Hyper Chassis 600cc X4-X7 Setup Guide

Suggested Starting Setup on a Normal Condition Track, Wingless				
	Left Front	**Right Front**	**Left Rear**	**Right Rear**
Torsion Bar Size (+ Turns)	.712 (+1/4)	.700 (+1)	.725 (+1)	.700 (+1)
Coil Size (+ Turns)	140 (+1)	125 (+3)		
Block Size	1-1/4"	1-1/4"	1-1/4"	1-1/4"
FK Shock Coil Over	389-321, 389-2002	389-320	389-327, 389-331	389-210, 389-210-NC
FK Shock 4-Bar	389-318	389-319		
Rebound Adjustment (Clicks)	Full Soft +2	Full Soft +1	Full Stiff -3 or -4	Full Stiff -5
Compression Adjustment (Clicks)	Full Soft +6		Full Stiff -7	Full Stiff -8
Center Line of Tire Offset	40-1/2" Front Axle	1" to the Right	5/8" from Chain Block	16" to 17-1/2"
Tire Pressure	9 psi	9 psi	4-1/2-8 psi	5-1/2-10 psi
Tires	57x6.0	57x6.0	62, 63, 64 x10	69Wx10
Wheels	10x7 (5" outer)	10x7 (5" outer)	10x10 (6" Outer)	10x13 Up to 10x17
Stagger	5-1/2" (5" to 8-1/2")	-Use 13" Jacob's Ladder, 5-3/8" straps top, 5" straps bottom, frame tab hole furthest left top & bottom. -Use Only 389-450 Left Rear Bump Rubber, 0" to 3/4" gap ** 383-600 Roll Shock optional (full soft)** -Ti brakes are highly recomended with 2 piston caliper on floater.		
Wheelbase	Long			
Jacob's Ladder	3 or 5 Hole in Paddle			
Front Panhard	3-1/4"			
Right Wishbone Frame Hole	Middle or bottom			

Suggested Starting Setup on a Normal Condition Outlaw Winged (14' sq Wing)				
	Left Front	**Right Front**	**Left Rear**	**Right Rear**
Torsion Bar Size (+ Turns)	.675(+1/2)	.700 (+1/2)	.725 (+1/2)	.712 (+1-1/2)
Coil Size (+ Turns)	115 (+2)	125 (+1)		
Block Size	1-1/2"	1-1/2"	1-1/2"	1-1/2"
FK Shock Coil Over	389-321, 389-2002	389-320	389-327, 389-331	389-210 DAS
FK Shock 4-Bar	389-318	389-319		
Rebound Adjustment (Clicks)	Full Stiff -2	Full Soft +2	Full Stiff -3 or -4	Full Stiff -5
Compression Adjustment (Clicks)	Full Stiff -4		Full Stiff -5	Full Stiff -6
Center Line of Tire Offset	40-1/2" Front Axle	1" to the Right	5/8" from Chain Block	16" to 16-1/2"
Tire Pressure	9 psi	9 psi	5-8 psi	5-1/2-10 psi
Tires	57x6.0	57x6.0	62, 63 x10	69Wx10
Wheels	10x7 (5" outer)	10x7 **(4" outer)**	10x10 (6" Outer)	10x13 Up to 10x17
Stagger	6-1/4" (6" to 8-1/2")	**-Use 10-3/4" top wing posts**, Aero wing tree, 12" nose wing posts, 22 degree angle on top wing. Start with wing full forward -Use 13" Jacob's Ladder, 3 or 1 hole in paddle, 5-3/8" straps top, 5" straps bottom, frame tab hole furthest left top & bottom. -Never use a bump rubber for outlaw winged -383-600 Roll Shock recomended (full soft +1 turn).		
Wheelbase	Long			
Wing	14 sq Top, 32" Nose			
Front Panhard	3-1/4"			
Right Wishbone Frame Hole	Middle or bottom			

