



## *Driving Watkins Glen International*

The purpose of this article is to serve as a uniform baseline for students and instructors participating in driver education events at Watkins Glen. It is not intended to represent the fastest or best line, but a conservative line that is consistent with competent high performance driving skills.

Watkins Glen is a 3.40 mile 15 turn course that has many elevation changes and is quite wide compared to many other road courses. It was designed to accommodate world class racing and remains one of the finest road courses in the world. Partially because of its design for safety at very high racing speeds, the guard rail is quite close to the track. Thus, there is little margin for error. An off course excursion is likely to damage your car. However, there are a several comers with runoff areas.

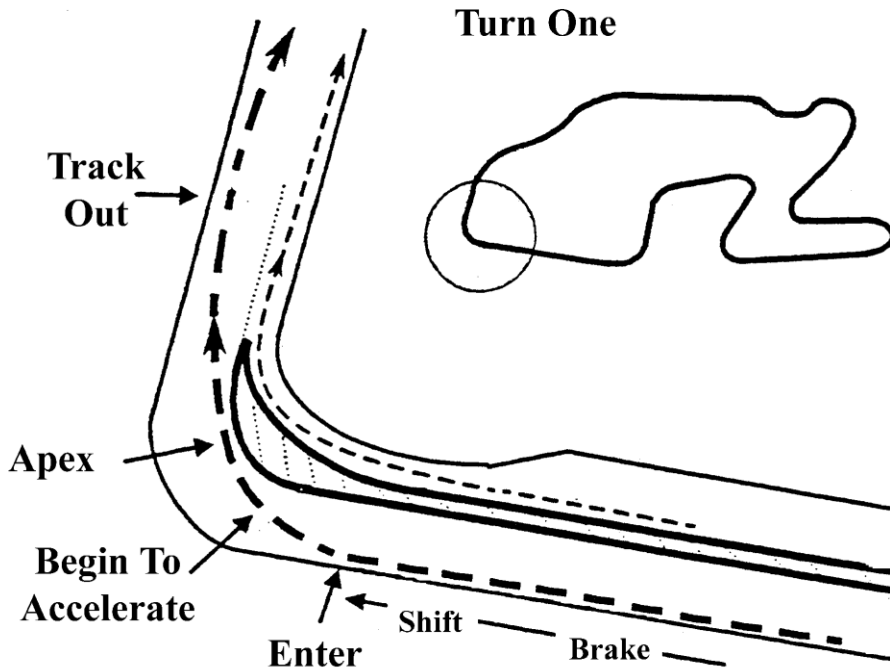
The criteria for the required liability insurance is that these events are functionally the same as one car at a time events. In particular, any form of racing is strictly prohibited. Car to car interaction must have no impact on safety. As a result there are very strict rules for passing. These rules are:

There is passing only in designated passing zones on designated straights.  
Passing only occurs with a signal to the passing car from the car to be passed. NO SIGNAL - NO PASS  
The overtaking car then goes off line to pass.  
The car being passed facilitates the pass by slowing slightly.  
The passing car **will not** start a-pass if the pass can not be completed before the end of the designated zone.

Cars that follow to close, pass without a signal or fail to give a passing signal where appropriate will loose run time on pit road in the black flag station and those that repeat offences will be ejected from the event.

Throughout this document, we mention the use of reference points as an aid to positioning your car, especially as you enter some of the longer corners. The reference may be a pylon or an object like a distance marker preceding a corner. In many cases, the pavement seams that run along the track or across the track are very useful. The seams make especially good markers for positioning the car on the -track while entering sweeping late apex corners. Instructors and students should work together to identify useful markers in order to develop consistent technique. However, do not fixate on these markers. Note them and relegate them to your peripheral vision. Keep your vision and your concentration well ahead of the immediate path of the vehicle.

