
Nor Cal SAAC Open Track Driver's Primer

Scott Griffith

This book is an effort to provide a head start to the first time driver at a Nor Cal SAAC open track event. It should help the new driver come to the event educated, prepared, and in a frame of mind that will allow the ground school portion of the first morning to be gotten through quickly and easily. The more of this information you can learn before the event, the less time we'll have to spend on it at the event. This will immediately result in more track time for you. And that's the point!

What is an Open Track event?

Welcome to the world of the racetrack! Most readers of this manual will have no experience with track driving. Most likely, you are an experienced driver, and comfortable with your high-performance car in street driving. You're looking forward to having a chance to stretch out your knowledge of the car, and really use it as it was meant to be used, in the relative safety of a racetrack environment. This is the right way to approach it! Nor Cal SAAC open track events provide exactly that for you. Our goal is to provide the maximum amount of quality driving time possible, and to make available instruction that will help you refine your abilities as a high performance driver.

An open track event is not a race, nor is the intent of this book to help you become a racing driver. Many of the techniques contained here are directly applicable to competition, and are based in years of racing experience. However, our events are not competitions. We are here to provide an environment where you can enjoy your car, and discover the unique joys of track driving. Drivers who get out on course and get sucked up into what racers call the "red mist", and get started driving as if it is a competition, will come to know the stewards very well very quickly. That's not the purpose of our event, and it should not be your purpose in running it.

Let's cut to the chase. This is the hardest, most intense and concentrated driving experience available that *isn't* competition, and we're going to try and teach you the basics you need to go fast safely. There will be more detail as this story unfolds, and we can dive headlong into the theories and such rot later. But what we're going to try and teach you can be summed up by three basic concepts:

1. Be smooth.
2. Be aware.
3. You must go slow to go fast.

Concept One: Be Smooth.

Everyone has heard this phrase used since the beginning of their driving careers. But until you have driven on the track, you have probably never experienced many of the reasons why. On the track, we'll be using all the grip the tires can give us all the time, and it is smoothness that allows us to maximize that grip, and go fast safely. Smoothness is a part of every action we take as drivers, from the way we turn the wheel when we enter corners to the way we use our brakes and roll on our throttles. As we get further into this text, this phrase will come up again and again. It's not just a trite old buzzword, believe me. It is the key to going fast safely, and the key to getting the most from your car.

Concept Two: Be Aware.

This doesn't get nearly as much emphasis as it should in a lot of professional driving schools. The track driver's greatest asset is his awareness- his ability to perceive what is going on around him, and to tell what the car is telling him as it corners and accelerates. As an experienced driver with a couple hundred thousand commuting miles, it's easy to get tunnel vision and concentrate only on the task at hand. On the track, this can be hazardous to your health! This text will try and help you widen your attention out once again, so that you can perceive all of the things that you need to be safe.

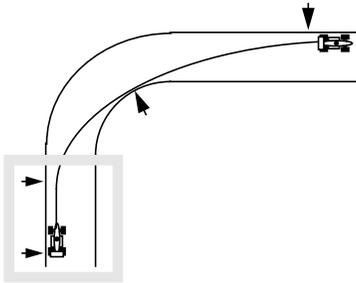
Concept Three: You must go slow to go fast.

The last one always gets me a lot of blank stares when I tell it to people in person. It certainly seems to be exactly the opposite of what you would expect, when you think about driving your car near its limits on a racetrack. But you will come to find that it's the absolute truth. If you are driving at your personal limit, and things begin happening too fast, and it feels as if the car is driving you, rather than you driving the car- you have to *slow down*. The fastest laps, and the most satisfying laps, and the safest laps, are the ones where you are moving very slowly in the cockpit, doing things deliberately, and driving well ahead of the car. The car can be absolutely flying, but if you're relaxed and well in control, it will be serene in the cockpit. That should be the track driver's motto: "*In order to go fast on the track, you must go slow in the cockpit*". A useful corollary to this is "*The least you can do in the cockpit is the best you can do!*"

If the car is driving *you*, you will be slow. You will also be a hazard to yourself and to others, and you won't be having nearly as much fun with your track time. You have to slow down until it is you driving the car. You will then be very surprised to find that this will make you faster. It is experience, relaxation, and comfort in the car that will allow you to go fast, and that cannot be rushed. Sawing at the wheel in a desperate attempt to hang onto the car is dramatic, and good for an adrenaline rush. But it is ultimately not very satisfying, nor is it quick. I imagine that you're skeptical about this bit of advice, but you will come to see it once we get on track.

