CONTENTS

0

1. CHASSIS

1.1 GENERAL

Chassis materials

Type (wheel base)	Design	Material
FT	Side member thickness 7 mm	KF 500 (1)
	Side member thickness 6 mm	KF 600 (1)
FTD	n/a	KF 375
FTG	n/a	KF 500 (1)
FTM	n/a	KF 375
FTP	n/a	KF 500 (1)
FTR	Side member height 310 mm	KF 375
	Side member height 260 mm	KF 500 (1)
FTS	Side member height 310 mm	KF 375
	Side member height 260 mm	KF 500 (1)
FTT	Side member height 310 mm	KF 375
	Side member height 260 mm	KF 500 (1)
FA	n/a	KF 375
FAC	n/a	KF 375
FAD	Side member height 310 mm, side member thickness 7 and 8.5 mm	KF 375
	Side member height 310 mm, side member thickness 6 mm	KF 600 (1)
	Side member height 260 mm	KF 500 (1)
FAK	n/a	KF 375
FAR	n/a	KF 375
FAS	n/a	
FAT	Side member height 310 mm, side member thickness 7 and 8.5 mm	KF 375
	Side member height 310 mm, side member thickness 6 mm	KF 600 (1)
	Side member height 260 mm	KF 500 (1)

Note:
1. KF 500 and KF 600 are “High Tensile Strength” types of steel.

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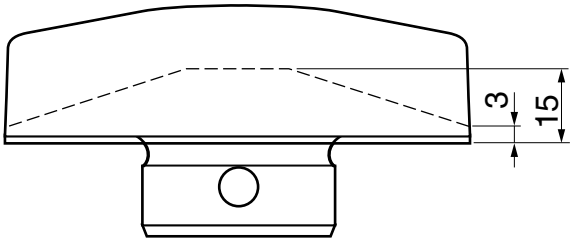
2. STABILISERS, TORQUE RODS AND LEAF SUSPENSION

2.1 GENERAL

Minimum dimensions of wearing plates
If one of the dimensions of the wearing plates, on which the spring assembly rests, is smaller than indicated by the dotted line in the opposite drawing, the wearing plates must be replaced.



W9 00 013

Alignment plate/tandem axle spring clearance
If applicable, the clearance between the alignment plate and the tandem axle spring is: 1.5 - 2.5 mm.

Overview of oversized wear rings
In order to correct the clearance which can arise in the front-axle suspension between the side of the leaf spring and the spring bracket, the following oversized wear rings can be ordered:

DAF part number	Wear ring thickness
1314278	3.5 mm
1314279	4.0 mm
1314280	4.5 mm
1314281	5.0 mm
1314282	5.5 mm

2.2 TIGHTENING TORQUES

The tightening torques stated in this paragraph are different from the standard tightening torques stated in the overview of the standard tightening torques. The other threaded connections which are not stated must therefore be tightened to the tightening torque stated in the overview of standard tightening torques.

When attachment bolts and nuts are to be replaced, it is important that these bolts and nuts are of exactly the same length and property class as the ones removed - unless stated otherwise.

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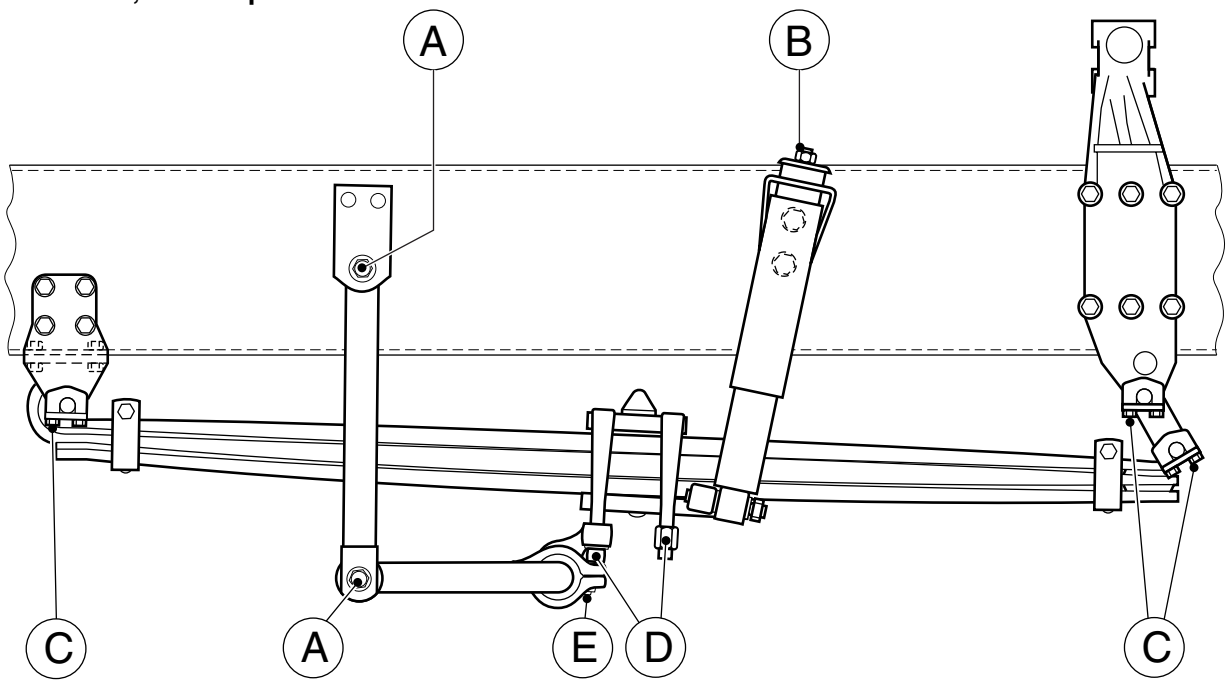
Front axle, leaf suspension

