

Wheel alignment measuring data

The following values apply at empty weight in accordance with German DIN 70020 standard (car with full fuel tank, spare wheel and tools).

	Adjustment values and tolerance	Max. difference between left/right
Front axle		
Height adjustment:		
From wheel contact patch to Measuring surface on rear control arm pivot	180 ± 20 mm*	10 mm
Toe-in, no pressure applied	+ 15' ± 5'	
Toe-out on turns at 20° steering lock	- 1' ± 20'	Can only be varied by renewing steering arms
Camber	- 30' ± 10'	10'
Caster	1990 models inclusive	3° 30' + 30***
	From 1991 models on	4° + 1***
Rear axle		
Height adjustment:		
From wheel contact patch to measuring surface on lateral subframe	173 ± 10 mm*	10 mm
Toe-in, each wheel	+ 10' ± 5'	10'
Camber	- 40' ± 10'	10'

* Height adjustment settings apply to new cars. After cars have been driven for a period the height may be max. 10 mm less, in other words the downward tolerance can vary by 10 mm more. However, this must then apply to both axles.

** The caster angle value of 4° + 1° can be adopted retrospectively on cars back to the 1986 model year inclusive (from introduction of vertical ball joint at front axle subframe pivot / refer to Page 40 - 19). The caster tolerance range on the measuring chart should be modified if necessary. The printed measuring chart will not be amended until a new issue is printed.

Specimen measuring chart*

Name: _____ Vehicle: All Porsche Types 928

Vehicle Ident. No.: _____ Licence plate No.: _____ miles/km: _____

Date: _____ measured by: _____

MEASURING CHART

Difference angle at 200 turning radius

Vehicle: Empty weight according to DIN 70020 (with full fuel tank, spare wheel and tools)

Fims and tires (damage and treads)

camber

Car's height* (nominal value 190 - 20 mm)

Wheel load in kg* Max. difference between left and right: 20 kg

camber

camber

Rear-wheel adjustment

Car's height* (nominal value 173 ± 10 mm)

Wheel load in kg* Max. difference between left and right: 20 kg

camber

* Refer to instructions in Repair Manual

* The caster adjustment setting has been changed for 1991 models on to 4° + 1° (previously 3° 30' + 30'). This changed caster value can be adopted retrospectively on cars back to 1986 models inclusive (from introduction of vertical ball joint at front axle subframe pivot / refer to Page 44 - 19).

Wheel alignment measuring data

The following values apply at empty weight in accordance with German DIN 70020 standard (car with full fuel tank, spare wheel and tools).

FOR GENERAL INFO ONLY

OLD

	Adjustment values and tolerance	Max. difference between left/right
Front axle		
Height adjustment: From wheel contact patch to Measuring surface on rear control arm pivot	190 -20 mm*	10 mm
Toe-in, no pressure applied	+ 15' ± 5'	SEE NEW SHEET Can only be varied by renewing steering arms
Toe-out on turns at 20° steering lock	- 1' ± 20'	
Camber	- 30' ± 10'	10'
Caster	1990 models inclusive 3° 30' + 30''** From 1991 models on 4° + 1''**	20' 20'
Rear axle		
Height adjustment: From wheel contact patch to measuring surface on lateral subframe	173 ± 10 mm*	10 mm
Toe-in, each wheel	+ 10' ± 5'	10'
Camber	- 40' ± 10'	10'

* Height adjustment settings apply to new cars. After cars have been driven for a period the height may be max. 10 mm less, in other words the downward tolerance can vary by 10 mm more. However, this must then apply to both axles.

** The caster angle value of 4° + 1" can be adopted retrospectively on cars back to the 1986 model year inclusive (from introduction of vertical ball joint at front axle subframe pivot / refer to Page 40 - 19).

The caster tolerance range on the measuring chart should be modified if necessary. The printed measuring chart will not be amended until a new issue is printed.

