Global Solar

Power the possibilities

Automotive Suspension Geometry

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10/25/2014

Automotive Suspension Geometry

Topics Covered:

- Camber
- Caster
- Steering Axis Inclination and Scrub Radius
- Toe In vs. Toe Out
- Ackerman Steering
- Rolling Resistance

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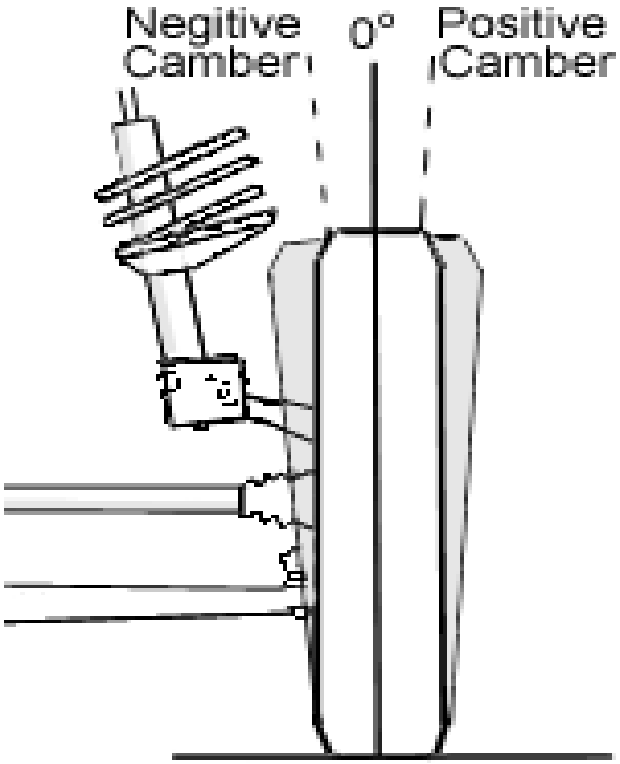
Automotive Suspension Geometry

Camber

- Reduces tire scrub during suspension travel
- Maintains tire contact patch with surface
- Recommend keeping camber near 0 degree for solar cart



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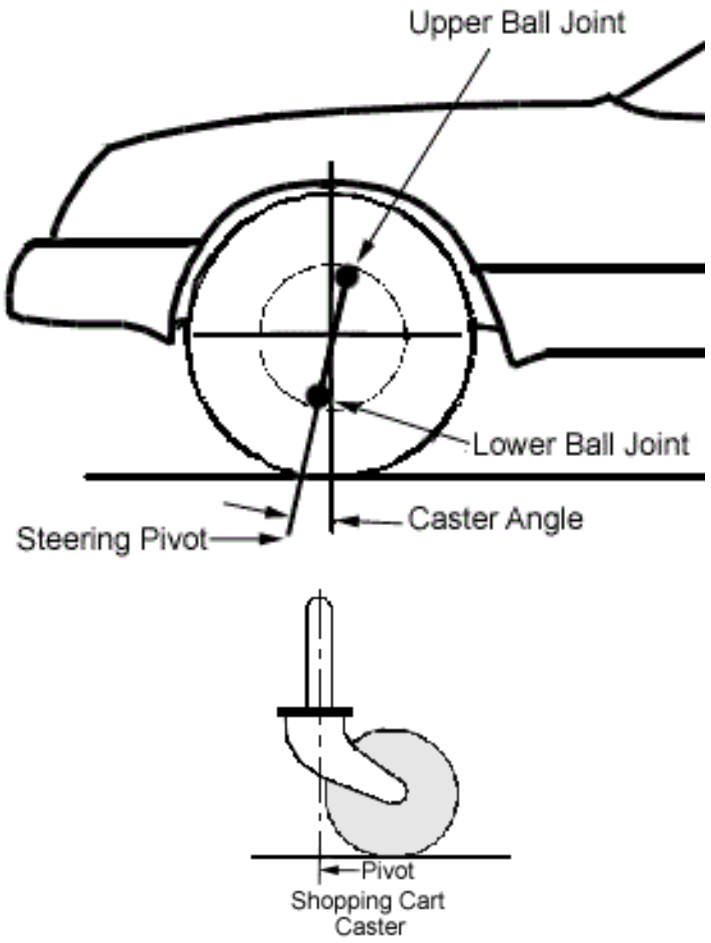
Automotive Suspension Geometry

