

So You Wanna Be a Race Car Driver?

Hi Miata Folks,

I know many of you were one of the 34 Miata's that joined us at Watkins Glen International Race Track Opening Day on April 17th for three laps around the track, our first Club event of the year.

If you were in sight of the official track pace car with the flashing roof light that led groups around the track, you may have been wondering why they were driving from left to right all over the track at each corner.

The *Wench* is here to explain. ☺

The pace car was practicing what is called in race parlance, "Driving the (Racing) Line". Yeah, okay you say, so what? Well, after I finish explaining what "the line" is, you may want to have fun with your car on the street practicing the principles or maybe even go back to The Glen and try driving it yourself in their "Drive the Glen" 3-laps/\$25 which runs all summer (<http://www.theglen.com/Guest-Info/Drive-The-Glen.aspx>). You will also find yourself enjoying auto racing much more as you watch it on TV or live at a race track because now you understand the art of cornering fast and efficiently. And then, if the driving bug really bites you as it did me and a number of our Club members, you may be interested in furthering your driving ability by taking a high performance driving class with a professionally-run organization like *Hooked On Driving*, *Chin Motorsports* or *Trackmasters*, etc.

Driving the (Racing) Line Definition:

Simply put, the racing line is the route that a race driver follows around the track in order to take corners in the fastest and most efficient way. Note that I said *fastest and most efficient*. To carry maximum speed, you need to minimize the tightness of the arch of the corner which maximizes tire grip and cornering force. Yeah, physics, I know. By using all of the available space on the track, a car can travel in a straighter line and go faster before reaching the limits of tire grip. I think of it as "straightening out the path around a corner". Sounds easy, doesn't it? There's a lot, lot more to it; it ain't rocket science but it is definitely an art. To do it well takes lots and lots of practice ("seat time", as we call it) after you understand the basics.

The best line depends on a number of factors and can be broken down into the following:

- Memorizing the track layout
- The braking point before a corner
- The turn-in point at the corner
- Apex of the corner
- Awareness of the position and direction of the next corner
- Some other stuff for advanced drivers like track conditions, weather, slip angles (more physics stuff), wet/dry track, other folks on the track trying to pass you or you're trying to pass others

So just the really simple basics here, but believe me, there's so much more to this as you study, learn and actually drive:

1. Braking point: This separates the boy/girls from the men/women in my opinion. ☺ How brave (not stupid) are you? How good are your brakes? How good are your tires? How experienced a driver are you? How fast can you slow down, say, from 100 mph to 40mph, without losing control? The big rule of thumb is to brake BEFORE turning into a corner although an advanced technique of light brake pressure on entry called "threshold braking" or "trail braking" can help give you a better turn. For most of us though, let's just brake

early and smoothly when you're a learning novice (and that includes me) and progressively shorten the braking point as you become more experienced and proficient (and brave, not stupid). ☺

