TECH: **SEAT POSITION**

MOVING THE COG HORIZONTALLY (cont.)

Remember, the red arrow represents the cornering force, so if we have identical corners left and right, this arrow will be the same. The green arrow always points from the COG towards (or through) the contact patch of the tyre. If the COG is a different distance from each contact patch, then the resulting blue arrow will be different from side to side! In this case, the kart will try to tip much more when turning right than turning left. For this reason, you ALWAYS want a kart to have 50% weight distribution side to side (in other words, both back tyres have the same amount of weight on them, and both front tyres have the same amount of weight on them).

Of course, you can also move the COG forward and back. Generally speaking, most karts will perform best with somewhere between 55% and 60% of the weight on the rear, and 40% to 45% of the weight on the front. The closer to one end of the kart the COG is, the more that end of the kart will flex. Karts are designed with a front end that is vastly more flexible than the rear, so the weight distribution is naturally required to have a rear-bias. There are a couple of signs that the COG is too far forward or back.

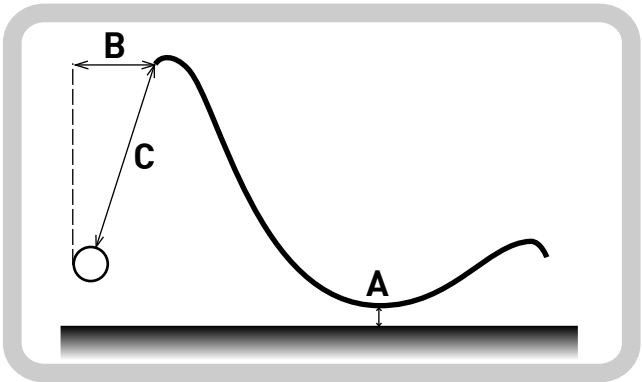
Firstly, if a kart ALWAYS understeers, no matter what chassis changes you make, then it's likely that the COG is too far back. Conversely, if the rear of the kart constantly oversteers, the COG is probably too far forward. Tyres make more grip with more weight on them (and physics nerds will tell you this is a non-linear relationship but that's probably not important just yet), so with incorrect weight distribution the "light" end will struggle to make grip.

Another way to tell that the COG is not in the ideal position is that your setup always tends to an extreme at one or both ends of the kart. For example, if you can only ever get the kart to work with a super-soft axle, short hubs and a loose third bearing, it's probably telling you that the COG is too far forward. Remember, the more weight over one end of the kart, the more that end will flex. If your setup is always trying to make that end flex, leaving you with no-where to go (setup-wise) in some conditions, then moving the COG is the solution.

INSTALLING YOUR SEAT

So, having read all this and realised that your seat needs to be moved, what is the best method of doing so? Firstly, before changing ANYTHING, accurately measure your present set-up, so you know where to go. Place the kart on a nice flat surface with the tyres inflated to the correct racing pressure. Measure the distance from the bottom of the seat to the ground (a pile of sprockets is handy for this – each sprocket is 4mm thick). Get a large carpenters square, place one side on the ground, and one up against the rear of the axle. With a steel ruler, measure horizontally from the square to the lip of the seat. Finally, measure the distance from the axle to the lip of the seat on the angle. In the diagram below, these dimensions are labelled A, B and C, respectively.

SEAT DIMENSIONS



To move the COG up, the easiest way is to reinstall the seat on more sprockets. Don't go overboard however, raising the height by more than two sprockets at a time is likely to take you too far. Most karts will run best with the seat on between four and eight sprockets (16-32mm off the ground). In some conditions it may be ideal to go to less than four sprockets, though this is likely to be at the expense of your behind!

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