

6. Suspension and steering

60 Wheel alignment

Specifications

Wheel alignment

Always check the wheel setting with the car unloaded.

Front adjustment values. Applies to model years: 1996 — 2000

Wheel alignment:	Check and adjust the values:	
	Front	
	-1997	1998-2000
King pin inclination (KPI) ¹	12.68°±1° 12° 41' ±1° ²	12.68°±1° 12° 41' ±1° ²
Caster ¹	2.2°±1° 2° 12' ± 1° ²	3.2°±1° 3° 12' ± 1° ²
Camber ¹	0° ± 1°	0° ± 1°
Toe-in per wheel	0.15°±0.05° 9' ± 3' ²	0.15°±0.05° 9' ± 3' ²

¹ Maximum permitted difference between the left and right wheels is 0.68° or 40'.

² Shows the angle in degrees, minutes and seconds.

Front adjustment values. Applies to model years: 2001–

Wheel alignment:	Check and adjust the values:			
	2001- Excl Japan/Sport	Japan USA 2002-	Sport	OCC (Over seas comfort chassis)
King pin inclination (KPI) ¹	13.68°±1° 13° 41' ±1° ²	13.68°±1° 13° 41' ±1° ²	14.07°±1° 14°4'±1° ²	13.26°±1° 13°15'±1° ²
Caster ¹	4° ± 1° 4° ± 1° ² A	4° ± 1° 4° ± 1° ²	4.15°±1° 4°9'±1° ²	3.86°±1° 3°51'±1° ²
Camber ¹	-0.16° ± 0.5° -10' ± 30' ²	-0.16° ± 0.5° -10' ± 30' ²	-0.33°±0.5° -20' ± 30' ²	-0.07°±0.5° -4' ± 30' ²
Toe-in per wheel	0.15°±0.05° 9' ± 3' ²	0.08°±0.05° 5' ± 3' ²	0.15°±0.05° 9' ± 3' ²	0.15°±0.05° 9' ± 3' ²

¹ Maximum permitted difference between the left and right wheels is 0.68° or 40'.

² Shows the angle in degrees, minutes and seconds.

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Rear adjustment values. Applies to model years: 1996–

Wheel alignment	1996-	Sport susp. 1998-	Sport/Dynamic with nivomat
Camber	$-0.67^{\circ} \pm 0.25^{\circ 1}$ $-40' \pm 15'^{21}$	$-0.90^{\circ} \pm 0.25^{\circ 1}$ $-54' \pm 15'^{21}$	$-1.16^{\circ} \pm 0.25^{\circ 1}$ $-1^{\circ} 10' \pm 15'^{21}$
Toe in	$0.15^{\circ} \pm 0.05^{\circ}$ $9' \pm 3'^2$	$0.15^{\circ} \pm 0.05^{\circ}$ $9' \pm 3'^2$	$0.15^{\circ} \pm 0.05^{\circ}$ $9' \pm 3'^2$
Thrust angle	$0^{\circ} \pm 0.05$ $0^{\circ} \pm 3'^2$	$0^{\circ} \pm 0.05$ $0^{\circ} \pm 3'^2$	$0^{\circ} \pm 0.05$ $0^{\circ} \pm 3'^2$

¹ Measure and adjust the camber before the toe-in is adjusted (rear side).

² Shows the angle in degrees, minutes and seconds.

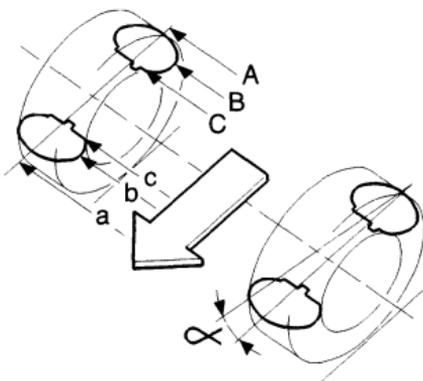
Adjust the wheel alignment to the given values if the measured values are outside the tolerances.

See more detailed information in VADIS, function group 60.

Camber angle

Note! It is important to slacken off the adjustment screw because this affects the camber angle.