On Course!

Ultimately, performance driving is about cornering and braking. The goal of the performance driver is to brake as little as possible, corner at the highest speed possible, and get to the next corner as soon as possible. Very little time is spent in the process of cornering on the racetrack. Most is spent on the straights, with the throttle held wide open. This fact leads us very quickly and inevitably to our first real exercise, which is braking. Cornering is important for speed, but braking is more important for safety, so we'll hit it first. There's more to it than simply pushing on the pedal!



Braking

For the purposes of our open track driving, our braking technique will be the simplest and most effective one available. It's called *straight-line braking*, and its name really tells you what you need to know. The car is settled into a straight line up the track, aimed at the turn-in point for the next corner (more on that later), and the brakes are applied progressively until the car is going slow enough to make the corner. It sounds very simple, doesn't it?

It turns out that good braking is a very hard thing to achieve, and that the key to good braking is smoothness. To go as quickly as possible, you want to brake as hard as possible short of locking up, so that the car spends as little time as possible going at less than maximum speed. Most beginning track drivers tend to brake either too hard (or too abruptly), and end up going through corners at a walking pace, or brake too little or too late, and end up going through the corner sawing at the wheel in a state of high drama.

The best technique to learn with is to pick a reference point to begin your braking, and to put pressure on the pedal and smoothly *squeeze* on more until the car is braking at its maximum, then smoothly roll out of the brakes to allow the car to turn. Many people, coming up to a corner at track speeds, jam on the brakes and really bury the car's nose in the track. This is great fun. But it's not smooth, and it eats brake pads and rotors as if they were candy. Worst of all, it is slow, because it upsets the balance of the car's suspension. When it comes time to turn in for the corner, the suspension is still trying to figure out what hit it, the tail is light, and the driver will have more drama than he needs. Squeezing on the brakes progressively, and rolling off of them progressively before turning in to the corner, is the first step in developing a smooth, quick, and safe driving style.

Some professional driving schools teach their students to imagine an egg between their foot and the brake pedal. Well, that's a good thought in a way, but the right leg of my driver's suit would be an omelette a hundred times over by now if it were true. Brake hard, but brake progressively- smoothly. Build up to the maximum, don't go there all at once. You're moving slow in the cockpit, so you have time, remember?

There's one other task you'll have to perform when braking, and that is downshifting. Different cars will require different techniques for managing the gearbox, and we don't have space to cover all of them here. Let's just say that you need to get your downshifting done while you're doing your straight-line braking. You don't want to be futzing around with the gear lever when you get to the turn-in point.

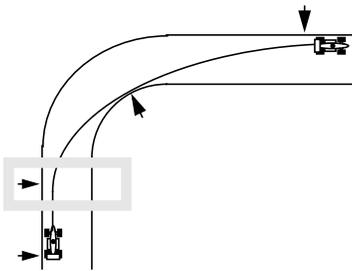
The last item I'll discuss in this intro to hard braking is to remind you to be aware. Entering a braking zone is a great time to crank your awareness up to the top of the scale. Look at the flaggers to see if the course ahead is clear. And check your mirrors to see who might be coming up behind you, and how close they are. At one of our open track events, you shouldn't be dealing with people passing you under braking. But this doesn't mean that it can't happen, and you need to be able to handle it safely. If this were a competition, you would be open to being overtaken when you got on the brakes. So, for the purposes of safety and education, let's treat it as if it is one. Check your mirrors and know your surroundings as you begin braking. We don't allow overtaking in the corners, but it's a very bad habit to become complacent and assume that nobody's coming alongside you. You should never be surprised by somebody else being there when you prepare to turn in.

