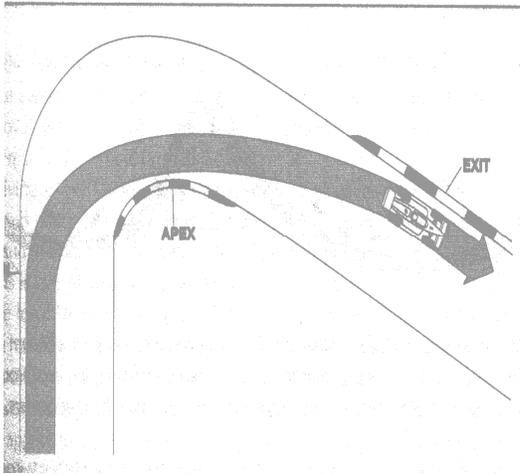
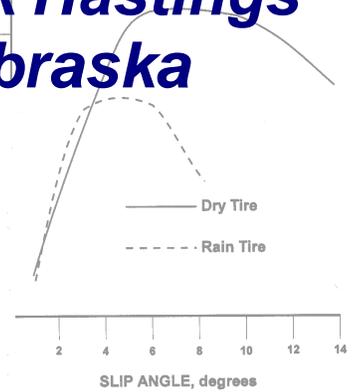




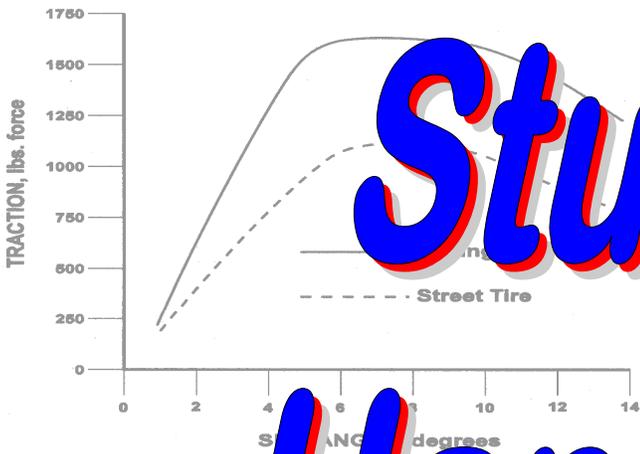
**Great Plains Region
Porsche Club of America
Drivers Education School
Motorsports Park Hastings
Hastings, Nebraska**



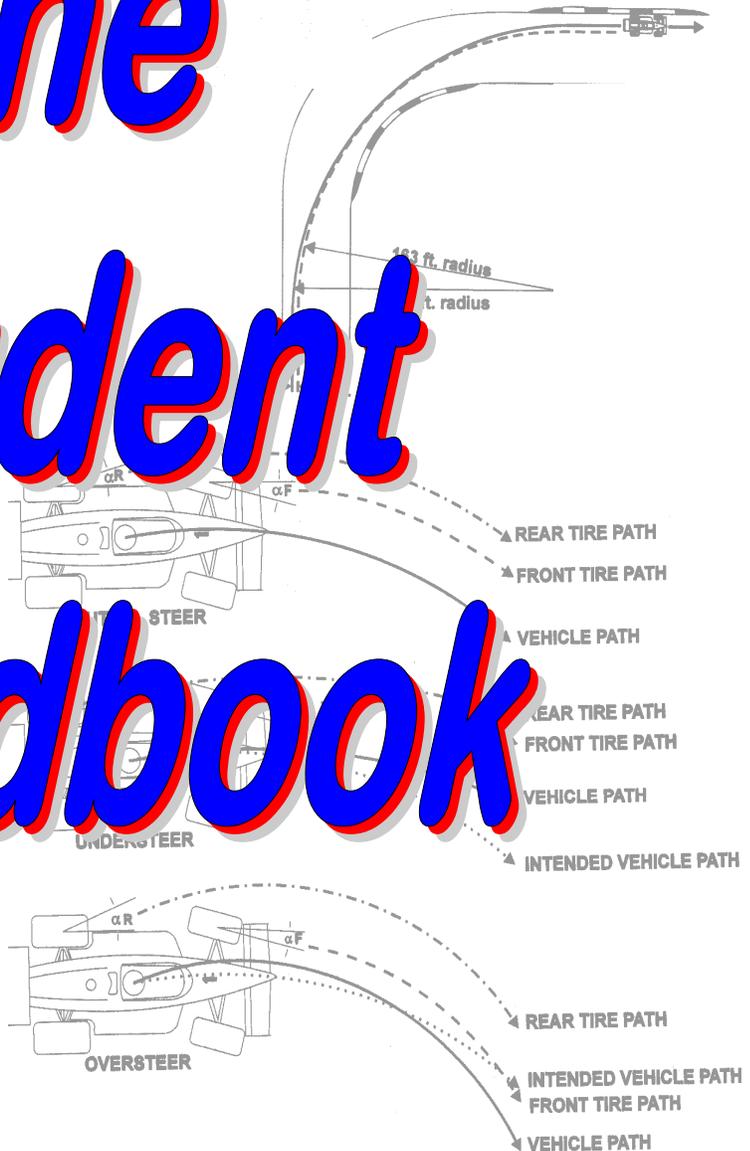
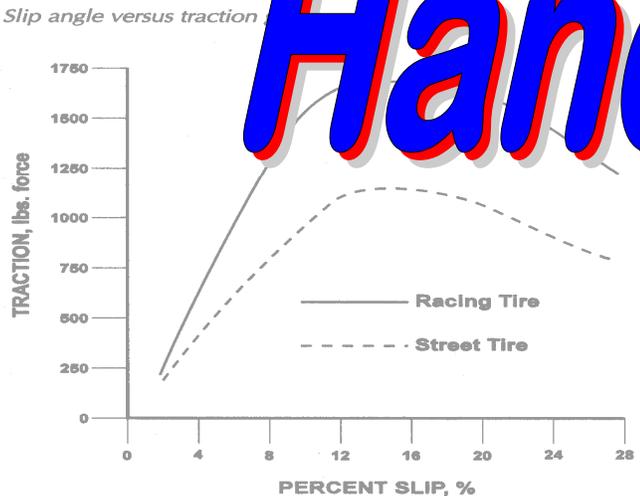
The



Student



Handbook





Great Plains Region - Porsche Club of America Drivers Education Event

This will likely be your first experience driving your car on a real race track. Prepare yourself for a lot of fun! Saturday morning is filled with apprehension. By Sunday, you will be wondering how to get that huge grin off your face in time for work on Monday morning. We are going to do our best to make this a great weekend for you as your introduction to “*being at the track*”.

