



NJMP Lightning



NNJR "Trackside Classroom"
Smoothness & How to "Read" the Car
October 7, 2020



Porsche Club of America



Disclaimer

The techniques shown here have been compiled from experienced sources believed to be reliable and to represent the best current opinions on driving on track. But they are advisory only. Driving at speed at NJMP Lightning, or any other track, requires skill, judgment and experience. These techniques assume the reader has high performance driving knowledge and applies them as applicable to their level of driving experience.

High-performance driving can be very dangerous, carries inherent risks and may result in injury or death. NNJR and PCA make no warranty, guarantee or representations as to the absolute correctness or sufficiency of any representation contained herein. Nor can it be assumed that all acceptable safety measures are contained herein or that other or additional measures may not be required under particular or exceptional conditions or circumstances.



Smoothness & How to Read the Car



- Time Off => Risks
 - Avoid Mistakes
 - Traffic Awareness
- Smoothness
 - What is it?
 - How to achieve?
- How to read the car?
- Q&A



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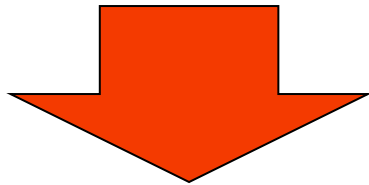
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How Long Since You Last Drove?



- VIR (November 1, 2019)
- Lightning (October 13, 2019)
- Before?



9 Months?

12 Months Since Light, 2019

Longer?



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NNJR Risks from Time Off



- Time off means you've "lost"
 - Reference Points (unless written down)
 - Muscle Memory
 - Sense of "Flow" or "Rhythm"
 - Track Awareness



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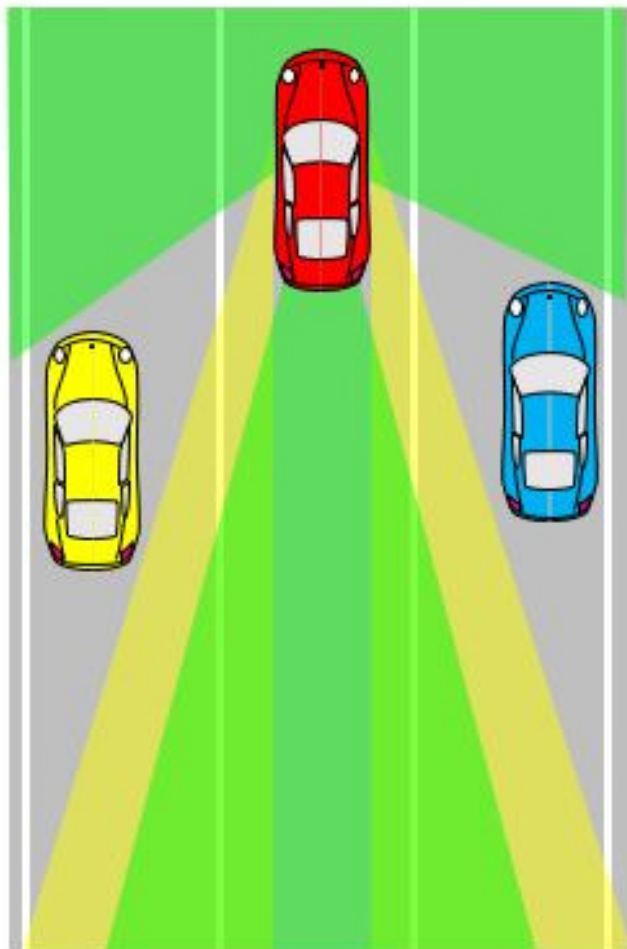


