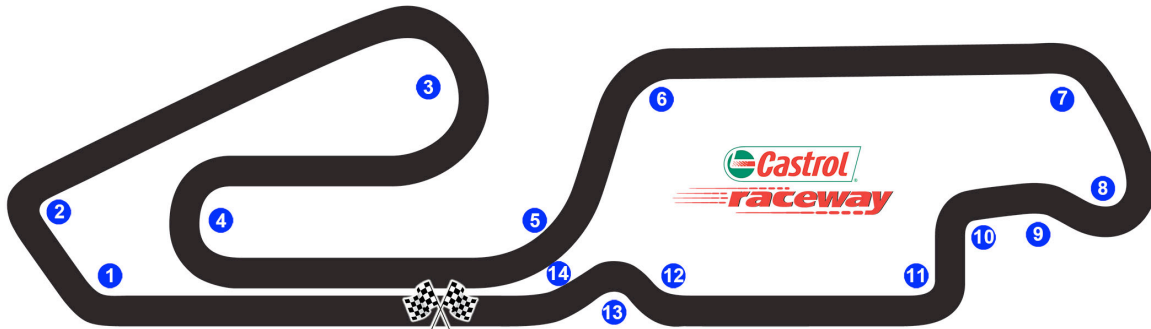


A Lap of Castrol Raceway

This description was updated in August 2014, which is before installation of kerbing but after all walls have been moved back from track edge. Corner numbers are as below.



If you are new to track driving, some basic theory on track driving and definition of key terms will help you absorb this description. If you've ever watched a road race, you will likely have noticed that the drivers spend most of the race driving in single file using the same part of the racetrack. This is because there is typically only one fast way to approach and execute the corners, commonly referred to as the "driving line", the "racing line", or just "the line". The fastest way through corners is generally to maximize the corner's radius, using all of the available track width. For a right-hand corner, for example, the fast line will generally require you to move to the left edge of the track before entering, move across to the right edge as you execute the corner, and move back across to the left edge again as you exit the corner. The point at which you begin decelerating before a turn is your "braking point", the point at which you initiate the turn is called "turn-in", the point at which you transition from entering the corner (slowing the car and increasing steering wheel input) to exiting the corner (unwinding the steering wheel and accelerating the car) is referred to as the "apex", and the point you move toward after the corner is referred to as "track out". The apex may or may not be at the edge of the track, especially if the pavement edge is not entirely symmetric.

This description also references the theory outlined in Alan Johnson's 1971 book "Driving in Competition." Johnson's major contribution to motorsport is a coherent, sensible approach to analyzing a road course in order to find a fast line. His approach divides the corners into three types: Type 1 corners are corners that feed into straights; Type 2 corners are corners that follow straights; and Type 3 corners are compromise corners that feed other corners. Corner importance is then ranked by the length of the straights they feed into (being the primary factor) or follow (being a secondary factor). Using this ranking, one adapts the line through each corner or sequence of corners so as to begin accelerating as early as possible on the longer straights and begin decelerating as late as possible, essentially elongating the straights. Once the line has been adapted in this manner, the optimal apex is seldom in the exact geometric center of the corner ... hence the terms "late apex" and "early apex" referring to the relative position of the apex within a given corner.



Track Entry

Track entry brings you into traffic flow at the exit of Turn 2, on driver's left. It is important to have your eyes up and be aware of traffic coming through Turn 2 at speed. Follow the pavement edge on driver's left as you pass the Starter, continuing to follow the pavement edge on driver's left as you turn onto the straight. Stay on the left pavement edge and watch carefully on driver's right for traffic coming through Turn 2 at speed. Once on the straight, accelerate hard to merge into the traffic flow and to avoid being a speed bump for faster cars.

Turn 3

About the physical layout: Your first corner at speed is the signature corner of Castrol Raceway, also referred to as the "Speedway" corner. This long right-hander with 6° of banking is a difficult corner due to the tendency to creep to the bottom of the banking too early. One can argue this corner has two turn-in points, and patience waiting for the second turn-in point is rewarded. Looking at the wall on driver's left is sobering, and tends to keep drivers from entering too fast. The apex is very late in the corner.

