Instruction Manual

Mobile Car Wheel Alignment System

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Version notes Page 7

1 General Safety Instructions

1.1 Owner/operator's duty of care

The AXIS10 car wheel alignment system has been designed and built following careful selection of the relevant harmonised standards. It therefore conforms to state of the art standards and offers maximum safety during operation.

Changes to the wheel alignment unit's construction may only be carried out with the prior written consent of the manufacturer!

Equipment safety can only be realised in practice if all the necessary measures are taken. The owner/operator's duty of care includes planning these measures and checking they are correctly implemented.

In particular, the owner/operator must ensure that

- the device is utilised for its intended use only
- the equipment is only used if it is in perfect, fully functional condition
- the instruction manual is kept in a legible condition and is available in full at the place in which the equipment is used
- qualified and authorised personnel only use the equipment
- the personnel receives regular instruction in all relevant aspects of health and safety as well as the instruction manual and in particular are familiar with the safety instructions given in the manual
- none of the safety or warning signs attached to the equipment are removed and that they all fully legible

1.2 Explanation of the symbols used

Specific safety instructions are given in this instruction manual. The following symbols are used in these

This symbol indicates that, above all, dangers to equipment and materials are to be expected.

This symbol does not denote safety instructions but information for improved understanding of the processes involved.

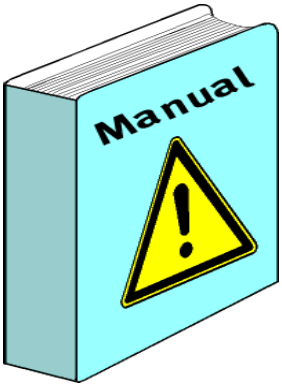
The symbols fixed to the laser measuring heads (sensors) are in the immediate vicinity of the emerging laser beam.

Laser radiation warning

This symbol indicates that, above all, dangers to people are to be expected.

Information sign with the laser class markings

1.3 Basic safety measures



The AXIS10 car wheel alignment equipment may only be used by authorised persons trained for this purpose who are familiar with the instruction manual and are capable of working according to the manual!

Before each use of the wheel alignment equipment it must be checked for visible damage; ensure that the equipment is only used if it is in perfect condition! Any defects found are to be immediately reported to your supervisor!

Laser product
CLASS 2
TYPE 1

Several basic instructions must be followed for all lasers:

- **Never stare directly into the beam!**
- Precisely define beam baths, use beam traps to prevent scattered laser radiation! Dangerous reflections are caused in particular by reflective or shiny surfaces.
- If possible, keep beam paths at a level above or below eye level!
- The course of the laser beam should not lie within the work or traffic area. If this is unavoidable, ensure that the laser area is clearly identifiable and is labelled with the prescribed warning signs.
- The lasers must be switched off after finishing the work!

Further safety instructions regarding the handling of laser products are given in the Accident Prevention Regulations.

The user is responsible for ensuring proper operation and compliance with the safety regulations.

2 Transport

2.1 Dimensions and weight

Length x width x height

140 cm x 100 cm x 70 cm

Transport weight:

145 kg

2.2 Information on general handling and storage

To prevent equipment damage and injuries during transport:

- Industrial trucks for carrying loads must comply with the provisions of the accident prevention regulations!
- Avoid large jolts or severe impacts during transport.

Protect the system against moisture.

This particularly applies during transport and storage of the complete wheel alignment system.

Ensure that the storage location is dry and free of dust.

3 Product Description

AXIS10 Mobile Car Wheel Alignment System

Part No. 921 000 001

Subject to technical changes.

6.1st issue 2017

Figures: HAWEKA AG / 30938 Burgwedel

3.1 Intended use

- The AXIS10 mobile car wheel alignment system has been developed to enable wheel alignment measurements to be taken on passenger vehicles and light trucks.
- It is used solely for fast measurement of single toe and total toe, camber, toe-out on turn, caster, max. steering angle and steering axis inclination at the front wheels as well as for the measurement of single and total toe and camber at the rear axle.
- The AXIS10 car wheel alignment system enables the measurements to be taken in "as driven" conditions and it is not necessary to lift the vehicle.
- Different car vehicle types can be measured fast and reliably. Especially suitable for vehicles with large rim diameters, e.g. SUVs (sport utility vehicles)

Safe and reliable operation of the equipment is not guaranteed if the AXIS10 car wheel alignment unit is not used in accordance with this intended purpose!

The owner/operator of the wheel alignment equipment is responsible for all personal injuries and property damage resulting from utilisation other than the intended use, not the manufacturer!

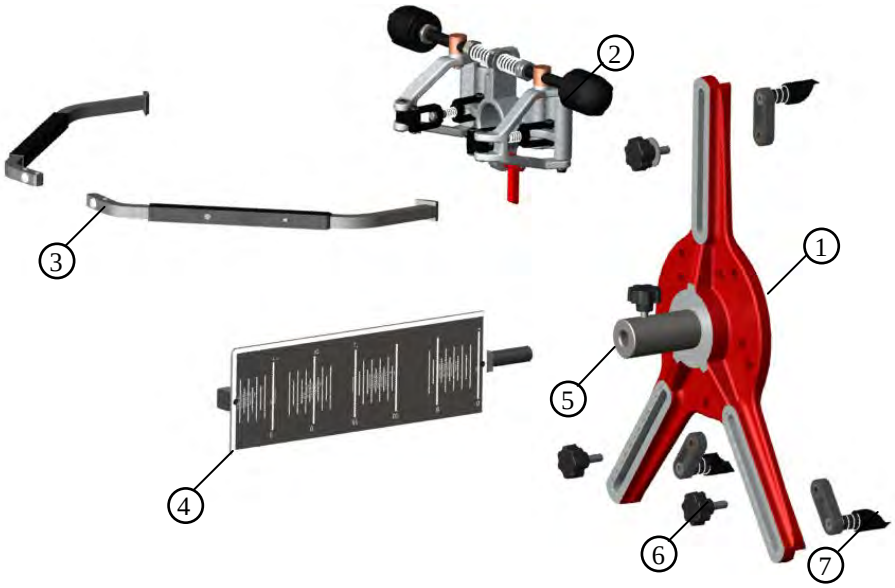
The laser used in the laser measuring head is a Class 2 laser product. The accessible laser radiation is safe for eyes for short radiation periods (up to 0.25 s). If the laser beam or radiation is accidentally and briefly stared into the eye is protected by the eye's natural blinking reflex.

NEVER DELIBERATELY STARE INTO THE LASER BEAM!

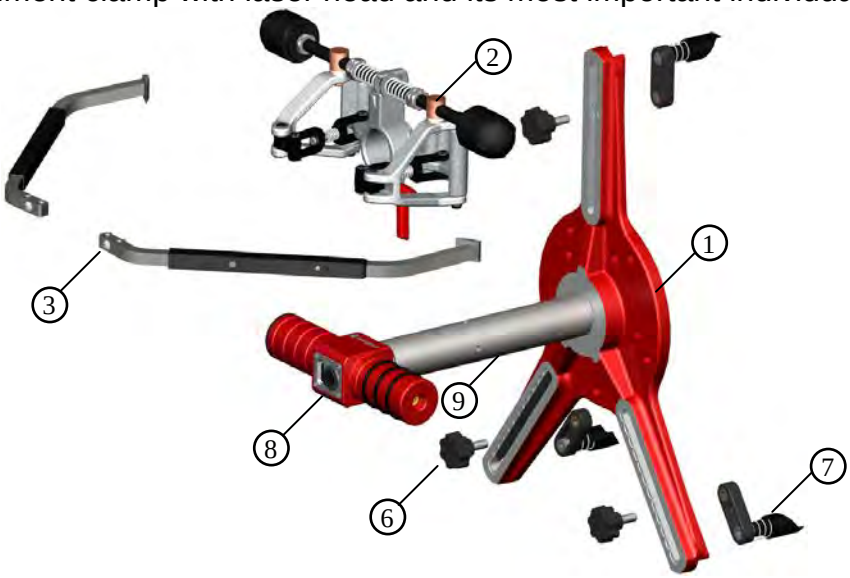
You should immediately consult an eye specialist if there is reason for assuming that eye damage has occurred due to laser radiation.

3.2 Structure of the various wheel alignment clamps

Wheel alignment clamp with scale and its most important individual parts:



Wheel alignment clamp with laser head and its most important individual parts:



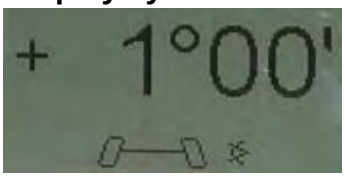
The laser housing can be freely rotated. After fitting to the vehicle's wheel ensure that the laser beam aperture of the laser heads is directed towards the floor before switching on.

Item	Designation	Part No.
1	**ProClamp** 3 arm star	912e008 265
2	Clamping head, complete	912e008 140
3	Telescopic grab arm (1 pce)	912e008 158
4	Clip-on scale	913 052 046
5	Scale locating pin	913 005 021
6	Star grip screw	912e008 006
7	Spring-loaded wheel alignment foot (1 pce)	912e008 216
8	Laser housing, complete	913 001 042
9	Measuring column	913 005 016

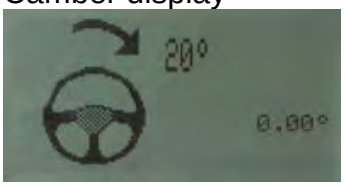
3.3 The electronic inclinometer

The electronic inclinometer is used to record angle values on the vehicle geometry.
This device enables the camber, caster and included angle to be determined.
Angles can be measured in the horizontal and vertical plane depending on the attachment face.

