



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF AGRICULTURE ENGINEERING

19AGB301-Farm Tractor

III year V semester

UNIT 3–Power outlets and Tractor Control

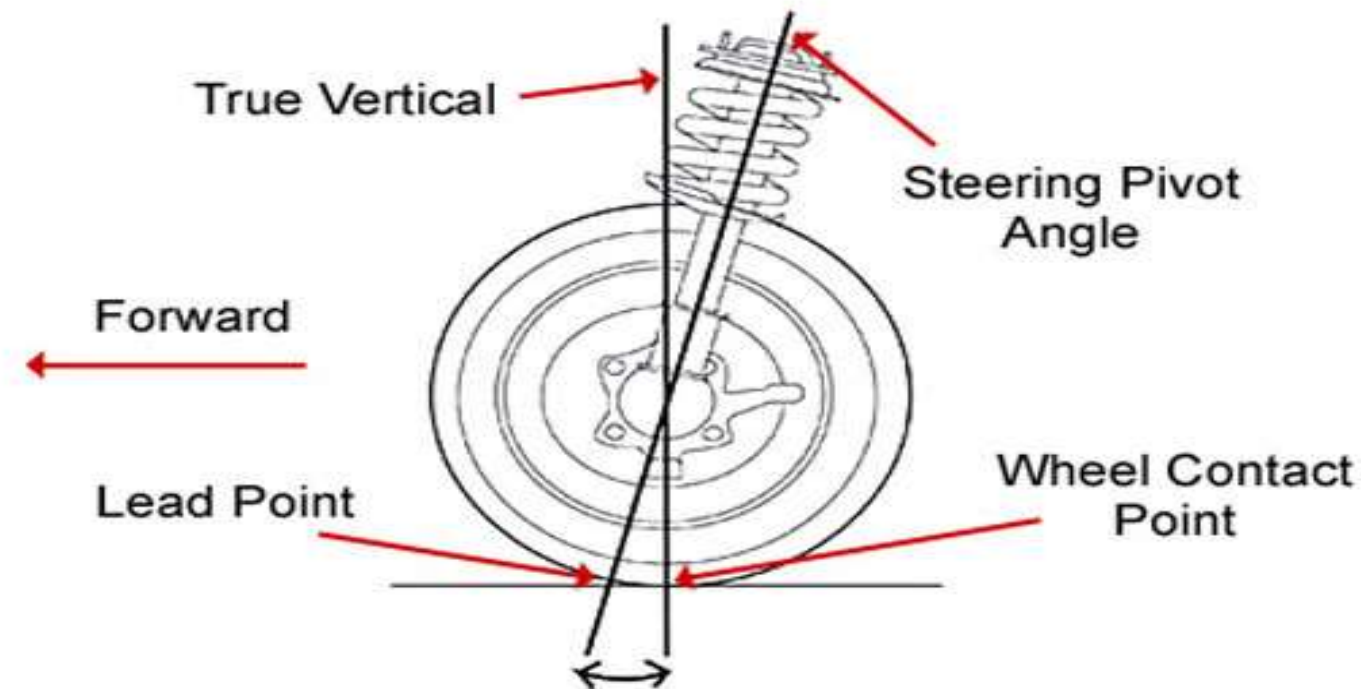
TOPIC –Caster Camber –Kingpin inclination –Toe in and Toe out





CASTER

Caster is the fore or aft slope of the steering axis. The steering axis is a line drawn through the upper and lower ball joints of the knuckle. Positive caster is when the bottom of the steering axis line is in front of the tire's contact patch. Zero caster is when the steering axis is at 0 degrees. Factory alignment specs for basically all vehicles call for a certain degree of positive (shown) caster. This ensures good stability, helps maintain straight-ahead direction and promotes steering wheel self-centering.





TYPES OF CASTER



Positive Caster – If the line slopes towards the rear of the vehicle, then you have positive caster. The down side to positive caster is if the vehicle does not have power steering. In this case steering effort will be increased. Positive caster is primarily beneficial to the vehicle as it increases the lean of the tire when the vehicle is cornering, while returning it to an upright position when driving straight ahead.

Negative Caster- If the line slopes towards the front of the vehicle then the caster is negative. Negative caster will allow you to steer less around turns, but may cause you to drift if you are driving straight forward.

Positive and negative caster mainly apply to race cars, and unless your vehicle is lifted or customized in some way that calls for an adjustment, street cars usually run on factory determined settings.