This is called a *Porsche Drivers Education Event*. Learning should be your primary goal, learning about your car, about the track and about yourself. Think of the entire weekend as a learning experience. This is not a race!. Leave your “Racing Ego” at home. The three most important points that you should be concerned with are:

Safety, Safety and Safety.

We will present to you a basic drivers classroom session covering a variety of subjects. These range from the importance of understanding flags, to knowing why a late apex is essential in some corners more than others . You will be assigned a specific instructor who will work with you throughout the weekend. Our instructors will challenge you but never push you beyond your limits. You are expected to listen, observe and drive safely. Working together with your instructor can make this a most enjoyable and rewarding experience.

The Great Plains Region, Porsche Club of America Welcomes you to Motorsports Park Hastings

Acknowledgement

*This handbook was originally compiled by Chris Weaver for the Heartland Park facility in Topeka, and later edited and adapted for Motorsports Park Hastings by Sandy Steckman.
Updated - 2020 Rick Mourey*

Table of Contents

	Page No.
<i>Personal and Safety Equipment</i>	4
<i>Track and Safety Procedures</i>	5
<i>Know Your Flags</i>	6
<i>Anatomy of a Corner</i>	7
<i>Early-Late Apex</i>	8
<i>Important Points for Novice Drivers</i>	9
<i>Proper Seating and Wheel Position</i>	10
<i>Track Truths</i>	11
<i>Weight Transfer & Heel Toe Basics</i>	12
<i>Threshold Braking Exercise</i>	13
<i>Understeer and Oversteer</i>	14
<i>Trail Braking Fundamentals</i>	15
<i>Track Map</i>	16
<i>Hot Lap of MPH</i>	17 & 18
<i>Notes</i>	19



Personal and Safety Equipment

For Your Car: (see technical inspection sheet for complete list)

- 1.) New or as-new brake pads.
- 2.) Fresh brake fluid (Dot 4), Have a mechanic power flush your system prior to the event.
- 3.) A 2 1/2 lb Halon, BC or ABC fire extinguisher **securely** mounted within easy reach of the driver.
- 4.) Tires with at least 2/32" tread depth.
- 5.) Empty your car of anything which could come loose and fly around while on the track. Remove floor mats, console items, check trunk area, check above visors and especially check thoroughly under your seats.
- 6.) Tire pressures should be set to the *manufactures* recommended setting for your car. Check your owners manual or door placard.

For You:

- 1.) A Snell 2010 (thru 2020) or higher helmet. **(required)**
- 2.) Long sleeve cotton shirt or short sleeve per Safety Chair. **(required)**
- 3.) Long pants (cotton). **(required)** - No Shorts!
- 4.) Rubber soled shoes. Leather uppers are recommended.

You may also consider the following:

- 1.) A quality torque wrench to check lug nuts.
- 2.) A quality tire gauge.
- 3.) Sun Blocker
- 4.) Cooler with plenty to drink. (no alcohol)
- 5.) Lawn chair
- 6.) Jacket
- 7.) Sun Glasses



Track and Safety Procedures

On the Track:

Eyes-Ears-Mirrors, always be aware of traffic approaching behind you.

Bunching up:

If traffic gets congested, exit the track and proceed down the hot-pit lane and re-enter the track after waiting for congested traffic to move half way around the track.

Passing Areas:

Passing will be allowed only on the straightaway sections. No passing in corners.

Being Passed:

If you see a car fairly close in your mirrors, move your car to the right, and signal them to pass by putting your arm out the window and pointing to the left. The passing car should always pass on the left. One point is required for each car you are electing to let pass.

Back-off the throttle and let the car pass. Do not race the car to the corner.

Passing:

If you catch a car, allow the car you have caught to give their signal. Pass when directed (**Left hand point-by signal from drivers window**), and not until you are directed to do so. When being passed, lift of the throttle slightly -DO NOT BRAKE. If the driver ahead directs you to pass in a no-passing zone, do not pass. Wait until you reach a designated passing zone and you get another signal.

Blue Flags:

Blue passing flags may be used at the corner station preceding the passing zones. If a corner worker shows you a blue flag, be prepared to signal the traffic behind you on the next allowable passing straight.

Exiting the track during a run session:

Signal cars behind you that you are exiting the track. This is usually done by showing your left fist held straight up out the window. Remember that the exit is VERY narrow. ***Drive slowly and carefully in the pit / paddock area, obeying the 10 MPH speed limit.***

Checkered Flag-Session End:

The end of a session will be signaled by a checkered flag shown by the flagman. Continue on the track at a reduced speed, with no passing, to the track exit near turn 11. This is your cool-down opportunity.

Sliding off the track:

If you slide off the track, steer straight, come to a complete stop before re-entering the track. Four wheels off requires your car to be *checked* before you are allowed to return to the track. Exit the track, and turn left, then proceed to the volunteer working the grid to have your car checked.

Drop a Wheel off The Track:

If you drop a one or two wheels off of the track, smoothly and carefully drive back on to the track, take a deep breath and think.

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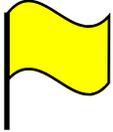
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Know Your Flags **Safety First**



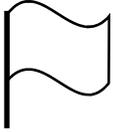
Green- Start of session, course is clear.



Yellow Stationary— Caution hazard ahead, no passing. no passing until you are sure there are no incidents between that point and the next flag station.

Yellow Waving— Danger, slow down safely, no passing. A situation exists ahead.

Yellow Double Flags—Caution, double yellow at all stations. Danger, slow down safely, no passing.



White— Emergency, service or slow moving vehicle on the course. Watch for additional flags from corner stations.



Blue w/Yellow Diagonal— Information flag. A car may be trying to pass you. check your mirrors.



Black w/Orange Disc— Your car may have a mechanical fault. Proceed cautiously to early session exit at turn 11 and proceed to grid for mechanical inspection.



