



NNJR Drivers Manual for new DE Drivers

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Preparing for your first event

More than two months before:

- Put the registration open date on your calendar. NNJR DE's open 8 weeks before the event and it is to your advantage to register on the first day.
- Create your account at www.motorsportreg.com. You will need it to register.
- Read the sections below on Helmet, Clothing and Shoes and Your Porsche. This way you will have plenty of time to buy or borrow anything needed and to make sure your car is ready.

Two months before:

- Register! Go to <https://nnjr-pca.motorsportreg.com/> and click on your event.
- Look for the date of the pre-event tech session ("tech") and put it on your calendar or plan to have your car tech'd elsewhere ~2 weeks before the event.
- Make hotel reservations, if you haven't already.
- Start reading the sections below starting with "What to Bring to the Track" and "What to Expect at your First Event."

Two weeks before:

- Get your car tech'd.
- Fix anything that fails tech (cars in good street worthy condition don't fail unless brake pads and/or tires are worn).
- Read the section below on "Driving Position" and adjust seating and mirrors accordingly.
- Continue reading, or reread, the sections below, starting with "Driving Terms/Terminology," "DE Event Rules" and "Driving on the Track."

Last week before:

- Get some rest! Several nights of solid sleep are much better than arriving at the track tired.
- Look for the Track Pack in your email and read through ALL of it. Print as much of it as you think you will need at the track. At a minimum, the Schedule and Entrant List.
 - Be sure to print the track map. Even better, also print the one here: <https://nnjr-pca.com/drivers-ed-2/>. It has more space for your notes.
 - Most of us also like to have the Track Pack (esp. the schedule) on our phone.
- The Track Pack will show your assigned car number and Run Group.
 - NNJR assigns each driver to one of six color-coded "Run Groups": Green, Yellow, Blue, White, Black and Red. Assignments are based on skill and experience.
 - Green, Yellow and Blue have an instructor assigned for the event. Green is for drivers with little or no DE experience. Yellow and Blue have more, but limited, DE experience. White is a solo group for intermediate drivers. Black and Red Groups have Advanced Drivers and Instructors.
 - See <https://nnjr-pca.com/wp-content/uploads/2018/03/NNJR-Run-group-Advancement-Criteria.pdf> for more details.
- The Track Pack references the Classroom topic for this event and has a link to the material on the NNJR website: read that material and consider printing it to bring to the track.
- Look for an email from your Instructor welcoming you to the event and suggesting where to meet at the track.



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- Organize and pack the materials you want to take with you to the track: any tools, chair, water (can't have too much, especially if it is warm), umbrella, rain gear, tape for numbers, etc. (see "What to Bring to the Track" below).
 - Consider that you will be removing everything loose from your car (explained in the Track Pack). You may want a tarp and/or a box to place them in. Leave anything you won't need at home.
 - If you have removable wheel locks, remove and leave at home. If you have wheel lugs that need a special key, be sure to pack it.
 - Remember: NNJR DE events are held rain or shine. It may be cold, hot, wet or dry!
- Check tire pressures when cold (i.e. first thing in the morning, before the car has moved). They should generally be at the factory settings. If you have a torque wrench, check the wheel lug torque.
- Reread "What to Expect at your First Event" below.



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Clothing and Shoes

How you dress is important for both safety and comfort. Long sleeves and long pants made of cotton (or other natural fibers) are required. Jeans work fine. So do long sleeved T-shirts or polo shirts. Make sure you can move your arms and legs easily. If it is cold, take off your heavy coat before you drive (you can always turn on the heater). Shoes are very important. Regular sneakers (especially ones that are well worn) work well for many drivers, as do “boat” type shoes. They need to be able to slide off the brake pedal without “catching”, but not be so slippery that you have to hold them onto the brake. Leather-soled shoes are generally not recommended. No shoe with aggressive soles will work well (e.g. hiking boots, many running shoes and walking shoes). After you drive a few events, you may want to consider driving shoes.





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Helmet

A helmet is the one required element that most drivers haven't experienced. Unless you are an experienced motorcyclist, you probably have never felt the claustrophobia of a modern helmet. Most drivers find that it takes some time to get used to the helmet. And the first run of your first event won't do it! You are likely to feel that you can't see and that your peripheral vision is particularly constrained. Add the pressure on your head from the padding, and most drivers feel uncomfortable. You can prepare (somewhat) by wearing the helmet at home (though we don't recommend driving in it unless you like to be stared at). Some people have been known to watch their favorite TV program with the helmet on! One last point: if you wear glasses, or sunglasses, take them with you when you try on helmets. The eyeports on some helmets may not fit your particular glasses.

In fact, try on different models and brands of helmets to find the one that fits your head and glasses the best. Do NOT try to buy a helmet online: go to a store like Stable Energies and try on several. It often takes many tries to find one that fits properly.





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Your Porsche

This section does not try to mention all of the things that you could do to prepare your Porsche for the track, because that list is almost endless. Fortunately the basics are easy:

- pass tech inspection,
- check tire pressures,
- gas (fill up the tank just before you arrive at the track),
- car numbers, and
- remove any/all loose items from the car.

The event pre-tech is scheduled approximately 2 weeks ahead. Any Porsche in solid street-driven condition should pass this tech IF the tires and brakes are not worn out.

Tire pressures should be checked at home and again each morning at the track; but they need to be checked before the car moves for the first time that day. At the track, this means at the hotel. Set them to the factory recommended settings to start.

Your car number will be assigned in the Track Pack. You can use blue painters tape or you can purchase vinyl or magnetic numbers. Remember: numbers are required on both sides plus front and back.

You will remove all loose items at the track and leave them in the paddock.

Be sure that all of those items are finished and out of your mind before you head onto the track! If any of these items are nagging at the back of your mind, it will affect your driving. Similarly, if the car is making an unusual noise, or something doesn't seem quite right, ask someone to help you investigate before it is time to go on the track!

Your mind should be free of distractions and ready to concentrate on driving. Make sure your Porsche is ready at least 15 minutes before your run. Use those 15 minutes to relax, go to the bathroom, get a drink and make sure your helmet is in the car!



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What to Bring to the Track

What you must bring:

- Valid driver's license
- Completed, stamped and signed tech sheet
- Track Pack
- Helmet -- Snell 2000-rated or later model (unless arrangements made to use Club loaner): See "Helmet" section above. Snell 2015 SA highly recommended if purchasing a new one.
- Clothing appropriate for the track (see "Clothing and Shoes" above):
 - Natural fiber garments such as cotton or wool (i.e., no synthetics)
 - Shirt(s), sweater(s), jacket(s), etc.
 - Long pants
 - Rubber soled shoes (see Section II)

What you'll want to bring (depending on weather and preference):

- Tire pressure gauge
- Magnetic or stick-on numbers (blue painters tape also works)
- Window cleaner and paper towels
- Tools
 - Tool box
 - Lug nut socket
 - Torque wrench
- Parts and supplies
 - Engine oil
 - Brake fluid
 - Brake pads
- Clothing (depending on weather)
 - Rain gear, umbrella
 - Extra jacket, coat or sweater
 - Warm gloves
 - Hat
 - Sunglasses
- Other items
 - (Plenty of) Water or other fluids to prevent de-hydration
 - Cooler for perishable food items
 - Weatherproof storage (ground cloth, tarp, plastic container, etc.) for your gear
 - Sunblock
 - Bug spray
 - Snacks and/or lunch (tracks do have food available; details in the Track Pack)
 - Camera



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What to Expect at Your First Event

Goals for your first event should be

- Safely learn to drive on the track
- Meet new people that share your interests and passion
- Have fun!

You will hear a constant emphasis on “Safe, Serious, Fun.” This NNJR motto has made our DE program large and successful into its 50th year!

Here is how your first day will go:

- Arrive at the track early in the morning (6:30 AM is recommended; 7:00 AM at the very latest).
 - Be sure to fill your gas tank just before arriving. You will need a full tank. Not every track has gas available. Only Lightning and Thunderbolt have gas at market prices; other tracks are higher.
- Sign the track waiver as you enter the facility.
- Find a place to park in the paddock: don't be afraid to ask any one you see for directions. (But don't park right in front of a trailer).
 - Note that the paddock is very busy with constant traffic including bikes, pedestrians and kids. Speeds are limited to 5 mph.
- Empty your car (details in the Track Pack), and proceed to Tech with your Tech Form from the pre-event Tech.
 - This “trackside tech” is not the same as the pre-event Tech. Here inspectors are primarily making sure that your car is empty, has the proper numbers in place and that wheels are torqued properly (be sure to bring your wheel lock key).
- Registration is normally adjacent to Tech. Be sure to register during or immediately after Tech.
 - You will get a Green wristband after you sign the PCA waiver. That wristband is required to enter the track.
- Note: at most events, you have the option to arrive the evening before (details in the Track Pack) and have Tech done then. This is optional but some drivers prefer to avoid the morning rush.
- Look for and meet your instructor, time permitting.
- At the time noted in the Schedule (in the Track Pack), all drivers must attend the Drivers Meeting. This meeting
 - Introduces event officials.
 - Reviews track conditions, passing zones, pit and paddock and other safety procedures
 - Notes any changes or additions to the schedule
 - Important note: this meeting does not cover much of the material in the Track Pack. All drivers are expected to have read and know the Track Pack.
- Immediately after the Drivers Meeting, all student drivers attend the Novice Meeting, usually in the track's classroom. At this meeting, the Track Chair and/or Chief Instructor will provide more detailed information on the day's instruction and give you a chance to ask questions. You will also get to meet other new-to-DE drivers.
 - For drivers new to DE, the day usually feels very rushed up to this point. But now is the time to take a deep breath and relax.
 - This meeting often includes the Trackside Classroom material referenced in the Track Pack. It may also include a “Turn by Turn” discussion of the track.



