of the club. You DO NOT have to work a position all day, just ask for a replacement when needed. All of the following positions are filled by volunteers, some of them are pre-assigned and others need people to step up every week. Don't be shy, help out where you can!

Pit Boss: Works in the staging area to make sure races are ready on time. Duties include making sure drivers are properly buckled into cars, making sure correct numbers are on the car, and making sure all cars and drivers are present. You will wear a headset to communicate with the tower and flagger. The flagger will signal to you when he/she is ready for the next race to be sent out. You will be given a copy of the line-ups for each race to check the numbers on cars. If any drivers or cars are missing, notify the tower to call that driver to staging.

Race Director: Wears a headset and stands in the pit area. Your job is to provide communication between handlers and judges. When calls are made, the race director notifies the handler of the call. The race director also opens the exit gate for cars after a race and closes the

gate once all cars have gone through. (The next race cannot start until all participants from the previous race are behind the gate.)

Corner Worker: Two corner workers are required per corner of every novice race. You will be required to work a corner while your son/daughter is racing. Volunteer to work corners anytime.

Judge: Every race is required to have a minimum of three judges. Their responsibility is to make sure drivers are racing cleanly and not being overly aggressive. Judges sit on the judge's stand and communicate with a headset to inform all volunteers when calls made. (ALL NOVICE HANDLER) should spend some time on the judging stand learning from veteran handlers. Handlers are assigned races to judge which is indicated by the names written on line - up sheets.

Lap Checker: Works in the tower and keeps a running order of cars and their positions in the race. Usually three lap checkers are required for every race.

Card Flipper: Counts down laps in a race by flipping a numbered card each time the lead car completes a lap.

Snack Shack: The snack shack provides food and income for the club. Any help you can offer with cooking food or managing the till would be greatly appreciated.

Flagger: The flagger controls the race. Novice handlers are generally not encouraged to flag unless they have to.

Scales: All cars and drivers are required to scale immediately after a race. Workers are needed to monitor scales and assist with lifting cars. For some races, cars are required to "cross the board" at scales. On the board, car tire widths are checked and knerf bars are checked to insure the car is legal. Scale workers record car placings and weights and communicate with the race director when there is a problem with the legality.

Fueling: For region races and qualifying races, track fuel is required. Volunteers are needed to fuel and seal cars.

Sealing: Motors are sealed with paint after qualifying and region heat races. Cars cannot leave the track exit area until they have been sealed. Novice handlers should observe veteran handlers to learn sealing procedures.

Quarter Midget Tools

Here is a list of different tools and materials you may want to acquire before the racing season begins.

Essential...

1. Stopwatch (As you make changes to your car, this is the only way you'll know if you're going faster.)
2. Tire pressure gauge (0-30 max. PSI range recommended; get one with a bleeder valve)
3. Air bottle
4. Fuel container
5. Tool tote stocked with tools (stock sparingly with tools needed for quick fixes) , usually this should include half inch wrench, screwdriver, and pliers.
6. Wheel wrench (if you have a splined rear axle)
7. 3M blue masking tape (for tape numbers onto the car)
8. Thin tape measure for measuring tire circumference. The difference in tire size from your left to right rear tires is called stagger and helps determine how the car turns.
9. Bolt bin (stock with nuts (nylock) and bolts, master links, half links, rod ends, valve stems, all the little pieces you may need for your car...)

Nice to have but not essential (you could probably borrow most of these)...

1. Cordless impact wrench
2. Tire de- beader (to get tires off of rims)
3. Tire mounting stand
4. Bender bars for straightening bent radius rods)
5. Silicon spray or glass cleaner for mounting tires
6. Front end alignment tool
7. Engine gear puller

Quarter Midget Baseline Chassis Setup

The following steps are intended to help handlers understand the basic steps required to set up their quarter midget chassis. Actual settings are not provided as they are different for each brand and model of the car plus the class the driver is racing in.

- 1. Tire Pressures:** Each time the car is setup to make sure to put the tires on the pressure you will raise them to make sure that any other measurements taken are relative to how the car will be raced. For asphalt this can be anywhere from 10 to 14 lbs for the right sides at the start of a race and between 5 and 8 for the left rear and 8 to 10 for the left front.
- 2. Approximate Ride Heights:** Put the car on a level flat surface and then set each corner to the height you want it in race trim. Even though this step will be repeated later it is important to do it now at this point also to ensure the next steps are accurate. Choose whether or not to complete these steps with or without driver and then always do it the same way for uniformity. Because this is kids racing and they are not always easy to find doing without driver is the most common. This means that comparing ride heights with other handlers may not always be a proper apple to apples comparison, but it will make sure your process is consistent. If you were to measure from the bottom of the car to a level surface underneath your left side heights are going to be somewhere around $\frac{3}{4}$ to $1 \frac{1}{2}$ inches while the right side will be about $1 \frac{1}{2}$ inches. All car manufacturers have different settings they prefer and I recommend following those.
- 3. Square the car:** Most often this is done by taking off the wheels and hubs and placing the car into a set of alignment bars. While some setups result in the rear axle being slightly out of square, for a baseline start with it parallel to the lower roll cage bar in front of or behind the engine. Be careful to measure precisely using squares to your level surface for references to make sure your measurements on each side are consistent. Even, $\frac{1}{16}$ th of an inch in the variance will make a big difference. Adjust your rear radius rods accordingly to put the axle square.

