



What is Proper Wheel Alignment?

A properly aligned vehicle is one in which all wheels are aimed in the same direction. Some very low tolerance or acceptable error is designed into each vehicle by the manufacturer (see the vehicle manufacturer specifications).

How Can Wheel Alignment Benefit Your Operation?

The number one and number two operating expenses in over-the-road transportation are fuel and tires respectively. Both are typically perceived as hard to control. Routine wheel alignment is the most effective way to control tire costs and can impact fuel costs as well.

Problems created by misalignment:

- ***Excessive tire wear***
- ***Increased fuel consumption caused by increased rolling resistance***
- ***Unsafe vehicle handling characteristics***
- ***Driver fatigue and driver retention***
- ***Premature suspension component wear***

Between 70 and 80 percent of heavy duty vehicles on the road today are misaligned!

The transportation industry, as a whole, finds that outsourcing timely, accurate alignment service performed by qualified technicians is difficult to manage. As a result alignment is mostly addressed after the damage has been done. Simply making alignment part of a vehicle or fleet preventive maintenance program allows operators to easily get a handle on this perceived uncontrollable expense.

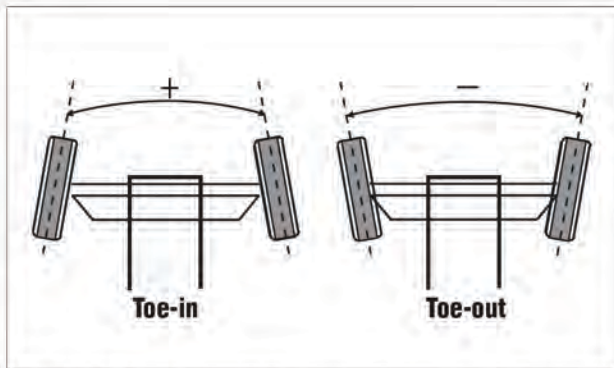
Hunter recommends a minimum of two to three alignments per year or every 50,000 to 60,000 miles as part of the average vehicle's preventive maintenance program.

Alignment service is a natural fit for service facilities currently repairing suspensions. Technicians performing repairs on heavy duty suspensions are in effect alignment technicians. The only required equipment is the precision measuring system.

Alignment Angles and Effects

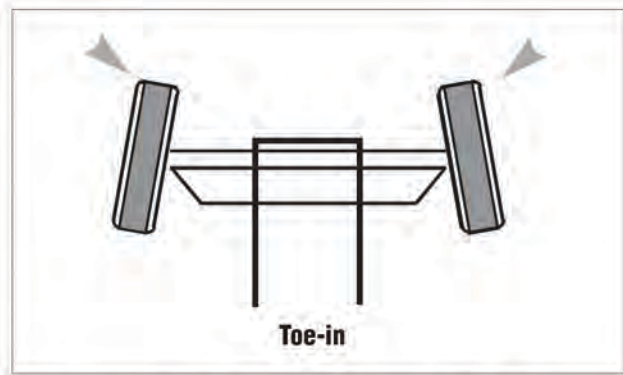
Tire Wear Due to Improper Toe Settings

Toe is the most critical alignment setting for steer axle tire wear. It is measured in inches, millimeters or degrees.

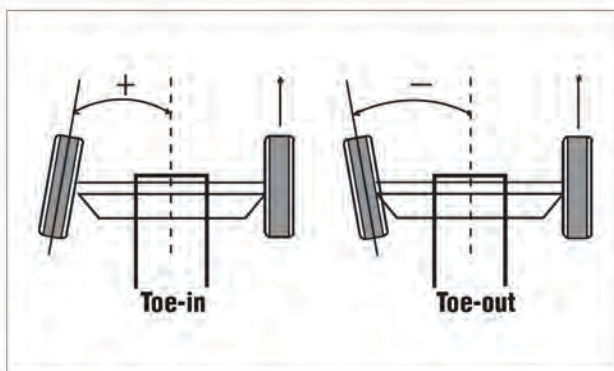


Total Toe is the angle formed by two horizontal lines through the planes of two wheels. Toe-in is when the horizontal lines intersect in front of the vehicle; Toe-out is when the horizontal lines intersect behind the wheels.

