

TECH: FRONT END SETUP

HOW FRONT END GEOMETRY EFFECTS HANDLING (CONT)

KPI, which affects the camber the same amount as the stub axle is welded solid. The camber change is what we are really trying to achieve so generally people will refer to it as “camber adjustment” rather than “KPI adjustment”.

On occasion, a bit of negative camber can help. There's a tyre characteristic called “camber thrust”, which is crucial to the handling of motor-bikes. Simplistically, a tyre that is “laid over” creates a force in the direction it's leaning. As a result, a bit of negative camber can help the front of a kart turn better, though usually at the expense of tyre wear.

Lastly, it's important that the tyres are facing in the same direction for the kart to behave correctly. In most conditions, Phoenix karts generally perform best with zero toe – perfectly aligned front wheels. Toe-out can increase turn in, but at the expense of stability and speed if the misalignment is too dramatic. You will almost never want a kart with toe-in.

SETTING UP YOUR FRONT END

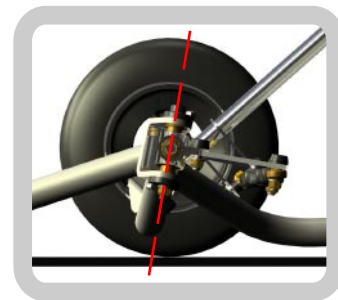
The easiest way to accurately measure front ends is with a laser alignment system. Interestingly, two Australian companies, Jet and Sniper, lead the world in the manufacture of these products. Phoenix has no particular affiliation with either of these companies, but we use both with great results (and as a testament to their accuracy, get the same result on each unit when comparing one to the other).

If you don't have a laser alignment system – fear not! – it's nothing you can't measure with a tape, it's just a bit more fiddly that's all. There are products on the market that aid front end alignment without the use of lasers, the best example being the ZTB (zero-toe-bar) from another Australian company – JL Racing Products (again, no affiliation with Phoenix Race Karts).

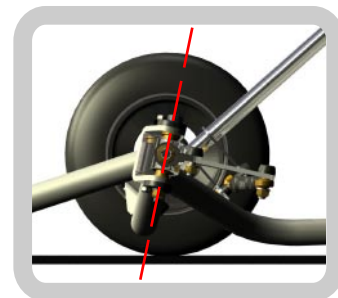
So how do we measure caster, camber, and toe?

Really what we're adjusting is angles, but on karts, the easiest way to measure is with millimetres. So “2mm toe-out” means that the rear of the tyres are 2mm closer together than the front of the tyres. Likewise, “4mm positive camber” means the bottoms of the tyres are 4mm closer together than the tops of the tyres. Caster is the hardest to measure, but is usually left in one of three settings – neutral, maximum, or minimum. There are laser systems that allow you to measure caster, but the reward doesn't often justify the cost, for the average racer.

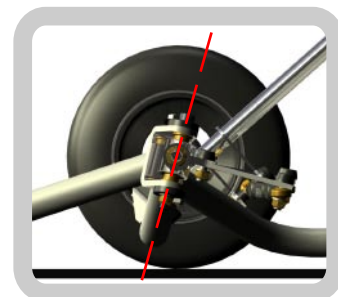
MINIMUM CASTER



NEUTRAL CASTER



MAXIMUM CASTER



There's an important point to make about setting up front ends, and that is to make the distinction between “static” and “loaded” settings. Most people set up their kart's front end on a stand, and the main reason is – convenience! The problem this creates is that the settings applied on the stand are