Specimen measuring chart*

Name: _____ Vehicle: All Porsche Types 928
 Vehicle Ident. No.: _____ Licence plate No.: _____ miles/km: _____
 Date: _____ measured by: _____

Rims and tires (damage and reads)

Vehicle: Empty weight according to DIN 70020 (with full fuel tank, spare wheel and tools)

MEASURING CHART

Difference angle at 20° turning radius

20° right turn-in measured left

20° left turn-in measured right

Toe-in (not pressed)

max. camber-difference left to right -20°

Car's height* (nominal value 190 - 20 mm)

Wheel load in kg* Max. difference between left and right: 20 kg

max. caster-difference left to right -20°

camber

caster

max. camber-difference left to right +10°

max. caster-difference left to right +10°

Rear-wheel adjustment

Car's height* (nominal value 173 ± 10 mm)

Wheel load in kg* Max. difference between left and right: 20 kg

max. camber-difference left to right +10°

4260.20

* Refer to instructions in Repair Manual

Printed in Germany

* The caster adjustment setting has been changed for 1991 models on to 4° + 1° (previously 3° 30' + 30'). This changed caster value can be adopted retrospectively on cars back to 1986 models inclusive (from introduction of vertical ball joint at front axle subframe pivot / refer to Page 44 - 19).

The caster tolerance range on the measuring chart should be modified if necessary. The printed measuring chart will not be amended until a new issue is printed.

Alignment

General

Use an optical or electronic axle measuring device to align the vehicle. Refer to the operating instructions for the axle measuring device for the measuring procedure.

The following preconditions must be fulfilled before starting alignment:

- Vehicle at curb weight as per DIN 70020, i.e. ready for the road with full tank, spare wheel and tools.
- Correct joint and wheel-bearing play
- Prescribed tyre inflation pressure, more or less uniform tyre tread

If vehicle is to be aligned front and rear, first check and/or adjust the wheel values for the rear axle. Center the steering wheel and steering for track adjustment.

Before starting to adjust the wheel values for front or rear axles, it may be advisable or necessary* to check the rear axle height setting at DIN curb weight, as well as the front axle for vehicles with adjustable front spring struts.

If wheel-load scales are available, it is possible to keep the difference between right and left wheel loads as low as possible thanks to the height adjustment facility. The difference in wheel load is adjusted by altering the height of the vehicle within the height tolerance. Priority is given to the least possible difference between right and left wheel load.

* following work which causes an alteration in height or if the height is incorrect.

Important notes for alignment

The following must be observed during alignment:

1. Actual vehicle height
2. Height setting / alteration in wheel load

To 1: (Actual vehicle height)

Explanation of vehicle heights:

Specified vehicle height

Corresponds to the specified value. The tolerance range may be used to reduce the difference in wheel load.

Actual vehicle height

- Should be within the tolerance range for the specified vehicle height.
- Is lost if the vehicle or front axle have been raised.
- Is recovered after a longer journey or longer operating period. Exact value can be achieved by pulling the front axle downward in a precisely defined way.
- Description in the following text.

Influenced vehicle height

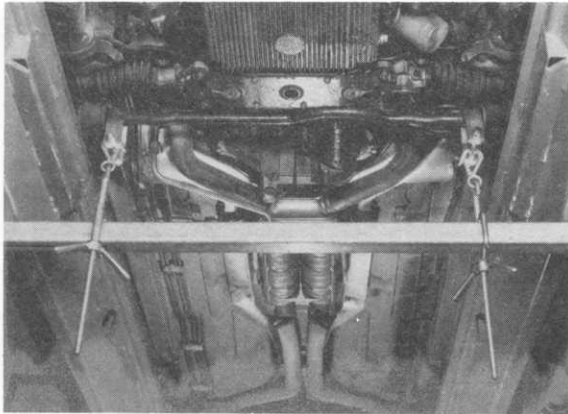
Existing height value after the vehicle or front axle have been raised. Never use this height value as a starting point, to prevent:

- a) a result of height measurement that does not correspond to the actual vehicle height, or
- b) a toe-in value, when correcting the wheel position, which, because of the FA kinematics, does not comply with regulations at actual vehicle height.

Obtain actual vehicle height as follows:

- After the vehicle has been raised, starting at the influenced vehicle height, pull the front axle down by 60 - 70 mm and hold for 1 minute. Use special tool 10 - 222 A for this. Keep to the specified time.
- After releasing the vehicle, bounce the front and rear axles – approx. 25 mm – a few times.

