



**PERFORMANCE DRIVING
EVENTS**

Performance Driving Handbook

***Presented by Jeff Lacina
Track Guys On Track Lead Instructor
Track Guys Inc.***

Copyright © 2002-2003

SECRETS OF SUCCESSFUL HIGH PERFORMANCE DRIVING

- Smooth, smooth, smooth... with the wheel, with the brakes and with the throttle
- Watch a good driver drive fast. There are no unnecessary movements of steering, braking, downshifting, and accelerating that would “unbalance” the car on its suspension.
- ALL movements in the car NEED to be smooth, progressive and calculated
- Be aware of your surroundings! The track, corner workers, other participants.

1) VEHICLE PREPARATION

- Vehicle Tech Inspection: It is up to YOU to bring a safe and well-maintained vehicle, not only for YOUR safety, but that of your instructor and fellow students.
- Clean Interior: ANYTHING loose in the car WILL become a flying hazard in the event of an accident or high-speed change of direction.
- Tire Pressure: Improves the handling (safety) and tire longevity.
- Driver’s Seating Position: Feet must be able to depress the pedals to the floor comfortably. Arms should be bent so that you have better leverage and range of motion to turn the steering wheel. Position the seat back up as straight as possible for the best vision out of the windshield and of the mirrors.
- Hands on Steering Wheel: 10 & 2 o’clock position. This allows you to turn the steering wheel the farthest without crossing your arms or moving your hands on the wheel.
- Mirror & Gauges: Once the driver’s seat is positioned, adjust your mirrors. You must be able to see surrounding traffic for obvious safety reasons. While on the straights, get into the habit of checking your gauges and warning lights, oil pressure, coolant temperature, etc.
- Seat Belts: Get them as tight as you can stand them, then make them TIGHTER! Buckle the belt, tilt the seatback rearward, try and “lock” the shoulder belt by quickly tugging on it. Once locked, bring the seatback to the original position.
- Under the helmet: You should be relaxed and focused on driving...and LEARNING. “Think” you are in control of your car. LISTEN to your instructor, he or she is here to help you LEARN.

2) WARM-UP / COOL DOWN

- Warm-up: Driver conservatively for the first lap or two to allow your car, tires, brakes and your BRAIN to warm-up. Also allows you to feel and listen to your car before you start going faster.
- Cool down: At the conclusion of each on-track session, you are given a portion of a lap to cool down. USE IT to do just that. Slow down and use your brakes as little as possible. Do NOT turn off your brain. Do not set your parking brake after you return to your pit area.

3) TRACK LAYOUT

- Memorize the track. To be the best in the car, you need to KNOW what's coming next, not simply react to it. You can't be "surprised" and still be smooth, safe and fast.
- Use warm-up/cool down laps to note track surface, edges, camber changes, elevation changes, curbs and any other marks that can help you "learn" the track as you build your experience.
- Mentally "drive" the track during "off track" times. Helps you visualize the layout and track configuration.

4) USING YOUR EYES

- Try to look as far ahead as possible. This give you time to PLAN where you want to go and be aware of up-coming track conditions.
- Your hands go where your eyes go.
- Check your mirrors, gauges and corner workers.

5) ON-TRACK ETTIQUETTE

- Watch your mirrors. Be aware of cars ahead and behind you.
- Watch for flags and signals from corner workers. They are your eyes and ears of what's ahead of you on the track.
- Passing **ONLY** in approved passing zones **AND** after a “wave by” from the driver you're passing.
- If you're being passed, give a passing signal then **LIFT** off the accelerator. **KEEP** your line. Do **NOT** brake! (Slower cars keep **RIGHT**)
- Complete your passing maneuver **BEFORE** the braking zone.

6) VEHICLE DYNAMICS

- To be a successful high-performance driver, you **MUST** understand how your inputs influence and affect your vehicle.
- Braking: reduced speed, transfers weight to the front tires
- Accelerating: increases speed, transfers weight to the rear tires
- Steering/cornering; turns the car, transfers weight onto the opposite side of the vehicle from the direction you are turning.
- Shifting; increases or decreases vehicle speed, momentarily “rocks” the car from a rear weight bias to a neutral weight bias. Generally, the fewer shifts you make the smoother your laps will become.
- Know **HOW & WHEN EACH** of these variables can work **TO** your advantage, either independently or in combination.