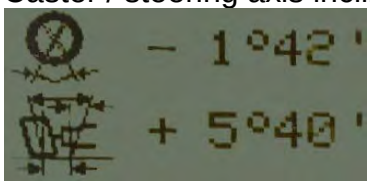
Display symbols:



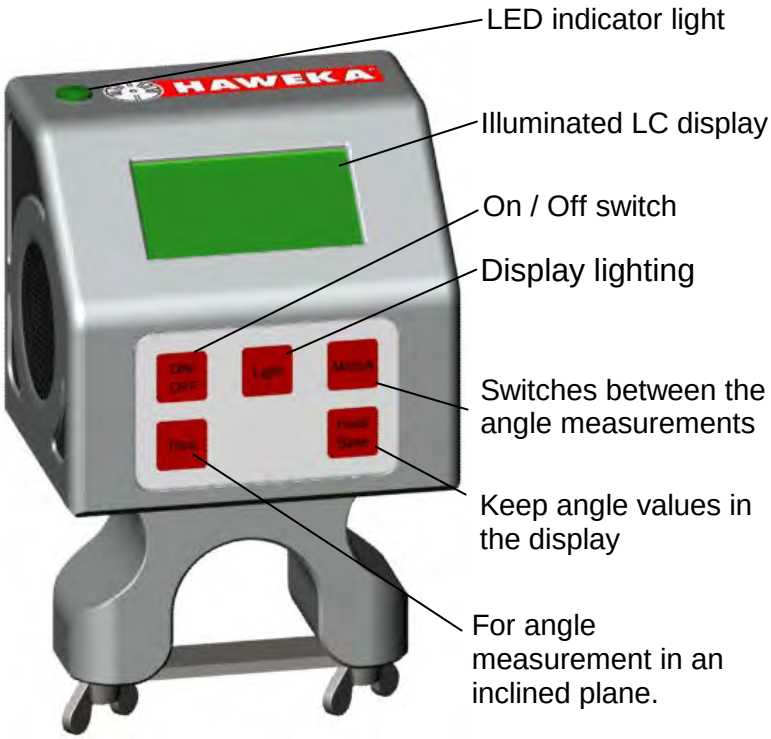
Camber display



Request for value recording
Caster / steering axis inclination



Angle value display:
Top: Caster
Bottom: Steering angle inclination



3.4 Button assignment

ON/ OFF	On / Off button
Light	Switch on background lighting for 30 seconds.
Modus	Switches between the camber measurements, caster / steering axis inclination and max. steering**.** The first mode is the camber measurement, where the result of the angle is directly shown. In caster / steering axis inclination mode, LED's light signals confirm the recorded angle changes and after the procedure has ended the display automatically switches to the display values for **caster** (top line) and **steering axis inclination** (bottom line).The third mode is for calculating the max. steering angle. Press the button again to switch back to the camber display.
Tara	Press this button to adjust the angle measurement to an inclined plane. The angles in both measuring directions are thus adjusted to zero. This operating state is indicated by a symbol in the bottom right-hand corner. Press this button again to switch back to display of the absolute angle.
Hold/ Save	Press this button to "freeze" the angles in the display. This operating state is indicated by a symbol in the bottom left-hand corner. If the button is pressed again the display switches back to continuous display of the measured values.

3.5 Technical specifications

Measuring accuracy:

Toe	< 0.5 mm
Camber Caster Steering angle inclination	0 ... 10°: +/- 0° 03' 10 ... 45°: +/- 0° 12'
Toe-out on turn	+/- 15 min.
Axle offset from the centre of the vehicle	+/- 1 mm

Laser:

Input voltage	3 volt (2 x Mignon Type AA Batteries 1.5 volt)
Radiant power P_o	0.91 mW
Wavelength λ	650 nm
Range	20 m
Laser class	2 DIN EN 60825-1:1994-07

Wheel alignment clamps:

Clamping range for car rims	12 – 22 inch

Electronic inclinometer:

Operating voltage	6 volt (4 x Mignon Type AA Batteries 1.5 volt)
Current input during operation	10 mA (without lighting), 60 mA (with lighting)
Closed-circuit current (unit switched off)	< 10 µA
Running time with one set of batteries	without lighting: approx. 50 - 60 h. with lighting: approx. 30 h.
Specified measuring range	+/- 45° for both axles
Extended measuring range	+/- 90° for both axles
Accuracy of the specified measuring range	0... 10°: +/-0° 03' 10 ... 45°: +/-0° 12'
Resolution	0° 01'
Temperature range	-5 to +50 °C (in use) -20 to 65 °C (storage)
Shock resistance of the sensor	3.500g

4 Equipment Components

4.1 AXIS10 standard version parts list

2 No. wheel alignment clamps with laser head

1 No. Part No. 922 001 006

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2 No. Wheel alignment clamps for clip-on scale

1 No. Part No. 913 052 047

---

8 No. Telescopic grab arm for ProClamp wheel alignment clamps

1 No. Part No. 912e008 158

---

2 No. Clip-on scale

1 No. Part No. 913 052 046

---

12 No. Spring-loaded wheel alignment foot for ProClamp wheel alignment clamp

1 No. Part No. 912e008 216
12 No. Part No. 912e008 217

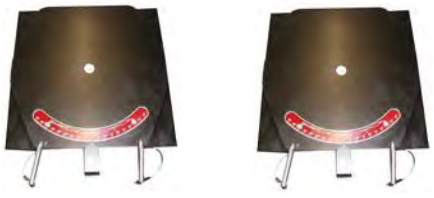
---

1 No. Electronic inclinometer for Ø 40 mm

1 No. Part No. 913 009 048

---

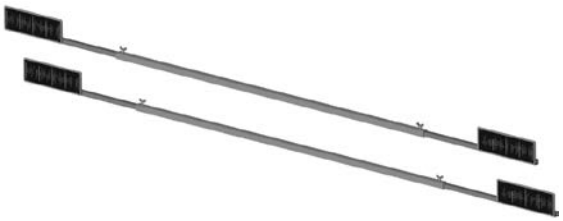
2 No.



Turn plates

heavy-duty, height 42 mm
1 Set (2 No.) Part No. HWK88992

2 No. Car toe scale (floor scale)



1 No. Part No. 913 015 024

---

1 No. Steering wheel locking device

1 No. Part No. HWK28751

---

1 No. Brake pedal locking device Type WA 15 S

1 No. Part No. HWKA15S

---

1 No. Steering wheel adjusting balance

1 No. Part No. 921 001 000

---

1 No. Equipment stand

1 No. Part No. 921 001 011

4.2 Accessories

2 No. Magnetic scale holder for supporting the toe scales on a hydraulic vehicle lift

1 No. Part No. 913 052 068

Not included in the scope of supply!

---

12 No. Wheel alignment feet for ProClamp wheel alignment clamps for rims larger than 22“

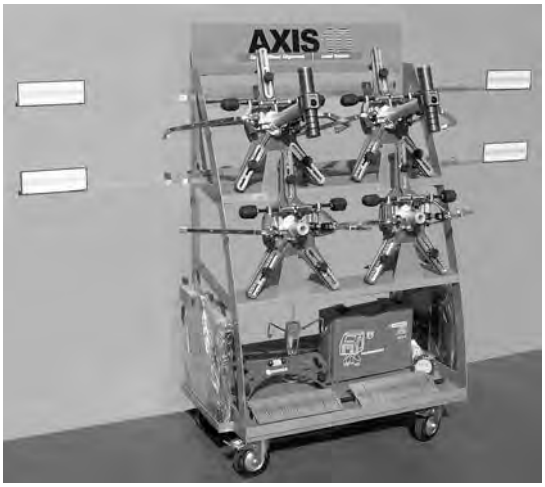
3 No. Part No. 912e008 087

Not included in the scope of supply!

5 Front Wheel Alignment

5.1 Preparations

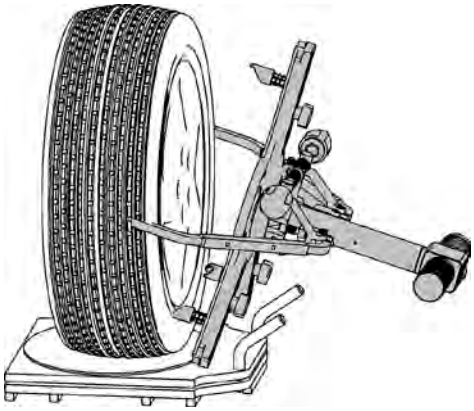
- Carry out the alignment of a flat, level floor.
- Check the tyre pressure, correct to the specified value if necessary.
  Visual check of the vehicle:
  - Rim size
  - Tyre size
  - Tyre wear (wear pattern / sawtooth)
  - Wheel bearings
  - Suspension struts
  - Steering gears
  - Automatic level control (yes / no)
- The prerequisites for alignment of the vehicle must be observed as some vehicle manufacturers specify loads to simulate driving conditions.



