44 – Wheels, Tires, Wheel alignment

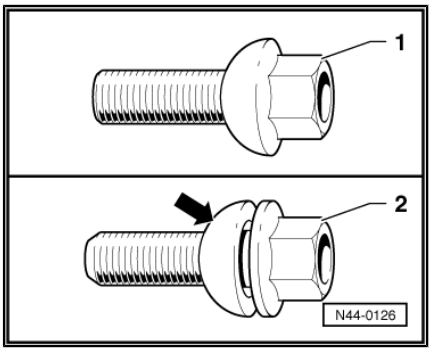
1 Description and Operation

1.1 Modified Wheel Bolts for Vehicles with 111 kW as of MY 2001

As of model year 2001, modified wheel bolts have been introduced for vehicles with 111 kW. The dimensions and tightening torques of the previous and changed wheel bolts are the same.

Changed wheel bolts are not permissible on vehicles which were produced up to m.y. 00.

Wheel rims of vehicles which were produced up to m.y. 00 are not permissible on vehicles as of m.y. 2001.



1. Previous wheel bolt

For vehicles up to m.y. 00.

Surface coated in black.

Part no. -701 601 139 B-

2. Wheel bolt for vehicles with 111 kW as of model year 2001

Collar -arrow- is not tightly connected to the hex head.

Surface is layered in silver.

Part no. -7M3 601 139 B-

Tightening torque:

Wheel bolt to wheel hub for all vehicles	170 Nm

1.2 Vehicle Data Plate, Installation Location Beneath the Cover for Central Electronics

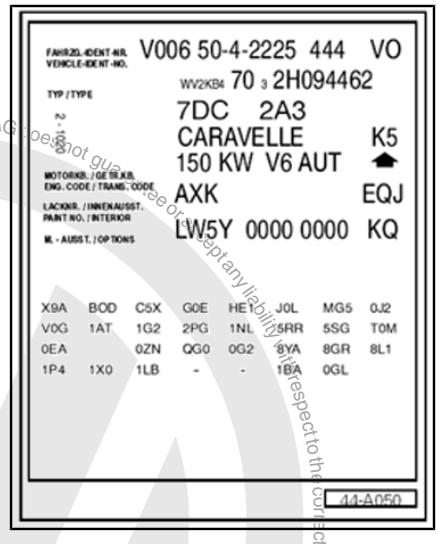
For vehicles with knee bar (USA) version, the vehicle data plate is located beneath the cover for central electronics.

1.3 Group Number on the Vehicle Data Plate, Location

Group numbers 1 - 8 exist at this time.

This number shows to which vehicle group a vehicle belongs.

The word “CARAVELLE” on the vehicle data plate is an example. Another word can also be printed in this location, e.g. “KOM”.

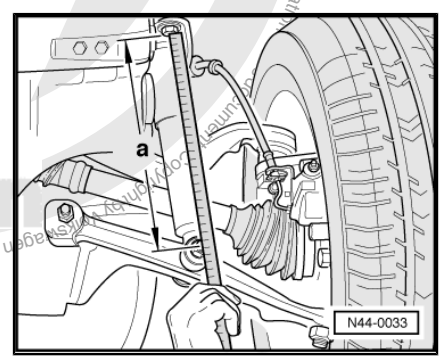


1.4 Standing Height at Front Axle, Measuring and Adjusting

Vehicle must be standing on its wheels.

Measure dimension -a- from bolt head of upper shock absorber mount up to center of bolt of lower shock absorber mount, or adjust prescribed standing height by turning nut at tensioning lever of torsion bar.

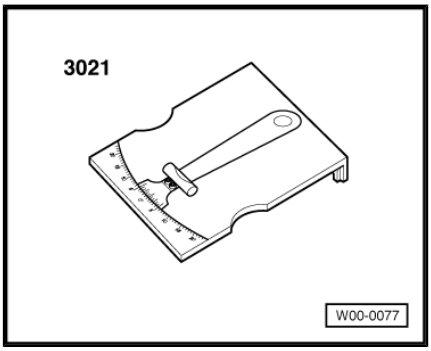
Adjusting torsion bar ⇒ page 21 .



