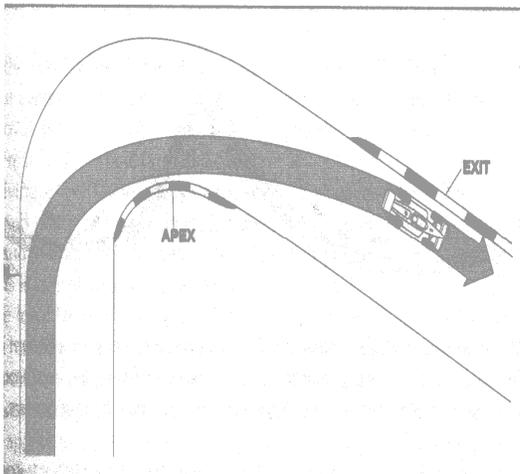
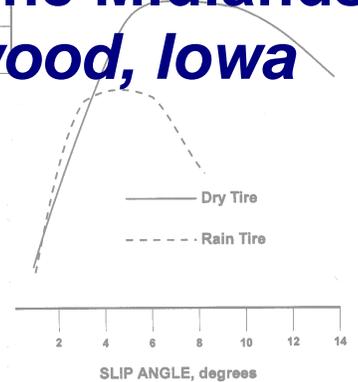




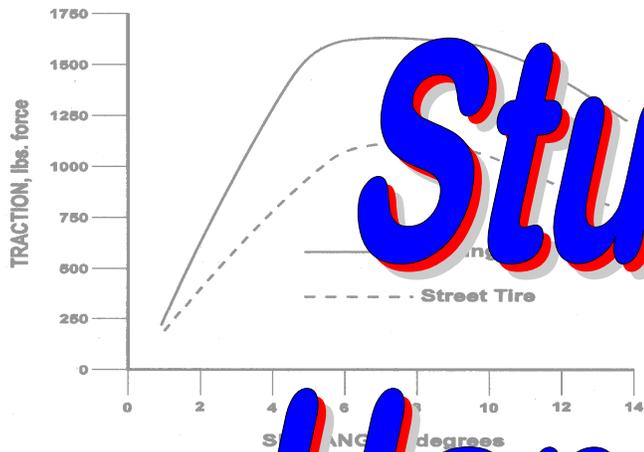
**Great Plains Region
Porsche Club of America
Drivers Education School
Raceway Park of The Midlands
Glenwood, Iowa**



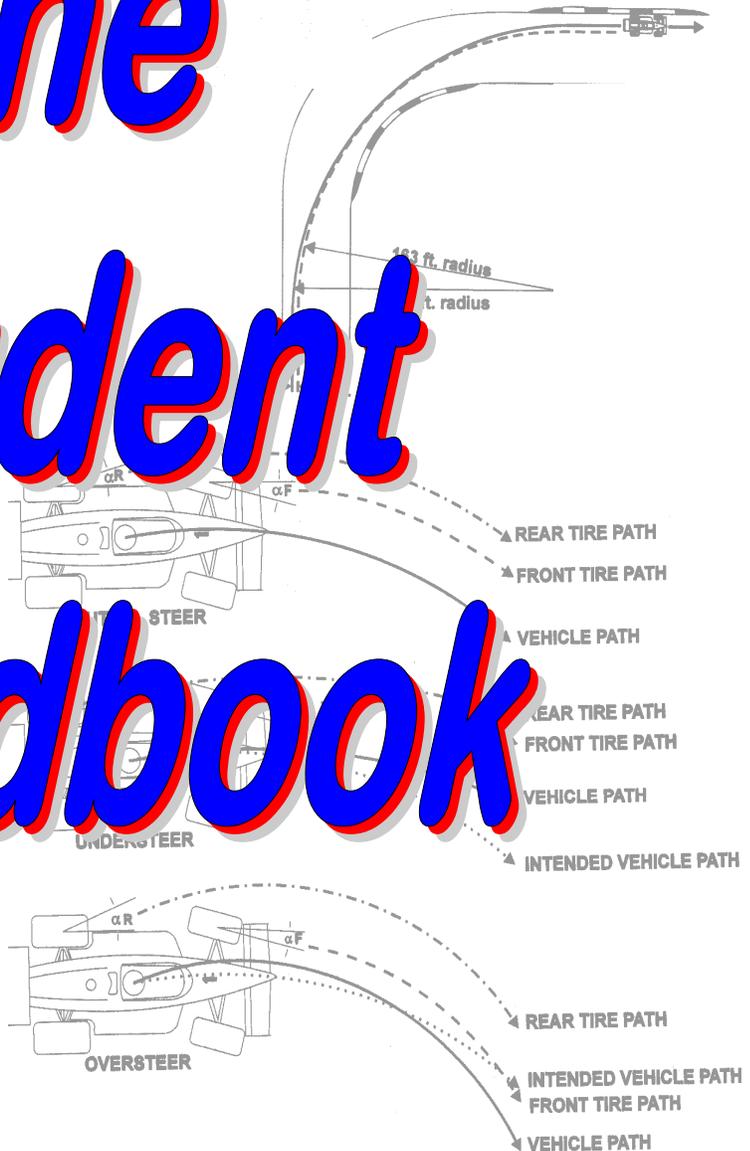
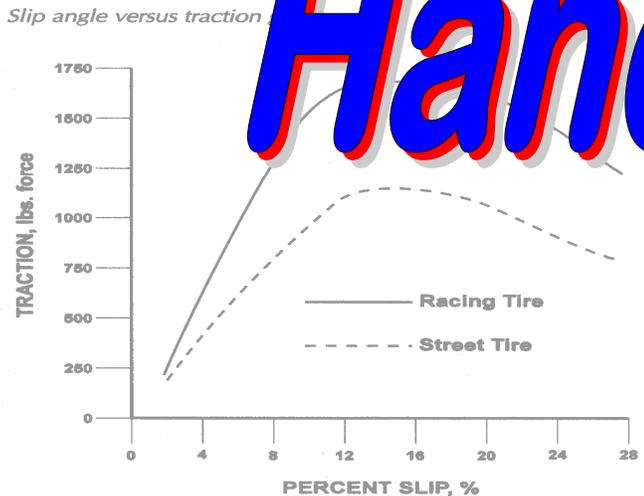
The



Student



Handbook





PCA

Porsche Club of America



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 Raceway Park of The Midlands

Acknowledgement

**Thanks to Ralph Woodard, Denny Strauss, Matt Salter, and Rick Shaffer for their input to this handbook. This handbook was originally compiled by Chris Weaver for the Heartland Park facility in Topeka, and later edited and adapted for MAM by Sandy Steckman. Becky Anderson is responsible for the superb graphics.
Updated: August 2017 & June 2020 Rick Mourey**

Table of Contents

	<i>Page No.</i>
<i>Personal and Safety Equipment</i>	4
<i>Track and Safety Procedures</i>	5
<i>Know Your Flags</i>	6
<i>Raceway Park of The Midlands track layout</i>	7
<i>Anatomy of a Corner</i>	8
<i>Early-Late Apex</i>	9
<i>Turn 1</i>	10
<i>Turns 2& 3</i>	11
<i>Turn 4</i>	12
<i>Turns 5 & 6</i>	13
<i>Turns 7 & 8</i>	14
<i>Turns 9 & 10</i>	15
<i>Turn 11</i>	16
<i>Turns 12 & 13</i>	17
<i>Turns 14 & 15</i>	18
<i>Important Points for Novice Drivers Proper</i>	19
<i>Seating and Wheel Position Track Truths</i>	20
<i>Weight Transfer & Heel Toe Basics</i>	21
<i>Threshold Braking Exercise Understeer and</i>	22
<i>Oversteer</i>	23
<i>Trail Braking Fundamentals</i>	24
<i>A Hot Lap of RPM</i>	25
	26-27



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 SA 2010 or higher helmet. **(required)** No Motorcycle Helmets
- 2.) Long sleeve cotton shirt or short sleeve per Safety Chair. **(required)**
- 3.) Long pants (cotton), NO SHORTS. **(required)**
- 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

Entering the track:

Proceed to the Flagman, stop when you reach him, proceed when the flagman gives you the signal to go. Stay left and proceed to turn 1.

On the Track:

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

Bunching up:

If traffic gets congested, exit the track at turn 11, 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 between corners 15 & 1, 4 & 5, 6 & 7, and 8 & 9. No passing in corners, or in any other areas not listed above.

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, and not until you are directed to do so. 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:

The only track exit is near turn 11. 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. Obey the posted speed limit signs, and take the first hard left to return to the paddock. ***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 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:

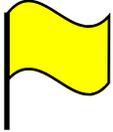
If you drop one or two wheels off the track, smoothly and carefully drive back on to the track, take a deep breath and think.



Know Your Flags **Safety First**



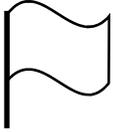
Green- Start of session, course is clear.



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 track out. Run session has terminated.



Red— Slow down safely but immediately and pull to the side of the track in sight of a corner worker station and wait for instructions / directions.



Checkered Flag— End of run session.

