



# North Hills Sports Car Club

## Autocross Novice Handbook

A guide to help you make it through your first season

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### **Preface:**

Regardless of what you are about to read in this handbook, no one but you is responsible for your actions. If you choose to participate in the sport of autocrossing, you must also choose to be safe, use common sense, and take responsibility for your actions. While all sports are inherently dangerous, ones involving motor vehicles are even more so. As participants, we are aware of the risks, but choose to participate anyway because it is enjoyable. Ultimately, you are the one responsible and accountable for the choices you make.

Remember this: all you need to do is ask. Anyone. Anything. If they can't help you, they'll point you to someone who can. The magic words are, "I'm new at this, can you help me?" There is no room for bravado or reason for shyness here, read this manual and ask questions.

Visit our website at [www.nhscc.com](http://www.nhscc.com) for more information, including event results, year-to-date club points, action photos, membership meeting details, and more. You will also find contact for our board member to request any information not found in this document or the website.

### **What is Autocross (aka Solo 2)?**

Autocross is an all forward motion driving skill contest. Each driver is individually timed to the thousandth of a second, over a short, miniature road course that is clearly defined using traffic cones. Cars compete one at a time, hence the name "Solo". Cars are grouped based on performance potential to allow competition between similar cars. An event can be held on any flat paved surface, usually a parking lot, or airport apron or runway.



Autocross emphasizes driver skill and vehicle handling rather than outright speed. The corners are tight, and there are lots of them, so the driving is exciting and challenging. Autocross speeds do not exceed those normally encountered in highway driving. The skills you learn and practice here—smooth transitions, enhanced braking, and skid correction—will have an immediate impact on improving the safety and skill of your street driving. Autocross is an excellent way to teach car control to young drivers in a safe environment.

Autocross is also a very social sport, filled with some of the friendliest people you'll ever meet. The camaraderie of the drivers is a special part of autocrossing that is profoundly satisfying.

Cars are initially divided into letter-based classes based on their performance. This means that Civics compete against Minis, Mustangs compete against Camaros, and Porsche 911s compete against Corvettes. Originally ranging from A to H—with A being the fastest—an even faster SS class was added as cars like the Porsche GT3 and Corvette ZR1 expanded the performance potential of production vehicles.

Cars are then further classified according to modifications from stock that have been made to increase their performance. Street is the first tier, allowing only minor modifications such as brake pads and shocks. Street-classes are intended for vehicles that remain street legal and run DOT-approved street tires.

Street Touring is the second tier, where the popular modifications such as lowering coils and cold-air intakes are allowed. More extensive upgrades will move a car progressively into Street Prepared and then Street Modified. As modifications move cars away from street use towards track use, they move into the Prepared class and finally the Modified class where almost anything goes. North Hills also runs an optional Vintage class that groups all vehicles over 25 years old together into single class.

Two new classes have been added in recent years to attract more cars and tighter competition. The first is the popular Classic American Muscle or CAM class, designed for rear-drive, American iron. Several sub-classes provide a home for everything from vintage muscle cars to lowered trucks. The second is SSC, a spec class for the popular Scion FR-S/Subaru BR-Z.

The complete descriptions of classes and preparation allowances are spelled out in the SCCA Solo 2 rulebook, which can be found online for free, purchased from the SCCA, or reviewed with the classing official before any North Hills event. The North Hills Sports Car Club bases our classes on SCCA classes, but reserve the right to make adjustments as we see fit to suit club rules and bylaws. The classing system is what keeps the costs of Autocross competition so reasonable; you can compete in anything from a real race car to the car you drive on the street every day. Please note that a maximum of two drivers can share a car, though each must register and pay for the event independently.



North Hills Sports Car Club events are insured through an independent insurance company so a day of autocrossing can be far safer for both car and driver than most people's daily commute to work. Perhaps that is why more people compete in autocross competition than any other motorsport except drag racing.

You can view the official SCCA rules, car classes, and more online at [www.scca.com/pages/autocross](http://www.scca.com/pages/autocross).

### **On Being a Novice**

You'll remember your first event for a long time. The adrenaline that makes you shake at the start-line before your first run, and the even bigger surge of adrenaline you feel when you finish, will stay with you for days. That excitement is part of the sport, and it's why we all do this. Don't let being a novice overwhelm you!

Every driver, including National Champions, had a first day and a novice season. Autocrossing is a skill that requires instruction and practice to see improvements. If it was easy, it wouldn't be so competitive, or so much fun. The great thing about this sport, though, is that even when you're going "slow", it's still fun driving. The course may seem "busy" at first, because it's tighter than what you see on the street, and you're trying to attack it faster than you could in traffic. You'll have fun learning the sport and learning to keep the car in control as you get faster and better with more seat-time.

