Buggy Setup Guide

This is a 'Quick Reference' setup guide, a cheat sheet.

This setup guide assumes you have some sort of 'standard setup' to begin with. One should come with your kit. You can also find standard setups on manufacturers' websites and on www.setupcentralrc.com
It also assumes your car is in perfect working order. (Bearings spinning freely, nothing dragging the ground, no binding in the suspension,..)

Tires

Tires are always the first element in setting up a car. If you've got the right tires, you're 90% there

Springs

Stiffer springs make the car feel more responsive, more direct.
They also help the car jump a little better and higher.
Stiff springs are suited for high-traction tracks, which aren't too bumpy.
Softer springs are better for (mildly) bumpy tracks.
They can also make the car feel as if it has a little more traction in low-grip conditions.

Stiffer Front: The car has less front traction, and less steering. It's harder to get the car to turn, the turn radius is bigger and the car has a lot less steering exiting corners.
The car will jump better, and maybe a little further.
On very high-grip tracks, it's usually beneficial to stiffen the front, even more than the rear. It just makes the car easier to drive, and faster.

Softer Front: The car has more steering, especially in the middle part and the exit of the corner.
Front springs that are too soft can make the car hook and spin, and they can also make it react sluggishly.

Stiffer Rear: The car has more steering, in the middle and exit of the turn. This is especially apparent in long, high-speed corners.
But rear traction is reduced.

Softer Rear: The car has generally more rear traction, in turns as well as through bumps and while accelerating.

Damping

Heavier: Thicker oil (heavier damping) makes the car more stable, and makes it handle more smoothly.
It also makes the car jump and land better.
If damping is too heavy, traction could be lost in bumpy sections.

Softer: Soft damping (and springing) is better for shallow, ripply bumps.
It also makes the car react quicker.
Damping should always be adapted to the spring ratio; the suspension should never feel too 'springy' or too slow.

Heavier Front: The turn radius is wider, but smoother. The car doesn't 'hook' suddenly.
The car is easier to drive, and high-speed steering feels very nice.

Softer Front: The steering reacts quicker.
More and better low-speed steering.

Heavier Rear: Steering feels quick and responsive, while the rear stays relatively stable.

Softer Rear: Feels very easy to drive, the car can be 'thrown' into turns.
More rear traction while accelerating.

If one end of the car has slightly heavier damping than the other, then that end will feel as if it has the most consistent traction and the most stable when turning in and exiting corners.

A car with slightly heavier rear damping, or slightly lighter front damping will feel very stable turning into corners on bumps or whoops sections. It won't feel 'touchy' at all.

Caster

More: More caster aids stability, and handling in bumpy sections.

Less: Less caster increases steering drastically. Steering feels much more direct, the car turns tighter and faster.

Ride Height

Higher: The car feels better in bumps, and jumps better. It can feel tippy, or even flip over in high-grip conditions.

Lower: The car feels more direct, and it can potentially corner a bit faster. It's also harder to flip the car over.

Lowering one end of the car, or putting the other end higher up, gives a little more grip at the lowest end, but try to avoid big differences in ride height between the front and the rear.

Wheelbase

Shorter: A short wheelbase makes the car feel very nimble, and good in tight turns. This is a good idea for very small and tight tracks, without big jumps or bumps.

Longer: The car becomes a lot more stable, and better in wide, high-speed turns. This is good on wide-open tracks.

Anti-Squat

More: More anti-squat generally makes the rear of the car more sensitive to throttle input.
The car has more steering while braking, and also a little more powering out of corners.
On high-traction tracks, it may feel as if the car momentarily has more rear traction accelerating out of corners.
A car with more anti-squat can also jump a little higher and further, and it will soak up bumps a little better, off-power.
A lot of anti-squat (4° or more) can make the car spin out in turns, and make the rear end break loose when accelerating.

Less: Less anti-squat gives more rear traction while accelerating on a slippery or dusty track.
It also gives more side-bite.
Less anti-squat will make the car accelerate better and faster through bumpy sections.
Very little anti-squat (0° or 1°) makes the rear end feel very stable. It also makes power sliding a lot easier.
Note that anti-squat only works when you're accelerating or braking, it does absolutely nothing when you're coasting through turns.

The harder you brake or accelerate, the bigger the effect of anti-squat is.

Shock Pistons

The assumption is made that if pistons are changed, the viscosity of the oil is also adapted, to give the same static feel. (Same low-speed damping)

Smaller Holes: Smaller holes mean more 'pack'. Pack means the damping gets very stiff, or almost locks up, over sharp bumps, ruts, or landing off jumps.
Small holes are good for smooth tracks, with big jumps or crummy jumps with harsh landings.

Bigger Holes Bigger holes mean less pack. The point at which the damping gets stiff (where the shock 'packs up') occurs a lot later, at higher shock shaft speeds.
Big holes are very good for bumpy tracks. The car is more stable and has more traction in the bumpy sections. It won't be thrown up over sharp bumps, the suspension will soak them up a lot better.

Smaller holes in front: The car jumps very nicely, a little more nose-up.
It feels easy to drive.
Bigger holes in front: Can give a subtle feel of more steering and more consistent front end grip if the track isn't perfectly smooth.

Always use the same, or about the same shock pistons front and rear. Big differences in pistons make the car feel inconsistent, and not very smooth.

Lower Shock Mounting Location

Bear in mind that changing the lower shock mounting location changes the lever arm of the shocks on the wheels.
So mounting the shocks more inward makes the suspension softer at the wheel, and mounting the shocks more towards the outside makes the suspension stiffer.

Front more inward: More low-speed steering. Usually makes the car very hard to drive.