4. **Square bird cages:** Most brand cars are designed so that the rear bird cages or "bearing carriers" are positioned so that the two radius rod mounting points are directly above / below each other. If a line was drawn from the top point to the bottom and continued to your level surface, it would be perpendicular to the level surface. Not being square can result in some funny rear axle steering movement as it travels up and down. This is also adjusted by lengthening and shortening the radius rods, again be careful to either make equal adjustments on top and bottom or to re-square the rear axle when you are finished.
5. **Set Axle Lead:** Next the front axle lead is measured by tape measuring from the outside edge of the front axle with wheels in straight position (if they were on the car) back to the rear axle with the table parallel to the outside frame rail of the car. There is a big difference in brands of cars with this setting. Anything from the right side shorter by a quarter inch to the right side longer by a whole inch. This is adjusted by lengthening or shortening the front radius rods. Making sure to adjust the top and bottom rods evenly on the side adjustments are made.
6. **Set Caster Camber:** Caster can be set with either a caster / camber gauge or an angle finder. Use an angle finder to measure the angle from the top of the spindle bolt to the bottom parallel to the length of the car front to back. Right front caster is usually set somewhere between 2 and 5 degrees. Caster is adjusted most often by shortening or lengthening a single radius rod on that corner of the car. Tiny adjustments make a big difference. Most front axles have a caster split built into them so setting the caster is done on a single corner and the LF will be what it will be.
7. **Set Front Alignment:** The Toe_In / Toe_Out is set next so that the front wheels are parallel with each other while the car is in the alignment bars or has the wheels on it on a level surface.

8. **Final Ride Heights:** With all the wheels and tires back on the car and back on your level surface check the tire pressures one more time, then re-measure to make sure each corner of the car is set to the desired height.
9. **Wheel Spacing:** Make sure the wheels are moved in or out to the desired position for each corner. This usually means the left sides are tucked in as far as legally possible (not inside the side nerf bars) and right rear in the middle of its adjustment range.
10. **Scale the car:** Using anything from accurate bathroom scales to electronic scales put each wheel on its appropriate scale pad and record the weights. Make adjustments to the coil spring collars or torsion bar adjusters to each the Cross Weight or Left Rear Split you are looking for. Make sure to make 4 equal adjustments all the way around the car. This will ensure that the ride heights remain where they should be. For example, if the gross weight is 50% (LR + RF) Total and you are looking for 54%, then put 1 turn in the LR and RF (clockwise) and take a turn out of RR and LF (counter-clockwise).
11. **Practice:** Put the car and driver on the track

Quarter Midget Chassis Glossary of Terms

Ackerman Steering: As the front wheels turn through the corner the left front turns a sharper corner than the right front. Ackerman is the principle of creating steering geometry so that as the driver turns the steering wheel the left front will turn more than the right. Some quarter midgets have a set amount built in to the spindle and others leave it adjustable.

Alignment Bars: These devices are used to line up the front and rear axles for squaring and to set the toe for the front wheels. After the wheels are taken off the car the rear axle and front spindles are placed into the appropriate fixture.

Axle Lead: This measures how far out of square an axle is set in the car. Most car builders recommend setting the rear axle with no lead so that when at ride height it is perfectly perpendicular to the car's main frame rails. Front axle lead anywhere from 0 to 3/4 inch is commonly found on various cars, this would be the right side of the axle forward of the left.

Front axle lead is determined by measuring from the outside edge of the rear axle forward to the outside edge of the front spindle and comparing the two sides of the car.

Baseline Setup: Refers to basic starting points for your chassis setup and includes a setting for each of the variables that can be adjusted. Every type of car uses different baselines and many have different baselines for different type of tracks based on banking, grip, surface, etc. A common practice is to always revert the car to its baseline for the upcoming track so you know exactly where you are when it's time for adjustments.

Bicycling: This what a car is called when it goes up on two wheels. In the center or exit of a corner a car with too much side bite or grip can transfer enough weight to lift the two left side tires.

Bird cage Timing: The birdcages, or "bearing carriers" are the free-floating pieces on the rear axle that connect the axle to the rest of the car. For suspension systems that use two radius rods to join the birdcage to the car frame the "timing" or bird cage angle is important to car setup. Even after the axle is squared it should still be checked. Most cars are designed so that the upper and lower arms are mounted directly above one another. This is because the shock is also connected to the birdcage and if the timing is off then as the car goes through travel the shock mount could rotate forward / back or up / down and create unpredictable results by "jacking" weight onto or off that corner.