In general, these events are not as stressful on your car as you might envision. However, brakes are an area of consistent stress, especially for intermediate and advanced drivers who tend to use their brakes hard. Vigorous use of power, tires, and brakes make it possible to overwork the brakes on this course. If you find this to be the case, there are several suggestions. One is to back off a little. Unfortunately, using the brakes easier but longer is not usually very effective. However, letting off on the gas early and letting aerodynamic drag slow the car seems to be effective. Then you can use the brakes firmly and properly, but from a slower speed it is also reasonable to give the brakes a little "test" before the critical braking point for a corner. This may not seem "cool", but it could save you or your car from more serious consequences. A problem commonly occurs if the brakes are very hot when you come into the pits after a run. Vapors from the pads condense onto the rotor as the car sits. Then, during the next run, this causes the brakes to thump and the steering wheel to shake when the brakes are applied. Although the problem often goes away with use, it may also lead to permanent damage and warping of the rotors. This can be avoided by proper cool-down of the brakes before parking the car. At most events the checkered flag is shown well before the entry to the pits. It is often shown at the end of the back straight. Please slow to a pace where the need to use the brakes is minimized but the airflow is still good. This is also a good opportunity to cool you r motor and your mind. Even with cool-down time, the brake problem may occur. It helps keep the car moving after the run. A slow 5 five minute drive around the infield access roads outside the pit area can be very helpful before parking the car.



**TO ENTER TRACK FROM PITS:**

After the go ahead signal from the staging worker, proceed across the paddock through the track entry gate and watch for another go ahead signal from the black flag marshal. Stay to the right of the orange cones on pit lane and check your mirrors for cars coming off track to your left. Once clear of the cones and off track traffic, drive down pit lane. Prior to entering the track, test your brakes and scrub your tires as necessary. Stay to the right of the yellow blend line between turns one and two and enter turn 2 from the far right. When you reach the apex of turn 2, resume the normal driving line.

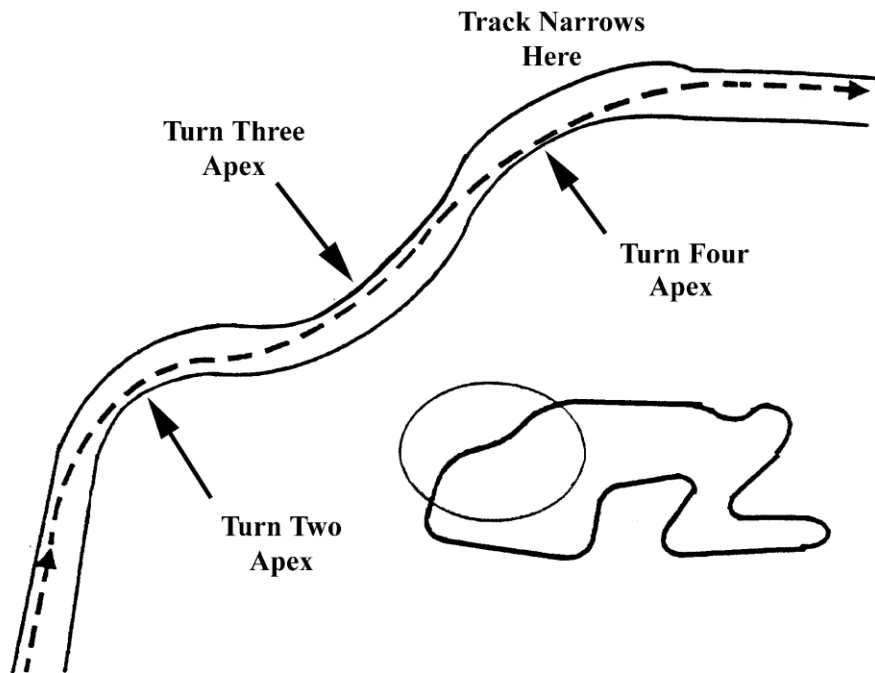
**NOTES: Turn One**

1. The approach to turn 1 is from the left side of the track. During the approach to turn one, stay 12 to 18 inches from edge of pavement on the pit straight away. This gives a safety margin during braking & down shifting.
2. The approach speed to turn 1 is much faster than the cornering speed. Hard braking is required because you are going down hill and a downshift is often necessary. RPM matching techniques are important here. Shift fairly late in the braking sequence to avoid over revving the engine.
3. This is a late apex corner, with a late and decisive entry.
4. Begin acceleration immediately after entry and increase acceleration as you move in toward the apex. You should come very close to the apex (6 – 12 inches is OK).
5. Go to full acceleration as you approach apex, unwind or drift toward track-out point.
6. Momentum and cornering force should carry car out toward track-out point. Stay about 12 to 18 inches from edge of track for a reasonable safety margin.
7. The most common problem is to brake too soon & too little and then enter too early & too fast.