(Figure 1)

Drive vehicle onto turn plates

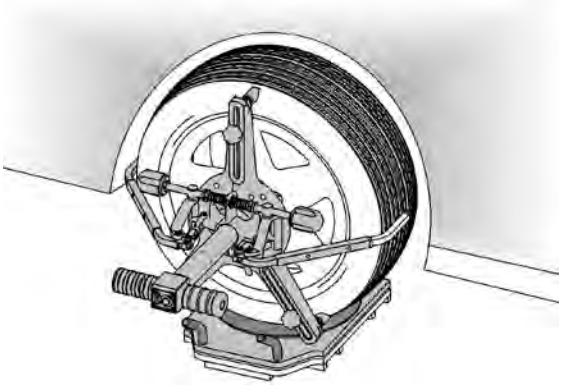
- Place turn plates in the middle in front of the front wheels.
- Use bolts to secure turn plates against twisting.
- Drive the vehicle onto the turn plates. The centre of the wheel must be positioned above the middle of the turn plate.



(Figure 2)

Mount wheel alignment clamps

- Before fitting on the clamps the 3 arm starts must be adjusted to the correct rim diameter using the star grip screws. The rim size can be adjusted beforehand at the equipment stand. *(Figure 1)*
- Depending on the rim condition and sign, alternative wheel alignment clamp feet may have to be used. (see optional accessories)
- The wheel alignment clamp is first positioned with the two bottom wheel alignment clamp feet on the rim flange. *(Figure 2)*
- When all three wheel alignment bracket feet are correctly positioned on the rim flange the wheel alignment clamp is pressed against the rim and is firmly clamped to the wheel using the spindle. *(Figure 3)*

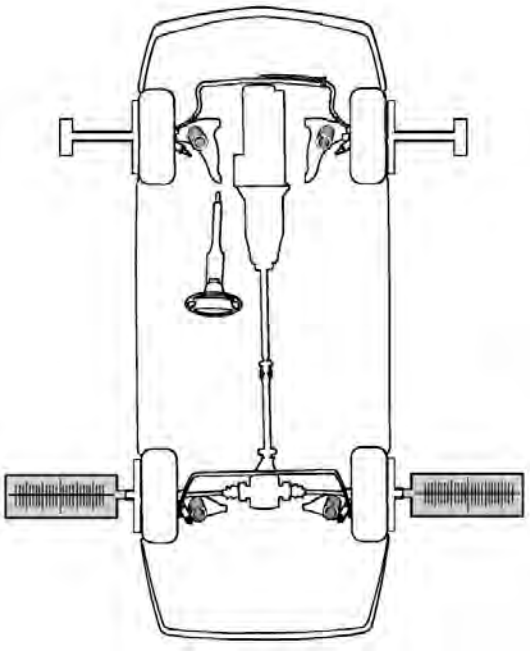


(Figure 3)

Front Wheel Alignment

- For the front wheel alignment it is necessary for the wheel alignment clamps with the laser measuring heads to be fitted onto the front wheels and for the wheel alignment clamps with clip-on scales to be fitted onto the rear wheels *(Figure 4)*
- The clip-on scales are to be vertically aligned so that they are at right-angles to the incident laser beam.
- Switch on the laser measuring head on both sides of the vehicle and align with the respective rear clip-on scales *(Figure 5)*

Before switching on, check the position of the laser beam aperture!



(Figure 4)

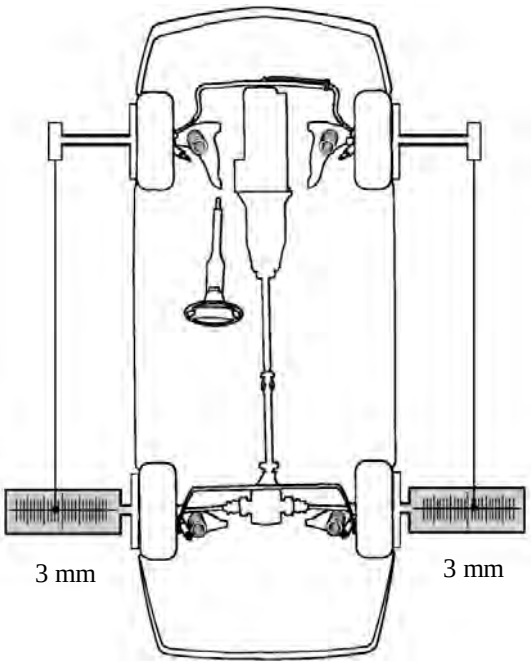
5.2 Aligning the front wheels

- Before you can start the front wheel alignment you must check the position of the front wheels.
- If the displayed values left and right on the clip-on scales are different the steering wheel is turned until the same value is displayed on both scales.
- The front wheels are now in the "Drive straight ahead" position.

Example:

Right-hand side display:	5 graduation marks owards the outside
Left-hand side display:	1 graduation mark towards the outside

Turn the steering wheel until the two laser dots point to 3 graduation marks towards the outside. *(Figure 5)*



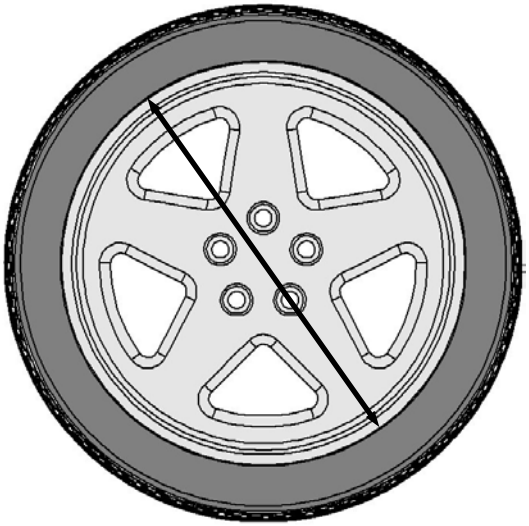
(Figure 5)

This procedure is important for all subsequent measurements.

Front Wheel Alignment

5.3 Set up toe scales

- Both laser housings must be aligned with the help of the spirit level so that the laser beam aperture is pointed vertically onto the floor.
- The calculated toe scale spacing must be drawn on the floor twice to define the measuring rectangle.



(Figure 6)

Note: The following formula is used to enable the value to be read off the toe scale in mm *(Figure 6)*:

$$\frac{\text{rim diametre} \bullet 10}{2} =$$

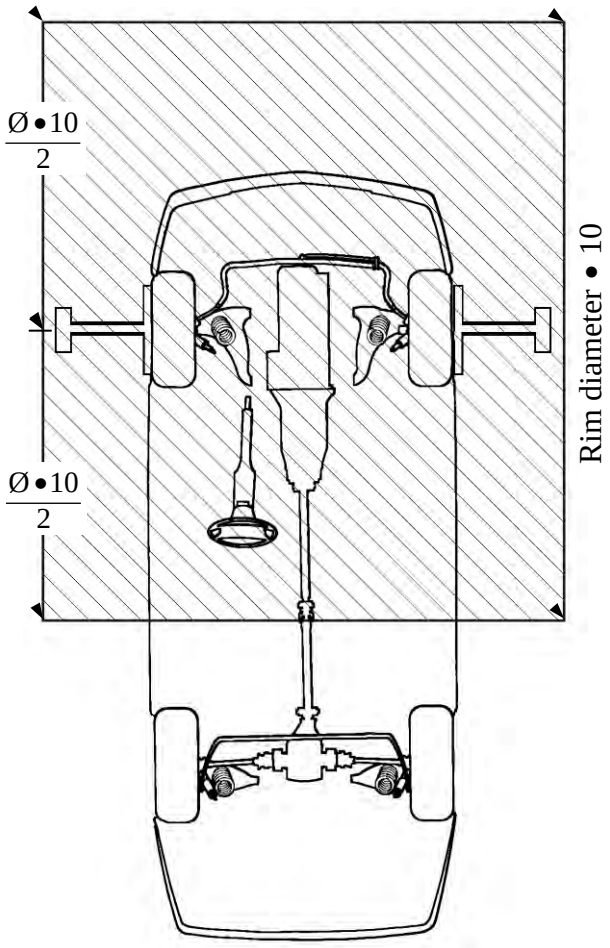
Scale distance in front of the front axle or behind the front axle

- Starting from the laser dots, the respective calculated length to the front and back is measured off with a measuring tape. Mark the positions on the floor with a chalk mark (or adhesive strips).

Example:

17" rim = determined rim diameter 47 cm

$$\frac{(rim\ \ diameter\ 47\,\text{cm}) \bullet 10}{2} = \frac{470}{2} = 235\,\text{cm} = 2{,}35m$$



(Figure 7)

In the example, a mark is drawn on the floor 2.35 metres in front of and behind the laser dot.

If this is not possible because there is an obstruction in this position it is possible to measure, e.g. 1.35 m to the front and 3.35 m to the rear, each from the laser dots. The total length must always be 4.7 m. (For this example!)

The total distance between the markings in front of and behind the front axle added together must always equal the rim diameter times 10 *(Figure 7)*

I.e. 1 long graduation mark on the toe scale ≙ 1 mm.