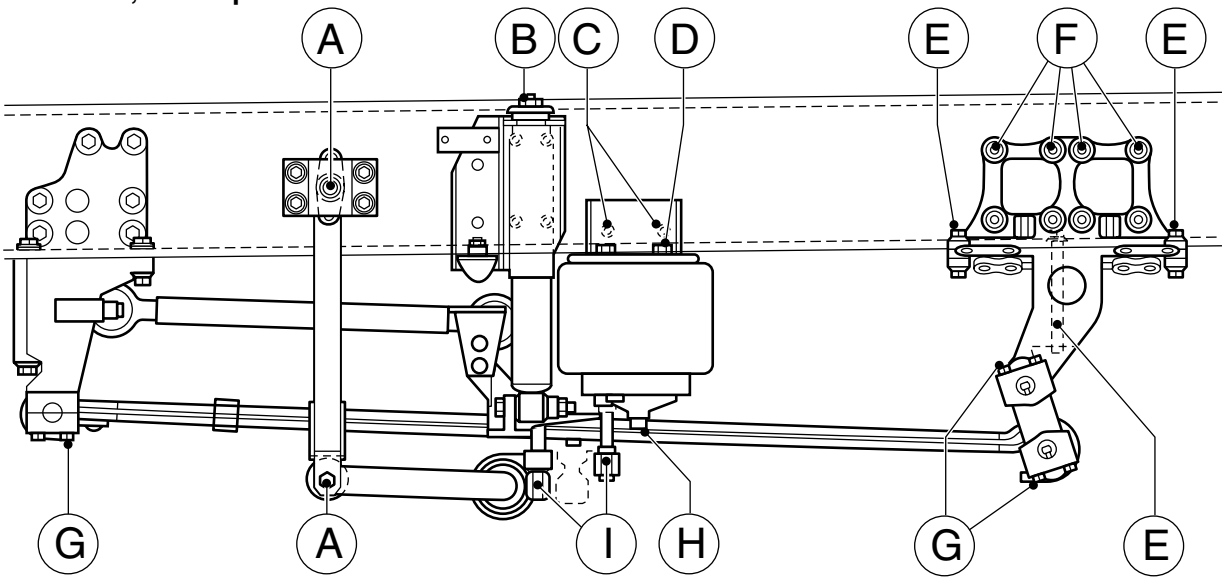


C9 00 468

A	Attachment bolt/nut M16 for stabiliser/shackle, property class 10.9/10	260 ± 20 Nm
B	Self-locking nut M16 for shock absorber	65 Nm
C	Spring locking plate attachment bolt	
	- if M10, property class 8.8/8	46 ± 4 Nm
	- if M10, property class 10.9/10	60 ± 4 Nm
D	U-bolt nut	
	- if yellow high hexagonal nut M22 with yellow washer	480 ± 40 Nm(1)
	- if flange nut M22	700 ± 50 Nm(2)
E	Attachment bolt/nut M12 for silentbloc bracket, property class 10.9/10	110 ± 8 Nm

Notes:
1. The high hexagonal nut can be recognised by its height being 1.5 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.
2. Evenly tighten the two U-bolt nuts alternately.