**OBJECTIVE:**

1. Fast exit.
2. Create an entry point that best suits the handling of your car.
3. This is probably most important corner on track for lower powered cars.

## The Esses



### NOTES: The Esses

Check your mirrors before entering turn two if you have been overtaken it's likely you will be passed on the back straight after you exit the esses. Move right and give the pass signal. Once the pass is complete get back on line in preparation for braking and the inner loop.

- 1) Turn 2 is quite fast and is entered gradually with minimal braking.
- 2) The apex of turn 2 is along the curb, stay right near the curbing after the turn two apex.
- 3) Near the end of the curbing, begin to cross over to turn three. Cross over firmly but very smoothly. This is where you head uphill.
- 4) Follow the camber of the road toward the apex reference for turn three.
- 5) The transition from turning left to turning right occurs shortly after you pass the apex reference for turn three. As before, follow the camber of the road so that it is in your favor.
- 6) The apex of turn four is not too critical, but do not go left too early. The track narrows slightly and you can run out onto the grass if you're not careful.
- 7) Check your mirrors again at the apex of turn four. This is where the 'set up' for passing occurs. If you are to be passed, stay right as you exit turn four onto the back straight away. If you are not being passed, be careful not to get to the track-out point too early, again the track narrows slightly and you can run out onto the grass. This is not a good scenario.

If you plan to pass coming out of turn four, stay to the left and watch for the signal to pass from the car ahead of you. Note: if you stay too far to the left, the car ahead may not be able to see you in his mirrors.

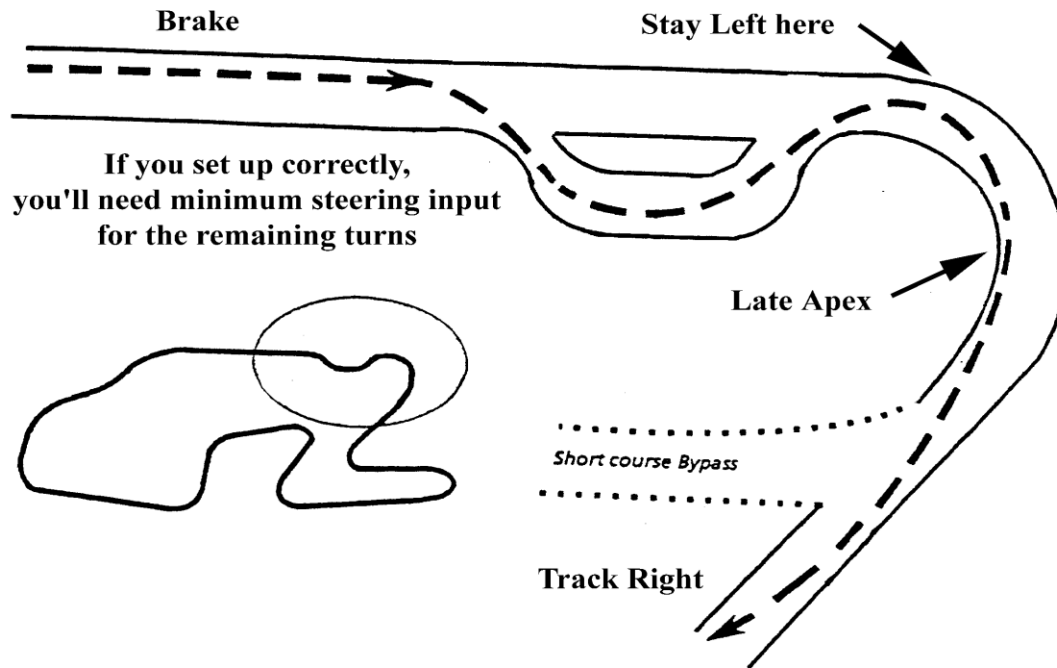
### OBJECTIVE:

- 1) Safe fast entry to back straight away.
- 2) Anticipate being passed.
- 3) Anticipate overtaking the car ahead.