Cornering

Well, all that braking has got us hauled down to the proper speed, so we can now begin cornering. When people think about track driving, they always think about cornering. The truth of the matter is that you spend very little of your time in the corners. Your goal is to minimize the amount of time you spend there, so that you can maximize the time that the car is going straight, with the throttle wide open! So how do we get through a corner the quickest?

Since you began your driving career, you've undoubtedly heard people say that the quickest way through the corner is to "straighten out the road". They were right, to an extent. But to really go quickly, you need to be precise about it, and I'll try to explain the why as well as the how.

This part is about finding the racing line, or simply "the line". To get into cornering, we'll split up the turn into 3 parts. They are the turn-in, the apex, and the exit.



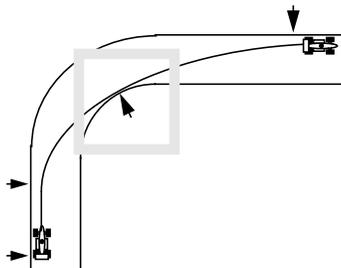
The Turn-in

The turn-in begins just as soon as you roll off the brakes at the end of the braking zone. Your braking should have been done right up the outside edge of the track, leaving about a 2-foot safety margin to the edge of the pavement. Your goal is to finish your braking just as you get to your turn-in point. Where, exactly, is the turn-in point? We'll get to that in a minute! For now, just remember the term "*late turn-in*".

As you get out of the brakes, you will go back on an even throttle. This is to say that the car is neither accelerating or decelerating- it's just cruising along at the speed it had when you finished the braking. You will smoothly turn the wheel until the car is on a single smooth arc that sweeps from the outside of the track, right across the whole surface, and just clips the inside edge of the track right in the middle of the turn. The point on the arc that you reach the inside of the track is called the apex.

Your goal in turning in is to move your hands just once, in a single very smooth motion. If you turn the wheel too quickly, the car will be unsettled. You want to disturb it as little as possible. If you turn the wheel too much, you'll have to turn back the other way before you get to the apex. If you turn too little, you'll have to crank on more steering to get to the apex. Remember this pointer- every time you move the wheel, you scrub off speed. You really

want to work on having your hands very still, and moving as little, and as slowly and progressively, as you can. This sounds easy. It isn't!



The Apex

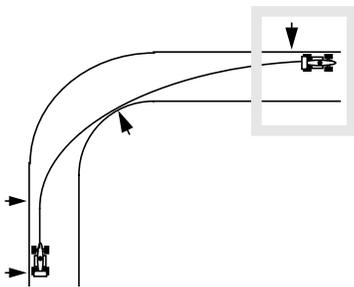
The apex is the point in the turn that your car makes its closest approach to the inside edge of the track. You control exactly where your apex is for any given corner by your braking and turn-in, and it's the apex that determines how well you have driven a corner- and how fast you'll be down the next straight. Much of the time you'll spend on the track will be spent getting your apexes right.

The exact location of the apex varies from car to car, driver to driver, and corner to corner. It is almost never in the exact middle of a turn. In fact, it is almost always further around towards the exit, and in the case of a hairpin it can be so far around that you'll feel as if you'll never get there! We'll discuss the why below, but for now, remember the term "*late apex*".

The critical thing about the apex is that you must get to it. On the racetrack, almost all the apexes will be right on sections of gently-sloped, painted curbing. You wanted to leave a 2-foot safety margin at the turn-in, but you want no safety margin at all at the apex. Missing the apex by a foot or two means that you'll be slow. Missing it by five feet means that you'll be very slow, and possibly run out of track at the exit. Ideally, you'll feel the gentle pat through the seat of your pants as your inside tires hit the curb.

Your goal is to actually hit the apex. This doesn't upset the car, because when you're carrying good speed through the corner, the inside tires have essentially no weight on them. If you've ever seen the photographs of the NASCAR cars cornering in Turn 2 at Sears Point with their inside tires off the ground, you'll understand this. You'll understand it more after your first day's track time! Most students have a very hard time getting to apexes. Do whatever you must to get to them, without compromising smoothness.

