

The drive axles' geometry Fault simulation

Guide 2013 / EN

Fault simulation
quickly achievable

Angles Front /
Rear modifiable

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New:

The Solidwoks® files are available
for functional analyze of system.



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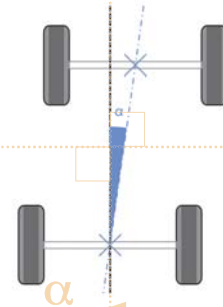
THE INFLUENCE OF THE DRIVE AXLES

The technical specialist should be able to identify the different angles of axles on vehicle. He should correlate the behavior of the

Thrust axis

The " α " angle of offset is formed by divergence between thrust axis and axis of symmetry (in theory = 0).

Incorrect toe-setting of the rear wheels or wheel set-back may cause the angle to be not equal to zero. In this case we may find the next problems: the vehicle moves like a crab, premature wear of tyres, steering imbalance, vehicle moves on direction inverse to thrust axis.



Rear camber

Look at front camber.



Rear wheel toe

Look the definition at front wheel toe.

Generally, the rear wheels present the positive wheel toe that stabilizes the rear axle and limits the over steer.

If the rear wheel alignment is not adjusted or bad dissipated, the " α " angle is important: theoretic thrust axis is modified.

This adjustment should be done before front wheel toe.



Caster angle

The caster angle " ch " is the tilting of the kingpin either forwards or backwards from the vertical, as seen from the side of the vehicle. Normally, the caster angle is positive because it improves the directional stability of the steering and increases the tendency of the steering to self-center.

Too small

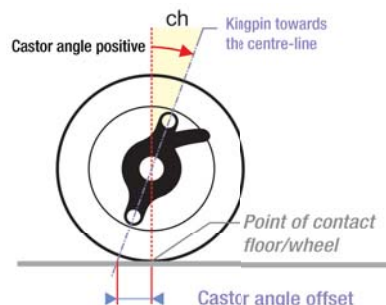
Bad self-center of the steering, adulatory motion of vehicle (direction stability is not sufficient, wobbling).

Too important

Direction is too hard; instability on curve, self-center of the steering is too strong, reaction on brakes.