Body Roll: This is what the car does as it is turned into and goes through the corner. How much the body rolls does not change how much weight transfers, but affects how fast and where it transfers from and to the different corners of the car.

Camber: Describes the angle of each front wheel and tire if you were looking at the car directly from the front. It is measured in degrees and can be negative or positive. Negative camber means the top of the tire is leaned in towards the car and positive camber means the top of the tire is leaned out away from the car. A small amount negative camber is used on the right front tire of quarter midgets to keep the tire from rolling over when it gets loaded during cornering. Left front tires are usually straight up or having a smaller amount of positive camber. Some cars

have specific camber adjustments in their spindles and others are adjusted by using different sized tires on the two sides.

Caster: This is the angle of the part of the front spindle that it rotates around. Looking at the spindle bolt or "king pin" from the side of the car. If the top is leaning backwards it is known as positive caster and if the top is leaned forward it is negative caster. Too much positive caster and the car will be hard to turn, not enough and it can be very "twitchy" or "darty" for the driver. Most quarter midget axles have a "caster split" built into them of 2 to 5 degrees or so, so that a more positive caster can be run on the right front and less positive, 0, or even a small bit of negative caster on the left front. Besides providing tracking and driver feel caster does two other important things. When wheels are turned with caster on them the ride height for that corner is changed so the corner weight is adjusted or "jacked". In addition, negative camber is added or "gained" as a wheel with positive caster is turned.

CG Height: Center of Gravity Height, refers to the center mass of the car. The higher the CG Height the more body roll will occur. Most important at two points, directly above the front and rear roll centers. If a line was drawn from the front CG Height and rear CG Height it should be parallel with a line drawn between the front and rear roll centers to provide unbound body roll.

Corner Weights: When setting up the car it is important to set the corner weights. This means actually weighing each corner of the car on a scale adjusting them by changing the ride heights for each corner. Every car manufacturer has different recommendations for their car that should be followed depending on the springs and shocks that are used.

Cross Weight: This term refers to the percentage calculated by adding the diagonal combination of left rear and right front corner weights and dividing by the entire car weight. Depending on whether the car is locked or not and depending on how much it is using the LF tire changing the cross weight will either tighten or loosen the car up. Different cars react different.

Durometer: Device used to measure the hardness of the rubber on a tire. The readings can be used to compare different compounds of new tires or to track the life of an existing tire that will get harder over time until it is no longer an effective tire.

Gas Shocks: Shock absorbers or "dampers" that have a small chamber in them filled with nitrogen to keep pressure against the shock oil so that bubbles are not created when the shaft goes in and out.

GearRatio: A measure of the actual RPM reduction from the engine to the rotating rear axle. It is calculated by dividing the number of teeth on the axle gear by the number of teeth on the engine gear and multiplying that by the engine's gear box reduction ratio. For Honda engines this is 6.0 and for DECO engines, it is 5.73. For example a 30 engine gear with a 25 axle gear would be $25 / 30 * 6 = 5.00$

Locked: Refers to the type of left rear wheel hub used. A locked car uses a hub that directly connects the wheel to the axle while an unlocked car connects the wheel to a hub with a free spinning wheel bearing. A locked car uses both rear wheels to drive the car and an unlocked car uses only the right rear. A locked car is more stable and tighter in the corners, but will scrub speed on the straights.

Loose: Describes the car's handling when it wants to turn more than the driver is trying to turn it. Also known as over steer.

Pattern: The line around the track that the drivers take the car. Low in the corner and high in the straight for asphalt tracks. Different tracks have different preferred patterns with small differences like how close to the wall the car should be, how far down the straight the car should be before it turns, and just where in the corner the driver should apex. A driver can also adjust their pattern to accommodate the car's handling. Different classes sometimes have different patterns because of the power differences.

Panhard Bars: The suspension link that locates each axle laterally in the car. One per axle, this normally straight bar with rod ends connects on one end to the axle and the other on the chassis frame. The center of this bar determines both the height and left to right location of the roll center for that particular end of the car.

Push/tight: A car with this handling condition does not turn as much as it should. It's hard to get down to the bottom of the corner in the middle and hard to keep off the wall coming out. It results from the rear tires having more grip than the front. In addition to being hard to keep off the wall this condition can also bog down the motor exiting the corner.

Rake: The difference in ride heights from the back to the front of the car. Positive rake means the rear of the car is higher and is common for asphalt tracks.

Rear Split: The difference between the two rear corner weights. Expressed as a single number it is usually expressed as how much more the left rear corner weighs than the right rear. The negative rear split would mean the right rear corner weighs more than the left rear.

Ride Heights: This measurement describes how far the bottom of the chassis from the ground. It is taken at each corner of the car. Some manufacturers recommend taking from cross tubes while others measure directly from the underside of the frame. It is important to track and maintain proper ride heights so the chassis geometry stays as intended.

Roll Center: The imaginary point of the chassis that it pivots "over" as it rolls into and out of the corners. Each car has a front and rear roll center. For most QM suspension types it is determined by finding the center of the panhard bar for each end of the car. Typically raising the roll center results in less body roll and loosens the car while lowering it lets the body roll more and tightens it up.