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- After the meeting, you will have time for a break before your first driving session. If you haven't met your instructor, you may be able to do so now. Do note that your instructor will be driving on track during Black or Red. He or she may also have a student in another group (e.g. Yellow or Blue).
 - If you haven't met your instructor ahead of time, drive to Staging at the time noted on the schedule (10 minutes before your first run). Your instructor will meet you in staging.
- For your first session on track, your instructor will drive the first 2 laps. This allows you to see the track, observe the correct line that your instructor is driving and feel what an appropriate pace is like.
 - If you can, pay attention to where the flag stations are (they will be holding a yellow flag for the first lap).
- After the first 2 laps, you will drive with your instructor in the right seat. Since helmets make talking difficult, your instructor will use a helmet-to-helmet communicator that makes normal conversation possible.
- For the remainder of this session and for 3 more, you will be driving on track! See "Driving on the Track" below for more information.



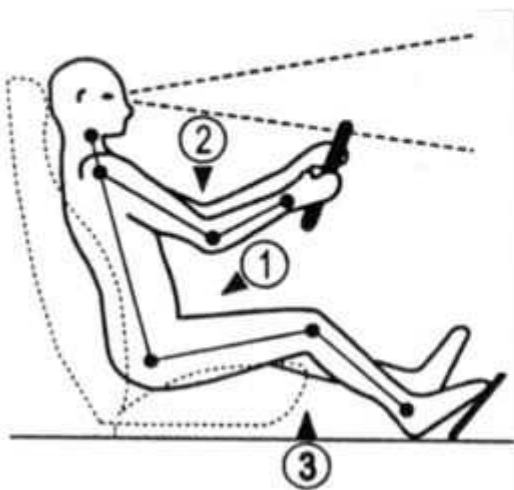
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Driving Position

Your position in the seat makes a big difference in your ability to control the car properly. Many drivers do not naturally sit in the proper position. The objective is to get you situated so that you have maximum support for cornering, easy control of gas, clutch and brake pedals, and complete ability to turn the steering wheel.

To get started, try the following (after hooking up your seatbelt, of course; and don't forget to put on your helmet!). First, adjust the seat cushion so that you are "in" it as much as possible (put your left foot on the dead pedal and push your butt and shoulders all the way into the seat). Make sure you are getting maximum use of the seat bolsters. Next, slide the seat so that you can push the clutch and the gas all the way to the floor with some bend still left in your knee (if your knee is completely straight, you are too far away). Then, adjust the seat back so that your wrists are on the top of the steering wheel with some bend still left in the elbows. Remember that your shoulders should be all the way back in the seat. You can test the arm distance by putting your hands at 3 and 9 o'clock (some people prefer 2 and 10 o'clock; most of us hook our thumbs over the spokes) and turning the wheel more than 90 degrees to the left and right-without pulling your shoulders away from the seatback. Your elbows should still have a little bend in them. This technique allows the driver to use their arm muscles on the steering wheel, not the wrists. The wheel should be pulled in the proper direction. This provides the maximum amount of control, and is the least tiring. Don't be surprised if you find yourself closer to the wheel than you expect: many drivers sit too far back.

Preparing to drive on the track:



Proper seating position



Proper hand placement



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Finally, after you are properly seated, adjust the mirrors so that you have maximum field of view. Note that most drivers do not have the outside mirrors adjusted to eliminate blind spots. To adjust them properly, as shown on the right below, take the following steps:

Rearview Mirror Adjustment

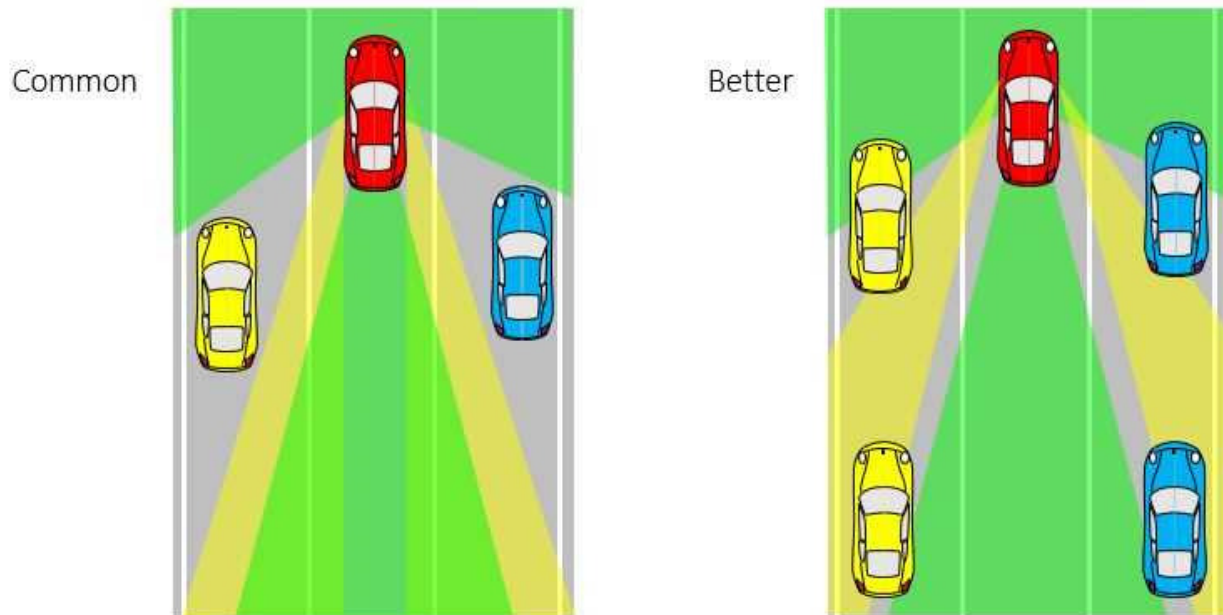
From your new seating position (as per above), adjust the rearview mirror so you can see the entire rear window.

Left Mirror Adjustment

From the proper seating position, rest your head against the driver's side window;
Adjust the left mirror until you can barely see the left rear back of your car.

Right Mirror Adjustment

From the proper seating position, lean to your right so your head is near the rearview mirror mount;
Adjust the right mirror until you can barely see the right rear back of your vehicle.



G. Plazer, "The Geometry of Automotive Rearview Mirrors—Why Blind Zones Exist and Strategies to Overcome Them," SAE Tech. Paper 950601 (1995).



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Driving Terms and Terminology

Driving on the track is very different than driving on the road. It's important to know the "new" vocabulary.

APEX: The area on the inside of a turn at which the car finishes the entry phase and begins the exit phase. The car must be as balanced as possible when it "clips" this point. * *See diagram below.*

BALANCE: The relative amount of weight -- or download -- at each wheel. Download changes -- front to back and side to side -- affect traction and handling as various forces are applied to the car (e.g., acceleration, deceleration, shifting, braking, inclines, variable road surfaces, etc.).

BLEND LINE: On most tracks, a line (often but not always painted on the track surface) behind which the driver must stay when entering the track; also when exiting the track.

CONE: A traffic pylon used to mark Reference Points on the track, typically Turn-In, Apex, and Track-Out. *See diagram below.*

CONTROL OR TOWER: The individual(s) in the Michelin Building controlling the event and to whom flaggers report.

FLAGS AND FLAG STATIONS: On track driving is always controlled by flaggers who communicate track conditions via colored flags. See Flagging Section.

FOUR-OFF (4-OFF): Four wheels off the edge of the track surface. This is sometimes referred to as an off-track excursion.

HEEL-AND-TOE: A down shifting technique used to match engine speed with transmission speeds, all while continuing to brake. The sequence is: brake; clutch in; "blip" the throttle with the right side of the right foot; shift to lower gear; clutch out. Brake pedal pressure should remain constant throughout this sequence. *

LIFT(ING): Letting off the gas pedal.

