

All Loads Great and Small

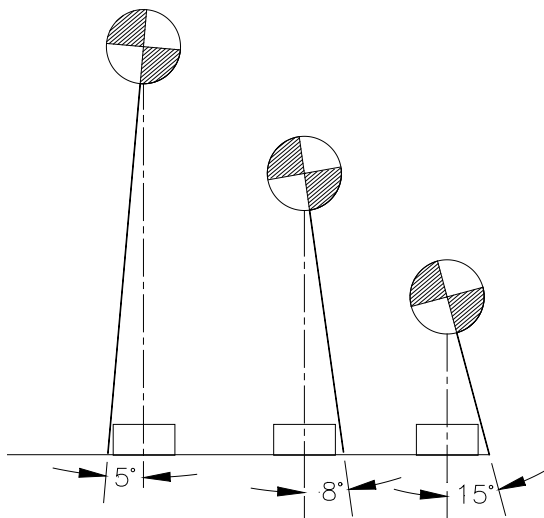
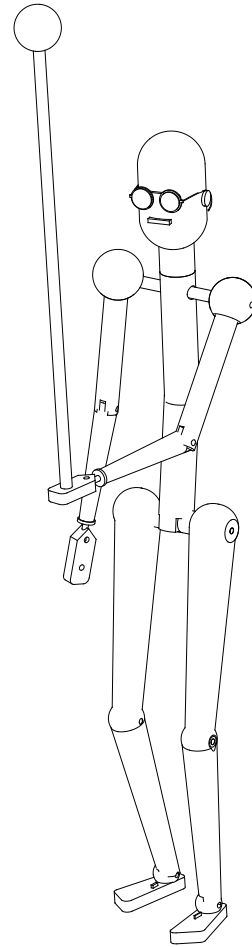
By Bingo Sun Noon

Living the bicycle lifestyle is impossible without the ability to carry loads safely and comfortably. Children, adult passengers, building materials, guitar amps and touring equipment all qualify as loads as they apply to this exercise. Whether great or small, light or heavy, mastering load carrying is essential and not all that difficult. Mostly it's about controlling your center of gravity, avoiding phugoids and ensuring adequate braking power.

There are three design criteria to consider when building or modifying a bike for load carrying. Numbers one and two are crucial. The third is illustrated by the fellow shown at the right. Imagine a coconut impaled on a stick. The longer the stick, the easier it is to balance the coconut.

Keep your coconut as high as possible.

The other two design elements are not quite so simple. They involve keeping the centers of mass as close together as possible. This is very important. Also, be aware of where the center of gravity is found along the longitudinal axis. If given the freedom to do so, bikes would always translate about the center of gravity. They do not have that freedom (only airplanes and submarines do) but the concept is a valuable tool all the same. High rigidity is required for load carrying. So is balance. A properly designed front loader is tail heavy when ridden empty; a rear loaded bike is heavy on the front end when ridden empty. Anyone who has ridden a tandem solo knows this. These effects can be reduced a bit but will always be there. That's just the way it is. And what is it about those phugoids anyway that makes them so important?



Three bicycles with center of gravity as shown execute the same maneuver, in this case avoiding an obstacle. Since all bodies in motion translate about the center of gravity, the bike with the highest center of gravity has an easier time of it.

A low center of gravity is beneficial when the bike is stopped or being pushed along with a flat tire.

Ask the guys with the tall bikes. They know all about this stuff.