Settings for the toe-in



Measure the difference between the front and rear edges of the wheels through A-a, B-b or C-c.

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The settings apply for model years: 1996 — 2000

Toe in:	∞ per wheel ¹	A-a	B-b	C-c
Front axle	$0.15 \pm 0.05^{\circ}$ $9' \pm 3'^2$	2 - 4 mm	1.7 - 3.4 mm	1.4 - 2.8 mm
Rear axle ³	$0.15 \pm 0.05^{\circ}$ $9' \pm 3'^2$	2 - 4 mm	1.7 - 3.4 mm	1.4 - 2.8 mm

¹ ∞ is the toe-in value in degrees per wheel.

² Shows the angle in degrees, minutes and seconds

³ Set the camber first. **The settings for the left and right wheels must be the same.**

The settings apply for model years: 2001–

Toe in:	∞ per wheel ¹	A-a	B-b	C-c
Front axle Japan. USA 2002-	$0.08^\circ \pm 0.05^\circ$ $5' \pm 3''$ ²	0.6 - 2.6 mm	0.4 - 2.0 mm	0.2 - 1.4 mm
Front axle Excl Japan. USA 2002-	$0.15^\circ \pm 0.05^\circ$ $9' \pm 3''$ ²	2 - 4 mm	1.7 - 3.4 mm	1.4 - 2.8 mm
Front axle 17" Wheel	$0.15^\circ \pm 0.05^\circ$ $9' \pm 3''$ ²	2.2 - 4.0 mm	1.9 - 3.3 mm	1.7 - 3.2 mm
Rear axle ³	$0.15^\circ \pm 0.05^\circ$ $9' \pm 3''$ ²	2.0 - 4.0 mm	1.7 - 3.4 mm	1.4 - 3.8 mm
Rear axle ³ 17" Wheel	$0.15^\circ \pm 0.05^\circ$ $9' \pm 3''$ ²	2.2 - 4.0 mm	1.9 - 3.3 mm	1.7 - 3.2 mm

¹ ∞ is the toe-in value in degrees per wheel.

² Shows the angle in degrees, minutes and seconds

³ Set the camber first. **The settings for the left and right wheels must be the same.**

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Tolerances

Ball joints / stub axle:		
Maximum permitted clearance	Axially	0.5 mm
.....	Radially	0.5 mm
Ball joint torque when turning		1.0-3.0 Nm

Model year 2001–.

Specification according to "G" chassis code, 6 characters.

Chassis code has 6 positions as follows: 2001–

Position 1+2: Specification of the front spring and front shock absorber	
Comfort:	2A, 3A, 4A, 5A, 6A
Dynamic:	2B, 3B, 4B
Sport:	2C, 3C, 4C, 5C
OCC ¹ :	2D, 3D, 4D, 5D, 6D
Position 3: Dimension of the front stabiliser	
Comfort, Dynamic, Sport:	V (Ø19 mm)
OCC ¹ :	W (Ø17 mm)
Position 4+5: Specification of the rear spring and rear shock absorber	
Comfort:	1A, 2A, 3A, 4A
Dynamic	1B, 2B, 3B
Comfort OCC ¹	1C, 2C, 3C
Comfort nivomat	1D, 2D
Sport nivomat	1E, 2E
Dynamic nivomat	1F, 2F
Position 6: Dimension of the rear stabiliser	
Sport, Dynamic	X (Ø16 mm)
Dynamic nivomat	Y (Ø15 mm)
Comfort, Comfort nivomat, OCC ¹	Z (Ø13 mm)

¹ Overseas Comfort Chassis

Front Stabiliser

Installed type:	mm	Chassis code position 3 (2001-)	Colour
Front stabiliser, diameter	19 mm	V 2001- -2000	Brown Blue
Front stabiliser, OCC, heavy duty, diameter ...	17 mm	W 2001- -2000	Blue Yellow

Shock absorber, front 1996-1999

Identification:	Family -1997	Comfort 1998-1999	Dynamic 1998-1999	Sport -1997	Sport 1998-1999
Setting no.	F40	F42/F93	F62/F63	F50	F52/F53
Colour -2000	yellow/grey	yellow/grey	yellow/brown	yellow/pink	yellow/pink

Shock absorber, front 2000-

Identification:	Heavy duty 2000-	Comfort 2000	Comfort 2001-	Sport 2000	Sport 2001
Setting no.	F42	F93	F95	F53	F55

Shock absorber, front 2000-

Identification:	OCC ¹ 2000-	USA 2000	Dynamic 2000	Dynamic 2001-
Setting no.	F42	F93	F63	F65

¹ Over Seas Comfort Chassis

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Front coil springs

-2001: The front coil springs are colour coded.

