Driving Lime Rock

By Bill Gilbert

With the Lime Rock DE in a few days, it is timely to describe one of my favorite tracks: Lime Rock Park in Connecticut. I have been driving Lime Rock for more years than I care to admit, but I always love to go back. It has a flow, and challenges, that reward the driver. It reminds me of Watkins Glen and some of you have heard me describe it as "half of Watkins Glen".

In a moment we'll do a lap around the Lime Rock. But first let's consider lessons that Lime Rock has to teach us.

At Lime Rock, the track surface is generally smooth and grippy but, in some not helpful situations, off camber. Consider the exit of the right-hander onto "no name" straight. This corner would be a lot more fun if it were banked properly. Instead, just at the point we are picking up speed, headed toward track out, the road goes from being banked properly to off camber. In fact, the road here is much like a typical crowned road. This may not seem like a big difference, but a typical road crown is about 4°: positive 4° versus -4° is approximately 15% difference in traction! A very noticeable amount. The same phenomenon happens when exiting the downhill. The road goes from on-camber to off-camber.

On to lesson two: the track configuration. And here we have a lot to learn indeed. Lime Rock has several very fast corners, and no "slow" corners: third and fourth gear in most Porsches. When almost anyone pictures Lime Rock, they first think of Big Bend. This signature corner is indeed challenging, and no two drivers take it the same way. Big Bend is actually two corners, numbered 1 and 2 on the track map. And it is best learned, and driven, as two corners (though there is a perfectly safe way to drive it as one, single apex corner). Since turn 1 finishes the longest straight on the track, this means it is a classic type II corner (type I, type II, and type III corners were first described, as far as I know, by Alan Johnson in his book "Driving in Competition").

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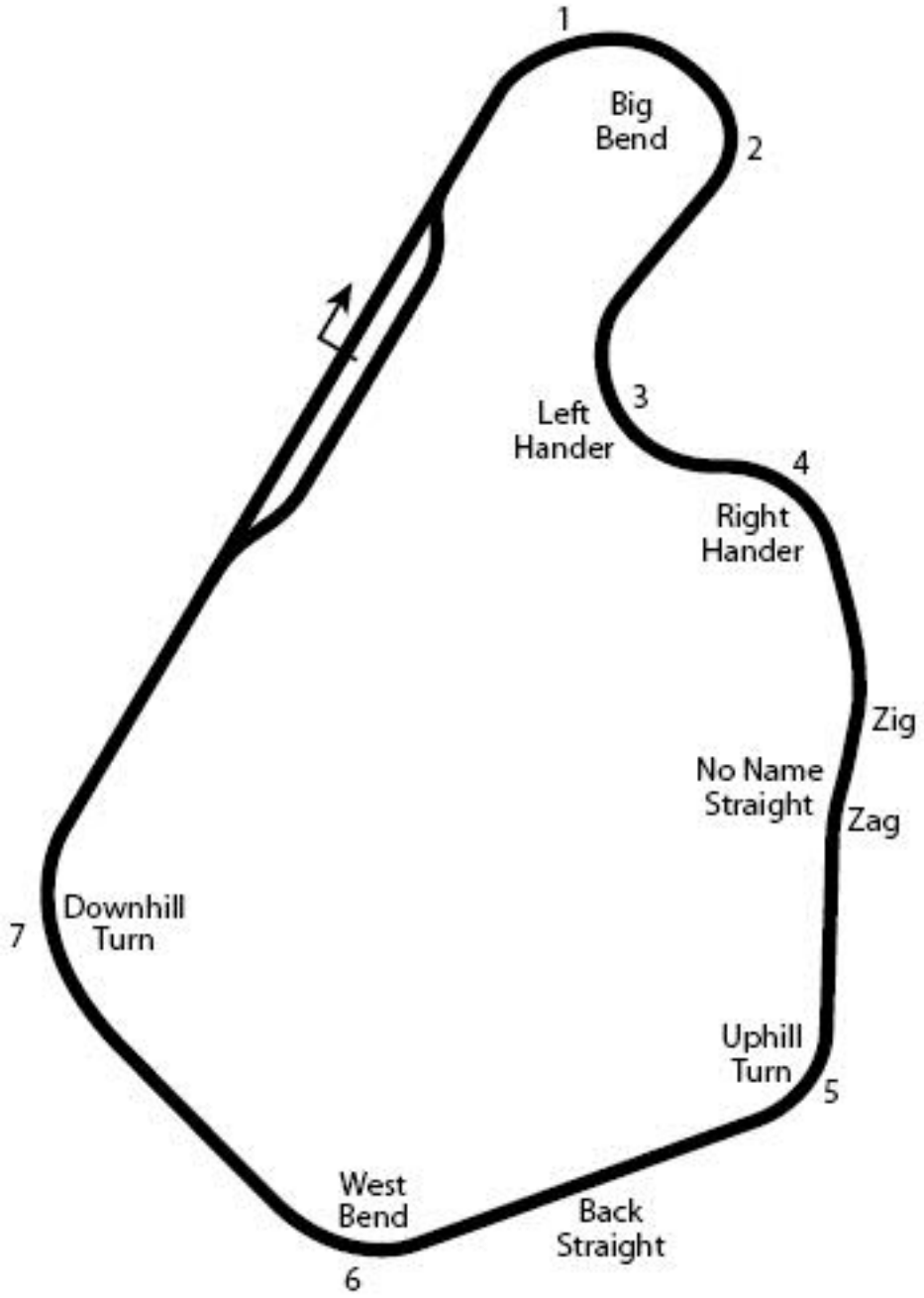