Front Wheel Alignment

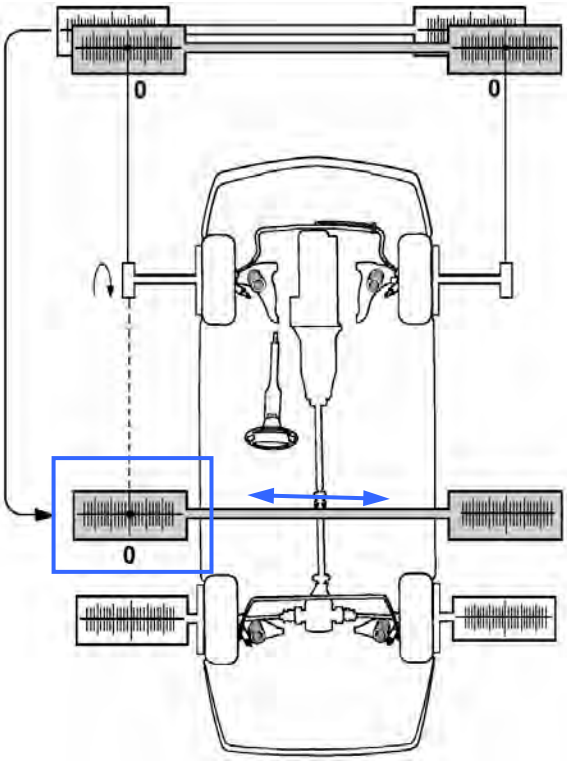
5.3 Set up toe scales (continued)

- Place the first toe scale on the floor marking parallel and in front of the front axle.
- Move the toe scale so that the laser beam hits the value zero on both scales.

The laser housing must be rotated so that the laser beam wanders over the floor.

- Fix the length of the toe scale using the wing screw and repeat this procedure with the second toe scale on the same front floor marking. Both toe scales now have the same length.
- One of the toe scales is not placed on the other floor marking behind the front axle. *(Figure 8)*
- Rotate the left-hand laser to the rear and move the whole toe scale on this side of the vehicle to the scale value zero.

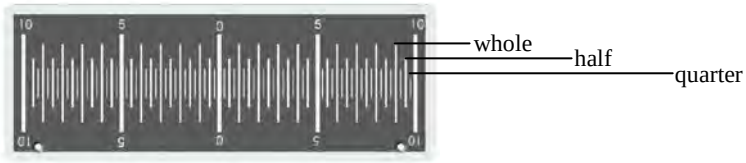
Rear left-hand value = **0**
Front left-hand value = **0**
Front right-hand value = **0**



(Figure 8)

5.4 Toe measurement - Read off the total toe

- Point the right-hand laser to the rear onto the toe scale.
- Read off the measurement result:
  Graduation of the toe scale.



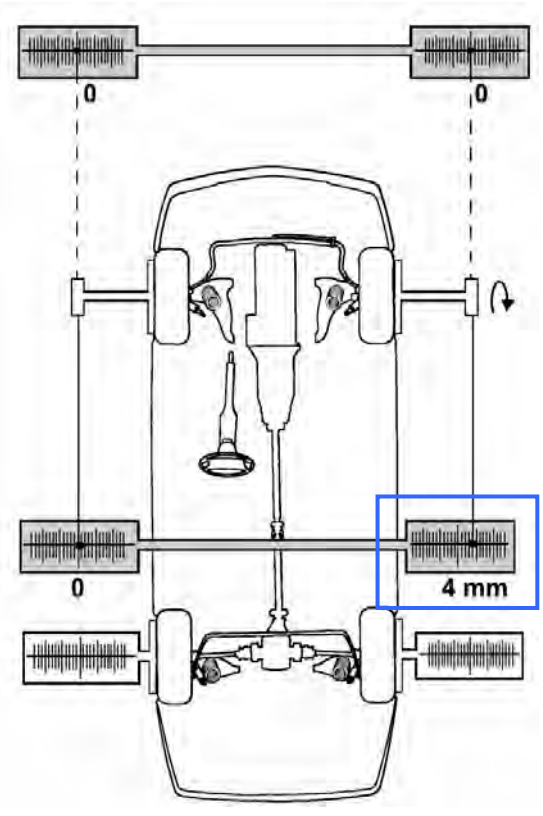
1 whole graduation mark on the scale ≙ **1.00 mm**
1 half graduation mark on the scale ≙ **0.50 mm**
1 quarter graduation mark on the scale ≙ **0.25 mm**

Laser dot points to zero = toe is zero too
Laser dot points from zero inwards = toe-out
Laser dot points from zero outwards = toe-in

- Enter the measured value in the measurement sheet

Example:

Laser dot behind the front axle on the right points to 4 whole graduation marks towards the outside, i.e. the front wheels have 4 mm toe-in*(Figure 9)*



(Figure 9)

Front Wheel Alignment

5.5 Single toe

The AXIS10 can also be used to determine the single toe for each side of the vehicle in vehicles with independent suspension.

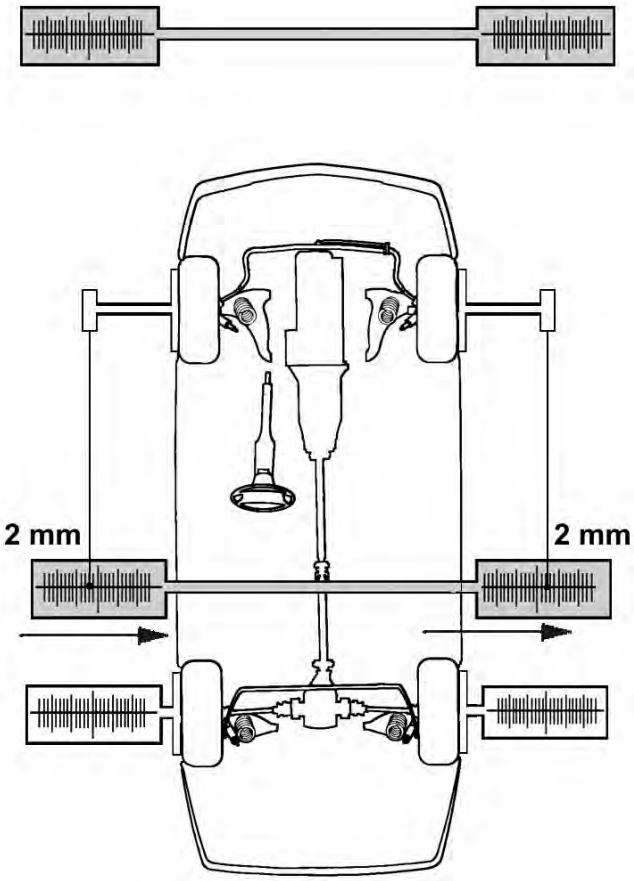
To determine the single toe, the displayed value for the total toe must be halved first.

This is done by moving the toe scale to the side so that the same value is displayed on the left and right.

In our example:

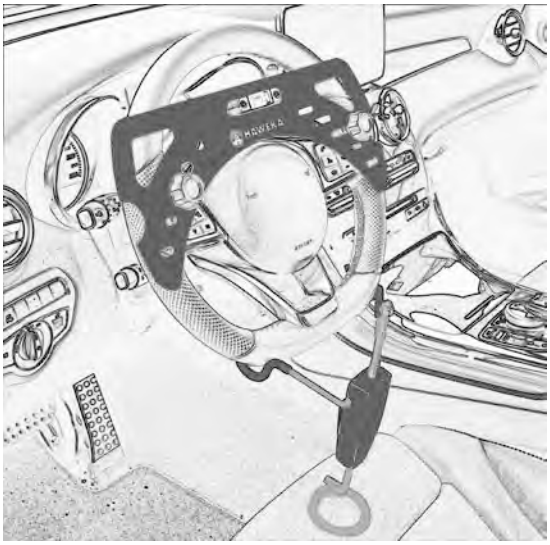
Display of total toe 4 graduation marks to the outside.

Push the rear scale until both scales on the left and right display the value 2. *(Figure 10)*



(Figure 10)

If the toe scale has been moved equivalent to half the total toe value the steering wheel must then be aligned using the steering wheel adjusting balance and fixed with the steering wheel locking device. *(Figure 11)*



(Figure 11)

Front Wheel Alignment

Continued: Single toe

If the steering wheel has been horizontally aligned, the single toe for the left and right-hand side of the vehicle can now be read off.

To do this, the laser measuring heads are pointed at the individual toe scales and the displayed value is read off *(Figure 12*)

In our example:

Single toe left-hand side of the vehicle:

Front scale value 2 mm towards the outside

Rear scale value 0 mm

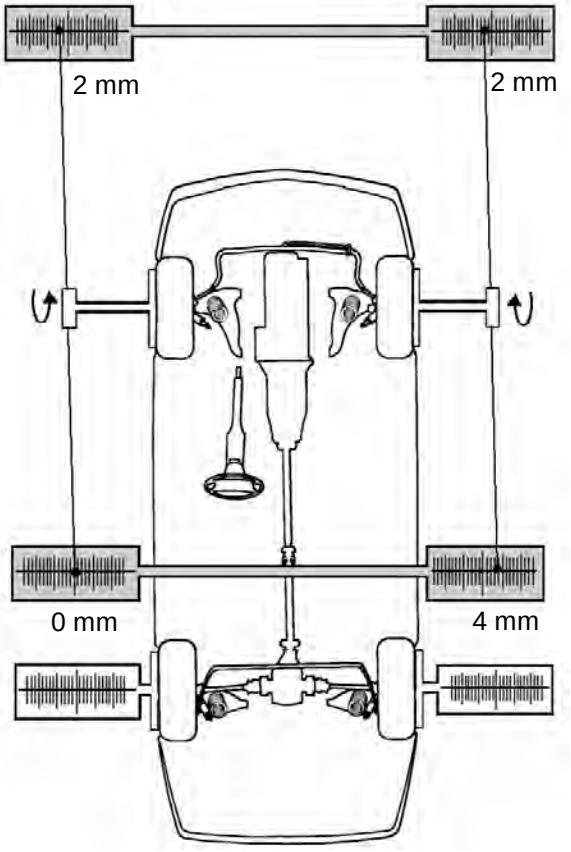
Result: **2 mm toe-out**

Single toe right-hand side of the vehicle:

Front scale value 2 mm towards the inside

Rear scale value 4 mm towards the outside

Result: **6 mm toe-in**



(Figure 12)

- If the toe equals the specified values, enter the measured value in the measurement sheet
- If the toe does not equal the specified values, adjust the toe.