The location of the colour bands on the coil springs provide the following information:

The first colour marking is on the second coil and indicates the stiffness of the spring (see the table below).

The second colour marking indicates the length of the spring (see the table below).

From model year 2001- specification according to chassis code, 6 character. For more information see "G" product plate .

Front coil spring, marking

	Family -1997	Sport -1997
Colour code	brown-green	green-grey or yellow-grey
Colour code	brown - grey	green- light blue or yellow - light blue
Colour code	brown - light blue	green - orange or yellow - orange
Colour code	brown-orange	-

Front coil spring, marking

	Comfort 1998-	Chassis code position 1-2 (2001-) Comfort	Dynamic 1998-	Chassis code position 1-2 (2001-) Dynamic	Sport 1998-	Chassis code position 1-2 (2001-) Sport
Colour code	brown-green	2A	green - yellow or yellow - green	(98-99)	white - grey	2C
Colour code	brown - grey	3A	green-grey or yellow-grey	2B	white-light blue	3C
Colour code	brown - light blue	4A	green-light blue or yellow - light blue	3B	white - orange	4C
Colour code	brown-orange	5A	green - orange or yellow - orange	4B	white - yellow	5C
Colour code	brown - yellow	6A	green - yellow or yellow-yellow	(99-00)	-	

Front coil spring, marking

	OCC 2000-	Chassis code position 1-2 (2001-)	Comfort USA 2000	Heavy Duty 2000
Colour code	brown-green	2D	lilac-yellow	lilac-grey
Colour code	brown - grey	3D	-	lilac-light blue
Colour code	brown - light blue	4D	-	lilac-orange
Colour code	brown-orange	5D	-	lilac-yellow
Colour code	brown - yellow	6D		

Tightening torques

Mechanical component:	Nm
Nut, front fixation lower arm to cross member: ¹	
-Stage 1	90
-Stage 2	Tighten 60°
Nut, lower arm front ball joint to knuckle:	
-Stage 1	40
-Stage 2	Tighten 180°
Screws, cross member	90
Nut, front shock absorber piston rod	65
Nuts, link rod	50
Nuts, top mont front shock absorber to bodywork (3 nuts)	40
Installed screws, shock absorber to knuckle	90
Screws, stabiliser mounting on cross member	25
Centre nut drive shaft: -2000	
Stage 1	120
Stage 2	Tighten 60°
Centre nut drive shaft: 2001-	
Stage 1	180
Stage 2	Tighten 30°

¹ Unloaded, bounce the car up and down a couple of times before tightening.

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Specifications

Power steering, lubricant

Lubrication:	
Oil type:	Pentosin CHF11S
Power steering fluid	Volvo power steering oil P/N: 11 61 529-1
Approximate capacity	1.0 litre
Grease:	
Grease	Volvo Grease P/N: 11 61 669
Approximate amount	100 g

Steering gear

Servo, steering housing:		
Manufacturer		SMI
Number of turns lock to lock	-1997	3.11
Number of turns lock to lock	1998-	2.91
Number of turns lock to lock	215/45 R 17	2.78
Balance in the steering system (active at 1.2 MPa)	Nm	2.8 - 4.0
Maximum difference between right and left turns	Nm	0.7
Torque, pinion shaft (mechanical)	Nm	0.6 - 1.4
Turning circle	m	10.6
Turning circle	215/45 R 17 m	11.2

Power steering pump:					
Type	Saginaw	Kayaba	ZF		
Drive	Mechanical belt drive				
Type of power steering oil	Volvo power steering oil as above				
Maximum pump pressure	MPa	9.6	9.8	11.0	
Measuring point for balance pressure check	MPa	1.2	1.2	1.2	
Oil pressure switch	On / Off	MPa	-	1.8-2.4	-