With that said, here are some tips to give you the right novice attitude, so you don't become discouraged:

- Your goal for the day is to have fun! That's why everyone is here.
- Your goal for the first run is to avoid getting lost on course.
- Your goal for the rest of the day is to improve your time on each successive run.
- Your goal for the second event is the same as the first.
- Your goal for the rest of the season is to beat somebody and make each run faster than the last.

When you first begin, you are learning a lot on each run and going fast, yet you may still be 10 seconds behind the class leader. That's not unusual! You're still doing OK. Generally speaking, veteran drivers like to help the novices. The magic words "I am a novice" will get you extra instruction from other competitors who can critique your run, offer pointers, or even jump in your passenger seat for a run. Just be careful not to interrupt a driver on a course walk, or while he or she is concentrating on going over the course in his or her head. Don't forget, there are lots of people available to answer your questions and help you get started!

### **What to Bring to an Event**

This list covers everything from sunscreen to snacks to a tire pressure gauge. You will probably come up with your own list of things you need at an Autocross event, but this will get you started.

#### **You must have:**

- Your street legal car showing current registration, inspection, and insurance.  
*You can share a car with somebody else at the event provided you have the next two items.*
- Your entry fee (cash or charge)
- A valid driver's license

#### **You may want to bring:**

- A safety helmet rated Snell 2015 or higher (*loaner helmets are provided but not guaranteed*)
- Extra air in your tires (*to prevent tires from rolling under, more on that later*)
- An air tank or compressor (*for adjusting tire pressures at the event*)
- Suitable shoes for driving. (*light, with a narrow sole that doesn't stick out past the side of the shoe*)
- Magnetic numbers for your car, or tape in a contrasting color to your car to make your own
- Sunscreen, Sunglasses, Hat with Brim
- Clothes appropriate for the weather forecast, and a change for when the forecast is wrong (*we race—and work—even in the rain*)
- Rain gear / umbrella
- Waterproof storage for things in your car (*garbage bags work well*)
- A folding chair
- Thermos of water or other non alcoholic beverage
- Cooler for lunch or snacks
- Windex and paper towels
- A way to record all the great advice you'll get
- A good tire pressure gauge
- Chalk or white shoe polish (*to mark your tires, more on that later*)



### **Arriving at the Autocross**

Once you arrive, begin by finding a place to park and prepare your car. This will be your pit area for the day, and it's not a bad idea to park next to a car similar to yours. People tend to arrive well before registration opens so they can get their car ready before getting in line. You will want plenty of time to register—lines can be long—before walking the course and attending the novice walk through and driver's meeting.

Start by removing all loose articles from your car. This means cleaning out the back seats, the hatch, or the trunk. Remove garage remotes from the visors and look under seats. You will be generating higher forces in every direction than on the street, and you want to prevent anything from dislodging and striking you or becoming lodged beneath your pedals. This is also an opportunity to legally shed some weight by removing that spare tire or speaker box. If it was not bolted to the chassis at the factory, it can go.

This is also a time when some participants change from their street tires to their race tires. USE CAUTION, the surface may be uneven where you are parked so cars should be properly chocked to prevent rolling. NEVER PLACE ANY PART OF YOUR BODY BENEATH A CAR SUPPORTED ON A HYDRAULIC JACK. Before leaving your pit area, be certain that you won't run over any items- whether your own or newly unpacked by your neighbor(s). This goes double for your neighbors themselves, who may be sitting on the ground.

### **Registration 8:30 am to 9:30 am**

To register for an event, you must have a valid driver's license and entry fee, currently \$30 per event, or \$25 for Club Members, though special events may carry a different cost. Before approaching the timing trailer, fill out the required paperwork.

Begin by filling out the tech slip for your vehicle. Officials will help choose the class for your car if you are unsure. You will also be assigned a car number for the day. You may be able to pick your own number, but it will depend on how many other people have asked for the same number.

You will need to sign the insurance waiver. You MUST do this to compete, and any guests you bring must sign the waiver also. If you would like to apply to become a member of the club, there is an additional form and fee for this provided as well. With paperwork in hand, get in line for registration at the trailer. Officials will enter your name and car info into the timing system based on your paperwork and collect your fees. They will return your Tech Slip for the next part of the registration process.

### **Tech Inspection 8:30 am to 10:00 am**

Your car must pass a technical inspection before you can compete. You should identify yourself as a novice when you go to tech. The purpose of the inspection is to ensure that your car is safe and legal to compete. Inspectors will need to look under the hood, inside the car, and in the hatch/trunk area. They will check for a current state inspection and ensure that the lug nuts on your tires are properly tightened. They will also inspect your helmet if you bring your own.