A type II corner means that we want to enter as fast as possible, lengthening the previous straight. It is a type II corner because we do not need to worry about the exit speed. Specifically turn 1 leads immediately into turn 2, which is slower and slightly decreasing in radius. To oversimplify slightly, the only thing we have to worry about in turn 1 is entering as fast as possible, and setting up properly for the entrance to turn 2. If you inspect the track map carefully, you'll see that turn 1 is indeed faster (i.e. bigger radius) than turn 2, which explains why there are so many different lines: everyone is looking for the fast way in.

Turn 2 is important because it leads onto a short straightaway. But it is very easy to early apex turn 2 and lose momentum or end up in the grass. The typical maneuver onto the grass starts when the driver approaches track out and "discovers" that he or she is going too fast (usually caused by being early, or using too much gas, too soon). The inexperienced driver, seeing the edge of the road approaching rapidly, will want to lift off the accelerator pedal. Of course, this is the worst thing to do, and inevitably leads to a spin onto the grass. If the driver is lucky, the spin will be to the outside. If the driver is unlucky, the spin will be to the inside of the track, where a tire wall awaits. So turn 2 deserves to be treated with great respect and has a lot to teach us.

Turn 3 is the only left-hander at Lime Rock. It is a type II and almost a type III corner. The line into turn 3 is determined completely by turn 4 which comes immediately after. In fact, they should be thought of as one maneuver or sequence even though they are numbered 3 and 4. Since turn 4 leads onto the back straight, it is very important (a type I corner). The only way to properly set up for turn 4 is to exit turn 3 on the far left, which is completely opposite of where we would like to be! This strange configuration has been known to confuse more than a few new drivers. The entrance to turn 3 is not terribly critical, as long as we can set up the exit. This means we should carry as much momentum as possible into the corner. There is some banking to help us, and quite a bit of real estate. However, it is not worth getting too ambitious, because we really need to focus on the exit.

The key is for the car (and the driver) to be calm, cool and collected on the far left of the track exiting turn 3, ready to turn in for turn 4. There are only a few feet here where the car is truly straight and they are critical for proper entry to turn 4.

