

SPEED SECRETS Weekly

It's interesting just how many things that one hears in the paddock, during conversations between drivers (and others), that are just...well, untrue. Okay, a few have some truth behind them, but not always. And some are misunderstandings and misinterpretations. Unfortunately, many have led drivers to do the wrong things (thinking they're doing the right things) or, at a minimum, to apply things in the wrong way.

That's the theme behind this week's issue of *Speed Secrets Weekly*, and my feature: To clarify and dispel some myths, urban legends, folklore, and "truths," with the intent of helping you get a deeper understanding of these topics, so you can drive even better.

Enjoy!

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Myth-Busting!

Doing my very best imitation of Adam Savage and Jamie Hyneman from one of my favorite TV shows, *MythBusters*, I'm going to tackle some of the most common myths in the driving community. Unfortunately, unlike Adam and Jamie, I'm not able to use any explosives!

But first, according to the *Oxford Dictionary*, a myth is "A widely held but false belief or idea." I would add that many are somewhat controversial, as well, so let me stir things up.

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Myth: Brake pedal went to the floor with no warning and there was nothing I could do.

Busted: The only time your brakes won't give you some kind of warning before failing is when the actual hose or hard line carrying brake fluid to the calipers breaks or is cut. Otherwise, the brake pedal will feel different before there is some loss of braking power.

There are two kinds of brake fade: The most common is when the brake calipers and disks become so hot that the brake fluid actually boils, causing small bubbles of air to form. These air bubbles are compressible, but the fluid is not, and that leads to the pedal feeling soft and even traveling all the way to the floor without slowing the car much.

The second kind of fade is caused by the pads themselves overheating. In this case, a thin layer of gas forms between the pads and the rotors/disks, which acts almost like a lubricant.

As you can see, in both cases, the brake fade is caused by overheating components of the brake system. Now, the way brakes work is by converting friction into heat, so there is nothing

wrong with them getting hot. But not too hot. And here's the most important take-away: they don't get hotter, hotter, hotter... and then suddenly fail completely. Every single time, they give you a warning. Sure, the warning may seem subtle, but it's there. The pedal will begin to feel spongy or soft, and travel a bit further if the brake fluid is beginning to boil. Or it will feel solid and stiff, but the car will just not decelerate at the same rate, as the pads are not biting the rotors as much (less friction). In both cases, you may also smell the overheating pads and rotors. The second you notice even a slight difference in how the pedal feels, or the lack of deceleration, you know that the brakes are fading. Notice that I keep using the word "fade." That's because that's what they do: their performance fades; it doesn't just quit.

So, you always have something you can do (i.e., brake earlier and lighter, which generates less heat, possibly leading to them cooling down and the braking performance coming back). You may even have to make a slow lap (which keeps cooling air flowing through the system) and park your car in the pits, make a change to new pads, and/or bleed the brake fluid. If it ever feels as though the brakes didn't give you any warning before "failing," that's because you were not paying enough attention to how the pedal feels, or the deceleration rate.

Myth: Slow in – fast out.

Busted: This is not terrible advice to begin with, but it's way overdone by many drivers. Should that make it plausible? Not in my mind, since it leads to teaching drivers the wrong thing, before having to teach them the right thing. If I enter a corner at 50 MPH, and begin accelerating at the apex, whereas you enter the corner at 55 and begin accelerating at the same place, who's going to be fastest? You! You want to be fast in, and even faster out.

Myth: There is a "school line" and a "racing line."

Busted: The intent of teaching the line around a race track is to get from the start line to the finish line as safely and consistently fast as possible. Physics doesn't care whether the driver is racing or in a school; the line is the line. Typically, the "school line" mistakenly uses later apexes, and you'll read below why that doesn't make it any safer.

Myth: There is a "racing line."

Busted: There is no single line that is used in racing; there is one line that is safe, fast, and consistent. Some people seem to think that the "racing line" means blocking competitors behind them by entering corners from the middle or inside of the track. Do you know the best way of staying in front of competitors? Drive faster than they do. To do that, drive the safe, consistently fast line.