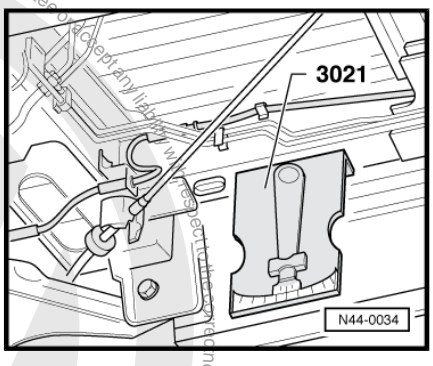
1.5 Vehicle Longitudinal Tilt, Measuring

Special tools and workshop equipment required

- Protractor -3021-



– Measure vehicle longitudinal tilt at longmember.



For determining caster on vehicle tilt at zero, subtract or add measured caster value of vehicle tilt.

Example:

Values measured at wheel alignment tester	1° 10'
Correction value for vehicle tilt (e.g. 1° toward front)	+ 1°
Caster (for zero vehicle tilt)	2° 10'

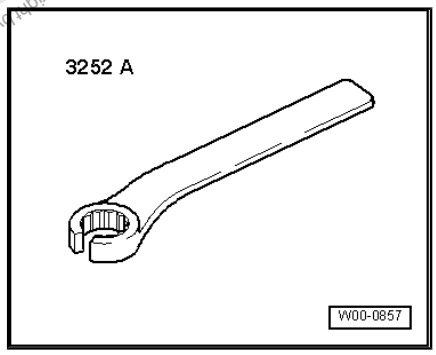
Note

- *Tilt of vehicle toward front: Add correction value.*
- *Tilt of vehicle toward rear: Subtract correction value.*
- *Make sure the surface of the longitudinal member in measuring range is clean and even.*

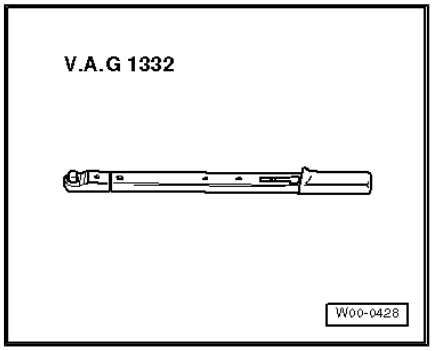
1.6 Camber, Adjusting

Special tools and workshop equipment required

- box wrench 46 mm -3252 A-

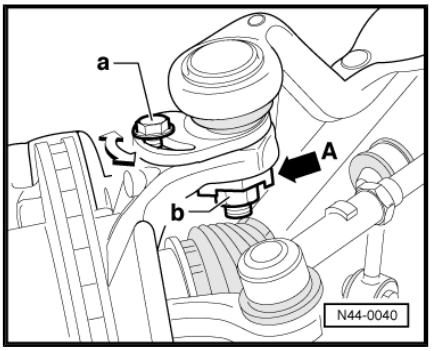


- Torque wrench -V.A.G 1332-



– If necessary, remove right protective panel for horn.

– Loosen bolt -a-.

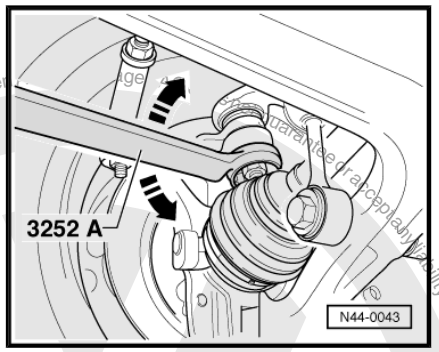


Note

- *For loosening and tightening with the wheel installed, turn steering wheel if necessary.*
- *For the sake of illustration, the figure shows the threaded connection without the wheel.*

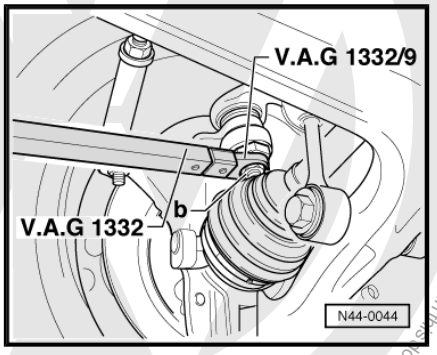
– Loosen nut -b-.

– Adjust eccentric socket until the specified value has been reached using box wrench 46 mm -3252 A- .



– Re-tighten nut -b-.

– Re-tighten bolt -a-, if necessary remove wheel to do so.