Front axle, air suspension

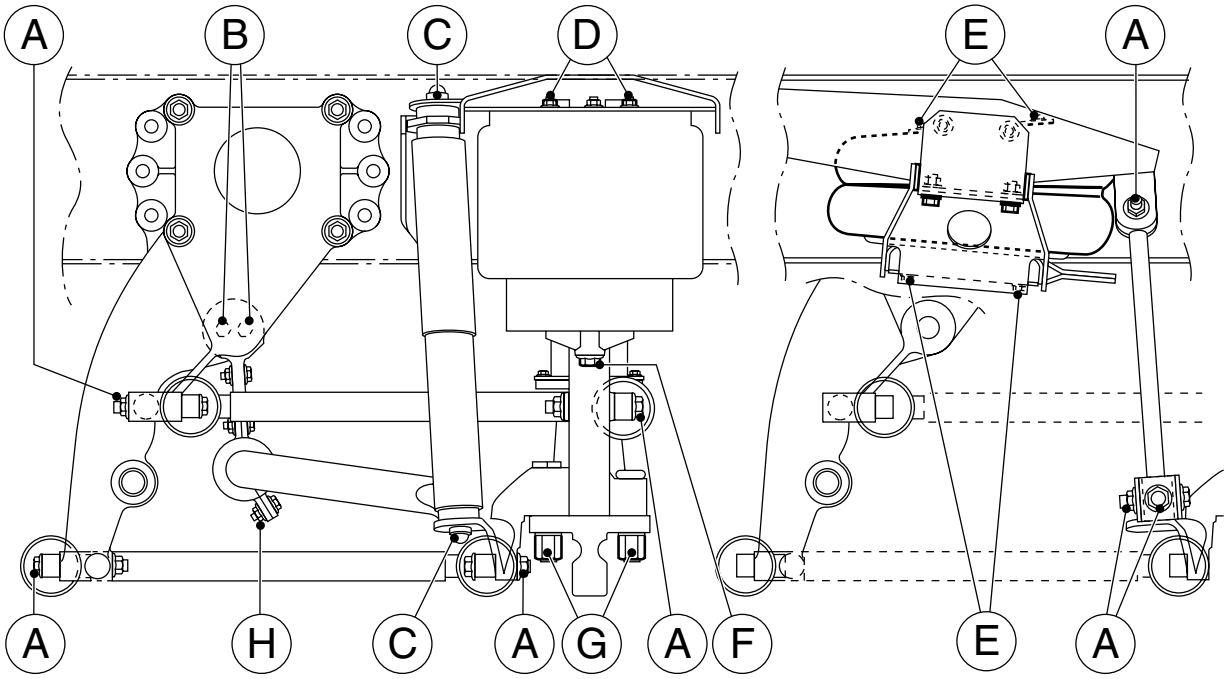


A	Attachment bolt/nut M16 for stabiliser/shackle, property class 10.9/10	260 ± 20 Nm
B	Self-locking nut M16 for shock absorber	65 Nm
C	Attachment bolt/nut M12 for air bellows bracket, property class 10.9/10	110 ± 8 Nm
D	Attachment nut M10 for air bellows, property class 8.8 or 10	46 Nm(1)
E	Attachment bolt/nut M16 for spring bracket, property class 10.9/10	260 ± 20 Nm
F	Attachment bolt/nut M14 for spring bracket, property class 10.9/10	170 ± 15 Nm
G	Spring locking plate attachment bolt	60 ± 4 Nm
	- if M10, property class 8.8/8	46 ± 4 Nm
	- if M10, property class 10.9/10	60 ± 4 Nm
H	Attachment bolt M16 for air bellows, property class 8.8 or 10.9	195 Nm(1)
I	U-bolt nut	
	- if black high hexagonal nut M22 with yellow washer	555 ± 45 Nm(2)
	- if flange nut M22	700 ± 50 Nm(3)
	- if yellow zinc-plated hexagonal nut M22, property class 10 with black washer	530 ± 40 Nm(4)

0

Notes:
1. Air bellows must be tightened on the chassis side first.
2. The high hexagonal nut can be recognised by its height being 1.5 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.
3. Evenly tighten the two U-bolt nuts alternately.
4. The yellow zinc-plated hexagonal nut can be recognised by its height being 1 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.