Myth: There is only one line around a track.

Busted: This may sound like I'm contradicting what I just said above, but there are subtle differences in the line for different cars. But this is only the case when the car is driven to its limit, and the car is telling the driver to adjust the line slightly. Notice I said the line adjustment is "subtle" and "slight." I'm talking here about a few inches, not feet. And again, it's only when the car is telling the driver to make the adjustment, and that's only going to happen when the car is driven to its limit, and not before.

Myth: All your braking should be done in a straight line before the corner.

Busted: This is such an old and outdated myth that I almost left it out because I think it's pretty much been done away with. But there are still a few old-timers out there teaching this – especially in driving schools. The thinking is that novice drivers are incapable of releasing the brakes smoothly when approaching a corner, so they're told to do all the braking before turning into the corner. In doing so, they're teaching drivers the wrong thing – something that will need to be corrected in the near future. Which is easier to do, learning something freshly new, or undoing an old habit? Teaching someone the wrong thing, only to have them undo that wrong thing in the future is just plain silly. That's like teaching kids in kindergarten to call all animals "dog" because it's easier, and then a couple of years later teaching them the right names for the animals. It's rare that any time you apply the brakes that you should quickly snap your foot off the pedal when releasing them, and yet that's what some schools/instructors teach when they tell drivers to get all of their braking completed before turning into a corner.

Myth: Trail brake into every corner.

Busted: The amount you trail brake into corners can vary from none at all to a long ways. As a general guideline, trail brake in slow/tight corners, and less in fast sweeping corners.

Myth: Never coast. You should either be on the brakes or on the throttle.

Busted: In some corners, with some cars, the best thing you can do after finishing releasing the brakes is... nothing. Sometimes it's best to coast for a fraction of a second before applying the throttle to let the car finish rotating, or changing direction. If you want, think of it as hesitating before applying the throttle, not coasting. If you get on the throttle immediately after releasing the brake pedal, but then have to back out of the throttle because the car isn't pointed in the right direction yet, then you should have hesitated going back to throttle.

Myth: The best drivers never lose their focus.

Busted: Even World Champions lose their focus. The difference is they regain it quicker than most. Accepting that you will lose your mental focus, and learning to regain it is far more important than trying to keep your focus. Use a "trigger" to regain your focus – something that brings you back into the moment, into the act of driving right now.

Myth: The best drivers were born with more talent than everyone else.

Busted: Hard work, commitment, and "strategic practice" will beat undeveloped talent every time. Period.

Myth: There's one way to drive a track.

Busted: Oh, how I hate it when someone says a particular corner must be driven a certain way, or that you must trail brake or not trail brake, late apex or not late apex... every corner. For example, a driver recently told me that a well-known driver and coach said that every corner at Road America required coasting from the turn-in to the apex. That's poop advice! It might be true for some cars, but not for others (and it bothers me when someone whom drivers trust misleads people with blanket statements). Here's my advice: if someone gives you this type of blanket advice that includes the words like "always," ignore them. Except for this advice to always ignore advice that's a blanket statement! :)

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Myth: Late apexing a corner is safer.

Plausible: To drive a later apex line, what do you need to do early in the corner? Right, turn the steering more, to drive a tighter radius. That's just basic geometry. One thing I know for sure is turning the steering less is safer than turning it more. So, a later apex can be more dangerous. I've seen many instructors and driving schools deliberately exaggerate the lateness of the turn-in and apex with the intent of making it safer, when in reality they've increased the odds of the driver spinning by turning the steering too much. Is a late apex safer? Not necessarily. Could it be safer. Maybe. So, this is plausible, but far less true than not-true.

Myth: Braking late makes you fast.