Scaling: Process of determining how much static weight is on each corner of the car while it is just sitting there. It is done by sitting the car on four individual scales or scale pads.

Scrub Radius: The imaginary line between the center of a front tire contact patch and the axis that it pivots around when the wheel is turned. Newer cars tend to have a much shorter scrub radius that results in easier steering and potentially less speed "scrubbed" off through the corner.

Shock Valving: The inside make up of a shock that determines how easy or hard it is to push it in or extend it out. Straight valved shocks are the same in both directions while split valve shocks require different levels of force to move them in from moving them out. The higher the shock number the stiffer it is 'valved'. Shocks determine how fast weight is transferred from corner to corner in a car, now how much weight is transferred. Heavier valved shocks are typically required for heavier and faster cars.

Spring Rate: The wire thickness, coil diameter, and number of coils a spring has determined the rate of a spring. It is measured as how many pounds of force are required to compress the spring one inch.

Squaring: Process of making sure the rear axle of the car is perpendicular to the frame of the car and that front axle is parallel with that. An axle accidentally out of alignment will cause undesired steering.

Stagger: Difference in circumference between the two rear tires. When the rear axle is locked up it is important to have the proper amount of stagger so that the rear tires can work together through the corner and not fight each other and scrub speed. Since the outside tire has to go around a bigger circle it requires a bigger size because the same axle is turning both tires at the same time.

Sway Bar: A rigid bar that connects one corner of the suspension to the other on the same end of the car. Also called an Anti-Roll bar its purpose is to provide roll stiffness to lessen the amount of body roll into and out of a corner.

Tilt: The difference in ride heights from the right side of the car to the left side. Positive tilt means the right side of the car is higher than the left. Negative tilt would mean the left side is height. A car with 1/8 inch of tilt would mean the right side of the car is 1/8 inch higher than the left.

Tire Compound: Type of rubber used to construct the contact surface of the tire. Every manufacturer has different letter codes to designate the hardness and type of rubber. Softer tires are stickier and provide traction faster, but will wear faster and can become too sticky. Harder tires last longer, but take longer to "come in" and don't always provide enough traction. The right tire depends on the track surface, class of quarter midget, and chassis set up used.

Tire Pressure: Measurement of how much air is in the tire, expressed in pounds per square inch or PSI. Right side quarter midget tires on asphalt are typically between 10 and 15 psi, while left sides are typically below 10.

Tire Temps: Handlers will often measure and record the surface temperature of the contact area of each tire when a practice or race run is completed to help them make setup adjustments to balance the chassis. Extreme temperatures on a single tire usually indicate a setup that is not balanced.

Toe In/Out: "Toe" refers to one of the front wheel alignment adjustments. Looking at the front wheels from the top of the car if they are parallel to each other than the toe is set to zero, the most common setup for a quarter midget. Toe In means the front of the tires are pointed to each other and Toe Out means the front of the tires are pointed away from each other. Too much Toe either direction will scrub speed from the car, but a slight bit of Toe Out can provide some steering stability, especially for newer drivers.

Torsion Bar: A rigid bar that is mounted on each corner of the car so that when the chassis goes up and down it twists and absorbs the force like a coil spring does. Very common on dirt cars and older quarter midgets.

Weight Percentages: Used to record corner weights when scaling a car. Left side percentage, Rear percentage, and Cross Weight are all calculated by adding the two appropriate corner weights and dividing them by the total.

Wheel Offset: Used to describe how a particular width wheel is divided between its "inside" and "outside" halves. For two piece wheels its is the width of each half while one piece wheels

are described by their total width and the distance between the plate where the hub mounts and the inside edge. For example an 8 inch wheel with a 3 inch backspace.

Wheel Spacing: Refers to where the wheel is positioned on its axle in relation to inside or out. Right rear wheel spacing is a common adjustment for then handling of the car. Moving that wheel in tightens the car while moving it out can loosen the car.

