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--In auto racing, slip angle is the angle between a wheels actual direction of travel and the direction towards which it is pointing. The more slip angle the more side force will start to drop off again.-- Hello, fellow drifting.com members. In auto racing, slip angle is the angle between a wheel will generate - this is true up to a certain maximum, typically around 4-8 degrees, where the side force will start to drop off again.-- Hello, fellow drifting.com members. In auto racing slip angle is the angle is the angle between a wheel will generate - this is true up to a certain maximum, typically around 4-8 degrees, where the side force a wheel will generate - this is true up to a certain maximum, typically around 4-8 degrees, where the side force as wheel will generate - this is true up to a certain maximum, typically around 4-8 degrees, where the side force as wheel will generate - this is true up to a certain maximum, typically around 4-8 degrees, where the side force as wheel will generate - this is true up to a certain maximum, typically around 4-8 degrees, where the side force as wheel will generate - this is true up to a certain maximum, typically around 4-8 degrees, where the side force as wheel will generate - this is true up to a certain maximum, typically around 4-8 degrees, where the side force as wheel will generate a certain maximum and the direction of the side force as wheel will generate a certain maximum and the direction of the side force as wheel will generate a certain maximum and the direction of the side force as wheel will generate a certain maximum and the direction of the side force as wheel will generate a certain maximum and the direction of the side force as wheel will generate a certain maximum and the direction of the side force as wheel will generate a certain maximum and the side force as wheel will generate a certain maximum and the side force as wheel will generate a certain maximum and the side force as wheel will generate a certain maximum and the side force as wheel will gen write this today to explain one thing that is often confusing to newbies and even those who are already drifting. It is the old grip vs. drift arguement. As many of you already know, there is a time and place for each. Drifting is not just used for fun and to keep the revs up and waste gas. Drifting can be fast. It is widely known that with some slip angle, usually still considered grip by most racers, tires can really grab the road better. One basic rule of thumb is that if you can take the fastest line at near wide open throttle or at wide open throttle and keep in grip, you should never drift on that corner (dynamic drifting doesn't have much of a place here). Another rule of thumb is that (I know this thanks to malcolm, GridRaceTech, and Ryan) the best slip angle for radial slicks is around 3-5 degrees, for bias-ply slicks, around 5-7 degrees, and for street tires, anywhere between 4-9 degrees. An example is at a chicane. If you rotate the car on corner entry where you would normally already be turning in and on the gas, you can hold this until the middle point of the chicane. Why would you do this? Well, with a simple short moment off the gas and perhaps a dab on the brakes, the car will automatically swing back around for the corner and you can slowly let off the gas and retain grip ASAP after the apex for corner exit. After corner exit, you should be flooring it, so don't try to drift here. Always remember to keep it stable here). Becuase of the fact that you only want a bit of slip in a straight line, at corner exit you dont want to have the rear tires hanging out, but you do want to have the car rotated which is the whole point of drifting. Well, that and fun. Unfortuneately, I had trouble while uploading a picture of this but you get the point of drifting. Well, that and fun. Unfortuneately, I had trouble while uploading a picture of this but you get the point of drifting. Well, that and fun. Unfortuneately, I had trouble while uploading a picture of this but you get the point of drifting. opposite direction (like a chicane with a straight in between). Another important thing to understand is the under normal cornering, parts of the tire are already slipping a bit since it is as if your tires is a drivetrain with a locked differential. The inside of the tire cannot rotate slower than the outside, thus causing slip. With front-wheel STEERING, the rear tire's contact patch gets this amount of slip in a diagonal pattern, starting at the inside rear portion of the tire, even moreso on the outside tire since it is travelling faster and the outside tire travels fast with a differential on the car), the faster the outside of the tire must travel and, to a LESSER extent, the inside portion of the tire (depending on camber, caster, and other alignment settings). This is an elementary version of slip angle. With HICAS (four-wheel steering), the same principle applies except the slip effect isn't as diagonal and it is moreso starting from the back and heading to the front of the contact patch. A drift is defined as the point at which the ENTIRE tire gains this slip effect and the car begins to rotate. The more you break traction at this point, the greater the slip angle. Here are some examples of exhibition (slow) drifting. it is only done for spectators, not speed. In the picture below, Ueo Katsuhiro (in the hachiroku) has a very high drift angle whereas the driver of the 240 behind him is demonstrating a somewhat fast but still an exhibition drift. This is quite often used to catch up to the person in front of you during Tsuiso. The Hachiroku in the picture below is demonstrating just 1 or two degrees of drift angle, the perfect angle for most cars near corner exit. Cars with biasply slicks benefit from slightly more drift angle like the one below. Keep in mind that I am NOT saying that this MR-S has bias-ply slicks, but its drift angle is about appropriate for such a tire Can't stress this one enough people, NO. The cars below have drift angles slightly beyond the drift angle that is desirable and beneficial to most racers. However, on lower traction surfaces or on street tires, this is the perfect race drift angle for the turn shown. Picture this: Petter Solberg (famed WRC driver, almost killed his co-driver in Rally Deutchland; actually he escpaped without a scratch even though he