Caster

- Controls vehicles stability at higher speeds
- Controls steering self correcting to a center position
- Different for front wheel drive cars vs. rear wheel drive
- Recommend keeping caster angle between 3-7 degrees for solar cart



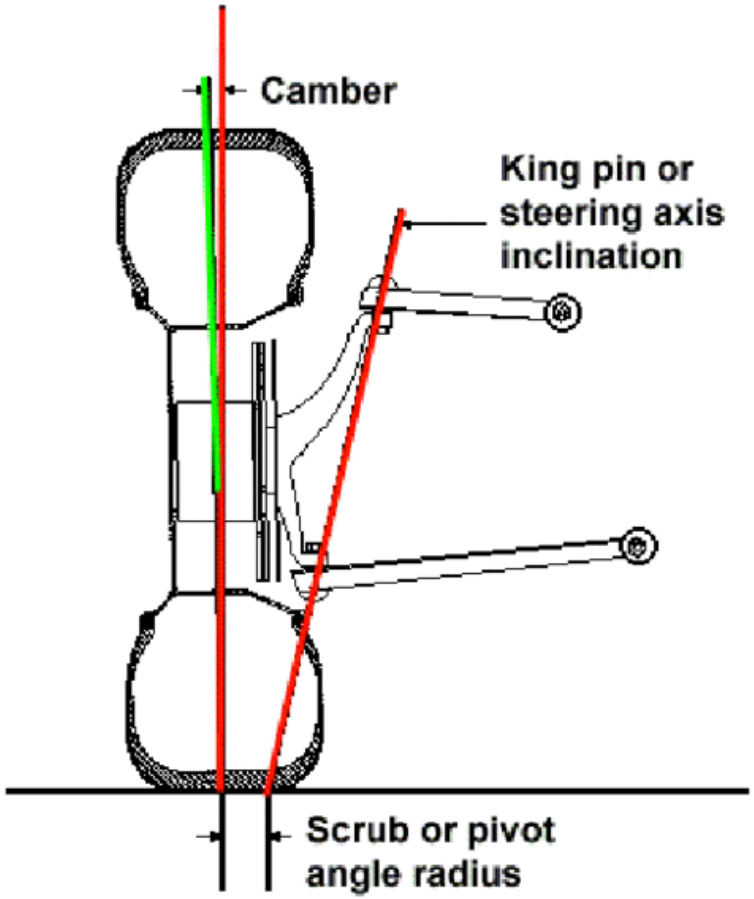
Automotive Suspension Geometry

Steering Axis Inclination (SAI)

- Changes wheel camber throughout steering motion
- Too much SAI makes steering difficult

Scrub Radius

- Distance between tire center line and SAI intersection with surface
- Keep to a minimum to reduce difficult steering