LATE APEX (line): The line used through most corners. Rather than the largest radius, the apex is past the geometric center to allow for acceleration onto the following straightaway. *See diagram below.*

LINE: The optimum path around the track. In corners, this path is usually the largest "late apex" arc that can be fit into the confines of the turn. The Line can vary with track conditions and the type of car being driven. * *See diagram below.*

NEUTRAL THROTTLE (also called Maintenance Throttle): After braking for a corner, just enough pressure on the gas pedal for the car to maintain speed without slowing. *See diagram below.*

NINE & THREE (9 & 3) O'CLOCK: The basic steering wheel grip, when visualizing the wheel as a clock dial, with the left hand at "9" and the right hand at "3".



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OVERSTEER: In cornering, conditions in which front tires have more traction than rears, causing the rear of the car to point to the outside and the nose to point to the inside. *

PIT IN: The section of the track where you exit into the pits. Preceded by giving the Pit In Signal.

PIT IN SIGNAL: A left hand fist raised as far as possible out the driver's window indicating the driver's intent to exit the track.

PIT OUT: The section of the pits that feed onto the track. Sometimes controlled by a track worker who can be referred to as Pit Out (or Pit Out Marshall).

POINTING (FLAG): The flag is held, partially unfurled, with one hand grasping the stick and the other hand stabilizing the flag surface. The flag is pointed at a specific car (e.g. Black Flag pit stop).

Reference Points (RP's): The general term applied to any point used by a driver as a reference: e.g. for braking, turn-in, etc. The most common are Turn In, Apex and Track Out (usually marked with cones).

ROLL: Movement (or tilt) of the car which changes the ride height on the left or right of the vehicle's centerline. *

RUN GROUPS: Six color-coded groupings used in the Driver's Ed program that separate drivers according to their skill and experience levels.

SQUEEZE (throttle/gas): Gently adding pressure to the gas pedal to accelerate the car. Smooth application of acceleration is needed to avoid upsetting the balance of the car. *See diagram below.*

SPIN: Condition where the car rotated direction beyond the point of driver control. Either on or off the track.

STAGING: The section of the paddock or pits where cars are lined up prior to going onto the track. Staging personnel check drivers to make sure seat belts are fastened, helmets buckled tightly and that each driver has the proper wristband.

STANDING (FLAG): The flag is held unfurled with one hand grasping the stick and the other hand holding the outer edge of the flag surface. It is kept high and stationary -- facing oncoming cars -- to maximize visibility.

START-FINISH: A line across the track at the Start-Finish Flag Station.

TRACK-OUT: The point past a turn, typically at the far outside edge, at which the car has completed the turning stage and all the dynamic forces acting on the car are in balance. * *See diagram below.*

TRACK SESSION: A period when the cars in a particular Run Group are out on the track.

TURN-IN: The point at the entrance to a turn at which the driver first turns the steering wheel to initiate the cornering sequence. * *See diagram below.*



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TWO-OFF (2-OFF): Two wheels off the edge of the track surface.

UNDERSTEER: In cornering, the condition in which the rear tires have more traction than the fronts, causing the fronts to slide across the road toward the outside edge rather than turning or pulling the car into the turn. *

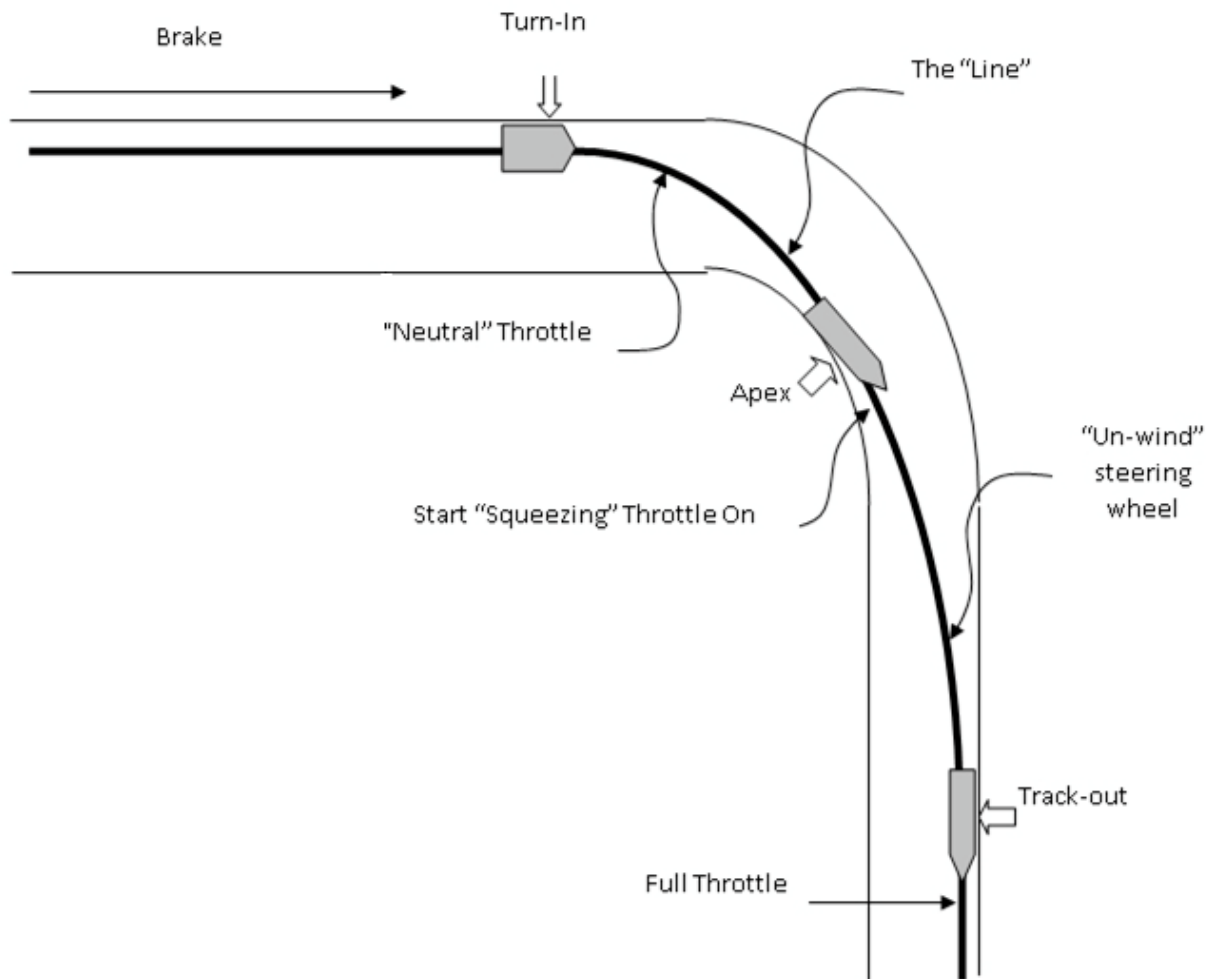
UN-WIND: Gently reducing steering input after the apex of a turn to allow the car to accelerate. *See diagram below.*

WAVING (FLAG): The flag is held by the stick, unfurled, and waved energetically in a figure eight pattern toward oncoming cars.

* Source: Skip Barber Driving School
Special thanks to Connecticut Valley PCA for their definitions.

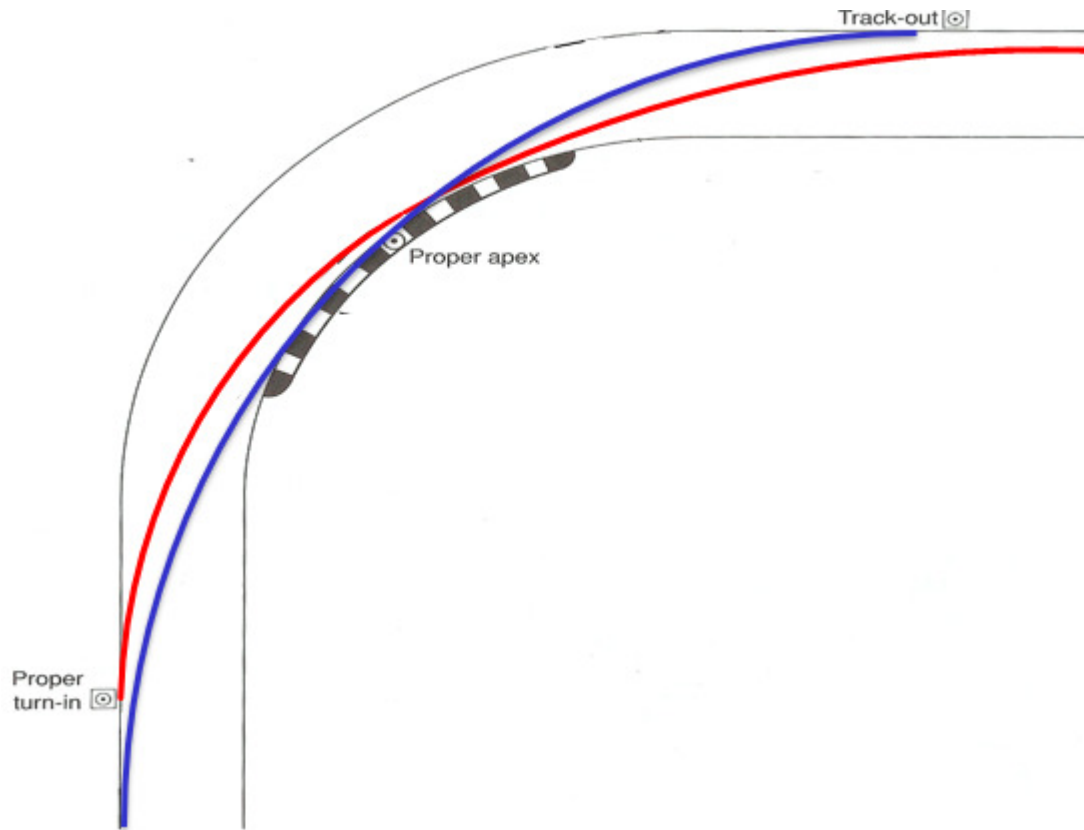


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Late Apex line vs. geometric line.