The tech inspectors will mark your car and helmet if they pass, or recommend changes to make, such as additional tie-downs for the battery or removal of loose items or hubcaps if you've forgotten. Inspectors can help determine what class your car is in based on your modification, sometimes that means changing classes after you've already registered. Remember, Tech Inspectors have the final say!



### **Course Walking**

After tech, you will have time to walk the course. There will be an announcement over the PA system when the course is open for walking. Before you go, read the section on course walking tips. You may walk the course several times if you like, try to have the course memorized before the novice walk through.

### **Novice Walk Through 10:00 am**

Mandatory for all novices, optional for everyone else. An experienced club member will review everything that novices need to know for the day, including how to work the course and safety rules. They will then lead the group on a walk through the course, teaching the line, pointing out concerns, and offering tips. This is an ideal time to ask questions or get clarification.

## **Drivers' Meeting 10:30 am**

Mandatory for all drivers. NHSCC board members and the event chairs hold the driver's meeting shortly before the first car is scheduled to start. This is where you will find out information you'll need to know about the course conditions, number of runs, particular safety concerns, how penalties are assessed, and how work assignments will be handled.

## **Run/Work Order**

Depending upon weather and the number of drivers, you will get between four and six timed runs, broken into 3 - 5 heats. You will work during one heat, and drive during the remaining heats. Work assignments are broken up by car number, it is helpful to write them down or take a photo of the heats with your phone.

## **Your Work Assignment**

Work assignments will be announced at the driver's meeting, take note that you may work the first heat, so please pay attention. It's best to report for your work assignment as quickly as possible when it is time for you to work. Otherwise, some people end up working longer than others, which is no fun. Generally, workers are changed at the end of each heat, giving you plenty of time to check in and get into position.

When it is your turn to work, head to the timing trailer and check in with the Chief of Workers. Be sure to tell them that you are a novice and they will pair you up with someone who has worked the course before. Tell the worker you are paired with that you are new, and they will help teach you course working skills. For a little bonus instruction, ask your co-worker to talk about the techniques of the drivers on course. Read the section on Working to get more detail on penalties.

During the novice walk through, penalties and how to signal them to the spotters will be covered. **YOUR SAFETY IS MORE IMPORTANT THAN CHASING CONES! IF THERE IS ANY DOUBT ABOUT MAKING IT TO A CONE AND BACK BEFORE A CAR PASSES BY, LEAVE THE CONE DOWN!** We would much rather give a driver a re-run than have to call an ambulance.

## **Your Timed Runs**

We run in numerical order at NHSCC, not in class order like other clubs. You will have to pay attention to the run group and bring your car to the line when your number is up. Sometimes you may end up slightly out of order, that's okay, as long as you are close. Note that cars may need to "jump" in line to get closer to their numerical order or as a result of a re-run. Please be courteous with other drivers.



Make sure your car is ready to go well before it's time to get in line. You should have your tire pressures set and you should be prepared to drive. The North Hills Sports Car Club may have loaner helmets available, please grab a helmet when you are 5-6 cars from the front.

After your run, park your car and then return the helmet so that another competitor may use it. If you need to borrow a helmet, ask around during registration or before the drivers meeting, NOT when you are on the grid. You might be able to find another competitor who is willing to share theirs.

Once you are in line, you will wait for the cars in front of you to launch, and you will move up until you are on the start line. A starter will signal when it is OK for you to start. You should go as soon as you are ready, although the timer will not start until you pass through the timing lights. Don't take too long if we are running two cars on course at once because your start is timed to make sure you do not get too close to the car already on course.

If you do get "lost" on course, take the time to orient yourself and continue. Don't head back to the start line, because you may be pointed toward another car. Just take the time to get back on course, and continue the run as a practice. Always finish each run by driving through the finish area to reset the timer for the next driver. Be aware of the course workers and follow their directions when on course.

If you see a red flag on course, come to an immediate halt and await instructions from the course workers.

After your run is finished, slowly proceed back to your pit area, 5mph in the parking lot and 15 or 25 on park roads as posted. Along the way, listen for your time over the PA system or on the radio, or look for it on the display board near the finish. If you don't see or hear it, don't worry, it will be printed and posted after each heat. Times will also appear on the NHSCC.com website under Live Timing and after the event is concluded.



Your time may be something like "54.117 plus 2" or "off course". In these examples, the first number is the time in seconds, the next tells how many pylons were hit, and the "off course" means that you missed at least one gate. It helps to have someone watch your run so they can provide valuable constructive criticism. Above all, have fun- don't let the competitive nature of the event spoil the day. Some "novices" are quite good- start with personal goals, then, only after gaining some experience, concern yourself with the competition.