For the pulling down procedure, fasten the engine support (prop device) 10-222 A to the stabilizer. Use suitable hooks or straps. The transport lugs (strap No. 28, Page 40 - 7) may be used if there is enough distance between the rails of the platform. This is possible without removing the sump guard.



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To 2: (Height adjustment/alteration in wheel load)

Changing the height on one side causes an alteration in wheel load. If there is an alteration in wheel load for one wheel, the loads for the other wheels also change.

An increase in spring pretension (raising the vehicle) on one side causes an increase in wheel load.

A reduction in spring pretension (lowering the vehicle) on one side reduces the wheel load.

An alteration in wheel load always acts on the wheel diagonally opposite. In other words, if the wheel load of one wheel is increased or reduced, the diagonally opposite wheel undergoes the same alteration.

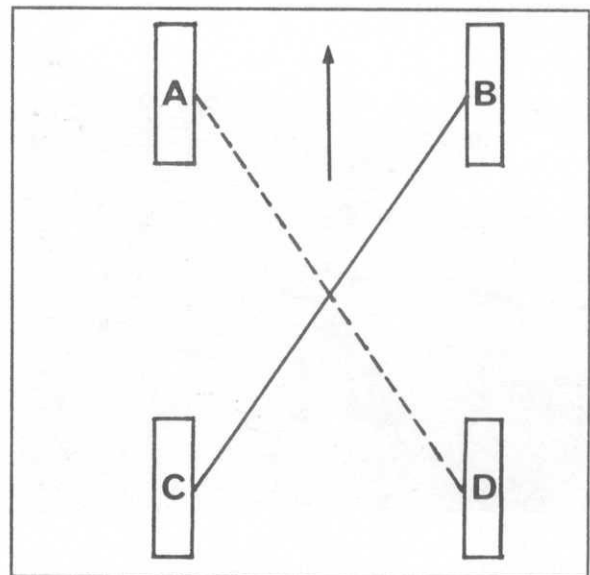
Example

Spring pretension is increased at the rear left C.

This means that the wheel load:

- increases rear left C and front right B

- reduces rear right D and front left A



The difference between left and right wheel load should be kept as low as possible for front and rear axles (less than 20 kg).

Check/adjust height

Note

The adjustment facility is used to correct differences between left and right wheel loads. If the height is correct, the differences in wheel load are within a permitted tolerance as long as the coil springs on each axle are the same length (spring pretention).

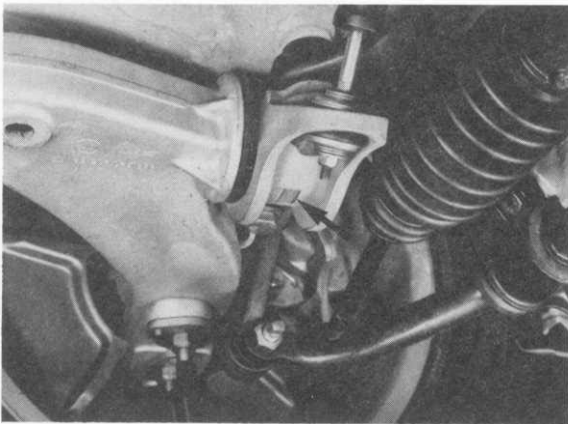
Tolerance ± 1 mm.

It is possible to keep the differences in wheel load as low as possible if wheel-load scales are used. The tolerance between right and left on front and rear axles less than 20 kg.

Front axle

1. At actual vehicle height

(Page 44 - 2 / 44 - 2a), measure the distance between the tire contact surface and the measuring point on the rear link bearing.



Nominal value 180 ± 10 mm
max. difference between left and right 10 mm.

2a) If spring struts are not adjustable

the vehicle height at the front axle is determined by the coil spring and cannot be adjusted. It is only possible to make a correction by replacing the front axle coil springs or fitting spacers under the lower spring seat.

No more than max. 2 spaces may be fitted to each spring strut to ensure that the guide for the lower spring seat is maintained. Bear in mind that a settling allowance must be made for new vehicles and replaced axle components.

