

TECH: KART 'SUSPENSION'

KART SUSPENSION – WEIGHT TRANSFER

Alright, so if none of the changes we make actually effect how much grip we have, what do they actually do? Well, we've been saying all along that karts don't have suspension, but in reality, they do. The tyre is the biggest factor in karting suspension (don't believe me? – in an F1 car more than 50% of total suspension travel is in the sidewall of the tyre!). The wheels are part of the suspension. The hubs are suspension, the axles are suspension, the chassis is suspension, even the seat is suspension.

Put a rock hard seat in your go-kart and see how it handles. Probable answer – badly.

Karts are full of items that behave like suspension, it's just not as obvious as the linkages and coil springs in the family Commodore's MacPherson Strut setup. No-one would doubt that a leaf spring under your trailer is suspension, but really, how is it any different from your chassis? There's no dampers in the form of shock absorbers in the trailer, but it still has suspension. There's no dampers in a kart either, but 4130 Chromoly is the material of choice for chassis's because it can withstand enormous strain (deflection) without permanently deforming. This allows the designer to create a very flexible design (ie, like a fairly soft spring rate in a car) without the chassis being permantly bent every time you take a corner!

Your kart's suspension is there to perform a number of tasks. Firstly, like the obvious purpose of suspension in a car, it's there to help you ride bumps. Fortunately for karter's collective behinds, most tracks are pretty smooth so that's not usually it's primary task. Suspension also plays a large role in the transfer of weight to the tyres through the corner.

In a race-car, suspension tends to be very stiff, and the centre of gravity very low. This minimises the transfer of weight to the outside tyres, retaining as much weight as possible on the inside wheels. This is because two tyres sharing a load create more grip (the collective coefficient of friction is higher) than a single tyre carrying that same load. So on a racecar, they can generate more TOTAL grip (and he who has the most grip wins, remember) by preventing as much weight as possible from transferring onto the outside tyres.

On a kart, however, we don't have that technological marvel – the differential. So, we actually want to transfer a LOT of weight to get the inside tyre clean off the track. The whole reason the rear tyres are so much

bigger than the fronts is that, when cornering in a go-kart, we're only using ONE rear tyre!

You might be wondering why, if we're trying to transfer a lot of weight, we don't just set up karts really soft, as this promotes a lot of weight transfer. The answer is that while some is good, more is not better. As with many things in racing, there is a "sweet spot" somewhere in the middle, that we are all trying to find on any given day. A kart that is too soft will transfer weight too quickly, loading the chassis up, and making it spring back down, dropping the tyre onto the track surface, binding up the kart. "I've got too much grip!" you'll hear them cry!

Likewise, a kart that is too stiff will not transfer enough weight, meaning that the inside rear tyre won't lift off the track at all, binding up the chassis. "I've got too much grip!" they cry again!

Now you know why I hate the term "too much grip". It describes the symptoms, but not the cause. Any time you are tuning a chassis you need to look for the reasons why things happen – whether that be by getting your head as close to the ground as you can to get a good look as your driver goes past, or by carefully feeling the machine underneath you and looking for the exact behaviour that creates the undesirable handling as you drive.



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