

TECH: SEAT POSITION

INTRODUCTION

Here we are, already into the second tech article from the www.phoenixracekarts.com.au website. The hardest part of creating a series of articles is deciding in what order to tackle the various areas of kart setup. Because each adjustment you can make will intrinsically effect almost every other facet of kart setup, it seems that that before you grasp ALL of it, it can be difficult to grasp ANY of it!

Rather than trying to describe everything in detail as we go, there may every now and then be a term that you're not familiar with – fear not – we will cover it all soon. This time, we will discuss the most important setup change you can make to your kart – seat position.

WHY IS IT SO IMPORTANT?

The dynamics of any racing machine, be it a go-kart or a Formula 1 car, are highly dependent on the location of the Centre of Gravity (COG). The centre of gravity is an imaginary point at the centre of all the mass in the machine. It is important because all the forces that act on the machine due to acceleration and cornering, act through that imaginary point. If we move the COG, we move the point through which all acceleration, braking, and cornering forces act on the kart.

In a V8 Supercar, this makes the location of the engine itself very important, as it is the largest and heaviest single object in the vehicle. A slight change in the position of the engine can move the COG of a V8 Supercar quite dramatically. In a kart, the largest and heaviest single object is... you, the driver!

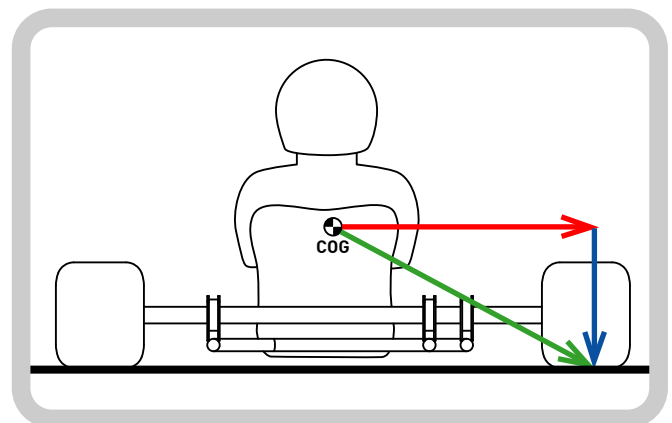
The best way to move the COG of a go-kart is to move the driver. Because the driver often weighs as much as the rest of the kart, the seat must be moved in very fine increments or the balance of the kart will be lost very quickly.

MOVING THE COG VERTICALLY

Let's have a look at how exactly the location of the COG effects handling. We will start with the VERTICAL position of the COG. Remember, the most important aspect of a good handling go kart is unloading the inside rear wheel while entering a corner, maintaining the lift mid-corner, and gently placing it back down on corner exit. Our first tech article on front ends explained how the weight jacking effect of the front end lifts the inside rear on corner entry. The location of the COG is one of a number of other parameters that effects how this initial lift is sustained.

Let's have a look at the kart from behind. Once a kart has begun cornering, the mass of the system (kart and driver) is thrown outwards, away from the centre of the corner. This force is applied at the COG. The force must find its way to the outside rear wheel, shown by the green arrow. Those of you who have done Year 11 Physics will know that a force vector can be broken into two components, horizontal and vertical. The green vector can be duplicated with two vectors, the red and blue arrows.

THE FORCE TRIANGLE



Now, we all know that the cornering forces help tip the kart up, off the inside rear wheel. The amount that the force will try to tip the kart is modelled by the length of the blue arrow. Imagine the blue arrow is a spanner, the longer it is, the more TORQUE the cornering forces can apply to the kart, to turn it over the outside rear wheel. A nut that is difficult to turn