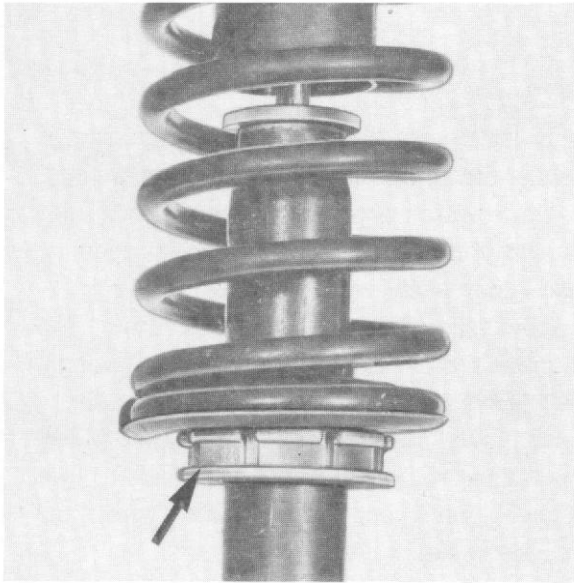
2b) If spring struts are adjustable

the vehicle height is adjusted at the front axle by turning the adjusting nut. Set the wheels to a suitable lock to give access to the adjusting nut (do not raise the vehicle). Should the vehicle be raised, restore to actual vehicle height before checking the height again.

Adjusting nut

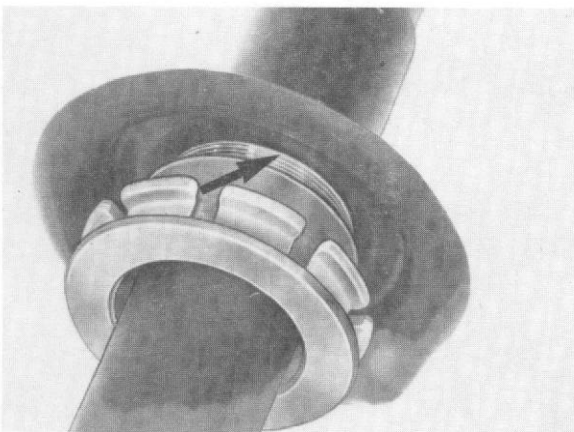
- turn to the right = vehicle higher
- turn to the left = vehicle lower

Adjust using the same tools as for the rear axle.



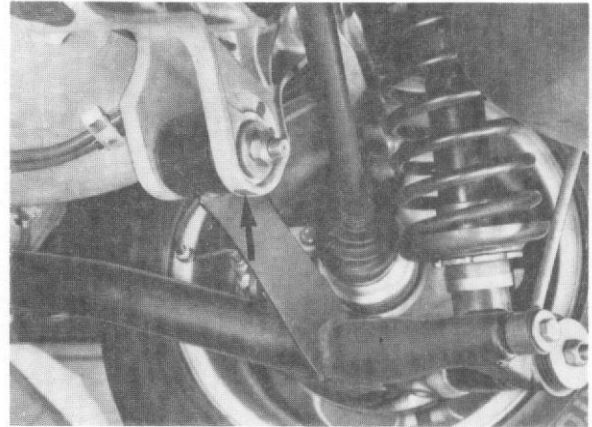
Note

If **Bilstein spring struts** are installed, the adjusting range for lowering the vehicle is limited by a stop for the adjusting nut. If **Boge spring struts** are installed, the adjusting nut turns too easily at the lowest position. This means that the lower spring seat no longer has contact with the adjusting nut, but with the threaded sleeve. Under normal conditions, this acceptable range is not reached (if height is adjusted according to regulations).



Rear axle

1. At actual vehicle height (Page 44 - 2 / 44 - 2a) measure from tire contact surface to measuring point on the cross member.



Specified value 173 ± 10 mm
max. difference between left and right 10 mm

2. The vehicle height is adjusted at the rear axle by turning the adjusting nut. Use an extended hook wrench (with welded-on pipe) or Special Tool VW 637/2 (lever) to turn the nut accordingly. Do not raise the vehicle.

Adjusting nut

- turn to the right = vehicle higher
- turn to the left = vehicle lower

Wheel alignment values

Important notes

Only check and/or adjust wheel alignment values if the specified preconditions have been fulfilled (Page 44 - 1 under general) and at actual vehicle height (Page 44 - 2/ 44 - 2 a).