Yellow w/Red Stripes— *Caution* slippery surface or debris on the track.



Black Closed/Furled— Warning. You are driving over-aggressively or in an unsafe manner.

Black Open— Proceed safely to early session exit at turn 11 and proceed to the grid area for driving behavior discussion with event official. Listen to him/her!

Black Open All Corners— Run session is halted. Reduce speed safely, no passing. Proceed to early session exit at turn 11. Run session has terminated.



Red— Slow down safely but immediately and pull to the side of the track and wait for instructions / directions.



Checkered Flag— End of run session.

Watch for flag stations as you drive around the track. They may be flagging you . There are 9 stations around the track. It is good practice to acknowledge their presence.

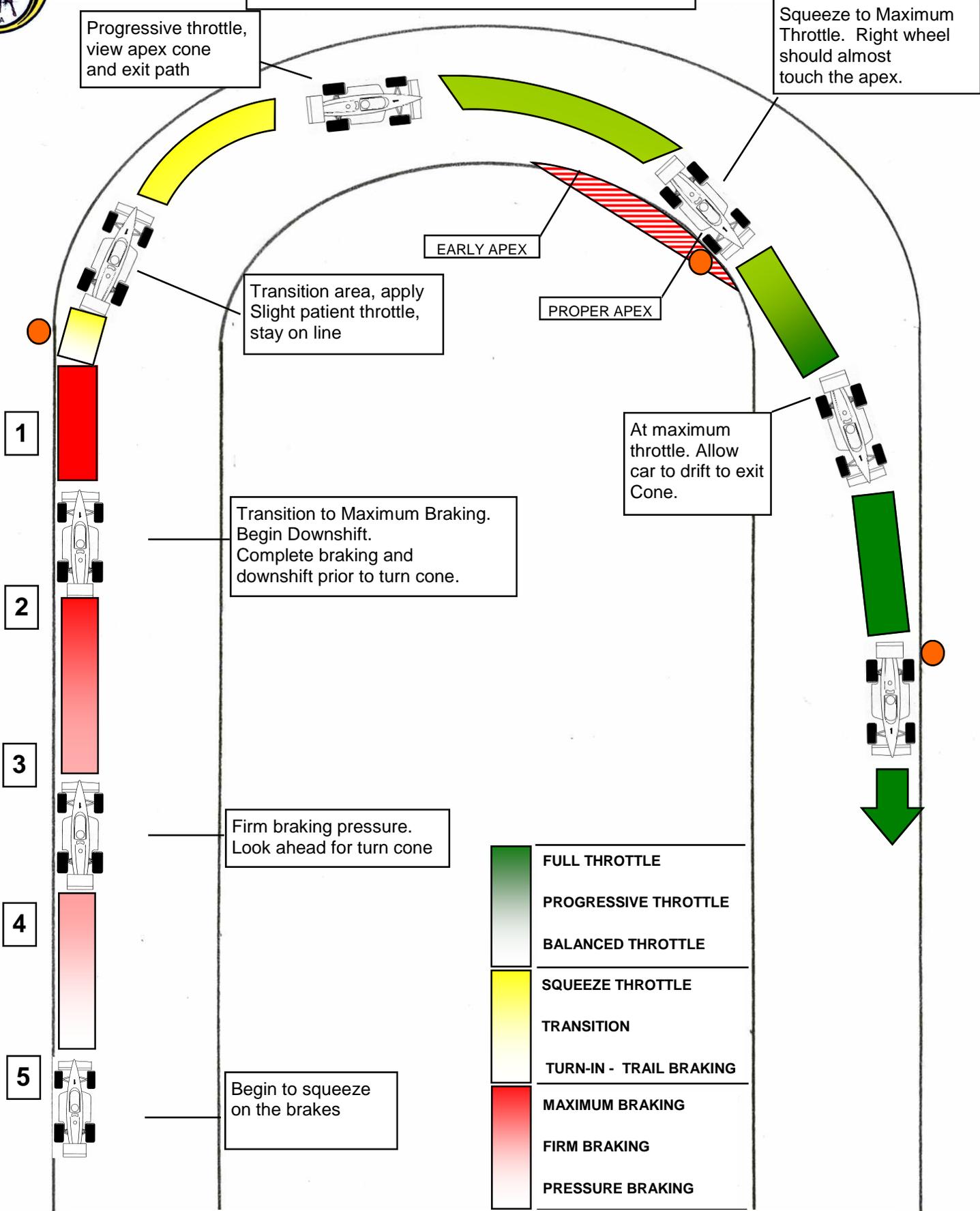


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The Anatomy of a Corner

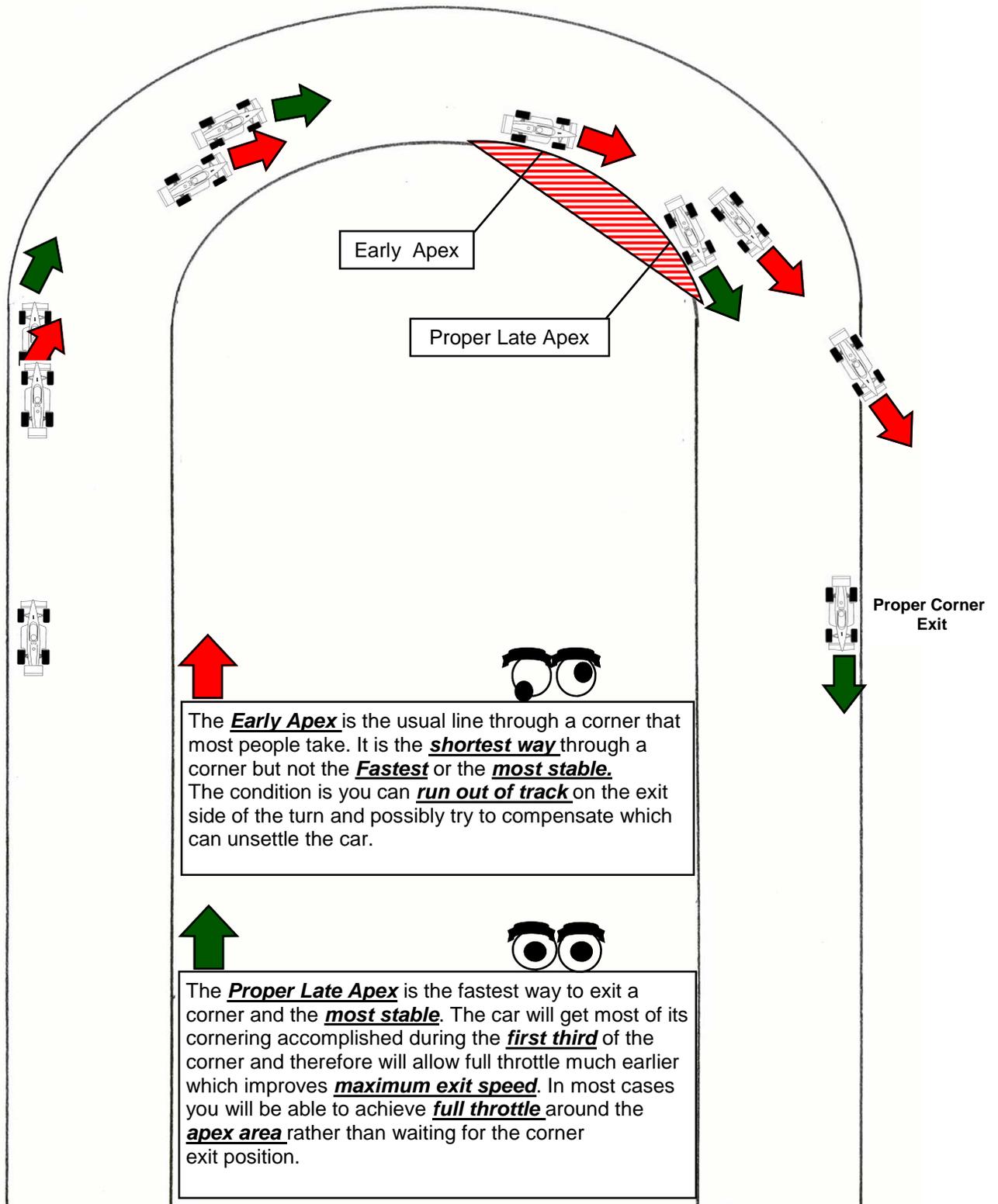


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Early - Late Apex





Important Points for Novice Drivers

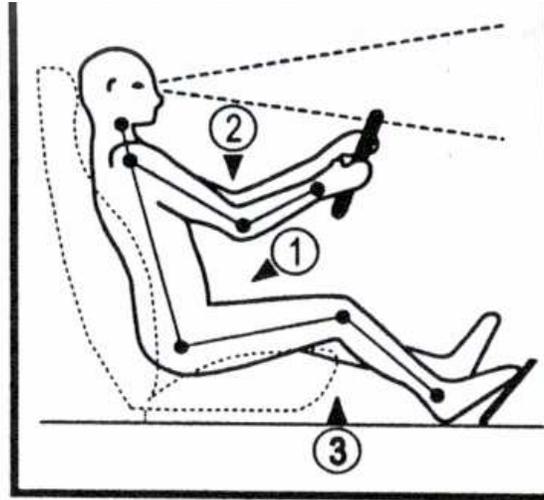
- 1.) Be safe and drive within *your* limits. **Start slow and grow.**
- 2.) Relax, listen and concentrate — be **smooth** and consistent.
- 3.) Adjust your seat for good driver position.
- 4.) Develop an accurate mental image of the track , one corner at a time. Drive in your mind, create a mental slide show of the track develop **“Imagineering”** skills.
- 5.) Be ready to go at track entrance (grid), Helmet on, belt tight, windows down.
- 6.) Be alert at all times, **Eyes, Ears, Mirrors.**
- 7.) Your car will talk to you...listen.
- 8.) Never use downshifting as a braking method, **use your brakes.**
- 9.) Avoid fixation, drive your **own line**, do not follow the car ahead of you.
- 10.) Drive and **think ahead**, keep your eyes up.
- 11.) Know the meaning of flags and watch for them during your run session.
- 12.) Know the rules of passing and being passed. Be aware of approved passing zones.