Honda Engine Gear Chart

		ENGINE GEAR																	
		26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	
AXLE	20	4.62	4.44	4.29	4.14	4.00	3.87	3.75	3.64	3.53	3.43	3.33	3.24	3.16	3.08	3.00	2.93	2.86	
	21	4.85	4.67	4.50	4.34	4.20	4.06	3.94	3.82	3.71	3.60	3.50	3.41	3.32	3.23	3.15	3.07	3.00	
	22	5.08	4.89	4.71	4.55	4.40	4.26	4.13	4.00	3.88	3.77	3.67	3.57	3.47	3.38	3.30	3.22	3.14	
	23	5.31	5.11	4.93	4.76	4.60	4.45	4.31	4.18	4.06	3.94	3.83	3.73	3.63	3.54	3.45	3.37	3.29	
	24	5.54	5.33	5.14	4.97	4.80	4.65	4.50	4.36	4.24	4.11	4.00	3.89	3.79	3.69	3.60	3.51	3.43	
	25	5.77	5.56	5.36	5.17	5.00	4.84	4.69	4.55	4.41	4.29	4.17	4.05	3.95	3.85	3.75	3.66	3.57	
	26	6.00	5.78	5.57	5.38	5.20	5.03	4.88	4.73	4.59	4.46	4.33	4.22	4.11	4.00	3.90	3.80	3.71	
	27	6.23	6.00	5.79	5.59	5.40	5.23	5.06	4.91	4.76	4.63	4.50	4.38	4.26	4.15	4.05	3.95	3.86	
	28	6.46	6.22	6.00	5.79	5.60	5.42	5.25	5.09	4.94	4.80	4.67	4.54	4.42	4.31	4.20	4.10	4.00	
	29	6.69	6.44	6.21	6.00	5.80	5.61	5.44	5.27	5.12	4.97	4.83	4.70	4.58	4.46	4.35	4.24	4.14	
	30	6.92	6.67	6.43	6.21	6.00	5.81	5.63	5.45	5.29	5.14	5.00	4.86	4.74	4.62	4.50	4.39	4.29	
	31	7.15	6.89	6.64	6.41	6.20	6.00	5.81	5.64	5.47	5.31	5.17	5.03	4.89	4.77	4.65	4.54	4.43	
	32	7.38	7.11	6.86	6.62	6.40	6.19	6.00	5.82	5.65	5.49	5.33	5.19	5.05	4.92	4.80	4.68	4.57	
	33	7.62	7.33	7.07	6.83	6.60	6.39	6.19	6.00	5.82	5.66	5.50	5.35	5.21	5.08	4.95	4.83	4.71	
	34	7.85	7.56	7.29	7.03	6.80	6.58	6.38	6.18	6.00	5.83	5.67	5.51	5.37	5.23	5.10	4.98	4.86	
	35	8.08	7.78	7.50	7.24	7.00	6.77	6.56	6.36	6.18	6.00	5.83	5.68	5.53	5.38	5.25	5.12	5.00	

Gear Box Ratio 6.00

DECO Engine Gear Chart

		ENGINE GEAR																	
		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
AXLE	22	7.88	7.42	7.00	6.63	6.30	6.00	5.73	5.48		5.25	5.04	4.85	4.67	4.50	4.35	4.20	4.07	3.94
	23	8.24	7.75	7.32	6.94	6.59	6.28	5.99	5.73		5.49	5.27	5.07	4.88	4.71	4.54	4.39	4.25	4.12
	24	8.60	8.09	7.64	7.24	6.88	6.55	6.25	5.98		5.73	5.50	5.29	5.09	4.91	4.74	4.58	4.44	4.30
	25	8.95	8.43	7.96	7.54	7.16	6.82	6.51	6.23		5.97	5.73	5.51	5.31	5.12	4.94	4.78	4.62	4.48
	26	9.31	8.76	8.28	7.84	7.45	7.09	6.77	6.48		6.21	5.96	5.73	5.52	5.32	5.14	4.97	4.81	4.66
	27	9.67	9.10	8.60	8.14	7.74	7.37	7.03	6.73		6.45	6.19	5.95	5.73	5.53	5.33	5.16	4.99	4.83
	28	10.03	9.44	8.91	8.44	8.02	7.64	7.29	6.98		6.69	6.42	6.17	5.94	5.73	5.53	5.35	5.18	5.01
	29	10.39	9.77	9.23	8.75	8.31	7.91	7.55	7.22		6.92	6.65	6.39	6.15	5.93	5.73	5.54	5.36	5.19
	30	10.74	10.11	9.55	9.05	8.60	8.19	7.81	7.47		7.16	6.88	6.61	6.37	6.14	5.93	5.73	5.55	5.37
	31	11.10	10.45	9.87	9.35	8.88	8.46	8.07	7.72		7.40	7.11	6.83	6.58	6.34	6.13	5.92	5.73	5.55
	32	11.46	10.79	10.19	9.65	9.17	8.73	8.33	7.97		7.64	7.33	7.05	6.79	6.55	6.32	6.11	5.91	5.73
	33	11.82	11.12	10.51	9.95	9.45	9.00	8.60	8.22		7.88	7.56	7.27	7.00	6.75	6.52	6.30	6.10	5.91
	34	12.18	11.46	10.82	10.25	9.74	9.28	8.86	8.47		8.12	7.79	7.49	7.22	6.96	6.72	6.49	6.28	6.09
	35	12.53	11.80	11.14	10.56	10.03	9.55	9.12	8.72		8.36	8.02	7.71	7.43	7.16	6.92	6.69	6.47	6.27
	36	12.89	12.13	11.46	10.86	10.31	9.82	9.38	8.97		8.60	8.25	7.93	7.64	7.37	7.11	6.88	6.65	6.45
	37	13.25	12.47	11.78	11.16	10.60	10.10	9.64	9.22		8.83	8.48	8.15	7.85	7.57	7.31	7.07	6.84	6.63