If the vehicle is to be aligned front and rear, first check and/or adjust the rear axle.

Front axle

Prepare the vehicle for checking and/or adjusting the wheel alignment values. Position the front wheels on rotary plates, etc.

If the vehicle is not driven onto rotary plates, but raised, or raised for any other reason, the actual vehicle height must then be restored by pulling down.

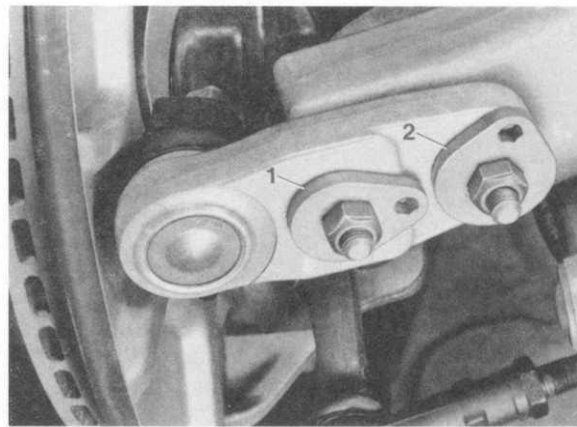
Adjust camber and caster

Camber and caster are both adjusted by means of eccentrics on the lower control arm. Tighten self-locking hexagon nuts with 120 Nm (88.5 ft. lb.)

Seal the slit openings for the adjusting eccentrics (Page 40 - 23).

Note

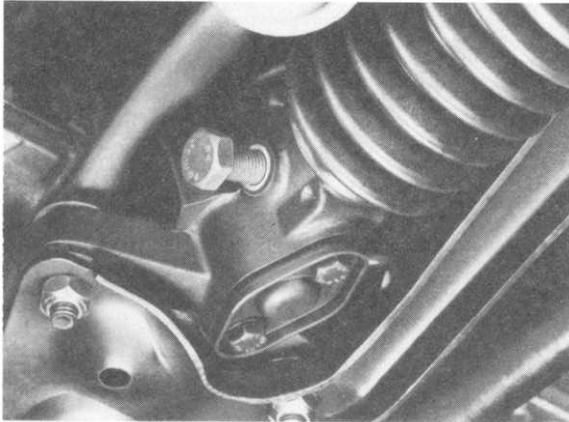
If vehicles have **aluminium joint carriers**, always turn the caster eccentric from small values towards large caster values, i.e. if the caster value is too high, first turn the eccentric back completely and then adjust to the correct value. This guarantees that the camber and caster values are always maintained, even under extreme operating conditions. If it is not possible to achieve the prescribed caster value, adjust the other side to the higher value if necessary (up to 4 degrees 30' is acceptable).



No.	for aluminium joint carrier	for steel joint carrier
1	Caster eccentric	Camber eccentric
2	Camber eccentric	Caster eccentric

Adjusting toe

- Preparation: Center steering gear with Special Tool 9116. If the steering wheel is offset, relocate at the best value. Then remove Special Tool 9116.



- Clamp the steering wheel in the central position with **steering wheel lock** and adjust the toe with the tie rods.

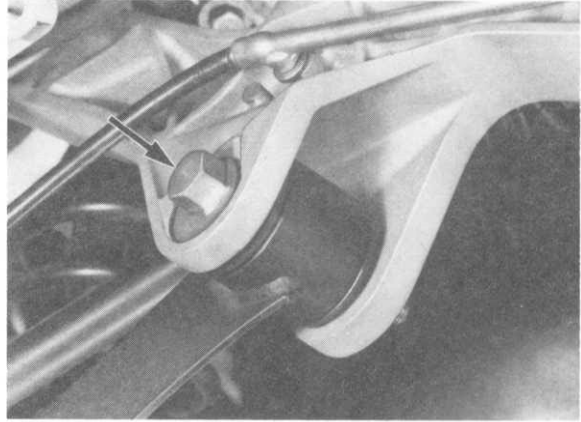
Track difference

It is not possible to adjust the track difference (can only be affected by replacing steering arms).

Rear axle

Adjust camber

The camber is adjusted by means of an eccentric screw on the inner link bearing.



Adjust toe

The toe is adjusted by means of an eccentric screw on the front link bearing.