Negative Caster



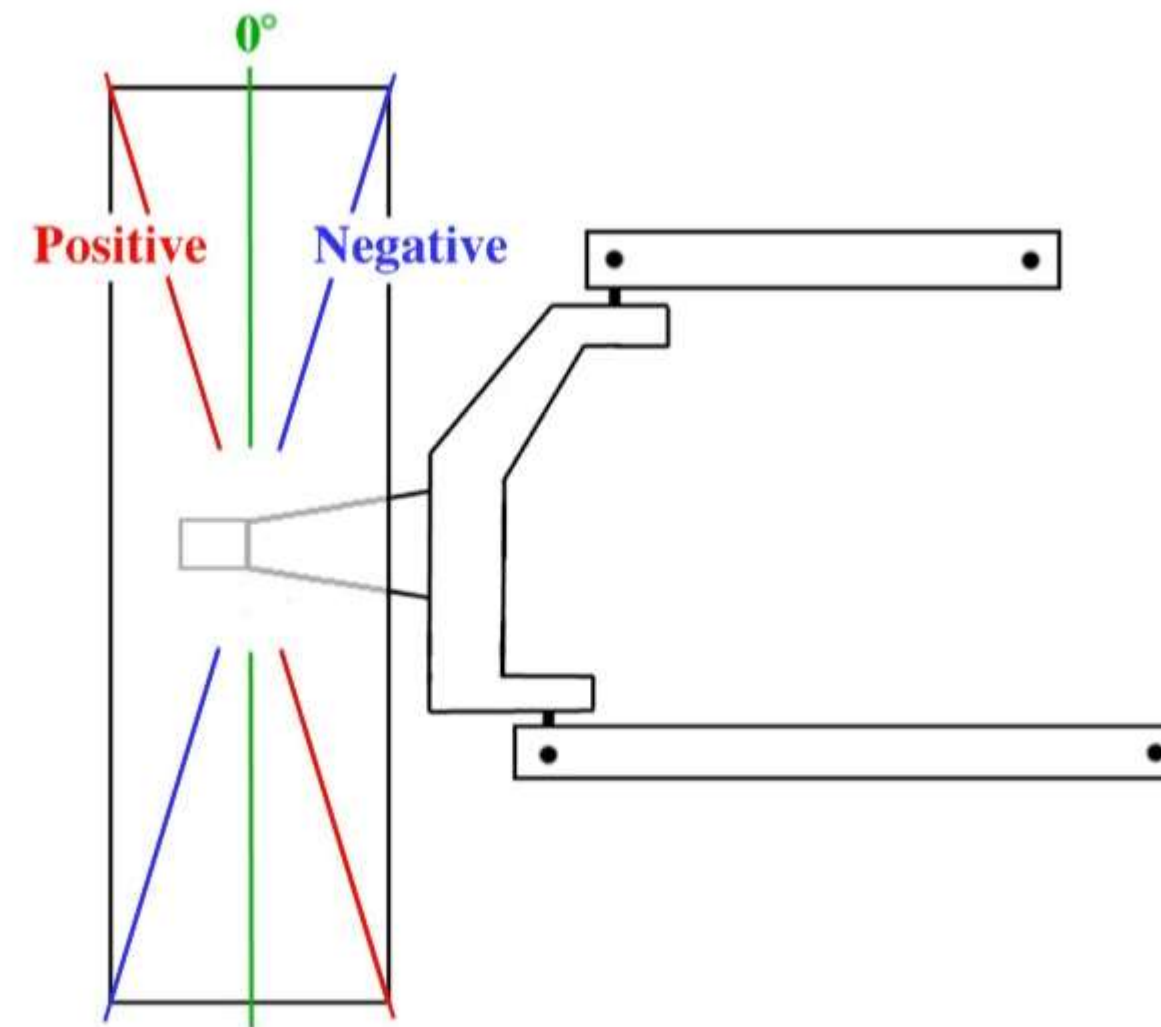
Positive Caster



CAMBER



Camber is the angle of the wheel relative to the vertical of the vehicle, and depending on the tilt, is either considered positive camber or negative camber. When the top of the tires tilt away from the center of the vehicle you have positive camber, and when the top of the tires are tilted inward you have negative camber. One isn't better than the other, but varying camber angles have different effects on your vehicle.