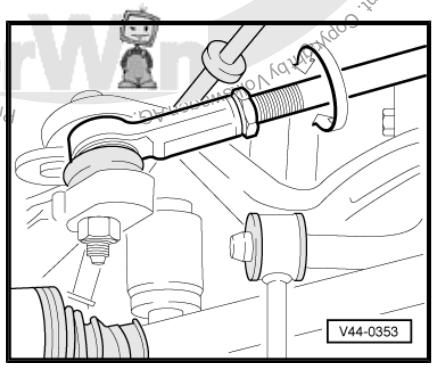
Tightening torques:

Bolt -a-	60 Nm
Nut -b-	110 Nm

1.7 Toe, Adjusting

– Loosen lock nut (bring steering gear into center position before) ⇒ page 104 .

– Adjust both tie rods until the specified value has been reached.



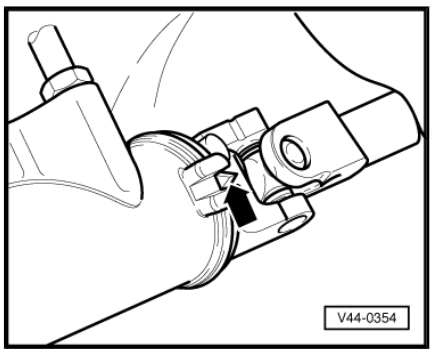
Note

Steering must remain in center position.

– After adjusting the tie rod, make sure the boots did not turn. Twisted boots wear out quickly.

1.8 Steering Gear, Bringing into Center Position

– Bring steering gear into center position. To do so, turn steering wheel from stop to stop and count rotations. Turn steering wheel back half of the rotations. Use tab -arrow- to align steering spindle exactly at rubber disc and notch in housing. Tab and notch must line up.



1.9 Caster, Checking and Adjusting

Checking

Caster must be checked at:

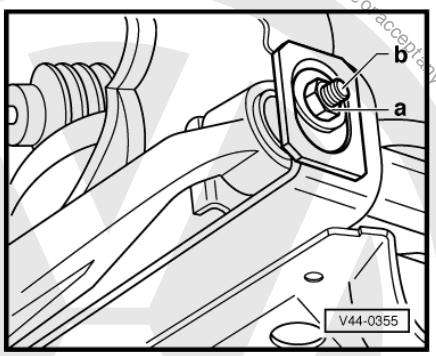
- Steering pulls to one side
- Wobbling of front wheels

Adjusting

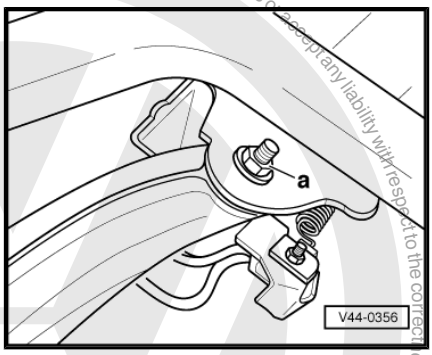
– Loosen nut -a-.

– Adjust eccentric bolt -b- until the specified values has been reached.

– Tighten nut to 160 Nm.



1.10 Rear Axle Toe, Adjusting



– Loosen nut -a- at control arm.

– Slide control arm toward front or rear until the specified value has been reached (vehicle is standing on its wheels).

Note

If toe setting at rear axle must be corrected, the brake pressure regulator adjustment must be checked and brake pressure regulator adjusted ⇒ Brake Systems from MY 1997; Rep. Gr. 47 ; Removal and Installation .

EVC does not have brake pressure regulator

Direction of rotation, calculating

– For toe widths with the same pre-symbol (+/+ or -/-), subtract the smaller value from the larger value and divide by 2.

Toe value left rear wheel	Toe value right rear wheel
+ 15′	+ 5′

15′ - 5′ = 10′
10′ : 2 = 5′

Deviation from the direction of rotation = 5′

– Values with unequal pre-symbol (+/-) are added and the sum is divided by 2.

Toe value left rear wheel	Toe value right rear wheel
+ 15′	- 5′

15′ + 5′ = 20′
20′ : 2 = 10′

Deviation from the direction of rotation = 10′

The appropriate result is the actual deviation of the direction of rotation from the longitudinal axis of the vehicle.