Leading rear axle, FAG, FAK, FTG and FTM version



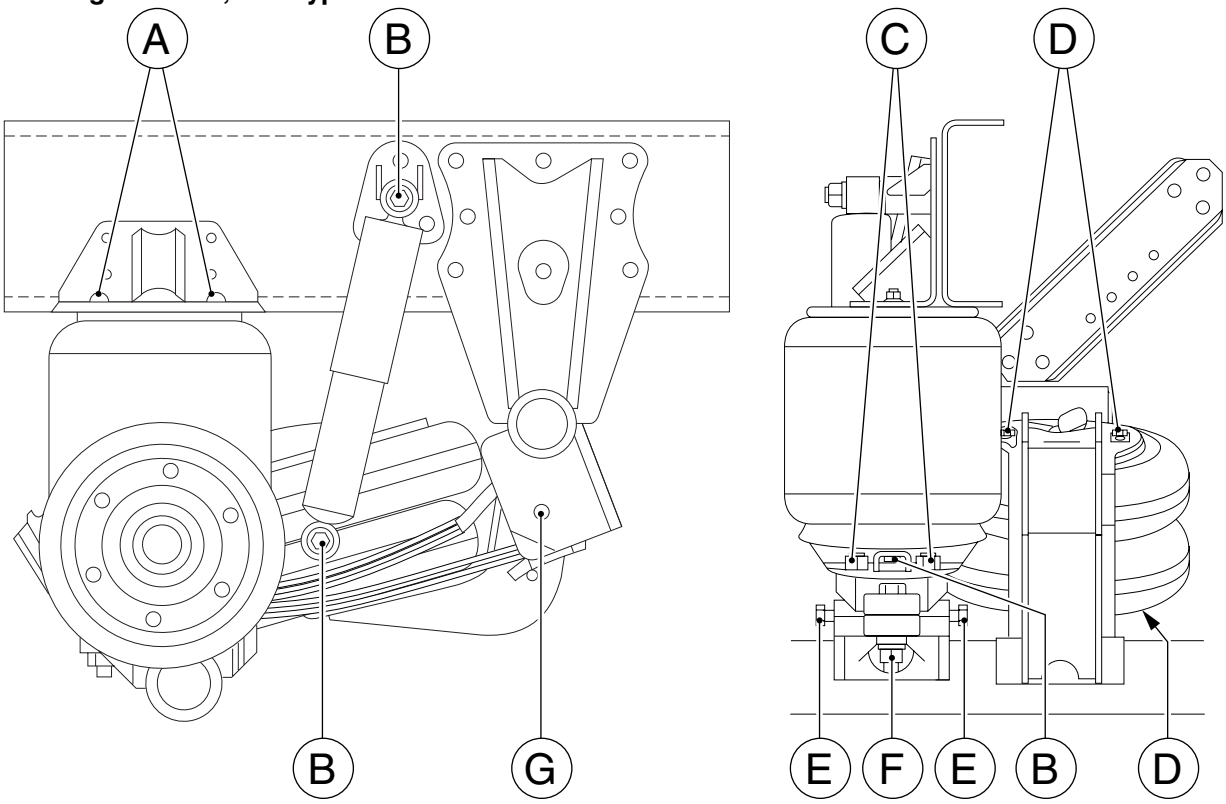
C9 00 417

A	Attachment bolt/nut M16 for torque rod bracket, property class 10.9/10	260 ± 20 Nm
B	Locking bolt M8 for stabiliser bar shackle, property class 10.9	30 ± 2 Nm
C	Self-locking nut M16 for shock absorber	65 Nm
D	Attachment nut M10 for air bellows, property class 8.8 or 10.9	46 Nm(1)
E	Attachment bolt M8 for lifting bellows, property class 10.9	20 ± 3 Nm
F	Attachment bolt M16 for air bellows, property class 8.8 or 10.9	195 Nm(1)
G	U-bolt nut	
	- if black high hexagonal nut M22 with yellow washer	555 ± 45 Nm(2)
	- if flange nut M22	700 ± 50 Nm(3)
	- if yellow zinc-plated hexagonal nut M22, property class 10 with black washer	530 ± 40 Nm(4)
H	Attachment bolt/nut for stabiliser bracket	
	- if M14, property class 10.9/10	170 ± 15 Nm
	- if M16, property class 10.9/10	260 ± 20 Nm

0

Notes:
1. Air bellows must be tightened on the chassis side first.
2. The high hexagonal nut can be recognised by its height being 1.5 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.
3. Evenly tighten the two U-bolt nuts alternately.
4. The yellow zinc-plated hexagonal nut can be recognised by its height being 1 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.

Leading rear axle, FTP type vehicles version



C9 00 405

A	Attachment nut M12 for air bellows	34 Nm
	Attachment nut M22 for air bellows	67 Nm
B	Attachment bolt/nut M12 for shock absorber attachment	395 Nm
C	Attachment nut M20 for axle	640 Nm(1)
D	Attachment bolt M12 for air bellows	67 Nm
E	Attachment bolt M16 for leaf spring	100 Nm
F	Attachment bolt/nut M20 for leaf spring	553 Nm
G	Attachment bolt/nut M24 for leaf spring	830 Nm

Note:
1. Evenly tighten the two nuts alternately.

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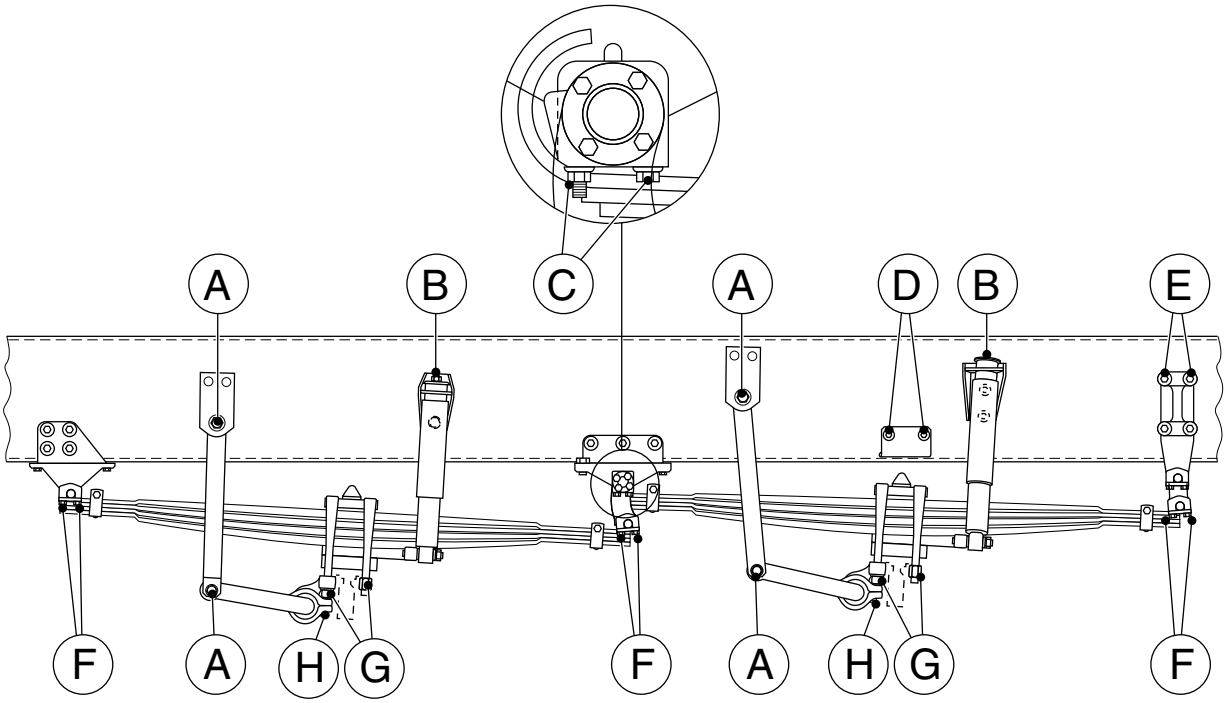
Dual front axle



