

LAP 11 - DRIVING TECHNIQUE

ave you ever thought about what makes a particular driver faster than everyone else? If so, have you thought about the particular Mustang they were driving and how did it compare to the others on the track? Was it the driver or the car? That's why racing has different classes and associated rules, to normalize the effect of the car and create an on track situation where the effect of driving skill is maximized. As more Mustang drivers begin to enjoy their cars on the road course it's important to consider these differences. It's common to see big motors placed in small cars in an attempt to go faster. While this is great strategy at the drag strip, it can result in a different outcome on the road course where driving technique is more important.

Since your tires are the only means whereby your car can effect a change in velocity (acceleration) this is where to start. Developing a feel for how much traction is available at each tire and using it to the fullest will result in faster lap times. A common teaching aide is the "traction circle", a theoretical chart used to demonstrate a tire has grip in all directions and that the limit of grip in a given direction is described by the edge of the circle. Your job, as the driver, is to keep the tires working near the edge of the circle at all times. That means accelerating, cornering and braking with minimal lazy time spent near the center of the circle, where the tire is really not working for you. So how do l'accomplish this?

When you're learning to drive fast it's helpful to think of dancing. Much like a dancer shifts weight from one foot to another a car does the same as it pitches and rolls, shifting weight from one tire to another. It's a zero sum game, adding the weights seen at each tire equals the total weight of the car at all times. When you feel weight shifting to the rear tires under acceleration an equal amount is removed from the fronts. The same holds true at all times, when cornering and braking too. When driving, try to imagine you're dancing, and tires feeling the weight are on their heels while the ones trying to lift are out on their toes. It's easy to pivot (turn) when on your toes but hard to do the same on your heels.

Grip is a function of the coefficient of friction between two surfaces and the normal (vertical) load. The coefficient of friction is a constant and the vertical load varies as described above so grip at a given tire is directly proportional to the weight (load) seen at the tire. This explains why some cars that exhibit generous body roll are faster through the corners. They are transferring weight and using the created grip better than the competition. Usually, they are doing more than that, they are maintaining the grip by not upsetting the car during the transition periods between braking, turning and accelerating. This is known as "smooth" driving. A good goal is to become a smooth driver, one conscious of the available grip and able to make transitions between various regions of the traction circle. This is another area where race driving compares to dancing, where a rhythm is established between weight

Learning where to begin and end the weight transfer involves reading the track and understanding the best line to take in the current situation. In an open track environment, where passing is typically not allowed in corners, the "ideal line" is the best line. In a race situation, the best line may be far from the "ideal line", because you may have cars on both sides of you in the corner, but it is the best line you can take in the current situation. The ideal line involves a braking zone, a turn-in point, a corner apex and then a corner exit. Identifying and smoothly executing the necessary weight transfers at these points will result in faster laps. Ideally, the braking zone should be entered as late as possible with a smooth, rapid application of the brakes that takes the tires to the limit of braking and holds constant until the turn-in point. A tire that is braking cannot dedicate all its available grip to turning so it's a good idea to be off the brakes when turning into the corner. More advanced techniques like "trail braking" and using the left foot for braking are very useful but we'll save that for another lap. At turn-in, the car is steered to the corner apex where the goal is to be full on the throttle at the apex shifting weight (and grip) to the rear tires as the car launches off the corner and drifts to the corner exit. In this dance, it's important to use the entire dance floor (track width) because anything left over is wasted.

Have you ever asked yourself why a road race car doesn't use the same size tires on all four corners? After all, proper cars like Mustangs have the engine in the front and use the rear wheels for driving don't they? With the weight in the front and the front tires steering and performing most of the braking it makes sense to have larger fronts than rears doesn't it? The reason is grip, larger tires in the rear provide more grip where the side loads of cornering are applied simultaneously with the large loads of acceleration. You need bigger feet and larger shoes to perfectly perform the dance.

Perfect execution of the dance results in a four-wheel drift, where the throttle is used with minimal steering inputs to steer the car past the apex and on to the corner exit. This is only possible if you execute the dance perfectly and your car is well balanced. Don't be discouraged if you can't achieve this level of driving, remember we're only amateurs and not many of us get to go "Dancing with the Stars."

See you next lap!

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