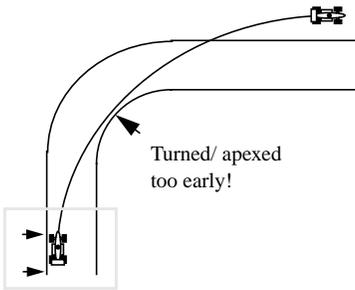
There is one other very critical and very enjoyable thing about the apex. Since you took a late apex, most of the actual job of turning the car was completed before you got to here. That means that, now that you're here, you can begin to smoothly and progressively unwind the wheel, and smoothly and progressively increase the power. After all, if the tires aren't fully employed with turning the car, they should be used to accelerate it!



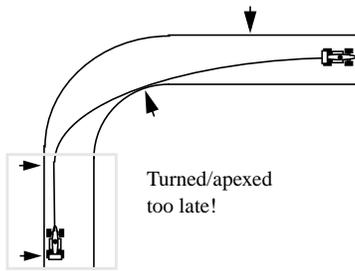
The Exit

The exit is the place where you find out how well you did. As you unwind the wheel from the apex, and increase the power, the car's momentum will carry it back out across the track towards the outside edge. If you've done it all perfectly, the car will drift right out to the edge of the track, and just as it gets there you'll straighten the last little bit of lock out of the steering wheel, and be back at wide-open-throttle. Your goal is to have this happen, and use all the track at the exit. In this ideal case, you simply roll out of the steering and onto the throttle, and you're fast and smooth heading down the outside edge of the track to the next corner. When this happens, it's a true joy.

However, you'll often find yourself with some driving to do at the exit. By studying what happens out there, you can figure out what you did wrong at the turn-in and apex, and fix it the next lap.



If you find yourself running out of road at the exit, this tells you that you turned in too early, and apexed too early. If you have to turn the wheel more to keep the car on the track, you were too early. Remember, *the exit is where you should be unwinding the wheel and rolling on the power.*

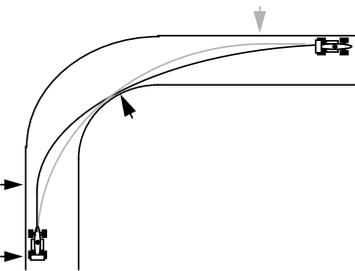


Similarly, if you find yourself in the middle of the road, with all the turning completed already and no momentum left to carry you out to the edge of the track, you know that you turned in and apexed too late. You must use all the track to carry the maximum speed through the corner. You should be able to smoothly unwind the wheel, and smoothly get back on the power, and have the car end up right on the edge of the track as it tracks out.

All through here, we've talked about smoothness. It's time to bring up my third concept again- you must go slow to go fast. Chances are that your first few sessions, you'll find yourself running out of road at the exits of corners, and getting very excited and pumped up. It's a natural reaction, and we've all been guilty of it at one point or another. But it is critical for safety to remember this concept again at times like this.

You must go slow in the cockpit to go fast on the track. If things seem to be happening too quickly, or if you find yourself sawing at the wheel and experiencing drama at the exits, *slow down*. Work on getting the turn-ins and the apexes right, but do it at a lower speed. You have to work up to it, and if you let yourself relax and take your time, you'll be faster, safer, and have a lot more fun than if you go out and attack the course. Learn to do it right slowly, or you'll never get it right fast, and that's a fact.

Ok, now why?



The absolute fastest way to get through a corner is to put the car on the single largest arc we can take, apexing right in the middle of the corner. But we're not very interested in that line, because the speed we have at the apex isn't that important. If we're on that line, cornering at the limit, we can't begin accelerating until the very end of the corner when we straighten the wheel all at once, out at the dotted arrowhead.