C9 00 418

A	Attachment bolt/nut M16 for stabiliser/shackle, property class 10.9/10	260 ± 20 Nm
B	Self-locking nut M16 for shock absorber	65 Nm
C	Attachment bolt/nut for spring attachment	
	- if M10, property class 8.8/8	46 ± 4 Nm
	- if M10, property class 10.9/10	60 ± 4 Nm
D	Attachment bolt/nut M16 for stop plate of bump stop, property class 10.9/10	260 ± 20 Nm
E	Attachment bolt/nut M16 for spring bracket, property class 10.9/10	260 ± 20 Nm
F	Spring locking plate attachment bolt	60 ± 4 Nm
	- if M10, property class 8.8/8	46 ± 4 Nm
	- if M10, property class 10.9/10	60 ± 4 Nm
G	U-bolt nut	
	- if yellow high hexagonal nut M22 with yellow washer	480 ± 40 Nm(1)
	- if flange nut M22	700 ± 50 Nm(2)
H	Attachment bolt/nut M12 for silentbloc bracket, property class 10.9/10	110 ± 8 Nm

Notes:
1. The high hexagonal nut can be recognised by its height being 1.5 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.
2. Evenly tighten the two U-bolt nuts alternately.

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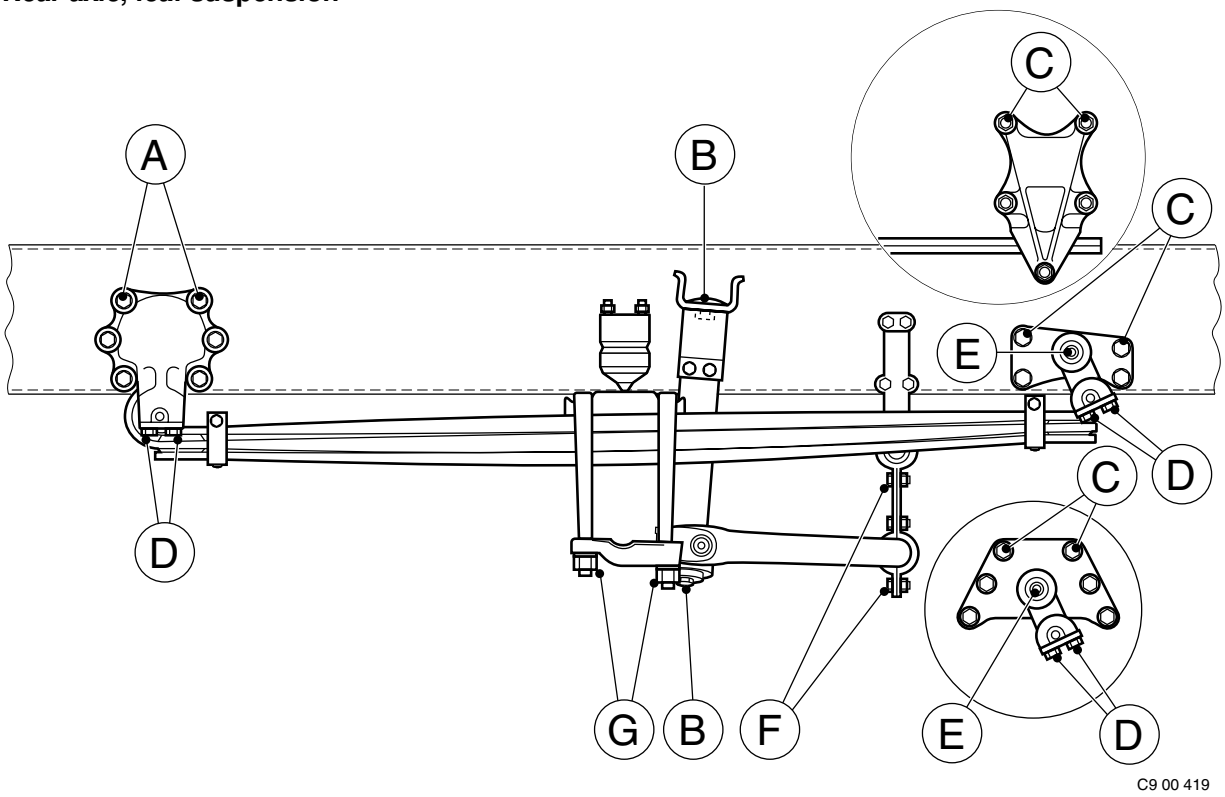
Rear axle, leaf suspension



A	Attachment bolt/nut M16 for spring bracket, property class 10.9/10	260 ± 20 Nm
B	Self-locking nut M16 for shock absorber	65 Nm
C	Attachment bolt/nut M16 for spring bracket, property class 10.9/10	260 ± 20 Nm
D	Attachment bolt/nut for spring attachment	
	- if M10, property class 8.8/8	46 ± 4 Nm
	- if M10, property class 10.9/10	60 ± 4 Nm
E	Self-locking nut M20 for spring shackle	235 ± 35 Nm
F	Attachment bolt/nut for stabiliser bracket	
	- if M12, property class 10.9/10	110 ± 8 Nm
	- if M14, property class 10.9/10	170 ± 15 Nm
G	U-bolt nut	
	- if yellow high hexagonal nut M24 with black washer	600 ± 50 Nm(1)
	- if flange nut M24	750 ± 50 Nm(2)

Notes:
1. The high hexagonal nut can be recognised by its height being 1.5 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.
2. Evenly tighten the two U-bolt nuts alternately.

