



Steering System of Go-kart

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Abstract The report covers all the parts of the structuring and examination of the last go-kart steering system mechanical linkage steering system are commonly used due to their simplicity in design and construction the main purpose of this paper is to design and manufacture the mechanical linkage and turning radius steering ratio, steering effort etc. Aside from this we will likewise investigate the parts coordinated into the go-kart and purpose for it.

Keywords Mechanical linkage, Ackerman principal, camber angle, articulation

Introduction

The act of driving the vehicle is called steering. The steering system is one of the main interfaces between driver and vehicle. It is a mechanism used to control the path allowed by the vehicle. The management of the articulation points is made simple and reliable through an adequate steering system. When the driver turns the vehicle, the rotational movement of the vehicle turns into linear movement. The basic aim of the steering is to ensure that the wheels are facing in the desired direction.

Steering is a system used in most types of transport to control the movement of the vehicle. The steering mechanism is the vehicle's motion control system that it includes few main components which are the steering wheel, the steering column, the steering vehicle rack and wheels.

Steering System

The steering system can be defined as the collective set of components, connections, joints. These are responsible for checking the vehicle. This system converts the rotation movement of the steering wheel into a different hand between the angular rotation of the steering wheel. The steering system should provide a mechanical advantage over the front wheel joints to help the driver turn easily. The effort applied by the driver must be minimal.

The direction must be to some extent irreversible so that the road bumps are not transmitted to the driver's hands. Management must have self-centered action. The steering should turn the wheel as quickly as possible.

Ackermann Principal of Steering

To solve the problem of the wheels inside and outside of a curve that must draw circles of different radius, Ackermann's management principle is used.

Hypothesis

- 100% Ackermann steering geometry.
- The maximum angle of the street side is 20 °.



- The optimal range of angle of inclination of the pin of the pin is from 4° to 8° .
- The front to rear weight ratio is 40:60.
- Taking acceleration due to gravity as 10 m/s^2 .

Camber Angle

Camber is a measure of the center line of the wheel / tire relative to the road surface. It is expressed in degrees and greatly affects the driving dynamics of the car.

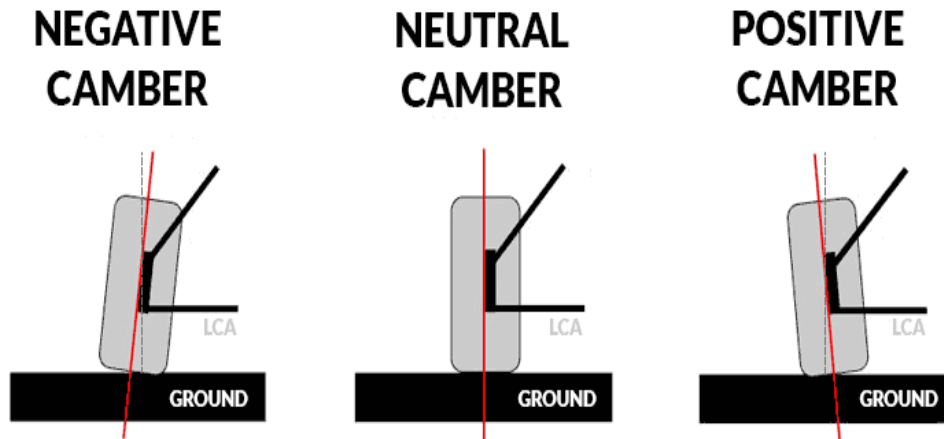


Figure 1: Camber Angle

Negative Camber

Negative camber occurs when the top of the tire folds inward. For a normal car, you generally want to maintain a slight amount of negative camber ($0.5 - 1^\circ$) to have a good balance between cornering grip, braking grip and tire wear. In most vehicles, it is common to have a slightly more negative tilt ($0.8 - 1.3^\circ$) at the rear to reduce the chances of over steer (loss of rear grip).

Positive Camber

Positive tilt is when the top of the tire extends outward and the base of the tire bends inward. This is rarely seen in a road car as it will reduce road management skills. In special situations, such as NASCAR, a positive slant will be applied to handle large amounts of track fill. If you are performing a positive tilt figure on your tram, it is highly recommended to inspect the suspension for damage and / or adjust the tilt to a slightly negative figure.

