Touring Car Settings

July 2012 Ver1

Short Camber Links

- Makes the car more aggressive, twitchy, but will produce a little less mid and exit corner traction; makes the car transition faster from side to side
- Good starting setting would be a medium inner link position both front and rear

Long Camber Links

- Makes the car lazy and a little easier to drive, with more overall traction; makes the car transition slower from side to side
- Good starting setting would be a medium inner link position both front and rear

Camber Link Roll Center

- Raising the Roll Center means lowering the link
  - Raising the roll Center will cause the car to slide more and have a little less traction
- Lowering the Roll Center means raising the link
  - Lowering the Roll Center will cause the car to roll around a bit more, have more overall traction and will make the car a bit easier to drive
- Good starting setting should be based on the recommended surface setup from the manufacturer; Good starting setting would be a medium roll center either with shims (3-4mm) or middle on the inner camber position; Rear may require some shims on the outside as well to create the proper angle

Arm Roll Center

- Lowering the arm will lower the roll center, which makes the car roll more and produce more traction
- Raising the arm will raise the roll center, which makes the car slide around a bit more and will feel more aggressive through the corner
- Good starting setting would be a medium roll center either with shims (1mm) or medium arm mount holders, you can also use arm pin height above chassis bottom of around 5 – 5.5mm, as different cars may require different shims

Ackermann

- Adding shims or moving the link forward in the car will give less Ackermann, which causes the outside wheel to turn in harder; this will make the car more aggressive with more steering!
- Removing shims or moving the links back will give more Ackermann, which makes the outside wheel turn less; this will make the car easier to driver with less overall steering!
- Good starting setting should be based on the recommended surface setup from the manufacturer; this one is harder because overall geometry of the steering system will determine a good starting position. A good place to start is with the link straight or with a slight angle

Shock Position

- Leaning the shocks in towards the middle of the car will make the shock initially softer, but will stiffen up as the car rolls, which will make the car lean around more; will help mid corner steering.
- Standing the shocks up away from the center of the car will make the car more stable coming out of the corner and will make the car feel like it has more traction; Initially harder, but will feel softer as the car rolls.
    - Standing the rear shocks up and laying down the front shocks will make the car under steer and easier to drive
- A good starting setting would be the middle position of both front and rear shock towers

Shock Springs

- Stiffer springs yield less overall grip, because they cannot absorb as much torque and as such repel weight transfer;
- Softer springs provide more grip as they are capable of absorbing torque loads applied to them to a point; chassis roll in increased with the use of softer springs
- A good starting setting would be one step stiffer spring in the front than the rear in the area of 14-16 pounds for rubber tire

Shock Dampening

- Thicker oil and smaller piston holes will produce more dampening effect and make the car feel slower to react to weight transfer and is better for higher traction conditions
- Thinner oil and more holes (or bigger holes) will make the car transfer weight faster and create more chassis roll and is better for lower traction conditions
- A good starting setting would be 1.1mm three hole pistons and 450Cst both front and rear; this tends to be the standard setting for most rubber tire touring cars

Shock Rebound

- Rebound is the amount of distance the shock shaft travels out after the shaft has been pushed in all of the way. This is normally measured in millimeters for consistency reasons
- Less rebound is better for higher traction smoother surfaces and more rebound for bumpier less smooth surfaces
- A good starting setting would be 1mm or less for smooth surfaces and three of four for not so smooth surfaces

Wheelbase

- Shorter wheelbase makes the car more aggressive
- More weight over the front makes the car easier to drive; lengthen rear and/or shorten front
- More weight over the rear makes the car looser mid corner; shorten rear and/or lengthen front
- Good starting setting should be based on the recommended surface setup from the manufacturer

Track Width

- Widen the rear of the car will make the car more stable
- Widen the front of the car will make the car more stable going into the corner, but will produce more steering mid and exit corner
- Good starting setting should be based on the recommended surface setup from the manufacturer

Caster

- 2* of caster makes the car more aggressive going in and will under steer exiting the corner
- 6* of caster makes the car easier to drive and will produce more exit corner steering
- Stiffening the c-Hub Material will make the car more responsive
- Good starting setting is 4deg of caster