- 13.) Clearly understand **Early** and **Late** Apex and its effect .
- 14.) Establish consistent braking points. **Establish Landmarks.**
- 15.) Never **abruptly** lift off the throttle in a corner.
- 16.) Brake and downshift before a corner in a **straight line.**
- 17.) Focus on **your** performance rather than those around you.
- 18.) Openly communicate with your instructor.
- 19.) At the end of the day, discuss the track with other drivers.
- 20.) Spend some time visualizing a couple laps around the track and what they look like. Think about the feedback you received in each turn.

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Proper Seating Position

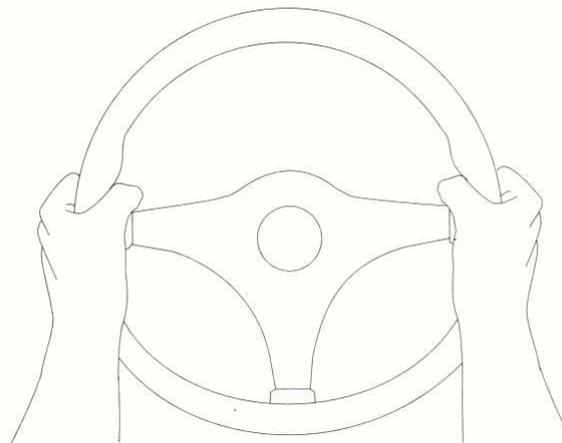


1. Do not sit on the seat, ***sit in it!*** Push your rump and the small of your back firmly into the seat by pressing against the “dead pedal” with your left foot. This procedure will anchor the seating position and allow freedom to turn the steering wheel instead of holding on to it to stay in your seat.
2. Adjust the seat so the heel of your hands can rest over the top of the steering wheel with completely outstretched arms. Your back should be firmly against the seat back. This enables you to reach the most distant point of the wheel with a bend of your elbows. All major control in the driver area should be reachable without leaning forward. Check the gear shift for a comfortable reach to your highest gear. Also check mirror adjustment.
3. With a slight bend to the knees be able to fully depress the pedals with no interference from the seat or the steering wheel. Ensure this is possible by depressing the clutch with the right foot. Spend the time it takes to adjust the seat-back and tilt control until the above three steps can be achieved. Avoid extremes. None of the driving moments involving arms and legs should end with the limbs fully stretched. The seat is the link between driver and every single reaction of the car.