Copyright © 2004 Phoenix CMR Inc.

This material recreated from "Driver Education At Watkins Glen" by Walt Leising

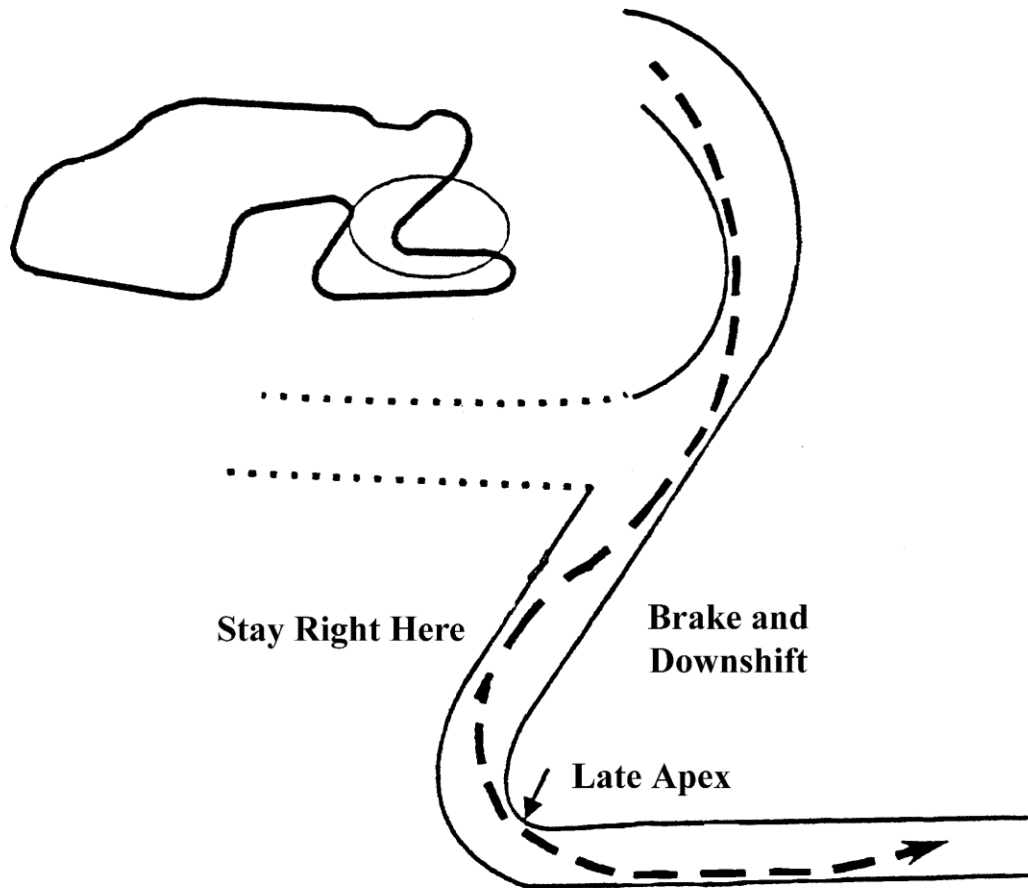
## The Inner Loop and Turn Five



### NOTES: Inner Loop and Turn Five

The Inner loop, although designated as 4 different turns, is actually a series of three turns. If you set up and enter properly, you can hold the steering wheel in one position through the inner loop turns. Entry to the inner loop from the straight is a hard right hand turn. The primary objective of this turn is to set up properly for the remaining two turns. These become one sweeping left turn that covers most of the inner loop. Getting the correct angle and transition out of this turn is one of the keys to success in this series of corners and setting up properly for the carousel turn which is a very long sweeping late apex right hand turn. It starts at the exit from the inner loop and carries all the way out to a very late apex heading down hill to the "Boot" section of the track.