5.6 Adjusting the toe

Note

The manufacturer's instructions must be observed for the toe adjustment procedure

In our example:
The required toe value should be zero*. (Figure 13)*

Adjust left-hand tie rod by 1 graduation mark:

Front scale value 1 mm towards the outside

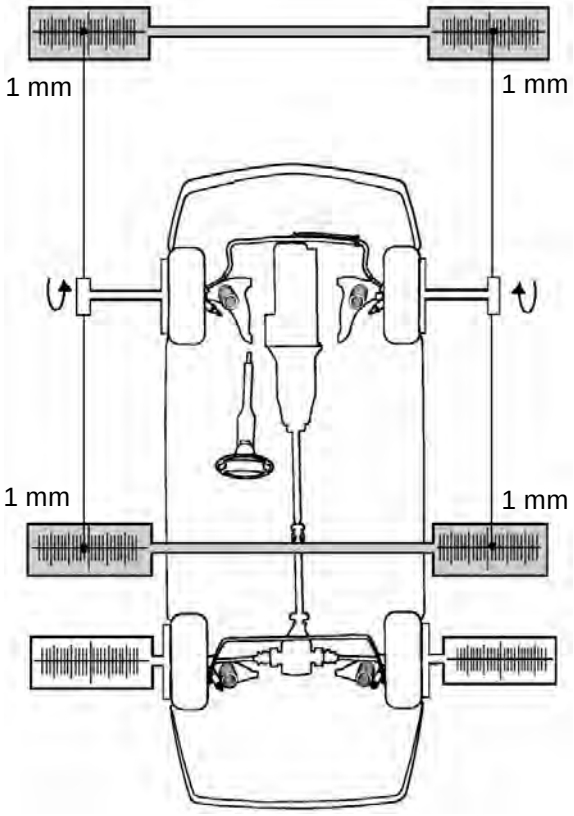
Rear scale value 1 mm towards the outside

Result**: Toe value 0 mm**

Adjust right-hand tie rod by 3 graduation marks:

Front scale value 1 mm towards the outside
Rear scale value 1 mm towards the outside

Result: **Toe value 0 mm**



(Figure 13)

Front Wheel Alignment

Check after toe adjustment

After the toe adjustment has been completed, check whether the front wheels are in the "Drive straight ahead" position.

To this end, both laser measuring heads are turned so that the laser beam hits the clip-on scale of the rear wheels.

The value now displayed must be the same on both sides of the vehicle. *(Figure 14)*

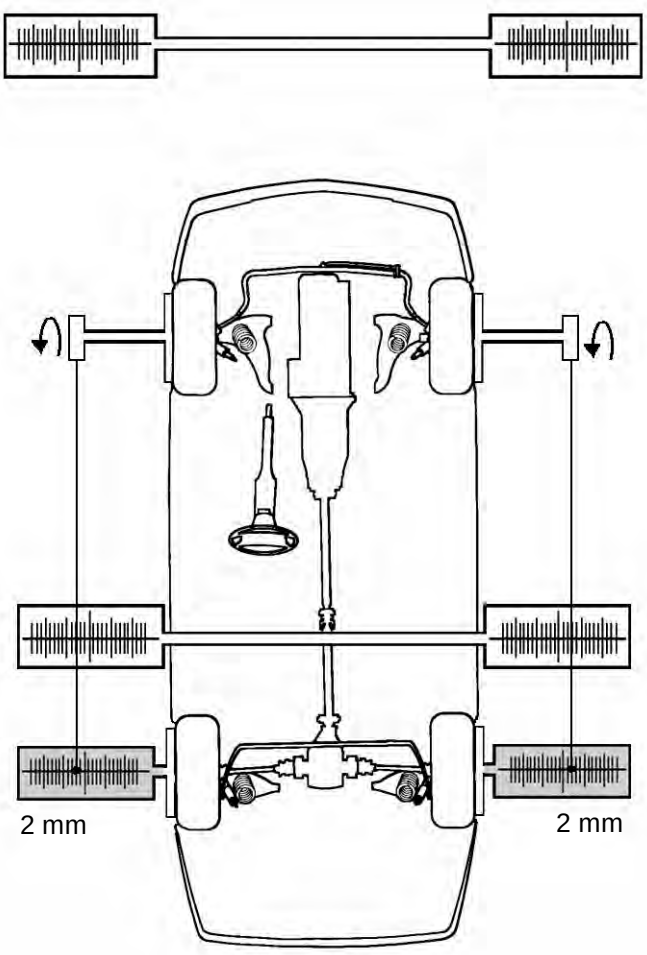
In our example:

Left-hand side of the vehicle:

Clip-on scale: Scale value 2 mm towards the outside

Right-hand side of the vehicle:

Clip-on scale: Scale value 2 mm towards the outside



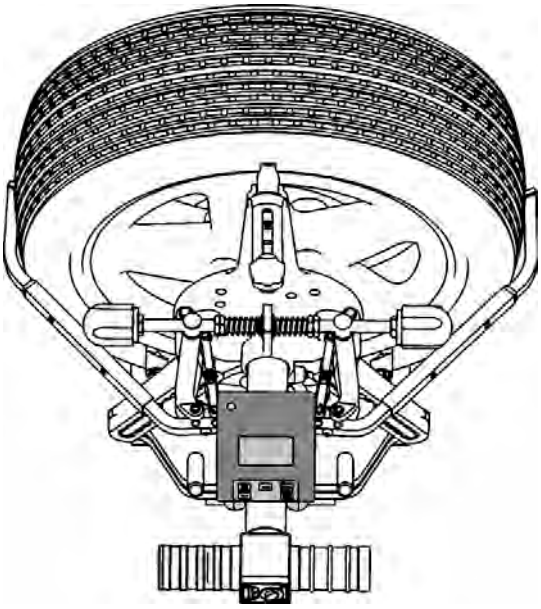
(Figure 14)

Front Wheel Alignment

5.7 Camber measurement

Note

If the camber has to be adjusted at the vehicle, this step must be carried out BEFORE the toe adjustment as the toe changes when the camber is adjusted.



(Figure 15)

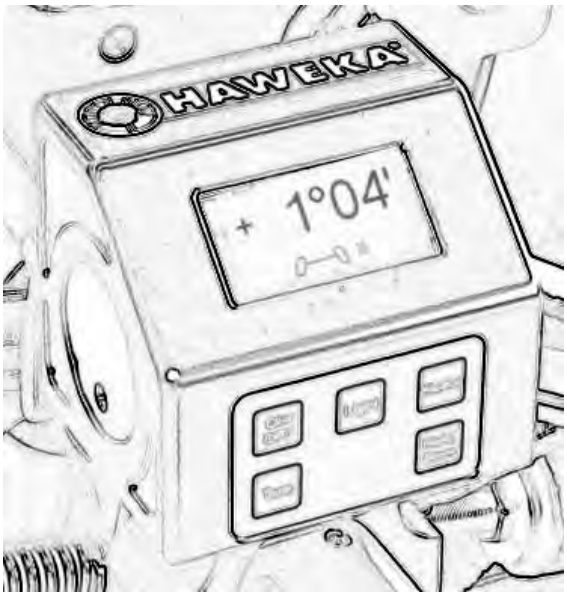
- Use steering wheel to set front wheels in "drive straight ahead" position.
- Position the inclinometer on the measuring column of the measuring head and lock into position with the wing screw. *(Figure 15)*
- Switch on the inclinometer using the **ON / OFF** button *(Figure 16)*
- After the welcome screen the current camber value immediately appears in the display. Read off the camber value from the display and enter it in the measurement sheet.

  Positive camber = Plus sign in the display.
  Negative camber = Minus sign in the display.

Note

For ”freezing“ the actual angle values, press the ”HOLD”-button. Now it is possible to remove the inclinometer from the measuring column without changing the results. For new measurements, press the “HOLD“-button again.

Repeat the same procedure (after acquiring all measurements) on the other side of the vehicle.