Proper Hand Placement

12 O'clock

9 O'clock



3 O'clock

With the 9—3 grip you should be able to steer through almost every corner ***without moving your hands*** from this position. This will result in smoother, more controlled steering. It allows *both* hands to do an equal amount of work, when one hand pushes up the other is pulling down. Steer smoothly without jerking the wheel into a turn. Small turning corrections are made with the wrists, not the arms. Always grip the wheel with a relaxed but firm grip, *no white knuckles*.

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Track Truths

One of the common denominators regardless of your experience level, is that performance driving or racing is a constant learning process or “work in progress”. What is shared between those two groups is what we call “*Track Truths*”. It ranges from un-learning bad habits from years of street driving to honing your driving skills at whatever level you compete. The list below represents several basic truths that both groups must share to improve their driving skills and be successful and safe on a race track.

1. **Be comfortable and properly seated in the car.**

Professional drivers spend a great deal of time assuring proper seating position. If you are not comfortable it will affect shifting, cornering, concentration, feedback, and require more physical energy to drive. Spend the time prior to your run session to assure proper seating position. (see previous page)

2. **Smooth is Fast.**

Many times given equal cars with equal horsepower, one car always manages to go faster. This is true for the weekend amateur or the professional circuit. The difference many times is smoothness. A smooth driver develops better corner traction and never unsettles the car. They do not spend time compensating for traction errors by asking too much out of the car or tires capability. They brake, steer, shift and use the gas pedal with seamless consistency. Therefore the cars balance is always correct, and never exceeds the traction limit. This allows the speed going into a corner and exiting a corner to increase as laps progress. This is one of the most important aspects of your weekend with us that we hope you will learn....**smoothness**.

3. **Mastering the Apex.**

Every turn around the track is different. A consistent smooth driver dedicates a great deal of time understanding the proper apex of each corner and adjusting his or her driving to reach the ideal apex, appropriate for that corner. One of the most important parts of a corner is the **Turn-in**. The turn-in sets the tone for the rest of the corner and determines how quickly you apex and exit a turn. Spend time with each corner visualizing and practicing your turn-in point and clearly understanding where the proper apex for that corner actually is. Establish consistent landmarks at your turn-in points and learn to adjust them to achieve the proper corner apex.

4. **Learn Where you can go fast.**

As mentioned earlier not all corners are the same. Each corner will have a *different* enter and *exit* speed. Learning this fact about each corner is critical in your personal improvement as a smooth driver. Learn to prioritize corners and develop **corner patience**.

This patience can be a brief second in a turn before you squeeze to full throttle to allow the turn to “**open-up**” and achieve a proper apex and exit speed. Developing a mental rolodex of these corners as to where you **can** go fast and where you must be **patient** is a critical part of your performance driving learning experience.

5. **Making Errors**

Every driver makes errors. Being able to recognize, analyze and improve is what's important. Sometimes the difference between a good driver and an average driver is the good driver has made errors and learned from them. If you blow a corner while on the track don't dwell on it. Log it in, make a mental note and try to correct the mistake next time around. Take a deep breath and focus on your next corner that is approaching rapidly. Many times a mistake can affect you for the next half lap simply because you couldn't “**shake your mistake**” and focus. Discuss errors with your instructor, he or she will be glad to discuss ways to correct them during your next run group.

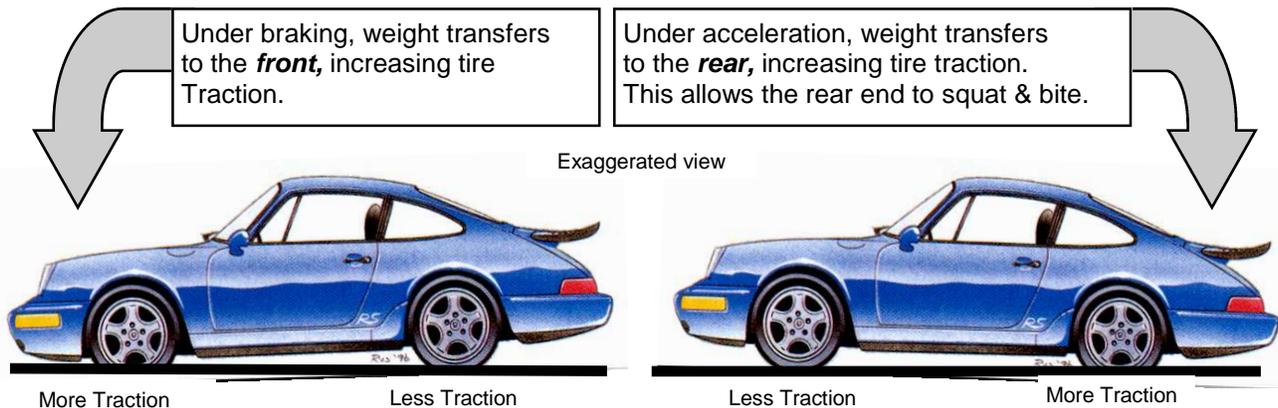
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Weight Transfer

The diagram below shows how the weight distribution of a car under braking or accelerating affects its control. The more traction the car has, the better its control. Under acceleration the rear end squats down, shifting a percentage of the car's weight to the rear end, thus increasing its control and increasing the tire patch area. Conversely under braking the weight or pressure is shifted forward to the front end. "Nose dive" occurs, and front tire traction increases.