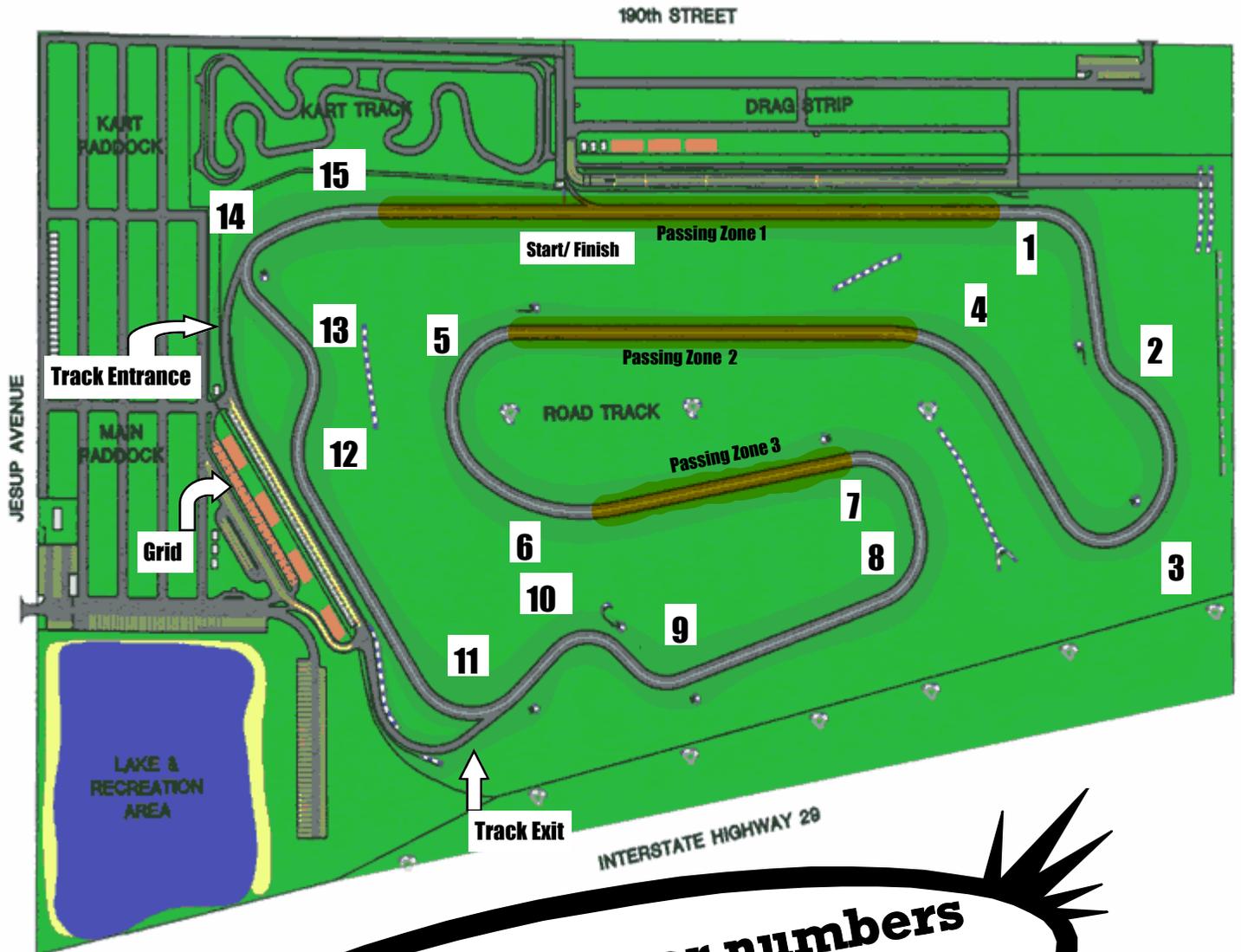
Watch for flag stations as you drive around the track. They may be flagging you . There are 9 stations around the track. It is good practice to acknowledge their presence.