Suggested Starting Setup on a Normal Condition A-Class Wing or U6SA Winged (10' sq or 12' sq Wing)				
	Left Front	**Right Front**	**Left Rear**	**Right Rear**
Torsion Bar Size (+ Turns)	.700(+1)	.700 (+1/2)	.725 (+1-1/2)	.712 (+1-/2)
Coil Size (+ Turns)	125 (+4)	125 (+2)		
Block Size	1-1/2"	1-1/2"	1-1/2"	1-1/2"
FK Shock Coil Over	389-321, 389-2002	389-320	389-327, 389-331	389-210 DAS
FK Shock 4-Bar	389-318	389-319		
Rebound Adjustment (Clicks)	Full Stiff -2	Full Soft +2	Full Stiff -3 or -4	Full Stiff -5
Compression Adjustment (Clicks)	Full Stiff -4		Full Stiff -6	Full Stiff -6
Center Line of Tire Offset	40-1/2" Front Axle	1" to the Right	5/8" from Chain Block	16" to 16-1/2"
Tire Pressure	9 psi	9 psi	5-8 psi	5-1/2-10 psi
Tires	57x6.0	57x6.0	62, 63 x10	69Wx10
Wheels	10x7 (5" outer)	10x7 **(4" outer)**	10x10 (6" Outer)	10x13 Up to 10x17
Stagger	6" (5-1/2" to 8-1/2")	**Use 12" top wing posts,** Aero wing tree, 12" nose wing posts, 25 degrees on top wing. Start with wing 2" back Use 13" Jacob's Ladder, 3 or 1 hole in paddle, 5-3/8" straps top, 5" straps bottom, frame tab hole furthest left top & bottom. Never use a bump rubber outlaw winged 383-600 Roll Shock recomended (full soft +1 turn).		
Wheelbase	Long			
Wing	Rules mandated			
Front Panhard	3-1/4"			
Right Wishbone Frame Hole	Middle or bottom			

Notes

- *If your chassis is older than 2023, make sure it has the safety update of the 95-810 left rear cage upright and the 95-800 & 95-801 Carge Supports welded in. This is very important.*
- *If the drivers head is less than 4" below the top of the roll cage, install a halo.*
- *Shock valvings are extremly important, it should be the first place you upgrade your setup. There are very few shock builders that know what will work on a Hyper chassis. Our chassis needs much differnt valving than others. Please talk to Mike or Jim at Hyper Racing to get advice. Or use our FK Shock selctor configurator 389-000-K on our website to as your guide.*
- *Make sure the car is setup square according to our setup video using our squaring kit 80-6023.*
- *Make sure you have enough counter steer. You will need more for wingless.* ***50-55 degrees*** *for wingless. Any less and you will spin. The left front tire needs to be able to turn right so much that it comes to within 1/8" of hitting the coil over spring.*
- *Use the 13" multipoint Jacob's ladder 04-6037 in hole 3 or 5. Hole 3 is better for corner entry. Use hole 1 if needed for heavy tracks or a heavy driver.*
- *Get the 2021 Jacob's ladder frame tab update (96-103 or T-561 (3),T-581 (1),T-591 (4)) and use the inner (left) most holes for all track conditions in combination with the 13" paddle. You must use the brake floater to do this. This helps significantly on cushions and bumps.*
- *Generally we add as much rebound to the left rear as we can without the car getting a traction hop. This usually happens at the -1 to -4 click range on our preferred shocks. If your car has a traction hop and you did not purchase the shock from us, get one of our FK left rear shocks. Other shock builders use too much rebound in the LR for our chasssis. And you can not just take rebound adjustment out of their shock to make it work, it will not.*
- *Driver weight and their contribution to the center of gravity height (CGH) of the car is huge. Heavy drivers (over 190) suffer from the car being tight. For them, make sure the bottom seat bar is flush with the bottom rail so the driver is not raised up at all. Use stiffer bars in the back and possibly softer springs in the front and lower the car.*
- *For light weight drivers (under 155), you will need to raise the seat higher than the normal 3" either by spacers (no more than 2-1/2" long spacers) or transition to the seat bar adjuster setup. Lightweight drivers will suffer from a lose car, you will need to keep the CGH up. Possibly use softer rear bars but keep the ride heights up (add more turns) to ensure enough longitudinal weight transfer.*

Notes (continued)