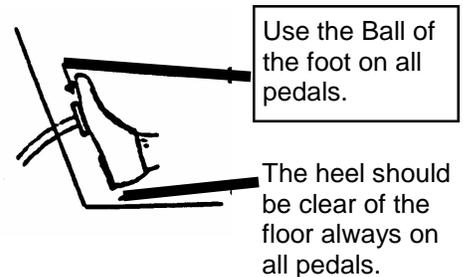
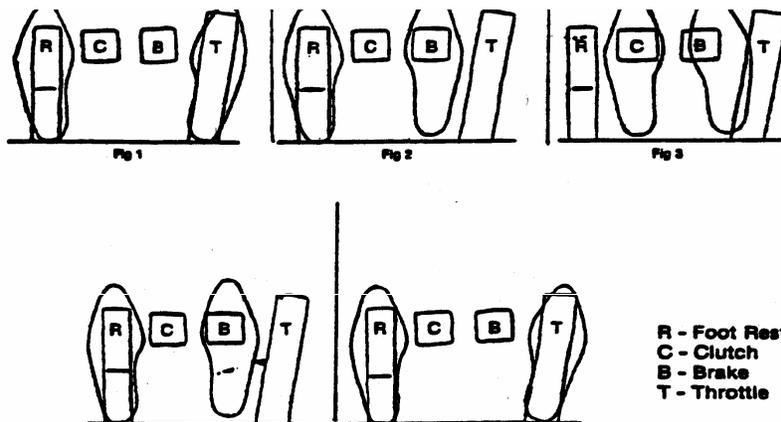
What is important to understand is that when weight is transferred to one set of tires, weight is being removed from the other set, **reducing its traction**. This condition either creates reduced steering control on the front or the potential for spinning on the rear. The same action occurs side to side as well during cornering. This is why braking properly is such a big part of the **weight transfer effect**.

Heel & Toe Downshifting

This is a technique of operating the brakes and the gas pedal simultaneously with the right foot **while** using the clutch with the left foot. With automatic transmissions this does not apply.

Heel and Toe downshifting allows you to brake, and match the engine RPM with the rear wheel RPM to allow smooth downshifting without up-setting the balance of the car.

First you start squeezing on brake pedal to slow your car down—then you **pivot** the heel or side of your right foot to the throttle pedal. While depressing the clutch with your left foot and maintaining even brake pressure, blip the throttle to bring up the rpm, shift into the lower gear necessary then release the clutch and pivot your right heel off the throttle back to below the brake pedal and continue trail braking. This is heel and toe downshifting. *This procedure requires practice to accomplish smoothly.*



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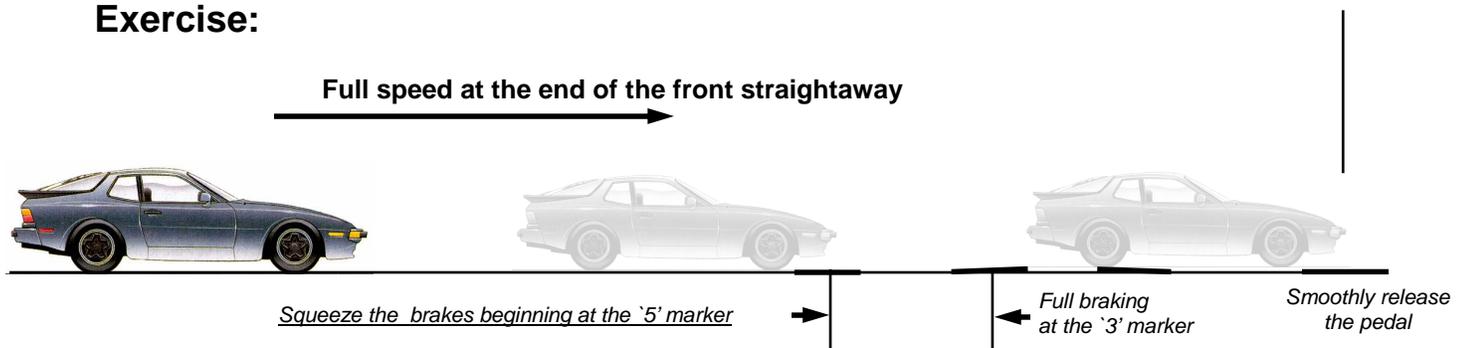


Threshold Braking Exercise

Understanding and using good braking techniques is essential in properly dealing with the demands of a race track. At times, only a light “**tap**” is needed to set the car up for a fast corner so we can maintain our momentum. The braking needed at the end of a straightaway approaching a tight corner is altogether different. Here we want to take advantage of our straightaway speed for as long as possible by late hard threshold braking—just short of lock-up. If we lock up the brakes, we drastically reduce our ability to slow the car down and we lose directional control. We want to be at the **threshold of locking** up the brakes.

The threshold braking exercise is designed to teach you how to consistently approach the limits of hard braking just before lock-up. Even if you drive a car with ABS capability, this exercise may give you a real opportunity to put the ABS to actual use.

Exercise:



Your instructor will ask you to practice threshold braking. Your braking should be hard enough to be just short of lock-up... **at the threshold**. “Hear the chirp—and not see the smoke”. The plan is to get you to use the brakes harder than you had in the past. It is important to know ‘how much is too much’ so you can then back it off a little. Your braking should be consistent, just short of lock-up, or at the threshold of your tire’s traction limits.

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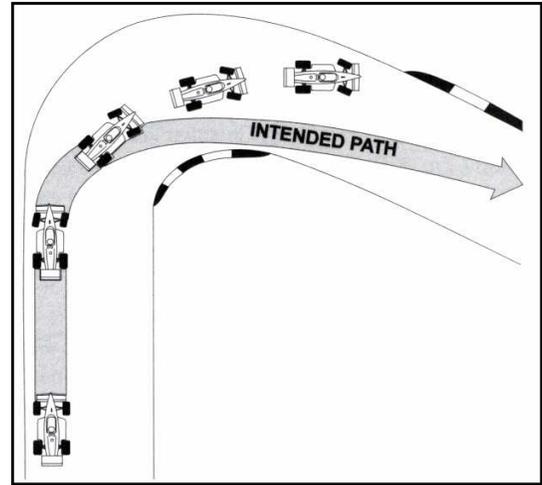
Understeer / Oversteer

Understeer

Understeer is a term used to describe when the front tires have less traction than the rear, and regardless of your steering corrections, the car continues “plowing” or “pushing” straight ahead to the outside of the turn. Think of it as the car is not steering as much as you want it to, so it is “**Understeering**”.

Understeer in effect, **increases the radius of a turn.**

Accelerating too hard or not smoothly enough through a corner transfers excessive weight to the rear, decreasing traction at the front and causing **Understeer**. Most drivers first reaction to understeer is to turn the steering wheel even more, **Don't!** This increases the problem because the tires were never designed to attack the road at an extreme angle. The tires **were** meant to face the road with their full profile, not with the sidewall. So now the tire's traction has been further decreased. To control understeer, decrease the steering input slightly and ease off the throttle (smoothly) to transfer weight back to the front. This increases the traction limit of the front tires, as well as reducing speed. Once you have regained front tire traction and controlled the understeer, you can then begin squeezing back on the throttle.