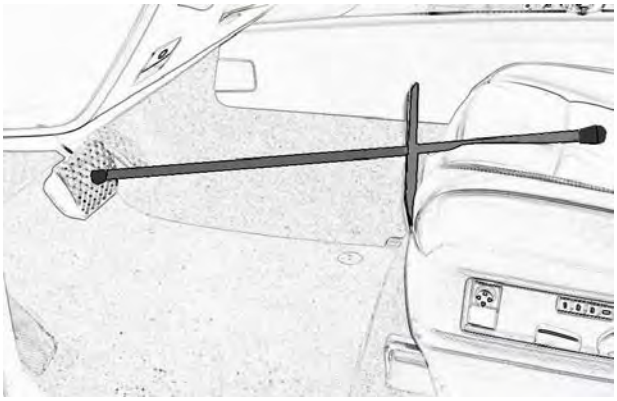


(Figure 16)

Front Wheel Alignment

5.8 Caster measurement and steering angle inclination

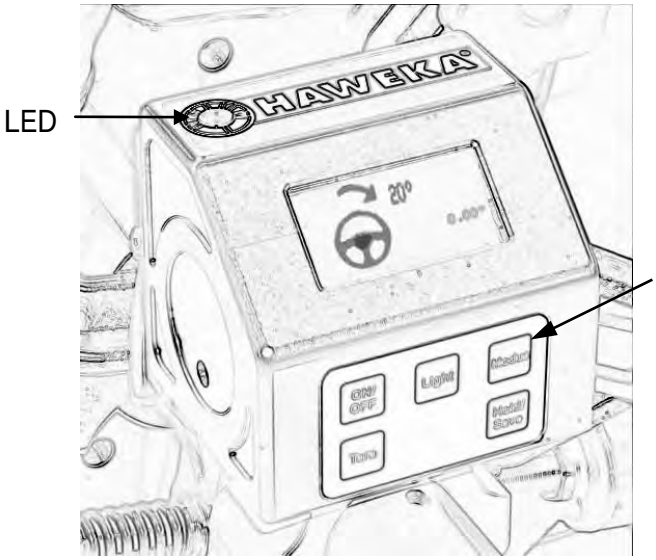
- After the camber measurement the inclinometer stays on the measuring column of the wheel alignment clamp.
- The unit is still switched on and displays the last determined camber value.
- Use the steering wheel to move the front wheels in the "drive straight ahead" position.



(Figure 17)

Note

To measure the caster and the steering angle inclination it is necessary to block the vehicle's wheels with the brake pedal locking device so that the result is not distorted by rolling when the wheels are steered. *(Figure 17)*



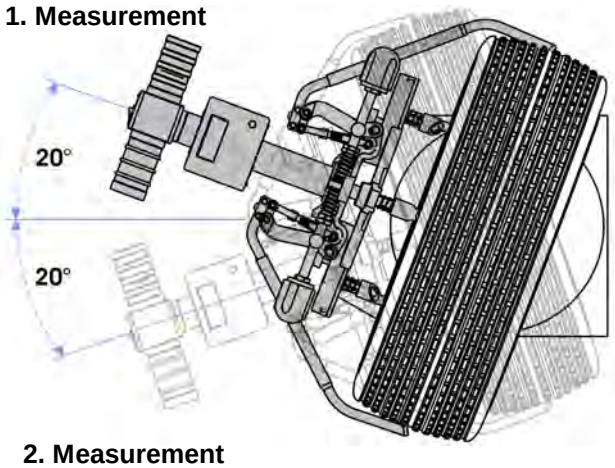
(Figure 18)

- The mode button on the inclinometer is pressed to switch to the *caster / steering axis inclination* measuring area. *(Figure: 18)*
- The LED in the upper part of the housing starts to blink. When it stops, a prompt appears in the display instructing you to turn the steering wheel through 20 degrees. *(Figure 18)*
- The wheel is turned with a uniform movement until the LED flashes again and thus confirms the steering has been turned through 20 degrees.
- Shortly after that the LED shuts off and the wheel is turned in the other direction until the LED flashes again.
- The wheel is held in this position until the LED is constantly lit and thus finishes the procedure. *(Figure 19)*

LED indicator light:

LED – off	For measurement: Start / End
flashes	For position: reached / change
constant	For measurement: Start / End

1. Measurement



2. Measurement

Front Wheel Alignment

Continued: Caster measurement and steering angle inclination

After all measured values have been successfully recorded the screen display automatically changes and the absolute values for the caster and steering axis inclination are displayed in degrees and minutes. *(Figure 20)*

- The determined values are entered in the measurement sheet.

Repeat the same procedure (after acquiring all measurements) on the other side of the vehicle.

(Figure 20)

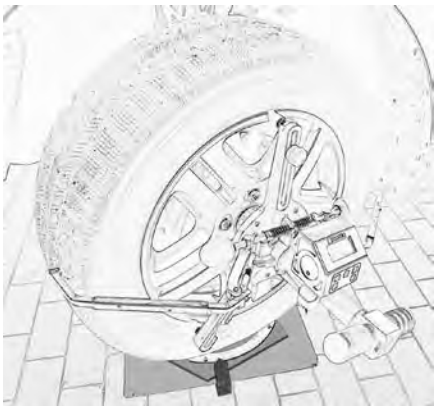
5.9 Max. Steering Angle

- If the caster and the inclination are determined, change the area steering angle by pressing the “Mode”-button.
- Now, the display shows the steering angle.
- The steering wheel is turned to the max. steering lock and the angle value for the max. steering angle can be read. *(Figure 21)*

(Figure 21)

5.10 Toe-out on turn

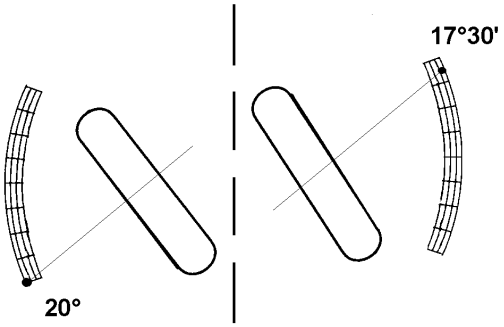
- Use the steering wheel to move the front wheels into "drive straight ahead" position.
- It is necessary to turn the steering wheel through 20 degrees on the left-hand side of the vehicle to determine the toe-out on turn on the right-hand side of the vehicle.
- Use the protractor on the turn plates for this *(Figure 22)*
- Read off the toe angle of the right-hand wheel and enter the difference between the two angles in the measurement sheet.
- Repeat this measurement procedure for the left-hand wheel.



(Figure 22)

In our example:

The scale indicates 20° at the left-hand wheel (inside wheel). The scale value at the right-hand wheel (outside wheel) is 17°30’. The right-hand toe-out on turn is 2°30’.



6 Rear Wheel Alignment

The front wheels have already been measured and adjusted.

Note

Before you can start the rear axle alignment it is necessary to ensure that the front wheels are in the "drive straight ahead" position and have been secured against turning with the steering wheel locking device.

In our example:

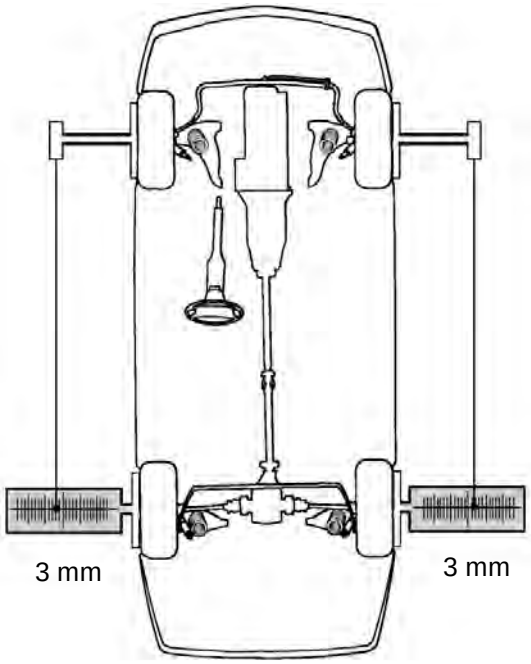
Left-hand side of the vehicle:

Clip-on scale: Scale value 3 mm towards the outside

Right-hand side of the vehicle:

Clip-on scale: Scale value 3 mm towards the outside

(Figure 13)



(Figure 23)

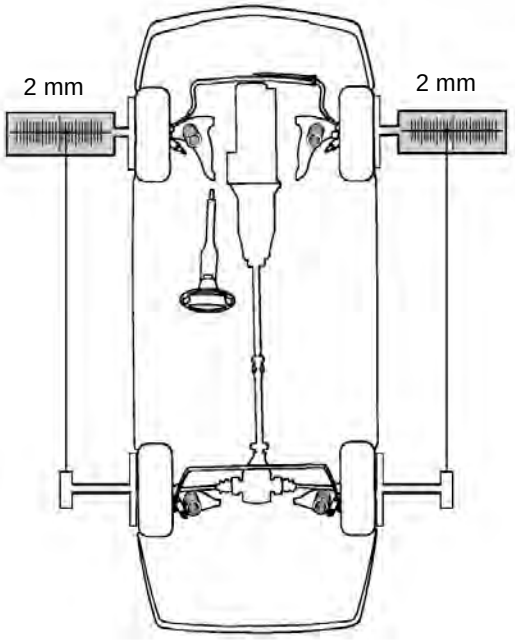
6.1 Preparations

- Moving the wheel alignment clamps.
- The wheel alignment clamps with the laser measuring heads are fitted onto the rear wheels and the wheel alignment clamps with the clip-on scales are fitted onto the front wheels.
- Switch on the laser measuring head on both sides of the vehicle and point each towards the front clip-on scale.

Before switching on, check the position of the laser beam aperture!