The remaining corners at Lime Rock: the uphill, West Bend, and the downhill are each very fast and require similar skills. First: the matter of trail braking. While most cars and drivers will benefit from trail braking into Big Bend, it is a major mistake to trail brake more than a tiny bit into these three fast corners. This is because none require heavy braking, and all require the car to be balanced carefully for proper entry. Advanced drivers may find that a very small amount of trail braking is helpful. But many intermediate and advanced drivers wonder why their cars feel nervous entering these corners. The reason is simple. They trail brake too far into the corner and wait too long to get on the gas, causing the back of the car to be unloaded and therefor nervous. And they've given up serious momentum.

On to lesson three. Driving a track requires reference points (RP's). Lime Rock has few paint marks or similar to help us (the Skip Barber Driving School dots are hard to see but worth looking for). However, there are trees, and other non-movable objects to serve as reference points. One aspect of Lime Rock that I always notice is the effect of the sun or, more specifically, the shadows. In the afternoon, the tree along no-name straight casts a shadow across the track where our braking zone is for the uphill. This may or may not be helpful, but it certainly can be surprising if we are not ready for it.

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The fourth lesson Lime Rock has to teach us relates to safety. Like many older tracks, there is little runoff room between the edge of the track and tirewalls and other barriers. What does this mean for our driving? It means that we need to be very conscious of our pace and keep our speed at or below "eight tenths". After all, this is Drivers Education, and we all want to take our cars home in the same condition they arrived.

So with all this in mind, let's take a lap around Lime Rock. First my normal disclaimer: the following reflects how I drive Lime Rock, in my car, under good conditions, once the car, tires, and my head are fully warmed up. And I've done more than a few laps here. Translation: my line and techniques may or may not work for you. And you probably have quite a bit more power (my car has 230 hp and weighs over 3100 lbs), meaning you may need a slightly later apex and will be further through the corners before your foot is on the floor. Some of this is for advanced drivers: if you are a beginner, please don't expect your instructor to teach all of these techniques! With that out of the way, let's go.

Let's start on the front straight. As I head down the front straight, my eyes are on the flag station far to the right (this flag station is not in my normal field of view, so it takes extra effort to pick it up every time). I am also watching the mirrors as this is a major passing area. As I proceed down the straight checking gauges and taking a deep breath, I am looking for the brake markers on the left. At about the 4 mark (5 also works), I angle the car toward the (early) apex of turn 1 (the point where the curbing sticks out the most, from this angle), and then begin braking, staying on this angled line (which gives me a straight line for braking, got it?). As I approach the apex curbing for turn one, I finish the downshift to third gear and trail off the brakes as the car brushes (or runs across) the apex curbing (this is one of the few friendly curbs, most of the others need to be avoided). Neutral throttle or a little more carries me toward the middle of Big Bend as I get my eyes up and to the right, looking for the flag station at Turn 2. I want the car 2/3 of the way towards the outside of the track, with the left side remaining on the positive camber. (This is another line determined by the banking; normally we would go all the way to the left, but the track goes off camber there). If momentum has carried me properly to this point, I can see through the apex of turn 2 (approximately opposite the flag station) to the track out curbing (20 feet or so before the end is my RP). There is a deep depression at the apex of 2, and I want to be looking well around that apex curbing and that depression, in order to avoid an early apex. Turn 2 can be a lot of fun. When the conditions are right, it's one of the few places on any track that rewards throttle steering (in the transition from turn 1 to turn 2).

When done properly, I come shooting out of turn 2, up the chute toward turn 3. I aim for the men's restroom building, and, as I approach the banking for 3, brake just enough to get the car turned—we want a relatively long trail brake here. I stay at least a car width or more in from the right-hand edge, knowing full well that most drivers are further out to the right. The critical thing for me in the left-hander is to avoid being early or getting on the gas too soon, both of which are very easy to do. It actually helps to come in fast and let the momentum carry you well into the corner. I look at the apex curbing and want to apex more than half way around it; I can even drive on the last portion though the gators are very rough. I'm also looking for the painted line at track left exiting Turn 3. As soon

as I can see (and feel) that the car is turned enough to line up that painted line, I begin to accelerate hard knowing that the car is pointed exactly where it needs to be. My foot is on the floor for a moment. As I line up the left edge and look at the apex for turn 4, I breathe the gas, turn in, pause for an instant while the car takes a set, then begin to squeeze the gas again. I never squeeze the gas hard until I'm very confident that the right front tire has dropped into the depression at the apex of turn four and the car is pointed safely into the banking past the apex. I do not want to be early here (remember the off-camber discussion?).