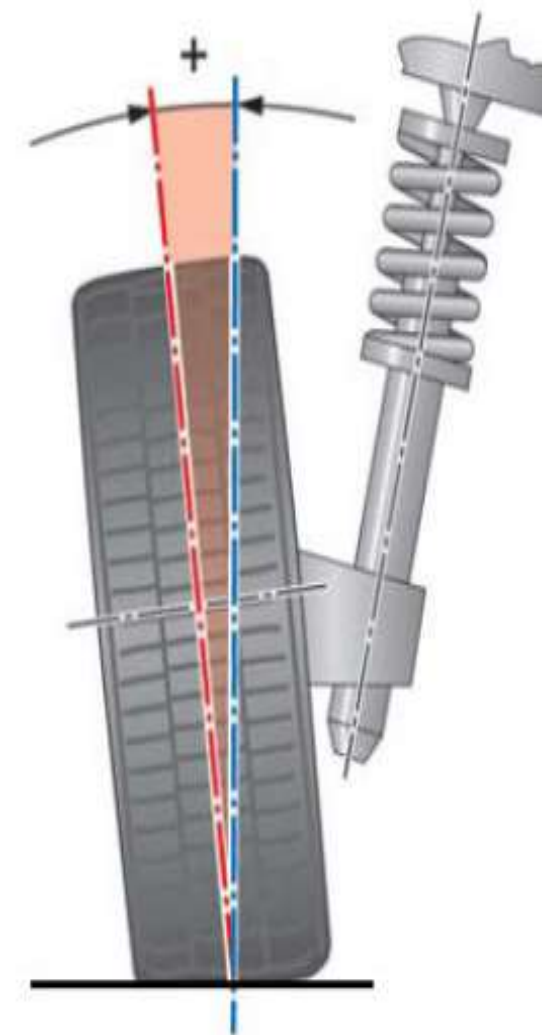


TYPES OF CAMBER

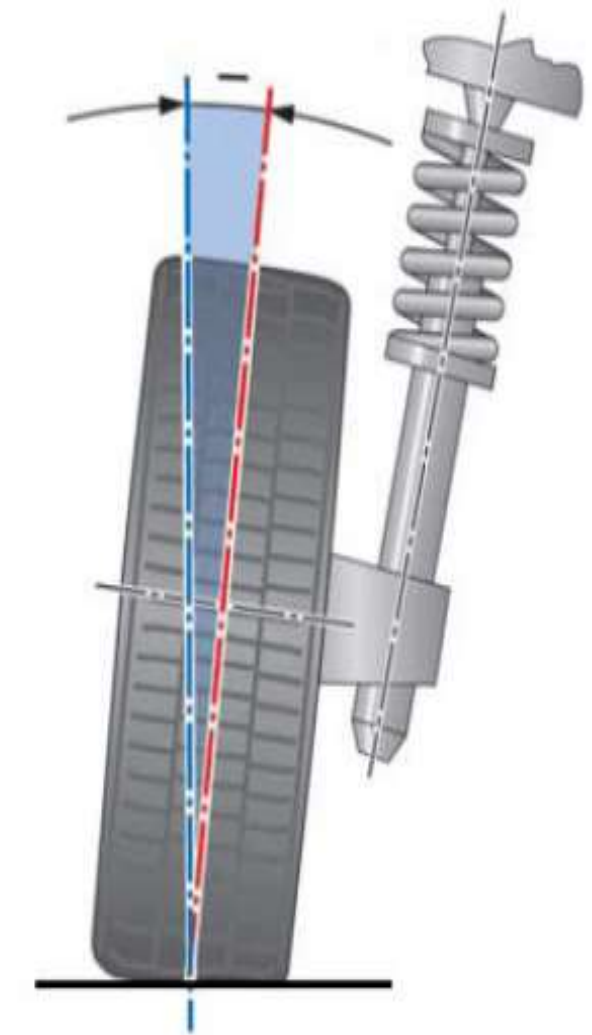
Positive Camber – When your wheels are tilted outward, the vehicle has improved stability

Negative Camber – High performance vehicles that require better cornering tend to use negative camber, because it gives the driver more control in this regard.

