1/5th SCALE SETUP GUIDE

This is a 'Quick Reference' setup guide:

This setup guide assumes you have some sort of 'standard setup' to begin with.
It also assumes your car is in perfect working order. (Bearings spinning freely, nothing dragging the ground, no binding in the suspension.
Tyres are always the first element in setting your 1/5TH scale. If you've got the right tyres, 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.

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 caster aids stability, and handling in bumpy sections.
Less caster increases steering drastically. Steering feels much more direct, the car turns tighter and faster

ANTI-SQUAT

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 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

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 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.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.
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 is never used. It makes the rear of the car very, very unstable.

SWAYBAR

Sway 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.
Sway bars reduce body roll in turns, so they make the car feel more direct, and make it change direction quicker.

STIFFER FRONT

Sway 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 a Sway 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 powersliding easier. It can also make powering out of turns and lining up for jumps a little easier.

ENGINE RUNNING IN PROCEDURE

Zenoah RC-style engines and clones are tuned for high performance and need to be well taken care of. Running-in an engine is a process of alternately heating and cooling the engine to allow
all parts to properly seat themselves, and allowing 2-stroke oil from the incoming fuel to coat the interior of the engine. DPS recommends the following running-in procedure:

We recommend the following running-in procedure:
Use 95 octane or higher fuel, mixed 25:1 with a quality non-synthetic 2-stroke oil. (You can use synthetic oil for break-in also. Just run slightly more fuel through the engine.)
Run the engine at varying speeds for periods of 3 to 10 minutes at a time. During this running-in time, **NEVER** go full throttle. Always let the engine idle for 30 seconds before turning it off.
Allow the engine to cool off for 10 minutes before starting it again. Repeat this process 3 or 4 times - 3 or 4 full "heat cycles".

After the running-in period, switch to a high-quality synthetic 2-stroke oil, mixed at 25:1.
Be sure to let the engine idle for 30 seconds to cool before stopping. Be sure to follow the maintenance schedule included in your engine owners manual.

OFF-ROAD TYRES

Off-road tires operate quite differently from on-road tires. They usually have some sort of tread pattern with pins that dig into the soil, or a series of small pins that scrape the top surface.

Off-road traction is generally more complicated, the curves have more complex shapes, there are more types of soil, more transients, and there are more variables.

Size of the pins/blocks

Rule of thumb that says:"The softer the dirt, the bigger the pins need to be." Long pins work by penetrating the soft soil, and short pins usually work by scraping off the upper layer of the soil. Bear in mind that long pins and very soft compounds don't mix very well, and then the spikes just bend over instead of penetrating the dirt

There is another basic rule. The higher the level of grip, the shorter the pins will have to be. Or:

the more power that's available, the shorter the pins have to be. Pins shouldn't bend over too much, that's all there is to it.

Pins or blocks

Round pins provide grip that feels the same in all directions, it feels consistent and it's somewhat easier to slide. Very useful on difficult, low-traction, bumpy tracks.

Square blocks feel more 'edgy', they can give the impression of generating slightly more grip, especially on smooth, hard surfaces. The forward traction they generate also feels nicer. Which is probably because each block has a wider 'edge', which scrapes off more material.

Density of the pins/blocks

For a given tyre width, the density of the pins is inversely proportional to the weight supported by each pin. There's usually an optimum, where the tyre works best. For example: if a certain

tyre works very well when it's heavily loaded, but doesn't feel right when it isn't loaded, the tread pattern is probably too dense. This can happen in very dusty or soft conditions. Tyres with lots

of pins don't like dusty conditions: there's not enough space between the pins for the dust to get out. Tyres for sticky mud usually have a very low spike density, because you need plenty of

pressure on a spike to push it into the mud. Too many spikes would mean not enough pressure on each one of them. Also because too many spikes cause too much friction for the amount of traction they create, slowing the car down.

Rubber compound

The softer the surface, the harder the compound, and vice versa. That's the basic rule. There is one exception. Some synthetic surfaces, like carpet require specially formulated compounds.

Hard compounds

These work well on very soft surfaces, such as mud, damp, loose dirt and fresh grass. The idea is that the tyre doesn't move, but the soil does.
Hard compound tyres aren't sensitive to changes in foam insert. Whether you use a firm one or soft one, it doesn't really matter.

Medium compounds

These compounds work well on most dirt surfaces. They're the best choice if the track is soft, or is starting to break up.

Soft compounds

Soft compound tyres work well on very hard, slick surfaces, where the rubber compound is more important than the tread design.

Choosing the right compound for the track conditions is not easy. It takes a lot of experience to 'read' the track. The best way to start is to kneel down and feel the dirt with your fingers. If it's hard as a rock, with very small grains, it's almost certain you'll need a soft compound. Even if there is some fine, loose dust.

If there is a serious 'blue groove' (rubber deposit), a medium compound is probably better. If there's plenty of traction, there's no point in using a soft, floppy tyre. It would just flop around and bend over too much.

If you're racing on dirt that's damp, rubber compound is not very important. The only difference is that a soft tyre will feel stickier, and a medium compound tyre will feel more direct because the carcass holds its shape better.

It gets difficult when a track is drying up, or when it has hard and soft parts. In that case, it's probably best to do some back-to-back testing with different tyres.