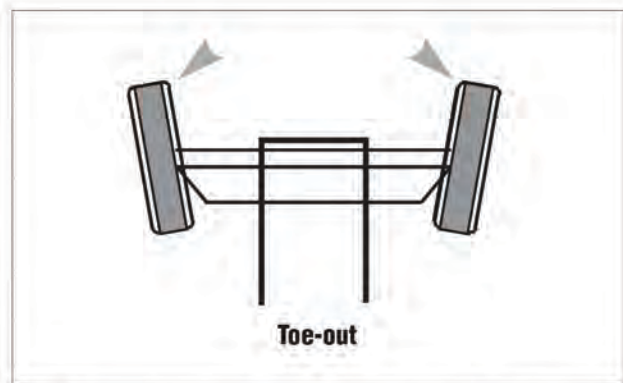
Results of excessive toe is wear on the leading edge of the tire.



Excessive toe-in wears the outside of the tire.

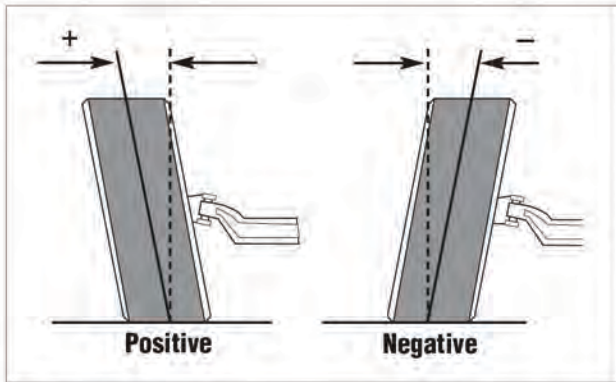


Individual Toe is the angle drawn by a line drawn through a plane of one wheel referenced to the thrust line of the vehicle. Toe-in is when the horizontal lines intersect in front of the wheel. Toe-out is when the lines intersect behind the wheel.

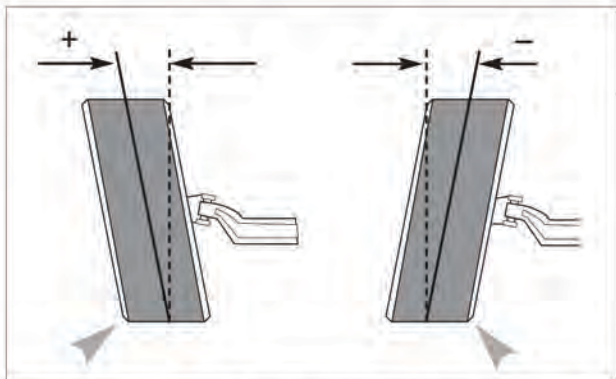


Excessive toe-out wears the inside of the tire.

Tire Wear Due to Improper Camber Settings

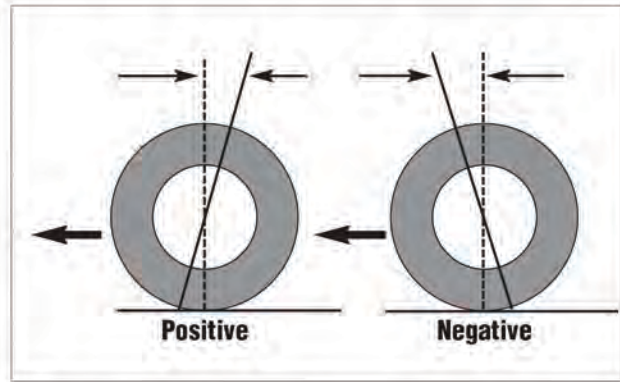


Camber is the angle formed by the inward or outward tilt of the wheel referenced to a vertical line. This angle is measured in degrees. Camber is positive when the wheel is tilted outward at the top and is negative when the wheel is tilted inward at the top.



Tire wear from excessive camber: Wear from positive camber is on the outside shoulder of the tire; with negative camber, wear is on the inside shoulder.

Caster: A Factor in Vehicle Handling



Caster is the forward or rearward tilt of the steering axis in reference to a vertical line. The angle is measured in degrees. Caster is positive when the top of the steering axis is tilted rearward and is negative when the tilt is forward. Caster is usually a factor in vehicle handling, but can affect tire wear. Proper caster is important for directional stability and returnability. Improper caster can cause shimmy, excessive steering effort, pulling and shoulder wear on the steer tires.

Turning Angle

Turning angle is the difference in the angles of the front wheels in a turn. This measurement is an aid in diagnosing steering problems and irregular tire wear. Improper turning angle may cause scuffing, leading to excessive tire wear.