Great Plains Region Porsche Club of America

<http://gpl.pca.org>

RPM Track Map

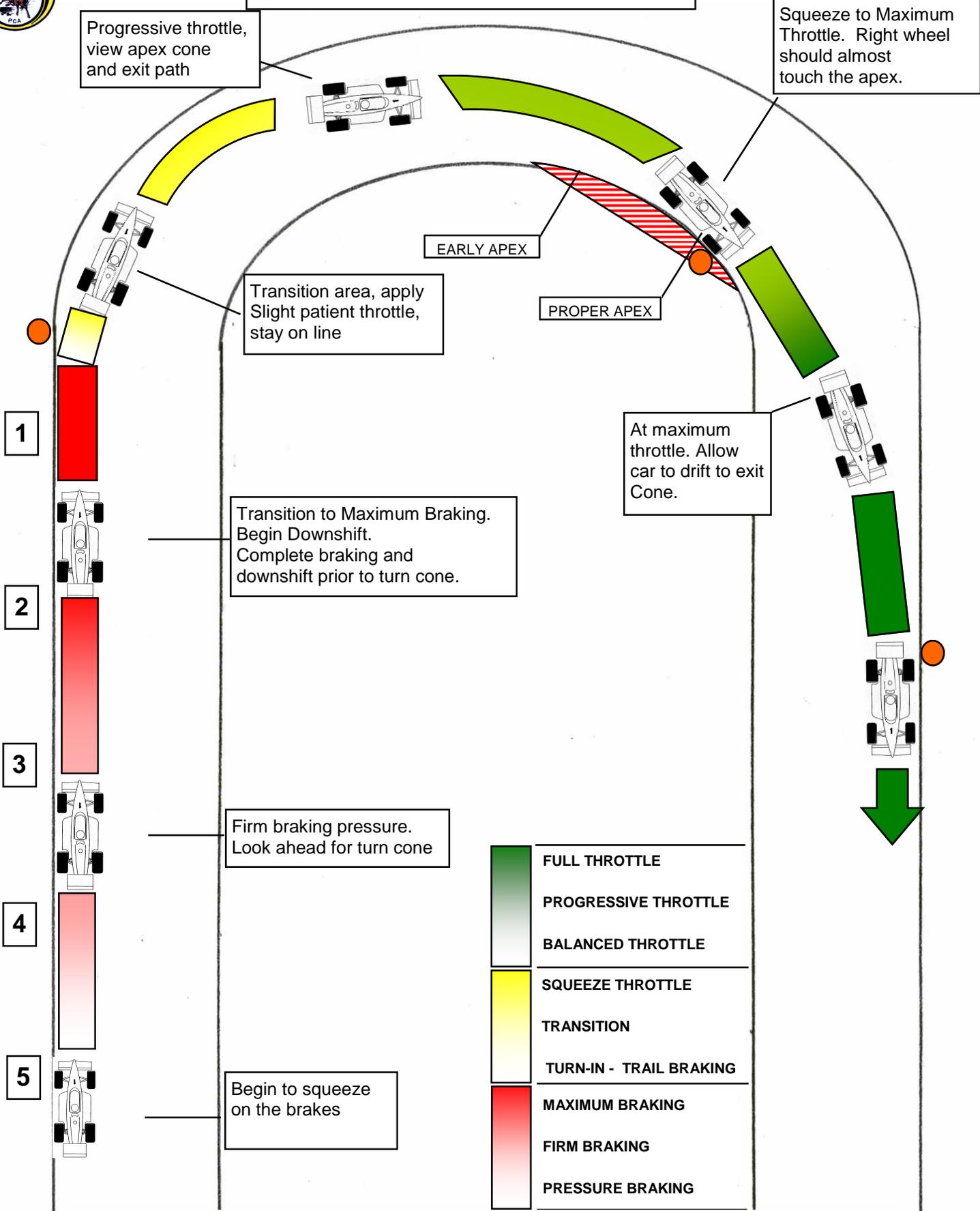


**Memorize corner numbers
and flag stations!**

Great Plains Region Porsche Club of America



The Anatomy of a Corner

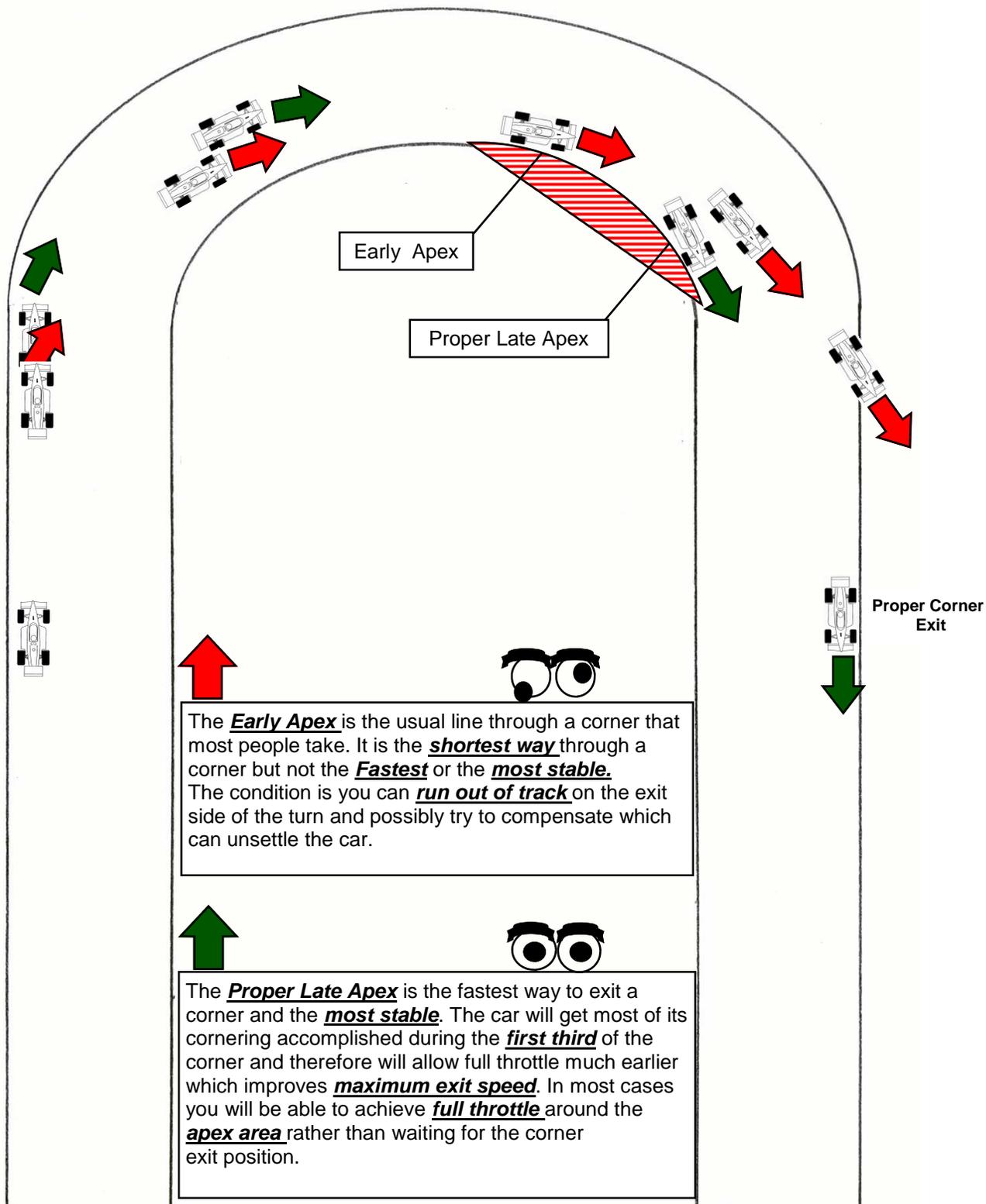


Great Plains Region Porsche Club of America

<http://gpl.pca.org>

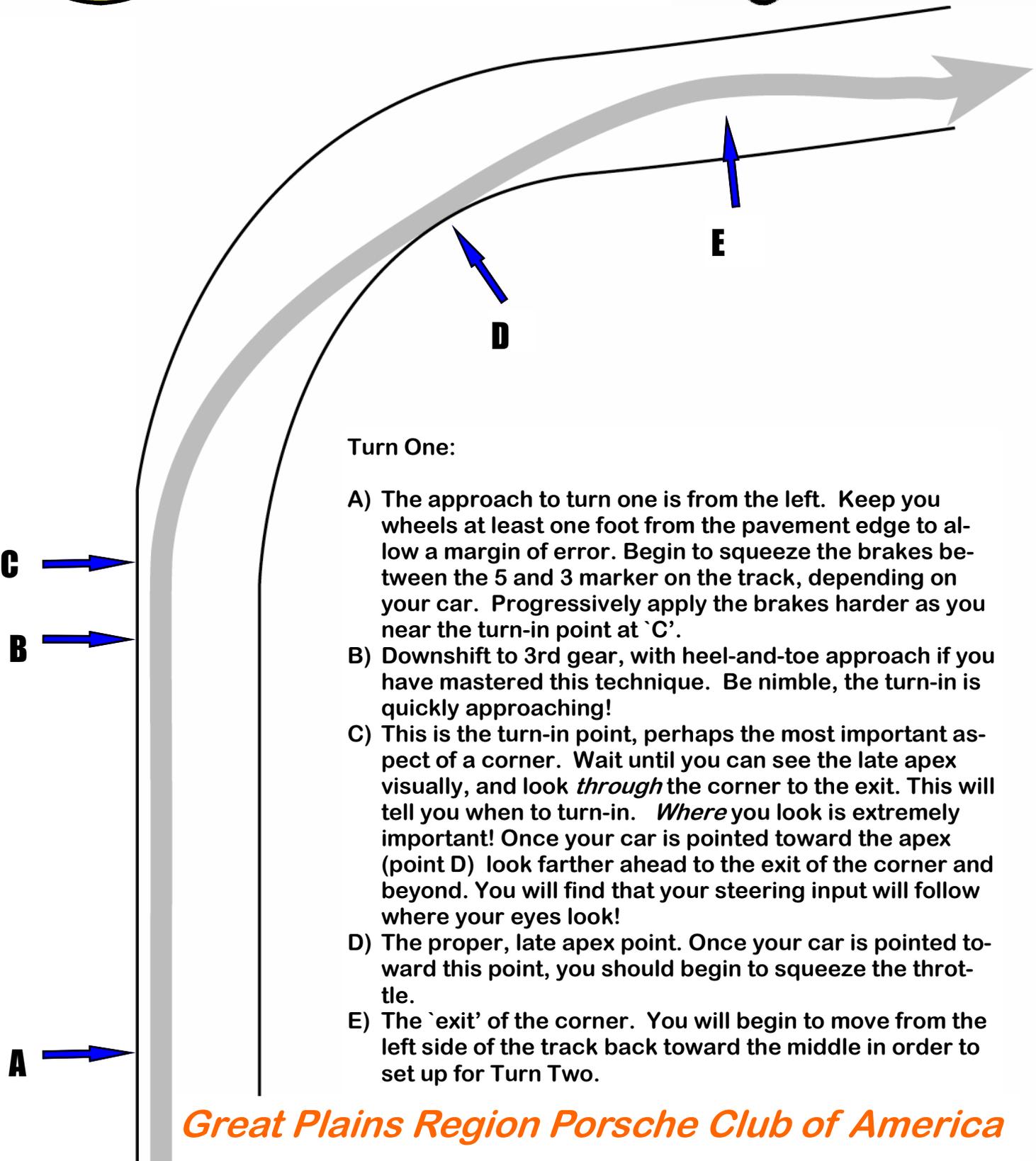
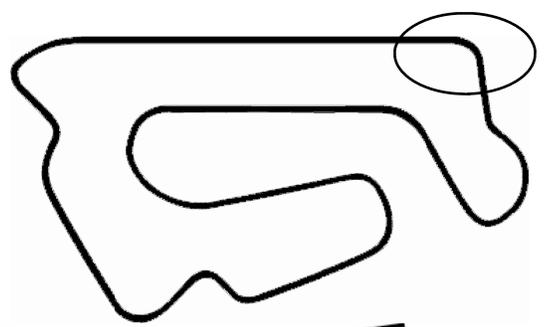


Early - Late Apex





Turn 1



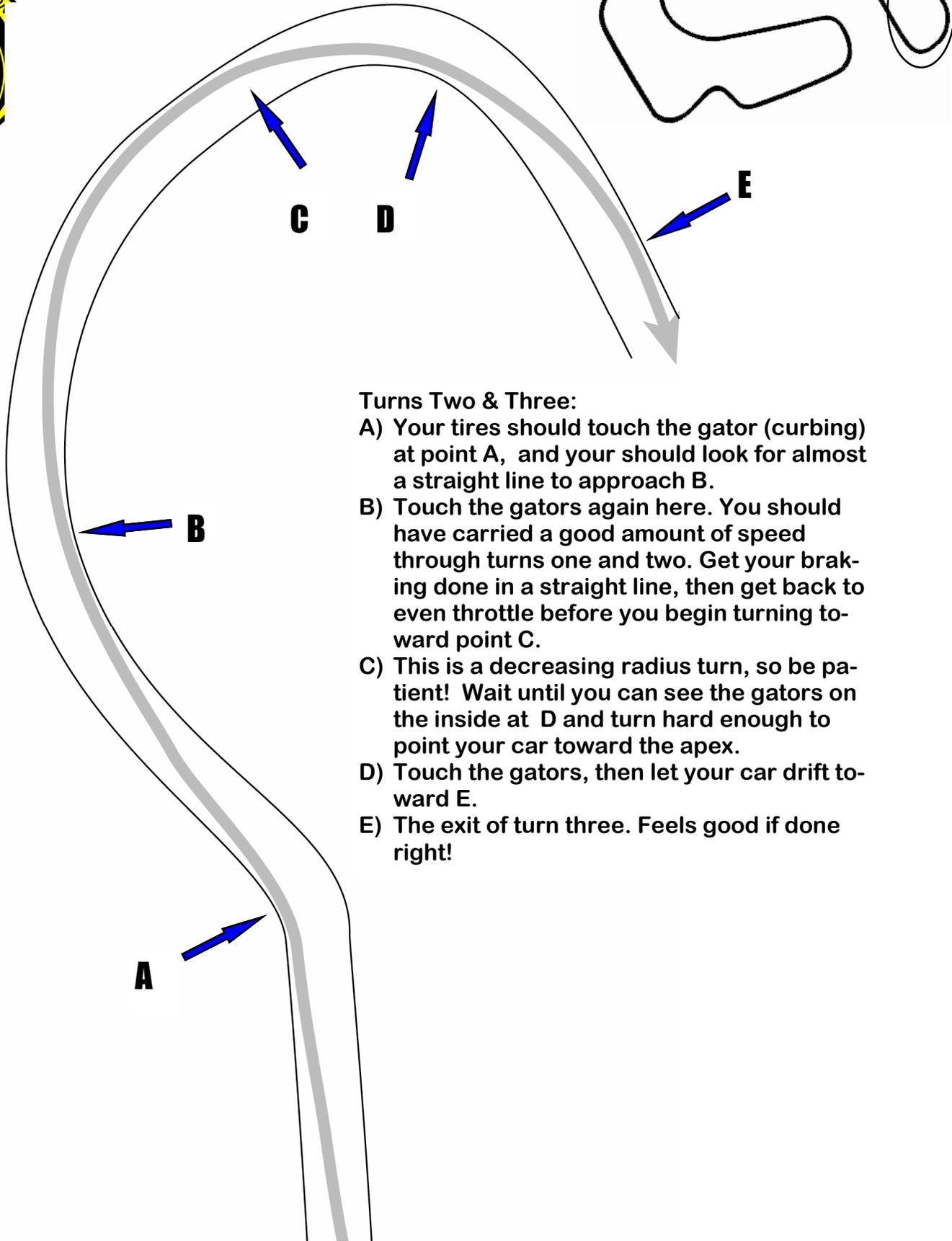
Turn One:

- A) The approach to turn one is from the left. Keep your wheels at least one foot from the pavement edge to allow a margin of error. Begin to squeeze the brakes between the 5 and 3 marker on the track, depending on your car. Progressively apply the brakes harder as you near the turn-in point at 'C'.
- B) Downshift to 3rd gear, with heel-and-toe approach if you have mastered this technique. Be nimble, the turn-in is quickly approaching!
- C) This is the turn-in point, perhaps the most important aspect of a corner. Wait until you can see the late apex visually, and look *through* the corner to the exit. This will tell you when to turn-in. *Where* you look is extremely important! Once your car is pointed toward the apex (point D) look farther ahead to the exit of the corner and beyond. You will find that your steering input will follow where your eyes look!
- D) The proper, late apex point. Once your car is pointed toward this point, you should begin to squeeze the throttle.
- E) The 'exit' of the corner. You will begin to move from the left side of the track back toward the middle in order to set up for Turn Two.