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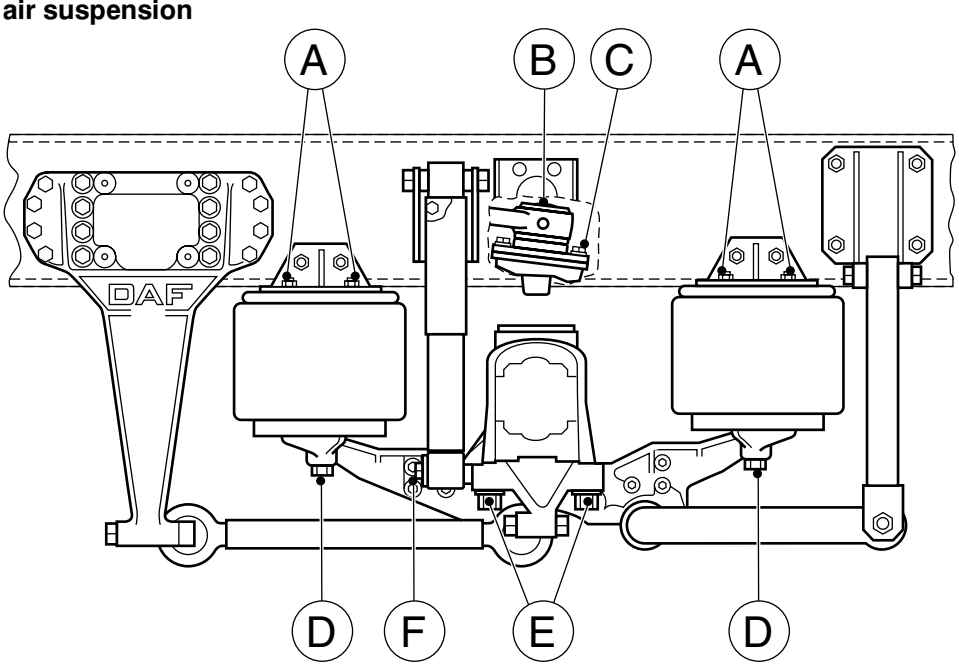
Rear axle, air suspension

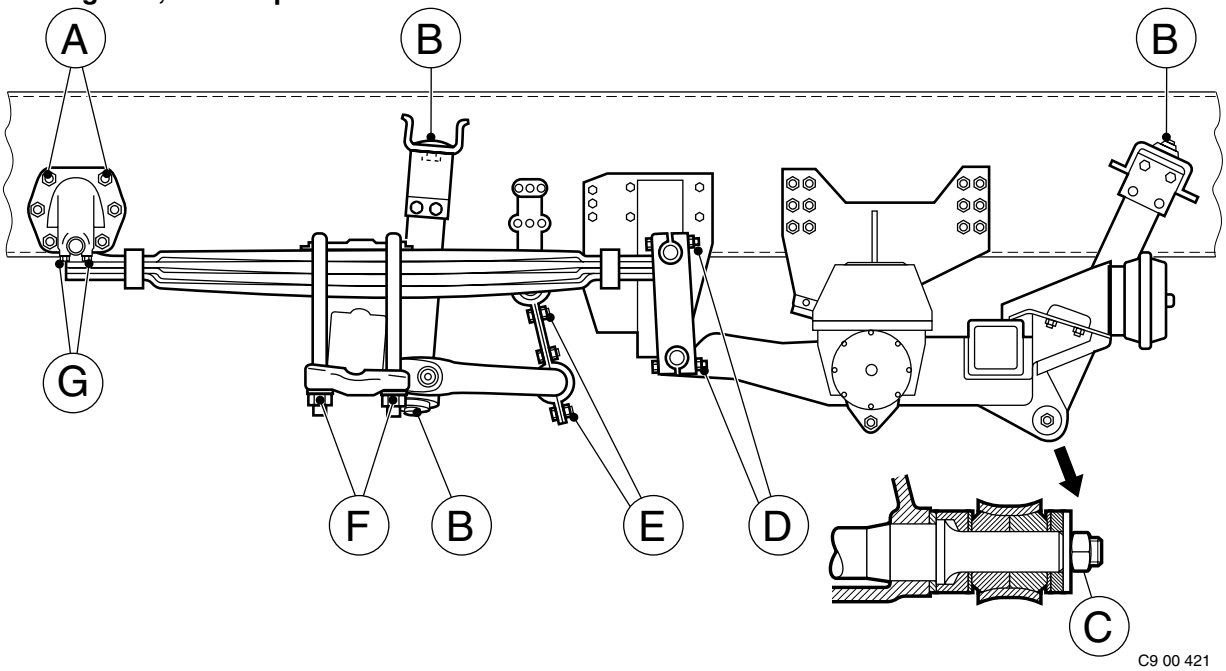


C9 00 420

A	Attachment nut M10 for air bellows, property class 8.8 or 10.9	46 Nm(1)
B	Attachment bolt M14 for ball joint, property class 10.9	148 ± 12 Nm
C	Attachment bolt M18 for triangular link, clamping flange bolt	460 ± 40 Nm
D	Attachment bolt M16 for air bellows, property class 8.8 or 10.9	195 Nm(1)
E	U-bolt nut	
	- if black high hexagonal nut M24 with black washer	770 ± 60 Nm(2)
	- if yellow zinc-plated hexagonal nut M24, property class 10 with black washer	615 ± 50 Nm(3)
F	Attachment bolt M16 for shock absorber, property class 10.9	200 ± 25 Nm

Notes:
1. Air bellows must be tightened on the chassis side first.
2. The high hexagonal nut can be recognised by its height being 1.5 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.
3. The yellow zinc-plated hexagonal nut can be recognised by its height being 1 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.