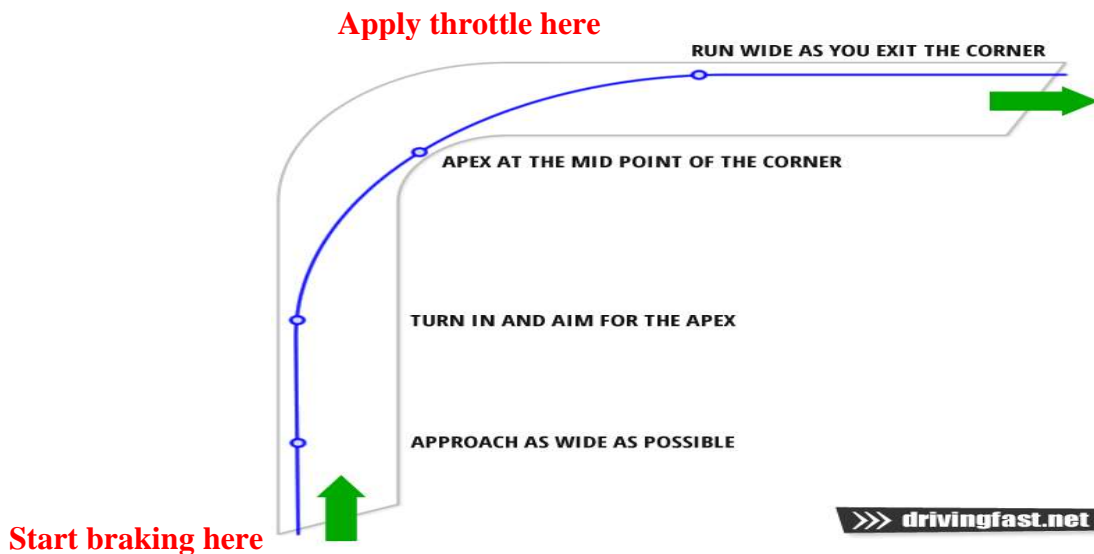
2. **Turn-in Point:** This is the key to getting “the line” right so it's very important to turn into a corner at the correct point as you aim for the corner apex (see term below). If you get it right, you'll be set up for a good line with, ah, no surprises such as running out of track and onto the grass (factiously called “agricultural racing”) or into (yikes) into the Big Blue Bush (the solid metal Armco wall at Watkins Glen). Definitely not recommended for Miata body sheet metal rearrangement and your personal safety, okay? ☺
3. **Apex:** This is a biggie in racing, the heart of the corner. The apex (also called “the clipping point”) is the point at which you are closest to the inside corner. There are two types of apexes, the geometrical and the racing apex. You may remember the term “geometric apex” from an old math or physics course as the exact point in the middle of a curve. But the “racing apex” may not always be the exact middle of a corner (may be an “early” or “late” apex) and it depends on a number of factors mentioned above such as: the type of next corner ahead, the track condition, low or high-powered car, the individual car's cornering ability, wet or dry track, other cars on the track trying to pass or that you're trying to pass, etc. To make matters more “interesting”, the apex may be further around the turn or up over a hill and not visible ahead so it's good advice to memorize the track map, watch videos on *YouTube* and consider your apexes carefully before actually driving them.

Generally, racers want to be aware of 1) carrying speed as late as possible into the corner, 2) decreasing the arc of the corner which lessens cornering force and therefore allows for more tire grip to maintain speed and stay on the track, and then 3) smoothly throttle (foot on the gas) as soon as possible without losing traction to efficiently and quickly navigate the corner and beyond. Since driving the apex correctly allows the car to take the straightest line and maintain the highest speed through corner by using the widest possible radius into a corner, the higher speed compensates for the extra distance traveled. Additionally, driving the classic racing line will prolong the life of tires, maximize fuel economy, maintain momentum, and reduce the chances of understeer/oversteer* (*Don't ask, just trust me. You just don't want to ever do either of these, if possible; look up the terms if you're interested).

So, in the diagram below, you can see why the Watkins Glen pace car weaved all over the track (or someone in front of you like me who was attempting to “drive the line” correctly). Then there's the The Racer's Mantras: “Outside/Inside/Outside... In Slow/Out Fast...Brake/Turn/Throttle...Smooth is Fast”.

Let me summarize with this simple diagram and maybe it will “all become clear”.

THE CLASSIC RACING LINE



For the corner entry, you will normally want to be as wide as possible. So, say there's a right-hand turn as above such as Turn One, the 90-degree turn at Watkins Glen. To enter this corner, you'll want to be on the far left side (outside). Brake smoothly before you turn the wheel. As you turn in, bring your car across smoothly to the apex to the right which is frequently marked with an orange cone on racetracks (the "inside"). You may possibly graze the painted FIA ribbed curbing of the corner. Smoothly apply throttle and then exit the corner by letting the steering wheel "unwind" (release) out of the bend which it almost does by itself and track across to the left side (the "outside") as you exit the corner.

It's kinda' fun practicing "driving the line" on old country backroads but stay in your own lane and obey the speed limits, of course.

I hope you found this interesting. Remember, this is just the basic bare-bones of cornering and there's lots of variables to consider depending on the conditions I have mentioned. There's plenty of info on the *Internet* for further reading.

Zoom-Zoom Safely!

Gail and "Scarlet" ('06 True Red)

DISCLAIMER

Please note these tips are not reviewed or approved by the Mazda Motor Corporation or any other corporation or entity other than the originator. The Midstate Miata Club of NY does not accept any liability for damage or injury as a result of utilizing these tips and pointers. Please use common sense and always remember safety first!