Great Plains Region Porsche Club of America



Turns Two & Three



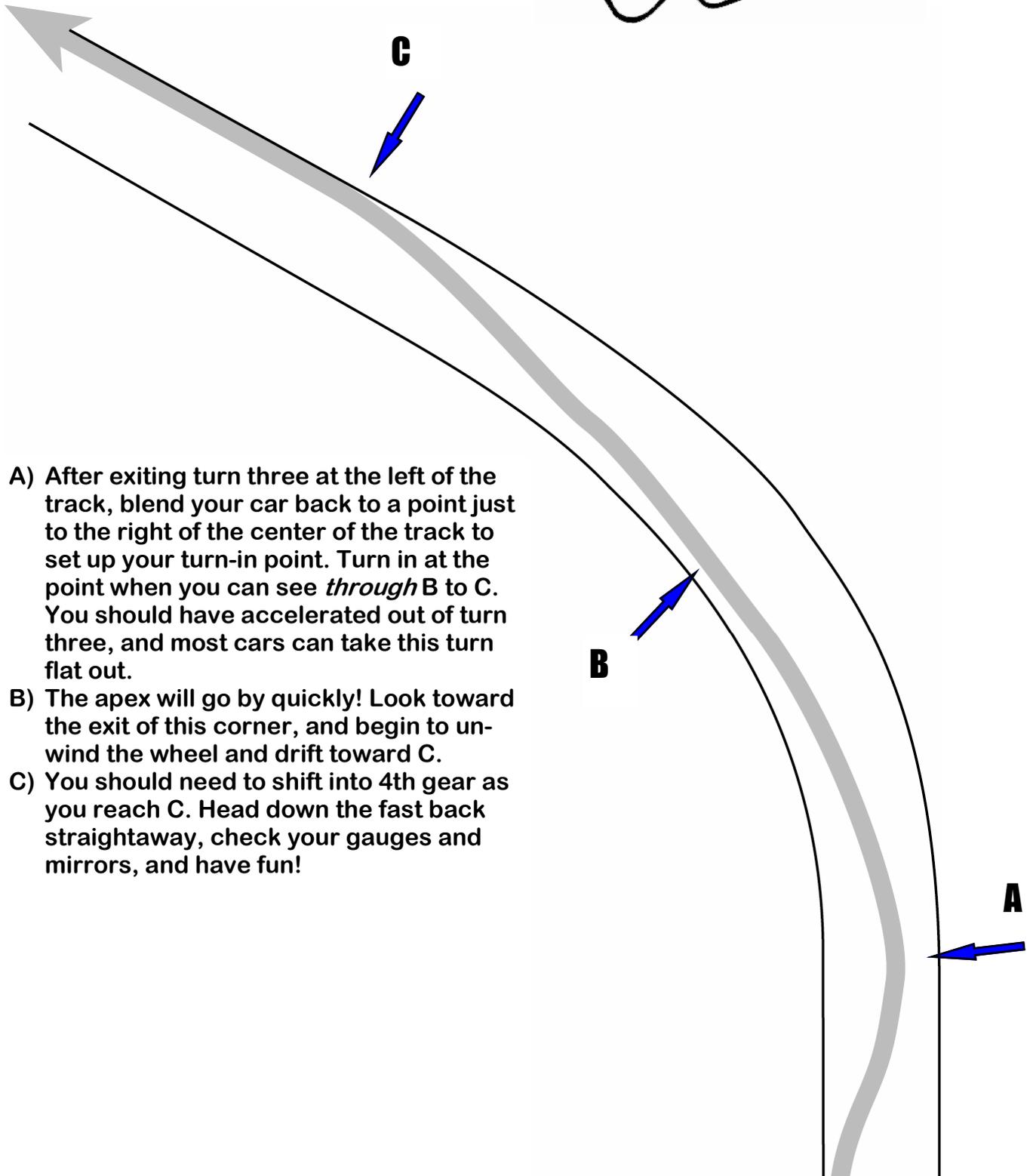
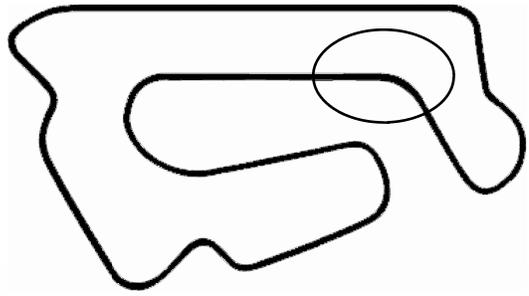
Turns Two & Three:

- A) Your tires should touch the gator (curbing) at point A, and you should look for almost a straight line to approach B.
- B) Touch the gators again here. You should have carried a good amount of speed through turns one and two. Get your braking done in a straight line, then get back to even throttle before you begin turning toward point C.
- C) This is a decreasing radius turn, so be patient! Wait until you can see the gators on the inside at D and turn hard enough to point your car toward the apex.
- D) Touch the gators, then let your car drift toward E.
- E) The exit of turn three. Feels good if done right!

Great Plains Region Porsche Club of America



Turn Four



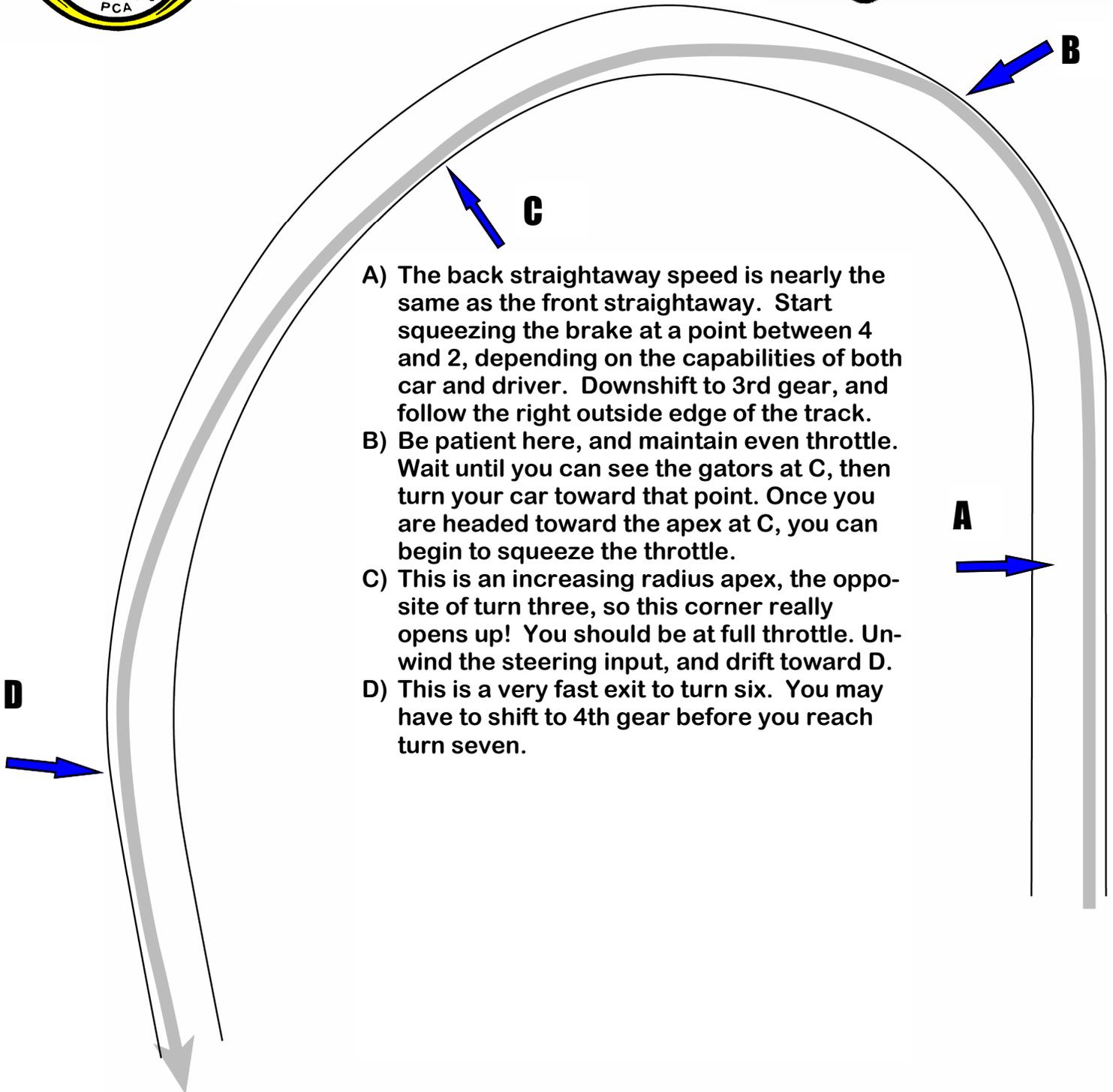
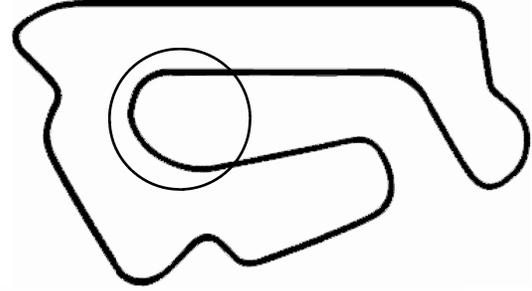
- A) After exiting turn three at the left of the track, blend your car back to a point just to the right of the center of the track to set up your turn-in point. Turn in at the point when you can see *through* B to C. You should have accelerated out of turn three, and most cars can take this turn flat out.
- B) The apex will go by quickly! Look toward the exit of this corner, and begin to unwind the wheel and drift toward C.
- C) You should need to shift into 4th gear as you reach C. Head down the fast back straightaway, check your gauges and mirrors, and have fun!