### **Fun Runs**

If time permits, fun runs are held at the completion of the event. They are timed runs on the course that are not scored with your official runs. This is your opportunity to ride with other drivers and have them ride with you. Fun runs cost one dollar and they allow you another chance or two to improve your time.

### **Course Clean-Up**

Once all the timed runs and fun runs (if any) are complete, a lot of people help clean up the course. This involves bringing in the flags, cones, fences, ropes, and timing equipment, and storing them in the trailer. The pit and spectator areas also need to be checked for trash. When everyone pitches in, this can be completed in fifteen to twenty minutes. If you are working the final heat, please stack cones as you exit the course to speed clean up, you do not have to carry cones to the trailer.



### **Before Heading Home**

Return all of the items you removed from your car and collect folding chairs. Swap back to your street tires or return your tire pressures to normal. Remove the numbers from the side of your car, and remember to adjust your driving style to remain legal on the road, the police don't like people using construction cones for slaloms! Take your newly found car control skills with you for emergencies and the next autocross.

# Working Rules and Safety

## Do's

- Report to work promptly.
- Make sure your station has adequate supplies; extra pylons and a red flag at minimum, you may have a radio and fire extinguisher as well.
- Know your area of responsibility and your station number.
- Make sure cones are in their proper place when you get to your station, and check them periodically during your shift.
- Understand the pylon rules. Pointer cones do not count if hit, and a car is off-course (DNF for Did Not Finish) if they pass on the wrong side of a cone.
- Pay attention to cars on course for accurate cone counts and your safety. It is best to watch the back of the car and the cones themselves to see the wobbling cone which may have left the box.
- Replace cones as soon as possible, another car will be coming through in as soon as 30 seconds, BUT DO NOT GO AFTER A CONE IF YOU THINK ANOTHER CAR WILL BE ARRIVING SHORTLY.
- Be prepared for exposure to sun/rain, wind, heat/cold while on station
- Keep red flag in your hand, unfurled (but not flapping) ready for immediate deployment.
- Stay alert for unexpected pedestrians and vehicles.



## Don'ts

- Do not use cameras or cell phones while on station.
- Do not sit down and do not wander away from your post.
- Do not turn your back on cars on course. Safety First!
- Do not red flag a car unless instructed to do so or if it is an emergency. However, if in doubt, err on the side of safety!
- Do not pick up hot parts dropped on course because of risk of burns.
- Do not litter.

## Penalties

A penalty is given if:

- If the cone is knocked over and is out of the box.
- If the cone is knocked over and is in the box.
- If the cone remains standing but is out of the box.

A penalty is NOT given if:

- The cone remains standing and is touching the box.
- The cone remains standing and is partially in the box.
- The cone remains standing within the box.





# Car Set-Up Tips

Keeping things inexpensive, we'll only talk about things you can do for free or at minimal cost. After a while, you may want to put more go-fast goodies on your car, but be sure to read the SCCA rulebook if you want to stay legal and/or competitive in class. Be aware that at this point you can go faster, sooner, by working on the driver instead of the car. Ask an experienced driver to drive your car on a fun run so you can see the potential gains you can make as a driver!

## What You Can Do Today

**Tires:** You've already read that you should put an extra 10 to 15 psi in your tires. The reason for this is to keep your tires from rolling under during hard cornering. But how much is too much? The way to find out is to put chalk on the edges of your tire, in at least two places around the diameter. This will allow you to see how far over the tire was going during your runs. Bleed out a little air if the chalk is still showing on the tread, or add a little more if the chalk has been worn off well down the sidewall. The line of worn chalk to remaining chalk should be right at the corner of the tread and sidewall. Keep notes on how many psi you ran, and where the chalk line was, for your next event. Remember that as you get better and corner harder, you'll need more air to compensate, so keep using the chalk at every event.

**Driver Restraint:** In order to have good control in driving, you, the driver, have got to stay put. So make sure your seat belt is tight and firm. Some people like to tug hard (fast) on the shoulder strap to engage the lock on the reel. You can also prevent the belt from loosening by twisting the buckle a few times before securing it, or purchasing a belt-lock device.

**Driver Location:** Most experienced drivers will agree that the best place for your seat - to give you the best control - is seat forward far enough to have your leg slightly bent when the clutch is all the way to the floor, and seat-back reclined or upright to a position that allows you to rest your wrists on the steering wheel when your shoulders are firmly against the seat. This position allows you run the full range of steering inputs and foot motion without stretching or moving in your seat, and may have a big impact on your driving skill.