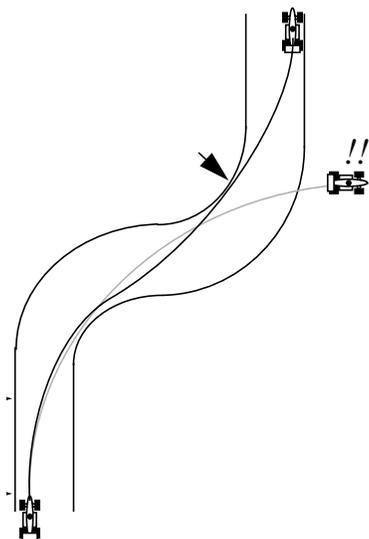
Our goal is to minimize the amount of time we spend cornering, and maximize the amount of time we spend accelerating up the following straight. The best way to do this is to get as much of the turning over with as soon as we can, so that we can unwind the wheel and get on the throttle earlier. This means that even though we are a bit slower at the apex, and got to it a little later, we're faster all the way down the following straight because we were able to begin accelerating sooner. Remember this: *"late turn-in, late apex"*. Or maybe Jackie Stewart's favorite phrase: *"slow in, fast out"*. It works. And best of all, it's the safest way to go through a corner as well.

We could get into the concept of the friction circle, and talk in glorious technical detail about what it means, but that would get very wordy and long. The gist of it is that your tires can only do so much. They can produce just so much traction, and if you ask for more they begin to break away. If you are asking for 100% of the tire's available grip for cornering (the dotted

line in the drawing), then there's no more left over for acceleration. You have to wait until the cornering loads are done with before you can get on the power, and that happens way out at the exit arrow. By taking our late apex, and unwinding the wheel, we let ourselves have more of the available grip to accelerate with. So we can accelerate earlier, from the apex- the solid arrowhead. It's that simple.

Compromises

In the case of a corner that leads directly into another corner, we are faced with a problem. If we take the late apex line we've talked about, and use all the track in the first corner, we'll find ourselves on the wrong side entering the second corner, and have to do some serious driving just to keep the car on the track. The rule to remember is that *the only important corner is the one that leads onto the next straight*. This means that we'll compromise the line we take in the first corner to make sure that we do the second one perfectly. In short, the first corner is a throwaway.



Straights

The straights are why we're here. They are the places that we're running wide open, hustling the car down to the next corner. It may seem that there's not much to say about straights, but that would be a disservice. A lot goes on there!

The first thing to say about them is that *straights are a place to go straight*. This may seem obvious, but a lot of people spend time veering back and forth across the track for some reason. You should aim the car directly at the place you want to be to begin your next braking zone, and drive straight to it. Remember, each time you move the wheel, you slow down.

Straights are also a place to relax- to take a deep breath, to shake out your hands and arms if they are stiff or crampy, to consciously make your body lean back in the seat and release the tension a bit. You can't go fast, or be safe, if you're tense to the point of tunnelvision. Relax.

But most importantly, straights are a place to be aware. Before doing anything else on a straight, check your mirrors, and glance out the sides of the car and see if anyone's there. We use some of the straights as passing zones, and you might well have had someone come up behind you in the previous corner and be setting you up for a pass. I'll get into passing in detail later, but for now remember the phrase "*the mirrors are your friend*". So are the flaggers. Look ahead to the next turn and see if there's a yellow flag there.

Finally, use just an instant of this time to flick your eyes down over the gauges, and check the oil pressure and coolant temperature. Usually, you're too busy to look at them, so make a habit of doing it once on each straight.

Passing someone else

Nor Cal SAAC events feature fixed passing zones on the straights, and all passing maneuvers must be completed on the side that will be specified at the morning driver's meeting. Chances are very good that you'll have someone to pass sooner or later.

It turns out that passing someone on the racetrack is often a very difficult thing to do. In highway driving, it's usually easy to pass. You simply pull out and open the throttle. At an open track event, however, the car you're interested in passing will probably have more or less the same amount of power yours does, and the driver will be hard on the throttle too. And what's more, they'll have gotten on it earlier, and they'll be right in the middle of the quick line. So how do you do it?

You have to drive the line through the corner better than they do, so that you come out of the exit and onto the straight with better exit speed. Drive the line perfectly, with a gap of a few carlengths between you. After you've finished your exit, pull out to pass them. If your exit speed is better than theirs, you can complete the pass. If it isn't, you can't.