Great Plains Region Porsche Club of America

<http://gpl.pca.org>



Turns Five & Six



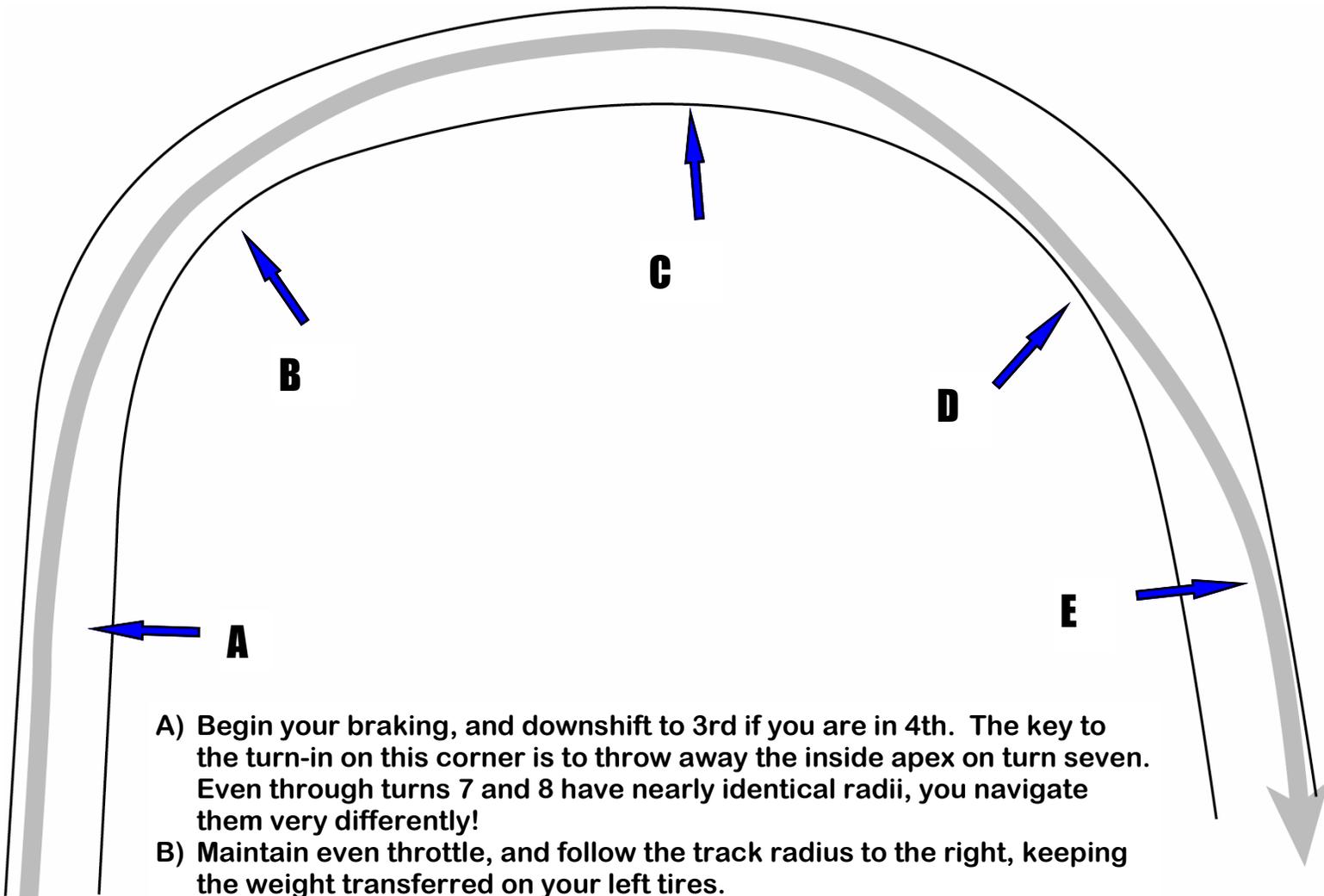
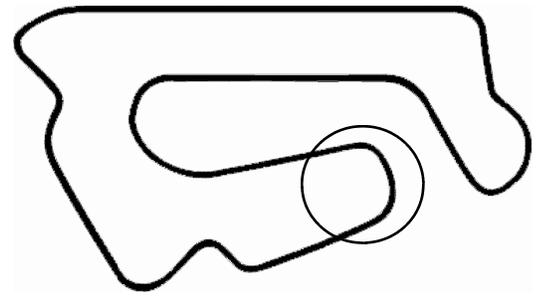
- A) The back straightaway speed is nearly the same as the front straightaway. Start squeezing the brake at a point between 4 and 2, depending on the capabilities of both car and driver. Downshift to 3rd gear, and follow the right outside edge of the track.
- B) Be patient here, and maintain even throttle. Wait until you can see the gators at C, then turn your car toward that point. Once you are headed toward the apex at C, you can begin to squeeze the throttle.
- C) This is an increasing radius apex, the opposite of turn three, so this corner really opens up! You should be at full throttle. Unwind the steering input, and drift toward D.
- D) This is a very fast exit to turn six. You may have to shift to 4th gear before you reach turn seven.

Great Plains Region Porsche Club of America

<http://gpl.pca.org>



Turns 7 and 8, "The Twins"



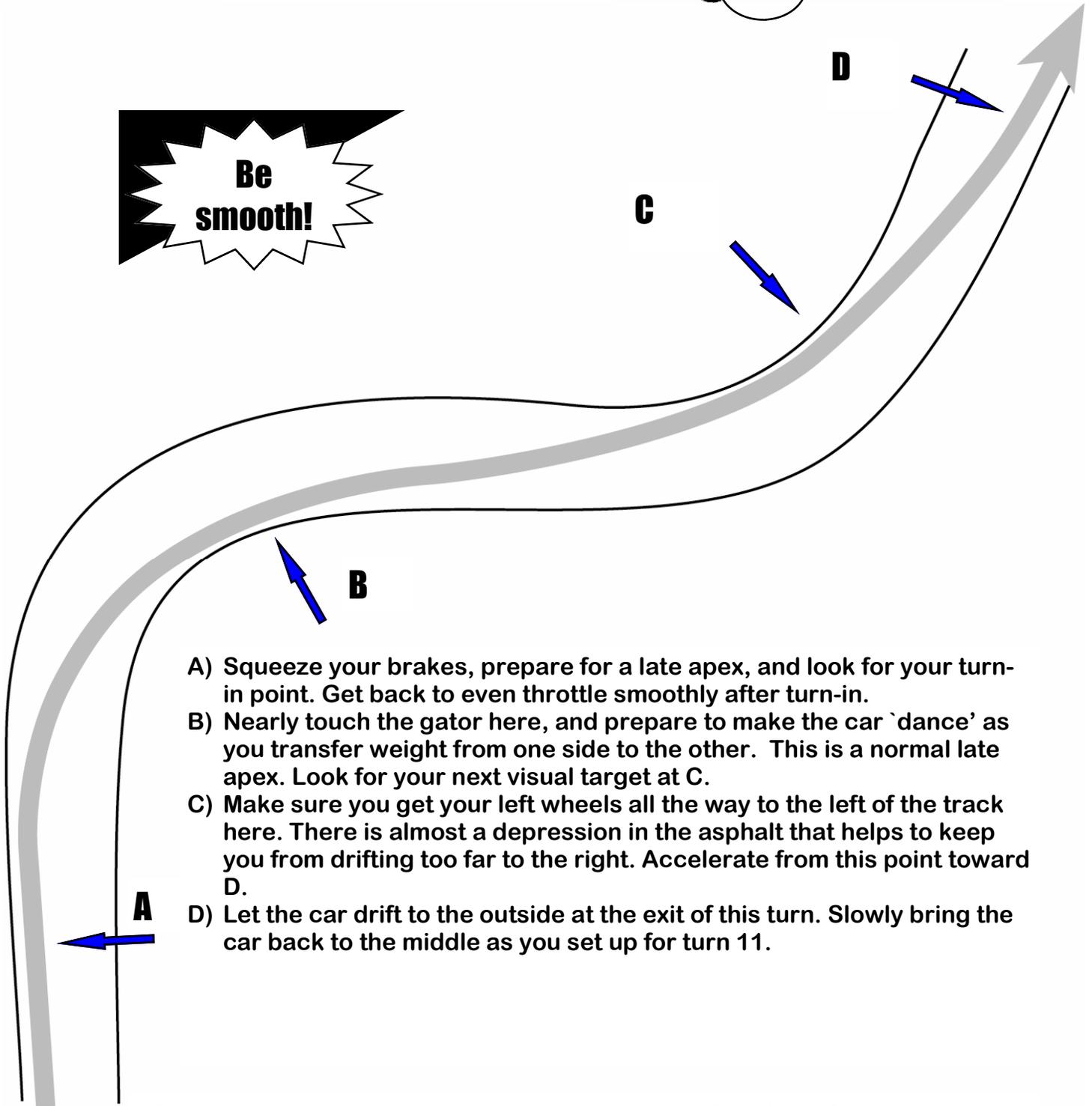
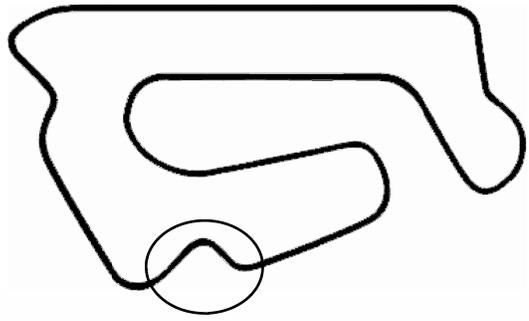
- A) Begin your braking, and downshift to 3rd if you are in 4th. The key to the turn-in on this corner is to throw away the inside apex on turn seven. Even though turns 7 and 8 have nearly identical radii, you navigate them very differently!
- B) Maintain even throttle, and follow the track radius to the right, keeping the weight transferred on your left tires.
- C) Wait until you can see the gators at D before turning in. Once you reach turn-in, begin to squeeze the throttle.
- D) Look through the corner toward the exit. Begin to unwind the steering input and drift toward E. You should be at full throttle.
- E) Exit the corner to the far left, and leave the car in 3rd. In fact, you will remain in 3rd gear until you reach the front straightaway, so ignore the transmission and concentrate on your line!