Nonuniform distribution

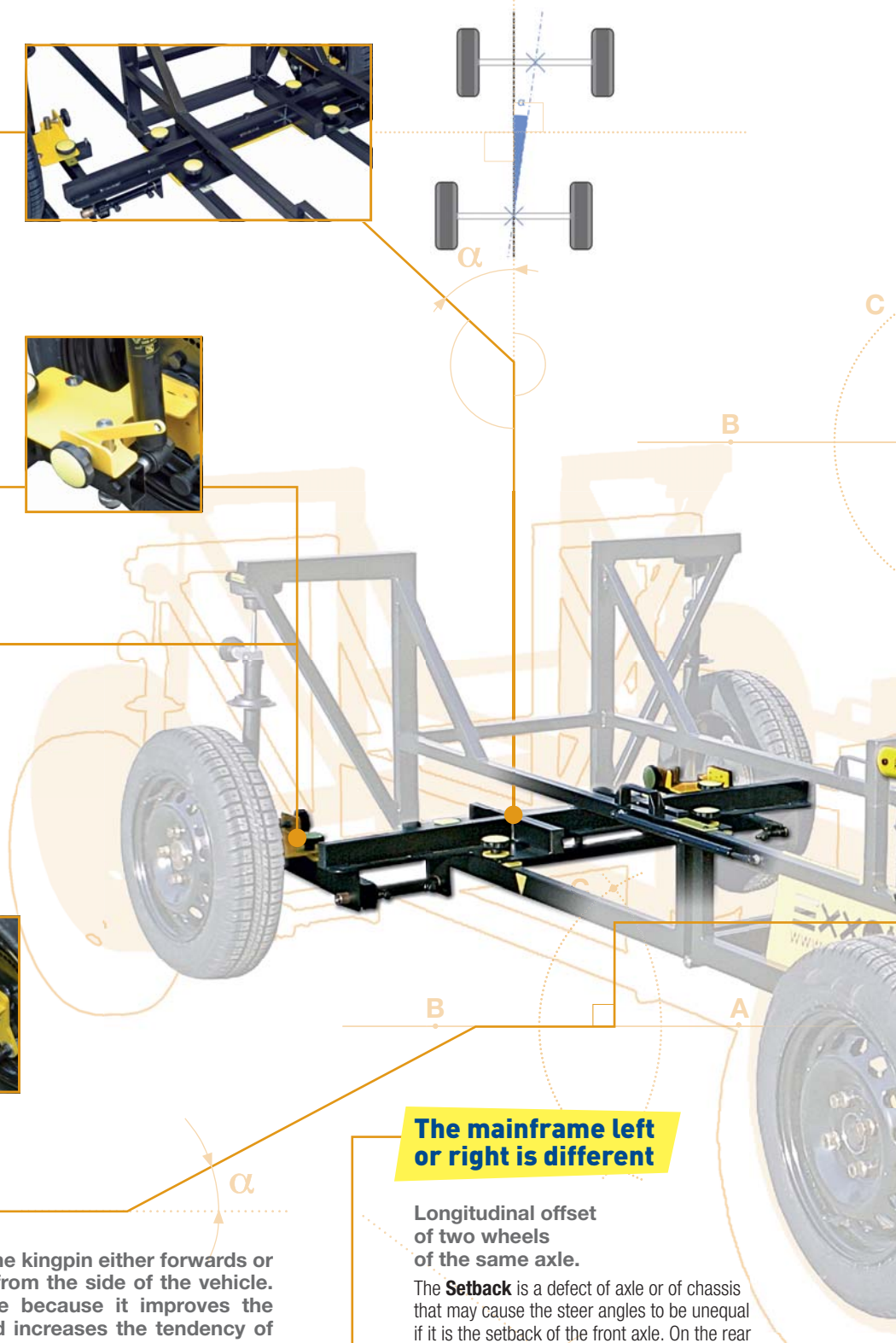
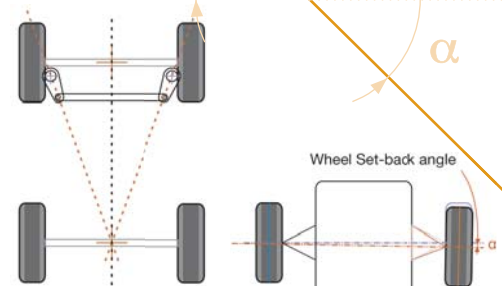
Movement to the side where the angle is smaller, self-center of the steering is not good, direction is too hard, trajectory instability especially on brakes.



The mainframe left or right is different

Longitudinal offset of two wheels of the same axle.

The **Setback** is a defect of axle or of chassis that may cause the steer angles to be unequal if it is the setback of the front axle. On the rear axle it gives the offset angle: difference between thrust axis and axis of symmetry.



GEOMETRY ON VEHICLE CONDUCT

vehicle with the values measured during diagnosis control. That allows executing the evaluation of the manufacturer conformity.

The steering rack hauteur

This adjustment has an effect on wheel alignment in case variation of suspension system.

The variation of right and left wheels toe involves a mismatch at the moment of acceleration on one side, **a mismatch at the brake on another side, change of direction on deformed wheels.**

The wheels toe variation is too important.

Two wheels wearing-out, adhesion is not sufficient.

The variation is mal distributed.

Vehicle moves to the one side at the moment of acceleration and to another at the brake, wheels wearing-out.

The possible reason

Shock, bad reposition after change of an element (stabilizer bar).