Positive camber



Negative camber





KINGPIN INCLINATION

Swivel pin or kingpin inclination is the lateral inward tilt (inclination) from the top between the upper and lower swivel ball joints or the kingpin to the vertical

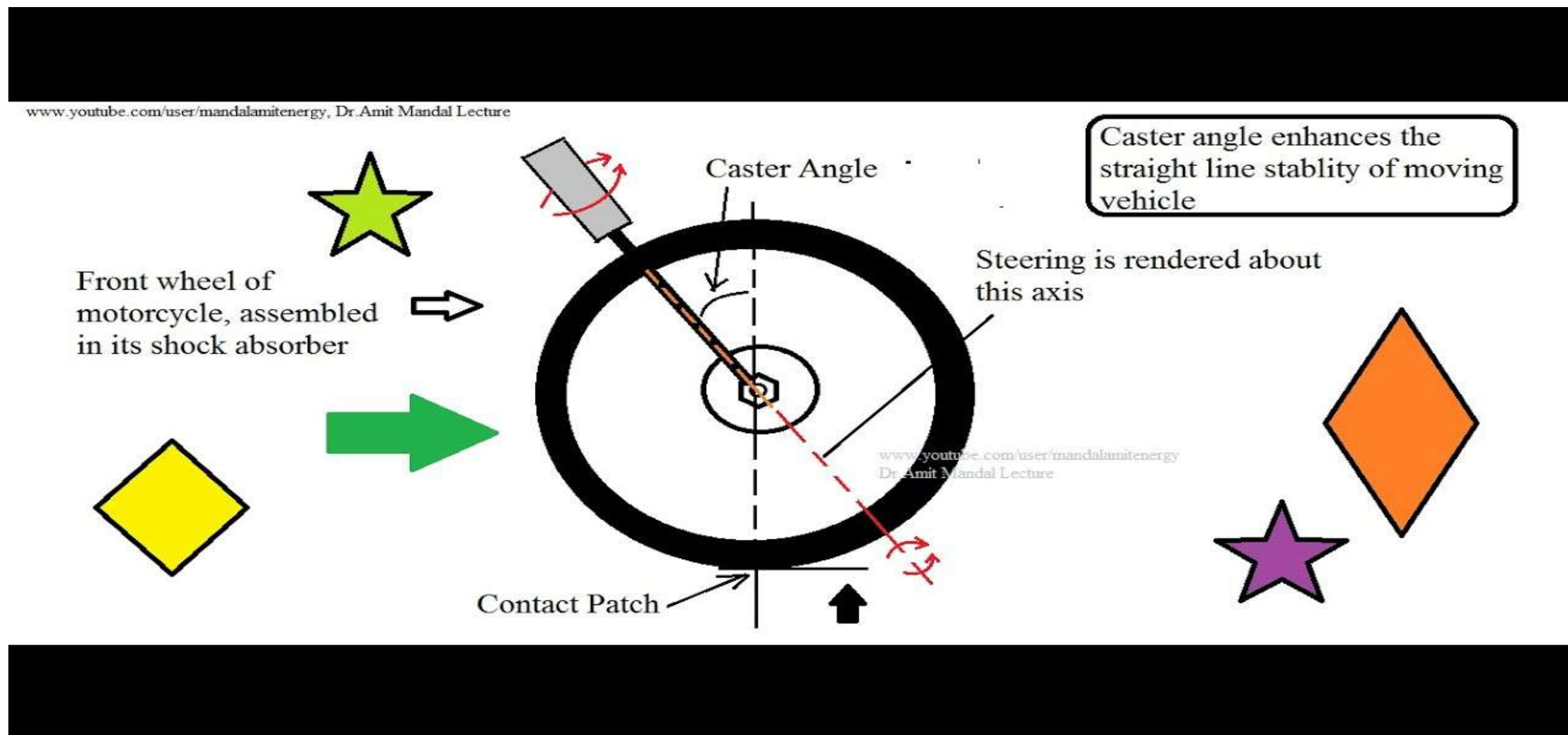
USES

King pins, the bushings that encircle them, and their related components are essential for proper steering. The king pin on a truck connects the steer axle to the steering knuckle, supporting the steering geometry and allowing the wheel ends to turn the vehicle.