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Driving on the Track

Driving on the track is much more different than driving on the road than most new DE drivers expect.

Differences include:

- Using all of the road, typically described as “outside, inside, outside” for corners.
 - There is an optimum “line” for each corner (see “Line” below).
- Using all of the gas pedal: i.e. foot on the floor, sometimes for an extended time.
- Using all of the brake: in some brake zones, we want to slow the car as fast as possible, using the maximum braking the car is capable of.
 - Learning proper braking technique is essential to high performance driving. See “Braking” below.
- There is no oncoming traffic to worry about.
- To share the track safely, we communicate with other cars via pass signals.
 - See “Passing” below.

But this means

- We are dependent upon flags and flaggers to tell us about upcoming road and traffic conditions.
- Braking is not intended to stop the car; instead it is intended to slow to the appropriate entry speed for a corner.
- There are other cars on the track with us. Each of us on track has a shared responsibility to keep each other safe.

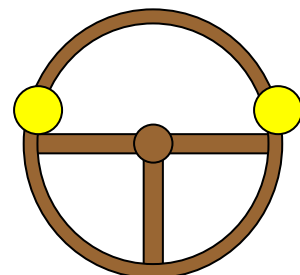
For your first few runs on track, these differences often add up to mental overload. This is normal and your Instructor is anticipating it. He or she will help you adapt, depending on your individual learning style(s). For example, most new drivers pick up the line quickly in several corners and only need to focus on the line for the few that remain (this is one reason that first time DE drivers are well advised to start at Lime Rock, Lightning or Thunderbolt, each of which has fewer corners than a track like Watkins Glen).

The on-track difference that surprises the most drivers is traffic: i.e. having cars ahead and behind. Passing and being passed are essential to driving safely and require a set of skills beyond driving the line. The “Passing” section below goes into more detail.

Being aware of everything going on around you on the track is referred to as “Situational Awareness.” This is something that is hard to teach but essential to learn. Among other skills, it includes looking far ahead, observing subtle changes in track surface, car noise, flags and flagger behavior, etc. and constant use of mirrors. To some extent, there is no substitute for “seat time”; the term used for cumulative on track experience. On the other hand, drivers who make it a habit to be observant will be safer on track than those who do not. To improve Situational Awareness, at certain tracks there may be “drills,” such as driving side-by-side around the track, designed to improve situational awareness.

For your first few session on the track, focus on these basics*:

- Hands at 9 & 3
 - Both hands on the wheel
- Eyes well in front of the car



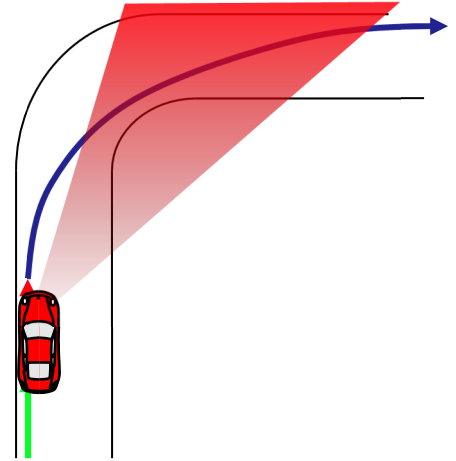


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- Look “through” the turns
- Smooth inputs to throttle, brake
 - apply brakes smoothly, deeply
 - roll on (“squeeze”) throttle gradually as you exit the turn
- Stay in 3rd or 4th gear or Drive

As a reminder: safety comes first. The primary person in charge of your safety is...you. Always pay attention to and obey flaggers and track workers. Listen to your Instructor. If you aren't comfortable, say so immediately.

Always drive within your abilities. Intense is OK. Scary is not!



**Thanks to Central Indiana PCA*

At the end of each session, you will see a Checkered Flag. From that point, drive your “cool down” lap at a slightly reduced pace. Concentrate on driving a perfect line. When you approach Pit In, give the Pit In signal, which is a fist with your left hand raised as far as possible out the drivers window. As you enter the pit lane, slow down to the posted speed: typically 35-40 mph. Entering the paddock, slow to 5 mph.

After your session, you will debrief with your instructor. Best practice is to assess the good and weak points of the run just completed, then agree on 1, 2 or 3 goals for the next session that you can write down and think about ahead of time. Having them written down lets you note how you did after the next session.

Once you've driven a few sessions on the track, you will be in the same situation as everyone else: learning the basics. This is true even for advanced drivers. Ross Bentley, well-known driving pro, author and coach has accurately said that “advanced driving techniques are just doing the basics better.” With that in mind, the following sections cover key aspects of on-track driving that you will want to learn:

- Line
- Vision
- Braking
- Car control
- Passing
- Situational Awareness

You will quickly get used to the rhythm of driving on track and are likely to finish each session with a big smile on your face. Be aware that driving on track requires intense concentration. That coupled with the adrenaline means that you will be very tired at the end of your first day, and subsequent days. You probably won't have any trouble falling to sleep!

One caution: it is very easy to get dehydrated, especially if it is warm. Be sure to drink plenty of water.



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As a last reminder: try to share your day with others. You will meet other student drivers in the classroom and elsewhere. Your instructor may introduce you to other experience drivers. And there is usually a social hour at the end of the day. NNJR is a club with many, many friendly drivers. Make sure you meet them.



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DE Event Rules

Every NNJR DE event has a primary focus: safety. From 50 years of on-track experience, we've developed a set of standards that we expect of every driver, in the spirit of "Safe, Serious, Fun." NNJR Drivers Education will afford you the opportunity to develop your driving skills in the relatively safe environment of a race track.

DE IS NOT A RACING SCHOOL, NOR IS IT PRACTICE FOR RACING. All drivers are expected to drive well within their capabilities and be courteous and respectful of others. Drivers who appear, to an event official, to be pushing too hard or driving in an unsafe manner, will be black flagged and will lose track time. Aggressive Driving will not be tolerated.

- In particular, we expect all drivers to be courteous and give prompt pass signals at the first opportunity, with a lift.
- Passing without a signal is a major transgression and will be black flagged.
- Drivers must pay attention to all flags. In particular, missing or ignoring either type of black flag is a serious mistake.

We expect drivers and guests to do their part to make the event safe for themselves, other drivers and guests, volunteers and workers.

Flags

It is each driver's responsibility to identify the location of the flag stations, know the meaning of each flag and immediately observe every flag displayed. Flag stations are your primary source of information about track conditions immediately in front of your car while you are running. See "Flags" below for a description of flags and their uses.

Passengers

If there are two persons in a car, one of those persons **MUST** be an NNJR approved instructor, and the other person **MUST** be a properly registered entrant. **NO EXCEPTIONS**. Failure to abide by this ruling is grounds for dismissal from the event. Insurance regulations require this - please cooperate.

For instructional purposes, a driver may ride with an instructor but only in the run group immediately "above" that driver's run group. For example, a Yellow run group driver may only ride with an instructor in the Blue / White run group with the instructor driving at Blue / White pace.

These passenger rules are dictated by national PCA insurance: there are **NO EXCEPTIONS**. Failure to observe is grounds for dismissal from the event.

Passing

Passing is permitted on designated portions of the track only as described in the Driver's meeting and as shown on the Track Pack. In many cases, passing must only be on one side. Passing is not permitted in the corners. The driver of the car being overtaken **MUST SIGNAL** with his/her hand by pointing over the roof (right side) or straight out the driver's window (left side) to the side on which the faster car is to pass. **DO NOT TAILGATE**.



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The obligation for a safe passing maneuver falls primarily on the passing car, but the car being passed should never do anything unexpected to interfere. The car being passed should stay on line. Be aware of what is going on behind you as well as in front.