The ideal approach: Stay along the left edge of the track through the braking zone as you approach, resisting the urge to turn in too early. Look ahead and visualize the car entering the corner with the left wheel on or just slightly left of the middle pavement seam, almost mid-track. Carry speed through the first half of this long corner by maintaining this mid-track line until you can see the apex cone around (not over) the wall far away on the right track edge, then lift slightly and feed in some additional steering wheel input to point the car down the banking toward a very late apex. As you reach the apex at the bottom of the banking, get back onto the gas and unwind the steering wheel. You will still have lots of grip as you pass the apex and begin to rise out of the bowl, but as the track levels out the suspension will unload a bit and the car will feel like it is losing grip ... be careful not to put a wheel off the left edge.

The short straight that follows is busy because it is a fairly short distance to brake, downshift, and get across to the right side of the track in preparation for Turn 4.

Turn 4

About the physical layout: This is a mid-radius left-hand hairpin leading onto a long straight ... a typical Type 1 corner. This corner has about 2° of banking and no appreciable change in elevation. Getting on the gas early and hard for the straight that follows is important, and again patience waiting for a very late apex (located about 160° around the corner) is rewarded.

The ideal approach: You want to get more than half way across the corner to the right, and preferably all the way right, as you approach. Go quite deep before turning in, and then gradually make your way across the track to the apex. You need to get the car rotated and parallel to the left pavement edge at the apex, which points you down the straight that follows and allows you to get back on the gas for the entire length of the straight. Visualizing track out being well in the distance on driver's right will help make the wall disappear.



Turns 5 and 6

About the physical layout: While Turn 5 and Turn 6 may seem like separate corners, they are best considered as one complex, high-speed, left-right chicane with Turn 6 being a far more important turn to get right than Turn 5. This is because Turn 6 is a Type 1 corner leading onto the second longest straight of this track, whereas Turn 5 is a corner following a slightly shorter straight. Be aware the banking falls off slightly at track out of Turn 6. This dictates giving up a bit in Turn 5 to get a clean exit from Turn 6 that will allow you to get on the gas early, and stay on the gas all the way down the long back straight.

The ideal approach: Stay on the right and hug the wall through the braking zone into Turn 5, initiating your turn where the wall begins to curve left. Plan for a very late apex (nearly at the end of Turn 5), and then continue along the left edge of the track. You will need to brake slightly before entering Turn 6 with its smaller radius. Again, a later apex is called for in Turn 6 so that you get on the gas early and stay on the gas without running out of track on driver's left and without having to lift.

Differences Between The East And West Ends Of The Track

At this point, it is important to understand that turns 1 through 6 were surveyed, graded and paved in fall of 2012, and turns 7 through 14 were surveyed, graded and paved the following summer. Turns 1 through 6 have constant banking of about 1-2° (and 6° in the signature Speedway corner), but turns 7 through 14 are crowned with zero overall banking. The crowned track surface means that you have slight banking in your favour near the apex of corners but the banking falls away as you cross toward track out. Planning for the loss of banking, and resulting loss of grip, is important if you want to stay on the asphalt.

Turn 7

About the physical layout: Definitely a Type 2 corner, where one wants to maintain and carry speed. The right-hand corner is significantly less than a right angle. There is a slight rise in elevation at the turn-in point, but the banking falls away drastically when you cross the crown on exit, and even experienced drivers underestimate the loss of grip. A lot of drivers find the Canola field at track out.

The ideal approach: Stay left in the braking zone and plan for a late apex. Track out is about half way down the short straight between Turn 7 and Turn 8. You will need to get all the way over to driver's left on exit, parallel to the track edge, in preparation for Turn 8. Your car will seem to turn in easily due to the suspension compressing at the turn-in, but this is short-lived due to your suspension releasing at the apex and the loss of banking after you cross the crown on exit. A gentle release of the brake will help you judge speed through this corner.

