

CORNERING BASICS

Part 2

Eyes & Steering

As we established in Part 1, what matters most when trying to lower lap times is exit speed. Curiously, however, if we took a sample of racers and asked them to write down their exit speed or exit rpms at their most-driven track, few would really know. Data Acquisition equipment and pit crews are not required to collect this information. All we need to do is pick a point just past track-out and glance at our dash. If a driver is serious about improving his or her performance, developing this habit is an easy and effective first step. Next, we need to make sure our line is consistent; our tires should be within a few inches of the edge of the road at turn-in, apex and track-out. If this is uncomfortable, try to be consistently a foot away at first and then start moving closer. When you're really consistent, a portion of your tire can be either riding on curbs or hanging off the edge of the pavement in nearly every corner. Our line also needs to be accurate... our tires should reach the extents of the pavement in *exactly* the same places, lap after lap.

Without question, the most important ingredient for achieving accuracy, consistency and smoothness is proper use of the eyes. Our eyes tell our hands where to steer, and they need time to communicate this. When driving in a straight line or at a casual pace, most of us drive with our eyes reasonably far ahead. Ironically, however, when we get into corners, or when we start driving aggressively, our eye come closer to the front of the car. The movie "Circuit" has some great in-car footage of Danny Sullivan racing a center-seat Can Am car at Riverside, California. The camera is mounted on the nose and pointed backward, showing Sullivan's hands on the steering wheel and his eyes through the visor. Entering Turn 7, while slowing from 160 mph, you see his eyes look left and into the corner, but his hands don't move until approximately 1.8 seconds later. At 120 mph this means his eyes were looking 316.8 feet ahead of the car. A good rule of thumb: try to keep your eyes looking three or four times as far (in feet) as your speed (in mph). Imagine that somebody throws a cone 50 feet in front of your car while traveling at 70 mph. You would have approximately 0.5 seconds to react... even if you missed the cone your evasive maneuver would likely cause worse problems than the cone. If the same cone was thrown 200 feet in front of your car, you'd have more than 2 seconds to react... enough time to make smooth and minimal inputs. When a driver identifies his track-out point prior to the apex he may see his early turn-in soon enough to fix the error by simply breathing off the throttle for a moment. If he doesn't see his mistake until after the apex it may require a large lift and/or added steering input, both capable of causing a slide or a spin. When we see our mistakes sooner and can correct them with less input. This discipline is important enough to warrant its own article and it's in the VRG archives, entitled "The Eyes Have It". I'd recommend reading it.

Paying close attention to the movement of our steering wheel is another important ingredient to lowering lap times. In most corners the steering wheel should be given a single input at turn-in, and that single input should take us to the inside edge of the road at the apex and then to the outside edge of the road again at track-out, where we again straighten the wheel. This movement of the wheel should happen as slowly and smoothly as possible. If you provide a certain measure of steering input at the turn-in, but miss the apex by 4 feet, then you turned in too late, too little or too slowly. If, approaching the apex, you have to remove steering input to avoid putting wheels in the dirt at the apex, then you turned in too soon, too much or too quickly. Let's say you turn-in smoothly, hold a steering arc that brings you to the edge of the road at the apex, but then as you approach track-out you have to add more steering to stay on the road. In this case, you turned into the corner too early. The feedback provided by steering wheel movements is pretty simple to work out, but we must be diligent at paying attention to it. Further, we must discipline our hands to remain as still as possible. Far too many drivers go through corners sawing at the wheel like Speed Racer. In road racing, most who do this think they're responding to changes in yaw, when in reality they're compensating for their last unnecessary steering input they made that upset the balance of the car. The first couple of laps of every practice and qualifying session should be driven with smooth, precise steering inputs, and without the need for steering corrections of any kind. Once the speed comes up and we begin generating slip angles, we will make corrections as necessary. The smooth, single steering input, however, should be our baseline.

The best way to practice making precise steering inputs, evaluate the success of those inputs and envision the proper line while entering a corner is to do so every time you set foot in a car... any car. Next time you leave your driveway challenge yourself to obey the 3-4X speed/distance rule with your eyes. As you go through corners your tires should kiss the double yellow line at turn-in, flirt with the edge of the road at the apex, and return to the double yellow at track-out... all with a single steering input made at turn in.