- ***The long 389-450 (or two blue FK bump stops stacked) are the best thing to use as a bump rubber. The short bump rubbers are too inconsistent. If there are any bumps in the track the car gets tight. Use the siffer version for super slick tracks and the softer version for heavier or rougher tracks.*
- *Set the bump gap with the driver in the car, on a relatively flat area, the left rear shock not tied down (or roll the car to make sure the left rear rebound dampening is not influencing the position of the car), and no one leaning on the car. Use 3/4" or no bump stop when the track is heavy. Go to 0 gap for slick smoth track. Start with 1/4" to 1/2" for a normal track.*
- *Experiment with wider right rear wheel widths to help the car be stable on the cushion. We run as wide as 17" achieved by using a 9" outer and an 8" inner.*
- *Use a 3" Shackel Rod on the Left, and a 2-1/2" on the right.*

To Make the Car Looser

- *For wet/heavy conditions, lower the whole car as much as -1-1/2 turns in the back and -4 turns in the front (-1 turn on torsion). The amount of adjustment depends on how tight the car is. (mostly for exit)*
- *Add rebound to the front shocks, this helps keep the CGH low. (mostly for exit)*
- *Remove rebound from the right rear shock, add compression to the right rear shock*
- *Add stagger. 7" wingless & 8" winged are not uncommon. As much as 9" can be used. (mostly for entry)*
- *Move right rear wheel out. As much as 17-1/2" or as far out as it will go, make sure you have our long rear axles, 56" for the 1-3/4", and 57" for the 2" rear axle.*
- *Add more rear tire pressure. 8-12 psi on the right rear ansd 6-8 on the left rear.*

To Make the Car Tighter

- *For slick conditions, add cross weight (LR and RF turns) and raise car. Typically add 3 turns to the RF, 2 to the LF, 1-1/2 to the LR and 1/2 to the RR.*
- *Use less rear tire pressure. 4-1/2 PSI Left rear and 5-1/2 psi on the right rear.*
- *Add Right rear rebound. For a track that is consistently smoth and slick with no cushion, like the east coast tracks, use the **389-210-NC right rear** shock (NC for no cushion). This shock has a lot more rebound and will tighen the car considerably. Note that simply removing the rebound by using the adjustment does not make the -NC shock behave like the regular 389-210 shock. The car just will not work right with the -NC shock on any kind of cushion.*
- *If there is too much cross, the car will get lose on entry. Ideas to help entry on a slick track are: Raise the rear roll center, more RR shock compression, make sure the Jacob's Ladder is in the 3 hole of the paddle, and don't be too soft on the right rear bar, decrease RR offset (15-3/4" is the most we would move the right rear in).*
- *Raising the rear roll center will tighten on entry, lowering the rear roll center will tighten middle and exit.*
- *Go to stiffer coils in the front, in extreme cases go to 150LF and 150RF. Only go this stiff if the track is smooth. Too stiff will cause the nose to push everytime the front hits a little bump. A stiffer LF will tighten up on entry and a stiffer RF will tighten from the middle out.*
- *Possibly try a softer right rear bar or stiffer left rear bar. Just check ride heights before changing the bar and then reestablish the same ride height after bar change.*

Suggested Setup Changes for Winged

- *Track conditions will affect a wingless car a lot more than a winged. We typically don't have to change much from warmups to feature once we have the car and driver happy. Typical changes through the night are: move the top wing back (up to 5"), add left front compression and maybe take 1/2" to 1" of stagger out.*
- *We really like and recomend the right rear roll shock for winged. When using this shock you will want to keep the regular shock (bump shock) full soft on compression. To help the car on the cushion, add more compression to the roll shock, generally we add at least 2-4 turns to notice a difference, this shock has a small adjustment range.*
- *To make the car tighter, move top wing back to tighten on exit, add left front compression, and add LF/RR weight to tighten on entry. Also take out stagger but be carefull, less than 6" is not typically recomended for winged.*
- *Resist the temptation to take rebound out of the left front for winged racing. The car becomes eratic and hard to drive.*
- *On larger tracks winged, more right rear weight is needed for corner entry due to the massive wing force that rolls the car left and unloads the right rear. Start with the Normal Condition setup listed above except add one more turn (+4 for coil) on the LF and RR.*
- *Left front compression means a lot on larger tracks on corner entry, the larger the track the more impact it has. Use more compression with linear or progressive valving on the left front to keep the weight on the right rear during the winged down phase.*
- *Use a 32" wide nose wing where legal. Set the nose wing at 25 to 28 degrees.*
- *Set the top wing at 22-25 degrees on a 1/4 mile or smaller. On bigger tracks go as low as 18 degrees to eliminate drag and increase straight away speed.*
- *Pay attention. If your car is bottoming out on entry, this will kill speed. Add left rear compression just enough to keep the left rear off the track. Do not use a bump rubber on the left rear for winged.*
- *If the car is not pointing in, (has a slight push when you first point the car in), add more RF weight. Make sure the right front tire is not too far out, use a 40-1/2" front axle and a 4 on 3 RF offset wheel and a 5 on 2 LF offset wheel.*