7) HOLDING THE STEERING WHEEL

- Hands at 10 & 2 o'clock positions
- Elbows slightly bent
- Steer by pulling DOWN, not pushing UP on the steering wheel
- NO one-handed driving – only time with one hand on wheel is during shifting
- Shuffle steering when appropriate.
- Steering input: one, smooth continuous movement. Don't yank or jerk the wheel.

8) TERMS & DEFINATIONS

- Turn-in: Place on the track where you begin your turn.
- Throttle/Power: Location in a turn where you begin to accelerate out of the turn.
- Apex: Location of each turn where you are CLOSEST to the inside of the turn.
- Track-out: Location on the track where you complete the turn.
- Open the wheel: Moving the wheel back toward straight. Less steering input.

9) THEORETICAL APEX – LARGEST POSSIBLE RADIUS

- The larger the radius of a turn, the faster you can travel through the turn.
- The largest possible radius is the fastest way around the turn.
- The largest possible radius is generally not the fastest way around a race course.
- A late apex line through the corner, in effect, lengthens the straight. You make up time going faster, LONGER on the straight.

10) EARLY APEX

- The sharpest part of the turn occurs AFTER the apex.
- You can not negotiate a turn, after the apex, at the same speed as earlier in the turn.
- Early apexing is DANGEROUS! You will run out of track during the exit or you will have to brake while turning and the car is unbalanced.
- Early apexing will give you LESS straight line braking distance.

11) BRAKING & THRESHOLD BRAKING

- Only the brakes should be used to slow the car. Brakes are cheaper and more effective at slowing the car than are transmissions and clutches.
- SQUEEZE the brake pedal, don't "pound" it.
- Apply brakes SMOOTHLY and progressively, hard enough for the wheels to reach a point just SHORT of lockup. This is called threshold braking.
- Cars with ABS need not be concerned with wheel lockup, but can still use threshold braking to maximize braking effort.

12) BRAKING POINTS

- The ideal brake point is one, which uses threshold braking, slows the car enough to negotiate the turn on the proper line and permit the earliest application of throttle.
- Remember, always brake early and gradually move your braking point closer to the turn-in point of the turn.

13) ACCELERATION

- As soon as you make your turn-in and point the car toward the apex, begin to accelerate. SQUEEZE the throttle, don't "pound it". Don't coast.
- Good rule of thumb; Gradually accelerate from your turn-in point and be at maximum effort at or just past the apex.
- Do NOT lift your foot off of the accelerator during the turn. (TTO - Trailing Throttle Oversteer)

14) SLIP ANGLES

- Slip angles are the difference between the direction the tire is pointed and the path the tire (and vehicle) is actually traveling.

15) UNDERSTEER / OVERSTEER

- Understeer (pushing) – To the driver, it feels as if the car won't turn in. You have less traction with the front tires than the rear tires. Understeer/pushing increases the radius of the turn.
- Oversteer (loose) – To the driver, the rear of the car wants to come around. You have more traction with the front tires than the rear tires. Oversteer/loose decreases the radius of your turn.

16) TRAIL BRAKING

- Trail braking is when you continue to use or ride the brakes after your turn-in. This helps to keep some of the vehicle's weight transferred to the front tires and makes the rear end of the car light.
- Trail braking can assist you in rotating/turning the car on low-speed, tighter turns. The throttle must be squeezed on gradually to transfer weight to the rear tires which will stop the car's drift/rotation. This should NOT be practiced on high speed turns!

17) TRAILING THROTTLE OVERSTEER (TTO)

- While cornering, a sudden lifting off of the throttle will transfer weight off the rear tires, reducing their traction and increasing oversteer.

18) SKID CONTROL

- Be very alert to the first signs of the rear of the car losing traction or feeling like it's "coming around". Learn to detect this condition early and maintain a constant throttle application, while keeping your front tires in the same direction as if the car's rear wasn't hanging out. Steer "with" the slide.
- Note: This steering correction will catch the car from further skidding, while keeping you on the preferred driving line. Always try to keep your front tires pointed in the direction you WANT to go.