Pulley

Position on shaft:		
Diesel engines D4192TX	mm	55.5 ± 0.1
Petrol engines, except B4184SM/SJ		Level with shaft end

Tightening torques

Mechanical component:	All models Except B4184SM/SJ	B4184SM B4184SJ
	Nm	Nm
Screw, pipe mounting on cross member	25	25
Nut, pressure block ¹	15	15
Lock nut, track rod end	50	50
Domed nut, steering column adjustment mechanism ..	8	8
Airbag on the steering wheel	10	10
Steering column mounting screws	25	25
Screw, steering shaft / pinion shaft	17	17
Steering wheel lock nut	43	43
Screws, pinion shaft housing	20	20
Ball joint, track rod, stub axle	24	24
Track rod to steering rack	88	88
High pressure pipe on steering housing	13	13
Control valve in pump housing	75	75
Banjo screw, high pressure pipe to the hydraulic pump	26	17
High pressure pipe to steering pump	19	17
Hydraulic pump mounting screws Petrol	25	45
Diesel	42.5	-
Screws, steering housing to cross member	80	80
Jointed connection pipe to steering housing (Return) ..	15	15
Connecting nuts, hoses on steering housing	15	15
Screw, pinion shaft boot on bodywork	10	10
Screw, heat shield on steering housing	10	10
Non-return valve on steering housing	25	25
Screws, pulley on pump (diesel)	11	-
Pressure switch	-	17
Screws, housing	-	23
Nut, track rod ball joint	24	24

¹ Turn back 30-60°.

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Specifications

Specification according to "G" chassis code.

Chassis code has 6 positions as follows: 2001–

Position 1+2: Specification of the front spring and front shock absorber	
Comfort:	2A, 3A, 4A, 5A, 6A
Dynamic:	2B, 3B, 4B
Sport:	2C, 3C, 4C, 5C
OCC ¹ :	2D, 3D, 4D, 5D, 6D
Position 3: Dimension of the front stabiliser	
Comfort, Dynamic, Sport:	V (Ø19 mm)
OCC ¹ :	W (Ø17 mm)
Position 4+5: Specification of the rear spring and rear shock absorber	
Comfort:	1A, 2A, 3A, 4A
Dynamic	1B, 2B, 3B
Comfort OCC ¹	1C, 2C, 3C
Comfort nivomat	1D, 2D
Sport nivomat	1E, 2E
Dynamic nivomat	1F, 2F
Position 6: Dimension of the rear stabiliser	
Sport, Dynamic	X (Ø16 mm)
Dynamic nivomat	Y (Ø15 mm)
Comfort, Comfort nivomat, OCC ¹	Z (Ø13 mm)

¹ Overseas Comfort Chassis

Rear anti-roll bar

Installed type:	Family -1997	Comfort, OCC ¹ 98-00	Comfort, OCC ¹ 2001-	Dynamic 1998- 2000
Rear stabiliser, diameter mm	13	13	13	15
Chassis code position 6 (2001-)	–	–	Z	–
Colour code 2001-	White	White	White	White

¹ Over Seas Comfort Chassis

Rear anti-roll bar

Installed type:	Sport -1997	Sport 1998-2000	Dynamic/ Sport without nivomat 2001-	Dynamic nivomat 2001-
Rear stabiliser, diameter mm	15	16	16	15
Chassis code position 6 (2001-)	-	-	X	Y
Colour code 2001-	-	-	Orange	Brown

Rear suspension, shock absorber

Type:	Family -1997	Comfort 1998-1999	Dynamic 1998 -1999	Sport 1997-1998	Sport 1998- 1999
Setting number	R40	R40	R40	R50	R52
Colour -2000	grey	grey	grey	pink	pink

From model year 2001- all sport suspension have Nivomat as standard.