2 Specifications

⇒ “2.1 Wheel Bolts, Tightening Specifications”, page 106

⇒ “2.2 Wheel Alignment, Specified Values for Vehicles up to 04.00”, page 106

⇒ “2.3 Vehicle Alignment, Specified Values for Vehicles from 05.00”, page 110

2.1 Wheel Bolts, Tightening Specifications

Wheel bolt to wheel hub for all vehicles	170 Nm

2.2 Wheel Alignment, Specified Values for Vehicles up to 04.00

⇒ “2.2.1 Vehicle Group 1”, page 106

⇒ “2.2.2 Vehicle Group 2”, page 107

⇒ “2.2.3 Vehicle Group 3”, page 108

⇒ “2.2.5 Vehicle Group 5”, page 109

2.2.1 Vehicle Group 1

Front axle (dual transverse-link suspension)			
Load condition	**empty[85)]**	**1/2 net load[85)]**	**Full load[85)]**
Standing height[83)] front (± 2 mm)	273	260	248
Toe per wheel (wheels not pressed)	+10′ ± 10′	0′ ± 10′	-10′ ± 10′
Overall toe[83)] (wheels not pressed)	+20′ ± 20′	0′ ± 20′	-20′ ± 20′
Camber (in straight-ahead position)	-25′ +20′ / -40′	-40′ +20′ / -40′	-50′ +20′ / -40′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′
Toe-out angle with steering wheel turned 20° to left and right	2° 10′ ± 30′		
Caster (for zero vehicle tilt[84)])	+3° 10′ ± 30′	+3° 20′ ± 30′	+3° 30′ ± 30′
Maximum permissible difference between sides	max. 1°	max. 1°	max. 1°

83) If the standing height must be adjusted, the front axle must be aligned completely. After adjusting the standing height, push vehicle forward and backward approx. two meters and then measure standing height once again. Measure standing height at front ⇒ page 101 .

84) Measure vehicle longitudinal tilt ⇒ page 101 .

85) Load condition at time of vehicle alignment.

Rear axle (trailing link axle)			
Load condition	**empty[86)]**	**1/2 net load[86)]**	**Full load[86)]**
Toe per wheel	+10′ ± 10′	+20′ ± 10′	+30′ ± 10′
Overall toe (at specified camber)	+20′ ± 20′	+40′ ± 20′	60′ ± 20′

Rear axle (trailing link axle)			
Load condition	**empty[86)]**	**1/2 net load[86)]**	**Full load[86)]**
Maximum permissible deviation from the direction of rotation	max. 30 ′	max. 30 ′	max. 30 ′
Camber	-30′ ± 30′	-1° 10′ ± 30′	-1° 35′ ± 30′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′

86) Load condition at time of vehicle alignment.

2.2.2 Vehicle Group 2

Front axle (dual transverse-link suspension)			
Load condition	**empty[89)]**	**1/2 net load[89)]**	**Full load[89)]**
Standing height[87)] front (± 2 mm)	273	260	248
Toe per wheel (wheels not pressed)	+10′ ± 10′	0′ ± 10′	-10′ ± 10′
Overall toe[87)] (wheels not pressed)	+20′ ± 20′	0′ ± 20′	-20′ ± 20′
Camber (in straight-ahead position)	-25′ +20′ / -40′	-40′ +20′ / -40′	-50′ +20′ / -40′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′
Toe-out angle with steering wheel turned 20° to left and right	2° 10′ ± 30′		
After-run (for zero vehicle tilt[88)])	+3° 10′ ± 30′	+3° 20′ ± 30′	+3° 30′ ± 30′
Maximum permissible difference between sides	max. 1°	max. 1°	max. 1°

87) If the standing height must be adjusted, the front axle must be aligned completely. After adjusting the standing height, push vehicle forward and backward approx. two meters and then measure standing height once again. Measure standing height at front ⇒ page 101 .

88) Measure vehicle longitudinal tilt ⇒ page 101 .

89) Load condition at time of vehicle alignment.

Rear axle (trailing link axle)			
Load condition	**empty[90)]**	**1/2 net load[90)]**	**Full load[90)]**
Toe per wheel	+3′ ± 10′	+12′ ± 10′	+20′ ± 10′
Overall toe (at specified camber)	+6′ ± 20′	+24′ ± 20′	+40′ ± 20′
Maximum permissible deviation from the direction of rotation	max. 30 ′	max. 30 ′	max. 30 ′
Camber	0′ ± 30′	-40′ ± 30′	-1° 10′ ± 30′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′

90) Load condition at time of vehicle alignment.