This is why so many beginning drivers get frustrated while trying to pass. They try to pass by starting their move right after the apex of the corner that leads onto the straight. They forget all about unwinding the wheel and accelerating out of the corner. They crank the steering down, and stand on the throttle, and get all out of shape trying to get around the guy in front. They may have the throttle wide open, but they have completely spoiled their exit speed by trying to pinch off the exit! All that steering they had to do to tighten their line scrubbed off all their speed. This leaves them slow up the straight, and the car that they were trying to pass will simply drive away from them. A similar thing will happen if they follow the car in front too closely. The car in front will control their exit speed, and away he'll go.

To pass safely, you should not compromise your line, and you must have a gap of a few carlengths as a buffer zone. The only time you can pass by going offline, or compromising your exit, is if the car you're passing is much slower than you or if the driver doesn't want to contest the pass. If you drive the line better than the person in front, and carry better exit speed, pulling out to pass him will be easy.

If you can't make the pass cleanly, pull back in line and wait for another opportunity. Never try to force a pass. It will be noted by the cornerworkers, who are well trained to see and report everything, and will simply get you an angry talking to by the stewards. This is not a competition! Take your time. Remember the golden rule of track driving: *"It is the responsibility of the overtaking driver to make a clean, safe pass"*. If you're doing the passing, the onus is on you to do it safely.

Finally, if you find yourself stuck behind a car that's slower than you in the corners, but much faster on the straights, consider simply pulling in to the pits and letting him drive away. The pitlane crew will reenter you in an open gap, and you'll be able to drive at your own pace without the stress. Frustration leads to no good. Feel free to come in, cool off, get a gap, and go back out and have fun.

Being passed

Chances are also good that you'll be passed sometime during the event. As an aware driver, this will come as no surprise to you. You will have seen the overtaking car coming up in your mirrors, and getting closer in each successive braking zone. You will probably see the flaggers showing you the blue

Putting a lap together

passing flag, which is your cue to check your mirrors (in case you haven't been!). Finally, as you enter a passing zone, the driver behind you will pull out to pass.

The important thing to remember is the golden rule above. The overtaking driver is going to work hard to make a safe pass, so help him out a bit. This isn't a race, so there is no stigma associated with lifting off the throttle a bit to let him get by. Let him go and get on with his own driving, and you can get on with yours without having your mirrors filled with oncoming cars. It is extremely hard to drive well when under pressure from behind!

A very useful and courteous thing to do is to acknowledge the overtaking driver, and essentially give him your permission to pass, by *pointing him around*. Put your hand out the window, and point to the side you want him to pass on (the side that was designated for passing in the driver's meeting). Point-arounds are highly encouraged, and are evidence that you are aware of your surroundings in the car. Please use them whenever you can.

There are two rules to follow while being passed. The most important one is to maintain your line. It is the overtaking driver's problem to get around you, and you aren't going to learn much or have much fun if you are continually driving slowly around, far off the line, pointing faster cars by you. You need to drive the proper line, and let the guy behind you pull off line to pass.

The other is to not contest the pass after the overtaking driver is committed to it. If he has pulled alongside you, the pass is completed. No purpose will be served by racing him down to the next corner, other than to worry the flaggers and the stewards. Lift off the throttle, let him go, and go back to driving your own line at your own pace.

Many of us have cars with more horsepower than handling. In the corners, the guys with the less powerful cars are all over us, but we can motor away from them in the straights. Doing this once or twice is all right, but blocking another driver for a series of laps, or worse yet a whole session, is very discourteous. It will probably also result in your getting to meet the stewards, up close and personal. Be courteous. If the car buzzing around behind you handles better, he'll be completely out of sight within a few corners. Let him go.

Putting a lap together

Now we have talked about all the parts individually. The art of performance driving consists of finding the line through the corners and straights, and driving it to perfection at the limits of the car and driver. The sharp dividing lines between braking, turn-in, exit and straight blur once we get out there and begin to put it together. Other distractions appear, like the other people who are on course with us, the flaggers, and the possible changes the course goes through as cars kick up dust, put down rubber or oil, and so on.