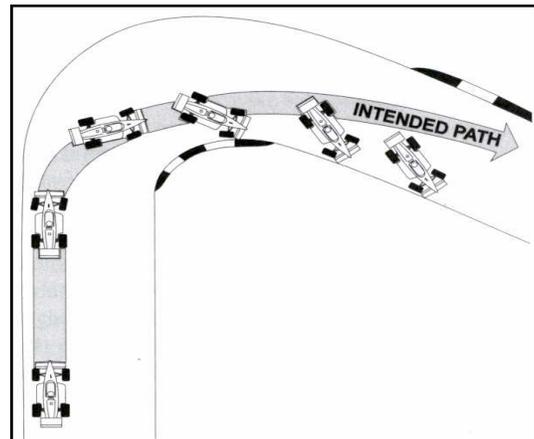
An Understeering car does not steer or turn, as much as you want along its intended path.

Oversteer

Oversteer is when the rear tires have less traction than the fronts, the back end begins to slide, and the nose of the car is pointed at the inside of the turn. The car has turned more than you want it to, so it has “**Oversteered**”. This is also called being “loose”, “fishtailing” or “hanging the tail out”. Its effect is to **decrease the radius of a turn.**

Turning into a corner with the brakes applied, or lifting off the throttle in a corner causes the weight to transfer forward, making the rear end lighter, thus reducing rear wheel traction.

The result... **Oversteer**. Also if you accelerate too hard in a rear wheel drive car, it will produce *power oversteer*. Simply ease off the throttle slightly. To use oversteer to your advantage, just look and steer where you want to go. This forces you to turn into the slide, or to “opposite lock”, thereby increasing the radius of the turn. At the same time, gently and smoothly ease on slightly more throttle to transfer weight to the rear and thus increasing traction. Whatever you do avoid *rapid deceleration*. This will most likely produce a spin as you decrease the rear wheel traction even more.



An Oversteering car steers, or turns more than you want, along its intended path.

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Trail Braking Fundamentals

Trail Braking is a technique that requires practice to accomplish. We do not recommend utilizing this technique during the course of your weekend. It is our goal to have you focus on the fundamentals of performance driving and offer it as a technique to learn and practice in the future. Remember ***start slow and grow***.

This technique uses the brakes as a ***handling device*** as well as a ***braking device***.

As you approach a turn, initiate your braking smoothly to transfer the weight forward, setting the chassis by compressing the shocks and springs, thus increasing the front tire patches. Efficient braking is always done in a straight line just short of lock-up. However, instead of releasing the brakes as soon as you begin the corner, continue to use the brakes as you turn-in for the corner. As your cornering force *increases*, your braking force should *decrease*. This technique keeps the outside front tire patch loaded allowing for better adhesion and therefore, allowing the car to better "***point***" into the turn, decreasing the tendency to *understeer*. This technique will make the car much more controllable and safer in a cornering situation.

Reading Material

For those who would like to further their driving education we have listed several excellent books for you to help advance your driving skills.

Speed Secrets by Ross Bentley

Driving in Competition by Alan Johnson

Porsche High Performance Driving by Vic Elford

Going Faster from the Skip Barber Racing School

Principals of Race Driving by Ayrton Senna

Bob Bondurant on High Performance Driving by Bob Bondurant

Prepare to Win by Carroll Smith

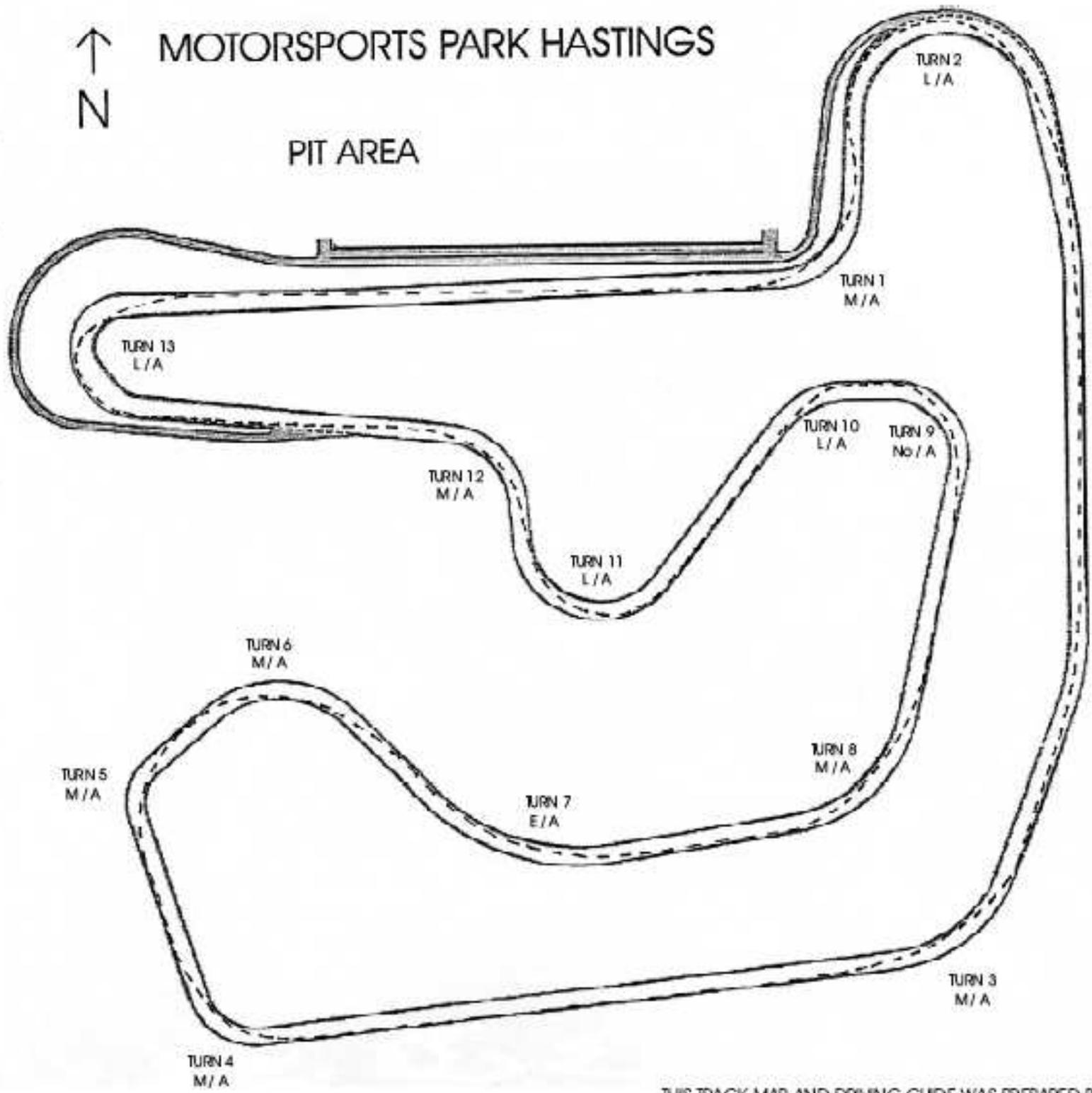
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MOTORSPORTS PARK HASTINGS