19) AGRICULTURAL DRIVING

- Fear of going off the track actually causes most of the serious damage suffered by cars at club driving schools and open track events. If you know you're going to drop 2 or 4 wheels off the track, DON'T fight it, rather just drive it off.
- If you drop just 2 wheels off the edge of the track, DO NOT yank or "jerk" the car back onto the track. Rather, gradually ease off of the throttle and allow the car to "settle".
- Don't add more steering lock or "jump" off of the throttle, as both of these actions will greatly "unsettle" the balance of your car.
- After you are FULLY under control and slowed significantly, check for on-coming traffic and re-enter the track.

20) LESS THAN A TOTAL LOSS

- Somewhere between a lazy skit and a total spin, lies "Less Than a Total Loss."
- Ease SLOWY out of the accelerator and gently steer into/with the skid.
- Keep the front tires pointed in the direction you want to travel.

21) TOTAL LOSS

- If you loose it **BADLY**, don't fight it. Put **BOTH FEET** in. Left foot down on the clutch, right foot down on the brakes.
- Locking the brakes during a spin helps to stop the spin and will mean that you car will travel in a more predictable direction.

22) DRIVING IN THE RAIN

- Driving on wet surfaces requires smoothness to the Nth degree!
- Smooth line, smooth steering, smooth braking and smooth acceleration.
- In the rain, you'll have approximately
 - 70% of dry acceleration
 - 50% of dry braking
 - 20% of dry cornering traction
 - **SLOW DOWN!**
- The "line" can become extremely slipper due to rubber deposits and fluids leaked onto the track's surface.
- Drive a "wider" line through the turns and be extremely gentle with **ALL** driving inputs (braking, steering and throttle).

About your Track Guys On Track instructors

These types of events would be completely impossible without the assistance of our team of Track Guys Instructors. They have the experience, knowledge and skills to help YOU become a better driver, both on the street and on the track.

Believe it or not, your instructors are volunteering their time and their own out-of-pocket resources to be here to help you. When they are in your car riding with you and coaching you, please remember that they are here to HELP you...not embarrass you. Their job is to watch and feel everything you do in the car and then help you get better at controlling your vehicle. But ultimately, it is YOU who is driving, so please listen to their coaching and drive accordingly!

Our team of Track Guys Instructors comes from a wide range of driving and motorsports backgrounds and experiences – autocrossing or Solo II, Solo I, amateur and professional wheel-to-wheel road racing. Many have been attending performance driving schools for more than 10 years! We encourage you to tap into their experience and knowledge with appropriate questions and discussions. And don't forget to thank them for their willingness to share their time-earned experiences with you!

About Jeff Lacina, Lead Instructor, Track Guys On Track events

Jeff has been participating in motorsports events since 1979 when he started participating in autocross events just months after getting his license. He then started competing in SCCA Solo II events on a state and regional basis in 1988 when he purchased a new Mustang GT. He earned the Tires Plus All Iowa Challenge Championship in 1991 and 1992 piloting his E Street Prepared Mustang.

However, in the fall of 1987, Jeff got his first real taste of high-speed performance driving during an event at Elkhart Lake, Wisconsin's Road America. After one event, he was SERIOUSLY hooked on wanting to learn EVERYTHING he could about on-track performance driving.

After almost 10 years of being a "student" of performance driving, Jeff began serving as an instructor for numerous auto enthusiast clubs and driving schools, including; Porsche Club of America, BMW Car Club of America, Shelby American Automobile Club, Audi Quattro USA, as well as Track Time. Jeff is also a graduate of the Bondurant School of Performance Driving. During the course of his driving adventures, he has driving at more than 20 of America's finest and most diverse road courses.

Finally, following his own "drive" to develop his own performance driving school, Jeff and a former student of his, Todd Zikas formed Track Guys Performance Driving Events. Jeff's understanding of both the novice and advanced aspects of performance driving is just one reason why he was hired by SVTOA to conduct their On Track programs across the U.S. and Canada.

Feel free to visit his web site at; <http://www.trackguys.com> or drop him an email at Stanger58@aol.com.