Pivot roll

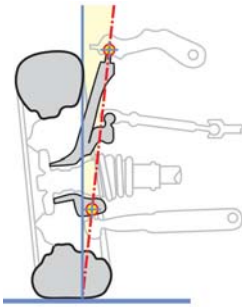
This angle is formed as an angle between a vertical line and axe of the column wheel turning (axe passing through the pivots).

Strong

Direction is too hard, self-center of the steering is too important.

Feeble

Direction reaction, self-center of the steering is not sufficient, direction is feeble.



Front camber

The camber is an angle formed by median plane of the wheels and vertical line.

The positive camber

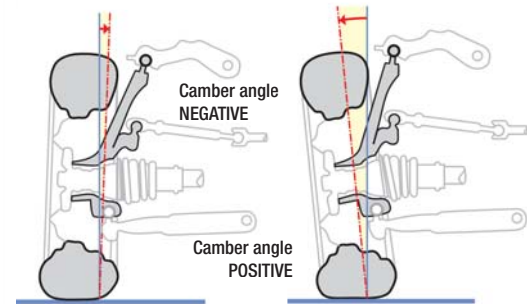
Wearing-out of wheels' external board.

The negative camber

Wearing-out of wheels' internal board.

Dissymmetric C

The mismatch on the side, where the angle is more positive. Could be adjusted on several vehicles.



Front wheel toe

The toe setting is the amount by which the front or rear wheels point inwards or outwards at the front of wheel in relation to each other.

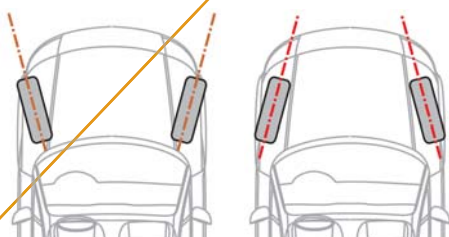
When the wheels point inwards they are said to toe-in. Toe-in figures are given a positive value.

Conversely when the wheels point outwards they are said to toe-out and the figures are shown as a negative value.

The purpose of correct toe is to ensure that the wheels run parallel when the vehicle is in motion. An incorrect toe setting may affect the stability and controllability of the vehicle.

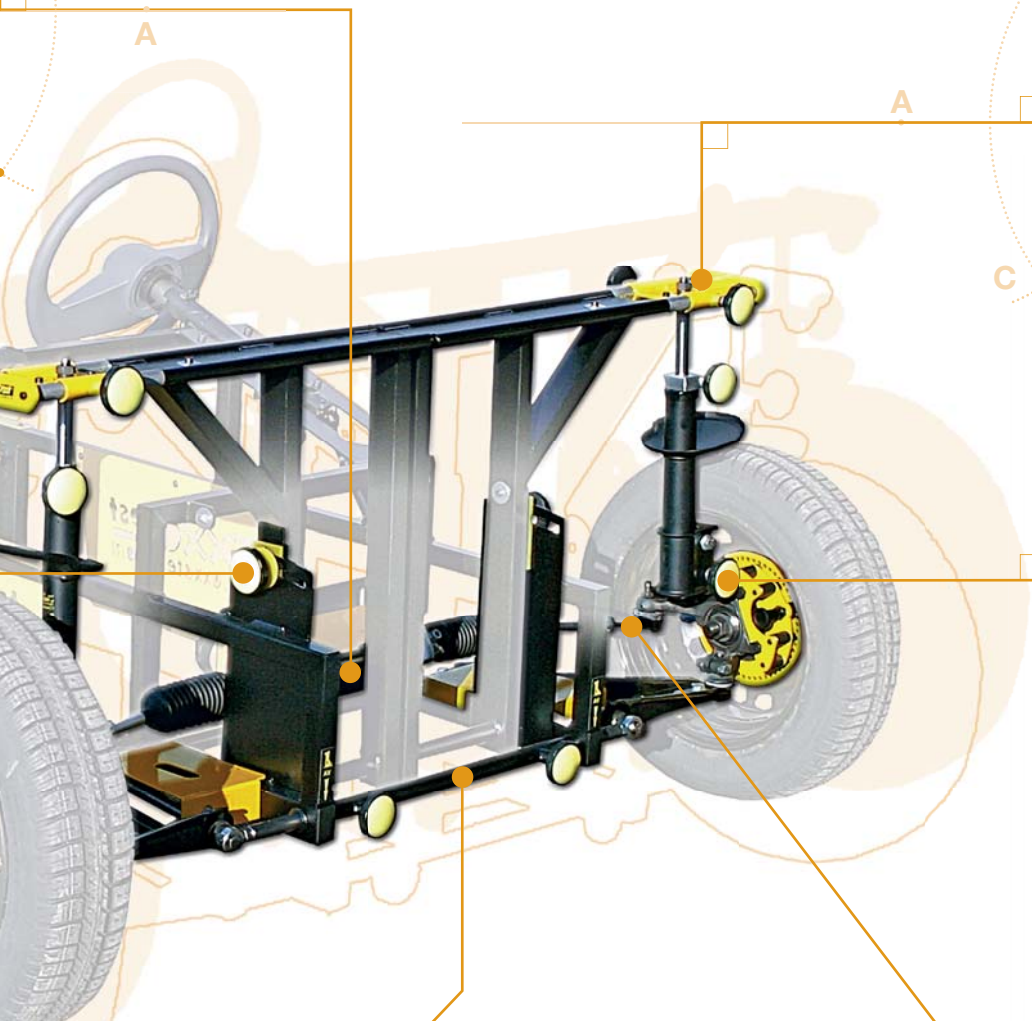
Wheel toe can be measured as an angle or a linear dimension depending upon the equipment used.