Turns 8 through 11

About the physical layout of these corners: This is a complex series of quick corners, made much more difficult by the crowned track surface and its dynamic effect on grip. The most important corner of the sequence is Turn 11, a Type 1 corner requiring a late apex. Setting up for Turn 11 requires a very late apex in Turn 10. Turn 9 is actually a straight. Turn 8 is virtually a



hairpin, perhaps the slowest corner on the track, and more drivers go off track here than anywhere else. Mastering this series of corners requires planning your exit from Turn 11 at the time you enter Turn 8.

The ideal approach: Your car needs to be parallel to the left track edge as you approach the turning point for Turn 8. Turn hard and stay on the right half of the track so you have the benefit of banking. Look over your right shoulder for the right track edge at the back of the hairpin, working the car all the way around to the right edge. Then unwind and point the car between the left edge of Turn 9 and toward the right edge at the entry of Turn 10 in the distance, briefly getting on the gas and squirting through Turn 9 almost in a straight line. You need to brake hard and position your car parallel the right edge as you approach the turn-in point for Turn 10. A very late apex in Turn 10 will allow you to position the left wheels along the left edge of the track between Turns 10 and 11, then take another late apex in Turn 11 and get on the gas.

Track Exit

If you are exiting the track on this lap, you will stay left on the straight between Turn 11 and Turn 12, signal that you are leaving the active track, and continue straight into the hot pit rather than turning right for Turn 12. Braking slightly in the brake zone for Turn 12 is acceptable, but the majority of your braking will take place after the turn-in point for Turn 12 as you pass the tire wall on driver's right. Entrance to the Paddock is at the east end of the Hot Pit behind Turn 1.

Turns 12 through 14 (the "Kink")

About the physical layout of these corners: This is a quick right-left-right chicane preceding the longest straight of the track. Lots of drivers wish this chicane was straighter (or not there at all), but the trade-off is that this chicane limits speed on the approach to Turn 1 for safety reasons. The effect of the pavement crown combined with Turn 13 being slightly elevated caused the car's suspension to compresses after the apex of Turn 12 and release after the apex of Turn 13. Turn 14 is really part of the long straight that follows, so it is important to treat Turn 13 as a Type 1 corner and plan a clean exit that allows you to get on the gas and stay on the gas without running out of track on driver's right in Turn 14 and without needing to lift.

The ideal approach: Stay left in the braking zone as you approach Turn 12. Turn 12 requires a late apex, and you need to get all the way over to track edge on driver's right, then continue up the middle of the hill where you can brake and reduce speed a little further. Your car needs to be fully rotated and parallel to the left track edge as you crest the hill and pass the apex for Turn 13. Track out for Turn 13 and the apex of Turn 14 are virtually the same place, so unwind the steering wheel and point the car down the straight and get hard on the gas as you head toward the start/finish line.

The test of whether you are optimizing your exit from Turn 13 right is that you can get hard on the gas at the apex without running out of track on driver's right in Turn 14 and without needing to lift; AND that you actually need all of the track on driver's right as you approach the apex of Turn 14. If you are just driving over to the right side of the track, you are leaving a bit on the table.



Turn 1

About the physical layout: This right-hander is a Type 2 corner with some of the faster cars reaching 180+ kph as they approach their braking point. The approach speed combined with concrete safety barriers on both sides of the track make this the most intimidating corner on the track, but frankly there is more room than you think. Important to note that the pavement edge on driver's right is almost angular, and straight rather than curved for a two car-lengths near the apex. Due to its asymmetric shape, the proper apex is about 2 feet off the pavement edge, about half a car-length before the end of the straight section of track edge. There is very little banking in this corner (less than 1°), and it is very slightly off camber at the exit (about 0.5°).

The ideal approach: Hug the wall on driver's left as you approach, and when you get near the 100ft brake marker the concrete on driver's right will open up allowing you to see through to track out. There is a small depression at the apex that tends to unsettle some cars, but still you want to get all the way over and pass the apex with your car parallel to the straight portion of track edge. Then track out near the tire wall on driver's left, straighten out the car and get hard on the brakes for Turn 2.