Trailing axle, leaf suspension



A	Attachment bolt/nut M16 for spring bracket, property class 10.9/10	260 ± 20 Nm
B	Self-locking nut M16 for shock absorber	65 Nm
C	Attachment nut M16 for shock absorber	260 ± 20 Nm
D	Attachment bolt M12 for shackle, property class 10.9/10	110 ± 8 Nm
E	Attachment bolt/nut for stabiliser bracket	
	- if M12, property class 10.9/10	110 ± 8 Nm
	- if M14, property class 10.9/10	170 ± 15 Nm
F	U-bolt nut	
	- if yellow high hexagonal nut M24 with black washer	600 ± 50 Nm(1)
	- if flange nut M24	750 ± 50 Nm(2)
	- if yellow zinc-plated hexagonal nut M24, property class 10 with black washer	615 ± 40 Nm(3)
G	Attachment bolt/nut for spring attachment	
	- if M10, property class 8.8/8	46 ± 4 Nm
	- if M10, property class 10.9/10	60 ± 4 Nm

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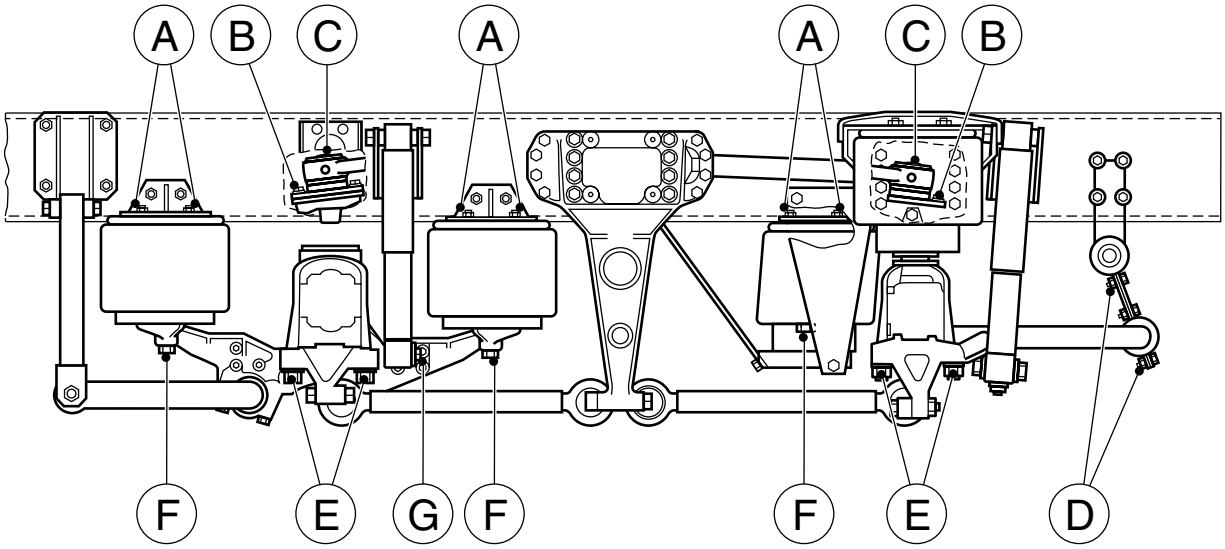
Notes:
1. The high hexagonal nut can be recognised by its height being 1.5 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.
2. Evenly tighten the two U-bolt nuts alternately.
3. The yellow zinc-plated hexagonal nut can be recognised by its height being 1 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.

Trailing axle, air suspension, 6-bellows version



C9 00 422

A	Attachment nut M10 for air bellows, property class 8.8 or 10.9	46 Nm(1)
B	Attachment bolt M18 for triangular link, clamping flange bolt	460 ± 40 Nm
C	Attachment bolt M14 for ball joint, property class 10.9	148 ± 12 Nm
D	Attachment bolt/nut for stabiliser bracket	
	- if M12, property class 10.9/10	110 ± 8 Nm
	- if M14, property class 10.9/10	170 ± 15 Nm
E	U-bolt nut	
	- if black high hexagonal nut M24 with black washer	770 ± 60 Nm(2)
	- if yellow zinc-plated hexagonal nut M24, property class 10 with black washer	615 ± 50 Nm(3)
F	Attachment bolt M16 for air bellows, property class 8.8 or 10.9	195 Nm(1)
G	Attachment bolt M16 for shock absorber, property class 10.9	200 ± 25 Nm

Notes:
1. Air bellows must be tightened on the chassis side first.
2. The high hexagonal nut can be recognised by its height being 1.5 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.
3. The yellow zinc-plated hexagonal nut can be recognised by its height being 1 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.