# Turn Six



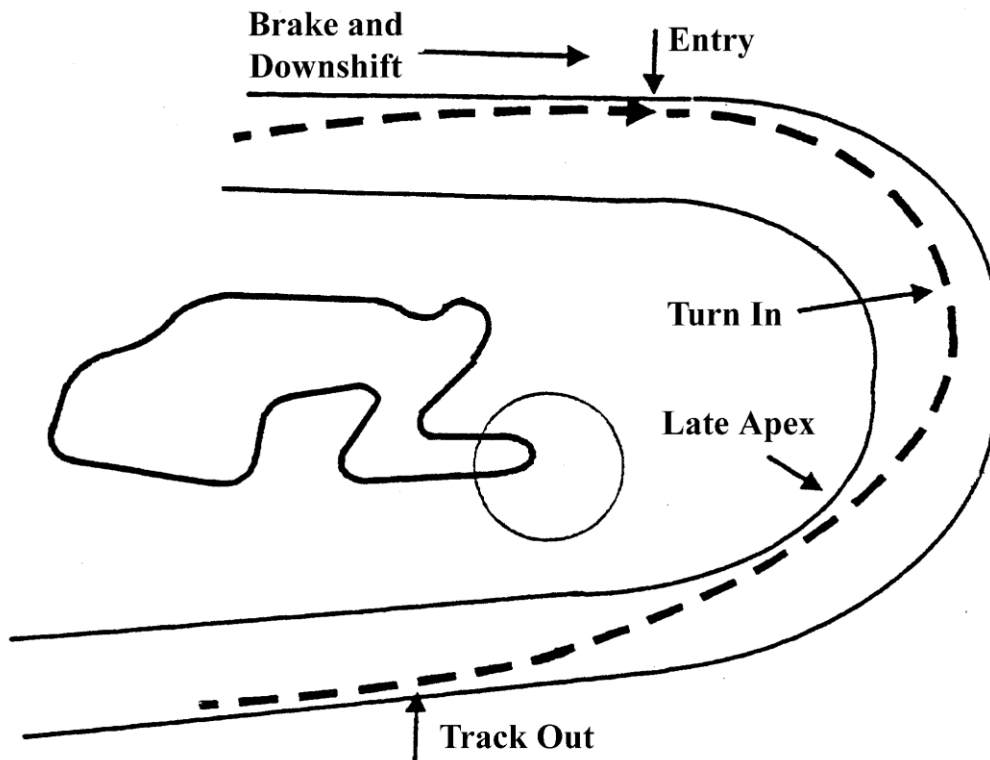
## NOTES: Turn six

- 1) Strong braking at approach to the turn since you are going down hill and carrying a lot of momentum. A downshift is probably required for this turn especially if you did not downshift for the inner loop.
- 2) The apex is not visible from entry point.
- 3) Stay right on approach and enter with a smooth arc leading toward apex.
- 4) Begin stronger acceleration when you see the apex
- 5) As you approach apex, use full acceleration and unwind to track-out point.
- 6) After track out, continue arc to cross over to track left for approach to turn seven (*TOE OF BOOT*).

## OBJECTIVE:

- 1) Maintain concentration and remember you're going down hill.
- 2) Braking is critical and after several laps your brakes may begin to fade. Be conscious of the condition of your brakes. A mistake here will find you in the tire wall.

# Turn Seven



## NOTES: Turn Seven

- 1) Approach with hard braking, but quite late and stay to track left. Remember that you are going down hill and you'll be carrying a lot of momentum.
- 2) Enter late and stay high on the track, carry a little extra speed.
- 3) At transition point, tighten turning radius, turn in toward apex, and begin hard acceleration ( if your car oversteers and you can maintain good control, it is possible to lift slightly at the transition just before turning in. )
- 4) Use the concrete insert in the pavement as a reference. Often you can place the car directly on the concrete insert and follow it up the hill.
- 5) Come all the way in to the apex
- 6) Unwind steering toward track-out point.