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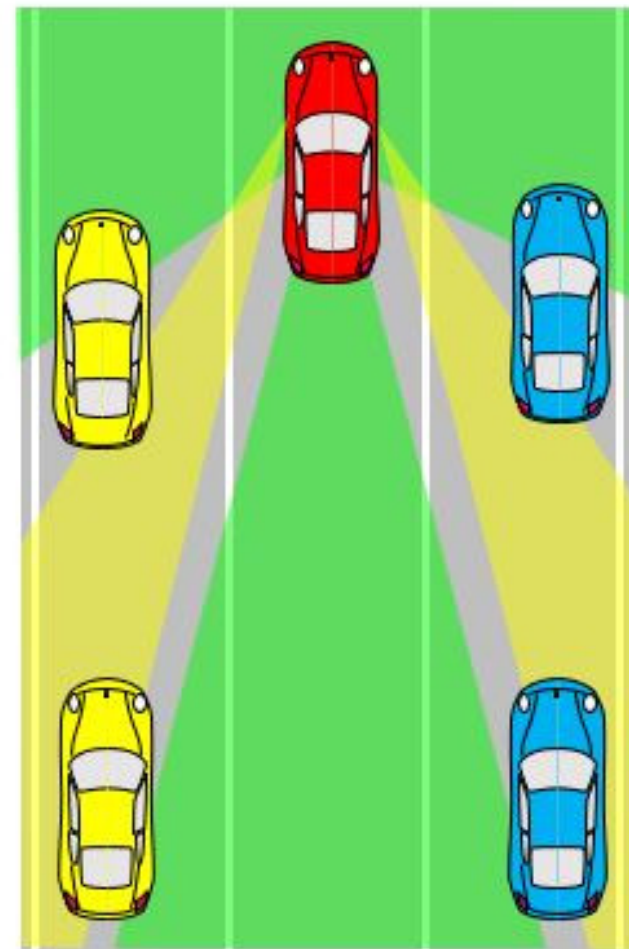
- Start in correct seating position!
- **MIRRORS**
- **Rearview Mirror**
 - Adjust to see entire rear window
- **Left Mirror**
 - Rest head against driver's window
 - Adjust to barely see left rear fender
- **Right Mirror**
 - Lean right so head is under rearview mirror
 - Adjust to barely see right rear fender



Common



Better



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

- Critical part of Situational Awareness
 - MUST be aware of cars behind
- Should never be surprised by a car in mirror
- Scan mirrors (esp. rear view)
 - On and end of straightaway
 - Are cars closer or further away?
 - Exiting a corner
 - Confirms how close the next car is





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Smooth is Fast (and Safer)



Smooth is fast because...
a balanced car has more traction.



www.SpeedSecrets.com

Ross Bentley



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Smoothness: What is It?



- Objective: keep the car balanced
 - i.e. No more weight transfer than needed
 - Just enough input

"Race car drivers are minimalist. They put the least amount of input in."

- Johnny O'Connell

- Deliberate and Precise use of the controls
 - Steering, gas, shifting
- Never upset the car

*"When I look fast, I'm not smooth and I am going slowly.
And when I look slow, I am smooth and going fast."*

- Alain Prost





Smoothness: How to Improve?



1. Vision
2. Awareness
3. Practice
4. Never rush



- The first prerequisite to be smooth
- How far ahead are you looking?
 - Look through and around each corner
 - Look at exactly where you want to go
 - 20 seconds ahead!





- Controls are “rheostat” not on/off
 - Steering
 - Gas
 - Brakes
- “String Theory”: Gas and Steering connected by a string





2. Awareness: Try This



- Focus on (amount of) Pressure
 - Amount on gas pedal: 1-5 or 1-10
 - Amount on brake: 1-10
 - Amount (push plus pull) on steering: 1-5 or 1-10
- Sensitize feet and hands: exactly how much pressure?
 - Improves precision and smoothness
 - Requires being relaxed: tense muscles prevent feedback
- Goes beyond “what” to “how” (how much)



Adapted from Speed Secrets Weekly 314



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2. Awareness



- How smooth are you now? *
 - Pick one aspect
 - Rate from 1 (terrible) to 10 (perfect)
 - Write it down in your notebook
- Consider
 - Turn in (slow, fast, progressive?)
 - Brake application
 - Gas application
 - Upshifts
 - Downshifts
 - Brake release