## What you can do before the next event

**Alignment:** Alignments are under \$100, and if you're looking for a cheap way to improve your autocross set-up, this is a good one. A word of caution: most manufacturers set their alignments to what they consider to be the most predictable and stable settings. Improving your car's turn-in for autocross may make your car twitchy on the street. So use your own discretion. To get some suggestions, ask a driver who has a car similar to yours in weight, wheelbase or driven wheels. Also ask around for suggestions on where to take your car for the alignment. Some shops are more than happy to help with autocross alignments while others are not.

**Tune Up:** To deliver its maximum potential, your car should be in tip-top shape. Make sure that your engine is running as it should, a tune-up with fresh spark plugs and a clean air filter may restore some lost horsepower. If your brakes are worn, fresh brake pads will reduce stopping distances. Tires are the most important component of your car for autocrossing, so if your tires are bald or you are still on snow tires, now is the time for some fresh rubber.

# Course Walking Tips

Knowing the course layout is worth five seconds to a novice. Knowing how to walk the course is the most important step in being competitive and staying “ahead” of the course. Usually, you’ll want to walk the course at least three times.

## Step 1: Walk the Course

Your first walk will be to get the general layout, and is often a social walk. For your second walk, get away from friends and walk the course alone, concentrating on memorizing the layout. Think of it in sections, with key cones marking the turns, such as:

- Start straight
- Slalom (enter on right)
- Decreasing sweeper to the left
- “Little snake” then “big snake”
- Right-hand curve (look for three pointers)
- “Thread the needle” section
- Tight right, then tight left
- Over finish



Your goal is to learn the flow of the course and find visual markers to help you navigate at speed.

- Stop every now and then and run through the course in your head, from the beginning to where you are.
- Get down low - the course looks different from a seated position. This will give you a better picture of what the course will look like at speed.
- Pace off the distance between cones in a slalom. Some course designers vary the distance, and it’s good to know before you arrive whether you will have to vary your speed in a slalom.
- Take notes if you like, and make a note of pavement changes, camber change, bumps, sand, etc.
- Make a note to yourself of how far ahead you will be looking. Say to yourself, “OK, when I am here, I will be looking there.” This will help you to remember to look ahead while you are driving.

How do you know if you have memorized the course? Sit down by your car and try to draw it on a blank piece of paper, or sit behind the wheel with your eyes closed and mentally drive the course. Include the key cones you want to recognize while you drive. If you can’t draw or visualize the course, you will want to walk it again. It is easy to get lost in a sea of cones and things happen much faster at speed. Once you leave the start line in your car, you should not be spending any time figuring out where the course is or which direction to go.

## Step 2: Plan the course.

On your last course walks, decide exactly how you want to drive the course. Driving the course perfectly involves two things; coming up with the correct plan, and executing that plan correctly. If you don’t have a plan, you can’t possibly know where you didn’t execute it correctly. It’s hard to know if you did this step correctly-but it is something you can work on.

The plan involves the line you will take through the cones - the quickest way through. Note, we didn’t say shortest. Think about the characteristics of your car; does it corner better than it accelerates, or the other way around? That will tell you whether to slow down so you can get through the corner in control and get on the throttle as soon as possible, or try to carry speed through to keep the revs up. Any pro will tell you, position first, then speed. Being in the right place and heading the right direction is the key to fast times.

Don't forget to also plan where you will be looking. There is no need to memorize every cone on the course, only the ones you plan to be near...the "important" ones. Look from one important cone to the next as you move through the course.

### **Step 3: In the Grid**

Before you run, while you are in grid, go over the course again several times in your head, executing the plan you made before. Turn off the radio, stop socializing, get focused. You should have cameras rolling, belts tightened, and helmet on a few cars before you launch so you can be focused on the run to come.

### **Step 4: After the Run**

Sit in your car and go over your run. Figure out where you didn't execute the plan. If the plan was to be near a particular cone, and you were five feet from it, then you didn't execute the plan correctly, and a red light should have gone off in your head. Maybe you need to adjust the plan because you were going too fast in the slow parts. Decide at this point whether your next run needs to be a better execution of the plan, or a modification of the plan. Basically, don't use the car as an excuse, you will see a big difference in your times when you drive a course that never surprised you.



### **Step 5: Talk to People**

You will spend some time standing around and waiting. Actually, there will be lots of time that you are neither working nor driving. At this point you are officially a spectator, but most of your fellow entrants will also be spectators too. Talk to them. Ask questions. They will give helpful answers to even seemingly stupid questions. Even questions as broad as "How did he do that?" or "Why is he fast when he looks so slow?" may elicit answers that will help to increase your understanding of both the sport and the techniques that define the best drivers. Be wary of information overload. You may be told ten things that contribute to a fast run; if you understand one or two, concentrate on those. You'll hear the others again, many times. You don't have to (in fact, you can't) learn it all at once.