Plausible: There's more to be gained in how you release the brakes than how late you begin braking. Okay, this is not the case 100 percent of the time, but it's close, which is why it is plausible. If you're getting close to braking as late as you possibly can, then braking even later will not buy you much in terms of lap time. What will buy you more lap time is the timing and rate of release of the brakes. Get that just right and you'll carry a little more speed into the corner, and get to full throttle exiting it even sooner (sounds like "fast in, and faster out,") doesn't it?). That will make you faster than if you try braking later. I've heard the saying, "Ten feet later on the brakes is worth one-hundredths of a second, but ten feet earlier on the throttle is worth one-tenth of a second." I'd add that sometimes, one MPH more minimum cornering speed is worth a couple of tenths of a second (assuming that you can still do everything else the same).

Myth: The driver who begins accelerating first will be the fastest.

Plausible: If I begin applying the throttle a fraction of a second before you do, but I then have to ease back out of the throttle to avoid running out of track at the exit, then you'll be faster than me. Usually – but not always - the sooner you get to, and stay at 100 percent throttle, the faster you'll be.

Myth: The corner that leads onto the longest straight is the most important.

Plausible: This corner is very important, but it's not always the most important. In fact, often the fastest corner on the track is the most important. Why? Because if it's intimidating, and you master it before other drivers, you've gained an advantage. Sometimes the longest corner is the most important because of the time you spend in it. It's important that you prioritize corners, as it's difficult to focus on learning and improving all of them at the same time. Instead, focus on the most important ones first, and that could be the longest one, the fastest/scariest one, or maybe the one leading onto the longest straight.

Myth: Where you apex is critical.

Plausible: Your apex angle is as important as where the apex is. What I mean by that is the direction your car is pointing as you clip past the apex. If you're pointing down the track, you'll be fast; if you're pointing towards the outside edge of the track, you'll be waiting to begin accelerating, and you won't be fast.

Myth: Look where you want to go.

Plausible: If, just as you get to the turn-in point for a corner, you look directly across to the apex point, you're likely to drive an almost straight line towards it, instead of driving a smooth

arc towards it. Look along the path you want to follow. In fact, I can confirm that looking along the line you want the car to follow, to where you want to go, is as close to a truth as you'll ever get.

Myth: Learn and drive the perfect cornering line to be fast.

Plausible: Drive the car, not the track. Sure, you need to drive the ideal line to be fast, but how do you know where it is? By driving the car at its limit, and paying attention to what it's telling you about where the car should be. If you focus all your attention on driving a line that someone told you to drive (the myth), it's possible that you won't be driving your car at its limit, and you'll be slower than if you focused on driving at the limit.

Myth: Smooth is fast.

Plausible: I'm all about driving smoothly because that's how you keep your car balanced, which leads to having more overall traction. But you can be so smooth that you're slow. In fact, the best way to be super-smooth is to drive around at one MPH, but that's not the point! While a goal should be to be as smooth as you can, there are times where you need to be more aggressive with the controls. The key is to know when that pays off, and when it doesn't.

Myth: Friends don't let friends early apex.

Plausible: An earlier apex can be fast and safe, if you use your brake release to rotate the car, allowing for an earlier turn-in and apex, followed by early acceleration because the car is pointing in the right direction. Of course, the word "early" is relative, so when someone says, "Don't apex early," you need to know what the "early" is related to.

Myth: Winners are ultra-competitive by nature.

Plausible: Sure, most racers have a competitive trait inside them, but they've learned how to use that to their advantage. They've learned how to manage it. They know that to win, they have to perform at their best, and to do that, they need to focus on themselves rather than what their competition is doing. Their approach is, "focus on my own performance, and the results will look after themselves."

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Myth: There are no rules.

Confirmed: There are exceptions to every rule, including everything I've written here. But I hope this has cleared up some misperceptions, and done away with some misused advice. Of course, these are my opinions and interpretations. Think about, challenge, and understand every opinion and piece of advice you ever get. I can confirm that that's good advice (most of the time!).

- Ross Bentley

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