Great Plains Region Porsche Club of America

<http://gpl.pca.org>



Turns 9 & 10



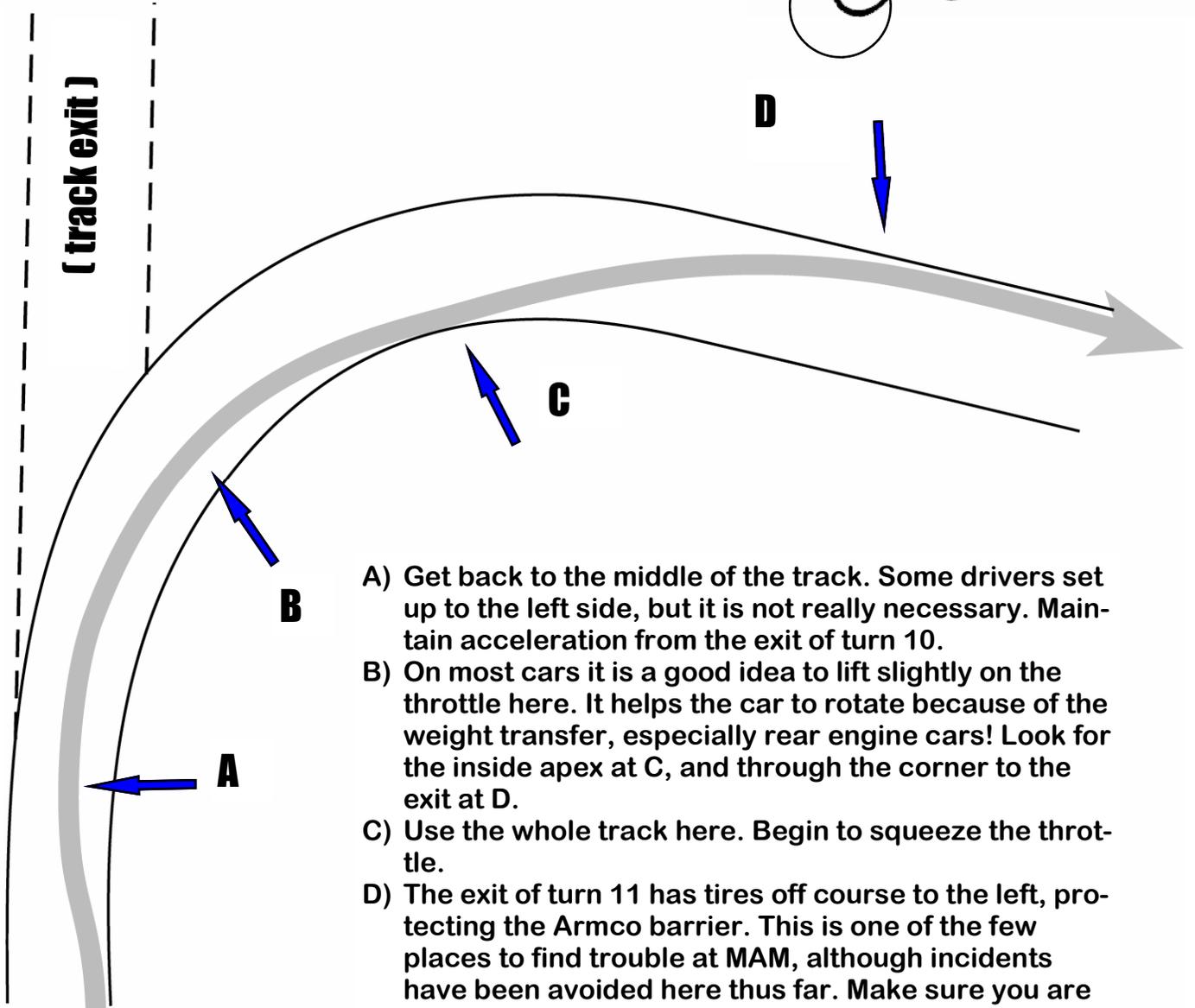
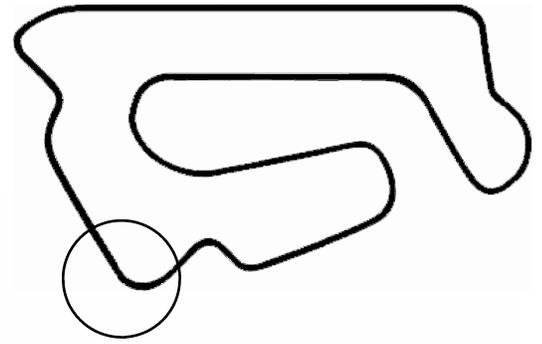
- A) Squeeze your brakes, prepare for a late apex, and look for your turn-in point. Get back to even throttle smoothly after turn-in.
- B) Nearly touch the gator here, and prepare to make the car `dance' as you transfer weight from one side to the other. This is a normal late apex. Look for your next visual target at C.
- C) Make sure you get your left wheels all the way to the left of the track here. There is almost a depression in the asphalt that helps to keep you from drifting too far to the right. Accelerate from this point toward D.
- D) Let the car drift to the outside at the exit of this turn. Slowly bring the car back to the middle as you set up for turn 11.

Great Plains Region Porsche Club of America

<http://gpl.pca.org>



Turn 11



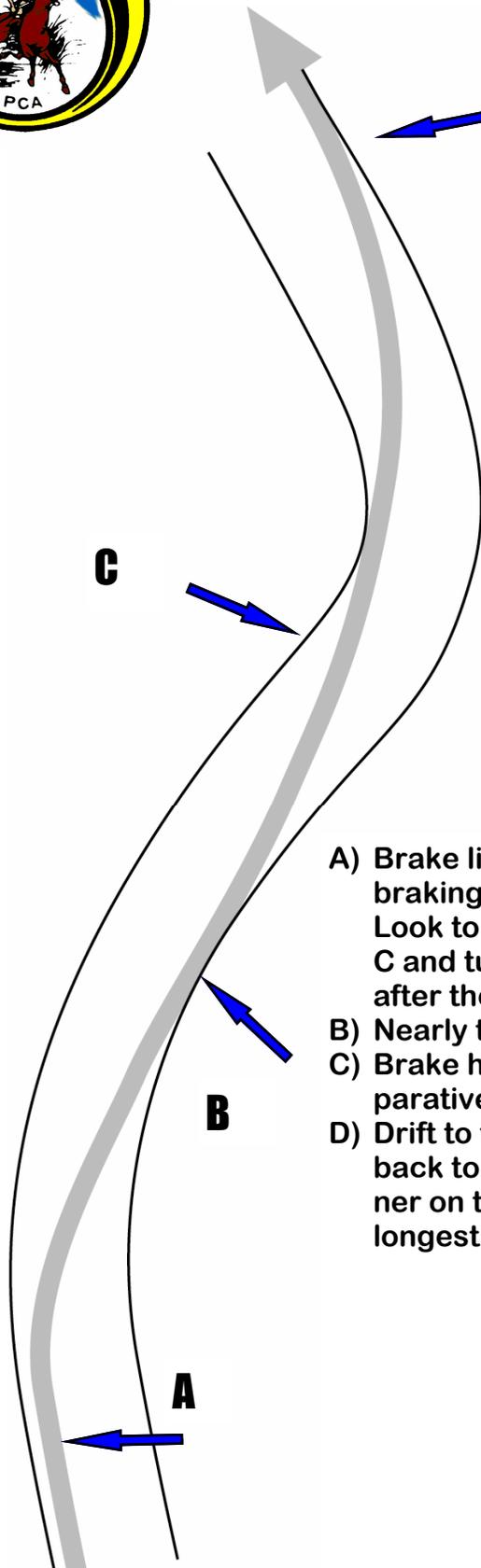
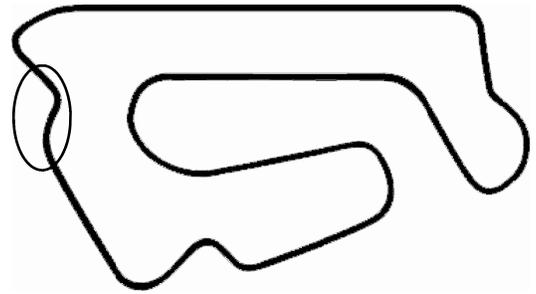
- A) Get back to the middle of the track. Some drivers set up to the left side, but it is not really necessary. Maintain acceleration from the exit of turn 10.
- B) On most cars it is a good idea to lift slightly on the throttle here. It helps the car to rotate because of the weight transfer, especially rear engine cars! Look for the inside apex at C, and through the corner to the exit at D.
- C) Use the whole track here. Begin to squeeze the throttle.
- D) The exit of turn 11 has tires off course to the left, protecting the Armco barrier. This is one of the few places to find trouble at MAM, although incidents have been avoided here thus far. Make sure you are at full throttle; despite the hazard this corner is pretty forgiving.