KINGPIN INCLINATION PRINCIPLE

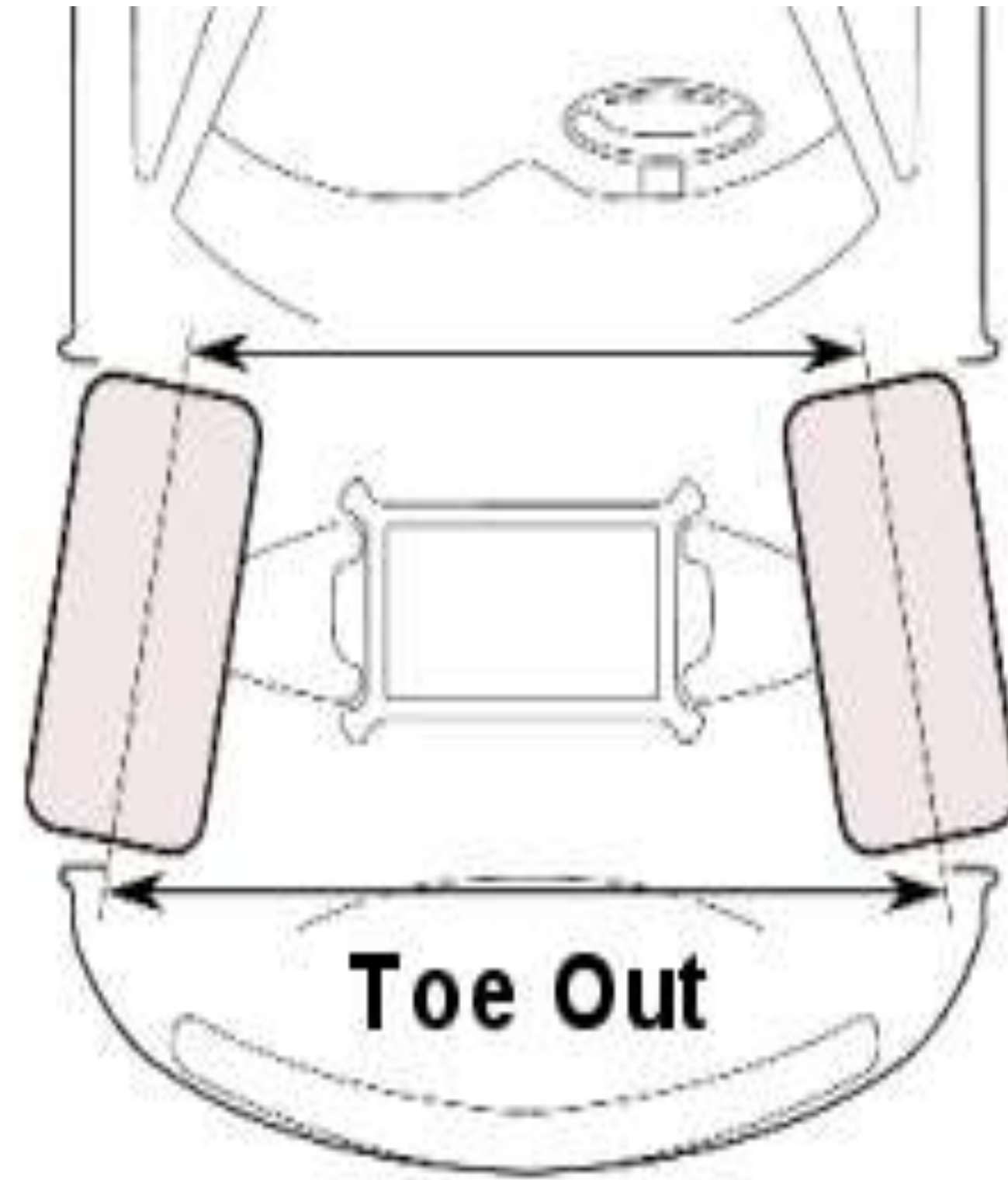
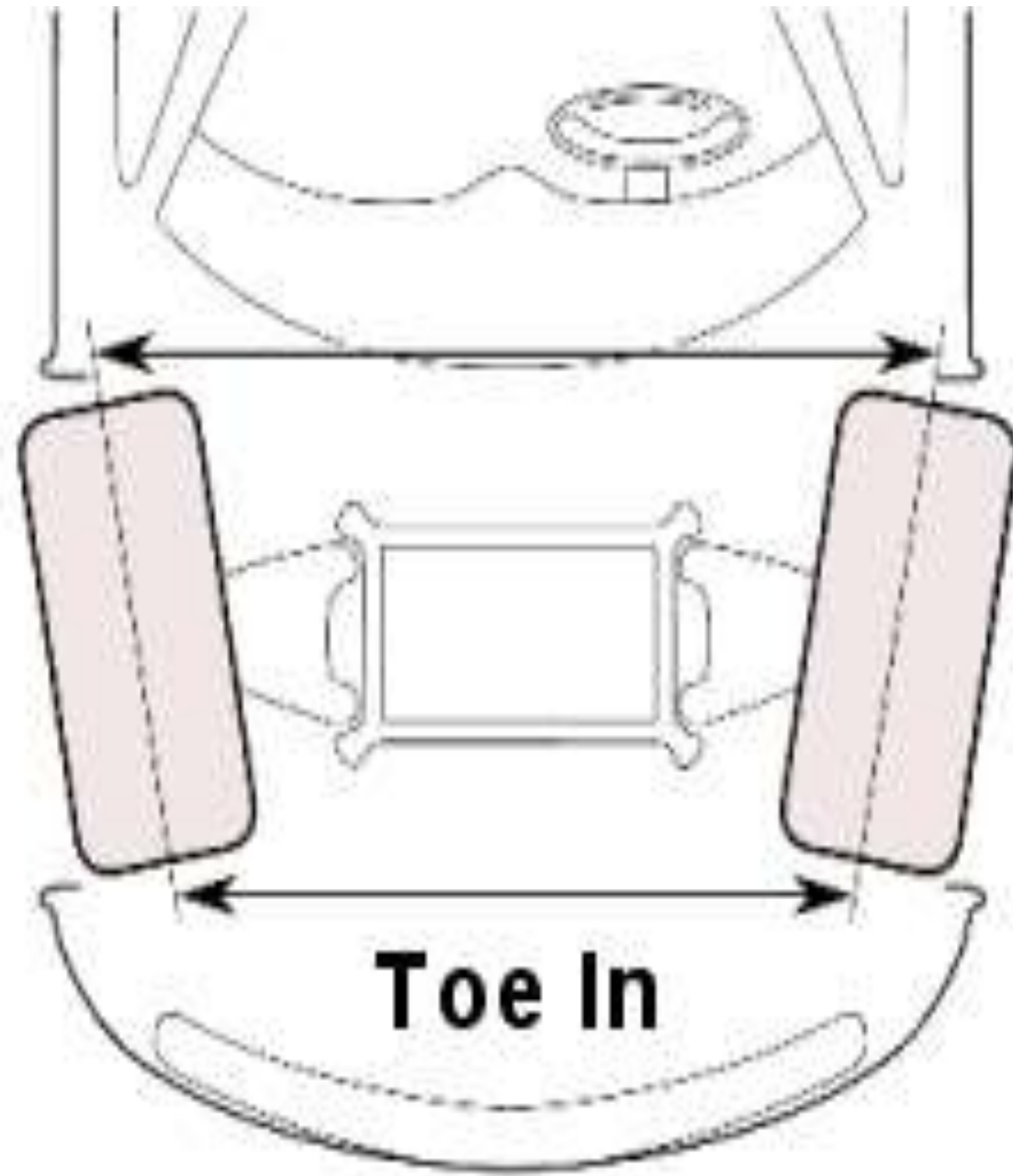
On current suspension systems, the kingpin is set at an angle to the vertical plane when viewed from the front or rear of the vehicle. This angle is known as the king pin inclination. The purpose of the KPI is to produce vertical displacement of the vehicle in during steering in an upward direction.





TOE IN AND TOE OUT

Toe is a measurement that determines how much the front and/or rear wheels are turned in or out from a straight-ahead position. The amount of toe, whether it's toe-in or toe-out, is expressed as the difference between the track widths as they are measured at the leading and trailing edges of the tires. Toe is expressed in degrees or fractions of an inch, and while your wheels should be pointed directly ahead as you are traveling straight forward, there are some benefits to toeing depending on the type of vehicle that you drive.





The purpose of toe is to ensure that all four wheels roll parallel to one another. However, race cars use toe-out to promote enhanced turning ability. Street cars, or basic passenger cars, use toe-in because there is no need to corner quickly. Toe-in also provides increased stability because it discourages turning. If your vehicle has the proper amount of toe you should experience ideal straight line stability, corner entry, and very little tire wear.



YOUTUBE LINK

<https://youtu.be/bYT4z9VCv14>



Thank you 😊 ✨ ✨ ✨