## **Driving Tips**

Seat time, seat time, seat time. This is by far the best way to go faster. They say, "Before you fix the car, fix the driver". That's because there are so many techniques to improve your driving, it takes seat time to learn them all. Once you do, someone without those skills would have to spend a lot of money on their car to beat you, and probably still couldn't. Here are a few techniques to get you started. Don't try to apply them all in your first run, you'll be too busy. Read through the list, then work at gaining these skills one at a time.

### **Look Ahead**

We can't emphasize this enough, and many of us repeat it out loud while we are driving. This tip relates to hand-eye—and eye-foot—coordination. Look where you want your hands to drive you, and look far enough ahead to take advantage of the feedback.

If you're looking at an outside cone you're afraid you'll hit, you are sure to hit it. If you're only looking ten feet in front of the bumper, turns will keep surprising you and you will overshoot them. Imagine looking at your feet while you are running, you wouldn't be very coordinated and you wouldn't have a good sense of distance or speed.

Instead, look far forward to see as much of the line you want to follow as possible. Your mind will plot your ideal trajectory and your peripheral vision will get you safely past cones without having to look down. You will be astounded at your performance the first time you remember to do this all the way through a course.

### **Slow Down to Go Fast**

A common problem when you're starting out is trying to take the tight sections too fast, and not staying in control. Most veterans remember finishing a run and thinking, "Well, I didn't go very fast, but it sure was smooth," only to find they had gone faster by a full second! Just be patient in the slow spots. They're slow spots, after all. If you run a section too slowly, you learned something and can add speed as a correction on the next run. If you enter a section too fast, you can overshoot the corner, add distance, have to brake and lose momentum, and maybe even go off course. You blew your whole run and learned little.

### **Brake Hard in Corners**

Go ahead, squeeze the brakes hard. There's no morning coffee on your dashboard, or eggs in the front seat. Once you decide to slow down for the corner, don't waste any time. If you find yourself at a crawl and you're not at the corner yet, why, you've just found out that you can brake later. Locking up your tires will not make you stop faster, so squeeze the brakes and let them do the work, not your tires. On the street, we often lift off the gas and let gravity or engine braking slow the car for a bit before getting on the brakes. You are not on the street, get right on the brakes.

### **Understand the Friction Circle**

This is a hard concept for most novices, but is the key to faster times. For any tire/pavement/condition combination, your tires have a finite amount of traction available. We'll call that 100% traction. When you accelerate hard in a straight line, 100% of the traction of your tires is pushing backwards, propelling the car forward. When you hit the brakes hard in a straight line, 100% of the traction of your tires is pushing forward, slowing the car. When going around a bend without accelerating or braking, 100% of the traction of your tires is pushing left or right, preventing the car from sliding. The problem arises when we ask our car to do more than one of these things at the same time.

For example, if you're going into a corner, using 100% of your traction to make the turn, what happens when you ask for more traction by applying the brakes. There is no more traction available, so you will be dividing your available traction between two tasks, reducing cornering traction and causing you to run wide or even spin. You also won't have the braking traction you expect, and can easily overshoot your braking point. Same goes for accelerating while cornering, not enough traction will mean oversteer in a RWD car or understeer in a FWD car. So how do you deal with this conundrum?



First, try to brake in a straight line. Slow the car to the speed you want for the turn, then ease off the brake pedal while initiating your turn. As you complete the turn, ease into the throttle as you straighten the steering wheel, not fully pressing the gas until the car is headed straight. To visualize this, imagine that the steering wheel and pedals are connected by a string: as the wheel is turned, it tightens the string and reduces how far down the pedals can be pushed. As it returns to straight-ahead, the pedals can go all the way to the floor again.

## Smooth Your Inputs

You may noticed that we use phrases like “squeeze the brakes” and “ease in the throttle”. This is where you have to change your mind-set about inputs to controlling your car. You need to convince yourself that you can make your car respond better by squeezing the brakes hard instead of standing on the brakes, by rolling in the throttle rapidly instead of stomping on the gas, by turning the wheel quickly instead of cranking it around. Subtle, but it will show up in how often your car is in control instead of scrubbing off speed pushing around a corner. And it will take a lot of practice to become second nature. Smooth is fast.