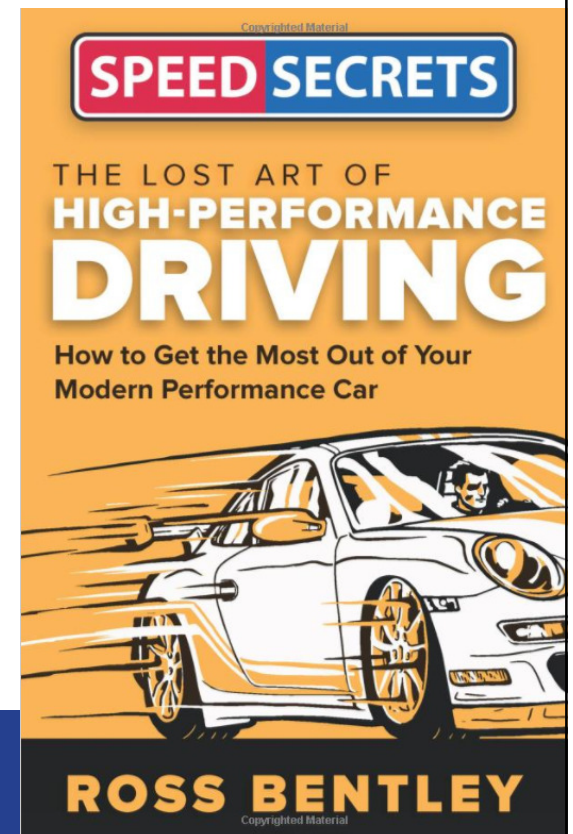
**Credit: Ross Bentley Speed Secrets 196*



NNJR 3. Practice



- Pick one aspect (one control) and focus on refining it
- Use your street driving for reinforcement
 - Lots more time on street than track
 - Will make you a better street driver!
- Ross Bentley's book
 - Lots of practical advice



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- Never rush or force controls
 - Upsets car balance
 - Harder on the car
 - May result in an error: e.g. missed shift
 - Accuracy, precision more important than speed
- Smooth use of controls is consistent with rapid use of controls
 - After LOTS of practice!
- Remember: less (use of a control) is more





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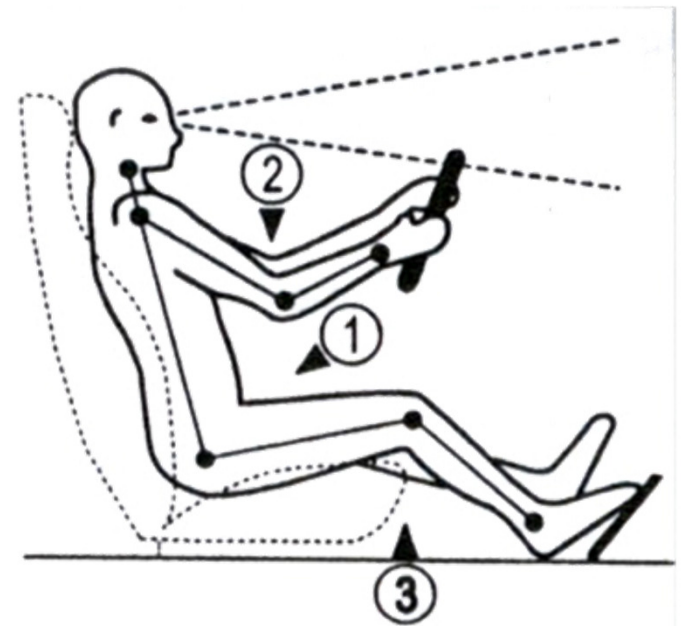
How to “Read” the Car



1. Proper positioning
2. More / Better Input
3. Car Control Exercises



- How much have you driven your track car lately?
- Check it out
 - Does seat fit perfectly?
 - Vision constraints with helmet and HANS?
 - Mirror adjustments
 - How does steering feel? Brakes?
 - How does it sound? Feel?





Positioning Refinements



- For 10 minutes or so, sit in stationary car with helmet, etc. on.
- What might be negatively impacting
 - The amount of quality visual information you take in?
 - What you feel?
 - What you hear?