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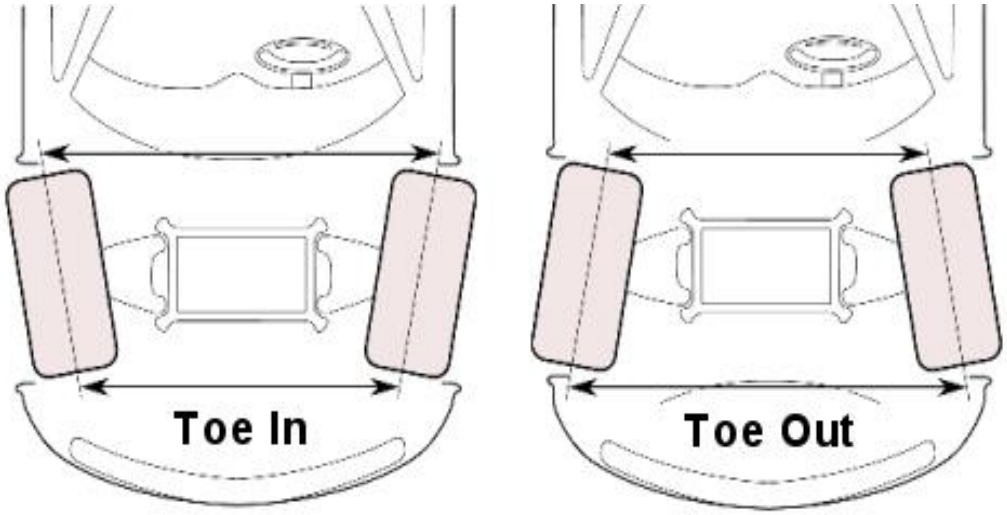
Automotive Suspension Geometry

Toe In vs. Toe Out

- Reduces loose feeling of steering by preloading steering components
- Too much can affect tire wear and increase rolling resistance
- Recommend 1/32” to 1/16” toe in for solar cart



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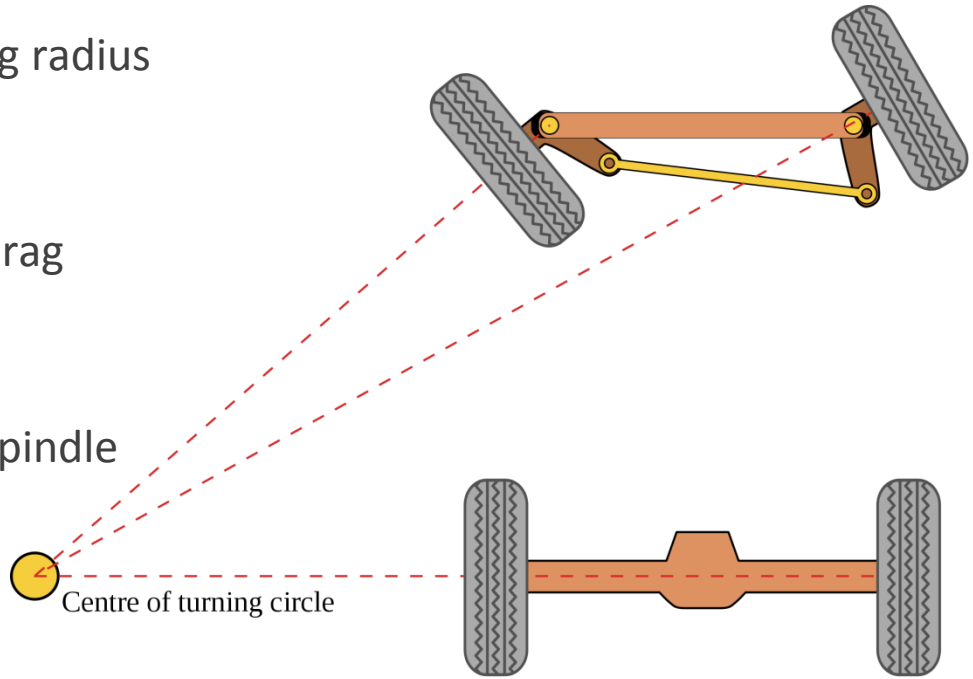
Automotive Suspension Geometry

Ackerman Steering

- Inside tire follows a smaller turning radius than outside tire
- Extremely important in reducing drag when vehicle is turning
- Controlled by tie rod location on spindle steering arm



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Automotive Suspension Geometry

Rolling Resistance

c = Rolling resistance coefficient

c = 0.001 steel wheel on steel track

c = 0.004 bicycle tire on asphalt

c = 0.03 car tire on asphalt

R = c W

Rolling resistance coefficient (c) and weight (W) directly affect power required to move car