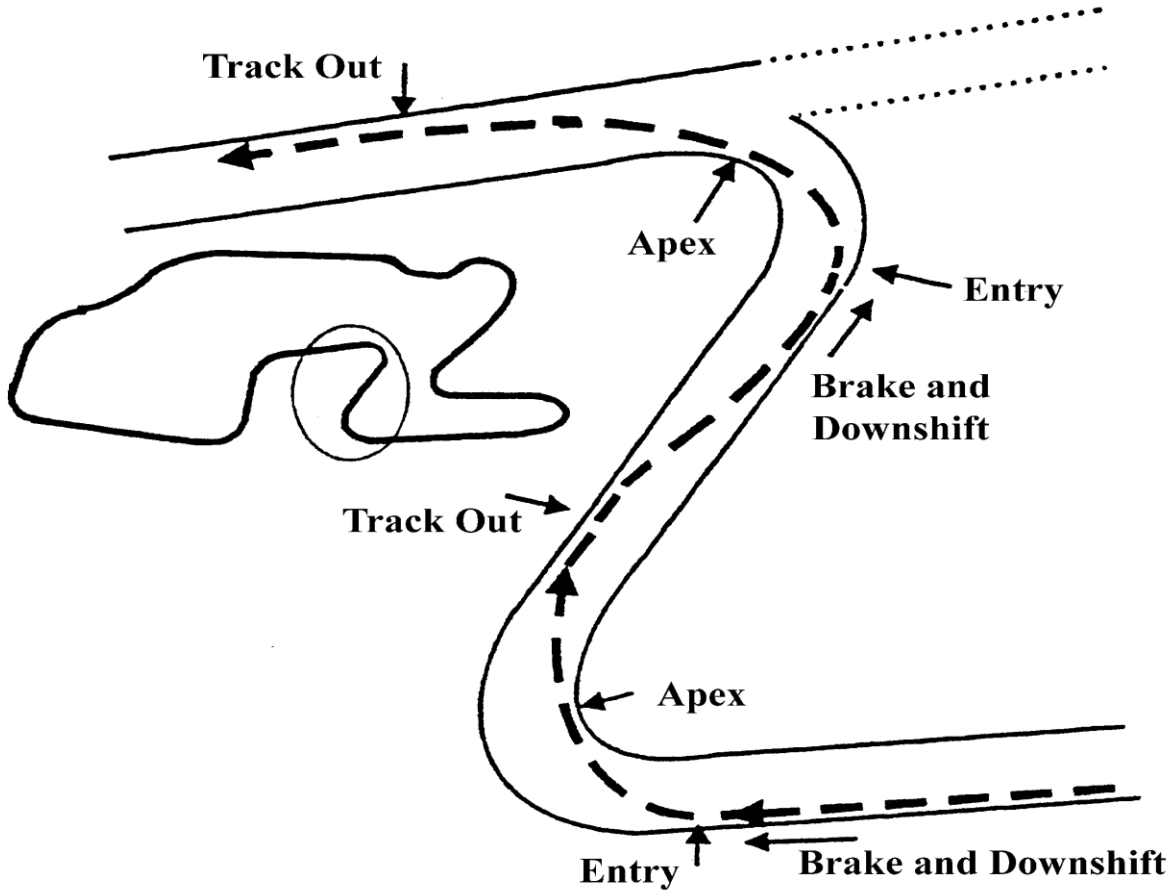
## OBJECTIVE:

Get as much speed at the exit as possible. This is important for lower powered cars since the degree of incline is significant here.

Copyright © 2004 Phoenix CMR Inc.

This material recreated from "Driver Education At Watkins Glen" by Walt Leising

## Turns Eight and Nine



### NOTES for Turn Eight:

- 1) Brake and downshift on the approach to turn eight
- 2) Typical late apex, much like turn 1
- 3) Begin acceleration before apex and unwind to track-out
- 4) Continue arc at track-out cross over to the right to set up for turn Nine

### OBJECTIVE:

- 1) Similar to turn 1 but more than 90 degrees.