- One CLEAR signal per car, with a brief lift.
- If a car is behind you for more than 1 or 2 corners, you must give them a pass signal. Be courteous and lift briefly to allow the pass to happen quickly. Do not race the overtaking car to the next corner.

You must USE YOUR MIRRORS! Make sure they are adjusted as shown above so that you do not have a blind spot.

Instructors and Students

- Each driver is assigned to a “run group” based on his/her track driving experience. Instructors are assigned to each driver in green, yellow and blue for the event.
 - If a driver feels they are in the wrong run group, they are encouraged to discuss it with the Chief Instructor, but only after at least 2 runs in the assigned group. Where appropriate, the Chief Instructor will change the assignment.
- We require that instructors drive all students’ cars for the first two laps of the first run in all run groups. This is to allow an experienced driver to evaluate the driving condition of your car, both for safety and to aid in instructing.
- Entrants assume all risk of damage to their car during the event. This includes the times when an instructor is driving your car. Because you are assuming the risk, it is your right to be satisfied with the manner in which the instructor drives your car.
- If you have a personality or communication issue with your instructor, please see one of the Chiefs or the Track Chair and we will make a change. This happens occasionally and does not reflect badly on you or your instructor. Our objective is for everyone to be comfortable and have a good time.
- Although not all entrants are required to work with an instructor, everyone is encouraged to make use of the instructors’ experience and skills.
- Use of video recording equipment on track is at the discretion of the instructor
- All students are required to leave PSM (or similar) ON. If your car has an automatic braking system, it must be turned OFF.
- Students: begin to look for your instructor as soon as you are in the staging area or make prior arrangements to meet your instructor in the paddock. However, note that your instructor may be on the track driving or instructing in the group immediately prior to yours. Do not proceed to pit out until signaled to do so.
 - It is strongly recommended that you agree with your instructor where to meet when you first meet each other, well prior to going on track.

Spins, 2 Off, 4 Off

If you go off track (2 wheels or more) or spin, you are required to immediately report to the pits and see the Chief Instructor to discuss what happened. Failure to report immediately means a black flag. After a spin or an off, you are on probation for the remainder of the event, and if you incur a second spin, your driving privileges may be suspended or revoked for the balance of the event at the discretion of the Chief Instructors.



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Driving Recommendations in Case of Trouble

If you make a mistake and lose control of your car, the best general rule is to engage maximum brake effort until you are completely stopped. If you see you are going to run off the track and if you still have control, drive off straight. DO NOT attempt to hold your car on the track or to bring it back onto the track. Your chances of escaping unscathed by driving off under control are MUCH better. Most contact incidents are caused by the driver attempting to keep the car on track when they should have driven it off.

Disabled Vehicles

If your car becomes disabled or you have an incident on the track, REMAIN IN YOUR CAR WITH SEAT BELTS FASTENED UNLESS THERE IS FIRE OR YOU ARE INSTRUCTED OTHERWISE BY THE CORNER WORKER. You are generally much safer in your car than if you get out. If you are O.K. and do not need medical assistance, signal likewise to the corner worker e.g., a thumbs-up or similar. This will avoid dispatching the ambulance unnecessarily and potentially delaying the event. If you need a tow vehicle, you can make a tow sign ("T") to indicate this. Do not remove your helmet or your belts.

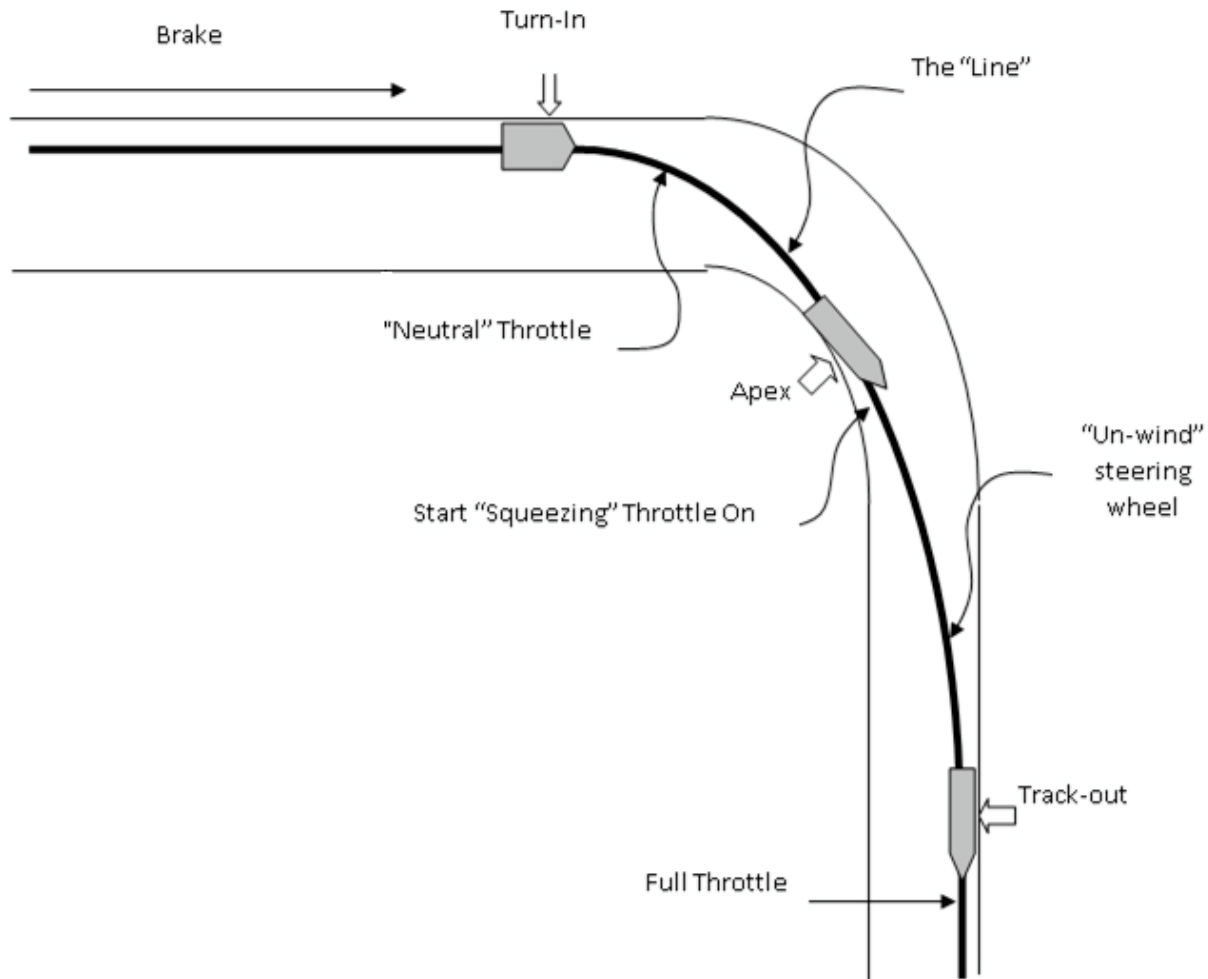
If you leave the track surface and the car is drivable, please come to a controlled stop in a safe position. If you have a clear vision of the track and oncoming traffic and/or can be assisted by a corner worker to re-enter, then proceed with caution, re-entering offline if possible. Otherwise, remain in your car with helmet on and seat belts fastened and await assistance.



NNJR Drivers Manual for new DE Drivers

Driving the Line

When your Instructor drives the first 2 laps he or she will show you the proper line around the track. The line is also marked with orange cones: one for the turn-in point, one for the apex and one for the track-out point at each corner (this is a safe, late apex line). Make sure you know what each term means (ask your instructor if you aren't sure).



While it may appear easy, actually driving the line consistently for each corner and for each lap is very challenging. In order to improve, one approach is to use the "Brake, Reduce brake pressure, Turn" sequence. "Brake, Reduce brake pressure, Turn" means that heavy braking (and downshifting) is finished in a straight line, while you can now lightly brake as you turn into the corner. This provides a consistent entry to each corner, and the car has a safe, consistent balance as you drive into the first third of the corner.