6.2 Aligning the rear wheels

Before taking the measurement, check whether the rear wheels are equally aligned with the front wheels on both sides of the vehicle.
This means the values displayed on the two clip-on scales must be the same.
If this is not the case the adjustment is made at only one track rod of the rear axle until the same value on both the left and right-hand scales is the same.
(Figure 24)



(Figure 24)

Rear Wheel Alignment

6.3 Set up toe scales

The toe scales are set up with the same steps as described under Point 5.3 above for the front wheel alignment. (See also Page 17)

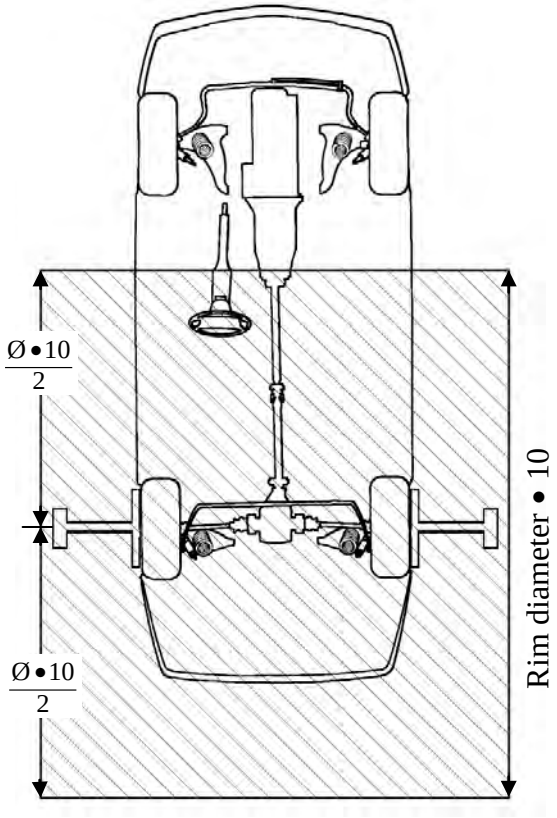
- The length of the measuring rectangle must be defined and the dimensions drawn on the floor. *(Figure 25)*
- Both toe scales are placed on the marking behind the rear axle.
- Switch on the laser measuring heads and align each with the toe scale.

Before switching on the laser measuring heads check the position of the laser beam aperture!

- The toe scales are moved one after the other on the same marking and their length is adjusted until both scales display the value zero. *(Figure 26)*
- One of these toe scales is positioned on the front marking between the axles.

Note

The length and position of the toe scales may now not be changed any more!



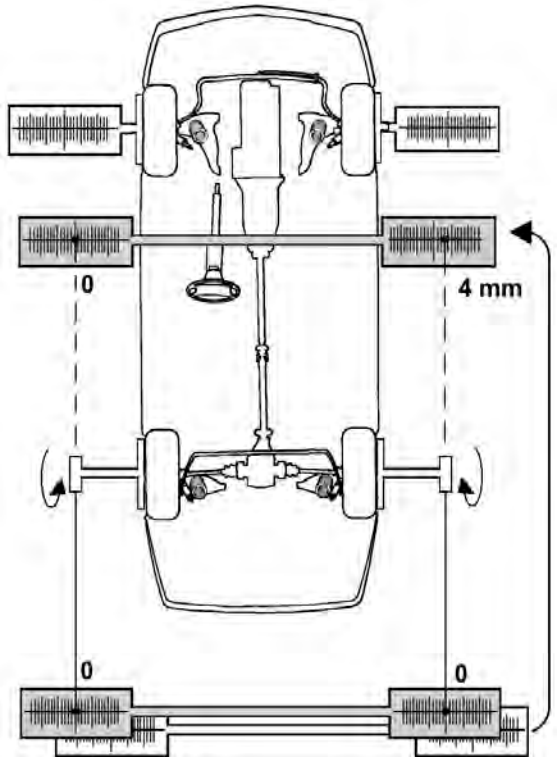
(Figure 25)

6.4 Toe measurement

Read off the total toe

The laser measuring heads are switched on and the laser beams are directed at each of the rear toe scales. *(Figure 26)*

- Point one laser beam (on the left in our example) at the front scale.
- Move the complete front scale until the value zero is reached on the scale.
- Direct the right-hand laser beam at the scale in the front and read off the measurement result.



(Figure 26)

In our example:

Laser dot in front of the rear axle on the right points to the 4th whole graduation mark towards the outside, i.e. the rear axle has 4 mm toe-out *(Figure 26)*

Rear Wheel Alignment

Adjusting the toe

- This is done by moving the complete front toe scale to the side until the same value is displayed on both scales on the left and right. *(Figure 27)*

In our example:

Move the toe scale to the left until the scale on the right-hand side of the vehicle reads 2 mm (towards the outside) and the scale on the left-hand side of the vehicle also reads 2 mm (to the outside).

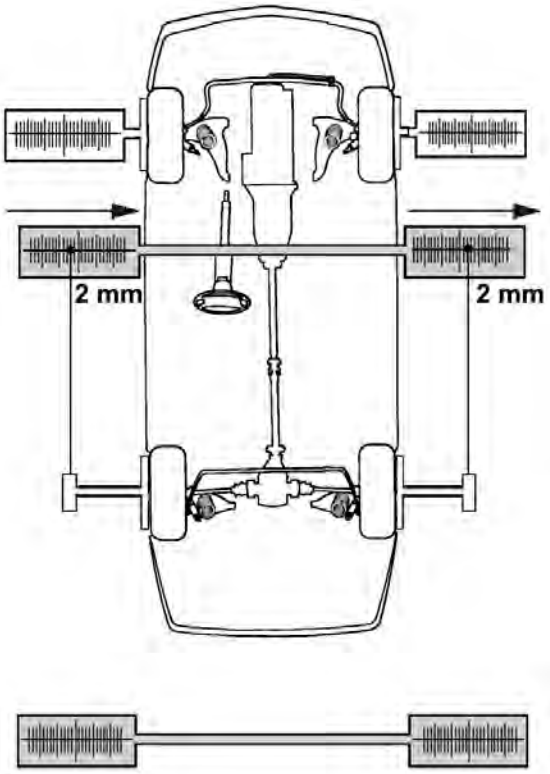
- Both track rods can now be uniformly turned until the required toe value is reached.

In our example:

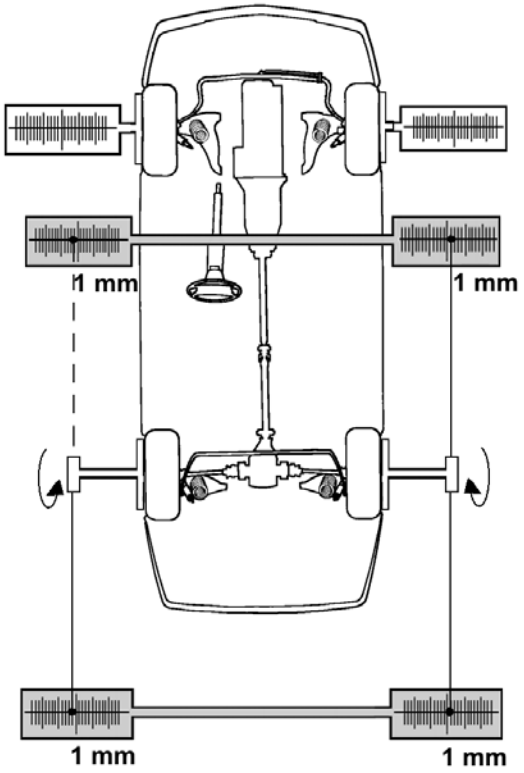
The setpoint value for the single toe (on each side of the vehicle) is 0.0 mm

The total toe would be 0.0 mm

Adjust both track rods by 1 graduation mark towards the inside on the scale. *(Figure 28)*



(Figure 27)



(Figure 28)

Note

The manufacturer's instructions must be observed for the toe adjustment procedure

CHECK:

Then, to check the set toe values, point the laser measuring heads back onto the rear toe scales.

The scale value readings must now be the same as at the front scales.

IMPORTANT: But only for a total toe of zero!

In our example:

All scales show the same value.
Each show 1 graduation mark towards the outside. *(Figure 28)*

Rear Wheel Alignment

6.5 Camber measurement

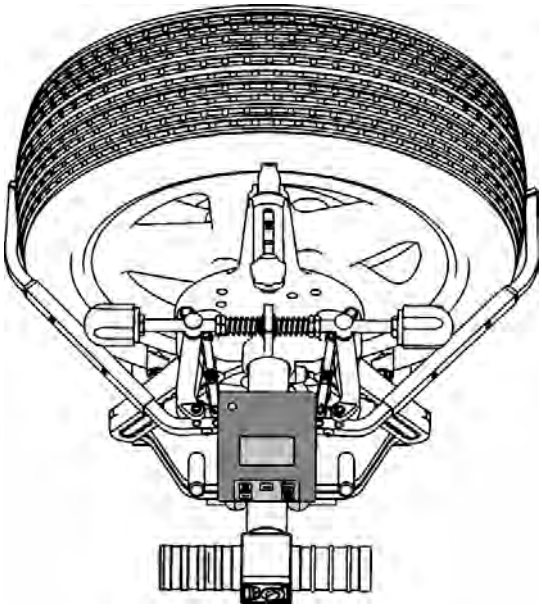
The same steps as described under Item 5.7 above for the front wheel alignment are repeated to record the camber value. (See also Page 22)

Note

If the camber has to be adjusted at the vehicle, this step must be carried out BEFORE the toe adjustment as the toe changes when the camber is adjusted.