**Credit: Ross Bentley Speed Secrets 189*



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2. More / Better Input



- Improve yourself
 - Equilibrium: e.g.
 1. Stand on one foot with eyes closed for 20-30 seconds
 2. Move head around
 - Brain integration
 - Cross Crawls

- Sensory Input Sessions
 - Vision
 - Hearing
 - Kinesthetics

**Credit: Speed Secrets Weekly 352*



NNJR Deliberate Practice*



- Re-learn the Track
 - Reference Points
 - Track Surface
 - Safety features
- Re-learn the Car
 - Brake Application
 - Brake Release
 - Throttle
 - Steering
- Re-learn the Traffic
 - Mirrors
 - What Would I Do If?
- Sensory Input
 - Vision
 - Kinesthetics
 - Hearing

* **How you practice is more important than amount**

Do it in a focused way,
With clear goals,
Plan for reaching goals, and
A way to monitor your progress

Sources: Ross Bentley, Speed Secrets Weekly 322 and 370; Talent is Overrated by Geoff Colvin, and Peak. Secrets from the New Science of Expertise by Anders Ericsson and Robert Pool



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Deliberate Practice Worksheets



Topics for Sensory Input Worksheets
Use these topics with your printed track map

Reference Points

- Not cones!
- Cracks, posts, seams, curbs, etc.
- BOB, TI, EOB, A, TO, in between

Track Surface

- Sealer, color change, etc.
- Elevation
- One new feature per lap

Safety

- How soon/far ahead can I see flag stations?
- Bail out area(s) for each corner
- Which curbs could I drive on? Not?
- Etc.

Brake Application

- Quick and hard enough? Too much?
- Does the car get upset?
- Totally consistent lap to lap?
- Get money in the bank early in the brake zone (Cass Whitehead)
- "On like a lion, off like a lamb" (Pobst)
- Etc.

Brake Release

- Modulating pressure thru brake zone properly?
- Beginning release at the right point?
- Right rate? Slow, medium, fast
- Totally consistent lap to lap?
- Come off the brakes politely (Peter Argetsinger)
- Etc.

Throttle

- Squeezing too soon? Too quickly? Not enough?
 - Pause between brake and gas?
- On floor until brake application?
- How are you using it (vs when)
- Use only the top half? (David Murry)
- Etc.

Steering

- Especially how you unwind on corner exit
- Is turn-in from track edge?
- Is turn-in crisp/flowing or gentle/progressive
 - Both correct, depends on corner
- Etc.

Mirrors

- Adjusted properly?
- How many cars behind?
 - End of back straight?
- Closing speed: is car in mirror closer or further away?
 - What color(s) is/are cars behind?
- Etc.

What Would I Do If

- I smell anti-freeze?
- Car in front swerves under braking?
- Brake pedal soft in middle of traffic entering bus stop? off camber?
- Two fast cars, you give one signal, can't see second one?
- Etc.

Vision

- Everything you can see on and off the track surface
 - Something new each lap
 - e.g. Horizon change during cornering
- How far ahead can you see?
- Etc.

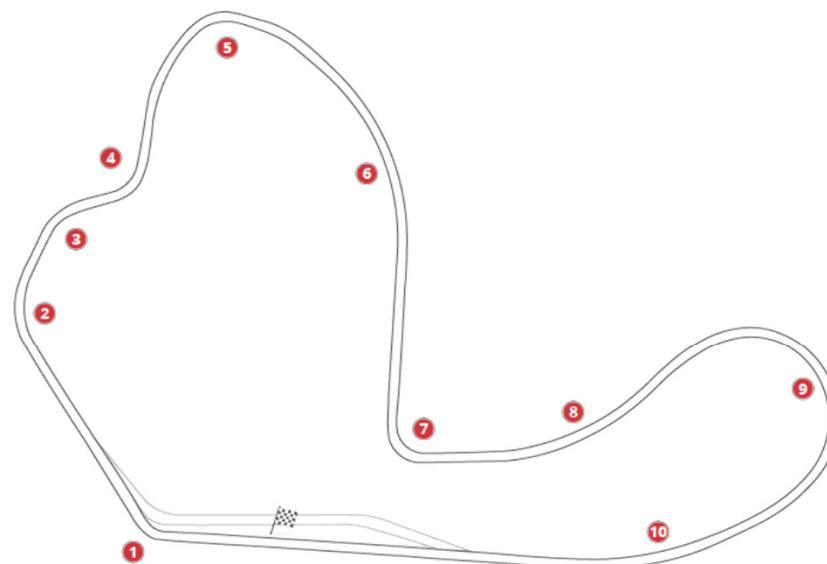
Kinesthetics

- Steering wheel feedback
- How g-loads build; weight transfer
- Feel the track surface
- Etc.