X7 Shackle and Bearing Carrier Notes

- *Use the X7 style rear bearings carrier plates and start with 2-1/2" RR and 3" LR shackle rods with the rod ends threaded in the whole way. Use the 40-400 Torsion Arm Standoff to allow proper shock travel on the RR. If using teh FK big body twin tube on teh LR, you do not need one there. The concept is to make sure the rear axle has the proper travel. Each style shock has a different overall length, so the standoff may or may not be needed.*
- *Use the suggested block heights with the shackles in the middle hole of the X7 bearing carrier plates. Then you have the option of moving the shackle pin to the top hole instead of adding a turn for slick tracks and to the shackle to the bottom hole on wet tracks. Doing this will keep the arm angle constant. Not a huge deal, but it helps.*
- *If you are documenting and comparing arm angles, keep in mind that block height, turns, tire pressure, tire offsets, fuel load, spring rates, driver, and other factors all play a role in the measured arm angle. Also know that arm angle on a wish-bone car is not near as important as on a Z-link car.*

X7 Short Wheelbase Notes

These notes apply only for the short wheel base (axle forward) configuration.

- *We found that the axle forward almost always has too much rear weight bias. Only with extremly light weight drivers do we recomend the short wheelbase. And even then extra weight is usually added to the rear to get teh extra rear weight and the long wheel basse is better anyway.*
- *If you do have to add weight to the car to make weight, usually it is best to add it at shoulder height closer to the left side right above the rear axle. We have special weights for that, call the shop for more info. Do not mount the weight low unless you want to losen the car up.*
- *The rear torsion arms have two shock mounts (forward and normal) and mount the shocks in the front hole. This will give the shocks more control over the added rear weight. If using the Torsion Arm Standoff (40-400) position the standoff so the shock is forward, and the standoff can be spun around for different shock positions.*

X7 Front Shock Sliders

- *To set the front shock sliders for wingless racing, jack the front of the car up, and make sure the front shocks are fully extended. Slide the clamps up or down so that the axle just touches the frame when the shocks are fully extended. Lock the slider clamp in place there.*
- *For winged racing, use the same method as above except set the LF shock so the axle is 1" away from touching the frame. This will allow the LF frame corner to travel down further as the chassis wings left. On small real slick tracks winged, if you need more drive off, set the LF front shock in the wingless position, or go to 1/2" away from frame.*

To Stop the Hop

- *A chassis hop in the turn is caused by too much right rear weight. The right rear can end up with massive amounts of dynamic weight transfer. All of this weight can cause the tire, which acts like a spring and has its own spring rate (but no shock to dampen it), to oscillate at a frequency. To reduce the hop, reduce the dynamic weight on the RR tire.*
- *How to do this? 9 times out of 10, this is from using a left rear shock that was not purchased from Hyper Racing or it was revalved by someone who thinks they know more than us about our cars. Almost every other shock builder will put too much left rear rebound to be used on a Hyper Chassis. Simply taking rebound out of the left rear through its adjustment does not work the same way. It needs to have a max 3" number of 215 or less. Other ideas to help the hop are: add LF shock rebound, reduce LR rebound, move RR tire out, lower chassis (generally more on left side), lower rear roll center, reduce RR compression, and move right side wishbone to lower hole.*

Other Setup Notes

- *Adding rebound on any corner will take weight off that corner anytime that shock is extending. Adding compression will add weight to that corner when that shock shaft is moving in.*
- *The suggested block heights are for use when the blocks are resting on the smallest diameter part of the axle. If using a 2" rear axle, use 1-1/2" blocks in the rear. If the blocks rest on the smaller diameter part of the spacer, subtract 1/8" from block height, if on larger diameter part of the spacer, subtract 1/4".*
- *Remember that with coil overs, you need to add 4 turns to make the same change as adding 1 turn on a torsion bar.*
- *Make sure your car is set up according to the squaring kit instructions with axles square, offset correct, and chain aligned. (Watch the squaring video on Hyper Racing's YouTube Channel.)*
- *Tire preparation, grinding, grooving, and siping are essential to getting the most traction. See the **Setup Manual** or watch the tire prep video on **Hyper Racing's YouTube Channel**.)*
- *Treat monotube shock pressures like extra turns in that corner. The more pressure you run in a corner, the more weight. A 30psi change is similar to adding a turn. Shock pressure is in no way like running a stiffer bar or stiffer shock, it adds weight on that corner but does not change spring rate. If you have our FK shocks, you do not even need to check pressure, race them the way we ship them to you until they need rebuilt (25 races or damaged)*