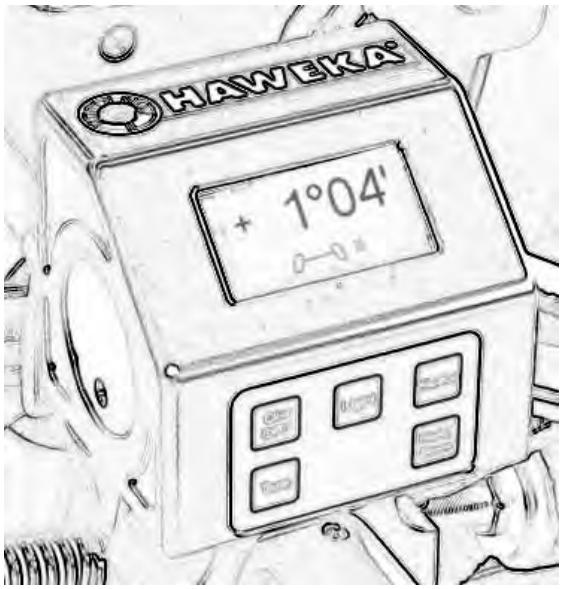
- Position the inclinometer on the measuring column of the measuring head and lock into position with the wing screws. *(Figure 29)*
- Switch on the inclinometer using the **ON / OFF** button *(Figure 30)*
- After the welcome screen the current camber value immediately appears in the display. Read off the camber value from the display and enter it in the measurement sheet.

  Positive camber = Plus sign in the display.
  Negative camber = Minus sign in the display.



(Figure 29)

Repeat the same procedure on the other side of the vehicle.



(Figure 30)

7 Maintenance

7.1 Care and maintenance

Please note that the laser measuring heads and their accessories are precision components.
Always ensure that these components are used and maintained with the greatest possible care.

The laser's lens as well as the inclinometer generally requires no maintenance. If the equipment is dirty the components can be cleaned using a soft dry cloth.
Do not use solvents or other liquids to clean them!

The life of the batteries for the inclinometer is approx. 60 h in normal operation (without lighting)
If the capacity of the installed batteries is no longer sufficient a battery symbol is displayed and the batteries must be replaced.

The unit continues to work correctly even if the battery power is weak. It does not display any incorrect angle values in relation to the measurement taken.

7.2 Replacing the batteries in the laser housing

To open the battery compartment in the laser housing, *(Figure 31* unscrew the black cap. *(Figure 32)*

Battery type: Mignon Type AA 1.5V

(Figure 31)

(Figure 32)

Using lithium batteries increases the life of the unit.

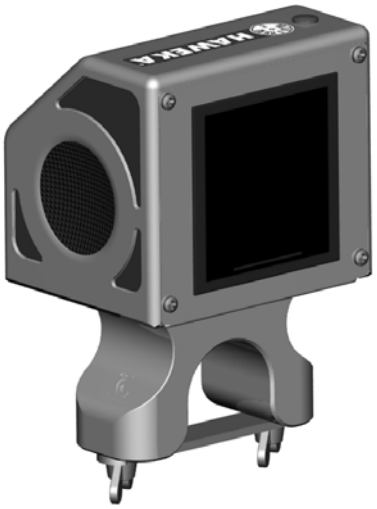
7.3 Replacing the batteries in the inclinometer

If the battery symbol appears in the display the batteries in the unit must be replaced. *(Figure 33)*

(Figure 33)

Four standard Mignon Type AA batteries 1.5 volt are required to replace the batteries.

To do this, open the cover of the battery compartment at the rear of the unit. *(Figure 34)*



(Figure 34)

Used batteries are to be disposed of in special collection containers for recycling.

8 Appendix

8.1 Table for converting toe in millimetres into degrees

Toe in mm	Wheel size						
	13“	14“	15“	16“	17“	19“	20“
0.5	0° 05'	0° 05'	0° 05'	0° 04'	0° 04'	0° 03'	0° 03'
1.0	0° 10'	0° 10'	0° 09'	0° 08'	0° 08'	0° 07'	0° 07'
1.5	0° 16'	0° 15'	0° 14'	0° 13'	0° 12'	0° 10'	0° 10'
2.0	0° 21'	0° 19'	0° 18'	0° 17'	0° 15'	0° 14'	0° 14'
2.5	0° 26'	0° 24'	0° 23'	0° 21'	0° 19'	0° 17'	0° 17'
3.0	0° 31'	0° 29'	0° 27'	0° 25'	0° 23'	0° 21'	0° 20'
3.5	0° 36'	0° 34'	0° 32'	0° 30'	0° 27'	0° 24'	0° 24'
4.0	0° 42'	0° 39'	0° 36'	0° 34'	0° 31'	0° 28'	0° 27'
4.5	0° 47'	0° 44'	0° 41'	0° 38'	0° 35'	0° 31'	0° 30'
5.0	0° 52'	0° 48'	0° 45'	0° 42'	0° 39'	0° 35'	0° 34'
5.5	0° 57'	0° 53'	0° 50'	0° 47'	0° 43'	0° 38'	0° 37'
6.0	1° 02'	0° 58'	0° 54'	0° 51'	0° 46'	0° 42'	0° 41'
6.5	1° 08'	1° 03'	0° 59'	0° 55'	0° 50'	0° 45'	0° 44'
7.0	1° 13'	1° 08'	1° 03'	0° 59'	0° 54'	0° 49'	0° 47'
7.5	1° 18'	1° 13'	1° 08'	1° 03'	0° 58'	0° 52'	0° 51'
8.0	1° 23'	1° 17'	1° 12'	1° 08'	1° 02'	0° 56'	0° 54'
8.5	1° 29'	1° 22'	1° 17'	1° 12'	1° 06'	0° 59'	0° 58'
9.0	1° 34'	1° 27'	1° 21'	1° 16'	1° 10'	1° 02'	1° 01'
9.5	1° 39'	1° 32'	1° 26'	1° 20'	1° 13'	1° 06'	1° 04'
10.0	1° 44'	1° 37'	1° 30'	1° 25'	1° 17'	1° 09'	1° 08'
10.5	1° 49'	1° 42'	1° 35'	1° 29'	1° 21'	1° 13'	1° 11'
11.0	1° 55'	1° 46'	1° 39'	1° 33'	1° 25'	1° 16'	1° 14'
11.5	1° 60'	1° 51'	1° 44'	1° 37'	1° 29'	1° 20'	1° 18'
12.0	2° 05'	1° 56'	1° 48'	1° 42'	1° 33'	1° 23'	1° 21'

Appendix

8.2 Measuring sheet for wheel alignment measurement

Insert your company name
Address
ZIP and town
Telephone

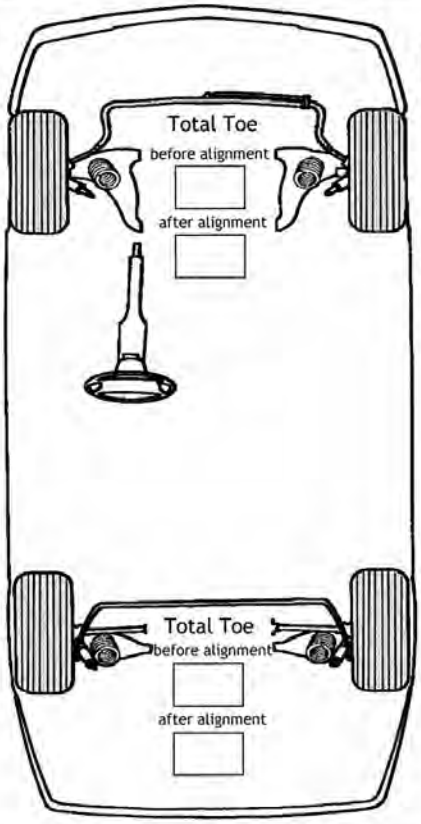
Manufacturer:	**Model:**
chassis number:	**Driven km/miles:**
Licence plate no.:	**Tyre pressure: (psi) f.l.:** **f.r.:**
Vehicle owner:	**r.l.:** **r.r.:**

Measurement report for wheel alignment

Camber, Caster, SAI/KPI, Toe-out-on-turns
Individual- and Total Toe

measured data in degrees [°]
measured data in millimetre [mm]

before alignment		after alignment
	Camber	
	Individual Toe	
	Caster	
	SAI / KPI	
	Toe-out-on-turns	



before alignment		after alignment
	Camber	
	Individual Toe	
	Caster	
	SAI / KPI	
	Toe-out-on-turns	

before alignment		after alignment
	Camber	
	Individual Toe	

before alignment		after alignment
	Camber	
	Individual Toe	

Mechanic:	**Date:**
Notes for Vehicle:	

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30938 Burgwedel
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Fax: +49 5139/8996-222
www.haweka.com
info@haweka.com

9 EC Declaration of Conformity

The manufacturer:	**HAWEKA AG** **Kokenhorststraße 4** **D-30938 Burgwedel** **Germany**
herewith declares, that following described device	**Laser Wheel Aligner AXIS10**
complies with safety and health requirements of following EC guidelines	**EMC – Directive 2004/108/EC** **RoHS – Directive 2011/65/EU** **NSR - 2006/95/EG**

Applied harmonized standards:

Immunity	EN 61000-6-1
Emission	EN 61000-6-3

Applied national standards and technical specifications:

Laser irradiation	VBG 93
Safety of laser devices	DIN EN 60825 – Part 1

In case of structural alterations that effect technical data and agreed functionality as described in these operating instructions this declaration will lose its validity.

President
Dirk Warkotsch

Burgwedel, 06.04.2016

CE

(signature)

HAWEKA AG

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