On "no name" straight, it is time to look in the mirrors and the gauges, but only a glance since no-name has a zigzag that requires lots of attention, particularly if we are giving or receiving a pass signal. After we finish the zigzag, we have a brief section of real straight before braking for the Uphill. I catch 4th gear here.

The Uphill is a lot of fun, but I also find it intimidating. Something about track out being about 12 inches from the Armco and the car goes light over the hill! So, just like we teach, I aim to be a car width inside coming across the top of the hill (which leaves margin if I need it). More important is that the car must be straight. This is especially true for moderate and high horsepower cars. You must be straight when cresting the hill and be prepared for wheelspin if you are on too much gas. There is a reason the pro races here use the chicane: otherwise cars get airborne and worse.

I brake early for the uphill, so that I can brake lightly in a straight line (more like a brush) and not upset the car. For the same reason, I stay in 4th gear, though 3rd will work (but the downshift upsets the car and causes me to overslow). So a gentle brush that takes off only a little speed and helps the car turn, aim for the apex curbing (run along it for a few feet), foot back on the gas, and into the hill. As soon as the car hits the hill, it feels solidly planted and will take full throttle; sometimes a minor correction to make sure I am straight over the top. No correction if I've done everything properly. But it is essential to be straight going over the hill! In a powerful car, you will need to breathe the gas going over the hill.

The little straight that leads to West Bend has a tire marks in the paint line on the left. These make great RP's for a braking point, and for a turn in point, but can be hard to distinguish, depending on the amount of sun/shadows and the angle of the sun. Again, I try to brake early and lightly, staying in fourth gear. The apex is the break in the curbing (look for the road) and we want to stay tight for a few feet. Track out is way down the left side (look for the break in the curb where the road joins track left). As soon as I have turned in, I'm looking through the apex at the bridge, squeezing gas on early, on the floor before or by the apex.

As I head toward the bridge, I check the mirrors (passing zone is on the front straight) and line up a straight line down the hill staying all the way to the left. This means my left front tire is exactly at the edge of the track at the bottom of the hill. As I start down the hill, a brief brush of the brakes to settle the car. It is easy to know when to turn: I can feel the front end hit the flat road surface at the bottom of the hill, time to turn. Since I have

that bit of compression and help from the trailing off the brakes, the car turns readily and I'm looking at the apex. This is another relatively long apex where I want to use every inch I can to lengthen the corner. I'm feeding gas on briskly after the car turns in. And remember, the track goes off camber half way between the apex and track out. This isn't an issue if we are unwinding the steering and accelerating. But it is an issue if you are early are on too much gas too soon! If you find the car running wide, do not try to hold it on track. There is room to drive onto the grass with one or both sides of the car. But be sure to keep the car straight on the grass and slow way down, then slow some more, before easing the car back onto the track.

And here we are again on the front straight. I look in the mirror as soon as possible to know if an early pass signal is in order. The front straight disappears fast and here we are entering Big Bend again!

One last comment harkening back to Lesson 4. We've all heard people say, "You can take the downhill flat." I'm sure that is possible in some cars and for at least some drivers. I'm even sure that I could if I wanted to. But I have no plans to try. I strongly recommend that you don't try it either!

So there you have it: one lap around Lime Rock Park. I hope I've stimulated your thinking—and that you find a few tips that you can apply for your "Safe, Serious, Fun" at Lime Rock.

See you in the corners,

Bill

Disclaimer
The techniques shown here have been compiled from experienced sources believed to be reliable and to represent the best current opinions on driving at Lime Rock Park. But they are advisory only. Driving at speed at Lime Rock, 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.

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