was almost crushed by [this will suprise you] the rollcage) is drifting a corner (in an AWD, mind you) covered in snow. it has a 90 degree turn (which he is on), a short straightaway, and then another left-hander. What he will do is rotate the car slightly before normal corner entry and power through with minimal steering work. With the AWD system, this is all very fast and his drift angle will stay constant (by this I mean as seen from above, the angle will decrease slowly to zero in relation to the road ahead as he rounds the bend. He will almost floor it (for traction purposes), then brake for the next corner and do the same thing. This also demonstrates how on slippery, gravel, and snow covered areas with low traction, the optimum drift angle can raise up to as much as 20 degrees on some street tires. This time a different car is on dry, hot tarmac. He does the same thing except without the straightaway in between. This is hardly a drift. It is simply a controlled spinout which also involves flooring it afterwards and travelling 10 feet to the left while he's at it. This time a video of the same type of corner. Ignore the minimal countersteering due to AWD. The same type of corner demonstrated in a different car at a different angle. This is another demonstration of an appropriate corner exit drift angle on tarmac, this also applies similarly to RWD This is an actual, real-world use for high-angle, slow exhibition drifting. The FD in front is trying to block the other FD from passing by taking up too much space and blocking all of the fastest lines. There is also another variable here. With all the weight shifting and slip being uneven throughout the tires under grip, traction can be upset very easily from (and I'm quoting Malcolm here) a small crack in the pavement or a little pebble. This sudden onset of oversteer or understeer or excessive fourwheel sliding isn't as violent when drifting. The higher angle the drift, the more this is true. But, because of reduced grip, there is a dropoff point when these benefits become useless and, in fact, damaging to your speed and possibly to your car. Yet another reason to drift slightly is weight transfer throughout the contact patch. Yes, weight transfer throughout the contact patch. Picture the tire as mostly gripping. There is a diagonal path of where the slippage passes the point on the tire with the most work being done. During a full drift (at a few degrees of yaw) the weight is evened out much better and the uneven speed of the tire is essentially fixed. This can be compared in the exact same way to giving some gas to a car with a locked differential. And that, my friends, is how slip angle works. Plus, you get the benefit of rotating the car without some ridiculous 90 degree four wheel steering (well that's a thinker, I wonder if that would work. You would need two steering wheels but that's no problem. If you have multiple arms like that dude in Spiderman 2 or whatever). If you want more reasoning, lets look at the traction circle. As you can see, 1g of braking force and 1g of turning force at once, amounting to 2gs. This would make some people assume that the cornering force and braking or acceleration force can only amount to 1g. WRONG. If you look at the square in the top right quadrant of the traction circle, you will notice that if you are to use around 65% (0.65g) of your cornering force, you can use up to 75% (0.75g) of your potential acceleration force! The reason behind this is that a tire can potentially, in a perfect world with perfect conditions (not seen on ashphalt) generate full potential in all directions at one time. However, to harness this and essentially "line up" the traction circle with your car, you need some slip. Now I know what you are all thinking: 2 things. #1: if you can only utilize 65% of your cornering force, then won't you run off the road/track? #2 What about the rules of dynamic and static friction? Won't the slip just cause you to slide away into the junkyard? Well, in regards to #1, you just need to brake earlier. If you brake later then a pro racer does, you won't be able to use any throttle and you will run to the outside of the turn and, as you slow down from cornering and friction, you will run back to the inside and you should be fine. If you brake earlier, then you can utilize the entire potential of the traction circle if done correctly. Now why would this slow entry speed, high exit speed pay off in the long run? You will take the proper line. You won't slowly run to the outside and back in again. You won't hit an early apex on a regular turn. That is what will shave precious seconds off your lap times. #2 This is the reason why you can't have the best of both worlds: 1g of acceleration + 1g of cornering. Because of the necessary slip, you can only corner (with the car demonstrated by the traction circle above) with up to 1.4g as opposed to 1.42g approx. (once again, thanks for clearing this up malcolm, I was quite tired when i wrote this section). It is 1.42g because of the approximate 45 degree angle between the acceleration and cornering force in the traction circle therefore you can add 1g + 1g together to get 2g, and then find the approximate square root, giving you about 1.42g. However, this is where the slip is required. This is also why it is not a traction square. I hope this has been helpful to you all in understanding the dynamics, reasons, and overall science behind drifting. You must also made sure that you do not mix up AWD and RWD, although, as you can see, there are very striking similarities since AWD drift is basicalle a useful form of partial understeer. In a way AWD is like having high grip with low traction. My conclusion is that, in reference to the idea in the beginning of this writeup about slip angle under complete grip (along the contact patch), small amounts of drift essentially help straighten out this contact patch thus increasing lateral traction therefore allowing for tighter steering angles. This is the concept behind the four-wheel slide. That, coupled with the rotation of the car, is what makes drifting faster on some curves. To sum it all up, go out there and try grip first. Once you have learned about taking correct lines, practice these techniques to find appropriate angles on each corner. You will find your lap times disappearing like Eddie Murphy after Delirious. After this you can learn how to use multiple