Reducing the majority of the braking force before initiating your turn but carrying light pressure on turn entry is called "trail braking". The important thing for new drivers is not to have full brake pressure AND try to initiate your turn-in. Some corners reward a lot of trail braking and some shouldn't have any, but

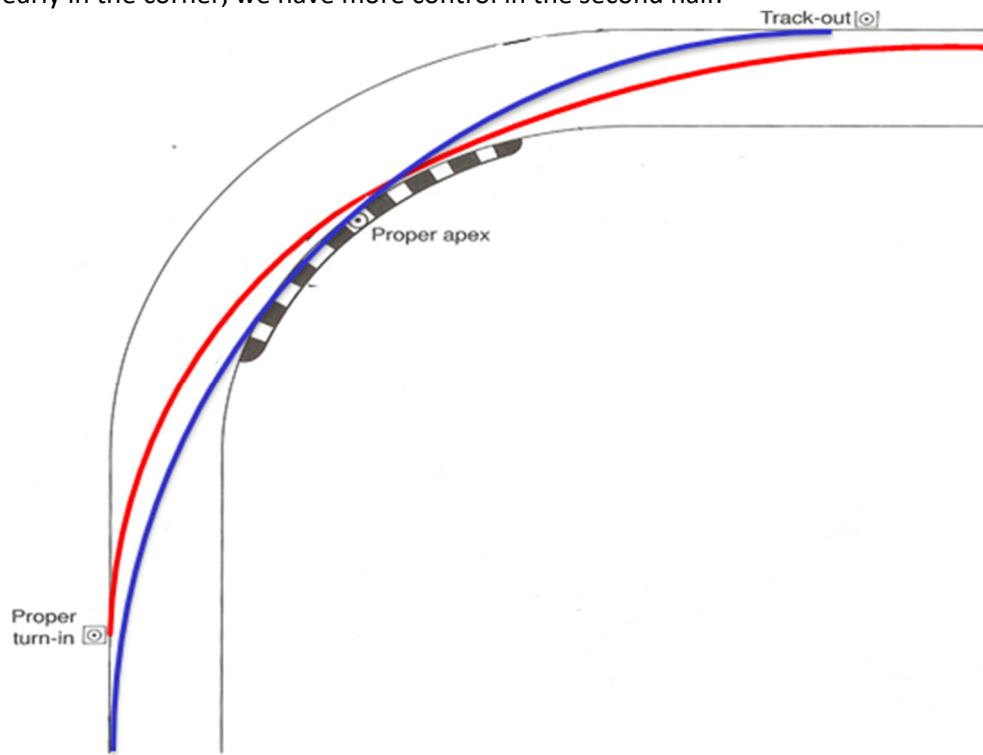


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your car will always reward a consistent weight transfer and smooth weight transfer from heavy straight-line braking to corner entry.



The line we use through most corners is referred to as a “late apex” line. As you can see in the diagram below, the late apex line has a later turn-in point, later apex and later track out. This means that the first half of the corner is slower but it also means that we can begin to unwind the steering after the apex while we begin to accelerate. Driving the geometric line means that acceleration can’t start until after track out. The other big advantage of the late apex line is that it is safer since we do all of our slowing early in the corner, we have more control in the second half.





NNJR Drivers Manual for new DE Drivers

Vision (Ocular Driving)

Beginning drivers seldom appreciate how important their eyes are: more specifically where to look. Like most drivers on the street, beginners usually don't look far enough ahead. Ignore your natural tendencies and try this: always have your eyes one step ahead. Here is how it works. On the straight, pick up the braking point as soon as you can. Once you are approaching it, start looking for the turn-in point, while you pick up the braking point with your peripheral vision (see example below). As soon as you are braking, start looking for the apex cone while you pick up the turn-in point with your peripheral vision. As soon as you turn in, look through the apex at the track out cone. Before you get to the apex, look down the track. At first, this may feel like "connect-the-dots". That is OK because as you get comfortable looking well ahead, the flow will become natural. This technique works because you are looking where you want to be, not where you are.



Remember that, even at 60 mph you are covering 88 feet per second. If you are only looking 1 or 2 seconds ahead of the car, you will always be "behind"; i.e. reacting. By looking several seconds ahead, you have the time to plan and act (much of which happens subconsciously). This "ocular driving" approach has the additional advantage of making you a smoother driver.

Mirrors are the other critical aspect of vision on track. Make sure your mirrors are adjusted as described above (Seating Position) to eliminate blind spots. Then it is essential to scan the mirrors every few seconds. As you gain experience, you should know which car(s) is behind, how far away they are and how fast they are closing. Using mirrors is a necessary component of Situational Awareness. Applying good eye scanning technique will make you a better DE driver and a better driver on the road.



NNJR Drivers Manual for new DE Drivers

Passing

As noted elsewhere, the biggest surprise for many drivers new to DE is dealing with other cars on the track: i.e. traffic. Since safety is the top priority, it is essential that all drivers know where other cars are at all times. That is accomplished first, by only allowing passes in safe areas, designated as “passing zones.” Passing zones are straight (or nearly straight) sections in between corners. No passing takes place in corners.

Second, passing is only allowed with a signal. This means that both the car being passed and the passing car know what to expect. But there are “rules of the road” to make sure that passing is safe every time. These include:

- Pass signals are done with your left hand and arm. One distinct signal per car.
 - To signal a pass on the right, fully extend your left arm over the roof of the car and point to the right.
 - To signal a pass on the left, fully extend your left arm straight out to the left.
 - To give a second pass signal, pull your arm back into the car, then give the second one.
- Pass signals need to be *clear*. Full arm extension, point with your index finger, arm parallel with the roof for a right signal, straight out for a left signal.
 - Give the signal as soon as possible: immediately after tracking out.
 - When giving a signal, always *lift* briefly to let the overtaking car by.
 - Do not give a pass signal approaching a brake zone; wait for the next passing zone.
- Be aware of flag conditions. For example, a yellow or black flag means no passing.
- Be aware of track conditions. For example, you might see something ahead that you are unsure about even if there is no flag indicating a problem. Or you may be behind other cars (referred to as a “train”). If you aren’t sure it is safe, do not give a pass signal.
- With very few exceptions (which will be described in the Drivers Meeting), the car being passed stays on line. The overtaking car goes off line. This is essential for predictability.
 - Do not “move over” to be “polite”!
- You must monitor your mirrors and send faster cars by at the first safe opportunity.
- When you are first on the track, your instructor will help you learn the passing zones and help monitor cars behind. But it is your ultimate responsibility to be aware of every other car that is nearby.
- NEVER pass without a point-by signal *from the driver*
- If you catch up to a car approaching a brake zone, do not follow them too closely. One to two car lengths, not right on their rear bumper.
- When approaching a car where you are expecting a pass, stay squarely behind until you see the pass signal. If you move over anticipating the pass signal, they may not see you in their mirrors.
- After taking a pass, do not move quickly in front of the car you passed: this is called “chopping” and is very disconcerting to that car.
 - As a result, after taking a pass, you will often need to enter the following corner off line, at a reduce pace.





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When to give a pass signal?

- Give a pass signal when a car shows up that wasn't there before, before a corner or immediately after a corner
 - Even if you can out-run them on the straight; in fact,
 - Especially if you can out-run them on the straight!
- If a car caught up to you:
 - They are quicker over the whole lap,
 - So they won't hold you up if you let them by
- If a car caught up to you and has lower horsepower:
 - They need you to point them by and go easy on the gas pedal,
 - And watching them take the turns is usually helpful

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When to expect a pass signal?

- Within one to two corners of catching a car at the end of a corner or sequence of corners.
- After following a car closely for more than two corners

When not to expect a pass signal?

- When not in a passing zone. Don't park yourself on their rear bumper!
- Catching a car at the end of a passing zone.
- Catching a car at the end of a straight, even if after several times. The car appears to be faster than you in the corners if you are only closing on straight sections.

CAUTION: Passing issues cause more consternation and close calls than almost any other aspect of on track driving. It's important to remember that COURTESY is the key. Don't let the "red mist" or your ego get in the way. If you feel you are being held up, simply roll through the pits to get some clear track. You have the option to tell the Chief Instructor which car is not giving pass signals.



NNJR Drivers Manual for new DE Drivers

Situational Awareness

Situational Awareness refers to a driver's ability to be aware of, interpret and react to events and circumstances that arise on track. AviationKnowledge defines it as:

Situational awareness is a term used to describe a person's awareness of their surroundings, the meaning of these surroundings, a prediction of what these surroundings will mean in the future, and then using this information to act.

This can be simplified down into three key words:

Look - Think - Act

The "surroundings" on track include track conditions, flags, other cars, our car and the track configuration. For a driver new to DE, there is a lot to absorb. At first, you instructor will help in order to minimize the overload. But it is ultimately the driver's responsibility to see what is going on around him or her and be prepared to react.

Drivers who have some experience are often able to drive the track on a reasonable line at a reasonable pace. But they may not have yet developed enough awareness. A common example is with flags. Inexperienced drivers often miss one or more black flags, sometimes a yellow flag. Another example: an inexperienced driver may not notice a new stripe of oil or antifreeze on the track surface until it is too late. Or know what to do if a car in front suddenly spins or leaves the track surface.

A basic early step for all drivers is to look for, then think about, an "escape route" for each corner: i.e. where he or she could safely drive off if the car suddenly lost power or if the driver entered the corner too fast. Consciously focusing on run off areas should be a standard part of your learning sequence for every corner on every track.