Great Plains Region Porsche Club of America

<http://gpl.pca.org>



Turns 12 & 13



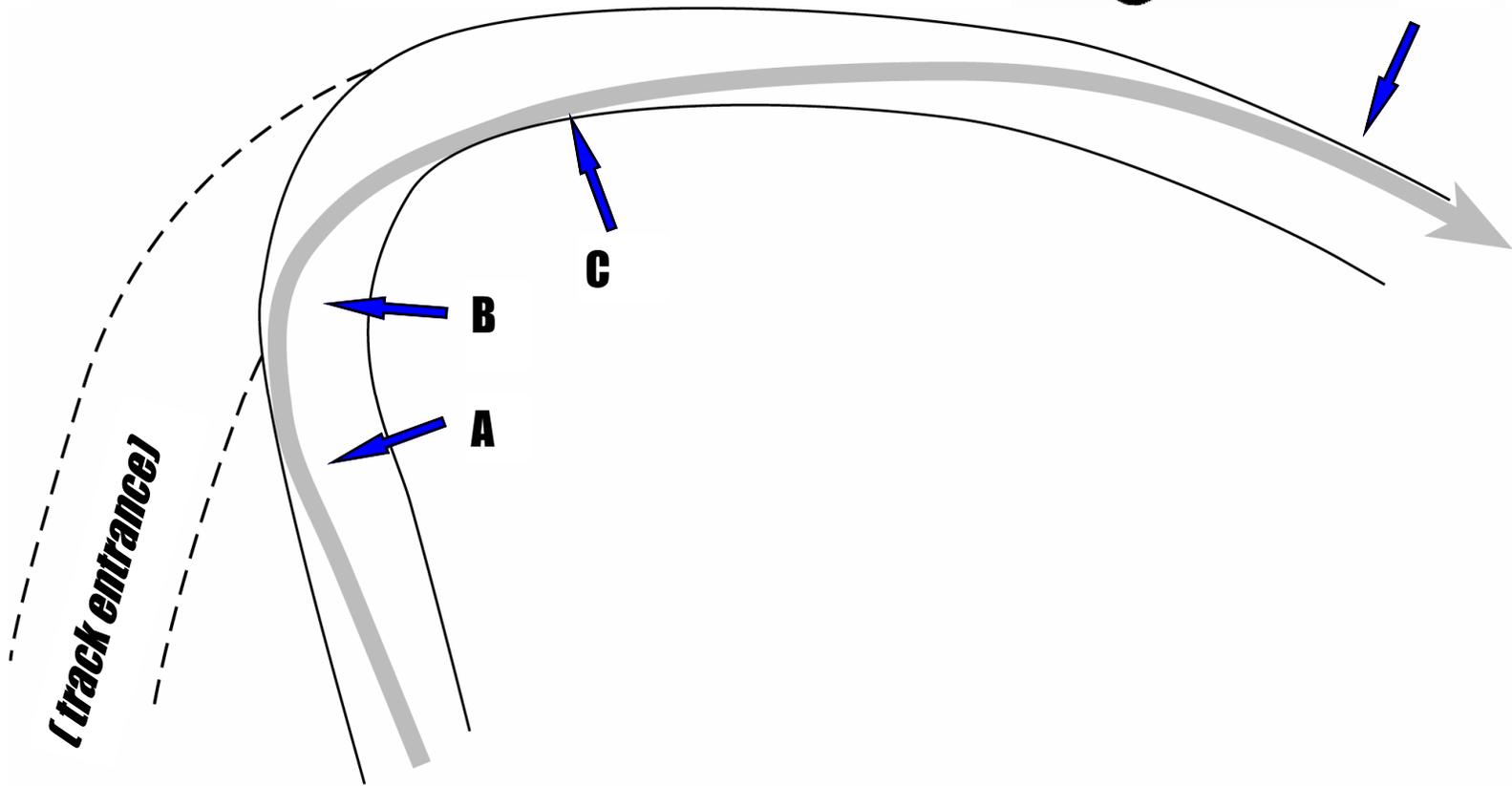
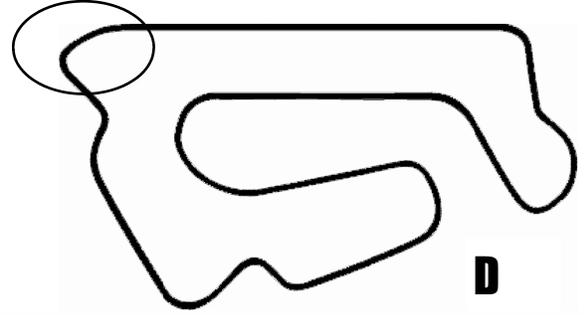
- A) Brake lightly before turn-in; save the heavier braking for C. This helps to maintain momentum! Look to connect-the-dots between points B and C and turn smoothly, once again at even throttle after the light braking.
- B) Nearly touch the gators, and be smooth!
- C) Brake heavier here, in order to make the comparatively sharper left hand turn.
- D) Drift to the outside, and then be prepared to get back to the left to set up the highest priority corner on the track. (the one that leads into the longest straightaway!)

Great Plains Region Porsche Club of America

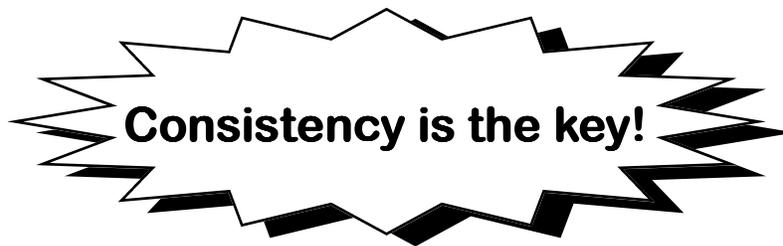
<http://gpl.pca.org>



Turns 14 & 15



- A) Squeeze the brakes lightly and wait patiently for your turn-in point.
- B) Look ahead for the gator at C and turn hard! Begin to squeeze the throttle.
- C) It is OK to actually run up on the gators with your tires here. It can actually help to transfer more weight onto your left tires. You should be a full throttle here.
- D) You will drift all the way to the left, nearly touching the dirt at the exit of this turn. Full steam ahead! You have a long straightaway in front of you. Check your mirrors, and be prepared to shift into 4th gear near the start/finish line.



Great Plains Region Porsche Club of America



Important Points for Novice Drivers

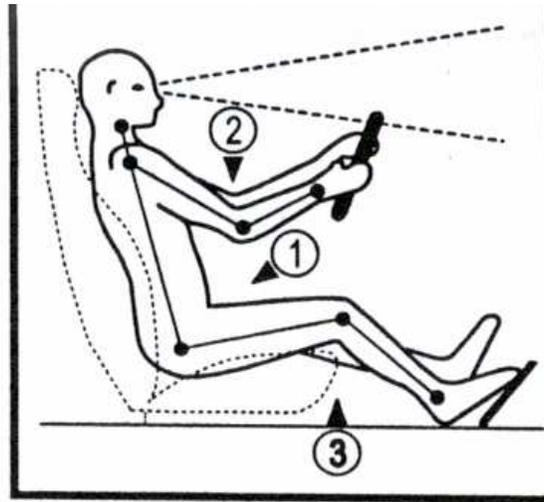
- 1.) Be safe and drive within *your* limits. **Start slow and grow.**
- 2.) Relax, listen and concentrate — be **smooth** and consistent.
- 3.) Adjust your seat for good driver position.
- 4.) Develop an accurate mental image of the track , one corner at a time. Drive in your mind, create a mental slide 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 feedback you received in each turn.

Great Plains Region Porsche Club of America

<http://gpl.pca.org>



Proper Seating Position

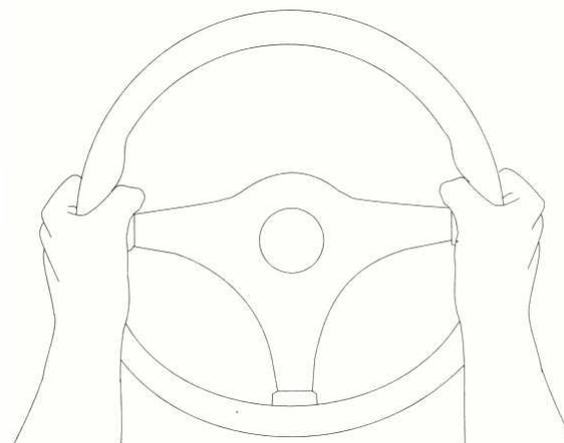


1. Do not sit on the seat, ***sit in it!*** Push your rump and the small of your back firmly into the seat by pressing against the “dead pedal” with your left foot. This procedure will anchor the seating position and allow freedom to turn the steering wheel instead of holding on to it to stay in your 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*.

Great Plains Region Porsche Club of America

<http://gpl.pca.org>



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.

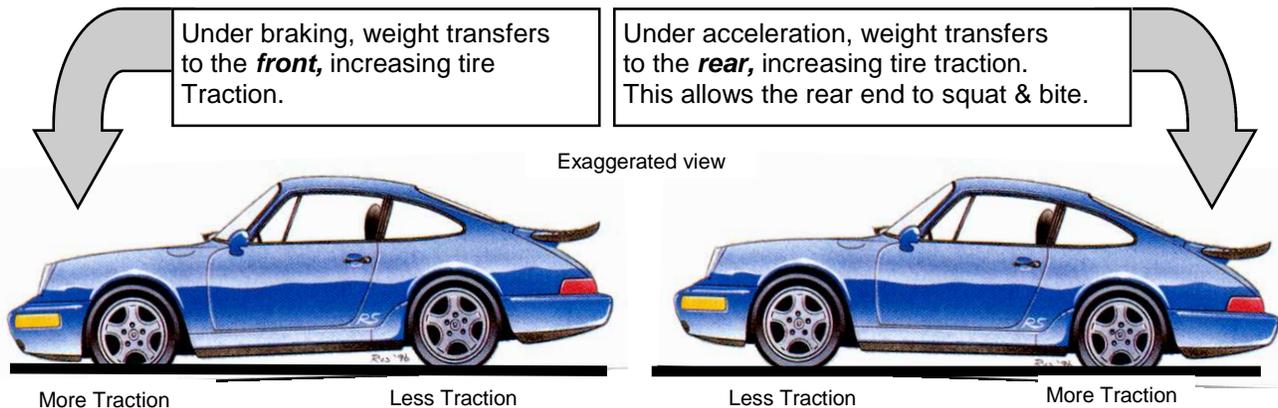
Great Plains Region Porsche Club of America

<http://gpl.pca.org>



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.



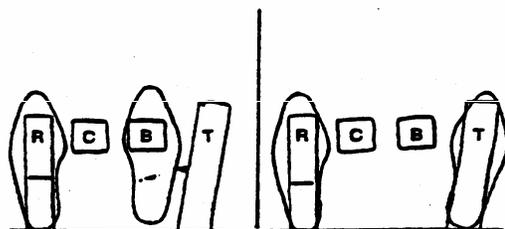
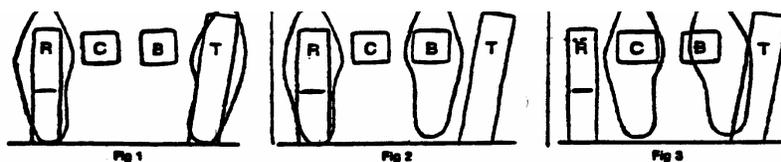
What is important to understand is that when weight is transferred to one set of tires, weight is being removed from the other set, **reducing its traction**. This condition either creates reduced steering control on the front or the potential for spinning on the rear. The same action occurs side to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

Heel & Toe Downshifting

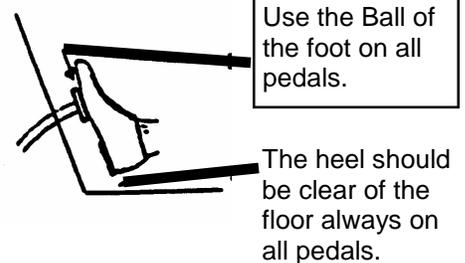
This is a technique of operating the brakes and the gas pedal simultaneously with the right foot **while** using the clutch with the left foot. With automatic transmissions this does not apply.