Hearing

- Wind noise, tires, brakes
- Cornering vs. straight
- Different parts of track
- Etc.

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Remember: Capture learning right away: in the first 10 minutes

- Write down what you saw, heard, felt
- Before lap times, data, video, socializing



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- Car Control can't safely be learned on track
- Safe learning environments
 - Car Control Clinic
 - Autocross
 - Skidpad



- Controls = rheostat; pressure 1 to 10
 - Adjust mirrors!
- Smooth is fast: keep the car balanced
 - Look (far) ahead
 - Be aware
 - Practice, including on the street
 - Less is more
- Improve your ability to read the car
 - Positioning
 - Sensory Input and Deliberate Practice



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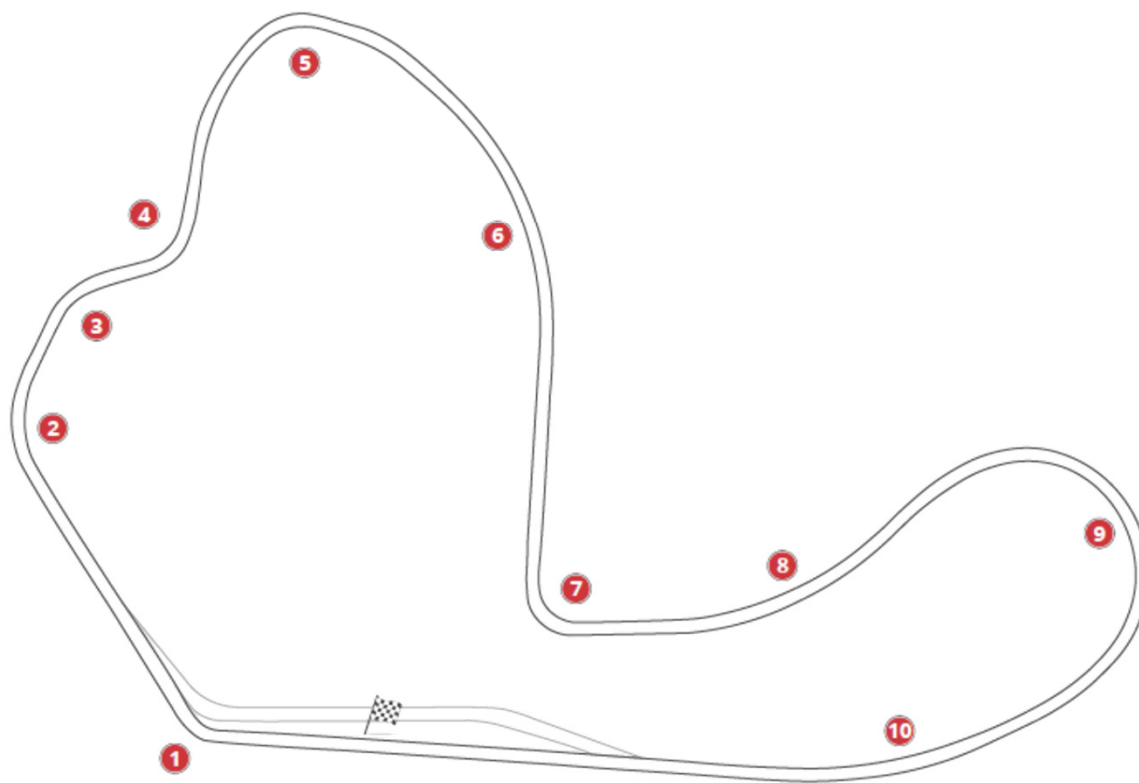




Lightning Turn by Turn



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