2.2.3 Vehicle Group 3

Front axle (dual transverse-link suspension)			
Load condition	**empty**[93)]	**1/2 net load**[93)]	**Full load**[93)]
Standing height[91)] front (± 2 mm)	265	255	248
Toe per wheel (wheels not pressed)	+5′ ± 10′	0′ ± 10′	-10′ ± 10′
Overall toe[91)] (wheels not pressed)	+10′ ± 20′	0′ ± 20′	-20′ ± 20′
Camber (in straight-ahead position)	-35′ +20′ / -40′	-45′ +20′ / -40′	-50′ +20′ / -40′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′
Toe-out angle with steering wheel turned 20° to left and right	2° 10′ ± 30′		
Caster (for zero vehicle tilt[92)])	+3° 10′ ± 30′	+3° 20′ ± 30′	+3° 30′ ± 30′
Maximum permissible difference between sides	max. 1°	max. 1°	max. 1°

91) If the standing height must be adjusted, the front axle must be aligned completely. After adjusting the standing height, push vehicle forward and backward approx. two meters and then measure standing height once again. Measure standing height at front
⇒ page 101 .

92) Measure vehicle longitudinal tilt ⇒ page 101 .

93) Load condition at time of vehicle alignment.

Rear axle (trailing link axle)			
Load condition	**empty**[94)]	**1/2 net load**[94)]	**Full load**[94)]
Toe per wheel	+10′ ± 10′	+20′ ± 10′	+30′ ± 10′
Overall toe (at specified camber)	+20′ ± 20′	+40′ ± 20′	+60′ ± 20′
Maximum permissible deviation from the direction of rotation	max. 30 ′	max. 30 ′	max. 30 ′
Camber	-30′ ± 30′	-1° 10′ ± 30′	-1° 35′ ± 30′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′

94) Load condition at time of vehicle alignment.

2.2.4 Vehicle Group 4

Front axle (dual transverse-link suspension)			
Load condition	**empty**[97)]	**1/2 net load**[97)]	**Full load**[97)]
Standing height[95)] front (± 2 mm)	257	252	248
Toe per wheel (wheels not pressed)	0′ ± 10′	-5′ ± 10′	-10′ ± 10′
Overall toe[95)] (wheels not pressed)	0′ ± 20′	-10′ ± 20′	-20′ ± 20′
Camber (in straight-ahead position)	-45′ +20′ / -40′	-50′ +20′ / -40′	-55′ +20′ / -40′

Front axle (dual transverse-link suspension)			
Load condition	**empty**[97)]	**1/2 net load**[97)]	**Full load**[97)]
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′
Toe-out angle with steering wheel turned 20° to left and right	2° 10′ ± 30′		
After-run (for zero vehicle tilt[96)])	+3° 10′ ± 30′	+3° 20′ ± 30′	+3° 30′ ± 30′
Maximum permissible difference between sides	max. 1°	max. 1°	max. 1°

95) If the standing height must be adjusted, the front axle must be aligned completely. After adjusting the standing height, push vehicle forward and backward approx. two meters and then measure standing height once again. Measure standing height at front ⇒ page 101 .

96) Measure vehicle longitudinal tilt ⇒ page 101 .

97) Load condition at time of vehicle alignment.

Rear axle (trailing link axle)			
Load condition	**empty**[98)]	**1/2 net load**[98)]	**Full load**[98)]
Toe per wheel	+12′ ± 10′	+22′ ± 10′	+27′ ± 10′
Overall toe (at specified camber)	+24′ ± 20′	+44′ ± 20′	+54′ ± 20′
Maximum permissible deviation from the direction of rotation	max. 30 ′	max. 30 ′	max. 30 ′
Camber	-40′ ± 30′	-1° 10′ ± 30′	-1° 10′ ± 30′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′

98) Load condition at time of vehicle alignment.

2.2.5 Vehicle Group 5

Front axle (dual transverse-link suspension)			
Load condition	**empty**[101)]	**1/2 net load**[101)]	**Full load**[101)]
Standing height[99)] front (± 2 mm)	257	252	248
Toe per wheel (wheels not pressed)	0′ ± 10′	-5′ ± 10′	-10′ ± 10′
Overall toe[99)] (wheels not pressed)	0′ ± 20′	-10′ ± 20′	-20′ ± 20′
Camber (in straight-ahead position)	-1° -40′	-1°5′ -40′	-1°10′ -40′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′
Toe-out angle with steering wheel turned 20° to left and right	2° 10′ ± 30′		
Caster (for zero vehicle tilt[100)])	+3° 10′ ± 30′	+3° 20′ ± 30′	+3° 30′ ± 30′
Maximum permissible difference between sides	max. 1°	max. 1°	max. 1°

99) If the standing height must be adjusted, the front axle must be aligned completely. After adjusting the standing height, push vehicle forward and backward approx. two meters and then measure standing height once again. Measure standing height at front
⇒ page 101 .