Rear suspension, shock absorber

Type:	Comfort 2000	Dynamic 2000	Dynamic 2001-
Setting number	R73	R73	R65
Chassis code position 4-5	-	-	1B, 2B, 3B

Rear suspension, shock absorber

Type:	Heavy Duty 2000 ¹	Comfort USA 2000 ¹	OCC ¹ 2001	Comfort 2001
Setting number	R146F	R93	R196F	R95
Chassis code position 4-5			1C, 2C, 3C	1A, 2A, 3A, 4A

¹ No nivomat USA, Heavy duty

Shock absorber, rear, Nivomat -2000

Type:	Family -1997 Comfort 1998-2000 Dynamic 1998-2000	Sport -1998	Sport 1999-2000	Sport 2000
Setting number	NH4	NH9	NH10	NH11
S40, 4-door Colour	grey/green	pink/green	yellow / orange	yellow / orange
V40, 5-door Colour	grey/blue	pink/blue	yellow/pink	yellow / pink

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Shock absorber, rear, Nivomat 2001–

Type:	Sport 2001- ¹	Chassis code position 4-5	Dynamic 2001-	Chassis code position 4-5	Comfort 2001-	Chassis code position 4-5
Setting number	NHS23		NHD18		NHC22	
S40, 4-door Colour 2000-	brown- orange	1E	pink/green	1F	white- lilac	1D
V40, 5-door Colour 2000-	brown-pink	2E	pink/blue	2F	white- yellow	2D

¹ Sport 2001- 100 % nivomat
OCC and USA no nivomat.

Rear coil springs

The rear coil springs are colour coded.

The location of the colour bands on the coil springs provide the following information:

The first colour marking is on the fifth coil and indicates the stiffness of the spring (see the table below).

The second colour marking indicates the length of the spring (see the table below).

Rear coil spring, standard

Family -1997	Comfort 1998	Dynamic 1998-	Chassis code 2001– position4-5	Sport -1997	Sport 98-99
grey-green	grey-brown 1998- 1999	brown-brown 1989- 1999		brown-green	green-green
grey-lilac	grey-green	brown-green 1989- 1999		brown-lilac	green-lilac
grey-pink or red	grey-lilac	brown-lilac 2000	1B	brown - pink or red	green-red
	grey-red	brown-red 2000			green-yellow
		brown-yellow 2B			
		brown-white 3B			

Rear coil spring, standard

Heavy duty	OCC 2001 ¹	Chassis code 2001– position 4-5	Comfort 2001-	Chassis code 2001– position 4-5	Comfort USA 2000
lilac-red	red-red	1C	red-lilac	1A	red-lilac
lilac-yellow	red-yellow	2C	red-red	2A	red-red
	red white	3C	red-yellow	3A	red-yellow
			red white	4A	

Rear coil spring, Nivomat

Type:	Other ¹	Chassis code 2001– position 4-5	Sport 2000- ²	Chassis code 2001– position 4-5	Comfort 2001	Chassis code 2001– position 4-5
S40, 4-door	–	1F	orange	1E	lilac	1D
V40, 5-door	blue	2F	pink	2E	yellow	2D

¹ OCC no nivomat.

² From 2001- Sport has only nivomat

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Specifications

Tightening torques

Mechanical component:	Nm
Screws, trailing arm to bodywork	90 ¹
Screws, rear dust cover / ABS sensor	55
Hub, lock nut	175
Screws, lower shock absorber	90 ¹
Nut, shock absorber piston rod	Standard
Nut, shock absorber piston rod	Nivomat
Nut, shock absorber, body	50
Nuts, link rod to stabiliser	50 ²
Screws, stabiliser to mounting	25
Screw, upper link to the trailing arm	90 ¹
Screw, wheel arm to the bodywork (adjustment):	
without flange nut	80 ¹
with flange nut	90 ¹
Screw, wheel arm to the trailing arm	90 ¹
Screw, upper link to the bodywork	35
Screws, to the link arm control link/ trailing arm	35
Screw, toe-in adjustment arm to the bodywork (adjustment) without flange nut, control link to body	80 ¹
Screw, toe-in adjustment arm to the bodywork (adjustment) with flange nut, control link to body	90 ¹
Nut, stabiliser on the lower wheel arm	45
Screws, anti-roll bar mountings on bodywork	35

¹ Unloaded. Bounce the car up and down a couple of times before adjustment.

² Tighten so that 3-5mm of the thread is visible, if the link with the threaded end is installed.