Caster Angle

The wheel is the measure of how much in front or behind the steering axis is the vertical axis, seen from the side. An example of wheels in action are the front wheels of a trolley. They run a series of positive wheels to keep the trolley straight without wandering. However, the method used by the trolley (scroll wheel) is different from how your car develops its steering angle (rotation angle), but the effect is the same.

Positive Caster

Positive front angles range from 3 to 5° in modern vehicles. This provides a good combination of road stability and steering feel. For a more performance-oriented configuration on a MacPherson mast, a degree or two can be added for more favorable tilt gain with high steering angles.



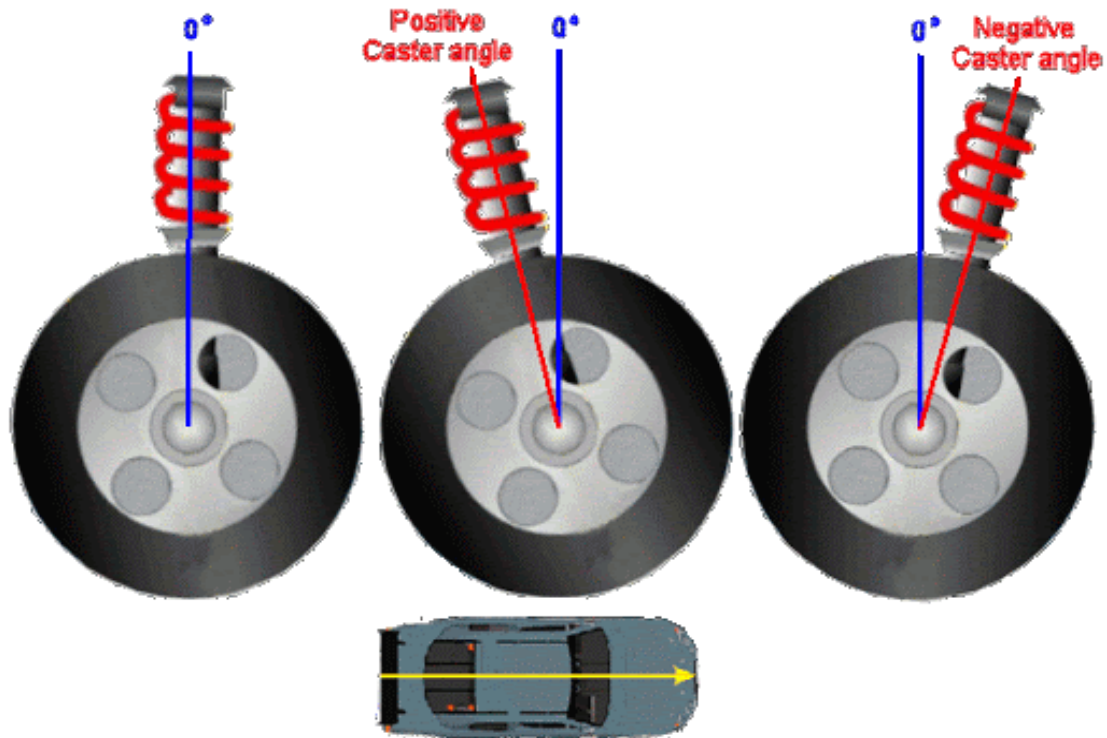


Figure 2: Caster Angle

Negative Caster

The negative wheel is when the steering axle is behind the vertical. This is generally only found in older vehicles due to tire technology, chassis dynamics and other reasons. Modern vehicles do not use negative wheels. It will lighten the steering effort but also increase the tendency of the car to wander on the road. If you've ever pushed a cart, you've felt the effects of the negative wheel on the front wheels.

Conclusion

The manual mechanical linkages steering system is not used in heavy weight vehicles due to high axle loads, although it is simple in design and easy to manufacture, therefore it is commonly used in light weight vehicles. The values calculated in the paper may differ practically due to steering linkages error or due to improper steering geometry, so these values are useful to understand the interdependency of the quantities on each other and to design a ideal manual mechanical linkages system for the vehicle.

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