## Shift Near Redline

On the street, we don't usually shift near our car's redline. But in autocross, you want to be making the most of the power available to you. You'll learn to hear the motor as you drive and stay in a low gear longer. Most courses will be in second gear for stock cars. If you're shifting to third, you're shifting too soon, and giving up power. Launch at 4000 rpm. Each car varies, but try to start at higher rpm's than you're used to. Don't “dump” the clutch, or you'll find your wheels spinning. Let it out rapidly and find the right rpm's to maintain traction. Higher horsepower cars will want to use lower rpm's than less powerful cars. Don't worry about the blinkers, wipers or horn. You're bound to hit them as you drive. Don't let it throw you. We've all done it!

## More, Later...

There are many more techniques for getting better times, but start with the ones listed above. After you've learned them, you'll be ready to buy a book on autocrossing (see Recommended Reading), or attend a driver's school and learn the advanced techniques of heel/toe, shuffle steer, late apex, and more. Go to as many events as you can. Always remember to have fun, even when you are being stomped by some national hot shoe. You'll never stop learning - the best drivers will tell you this still applies after ten or twenty years! Remember, seat-time, seat-time, seat-time. Nothing will make you go faster sooner. And nothing is less expensive in improving your times.



## Autocross Etiquette

Autocross is a social sport, and most drivers are happy to give you advice and critique your runs. Ask someone with a similar car if you may follow them through a course walk. Maybe they'll even think aloud for you (don't do too much talking yourself, or you will be making them walk again). Ask if you can ride with them on a fun-run, and offer to pay the \$1 for the run. If you're not sure when to line up, go ahead and ask. Ask someone to look at the chalk on your tires to see whether you need more air. Ask someone to watch your run if they have time, and tell you what needs changing. They'll be glad to. There are a few bad times to ask for advice, though. Here's a quick list:

- When they are quietly walking the course. (They're trying to memorize it.)
- When they are staring into space or have their eyes closed. (They're going over their run or plan.)
- When they are in grid near the start. (They are only thinking about the course.)

Sometimes events will conspire to keep a good driver from competing. It may be a broken car, it may be an injury that prevents them from being able to change tires. This is your chance! Offer that driver a ride (co-drive) in your car - make it free if you can afford to. So they use up \$20 worth of your tires. Not a bad price for a private instructor all day! It is an enormous benefit to have advice from these experts all day, and be able to walk the course with them.

Try to help out. There is more work to be done than the mandatory course-work. This is an all volunteer organization, so help is always appreciated. Luckily, this also puts you in a position to talk to other drivers, because the veterans are helping out, too. If you share the work, they'll have more time to talk to you. Likewise, showing up early will help out the registration and tech crew, and give you more time to walk the course. Read the next section on how to help, if you're looking for ideas to lend a hand.

A lot of people stay to help clean up the course and pit areas. Keeping the lot is important to everyone, so leave your pit area cleaner than you found it. A bunch of people usually go out for pizza after the event and everyone is welcome to join in. It's a great way to make friends and learn new things while having a great time.

## How to Help Out at an Event

*(You don't have to spend more money to help. The club pays for all supplies)*

### While you're still a novice:

- Arrive extra early and be a gopher during course set-up.
- Help sweep the course in sandy corners or carry cones for those setting up the course.
- Line the course, or mark the chalk boxes around the cones.
- Help at registration: carry the waiver through the line or go through the line with tech slips and a pen.
- Ask the people in the trailer if they need any help.
- Identify novices and give them a copy of this novice handbook.
- Corral people to help clean up after the event, or take a walk through the pit area to pick up things left behind.
- Bring in cones, boundary ropes, and fencing after the event.



### When you get more comfortable with the way things run:

- Learn how to tech cars.
- Learn how to design and set up a course of your own.
- Learn timing and scoring.
- Learn how to set up the timer and PA systems.
- Get your safety steward's license.
- Get involved! It's fun to be a part of the action.

## The Rule Book and Classes

The official SCCA Rule Book is a good investment. It will tell you about legal modifications, rules on re-runs, and many other topics. You may look through the club's copy to see what's there. Almost all un-modified cars start out in the Street category. There are a few exceptions, but most people can't afford them. From Street classes, each car moves to a designated Street Prepared or Street Modified class when it has modifications made to it, and with more modifications, on to a Street Modified or Modified class. Sometimes cars in different stock classes will end up in the same street prepared class once they have go-fast goodies added. The reason is that modifications may equalize the cars.

## **PAX Index**

The PAX index, calculated each year by the "Professional Autocross" people (whoever they are) is a commonly used handicapping system for comparing times of cars which are not in the same class. The index is composed of data from across the country, and tries to take the driver out of the equation and compare only the cars.

These indices are based on cars prepared to the limit of the rules and driven by top drivers. The index is multiplied against your run time to provide the time you would have had if you had been in an A-Modified car. It is interesting to compare the index of one class to another to see how much time you should gain if you prepared your car to, for instance, Street Prepared rules. Look in the rulebook to find out where your car would be if you made modifications. You can also see that alphabetically, higher cars are not necessarily faster.