Gear Box Ratio 5.73

Gear Ratio Needed = (RPM Wanted) / (Current RPM) X (Current Gear Ratio)

Quarter Midget Setup Sheet

Date:

Track:

Car:

Weather:

Session:

Laps Run:

Fastest Time:

Avg Time:

Ride Height

Air Pressure

Weights

Rear Split _____

Left %: _____

Rear %: _____

Compound

Tire Size

Wheel Size

Wheel Spacing

Tire Temps

Spring Rates

Shocks

Axle Alignment

Camber /Caster

Front:

Rear:

Gear

Engine:

Final Drive:

Axle:

Min/Max RPM:

Left Rear Drive

☐ Locked

☐ Ratchet

☐ Un-Locked

Panhard Bars

Front

Rear:

Notes

Adjustments

Basic Quarter Midget Preparation

Earlier in this training manual it was pointed out that the biggest secret to speed on the track was the driver's pattern. The next biggest secret is car preparation. Before you can expect your car or driver to perform to their potential on race day it needs to arrive properly prepared and ready to go. While quarter midgets are fairly simple race cars there are still a long list of things that go wrong at the worst times. Making sure the car is up to snuff before you get the track is the only way to make sure that at the track you will have to time to work with your driver and basic chassis adjustments and leave time enough to have fun as well. If you are fixing issues at the track that could have been fixed at home, you will usually start and end your day behind where you want to be.

The following sections will walk you through most of the basic areas of making sure your quarter midget race car is ready to go!!

BRAKES-BLEEDING THE HYDRAULIC SYSTEM

This, again, is a reasonably easy task. You should get a friend to help, as it needs someone to operate the brake pedal while you bleed the system. Make sure you have a supply of the same type of brake fluid that is already in your system. There's other ways to do this, and as long as you make sure you are getting all the air out of the system your brakes will be ready to go.

- 1) Get a clean, empty jar and put a little new fluid in it
- 2) Push a rubber tube over the bleed nipple on the brake caliper, and the other end into the jar of fluid
- 3) Now loosen the bleed nipple, and get your helper to press & hold the brake pedal; Fluid will begin to be forced through the bleed nipple and into the tube, towards the jar
- 4) Tighten the bleed nipple, and release the brake pedal
- 5) Loosen the bleed nipple, and press & hold the brake pedal
- 6) During this process, it will be necessary to keep refilling the main brake reservoir with new fluid
- 7) Repeat this process until no air bubbles are appearing through the bleed nipple, and new fluid is pumping out into the tube/jar
- 8) Tighten the bleed nipple, replace the reservoir cap, and the pedal should now stop solidly when pressed, with no 'sponginess' or unacceptably long travel.

BRAKEPADS

Many cars today have started using aluminum brake rotors and therefore have also started using softer brake pads. Make sure that you keep your eye on the wear on your brake pads and replace them before they result in metal on metal contact.

They are easy to replace and waiting too long, do so will result in irregular wear and possible gouging of your brake rotor it results in needed more parts to be replaced. If your rotor does get gouged you are better off putting a new one on so otherwise you will start to need brake pads even faster.

ENGINE SPECIFICATIONS

Be careful, when trying to make everything vibration-proof, not to overtighten bolts in the alloy engine casing (for example the throttle plate bolts), as I have found that it is all too easy to strip the thread in the bolt hole. On a similar note, while I was trying to screw the carburetor studs in as far as they would go, in order to gain more clearance between the carb and the right rear tire. I caused the alloy cylinder head to crack. Luckily, it was only my old reserve engine, but it was still a costly error. There are torque specifications for every part of a Honda engine, try to use them at all times to prevent breaking something that you don't want to break.

Honda Engines

- Crankcase 108 in. lbs
- Gearbox cover 204 in. lbs
- Gearbox 204 in. lbs
- Connecting Rod 108 in. lbs
- Cylinder Head 204 in. lbs
- Flywheel Nut 55 FT. lbs

Deco Engines

- Cylinder Head 204in. lbs
- Oil Pan 32FT. lbs

CHANGING VALVE SPRINGS

This is good if you're not familiar with engine maintenance, and hasn't done it before, but the good news is, with a little care, it's an easy procedure, without needing to remove the cylinder head. The Honda 160 engine may only need new valve springs once or twice per season. The Honda GX120 on the other hand, likes to have new valve spring about every other week for any class with the blue restrictor plate or no restrictor plate.