angles on different corners and take advantage of late and early apexs and keep in control and, most of all, have fun! Note: Some cars don't require such slip. For instance, Formula 1 cars never drift; not just because of near-perfect traction control coupled with drivers like Schumacher but they are set up perfectly within the restrictions and guidelines (I hate those). They also lose 50% of their downforce at 5 degrees yaw. A car that performs best under grip is a VERY good car. Yet another bunch of elements contribute to optimum slip angle and turning technique: alignment settings. These include steering axis inclination, Dave Point/steering axis point, camber, caster, toe, and individual toe on cornering. Although the Dave Point has to do with what kind of slip angle you want, I mentioned already how camber, toe, and other alignment settings change your optimum slip angle and how your contact patch is not always even. We racers sometimes like to call it the steering axis point or simply refer to the adjustment necessary if the SAP is offset, an adjustment to the "steering axis inclination". This can help scrub radius and many other handling characteristics of the car, or make them worse if you don't know what you're doing. Always remember to trust your mechanic because something might happen on the track one day and you front brakes will fail and the rears will lock and you want more alignment info, check out this site. It is a must-see for newbies: Anybody volunteer to make a glossary for this thread? Special thanks to malcolm and Ryan for helping me improve this thread with their helpful posts in other threads as well as this one. Also, thanks to Craftsman and Dave Coleman; Dave Point. Last edited by scirocco; 09-12-2004, 11:33 AM. what happened to the pics? there we go i was able to find a proper image hosting site, www.myonlineimages.com. Now this page is up and running, just out of interest, who here thinks that this should be stickied? Last edited by scirocco; 08-29-2004, 03:19 PM. Why only for effort? seriously though, i need some constructive criticism here. Did you not like the way i wrote it or was it hard to understand or was it not long enough or what? The truth is that you never really touched on slip angle dynamics. You didn't touch on why tires deliver the most grip at certain slip angles, and you didn't even show the traction circle is absolutely critical when talking about slip angles. Malcolm, Ryan, and I have all discussed this at length, so feel free to copy and paste from our posts. (Just make sure to give credit where credit is due.) well maybe i shouldn't have called it that then... the point of it was to explain my points of view.... perhaps i can complete with quotes from people or stuff that i already know... i did not completely finish it actually... if you mean that i should have talked about why this is so then maybe i will add that the best was the old bristish gp races were they would get side ways just to block a faster car haha what pricks. lol i love playing dirty in races and pissing people off behind me... i even used to do that in go karts.... kind of manji drift or whatever in front of people... they cant pass you but they gotta slow down.... people didn't like me Last edited by scirocco; 09-26-2004, 10:00 PM. one thing you should mention is that optimum slip angles in deformable surfaces are far greater than sealed surfaces. Watch a gravel rally, and you'll see slip angles are only about 1 degree (essentially inperceptible). I'd also suggest using what Ryan, GridRaceTech and I agreed on about slip angles for each type of tire construction. Radial Slicks: 1-2 degrees; Bias-Ply Slicks: 3-5 degrees; DOT-R Radials: 5-7 degrees; DOT-R Radials: 5-7 degrees; DOT-R Radials: 5-7 degrees; DOT-R Radials: 5-8 degrees; DOT-R Radials: 5-9 degrees; D R's). Also, the MR-S in your pic isn't on Bias-Ply tires I think you can find are Goodyear, Hoosier, American Racer, etc, etc), and maybe a historic tire manufacturer that makes tires for restored 1938 Ford coupes or something like that. :P You should rethink your math there for a second too.... one lateral, plus one longitudinal equals the square-root of 2 (1.51 something... I think) that is 45 degrees between the two. It's one of those "one-one-root2" triangles that you must have learned about in highschool math. Remember, you add vectors tip to tail, and 1+1 only ever equals 2 if the vectors are in the same direction, tonesdef, which qp's are you talking about? I've never heard anything about drivers drifting to block other drivers in any races. Doesn't sound like a good move to me. It would be better to take a tighter entry to not allow them to pass you on the inside, and then take the corner a little slower, and make sure you get a good run onto the next straight so they can't slingshot up the inside on the exit of the corner. You might want to drift the car (using the specs above for specific tire types) ever-so-slightly on entry, so you can get a straighter run out of the corner. As for the part about the chicane, drifting isn't the best way through most chicanes. Actually, cornering at all usually isn't right. He was trying to make the chicane 3 connected corners, and apexing at each kerb. I found (after asking permission to go over the kerbs, and just dab the brakes before turning into the final right hander in the chicane. This can, that once I turned in for the first right, that it was way faster to hit the gas hard and go straight over the kerbs, and just dab the brakes before turning into the final right hander in the chicane. was much faster because I didn't have to worry about the car getting upset over the kerbs while cornering, because I was just going straight (therefore, I could jab the gas, and hit the brakes, whereas he could only coast through). That enabled me to drop my laptime by almost half a second. This wouldn't be a good strategy for a circuit with tall kerbs like on most modern circuits, you need to cut them like crazy. Your ideaology would work quite well in a medium-speed S-curve, however. Brake, turn in to the first corner while letting off the brakes, allowing the tail to drift slightly. Ease onto the throttle to balance the car through the first corner. Just after the first apex, lift off the that people already knew that the straight line is best, it's just common sense. I was strictly talking about the mr-s. I was talking about the drift