For majority of vehicles this is the only setting available.



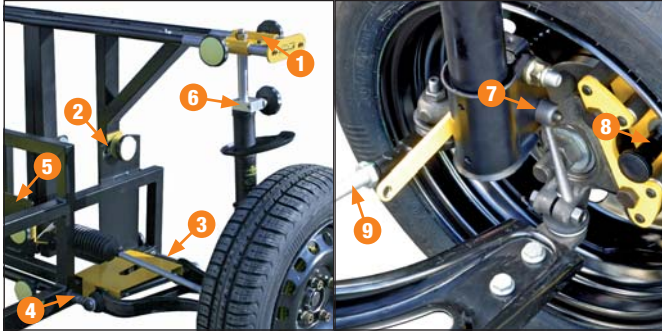
Wheel toe négative

Wheel toe positive



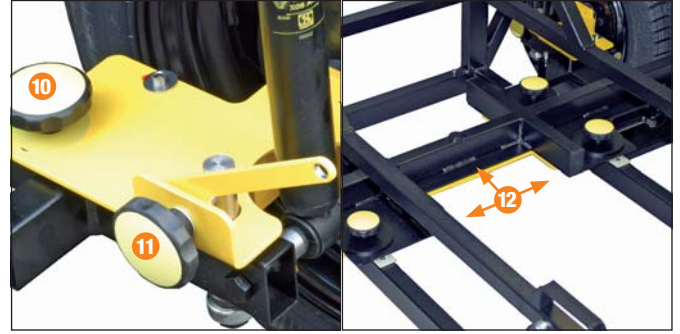
Description

Front axle



- 1 The pivot angle modification
- 2 The castor angle modification
- 3-4 Modification of the internal triangle position: castor angle, pivot, wheel toe and camber
- 5 The steering rack hauteur modification
- 6 The front case hauteur modification
- 7 The camber angle modification
- 8 The front wheel locking system
- 9 The front wheel toe modification

Rear axle



- 10 The rear wheel toe modification (the right and the left wheels are separated)
- 11 The rear camber angle modification
- 12 Modification of the angle between thrust and rear deport

Fold / unfold the chassis



Accessories

Front Wedge



Rear Wedge



Triangles (front-right-left) template



Key template



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