Jacobs Ladder

- *Our Multipoint Jacob's ladder can adjust the roll center right and left by 4". Generally, use the #1 or #3 hole for winged and the #3 or #5 hole for wingless. You can use the #1 hole on wet heavy tracks where you are trying to loosen the car. The #5 hole moves the roll center to the left the furthest and will make the car roll more which will tighten in middle and exit but can loosen the car on entry.*
- *The 3 point Jacob's ladder end tab and the Jacob's Jacker can be used to move the roll center up and down by 2". Moving the rod end down or the end tab to the top hole (moves the paddle down) will lower the roll center and tighten the car in the middle, just be careful if you get too low the car willg et lose on entry.*

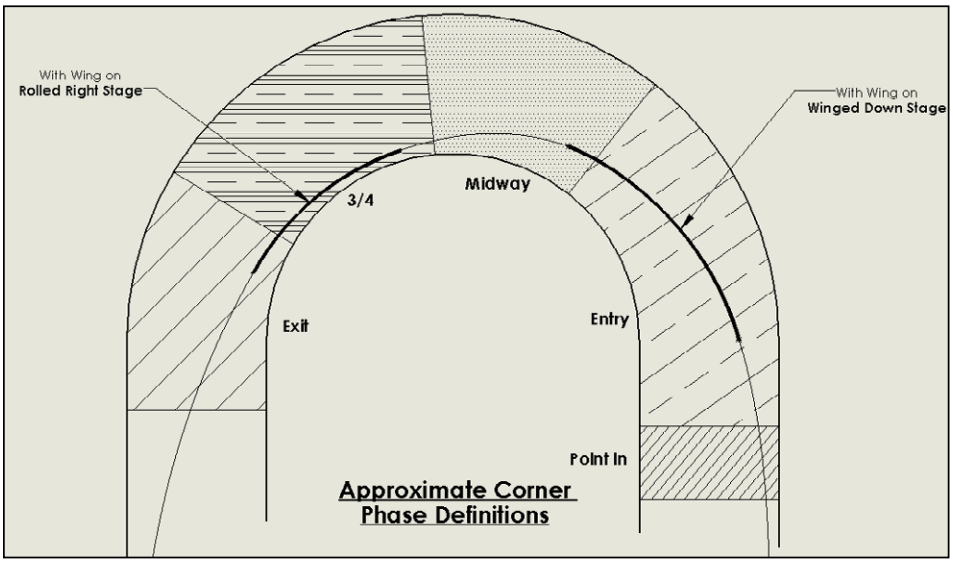
Right Rear Wishbone Height

Starting with the X6 model chassis, a second, higher, right side wishbone mount was added. A different wishbone is needed for each mount. The higher mount will yield more drive as it will lift the car more on acceleration (more anti-squat). It will also steer the car more to the left as the car rolls right due to the rear axle being pushed back. This is most helpful when hitting a cushion or bump. The other side effect of this adjustment is that it will cause the longitudinal weight to transfer through the mechanical linkages instead of through the suspension springs and shocks. This can cause a harsh ride and increase the tendency of the car to hop.

Figure Out What You Really Want | The Phases of Adjustment

One of the hardest things about trying to get your car faster is trying to figure out what exactly you want your car to do. If you can figure that out, we can usually find a really good solution, but only if you know what you really want. Many times, racers want too much traction or forward bite. Be careful. As a driver, focus on getting the car right on the point in and entry phases first, if the car isn't right in these stages, the rest of the turn will never be good.