angle being about apporpriate for a car with bias-ply slicks. By #\*\$@ing Dave's Point... I'm going to give you negative recommendations until you add Dave's Point to your article... Dave Coleman is the man! I refuse to let the Dave's Point be left out of the driving history books. Matt. Okay, I have found and read the article. I have already mentioned "weight transfer in the contact patch", which is basically what Dave is talking about. Although the Dave Point has to do with what kind of slip angle and how your contact patch is not always even. Unless you have another point that is perhaps deeper than this article, I will not post it in the actual post. Thank you for the info anyways, I highly suggest that everybody reads about the Dave Point, just not in this article. FYI, we racers sometimes like to call it the steering axis point or simply refer to the adjustment necessary if the SAP is off, an adjustment to the "steering axis inclination". This can help scrub radius and many other handling characteristics of the car, or make them worse if you don't know what you're doing. Always remember to trust your mechanic because something might happen on the track one day and you front brakes will fail and the rears will lock and you will lose control like that one day at the track a few years back. Anyways, I am going on a tangent now so if you want more alignment info, check out this site. It is a must-see for newbies: Last edited by scirocco; 09-01-2004, 07:09 PM. It's a joke, I might sound like a prick, but I'm just a real big fan of Dave Coleman. I found your biased, there were things that I could do to hold the drift since the rear wheels were pretty much always getting power. However, in a front-biased system like the 4G63T's or CR-Vs, your rears will only get power when the fronts are slipping, as I'd imagine you know by now. Part of All-wheel-drifting is exactly what the name says: all of the wheels drift. If you watch AWD rally cars you don't usually see the front wheels following the "best line" on the course like RWD cars do (for the most part). A lot of the time the midpoint of an AWD car will be following the best line but the fronts and rears will all be spinning and the steering is toggled back and fourth between almost aimed straight and almost fully counter-steered. This coupled with the insanely high rates of entrance speed helps the car to stay sliding on pavement as well. Most of the time you wont need to give as much steering input as you feel that you should after the initial shock of input to transfer the weight - sometimes only a third to half of a full counter-steer will be plenty to keep you sliding and a full steer will be too much and will whip you back around to the other side. Although AWD's purpose is to prevent cars from losing traction, you can really use it to your advantage to keep the wheels spinning. If you recall the "traction circle" that you learned in performance-driving kindergarten, you'll remember that the East and West directions represent acceleration and braking (respectively). Now, to make a car lose traction, the load on the tires must exceed their ability in any one of those will break the traction circle and spin the rear wheels. If car B were to send 100% of its power to the driveline, it would momentarily go 100% to the front wheels (in the TSi's case) and break the traction circle causing wheel slippage. The slip sensor will detect this and tell the transmission to take up to 50% from the front and send it to the rear. (NOTE: The initial driving wheels and amount of power distribution will always depend on the front tires will move to inside the traction circle when a car is going around a turn and power is being applied while there is a constant lateral load on the traction circles of all tires on both cars, during a left turn for example (meaning that the work done on the tires, car A can apply enough power to exceed the traction circle of the rear wheels (the work done by the tires is outside of the traction circle on the upper left side). Meanwhile, the front tires will stay at their half-capacity of lateral load on the front tires is reversed (to the right in a left-turn drift) and they are now working to prevent the car from going off of the track to the left - there's a split second in a feint where the rear is sliding and the fronts are pointed straight just after the body roll has passed neutral. In our left turn, if the driver does a power-over and applies just enough power for the rear is sliding and the fronts are pointed straight just after the body roll has passed neutral. In our left turn, if the driver does a power-over and applies just enough power for the rear is sliding and the fronts are pointed straight just after the body roll has passed neutral. Ok, the same left turn example with car B and AWD. If the driver applies power in a turn, it may cause the front wheels to exceed the traction circle and transfer power is going to the front wheels and half to the back wheels. This would essentially be like driving car A in the same manner but with half the power at the driver's disposal (65hp for a Nissan 240SX, probably not enough to exceed even the stock tires). Even if your TSi has 200hp to the wheels, each set of wheels will see only half of that during a drift, and to get it to slide you either have to be turning harder or going fastering the contract of the wheels will see only half of that during a drift, and to get it to slide you either have to be turning harder or going fastering the contract of the wheels will see only half of that during a drift. to have the work exceed the capabilities of the tires (or use less-sticky tires). Unless you have tons of power, All-Wheel Drifting techniques require knowledge of vehicle dynamics, your drivetrain, your AWD system, and your traction circle (the best drivers are subliminally imagining all 4 traction circles of all 4 wheels all at the same time all the time) I find that the majority of the time all wheel drifting is spent trying to find ways to "trick" the computer into giving more power to the rear wheels than they can handle. Rocking the steering wheel between neutral and counter-steered one direction is a pretty good way to keep constant load on the outside tires and to find the best steering angle. You may also want to try doing a moment of very hard braking during the moment of the feint that has the front wheels pointed