Similarly, you need to know how to enter a corner off line. This often arises when taking a pass since the car being passed stays on line and the passing car must avoid "chopping" in front of it. But you can (and should) work with your instructor to practice off line entries with or without passes.

Here are some other ways to improve your Situational Awareness:

- Improve your observation skills by making it a habit to see at least one new item on each lap: a tire mark, a shadow (that only shows up at certain times), an opening in the guard rail, a hole in the dirt where the curbing ends, etc.
- How far can you see ahead? Can you look further and still pick up your immediate surroundings?
- When you look in your mirror, how many cars do you see? Consciously estimate how far back they are? Where will you need to give them a pass signal?
- When you pass a car, how close are you (exactly)? Behind, along side. Before you pull back on line.
- What can you use as a Reference Point (RP) instead of the turn-in cone? Apex? Track Out?
- How much detail can you pick up about the track surface? Especially in the braking zone and in corners? What is different in Turn 1 vs. Turn 3? Etc.



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Being aware of your surroundings is the first part of Situational Awareness. Knowing what to do when something unexpected happens is the next, and most challenging, step. Here there is no substitute for experience ("seat time"). But your escape path, off line and similar drills can help.

Your instructor will help you become aware of issues and features that may not be obvious. But, at the end of the day, you need to increase your observation skills, and reaction skills.



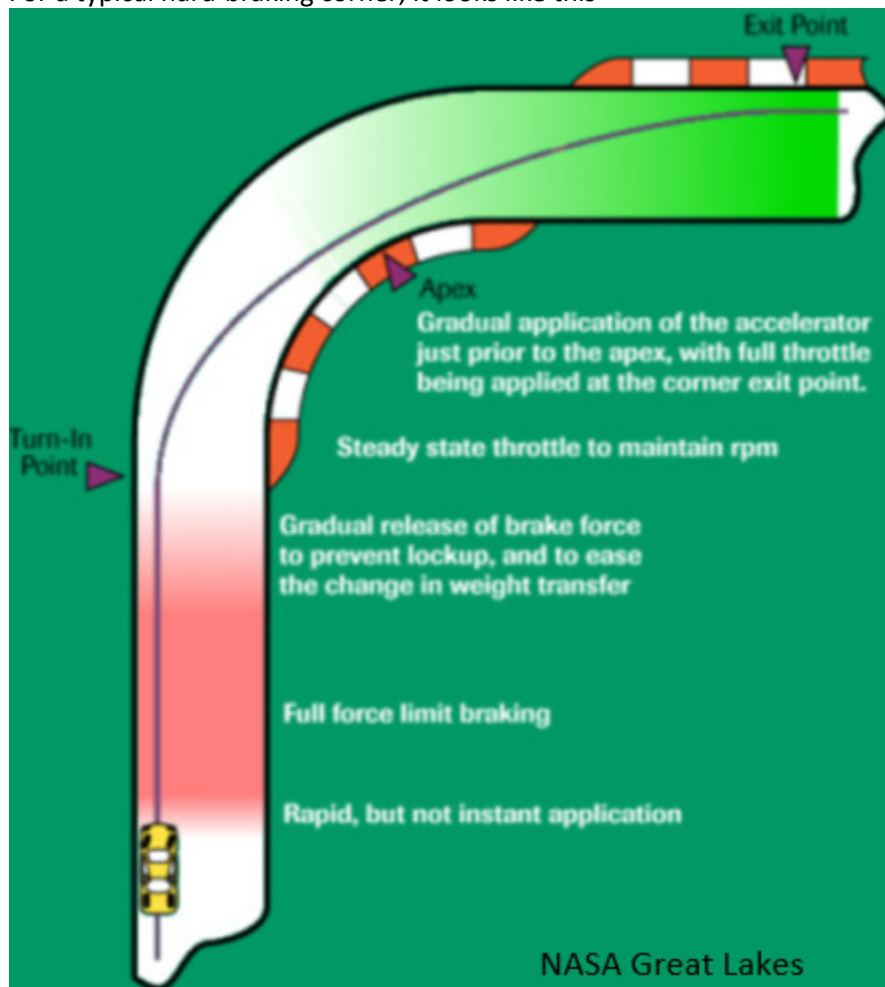
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Braking

Braking on the track is very different from braking on the street. In fact, in some ways, they are opposites. On the street, we typically apply the brakes gently, then more firmly as we approach a stop sign or corner. On the track, we do the opposite, especially for any corner that requires significant slowing. In fact, for those corners where we need to slow a lot, we want to brake at full force! Something we only do on the street in an emergency.

The other big difference: we want to come off the brakes gently. In other words, on the brakes hard, off the brakes softly. As Gunnar Jeannette (driving pro) described it: the first third of the braking zone is to slow down, the second third is to downshift (while still braking) and the last third is to come off the brakes.

For a typical hard-braking corner, it looks like this



Your right foot should be placed with your heel on the floor of the car so that it can pivot from the gas pedal to the brake. To apply the brakes, pivot your foot quickly from the gas pedal to the brake pedal and push down smoothly with the ball of your foot: don't jump or slam on the brakes. As soon as you feel resistance, push as hard as you can. If your car has ABS (most do), just keep up the strong



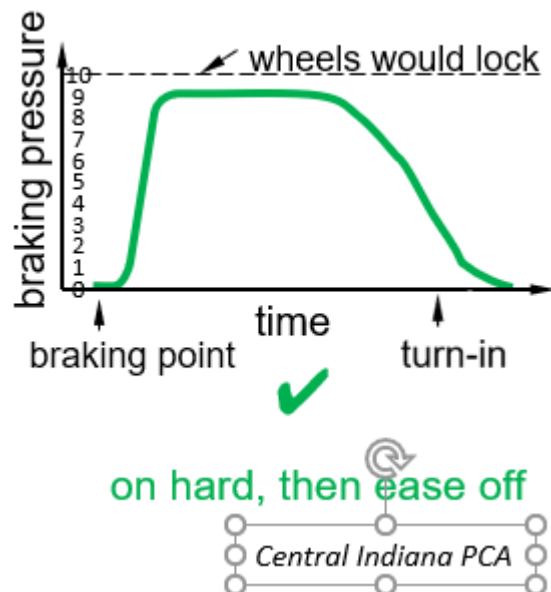
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pressure. If your car doesn't have ABS, you need to pay attention to the front wheels: if they begin to slide (lock up), you need to relax the pressure, then reapply (this is called threshold braking).

Let's measure the amount of braking (brake pressure) on a 10 point scale where 0 is no brakes and 10 is full on, ABS activated (or front wheels sliding). In a heavy brake zone, we want the initial application to quickly get to 9 and stay there long enough to take off the majority of the speed needed. Shortly before the turn in point, it's time to downshift. Don't downshift immediately after going to the brakes (a common mistake) as this could lead to over-revving the engine. But we want the downshift fully completed prior to turn-in.

Also, as we approach the turn-in point, we should reduce brake pressure significantly. As you can experience, you will learn how much for each corner. As a beginner, try to be around 2 or 3 on the brake pressure scale at turn-in and in the process of smoothly dropping to zero.

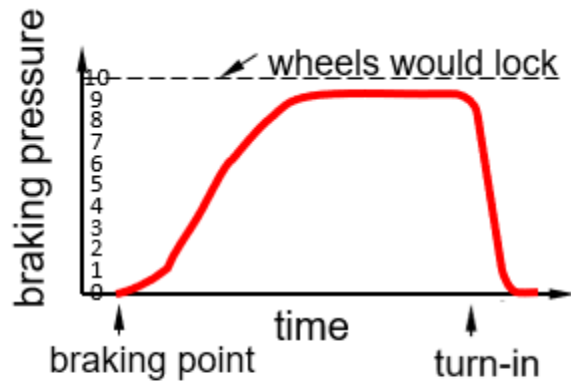
An ideal brake pressure graph would look something like this



However, a common beginner brake pressure graph looks like this



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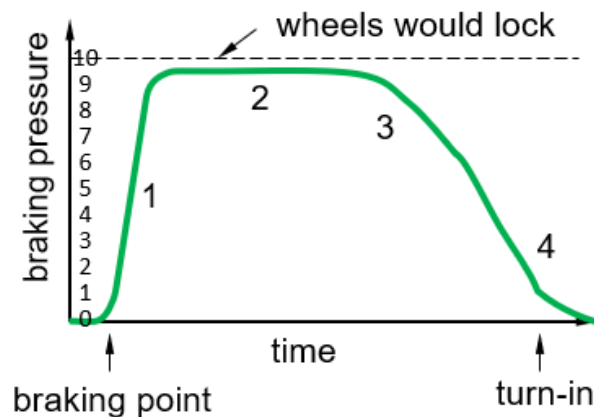
smooth on, quick off

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Braking like the second graph is more like typical street braking. On the track, this approach results in a car whose balance is completely upset at turn-in. On the other hand, a car driven like the first graph can transition smoothly from braking to cornering.