100) Measure vehicle longitudinal tilt ⇒ page 101 .

101) Load condition at time of vehicle alignment.

Rear axle (trailing link axle)			
Load condition	**empty**[102)]	**1/2 net load**[102)]	**Full load**[102)]
Toe per wheel	+12′ ± 10′	+22′ ± 10′	+27′ ± 10′
Overall toe (at specified camber)	+24′ ± 20′	+44′ ± 20′	+54′ ± 20′
Maximum permissible deviation from the direction of rotation	max. 30 ′	max. 30 ′	max. 30 ′
Camber	-40′ ± 30′	-1° 10′ ± 30′	-1° 10′ ± 30′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′

102) Load condition at time of vehicle alignment.

2.3 Vehicle Alignment, Specified Values for Vehicles from 05.00

⇒ “2.3.1 Vehicle Groups 1 and 6”, page 110
⇒ “2.3.2 Vehicle Groups 2 and 7”, page 111
⇒ “2.3.3 Vehicle Groups 3 and 8”, page 112
⇒ “2.3.4 Vehicle Groups 4 and 5”, page 113

2.3.1 Vehicle Groups 1 and 6

Front axle (dual transverse-link suspension)			
Load condition	**empty**[105)]	**1/2 net load**[105)]	**Full load**[105)]
Standing height[103)] front (± 2 mm)	273	260	248
Toe per wheel (wheels not pressed)	+10′ ± 10′	0′ ± 10′	-10′ ± 10′
Overall toe[103)] (wheels not pressed)	+20′ ± 20′	0′ ± 20′	-20′ ± 20′
Camber (in straight ahead position) except 111 kW TDI and 150 kW/6 cyl.	-25′ +20′ / -40′	-40′ +20′ / -40′	-50′ +20′ / -40′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′
Camber (in straight ahead position) for 111 kW TDI and 150 kW/6 cyl.	-40′ +0′ / -40′	-55′ +0′ / -40′	-1° 5′ +0′ / -40′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′
Toe-out angle with steering wheel turned 20° to left and right		2° 10′ ± 30′	

Front axle (dual transverse-link suspension)			
Load condition	**empty[105)]**	**1/2 net load[105)]**	**Full load[105)]**
Caster (for zero vehicle tilt[104)])	+3° 10′ ± 30′	+3° 20′ ± 30′	+3° 30′ ± 30′
Maximum permissible difference between sides	max. 1°	max. 1°	max. 1°

103) If the standing height must be adjusted, the front axle must be aligned completely. After adjusting the standing height, push vehicle forward and backward approx. two meters and then measure standing height once again. Measure standing height at front ⇒ page 101 .

104) Measure vehicle longitudinal tilt ⇒ page 101 .

105) Load condition at time of vehicle alignment.

Rear axle (trailing link axle)			
Load condition	**empty[106)]**	**1/2 net load[106)]**	**Full load[106)]**
Toe per wheel	+10′ ± 10′	+20′ ± 10′	+30′ ± 10′
Overall toe (at specified camber)	+20′ ± 20′	+40′ ± 20′	60′ ± 20′
Maximum permissible deviation from the direction of rotation	max. 30 ′	max. 30 ′	max. 30 ′
Camber	-30′ ± 30′	-1° 10′ ± 30′	-1° 35′ ± 30′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′

106) Load condition at time of vehicle alignment.