straight just before turn-in, and then applying maximum power through rate of speed that the rear and will swing out and then try a small steering angle while applying maximum power. Try getting up some speed (more than you think necessary) and cutting the wheel to one side and then counter steering with favor towards a small steering angle. You may be able to trick the AWD by pulsing the E-brake but not yanking it when you think the car is close to its lateral traction limit when approaching the apex. If you can, try to replicate the effect that rear-only ABS would have but make sure that you fully release before each pull - if your AWD computer is slow enough, it may see the braking moments as representing the wheels that grip and send power to those wheels with the power arriving at the rear axle just as you are releasing the brake pressure. Try this technique with the foot brake as well at various times through the turn, both with and without pressing the gas. I found that most of the operations in drifting an AWD car were pretty full on: full on the gas, full on the gas, full on the brake, etc. In racing they say that you should use smooth motions as to not upset the car's tenuous grip at the limit of traction, but in AWD drifting sometimes you will need to wrestle the car out of traction. Most of the time you will find that unsettling the car will be your best way to maintain control. MOST IMPORTANTLY: BE SAFE!!! Dont practice where you may run into something or someone or even where road surfaces are beyond an accepted level of safety. Dont try and take on more than you feel confident with drifting may be to-the-limit extreme, but that does not mean being stupid. Hope this helps and let us know how you make out! -MR That was great, im getting my WRX soon and willow definetly keep this in mind. I've heard that AWD does take more speed into a corner so there is enough momentum to carry the vehicle through. One major thing of this is the weight, and AWD car is generally 500-1000 lbs heavier than its RWD counterpartners. The 04 STi for example is close to 3200 lbs, most of it being the drivetrain. I've watched lots of rally and it seems the easiest way for AWD drifting would be to get a perfect suspension setup for soft in the front and hard in the rear. The advantage here is the weight transfer, make that front end light as heavy as possible. Hard braking before the corner, doing a feint motion, full throttle should easily get the rear to go out (or atleast make the rear tires loose traction). It seems, to drift AWD one would have to go beyond the "expected" limitations of drifting... Great info by the way, it was awsome. Thanks - it's been hanging around on my hard drive for almost a year, figured it was time to upload it all. If you're worried about weight, check the "weight reduction thread" in my signature. The "Braking Drift" thread is also aplicable for AWD drifting. Suspension setup is going to depend on the driver's preference - I had massive initial oversteer with a 24mm bar in the rear on my Legacy and the stock bar up front, with sustained neutral steer a tiny bit on the oversteer side. How far are you from Tampa? I could show you some things when you get your car if you are interested. Nice thread! Yep, AWD is a little different. It was something to get used to when I first got my Forester. I haven't really thought about the AWD system and how it initiates the AWD. Mines an '02 and I know it's the viscous type, but I don't know if it runs the front first then the rears. I know after the redesign for '03, they have a fuse in the engine bay you could remove to essentially make it a fwd car(disables the rwd). Mine doesn't have that. I'm thinking it just gives 50/50 and leaves it at that, not sure. I haven't really experienced anything to tell me different. Even on gravel from a stop, I don't notice the front or rear spinning alone. In fact it's quite hard to get the car to even spin its tires at all, even on gravel with pretty crappy tires, another testimate to the AWD requiring tons of power idea. One almost needs an STI to get enough power to freely light up all 4 tires. Good points too. They do like to be forced a little more. I think it's the whole trying to get all 4 wheels sliding idea. Mine's stock still, so I really don't do much for countersteering. I kind of have to actually steer into the corner to hold a slide under power, yay for understeer, lol. I plan to alieviate that problem in the near future. I'd also like to point out that all the offthrottle techniques still apply the same as with a rwd. Nothing changes in this respect...well except things like shift lock, clutch kick, and other things that affect the drivetrain since it now affects all 4 wheels. But braking, feint, e-brake and such all work the same way as a rwd. Things only start to change when you start giving a little gas. Thats when techniques need to change. Once you're on the throttle countersteering greatly diminishes, the gas pretty much stays on full throttle, and steering is then used to control drift angle. Throttle and braking modulation can still be used to adjust wieght balance and drift angle if needed. Awww, my first sticky Thanks mods! Food - The viscous type on your forester does drive the wheels 50/50 initially, which is why you probably get crappy gas mileage. The 5MT will vary power up to 80/20 or 20/80 depending on conditions and slippage (with pre-96 models having a 90/10 initial split). Post-2000 models used all sorts of computer sensors to split power for optimum traction using clutch-packs, and also raised atf and clutch fluid pressure to maximum to give a faster reaction time. The AWD system is really good, so there won't be times where you'll notice that you're just spinning the fronts only unless you get ahold of a high-speed video camera Drifting a stock AWD car can be really challenging because of this as well - usually in a drift the rears will be going faster than the front, enabling them to take a wider line, but in AWD all 4 wheels want to be going the same speed, which makes the car want to travel straight with power-understeer (as opposed to handling understeer). It's hard to say what exactly will be a good setup for AWD cars because all AWD systems are different. Even within in companies there may be several variations of a single system - my Legacy Turbo had a quite evident rear-biasment and slower reaction time than newer