It's easy to get what the formula-car racers call "gearbox mania", when you see a car in front of you. You want to catch it! The competitive instincts come into full bloom, and you focus on the tail end of that car, to the exclusion of everything else. Generally, when this happens, your concentration on the real task of driving smoothly goes to hell in a handbasket. Lap times go up, you start missing apexes, and that leads to more tension, and more mania, and you begin to forget all the fundamentals you've learned.

Well, this isn't a competition, and there are no prizes given. When you get out in traffic, you must concentrate more than ever on the fundamentals of smoothness, awareness, and relaxed control. Your goal is to drive the ideal line to the best of your ability, and smoothly knit together braking, turn-in, exit, and straight into a seamless lap. When you're doing it right, it all flows together, and it's easy to focus on doing it better. When you're having trouble getting it right, it's easy to get distracted. Use each exit to aim you down the straight directly at your next braking point. If you're getting it right, you should be able to turn the wheel exactly once for each corner. It's harder to do than it sounds, and a lot of people (the author included) make it their singular passion to try and do better at it every time behind the wheel.

Getting it all wrong

Sooner or later, even the best of us will turn in or apex just a bit too soon, or carry the braking in just a bit too late, and find ourselves running completely out of road. There are very few worse feelings in the world than coming to the sudden realization that your car is carrying you off into the tall grass at speed.

There are some very important things to remember when this happens, which is unfortunate since it is the single hardest time to remember *anything*. Just the same, remember them. If you drop two or four wheels off the track, the amount of traction you have drops to nearly zero. Your first impulse will be to turn the wheel hard to get back on the track, and get off the throttle and maybe onto the brakes to slow the car.

Don't do that!

Any of these actions will result in an instant spin, and you really don't want that. The right thing to do is exactly the opposite of what most people's reflex would be. You must *stay on an even throttle, and smoothly drive through it*. If you can, unwind the wheel so that the tires will have less cornering load on them. There is no grip out in the dirt, so take your time recovering, and don't try to get back on the surface instantly. If you smoothly steer back onto the surface well downtrack, after both you and the car have had a chance to regain your composure, you'll do nothing more than kick up some dust and scare the flaggers. You can then shake yourself out, relax and calm down, start breathing again, and make a mental note to turn in a little bit later there next lap.

The primary rule of recovering from situations like this is "*Be smooth, drive through it, and do nothing abruptly*".

That will cover 75% of the incidents you are likely to get into. However, if you really overcook it, and the car is actively involved in spinning, don't try to save it or you could easily make it worse. The rule for that situation is "*When you spin, both feet in*". Push in the clutch to keep the motor running, and lock up the brakes. This will get the car stopped in the shortest possible time. It also provides the highest probability that the car will take a predictable path, which is important for any drivers that may be coming up behind you. If you're struggling to catch the car, it may dart aside unexpectedly, worsening the situation for all involved.

Early warnings

Many places on a racetrack are blind. As you're driving, you'll be coming into blind areas at speeds well in excess of anything you may have experienced before. And, racetracks being what they are, one of your fellow drivers may have got it all wrong and be sideways in the track in front of you, right around the next bend. How do you find out about it early enough to slow down safely?

That's what the flaggers are for. These guys in white out on the turns are your best friends, and yet many drivers never notice them. At any Shelby Club event, the turn stations at every turn will be manned by highly trained people who have no other purpose at the event than to provide you early warning of situations ahead of you. They are your extra eyes that can see around corners and through hillsides, and they are very good at what they do.

Your goal is to be aware of these folks, and especially to be aware of every one of the turn stations as you get down to the braking area for that turn. If the flaggers are just standing there, observing calmly, then the track will be clear. If, however, they are holding up the yellow flag, or waving it vigorously, you'll know well in advance, so that you can adjust your braking and be prepared to avoid the incident when you get to it. Just a momentary glance is all it takes, but it's a critical element of safety.

You should familiarize yourself with every flag station around the track, and you should look at every one of them each time by. No news is good news, to be sure, but you do not want to miss a yellow flag and be surprised by a car sideways in front of you. Your own awareness is a major key to everyone's safety. And at the end of each session, give the flaggers at each station a wave. They're there for you, and that's one of the few fringe benefits they get. If nothing else, this exercise will make you glance up at the flag stations!