2.3.2 Vehicle Groups 2 and 7

Front axle (dual transverse-link suspension)			
Load condition	**empty[109)]**	**1/2 net load[109)]**	**Full load[109)]**
Standing height[107)] front (± 2 mm)	273	260	248
Toe per wheel (wheels not pressed)	+10′ ± 10′	0′ ± 10′	-10′ ± 10′
Overall toe[107)] (wheels not pressed)	+20′ ± 20′	0′ ± 20′	-20′ ± 20′
Camber (in straight ahead position) except 111 kW TDI and 150 kW/6 cyl.	-25′ +20′ / -40′	-40′ +20′ / -40′	-50′ +20′ / -40′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′
Camber (in straight ahead position) for 111 kW TDI and 150 kW/6 cyl.	-40′ +0′ / -40′	-55′ +0′ / -40′	-1° 5′ +0′ / -40′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′
Toe-out angle with steering wheel turned 20° to left and right		2° 10′ ± 30′	
Caster (for zero vehicle tilt[108)])	+3° 10′ ± 30′	+3° 20′ ± 30′	+3° 30′ ± 30′

Front axle (dual transverse-link suspension)			
Load condition	**empty**[109)]	**1/2 net load**[109)]	**Full load**[109)]
Maximum permissible difference between sides	max. 1°	max. 1°	max. 1°

107) If the standing height must be adjusted, the front axle must be aligned completely. After adjusting the standing height, push vehicle forward and backward approx. two meters and then measure standing height once again. Measure standing height at front ⇒ page 101 .

108) Measure vehicle longitudinal tilt ⇒ page 101 .

109) Load condition at time of vehicle alignment.

Rear axle (trailing link axle)			
Load condition	**empty**[110)]	**1/2 net load**[110)]	**Full load**[110)]
Toe per wheel	+3′ ± 10′	+12′ ± 10′	+20′ ± 10′
Overall toe (at specified camber)	+6′ ± 20′	+24′ ± 20′	+40′ ± 20′
Maximum permissible deviation from the direction of rotation	max. 30 ′	max. 30 ′	max. 30 ′
Camber	0′ ± 30′	-40′ ± 30′	-1° 10′ ± 30′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′

110) Load condition at time of vehicle alignment.

2.3.3 Vehicle Groups 3 and 8 Eurovan Winnebago Camper (EVC)

Front axle (dual transverse-link suspension)			
Load condition	**empty**[113)]	**1/2 net load**[113)]	**Full load**[113)]
Standing height[111)] front (± 2 mm)	265	255	248
Toe per wheel (wheels not pressed)	+5′ ± 10′ **+0.08 +/- 0.16**	0′ ± 10′	-10′ ± 10′ **-0.16 +/- 0.16**
Overall toe[111)] (wheels not pressed)	+10′ ± 20′ **+0.16 +/- 0.32**	0′ ± 20′	-20′ ± 20′ **-0.32 +/- 0.32**
Camber (in straight-ahead position)	-35′ +20′ / -40′	-45′ +20′ / -40′	-50′ +20′ / -40′
Maximum permissible difference between both sides except 111 kW TDI and 150 kW/6 cyl.	[illegible]	max. 30 ′	max. 30 ′
Camber (in straight ahead position) for 111 kW TDI and 150 kW/6 cyl.	-50′ +0′ / -40′ **-0.83 -0.66**	-1° +0′ / -40′ **-0.66**	-1° 5′ +0′ / -40′ **-1.08 -0.66**
Maximum permissible difference between sides	max. 30 ′ **0.5**	max. 30 ′ **0.5**	max. 30 ′ **0.5**
Toe-out angle with steering wheel turned 20° to left and right	2° 10′ ± 30′ **2.16 +/- 0.5**		
Caster (for zero vehicle tilt[113)])	+3° 10′ ± 30′ **+3.16 +/- 0.5**	+3° 20′ ± 30′ **+3.32 +/- 0.5**	+3° 30′ ± 30′ **+3.5 +/- 0.5**

Front axle (dual transverse-link suspension)			
Load condition	empty[113)]	1/2 net load[113)]	Full load[113)]
Maximum permissible difference between sides	max. 1°	max. 1°	max. 1°

111) If the standing height must be adjusted, the front axle must be aligned completely. After adjusting the standing height, push vehicle forward and backward approx. two meters and then measure standing height once again. Measure standing height at front ⇒ page 101 .

112) Measure vehicle longitudinal tilt ⇒ page 101 .

113) Load condition at time of vehicle alignment.

Rear axle (trailing link axle)			
Load condition	empty[114)]	1/2 net load[114)]	Full load[114)]
Toe per wheel	+10′ ± 10′	+20′ ± 10′	+30′ ± 10′
Overall toe (at specified camber) Maximum permissible deviation from the direction of rotation	+20′ ± 20′ **+0.32 +/- 0.32** max. 30 ′	+40′ ± 20′ **+0.66 +/- 0.32** max. 30 ′	+60′ ± 20′ **+1.0 +/- 0.32** max. 30 ′
Camber Maximum permissible difference between sides	-30′ ± 30′ max. 30 ′	-1° 10′ ± 30′ max. 30 ′	-1° 35′ ± 30′ max. 30 ′

114) Load condition at time of vehicle alignment.