cars, which made it much easier to drift and "trick" into being RWD. The ATTESA ETS will deliver 100% power to the rear and transfer up to 30% to the front under slip with enough delay to momentarily burn the rear skins. Mitsubishi's AWD will drive 90/10 initially and transfer up to a 60/40 split, but the rear skins. Mitsubishi's AWD will drive 90/10 initially and transfer up to 30% to the front under slip with enough delay to momentarily burn the rear skins. better as a starting point. Basically, getting some H&R springs with KYB AGX's and a 24mm rear sway bar from Cobb Tuning (for Subaru) will be a good starting point. Cusco makes all sorts of suspension parts for a bunch of different cars and will most likely have parts for a Forester (it's the same platform as an Impreza/WRX) or any other car you've got if you ask them. -MR I live in Orange Park, about 4 hours from Tampa, though I definetly am going to make it out to some of the drift days out there... awesome awesome! It's been a few years since I've had any seat time in an AWD (hopefully to change soon) but like I said, I'd be happy to try and show you some stuff. There are some pretty talented drifters in Tampa who could most likely show you some stuff as well. DGtrials is looking to do a bunch more drift events in Tampa in the very near future, and in the short run there are people on tamparacing.com who you could probably meet up with. arigatou just wanted to say thanks to mranlet, lots of stuff you said i actually discovered on my own by trying it for myself. i actually drifted my first car by accident (and it came out good actually) and i just applied what i learned from a little mistake in the rain to my gsx. all i do pretty much is go fast, feint a turn, and counter and give it a lot of gas, and when i want to gain traction again, i just tap the brakes and steer it straight... i'm not so good with technical related things... but i wanted to say thanks again for posting this! i don't know when i can really go to a track and apply your principles, but its good to know...i live in tampa too! just holler if you wanna meet bro! Originally posted by Miburo0721 just wanted to say thanks to mranlet, lots of stuff you said i actually discovered on my own by trying it for myself. i actually drifted my first car by accident (and it came out good actually) and i just applied what i learned from a little mistake in the rain to my gsx. all i do pretty much is go fast, feint a turn, and counter and give it a lot of gas, and when i want to gain traction again, i just tap the brakes and steen it straight... i'm not so good with technical related things... but i wanted to say thanks again for posting this! i don't know when i can really go to a track and apply your principles, but its good to know...i live in tampa too! just holler if you wanna meet bro! I'm glad I could help! I just got a Legacy Wagon with no power, so it looks like I might be doing the RWD conversion until I can get a GT-B motor or something... I'll PM you and we'll get together. RWD conversion is complete, and aparently I have a Torsen diff from the factory :dunno: AWD drift in this car was basically a battle against understeer - even pulling the E-brake caused understeer because it locked the center diff and acted like a weak form of the foot brake. I mostly had to initiate really late and feint, while clutch kicking right as you crossover from outside steer to inside steer to inside steer. Power always helps, and the stock Legacy motor has little of it wow...this is a great thread....ive been tryin awd drifts for couple years now...since my old 99 2.2 wagon...but now with my current car i havent been able to do much...though ive tried hard...but i have problem with findin a place with enough room where i dont hit anything....but this thread definatly helped!! ill go back out and try some of this.... Last edited by; 02-15-2009, 03:59 PM. Reason: misspelt I've got a '99 Audi A4 and it's AWD. Just to make sure, cuz I read that all AWD systems are different. Will everything explained by mranlet work with the Audi too? Just some things I've heard makes me curious about this, and I want to see what the Audi can do besides slide around in the snow in winters like I always see on youtube videos. Drifting is drifting. The only difference between fwd, rwd, and awd of various systems is how it applies power delivery. All off-throttle techniques are the same. On-throttle techniques simply need to be tailored to how your system delivers power. Don't get too caught up what system you have, just understand how it works. Also realize that a good goal for awd cars is a neutral balance. You want the car to rotate rather easily as understeer and pushing into corners will be what you will fight most. Once you get the car neutralled through suspension changes, you will find it very easy to drift, however, the style of drift will be different from, say, a rwd. Awd systems generally require a lot of power to break traction readily. Having a neutral setup helps considerably in getting the car to rotate freely and being able to toss the car around. The downside with low power is that you really have to drive the car right at the limit to get it to slide. You always seem to be closer to the limit driving an awd than a rwd. AWD Drifting Tech[nique] - A Difinitive Guide hi all, I've got a '99 Audi A4 and it's AWD. Just to make sure, cuz I read that all AWD systems are different. Originally posted by PhoPower I think they have the same rules about cages as in D1 and for D1 you need a 6 point or better roll cage. Here is the D1 regulations: 5. Roll cage tubing must be at a minimum of 1.25 inches OD tubing and no thinner than 0.098 wall mild steel or 1 .25x .083 Chromoly tubing. Man, I've never heard of a main cage being built with such small tubing. Secondary support braces sure but main hoops are usually at least 1.5" ..095...... I'm surprised the rules allow that...... AND 1.25....... I bet that would look funny....... I'm surprised the rules allow that...... AND 1.25........ I bet that would notice. Luckily he was busted before he ever got a chance to wreck and kill himself...... Do wings/Spoilers make a difference in drifting, what types make a difference in drifting, what types make a difference and would it be a good idea to get them? I know they create down force but how much of a difference is there? Last edited by Dc2TyP3R; 12-29-2004, 11:26 PM. Want the short version? The answer is no. Want the long version? Ok... First, "spoiler" and "wing" are not the same thing. A spoiler is a device designed to "spoil" lift. By definition a spoiler only gets airflow over one surface, and the other side is attached to the car. The spoiler syou see on street cars are generally not effective, and only cause drag if they have any effect at all. This is primarily because they are designed for looks rather than function, and because the rest of the car is designed for the same purpose. On a genuine racecar, one designed to minimize airflow separation and direct air to a functional spoiler, it might be useful, but even in D1 there are no purpose-built racecars, only modified street cars. A wing, on the other hand, gets airflow both above and below, and is designed to create a downward force. Unfortunately, the same problem as above occurs. The air that actually reaches the wing has already separated and is now turbulent and useless. If you were able to extend the wing has already separated and is now turbulent and useless. If you were able to extend the wing has already separated and is now turbulent and useless. If you were able to extend the wing has already separated and is now turbulent and useless. me to the next problem. Street cars, and professional drift cars, rarely see speeds over 80 mph, and a functional wing on the back. The car would almost definitely be illegal for drift competition use, but hey, just for the sake of argument, lets assume you actually have a useful wing. Since "downforce" increases as the square of the car's speed, the downward force generated by the wing at drifting speeds is basically nothing. I'll give you an example: if the car is moving at 60 mph and then accelerates to 180mph, the speed has tripled, but the change in downward force created by the wing has increased nine times. So lets say you have a big GT wing, and its designed to create 500lbs of downforce, a whopping 31lbs. That 31 lbs is not going to help you in any way. But whats even worse with drifting is that the air moving over the wing is at an angle, sometimes a very high angle. Even with the use of winglets (those vertical plates on the ends of the wing seffective surface into the airstream, and the airfoil is all wrong when the air is hitting it at a sideways angle. So you aren't even getting your 31 lbs. In fact, all you are getting is increased drag. There is, however, one benefit to a big huge GT style wing looks cool, and you get style points for looking cool. Thats it. Thats the only advantage to big wings in drifting. If I were you, I would spend my money on an LSD and entry fees to events like Just Drift and Drift Day. By the time you get good enough to need a wing for style points, you'll probably be driving someone else's car for them, and they will pay for the big wing. Unless u have a crazy fast car, you won't need it. Don't worry too much bout looks man, just poor the money into the engine, lsd and suspension. hey whisky, what about those big whale fins you find on old porsches and such?! They can't really have air flowing below them at all cause the bottom is basically the car! Good Example Well actually a spoiler can change the way a car drifts...but this is mostly due to the fact that your adding 15-25lbs to the back of your car. I noticed that when I had my old APR on my car it would like it to when it was on. Originally posted by rlngtngku hey whisky, what about those big whale fins you find on old porsches and such?! They can't really have air flowing below them at all cause the bottom is basically the car! Good Example Lol, but thats not downforce, you could throw a sandbag in the trunk and get the same thing. BTW, I dig the Srd gen f-body drifting, thats a huge spoiler, and I suspect is probably is fairly functional at higher speeds, but a lot of the purpose there was to get air to the engine. The old Porsches with the whale-tails were rear engined, and air-cooled, so it was a functional part of the car even if it didn't spoil much lift. I have no idea how useful it was as a downforce-generating device, I've never seen one in a wind tunnel Not everything that looks aerodynamic is, its not all as intuitive as it might look. Last edited by Whisky; 01-05-2005, 05:22 AM. I think he's forgetting the speeds at which that Porsche was built to operate. Good post up there Whisky Im just shottin the wind here, but since the spoilers are obviously for asthetics only. Are spoilers are supposed to give you better handling in a turning situation, and if so that it was possible to drift at higher speeds in order to make function properly? Originally posted by NismoSigma Im just shottin the wind here, but since the spoilers are obviously for asthetics only. Are spoilers are supposed to give you better handling in a turning situation, and if so that it was possible to drift at higher speeds in order to make function properly? Functional wings on suitably designed to do almost nothing but help in turning. Without getting into coefficient of friction (an often misused engineering term) too heavily, its fair to make a rough generalization that a tire's ability to grip the road is proportional to the weight placed on that tire (but NOT at a 1:1 ratio). Since added vehicle weight is bad for a number of reasons, aero downforce helps cornering and braking by increasing weight on the tires without some drag). The problem with drifting, at any speed, is that you are by definition getting the car sideways. When you bring that tail out, your frontal area has become the side of the car. Its about as aerodynamic as a brick. There is no way to build an efficient wing that tail out, your frontal area has become the side of the car. Its about as aerodynamic as a brick. There is no way to build an efficient wing that tail out, your frontal area has become the side of the car. Its about as aerodynamic as a brick. gyro... yeah right. Ok thanks for clarifying that. All this physics stuff confuses me but at least I try to understand it. Unfortunately, the same problem as above occurs. The air that actually reaches the wing has already separated and is now turbulent and useless. um, no. on all but a few modern cars, the airflow stays attached over the roof. Even with something like a Toyota MR2 (AW11, or SW20), a wing mount 5" off the rear decklid would be effective. There is no way to build an efficient wing that will provide