Putting the entire sequence in graphical form looks like this:

1. Apply brakes quickly; transfer weight forward.
2. Hold at threshold-braking pressure; slow the car!
3. Start to adjust corner entry speed and balance the car
4. Release gradually at turn-in, then transition to neutral throttle



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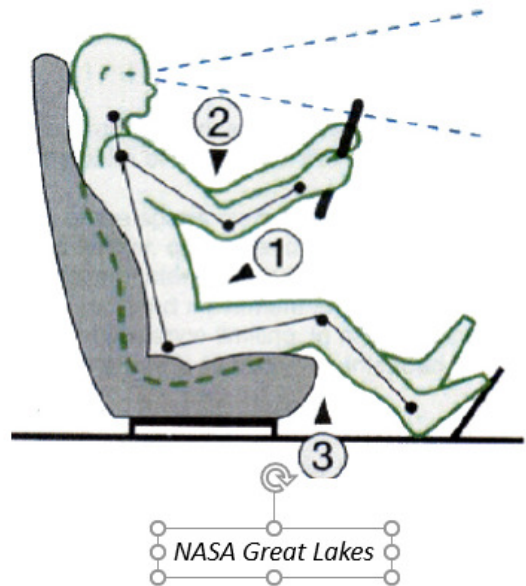
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Car Control

Car control refers to the driver's ability not only to use the controls but also to sense what the car is doing and respond appropriately, sometimes referred to as the "seat of the pants." Developing a sense of what the car is telling you takes experience. The best experience starts with skid pad and other low speed driving, like the NNJR Car Control Clinic and Autocross. These environments are designed to allow a driver to explore their car's limits safely. On the track, speeds are too high for an inexperienced driver to explore their car's limits.

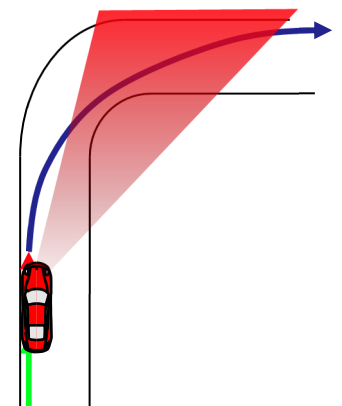
But we can gain useful experience on the track. Good car control starts with proper positioning (see "Seating Position" above). As a reminder:

- **Seating Position**
 - Sit upright and into seat
 - Sit close to wheel and pedals
 - Elbows and knees slightly bent
 - Allows for *SMOOTH* inputs
 - Lock seat belts (if possible)
- **Hand Position**
 - Keep hands at 9 and 3 o'clock
 - Use *relaxed grip* on wheel
 - Sensitivity is lost w/death grip



Once on the track, keep your eyes (vision) well ahead of the car (your instructor will provide occasional vision targets) and try to look "through" the turns, visualizing a smooth arc that your car will take. To minimize distractions and accelerate your learning curve, keep the car in one gear, if possible. It's easy to drive many tracks in 3rd or 4th gear. If you have to shift, minimize the number and be sure to shift only when on a straight. If you have a PDK or Tiptronic, keep it in Drive.

Be sure to use all controls as smoothly and gently as possible. Avoid rushing or feeling pressured. "Wind" and "unwind" the steering wheel in a smooth fashion: no quick movements. Do the same with the gas pedal: "roll" onto the throttle gradually as you begin to exit a turn. Apply the brake pedal smoothly: avoid jumping on it. Release the brakes very gently (see the "Braking" section for much more detail).



If you do need to shift gears, don't be in a hurry. Most new DE drivers rush upshifts and sometimes miss the gear. Same for downshifts. Here is the proper technique, as taught by the Jim Russell driving school. Think of each shift as 3 motions: out of gear, across the gearbox, and into gear. Use only 2 or 3 fingers.



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As an example, an upshift from 3rd to 4th is: clutch in, pull gear shift lever from 3rd to neutral, move lever across the gearbox (even if a very short distance), then move the gear lever into 4th gear and release the clutch. With a bit of practice on the street this technique results in smooth shifts that are easy on the car. And, it is faster than slamming the car into gear because, sooner or later, forcing the gear shift will clash with the synchromesh rings in the trans, resulting in a missed shift.



Downshifts use the same technique but also require “heel and toe” technique to properly match revs. Many newer Porsches have automatic rev matching. If your car doesn’t, you will need to learn and practice heel and toe on the street: it is impractical to teach on the track. But this is an advanced technique and one that new DE drivers do not need to know.



NNJR Drivers Manual for new DE Drivers

Concentration

While it may not be apparent, performance driving is primarily a mental sport. Sure, it helps to be in good physical condition and eye-hand coordination is great. But the biggest factor, by far, is your head. Start by leaving your ego in the paddock, so that you can hear what your instructor is telling you. The rest is easier than you may think. The key is to focus on the current corner. This means forgetting the previous corner (and lap) whether it was great or terrible. Doing so is harder than it may seem: we all like to remember a good corner and kick ourselves about a mistake. You have to overcome this natural tendency (your instructor will remind you).

The other mental factor that can affect new (and experienced) drivers is fatigue. Why should 25 minutes make you tired? The answer lies in the combination of 20+ minutes of concentration (we hope) coupled with physical fatigue from unfamiliar cornering and braking forces, heat (if the weather is warm at all), a tight helmet on your head, and bracing yourself in the seat. This doesn't factor in the effects of 3 previous runs (we do 4 runs a day), a long day outside in the sun, or the after effects of a long drive to the track yesterday (of course, we're sure none of you would stay up late at the bar the night before). Make sure you are aware of your physical and mental state. Nothing less than 100% focus will do.



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Consistency

Learning to drive well on the track is like learning any new sport. This means that you have to learn the technique first. After all, if you were learning to play tennis, you wouldn't start by playing a match against the club pro. Driving technique looks easy but that can be deceiving (just like the tennis pro makes it look easy). The hard part is driving each corner the same way on each lap. Novice drivers usually drive the same corner on the apex one lap, then a foot (or two) off it the next lap. Or the turn-in varies by 3 feet. Your driving technique won't improve until you can drive that corner within 6 inches of each mark, each lap (as you get more experience, within 2 inches). Now expand that technique to all of the corners.



NNJR Drivers Manual for new DE Drivers

Smoothness

One objective each time you go on the track should be to drive just a little smoother than the previous run. This applies to your use of the steering wheel, gear shifting, braking and-especially-the gas pedal. Smooth use of the controls translates into smooth, gentle movements of the car. Very few beginners use the controls smoothly. In fact, many use the controls like an “on/off” switch. The adrenaline associated with your first runs on the track doesn’t help. Try to slow down your movements in the cockpit, even though the car is moving quickly. Use your arms to gently pull the steering wheel in the proper direction: one constant motion (your fingers should have a relaxed grip on the wheel-not a deathgrip). Treat the gas pedal and gearshift as if you had to control them with a raw egg. Don’t jump on the brakes: put your foot on the pedal and push till you feel resistance, only then should you push hard. Come off the brakes slowly, not all at once. You will hear your Instructor say “wind” or “unwind” the steering wheel and “squeeze” the gas.

One important aspect of smoothness can only be learned on the street and not on the track: heel and toe. But this is something you should learn after you have done several events; it is not necessary for your early events.

Shifting (up or down) should be approached as a 3-step process: out of gear, across the gate, into gear-with a brief pause at each point. This is accomplished with two fingers and thumb on the gearshift lever: never the whole hand! Try this on the street: it may seem awkward at first. With practice, this becomes quick and smooth. As a side benefit, you won’t miss any shifts and your transmission will thank you.



NNJR Drivers Manual for new DE Drivers

Common Mistakes

Most of the mistakes made by beginners on the track are a result of trying too hard. One common mistake is over-revving the engine. (Fortunately, most Porsches have good rev limiters). Beginners should minimize shifting and use a higher gear. This makes everything easier and smoother. For instance, Lime Rock can be driven entirely in either third or fourth gear in most modern Porsches.

Another beginner mistake is too much focus on the mirrors, or too little. Some drivers are “worried” about the cars behind and become so distracted that it impacts their driving. Others may be so busy concentrating on the other aspects of driving that they forget to look at the mirrors at all. In either case, your Instructor will help. Learn to “scan” your mirrors; count them out to yourself, 1-2-3, and then focus forward.

Many drivers make the mistake of following the car in front through a corner, rather than driving their line. This is an easy trap, even for more experienced drivers. Your focus needs to be on your line, whether the other car is on line, or not.

Some drivers move their right hand onto the shift lever, then never move it back! Both hands should be on the steering wheel except for the brief moment required to shift.

Many drivers try to rush through upshifts and downshifts, with the inevitable result of missing a shift and/or horrible grinding noises from the transmission. Don’t rush the shifts: there is plenty of time. Your hand can move faster than even a Porsche gearbox! Also, make sure you are pushing the clutch all the way in.