2.3.4 Vehicle Groups 4 and 5

Front axle (dual transverse-link suspension)			
Load condition	empty[117)]	1/2 net load[117)]	Full load[117)]
Standing height[115)] front (± 2 mm)	257	252	248
Toe per wheel (wheels not pressed)	0′ ± 10′	-5′ ± 10′	-10′ ± 10′
Overall toe[115)] (wheels not pressed)	0′ ± 20′	-10′ ± 20′	-20′ ± 20′
Camber (in straight ahead position) except 111 kW TDI and 150 kW/6 cyl. Maximum permissible difference between sides	$-45'^{+20'}/_{-40'}$ max. 30 ′	$-50'^{+20'}/_{-40'}$ max. 30 ′	$-55'^{+20'}/_{-40'}$ max. 30 ′
Camber (in straight ahead position) for 111 kW TDI and 150 kW/6 cyl. Maximum permissible difference between sides	$-1°^{+0'}/_{-40'}$ max. 30 ′	$-1° 5'^{+0'}/_{-40'}$ max. 30 ′	$-1° 10'^{+0'}/_{-40'}$ max. 30 ′
Toe-out angle with steering wheel turned 20° to left and right	2° 10′ ± 30′		
Caster (for zero vehicle tilt [116)]) Maximum permissible difference between sides	+3° 10′ ± 30′ max. 1°	+3° 20′ ± 30′ max. 1°	+3° 30′ ± 30′ max. 1°

115) If the standing height must be adjusted, the front axle must be aligned completely. After adjusting the standing height, push vehicle forward and backward approx. two meters and then measure standing height once again. Measure standing height at front
⇒ page 101 .

116) Measure vehicle longitudinal tilt ⇒ page 101 .

117) Load condition at time of vehicle alignment.

Rear axle (trailing link axle)			
Load condition	**empty**[118)]	**1/2 net load**[118)]	**Full load**[118)]
Toe per wheel	+12′ ± 10′	+22′ ± 10′	+27′ ± 10′
Overall toe (at specified camber)	+24′ ± 20′	+44′ ± 20′	+54′ ± 20′
Maximum permissible deviation from the direction of rotation	max. 30 ′	max. 30 ′	max. 30 ′
Camber	-40′ ± 30′	-1° 10′ ± 30′	-1° 10′ ± 30′
Maximum permissible difference between sides	max. 30 ′	max. 30 ′	max. 30 ′

118) Load condition at time of vehicle alignment.

Degrees = Measurement

0.00 = 0″
0.08 = 1/32″
0.16 = 1/16″
0.24 = 3/32″
0.30 = 1/8″
0.38 = 5/32″
0.46 = 3/16″

3 Diagnosis and Testing

⇒ "3.1 Test Requirements", page 115

3.1 Test Requirements

- Test equipment adjustment according to prescribed regulations
- Tires inflated to correct pressure
- Vehicle accurately aligned, suspension bounced and rocked several times
- Check suspension, steering and steering linkage for excessive play and damage
- Prescribed regulation for standing height of vehicle

Note

- *Specified values for vehicle alignment are split up into 8 groups. The group to which a vehicle belongs is indicated on the vehicle data plate on the A-pillar at the same height as central electronics ⇒ page 100 or on the cover below central electronics for vehicles with 16" suspension.*
- *Standing height and vehicle longitudinal tilt influence the test values. Therefore the standing height and the vehicle longitudinal tilt must be measured or the standing height must be adjusted before checking/adjusting. Measuring and adjusting standing height ⇒ page 101 and measuring vehicle longitudinal tilt ⇒ page 101*
- *The actual load condition at the time of alignment is a deciding factor for the allocation of the specified values (empty, 1/2 net load, full load).*
- *After driving the vehicle onto the alignment stand in a pointed angle, drive vehicle forward and backward several times in order to prevent tension in the bonded rubber bushings.*
- *When making adjustments the relevant specifications must be adhered to as closely as possible.*
- *Wheels should not be aligned until the vehicle has been driven 1,000-2,000 km, since it takes this long to complete the settling procedures.*