- 1) Remove the 4 bolts securing the valve cover, and lift off the cover. Take care not to damage the gasket, as it may be reusable, though it's preferable to fit a new one.
- 2) Now ensure that the piston is at Top Dead Center - To do this, you need to remove the spark plug and shine a light inside to confirm that the piston is at the top of its stroke. The rocker arms should also be loose, indicating that both valves are closed. I like to then stick a plastic zip tie down into the cylinder fish it around until it is under the valve to keep it from dropping down past where it can be retrieved.
- 3) Remove the rocker arms, exposing the tops of the valve springs.
- 4) As stated, at this point the valve springs will be at their loosest, and you can now gently but firmly push down with your thumbs on the spring, and slide the collet out of it's notch, releasing the spring. (On the exhaust valve, the valve rotator must first be removed). The push rod will drop into the engine slightly, but it will not disappear if you have followed the above procedure to obtain T.D.C.
- 5) Lift the spring off, and replace with the new spring, pushing firmly down until you are able to slide the notch into position. This requires full compression of the spring by pressing down with both thumbs, but is easily possible without the use of a compression tool. (Remember to replace the exhaust valve rotator).
- 6) Repeat for the second spring.
- 7) Refit the rocker arms and adjust the valve clearances.(Exhaust = 0.20 mm, Inlet =0.15 mm)
- 8) Replace the gasket and cover.

NUT AND BOLTING

In addition to all the other work that you do on your quarter midget one of the most important steps you can take is to "nut and bolt" the car which simply means to start at one corner of the car with a set of wrenches and check each nut and bolt and make sure they are tight. The great thing about most quarter midgets is that the majority of nuts and bolts require a single or pair of half inch open end wrenches. My favorite tool for this job is a ratcheting box end ½ inch. wrench, it really helps speed things up.

During this process make sure to not over tighten and it is not that difficult to strip the threads and require you to put on a new nut or bolt.

Check each shock, radius rod, steering wheel, heel nut, foot pedals, spindle nut, exhaust system and so on. For the radius rods not only should they be tight to the car, you also want to make sure that they can "swivel" freely as well. If they don't then you can loosen the jam nuts and reposition the rod end to see if that makes a difference as well as making sure the end is lubricated as well with something like Tri-Flow or WD-40.

Also use this time to inspect the safety items. Make sure the seat belts are still properly attached and that all the required bolts are in the bumpers and nerf bars.

Making the above one of your weekly routines will go a long ways towards not only keeping your program in good shape but also leaving you time at the track to enjoy the time you can spend with your family.

REAR AXLE PREPARATION

When I first spun my rear axle with the Car on chassis stands, the wheels spun for just under 2 turns before grinding to a halt. There's potentially a lot of drag on the axle, what with chain & sprockets, brake disc & pads, and two or four axle bearings, all taking turns at dragging and rubbing in the wrong places. When you think about it, it's got to be a good idea to get the axle running as freely as possible and I've heard it said that a free-rotating axle could shave tenths off your lap times. I don't know how accurate that statement is, but in an effort to gain every advantage, I used the following method, which resulted in an axle that now spins freely with just a gentle push, and for much more than just two spins.

This next procedure assumes that you are starting with a straight & true axle, and a chassis with level axle mounts. First, remove the axle and all components.

Bearings

Carefully remove the seal from one side of the bearing, wash out the grease from around the ball bearings with WD40, starter fluid or carb cleaner and then re-lubricate with a high grade light oil. By doing this my bearings were immediately spinning completely freely. I am now in the habit of checking the bearings regularly, & re-oiling them before each race, just to make sure they don't dry out or seize. Do not use grease or WD-40. Grease will cause drag and WD-40 will collect dirt use a hi-grade oil like Marvel Mystery Oil or similar.

Hubs, Sprockets, and Brake Discs

Ensure that these items slide comfortably (but not too freely) onto the axle. Mine were **** extremely **** tight on the axle, and took considerable effort to move them even a tiny amount, making adjustments very difficult, if not impossible. After I had managed to remove all the components, I took the risk of VERY LIGHTLY smoothing the axle with a very fine wet and dry, afterwards cleaning the axle thoroughly with WD40. The components were ready to go back onto the axle.

Reassembly

With all the carriers, chains, and bearings loosely back in their correct positions, I then began replacing and tightening the bolts which hold the bearing carriers to the chassis, and the allen bolts which secure the two halves of the bearing carriers together. I found the tightening sequence to be critical, and took considerable time tightening each bolt a little at a time, constantly checking that the axle was still movable within the bearings, i.e. that it would slide a few inches in and out. If it becomes tight, back off the bolt that caused the tightness & tighten the bolts in a different order. It takes time and patience, but eventually all bolts are tightened down, and the axle should still be movable through the bearings.

CHAIN ALIGNMENT

One of the most common ailments to strike a car at exactly the wrong time is the chain falling off. To make sure that the chain stays on the car almost all the time requires a few steps that are simple but important.

The chain connects the engine gear to the axle gear so the first important step is to make sure that the two gears are in alignment with other. This step takes two parts, first making sure that the engine is bolted in square to the frame so that the gear is perpendicular to the rear axle, and secondly to make sure that the axle gear is position horizontally directly behind the engine gear.

The second part is usually accomplished by positioning a pair of locking axle collars, one on each side of the axle gear hub. Make sure to leave a little play in the axle gear hub so that it can slide a bit to the left and a bit to the right from center, maybe with just a bit under a $\frac{1}{4}$ inch total movement allowed.

Proper alignment will also ensure good wear on the aluminum gears that are commonly used. When the chain is misaligned it will not only be more likely to come off, but it will also chew up the gears causing them to be replaced more often.