The other early warning is one that drivers give to each other, and is very helpful in keeping the event safe for everyone. If you have a problem and need to slow down, *put your hand out the window*. If you are entering pit lane, do the same. If you see a yellow flag ahead, do the same. Your hand can serve as the signal to a less aware driver behind you to look at the flaggers, and you can help make the event much safer by doing so. This signal is universal. A hand out the window means that something is different, that something unexpected is happening, and that drivers behind you should be aware- and not just stare at the rear bumper of your car, lost in the throes of gearbox mania.

Flags

The stewards and flaggers communicate with you the driver through the use of flags. These flags will be very familiar to any race fan, but now you're on the receiving end. So we'll use the official language.

The following Command flags will be obeyed *immediately and without question*:

- GREEN: A session is underway at the instant the green flag falls. This flag will normally be in the possession of the Chief Starter at Start/Finish only. When displayed, the green flag indicates that the course is clear and ready for session activities.
- YELLOW: Held motionless (standing): Take great care. An obstruction of some sort is on or near the track. Passing is not permitted until after you have passed the incident. Be extremely aware, and be prepared to slow or alter your line. Waved: *GREAT DANGER*. Be prepared to stop. The problem ahead is in the line. *NO PASSING* until past the emergency area.

- **RED:** *Check your mirrors and STOP IMMEDIATELY.* Pull smoothly over and stop as soon as it is safe to do so. Clear the circuit as well as circumstances permit, so that emergency vehicles can get by you. The session has been stopped, and the track is closed to traffic. Remain in your car, and do not move it until directed to do so by the course workers.
- **BLACK:** Complete the lap you are now on. Then stop for consultation at the location designated by the Chief Steward or at the area specified by the regulations of the event.
- **BLACK WITH ORANGE BALL IN CENTER** (the Meatball, or Mechanical black flag): There is something mechanically wrong with your car. Proceed to your pit at reduced speed, and check your car. If you suspect that you are dropping fluids, please make every effort to stay off the normal line. Check in with the Chief Steward.
- **CHECKERED:** The session is over. Complete one more lap (the cooloff lap) at reduced speed before exiting the track and returning to your pit.

The following Advisory flags are used to inform you of track and traffic conditions. No actions other than your awareness are required, but the following actions are suggested:

- **BLUE WITH DIAGONAL YELLOW STRIPE:** Motionless: Another car is following you very closely, and may be preparing to overtake you. Waved: A car is overtaking you. Please allow them to pass at the next safe designated passing zone.
- **YELLOW WITH VERTICAL RED STRIPES:** *Take great care!* Oil, debris or some other substance has been spilled on the surface. Be aware that the surface ahead will be slick. If you see this for a lap or two in a corner, and then it is taken down, this does not mean that the slick condition has magically gone away. It means that the workers have taken down the flag so that if the situation should suddenly get worse, they can put it back up again!
- **WHITE:** An ambulance or emergency vehicle is on course ahead. Be prepared to alter your line to move around it.

Summary

This is a very brief overview of performance driving on the track. Words and pictures on a page cannot begin to convey what the reality of driving your car to its limits is like. All of us have a lot to learn about high performance driving, even if we've driven hard on the street before. The racetrack provides an unequalled environment for taking our equipment and skills to the limit.

However, track driving is an inherently dangerous sport. This manual cannot convey enough information to make you a safe driver, or one capable of extracting the maximum from your car. Only seat time can do that. Please do not make the mistake of assuming that, having read this book from front to back, you are ready to go out and go flat on the throttle. The words cannot convey what can only be learned by experience. As Eddie Cheever said during the 1992 IndyCar season, "A race car has two pedals- one that makes it go faster, and one that makes it go slower. It's up to the driver to decide which one to press."

Take your time, seek instruction, and work up to it slowly, and with safety foremost in mind. By the end of the first day, you'll likely be doing things with the car that you can't even imagine. And most of all, have fun! You are in for an unmatched treat.