Rear Toe

- More rear toe will makes the car more stable; more traction and less high speed steering
- Good starting setting is 3deg of rear toe

Camber

- The more negative camber you run the more traction you generate to a point
    - When the car begins to slide it will break free quicker with more camber

- Less negative camber may have less overall traction, but maybe be better and more consistent overall throughout the course of a run
- Good starting setting is negative 1.5deg front and rear

Anti-Roll Bars

- Stiffen the roll bar in the rear there will be less weight transfer to the front entering a corner; it will be more stable going in and have less traction coming out
- Stiffen the roll bar in the front will cause the car to be more aggressive going into the corner; but will wash out mid and exit corner because it will produce less traction
- Good starting setting is one step thicker in the front then the rear

Ride Height

- Lowering the ride height lowers the center of gravity and also produces more down force; This makes the car feel a bit more planted and makes the car easier to drive
- Raising the ride height raises the center of gravity and produces less down force; this makes the car roll more and typically makes the car a bit harder to drive consistently
- Good starting setting is 5-5.5mm front and rear

Droop or Up-travel

- Less front droop will make the car roll less and transfers less weight to the rear of the car on-power; better suited for smooth tracks
- More front droop will transfer more weight rearward and is better suited for bumpy tracks
- Less rear droop will make the car roll less and transfers less weight forward off-power; better suited for smooth tracks
- More rear droop will make the car transfer more weight forward and is better suited for bumpy tracks
- Good starting setting is 1.5mm over ride height both front and rear

Rear Gear Diff

- Gear diffs in the rear of electric touring cars are becoming very popular and as such have a lot of tuning capabilities; thinner oil will produce less rotation and thicker oil will produce more rotation in the car in an off-power situation
- Gear diff oil can be affected by temperature so make sure you adjust thickness based on the conditions; thicker oil when it gets hot and thinner when it gets cold; I always check the gear diff tension both before and after a race to see how much it changes and then adjust from there

- Good starting setting is 1000Cst for a four gear unit and about 2000Cst for the 2 gear unit (such as the serpent)

Front diff options

- A spool is probably the most common type of front diff used these days; a spool will push coming in, but really does a good job of pulling the car out of the corner; most people find the spool to be a bit challenging to drive at first, but overall will produce the best lap times
- Gear diff in the front is being used on tracks where you need a little more initial turn in and can be a great tuning option. Because of the nature of how these cars work, running thicker oil/putty in the front will produce the best overall effect; it is recommended that you start with 300,000-500,000Cst and adjust from there; you can also use putty which is really stiff; this gives you the feeling of a spool with more initial steering
- Ball diffs can still be used, but usually require a bit more maintenance and will provide the best initial steering/turn-in while sacrificing exit steering; ball diffs are also the easiest to drive and are great for beginners, but are usually the slowest
- Good starting point for most conditions is a spool or locked axle in the front

Tires

- There are lots of options for tires and this can have a huge effect on the handling of your car. Spec tires have narrowed the possible combinations and has made running rubber tire quite a bit easier. For outside people tend to use higher sidewall tires with a larger air gap. This helps keep the tire on the rougher surfaces and allows the sidewall to roll over a bit more. Good outside tires tend to be Sorex (28-36), Sweep (R28-R36 and EXP30 and EXP36), Solaris (Hard), Muchmore (28-36), and Ride (32-36). These tires all have specific temperature ratings and seem to work best within that range. In my years of testing outside the Sorex 36s tend to be the best all-around tire.
- Rubber tires for carpet tend to have a smaller air gap and smaller sidewall. Most of the good tires for carpet tend to be in the 32 range and include Jaco (Blue), Sweep (QTS Blue), and Solaris (Medium). Most clubs and race tracks tend to pick one spec tire, as tires can be a big performance advantage especially new sets. I find that the Jaco (Blue) tire to be the most consistent and cost effective tire over many runs. They are the tire of choice at most large US carpet races.

Final thought…so much of these settings are really related to weight transfer either on power or off power and if you consider that when making changes I think you will find it a lot easier to tune your touring car to the surface and traction you are running on. Sometimes leverage can be a factor as well, but in the end this to usually translates to transfers of weight. I am talking about weight transfer in all directions not just front to rear or left to right, but up and down as well. I hope you find this guide useful and informative.