## **Recommended Reading and Websites**

- Secrets of Solo Racing, by Henry A. Watts
- Prepare to Win, by Carroll Smith
- Tune to Win, by Carroll Smith
- Engineer to Win, by Carroll Smith
- Nuts Bolts and Fasteners, by Carroll Smith
- How to Make Your Car Handle, by Fred Puhn
- Smooth is Fast Autocross Performance - by Terry Heick and Bryan Heitkotter
  
- [www.scca.com](http://www.scca.com) (Sports Car Club of America)
- [www.autocrosstalk.com](http://www.autocrosstalk.com) (*autocross podcast and informative website*)
- North Hills Sports Car Club FaceBook Page

This handbook was last revised in May of 2019.

Please visit our website at [www.nhsc.com](http://www.nhsc.com) for event updates.



*We race rain or shine, hot or cold, so make sure that you  
and your car are prepared and ready for the day!*



### **Before You Go**

- 1. Class Your Car** - Vehicles are divided into classes by type and modifications made. Refer to current SCCA National Solo Rule Book (available on the SCCA website) to find your class, or speak with the designated official at the event.
- 2. Prepare Your Car** - Cars must carry a valid state inspection, be in good mechanical order, and be safe to operate under competitive conditions. Our tech inspection looks for excessive brake pedal travel, a secure battery, properly torqued lug nuts, play in the steering system, and several other items to ensure that your vehicle is safe.
- 3. Dress for the Day** - You will be outside for most of the day, often standing on the course for long periods. We run in the rain, cold, and blazing sun, so be sure to dress appropriately for the predicted and potential weather. Be sure to bring rain gear, an umbrella, warm clothes, appropriate shoes, sunglasses, hat with brim, sunblock, etc.
- 4. Pack for the Day** - A cooler with food and drinks is helpful, especially on hot days. We accept cash and credit cards for payment, check the website for current rates as they can vary by event. Bring anything you need for your car, including tools, and a way to keep things removed from the car dry if it rains. You must have a valid driver's license.

### **When You Arrive**

- 1. Park and Unpack** - Find an open parking space and remove anything that is not secured from inside of your vehicle, including remotes on the sun visors and anything that could slide under a brake pedal or strike the driver.
- 2. Register (8:30 - 9:30)** - Head towards the timing trailer to register. Begin by signing the waiver and filling out a tech slip for your car, both will be handed down the registration line or laying on the registration table. If you are unsure of your class, ask an official BEFORE approaching the trailer. Hand your tech slip to the friendly folks in the trailer and they will enter you into the timing computer and take your payment. Two drivers can share the same car, but both must register and pay as drivers, be sure to choose numbers far enough apart to switch drivers between runs. If you want to take a passenger, they must be at least 18 years of age and they must register and pay as a driver.
- 3. Tech Inspection (8:30 - 10:00)** - Take your tech slip with you and take your car to the tech inspection point. Officials will look over your car checking for safety and mechanical defects, and they will assist with putting numbers and class on your car if needed. They will also inspect your helmet if you brought your own, if not, you can borrow a helmet from another driver or loaner helmets may be available from the club. Helmets must carry a Snell rating. If you are not inspected by 10am, you may have to sit out the first heat until an inspector is available.
- 4. Walk the Course** - Each event features a different layout, so this is your opportunity to learn the course while planning a line, choosing visual references, and selecting braking and turn-in points. Walk as many times as you like.
- 5. Novice Meeting (10:15) and Driver's Meeting (10:30)** - Novice meeting is mandatory for all novices, driver's meeting is mandatory for all participants. Now is the time to ask any questions you have.

### **During the Event**

- 1. Run or Work** - Based on the Run/Work groups posted at the driver's meeting, you will either work the first heat or run. If working, head to the timing trailer and check in for your work assignment. When working on course, keep alert, no sitting and no photos, and if unsure, ask to work with a more experienced person.
- 2. Run in Numerical Order** - If running, watch cars as they approach the start line and get in line as close as possible to your numerical position. Keep in mind there are gaps in the run/work grouping. If you are a novice, it is helpful to ask for a ride with an experienced driver before your run, and to have navigator with you for your first run.
- 3. Have Fun and Be Safe** - As a novice, your first goal should be successfully and safely navigating the course. Ask for help if you struggle with anything, remember, it is up to you to make good decisions and keep yourself and your fellow participants safe. You can build speed as you gain experience and learn what your car is truly capable of. Stick around to help break down the course and get to know your fellow competitors, they can help you find more speed.