Experienced drivers who have learned to ignore the wall (very difficult) may want to trail brake through this corner, or at least use a trailing throttle. However, this is not the corner for novice drivers to learn this delicate technique because of the unforgiving wall at track out.

Turn 2


About the physical layout: This right-hander is a classic Type 1 corner leading onto a long straight, and the most important thing about this corner is that a clean exit that allows you to get on the gas early to maximize acceleration down the entire length of the straight. There is elevation change that compresses the car's suspension slightly as you approach the apex but unloads the suspension as you depart the apex. This corner is also asymmetrical, like the one before, with more pavement width on driver's right before the apex than there is after the apex ... due to its asymmetric shape, the proper apex is about 2 feet off the pavement edge about half a car length before the point at which you pass closest to track edge (also being the point at which the track levels off). Track entry brings cars onto the track on driver's left at track out.

The ideal approach: Stay far left as you approach and brake hard before the turn-in. The apex is blind as you approach the turn-in point, so you need to get your eyes up and look past the end of the concrete safety barrier on driver's right for the apex to come into view. As you cross the track and toward the apex, the elevation increases grip which helps you rotate the car. Once you reach the apex, however, the track levels out and your grip decreases. By the time you get to the apex the car should be rotated so that you can unwind the wheel and get back on the gas. If you have to stay off the gas after the apex because you are fighting understeer, you've likely turned in too early, not moved all the way right to the apex, or simply come in too hot ... and not being able to get on the gas will cost you speed down the entire length of the straight.

As you proceed through Turn 2, be aware of traffic entering the track on driver's left ... which means we have completed a full lap of the track.



What is a Fast Lap Time?

At the time of writing, the lap record for a closed-wheel sportscar is 1:19, held by Peter Spencer driving the -sponsored Porsche 997 GT3 Cup car ... and giving new meaning to “fast food”. We also thank Peter for providing critical feedback that has been incorporated into this description of a lap of Castrol Raceway.

What Should I Work On First?

The largest improvement in lap times comes from learning to drive an appropriate line. This means not just arriving at the optimal apex or track out location, but also having your car rotated and pointing in the right direction when you arrive there so that you can begin to accelerate.

Bear in mind Alan Johnson’s approach, and begin by first mastering the exit of corners feeding into the long straights. With some experience, and as you become more consistent, you can start moving the apex earlier in small increments until you find the earliest point at which you can get hard on the gas and stay hard on the gas without running out of track and without having to lift. This is a lower risk aspect to work on because you can usually lift slightly and regain control if you misjudge the apex by a small margin.

Then begin to work on carrying more speed through the middle of corners *without affecting your exit from the corners*. Especially on the longer corners, carrying slightly more speed through a corner can have a significant effect on overall lap times ... but not such a great effect that you should compromise your entry onto a long straight.

Lastly, you can start to maximize your speed at corner entry using advanced techniques like trail braking, and by moving your braking point later in very small increments. Bear in mind that as you maximize your speed earlier in a corner, you reduce the margin of error you have if you misjudge and need some room to recover. This is especially true in Turn 1 and Turn 3 with their unforgiving walls.

A General Note About Going Off Track

Should you go off track, it is best to ride it out until you have slowed the car and can drive back onto the track surface in a smooth and controlled manner. Slowing the car from speed is best accomplished by fully depressing both the clutch and brake (referred to as “both feet in”). Jerking your car back onto the track surface at speed will often cause a loss of control and a further incident. In fact, a controlled exit in a nearly straight line is almost always preferred to a Hail Mary maneuver that may upset the car or potentially cause a wheel to catch in the dirt. It is important to return to the track surface OFF THE DRIVING LINE so that any mud or gravel you bring onto the track, or fluids you may now be leaking, will not immediately affect other drivers. If you cannot return to the track surface, either because of traction or physical damage, you must stay in your vehicle until the safety crew arrives to avoid being struck by another competitor’s vehicle that may leave the track just as you did.

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