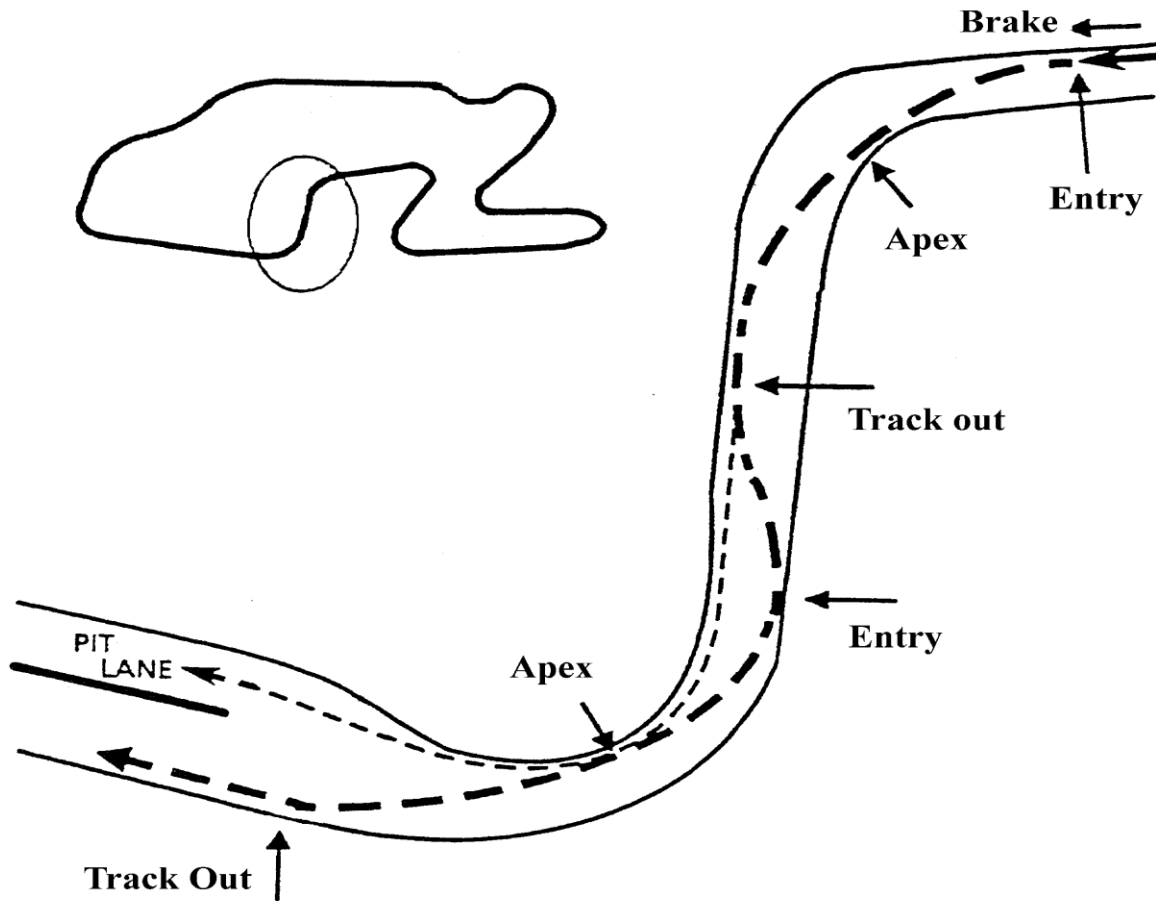
### NOTES for Turn Nine:

- 1) Firm braking for approach to turn nine, stay to the right.
- 2) Entry is late, and wide
- 3) Apex is not visible from entry
- 4) Arc inward toward apex with moderate power.
- 5) Very late apex. Accelerate upon approach to apex. Unwind steering and drift right on exit.

### OBJECTIVE:

- 1) Late apex this turn to compensate for off camber banking. This is possibly the slowest turn on the track.

## Turns Ten and Eleven



### NOTES for Turn ten:

- 1) Light braking for approach to turn ten.
- 2) This corner has a mid turn apex.
- 3) Begin acceleration before apex and unwind steering to track-out.
- 4) Watch for dip at track out point.
- 5) Continue arc after track-out in order to cross over to the left to set up for turn eleven.

### NOTES for Turn Eleven:

- 1) Modest braking needed at approach to turn eleven.
- 2) Mid to slightly late apex for the pit straight away.
- 3) Strong acceleration through turn eleven to track out. Stay left until turn one.
- 4) Be aware of cars entering the Pits. If a car is at the apex of turn 11, you'll need to adjust your line, speed and braking then stay left of the yellow blend line to avoid the car entering Pit Lane.

**OBJECTIVE:** When done well, turns ten and eleven are driven as a pair similar to the esses.

### TO ENTER PIT LANE:

Give signal on straight before turn ten, slow down between turns ten and eleven and stay to the right of the yellow blend line. Follow the yellow blend line to enter pit lane. **SLOW TO FIRST GEAR IN PIT LANE.**