downforce with omnidirectional airflow. well, actually, a lot of the WRC teams have come close: basically what happens is that as a car goes sideways, the length of the chord of the wing increases. (the air is going diagonally... if the car is sideways by about 45 degrees, then the length of the chord of the wing would be about 1.4 times longer). What Subaru did was they put in big strakes so the air that flowed under the wing would be running parallel to the car, no matter how much the car was sliding. here is a diagram that shows all the terms. this is an airplane wing, so to produce downforce, you'd need to flip the design, so the curved part is on the bottom. Basically, you COULD make a wing that would be effective for drifting, but it would be huge, and likely ugly too. You would need to flip the design, so the curved part is on the bottom. Basically, you COULD make a wing that would be huge, and likely ugly too. You would need to flip the design, so the curved part is on the bottom. Basically, you COULD make a wing that would be huge, and likely ugly too. You would need to flip the design, so the curved part is on the bottom. Basically, you COULD make a wing that would be huge, and likely ugly too. You would need to flip the design, so the curved part is on the bottom. Basically, you could need to flip the design, so the curved part is on the bottom. Basically, you could need to flip the design, so the curved part is on the bottom. Basically, you could need to flip the design, so the curved part is on the bottom. Basically, you could need to flip the design are the curved part is on the bottom. Basically, you could need to flip the design are the curved part is on the bottom. Basically, you could need to flip the design are the curved part is on the bottom. Basically, you could need to flip the design are the curved part is on the bottom. Basically, you could need to flip the design are the curved part is on the bottom. Basically, you could need to flip the design are the curved part is on the bottom. Basically, you could need to flip the design are the curved part is on the bottom. Basically, you could need to flip the design are the curved part is on the bottom. Basically, you could need to flip the design are the curved part is on the bottom. Basically, you could need to flip the design are the curved part is on the bottom. Basically, you could need to flip the design are the curved part is on the bottom. Basically, you could need to flip the design are the curved part is on the bottom. Basically, you could need to flip the design ar wing, like this one: So, if you use a wing like that, and make it work, you would most likely be able to generate 80-100 lbs of downforce at 45 mph. In a 45 mph drift, it would also act like a rudder, and want to steer you straight. This wouldn't be a bad thing, considering you would be able to throw the car in a little harder, and be able to run a bit more angle, because the endplates and strakes would want to push you straight again. Interesting project that would be to make strakes illegal, and limit thereof the banned from pro drifting shortly after someone tries it. A simple rule to prevent it would be to make strakes would want to push you straight again. Interesting project that would be to make strakes would want to push you straight again. cars to single-element wings (thus making them only useful for asthetics). Last edited by malcolm; 01-13-2005, 06:09 PM. Here is how you would want to mount the strakes, and the green lines represent the airflow as the car is drifting: Attached Files Thats a little more into it than I had intended to go in answering his question, as his question was pretty straightforward. I don't disagree that the use of custom made multi-element wings on a drift car could have some benefit. I'm quite familiar with the Subaru WRC rear wing and the purpose of the strakes, but that also comes at a loss of efficiency. Budgets and speeds are greater in WRC then they ever will be in drifting. Airflow separation is largely dependent on the car, but even F1 teams have been forced to bring the wings down and in to prevent such huge downforce gains. Your best aero gains come from minimising frontal area, whihe is essentially impossible with drifting since the whole side of the car becomes frontal area at times. On the speed issue, a recent Racecar Engineering article focused on a Formula SAE project working to develop low-speed aero downforce. If I recall correctly they had some success, but the car was ugly as can be. I'm out of town now, but when I get back I'll post more specifics about the article and what the team was able to accomplish. I'm glad to know I'm not the only one here that knows what angle of attack, separation points, and wing chord and camber are. We should keep this going Malcom, see if we can come to any interesting conclusions... don't worry Whisky, I am on a Formula SAE team, and I bought that exact issue for the exact is "frontal area" in the middle of a corner when the side of the car also counts partially toward that frontal area. a little wing sticking up would be hardly anything. Also, the wing wouldn't be difficult or expensive to manufacture. Take some foam, cut/shape it with a hot wire, and then wrap the foam with fibreglass... weld up some simple steel or aluminum mounts. Bond a piece of steel or aluminum to a small portion of the underside of the wing, weld a tab, and then mount that to the aforementioned mounts. Then take 0.040" aluminum sheet (sign material), and cut it to shape underneath the profile of the wing for the strakes. Attach them to the wing similarly to, but less extensively than the structural wing-mounts, and then just a simple L-bracket to attach the bottom of each strake to the trunk/decklid/etc... Cheap, and relatively straight-forward. I am sure I could do all this for about \$200, or less. About mounting wings on racecars... sure, a higher wing is usually better for downforce, but I still don't agree that wings are useless on road-based cars unless they are above the roofline. Now, this is far from a CFD drawing, but this is just what I think would happen with a wing mounted about half-way from trunk-height to the roofline on a car like a Mazda RX7 or a 240 SX (one of the fastbacks). Attached Files sorry to go off topic, but even the subarus mirors are areodynamicly designed! so cool

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