PIT AREA



THIS TRACK MAP AND DRIVING GUIDE WAS PREPARED BY
RANDY URLIK - MEMBER OF NASA ROCKY MTN. REGION

A Hot Lap of Motorsports Park Hastings by Sandy Steckman

Motorsports Park Hastings (MPH) is a new facility, opened in 2007. It is a very safe facility, with nearly no walls or Armco barriers to penalize you for a poorly executed corner. Very few cars have ever been scratched here, compared to other tracks where several cars can be totaled in a single weekend! While it lacks elevation changes, this can make it easier for novices to learn, and also aids in visibility. MPH has some technical challenges that require you to think ahead, and ensure the placement of your car on the track is set up just right for the corner ahead. Considering all of these factors, MPH is a great track for teaching and learning the fundamentals of racing.

Turn One

You are heading down the main straightaway, and if you launched well from turn thirteen, you should be at the top end of 3rd gear. As you approach turn one, you should set your car up on the right side of the track, and begin to squeeze the brakes at about the 3 marker. (depending on your car, you could possibly break a little earlier or later) Take your eyes away from the brake-point markers, and begin to look for your turn-in point well in advance. You should squeeze the throttle back to `even` at turn in. Look *through* the corner, and turn-in when you can `connect the dots` between the inside apex, and the right edge of the pavement, which is called the `track out` area of turn one.

Turn Two

Exiting turn one, you will be on the far right side of the pavement. In the short area between turns one and two, you will need to get your car near the middle of the track. You are still in third gear, and you will need to be patient, keeping the car at even throttle in this carousel turn. Look well ahead to the apex on the right side of the track, and when you rotate your car until your hood is pointed toward the pavement (and not the grass run-off area!) you can begin to squeeze the throttle. Shift to 4th gear at redline on your tach, and don't worry about the small bend between turns two and three. You can take it at full speed in most cars with no lifting or braking required. If you are carrying a lot of speed, smoothness of the car will keep the car "hooked up".

Turn Three

The track begins to bend to the right as you near turn three, so just let the left edge of the pavement come to you. Only light braking is required, and downshift to 3rd gear, or stay in 4th if you have great tires and can make a perfect apex. Make sure your car is perpendicular to the left edge of the pavement before turn in. Look for your turn-in point and to make a late apex, and get on the throttle as soon as possible.

Turn Four

Set your car up to the left edge of the track, begin braking at the 3 marker, and downshift to 3rd gear. You can jump over the gator just a bit with your inside tires. Just be patient to make a late apex, and get back on the throttle as you exit the corner. You will stay in 3rd gear all the way until turn 13 in most cars, so you can forget about shifting for a while and focus solely on great braking points and turn-in points.

Turns Five and Six

These are two right handed turns, with the most important corner being turn six, since it sets up for some higher speeds ahead. Turn six is a small radius right turn that bends to the right. This leaves your car on the left side of the pavement as you prepare to turn left on turn seven. Don't try to get back to the right for turn seven, just stay on the left of the pavement as you exit this corner.

Turn Seven

Turn seven bends to the left, and can be taken at full throttle in most cars. You will start on the left edge of the pavement, and using the whole track, you will end up on the right edge of the pavement as you set up for turn eight. Like turn 3, smooth accelerator inputs will help maintain the balance of the car and its traction.

Turn Eight

This turn requires only light braking. You can usually take this corner faster than you think, so try not to over brake. Remember, you are staying in 3rd gear for most cars until turn 13. Use the whole track, and squeeze the throttle to the floor heading into turn nine.

Turn Nine

Begin braking at the 2 or 3 marker, and don't worry about an apex on this corner. Instead this corner has an early turn-in. Get your braking done in a straight line. Look ahead to the center of the turn between turns nine and ten, and get your car to that point. Your right tires should be on the right edge of the pavement as you look ahead toward turn ten. As you progress, you will find this a good corner to practice "trail braking".

Turn Ten

Turn ten is a left-hander, and since it is really close to nine, it almost feels like one turn instead of two. Get to the left edge of the pavement heading into the next turn.

Turn Eleven

Some light braking is required, but the most important thing is to set up for a late apex. Do not let the car go back to the left here. Hug the right edge of the pavement, and set up for turn twelve.

Turn Twelve

This is a medium apex corner, and since it is a left hand turn, it will take your car to the right as you consume the whole track. Drift back to the left as you set up for turn thirteen. Watch for people who may be using the Pit Entrance.

Turn Thirteen

This is a decreasing radius turn. Make sure braking and shifting are completed before the apex of the turn as an unsettled car can send you for a spin. Begin braking at the 2 marker, and downshift to second gear. Keep you left tires along the edge of the pavement, and be very patient as you wait for this late apex corner. This is perhaps the most important corner, since it leads to a fast straightaway. Wait longer to turn in than you think you should, and you will be rewarded a great launch onto the straightaway.

You have just completed one hot lap of MPH. Have fun as you navigate your laps on this safe new facility!

Notes

** Thanks for attending our event **