Front more outward: Makes the car very stable, but it has a lot less low-speed steering.

Rear more inward: Makes the car soak up bumps a little better, and can make the car corner a bit faster. Can be good for bumpy, low-grip tracks, but general stability is greatly reduced.

Rear more outward: Feels very stable. This is the way to go for high-grip tracks.

Upper Shock Mounting Location

More Inclined: Has a more progressive, smoother feel. More lateral grip.

Less Inclined: (More Vertical) More direct feel; Less lateral grip. (side-bite) generally a bit better for jumps and harsh landings.

Front more inclined than rear: Steering feels very smooth. A little more mid-corner steering. Mounting the rear shocks very upright can result in the rear end sliding in the middle of the turn, especially in high-speed turns.

Rear more inclined than front: Feels aggressive turning in. The car has a lot of side traction in the rear, and the turn radius isn't very tight.

Roll Center / Camber links

Long Link: A long link gives a lot of body roll in turns.
It feels as is the body is willing to keep on rolling, until in the end, the springs prevent it from rolling any further. The car has more grip in corners, especially the middle part.

Short Link: A short link makes that the body doesn't roll as far, its tendency to roll drops off as it rolls. This can stabilize a car in bumps and curved sections. It feels as is the car generates a little less grip.

Parallel Link: (Parallel to lower arm) A parallel link gives a little more roll than an angled one. It feels very smooth, and consistent as the body rolls in turns.

Angled Link: (Distance between arm and link is smaller on the inside) An angled link makes it feel as if the car has a tendency to center itself (level, no roll), other than through the springs or anti-roll bar. It gives a little more initial grip, steering into corners. It makes it very easy to 'throw' the car. The body rolls a little less than with parallel links.
On bumpy tracks, it could be possible to use softer settings for damping and spring rate than with parallel links, without destabilising the car.

Beware that you should always keep an eye on the balance of your car; large differences in roll center front vs. rear will make the car feel less consistent and less confidence-inspiring.

Longer Front: The front rolls and dives more in turns. Lots of steering in mid-corner. Could make the car hook.

Shorter Front: The front feels very stable.
A little more turn-in, but less steering in mid-corner.

Longer Rear: More rear traction in turns, and coming out of them.
Rear end slide is very progressive, not unpredictable at all.
Make sure that there's enough rear camber though, or you could lose rear traction in turns.

Shorter Rear: The rear feels very stable. It breaks out later and more suddenly, but if it does, the slide is more controllable.
It makes the front dive a little more, which results in more steering, especially when braking.

More Angled Front: Turn-in is very aggressive. The front feels as if it wants to roll less than the rear.

More Angled Rear: The rear end is rock-solid while turning in. It feels very confident.

Camber

Camber is best set so the tires' contact patch is as big as possible at all times. So with a stiff suspension you'll need less camber than with a soft one.
If the tires wear evenly across their contact patches, camber is about right.
On really bumpy tracks, adding a little more negative camber (2 to 3 degrees) can help traction and reduce the chances of catching a rut and flipping over.

Toe

Front Toe-in: Stabilizes the car in the straights, and coming out of turns. It smoothes out the steering response, making the car very easy to drive.

Front Toe-out: Increases turn-in steering a lot. But can make the car wandery on the straights; Never use more than 2 degrees of front toe-out!

Rear Toe-in: Stabilizes the car greatly. It makes the rear end 'stick', but more toe-in makes the difference between sticking and breaking loose bigger.

Rear Toe-out: Rear toe-out is never used. It makes the rear of the car very, very unstable.

Anti-Roll bar

Anti-roll bars are best used on smooth, and high-traction tracks only.
If you must use one on a bumpy track, try to use a very thin one.
Adding an anti-roll bar, or stiffening it, reduces traction at that end of the car. So it feels like the opposite end has more grip.
If the track is smooth enough, it also makes the grip level feel more consistent.
Anti-roll bars reduce body roll in turns, so they make the car feel more direct, and make it change direction quicker.

Stiffer Front: An anti-roll bar at the front of the car reduces low-speed steering. The turning radius will be larger, but very consistent. It reduces 'hooking' by preventing front end roll. The car will have more rear traction in turns.

Stiffer Rear: Adding an anti-roll bar to the rear of the car gives more steering. The car steers tighter, also at low speeds.
On a very smooth track, it can make power sliding easier. It can also make powering out of turns and lining up for jumps a little easier.

Ackerman

More: (Bigger difference in steering angle between the two font wheels) More Ackerman makes the steering more consistent, and smoother. It just feels right, also at low speeds and in tight turns.

Less: (Smaller, or no difference in steering angle between the two font wheels) Less Ackerman makes the steering more aggressive at high speeds. The car turns in more aggressively. It doesn't work well when either traction or cornering speeds are low.

Internal Travel Limiters / Droop / Downtravel

More (less droop / downtravel): The car changes direction faster, and corners flatter. It feels generally more responsive. Adding a lot of travel limiters is only advisable on smooth tracks.

Less (more droop / downtravel): Less internal shock spacers give better handling on bumpy tracks, and more and more consistent traction on difficult tracks. The car also land better after jumps.
The end with the least downtravel will feel the most stable, and the most direct. But try to keep a balance (front and rear end droop about the same), especially on low-grip tracks.
Adding more internal travel limiters is a very effective way of reducing traction rolls, if not the most effective way.

Pinion / Spur

Overall Ratio Overall Ratio = (Spur/Pinion)*Internal Gearbox Ratio

Rollout
(mm/rev) Rollout = (Pi*Tire Diameter)/Overall Ratio