In addition to alignment you must also set the proper tension on the chain. This is done by selecting the correct chain length and fine-tuned by sliding the motor forward or backwards.

Of course, when moving the motor keep in mind to keep it straight as described above. You are looking for about a ½" of play up and down in the chain when on the ground ready to race. The absolute best way to check chain tension is with the car set on a flat surface, tires inflated to the proper pressure and the driver in the car.

Of course, this is not always possible as finding your car is often times much easier than finding your driver. If you are going to check chain tension on the pit car then you should at least do it on time on the ground properly then move it back up on the pit cart and check where its at so that you can benchmark yourself. Different rear geometry and different size gears will cause the difference on the ground to the pit car to go in different directions. Different brands cars are different in this area so there is no single rule of thumb.

GEARING

Selecting the right gear for your car and driver is a required step to make sure that your engine is operating at the most efficient RPM range for maximum power. Even if your driver is flat footing it around the track the RPM of the engine will still go up and down based on where on the track it is in relation to the corners and the banking. Choosing the right gear ratio determines what range your engine will be in. The Honda engines use a gear box that reduces the engine RPM by a ratio of 6:00 to 1. This means to calculate your gear ratio you use the following formula.

$$\text{Axle Gear} / \text{Engine Gear} \times 6.00$$

So for example an axle gear of 27 and an engine gear of 33 would equal

$$27 / 33 \times 6 = 4.91$$

The higher the number the higher the RPM your engine will turn. The lower the number the less RPM your engine will turn. If your engine is near its normal racing range (around 5100 or so with a Red restrictor plate or 5300 or so with a Blue one) then a change of .10 would equal APPROXIMATELY a change of 100 RPM. This is just a baseline to get started.

While RPM is important, it isn't really super important until you move from the novice to the competitive classes. Remember, nothing trumps driver pattern for performance on the track. When you get to that point, though a very important tip is to remember is that more RPM usually doesn't mean more speed.

For example, if your engine works best at 5300 RPM and your drivers lap times are 7.5 seconds per lap and the competition that you want to catch up to is turning laps of 7.2 seconds, if your RPM is down to say 5100 or so the first inclination many handlers have is to add more gear to get the RPM up. Often times this is the wrong thing to do. If your car is slower by .3 of a second per lap and you are down 200 RPM, then fixing whatever else is wrong with the car will bring your RPM right back to where it belongs. Look for driver pattern, if they are holding down the gas the entire lap, and how well the car is turning first before looking at Gear change. If you were down 300, 400, or 500 RPM while you are .3 off the pace then go ahead and try to get some of that back with a gear change.

FRONT WHEEL BEARINGS

Front wheel bearings are just as important as the rear but are put together in a different manner so they get their own section. There are two different types of front wheel bearings, sealed ball bearings, and tapered roller bearings. For both to work at their peak and not slow the car down it is very important that they are kept clean and lubricated.

When front wheels used the sealed ball bearing style of hubs the spindle nut that holds the hub on is put on until it is fully tight. The bearings are set at the right tension inside the hub already.

When tapered roller bearings are used the spindle nut is used to set the pressure of the bearings inside the races that are part of the hub. Set the pressure by tightening the nut to the point where the wheel still spins freely but doesn't have any side to side wobble.

Tapered bearings are great, especially for the right front of any class above Senior Honda as they can handle more load gracefully, but they still need to be maintained and well lubricated. Many people try thin lubricants such as Tri-Flow which a great product, but not the right choice here. Instead use something like a good quality white lithium grease.

ADJUSTING TIRE SIZES ONCE MOUNTED

It never fails when you buy a tire, it's the wrong size. This has frustrated racers for years! Well, now I have a couple tips to solve the problem! You should now be able to have any size tire you want.

Tire too Big

Make sure you've used the correct rim size.

It doesn't make sense to mount an 8.00 on an 8 3/4" rim and expect it to be 34"

Step 1: Pre-heat your oven to 350 degrees.

Step 2: Remove the valve stem from your tire.

Step 3: Insert tire into oven for 15 minutes. This should shrink the tire approximately 1".

Sometimes more, but usually less.

Step 4: Remove tire with oven mitts, either insert the valve stem and dunk into cold water for about 10 minutes or set in a cool place with no valve stem and cool for 30 minutes. You WILL notice a size difference when you remove the tire and think you 8.00 is about 33", and it COULD happen, so be careful.

Tire too Small

This one isn't as bad, we could use the oven trick but...

Fill your tire with about 20 lbs. of air and check the size. If it grows 1/2" then let it sit there overnight. If it doesn't grow that much, put another 10 lbs. in it and set it in the sun for a couple of hours. Usually what I do is set it in the car with my tape measure and check it during the day. Once it has grown 1/2" to 3/4" bigger than what you want, place it in a tub of cool water for about 15 minutes. Then let your air out and see what it comes up to. If it's too big by 1/4" or so, let all the air out overnight.