The diagram below attempts to divide the corner up into phases that best describe where adjustments will affect the handling of the car. Depending on track size, shape, and conditions, these phases of the turn can vary widely, so don't take them too literally. To better understand the adjustments and their effect on chassis handling, read ***Rethink Dirt: Advanced Dirt Track Theory*** *and* ***Shocks: A Mystery No More*** *on our website.*



The adjustments we make to help the car in these phases of the turn can be drastically different depending on if the car is winged or wingless.

Winged Down

A winged car adds two stages to the corner definitions. I call the first the ***Winged Down Stage****. This is when the car rolls to the left due to the wing sideboards. This happens on corner entry. The bigger the track and the bigger the wing, the longer the winged down stage will be. The way we adjust the car's right side springs to get the balanced roll couple for winged is going to be applied to the left side springs and shocks to adjust the car during the winged down phase.*

Rolled Right

*The second is the **Rolled Right Stage**, which occurs when the car slows enough that the lateral g-force on the car is greater than the side force generated by the wing panels. As a driver, you need to pay attention to how the car is working when it is winged left and rolled right and make your changes accordingly. The length of the winged down stage of the turn is different for each size and shape track, and it also changes during the night as the track goes slick. A track with tighter turns relative to the length of the straightaways will have more winged left effect, tracks that are larger will also have more winged left effect, and as the track gets slicker there is more winged down phase.*

Point In

*The **Point In** phase is very short. It is that phase of the turn where the driver first turns the car to the left. Once the car points in, the driver will need to start counter steering. If the driver turns the car, but the car does not react, a push can occur for a small part or the whole way through the turn. Generally, a push during point in is caused by not enough weight on the right front. A car will never be loose in this phase.*

If tight, add more static RF weight by adding turns to the RF, or take turns out of LF. Sometimes too much RF offset can cause this as well. A stiffer RF spring can help. Make sure the right front tire is not too far out, use a 40-1/2" front axle and a 4 on 3 RF offset wheel and a 5 on 2 LF offset wheel. Increasing wing angle can cause the car to do this as it causes the LR spring to compress unloading the RF. Adding RF/LR static weight or increasing the LR spring rate will help.

Corner Entry

***Corner Entry** is the phase of the turn where the car is in transition the most.*

In Wingless racing, this is the phase where the car is rolling from the left side to the right. If you start out with too much static LR weight, the car will be loose on entry until the weight transfers to the RR where the tires will be equally loaded and achieve maximum lateral traction. The slicker the track, the longer it takes the weight to transfer and the less amount of total weight transfers due to the reduced g-force (reference the formula). Right side springs, right side shock compression, left side rebound, and right side wheel offsets are all factors that matter.

In winged racing, this is where the very violent action of the car winging down left occurs. Pay attention to the car bottoming out on the LR during this phase. You may need to increase the LR shock high speed compression, increase the LR spring rate, or raise the LR ride height. LF compression, LF spring rate, LF & LR offset will all be big players in this phase with the wing on. Wing post height and sideboard location also matters.

Midway

*The **Midway Phase** is where the driver is getting back on the throttle or is back at full throttle. Lateral g-force is greatest here. The car is already rolled right, and the car's stance is pretty much set. Longitudinal traction becomes a bigger factor in this phase.*

Ride heights and corner weights are important, and front rebound also plays a roll. Shock dampening in both rebound and compression can matter here, as the shocks never stop moving.

3/4 Phase and Corner Exit

3/4 Phase *and the* ***Corner Exit Phase*** *are very close to the same: there is more lateral g-force during the 3/4 Phase. The driver plays a big role in 3/4 Phase as they are going to try to find bite in the track. Handling characteristics will change greatly depending on how well the driver can keep the car in the bite and how much they are asking the car to turn vs. accelerate forward. If the car is not right on etry, it is very hard for the driver to get the car in a good possition for 3/4 and exit.*
Near the end of the 3/4 Phase is also where the car begins to roll left and back to neutral again as the lateral g-forces decrease. During this transition, the left side compression, right side rebound, and the left rear bum,p rupper (for wingless) will have an effect.
CGH (ride heights) and rear weight bias are everything on corner exit. More rear weight and a higher car will always yield more longitudinal traction (forward bite). But don't forget all the factors that play into CGH dynamically. Anti-squat, spring rates, shock rates (both rebound and compression), seat height, engine mount height, tank tail mounting, etc. are all factors.

With the wing on, wing angle plays its biggest part in 3/4 and corner exit. More wing angle will get more weight on the rear of the car.