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.*



R - Foot Rest
C - Clutch
B - Brake
T - Throttle



Great Plains Region Porsche Club of America

<http://gpl.pca.org>

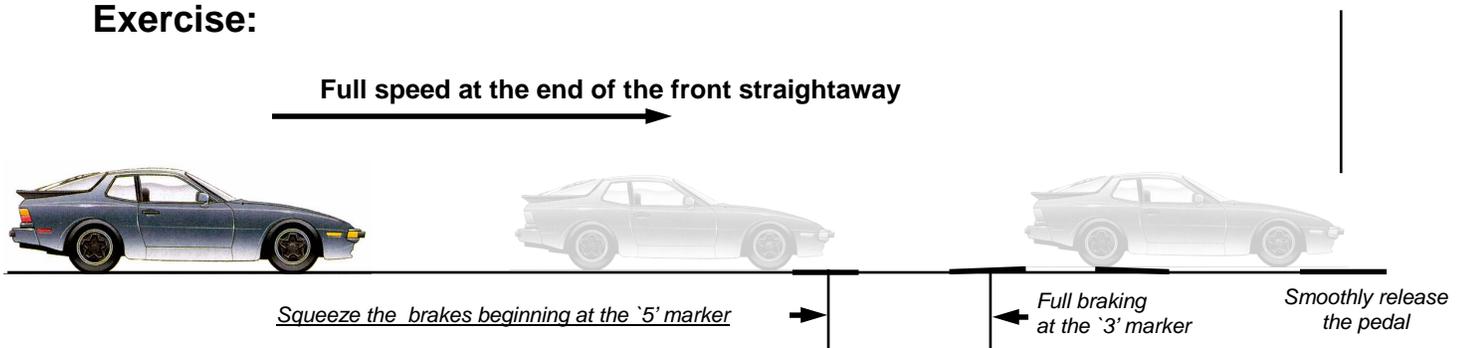


Threshold Braking Exercise

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.

Great Plains Region Porsche Club of America

<http://gpl.pca.org>



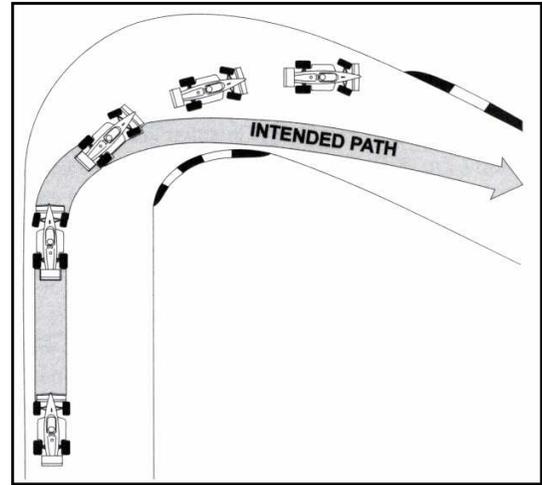
Understeer / Oversteer

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.



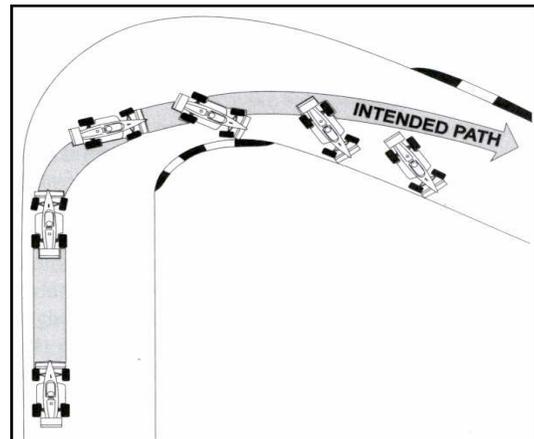
An Understeering car does not steer or turn, as much as you want along its intended path.

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.

Great Plains Region Porsche Club of America

<http://gpl.pca.org>



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

Great Plains Region Porsche Club of America

<http://gpl.pca.org>



A Hot Lap of Raceway Park of The Midlands

by **Sandy Steckman**

Mid-America Motorplex (MAM) is a new facility, constructed in 2002. It is a very safe facility, with nearly no walls or Armco barriers to penalize you for a poorly executed corner. In fact, after the first year of operation, very few cars had been scratched, 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. MAM 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, MAM 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 fifteen, you should be in excess of 100 MPH, having shifted from 3rd to 4th at just about the start/finish line in front of the timing tower. As you approach turn one, you should set your car up on the left side of the track, and begin to squeeze the brakes at about the 3 marker. (the 5-4-3-2-1 markers are set a little farther away from each other at this track, and 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. A quick downshift to 3rd gear will be required just before your turn-in, and 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 where you want your car to be for turn two.

Turn Two

Some drivers like to set up farther to the right as they head in to turn two, but this actually gets you out of position for turn three, and causes you to slow more. The fast line through turn two requires you to set your car up near the middle of the track. You are still in third gear, and you can accelerate pretty hard by making this into a short chute, thus straightening out the corner. Get your braking done in a straight line, and prepare for the most challenging and most important corner on the track, turn three!

Turn Three

To set up for turn three is disconcerting to most folks. You have carried a good deal of speed and momentum from turn two, and you are braking in a straight line, with your car heading at an angle that will soon run you out on to the dirt. At this point, you need to look to your far right, almost out the passenger window for your turn-in point. Turn three is a decreasing radius corner, and it requires a great deal of patience for a good late apex. Since it leads to the back straightaway, it is important to launch well, getting on the throttle as soon as possible. If you apex early, you need to stay off the throttle in order to gather up your car at the exit of the turn. No downshift is required; you are still in 3rd gear since turn one, so just brake in a straight line, look for your turn-in point for a late apex, and get on the throttle as soon as possible.

Turn Four

At the exit of three, your car will be on the gators on the far left of the track. To prepare for turn four, you will want to get back toward the right side of the track prior to your turn in point. Turn four is a 56 degree corner, so it is much less than a right-angle. As a result, turn four can be taken flat-out in most cars. You will probably need to shift to 4th gear at the exit of turn four, leading to the back straightaway. You will once again reach speeds of over 100 MPH as you reach the braking markers leading up to turn five.

Turns Five and Six

Begin to squeeze the brake pedal at the 3 marker, again depending on the type of car and setup that you have. Downshift to 3rd gear, and get back to even throttle. The trick to this corner is to keep your right wheels near the right edge of the track longer than you think you should. If you set this corner up by turning early, or by staying in the middle of the track, you will not be able to get back on the throttle nearly as soon. Part way through the turn, your wheels are near the right edge of the track, and as soon as you can see the gator on the left, turn in toward it. You should be able to be at full throttle as soon as your car is pointed toward this apex. Turn six is an increasing radius corner, so it really opens up! Unwind the steering wheel as you get through the corner, and let your car drift all the way to the gators on your right. You may have to shift to 4th gear as you head toward turn seven, and you will need to get your car back to the left edge of the track before you begin braking.

Great Plains Region Porsche Club of America

<http://gpl.pca.org>



Turns Seven and Eight

The `twins' are nearly identical 84 and 85 degree corners; however you navigate them very differently. After breaking in a straight line for turn seven, (downshift to 3rd gear if you had shifted to 4th) point your car toward a point halfway between seven and eight, on the left side of the track. By doing this, you are basically throwing away the inside apex on seven; your car should never get near this in order to set you up for a good launch from eight. Remember to be at even throttle! As you near the left edge of the track at this half-way point, move your eyes to look for the inside gator at turn eight. Once you see it, turn hard, so that your right wheels will nearly touch the gator, and get back heavy on the throttle. If you did this right, it will feel like you could have taken it much faster!

Turn Nine

As in most corners, the trick here is to late apex, which will help to set your car up on the right side of the track for turn ten. With this late apex, you can get on the brakes fairly late. Remain in 3rd gear all the way to the start/finish line after turn fifteen.

Turn Ten

Turn ten is a left-hander, and since it is really close to the right-handed turn nine, you will feel the weight transfer back and forth pretty quickly at this point of the track. If you anticipate this, and get the line right, it doesn't upset the car's balance too much. The apex of ten has a kind of a low spot in the asphalt, and this seems to help you to `hook' your left wheels which helps the car turn. Point the car toward the middle of the track heading into turn eleven.

Turn Eleven

After exiting ten, you have set up the car near the middle of the track. Many drivers will set up to the left, but this means that you needed to take ten much slower in order to do this, and you will find it is not really necessary. A lift on the throttle helps to allow the car to rotate once you reach the turn in point. This is a fun corner, and it sets you up for a short straight leading past the grandstands.

Turn Twelve

Set your car up on the left for this right hander. Only light braking is required before turn-in, and you can take this 53 degree corner fairly fast. The trick is to take twelve with little braking, then brake heavier in a straight line just before the left hander at thirteen. Keep your car to the left side of the track heading into thirteen.

Turn Thirteen

The distance between this corner and the all-important number fourteen is so short, that this corner is almost a throw-away. Maintain as much speed as you can entering into fourteen, and set your car up on the left side of the track.

Turns Fourteen and Fifteen

Since this turn (more like one turn than two) leads onto the long front straightaway, it is perhaps the highest priority corner on the track. Some drivers like to downshift to second gear for this corner, and others remain in 3rd. Once you have set you car up on the left, turn the wheel harder than you think you have to, and put your right wheels on the gators on the inside if necessary. You will find that they don't upset the balance of the car much at this speed. If you have hit the apex just right, you will exit this corner just at the left edge of the track, headed down the main straight.

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

Great Plains Region Porsche Club of America

<http://gpl.pca.org>

Notes

** Thanks for attending our event **