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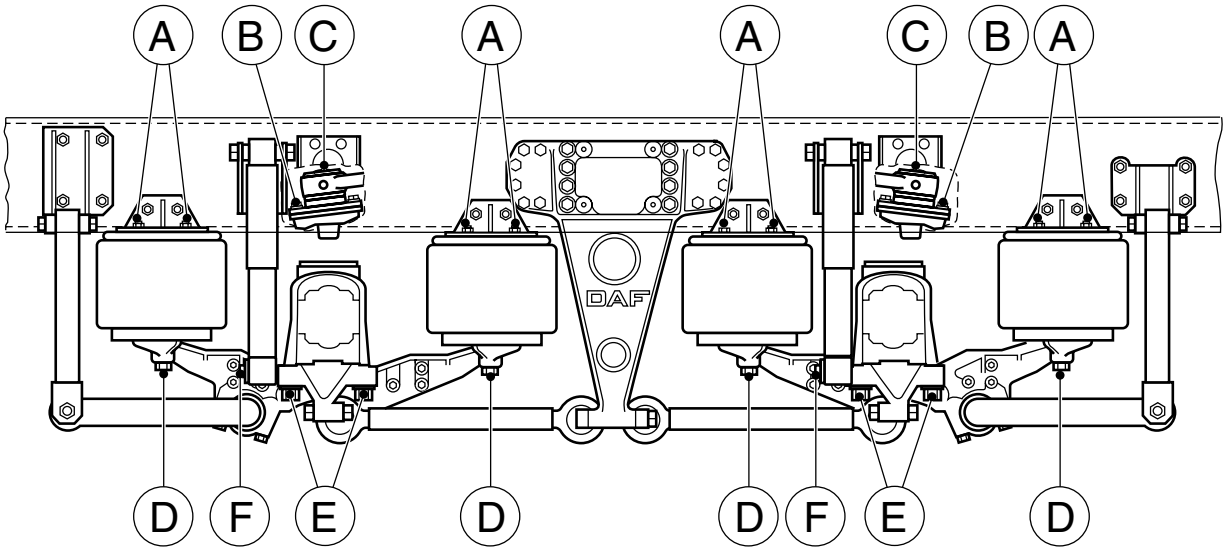
Trailing axle, air suspension, 8-bellows version

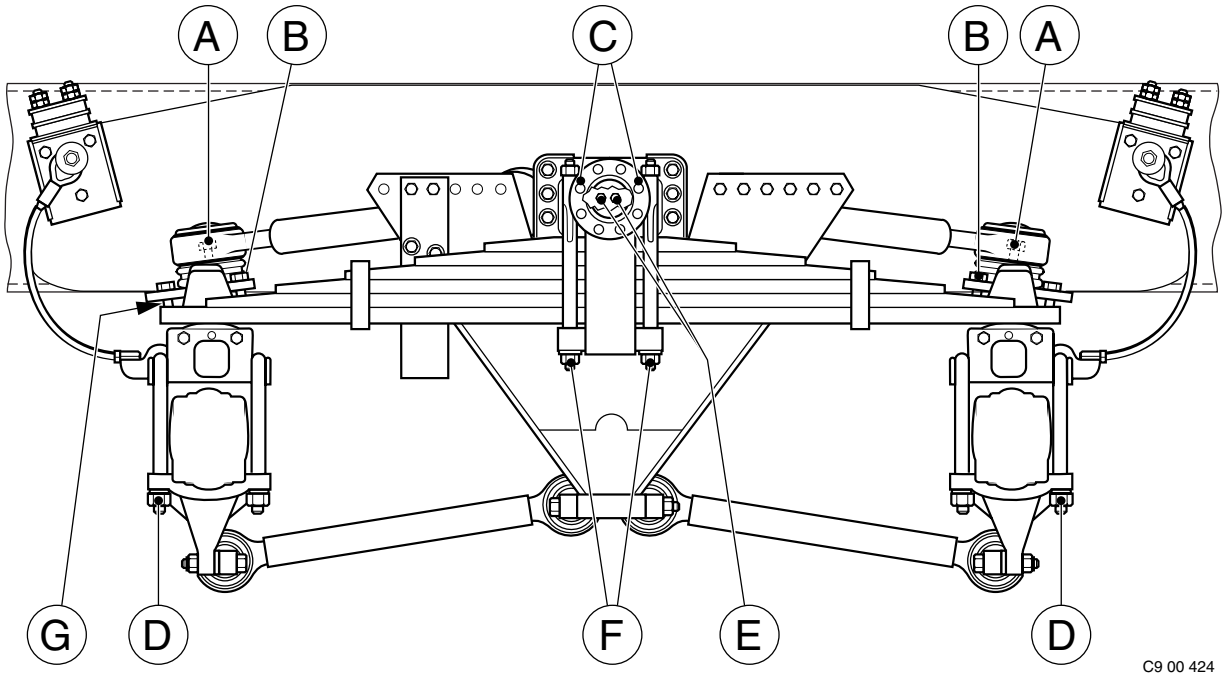


C9 00 423

A	Attachment nut M10 for air bellows, property class 8.8 or 10.9	46 Nm(1)
B	Attachment bolt M18 for triangular link, clamping flange bolt	460 ± 40 Nm
C	Attachment bolt M14 for ball joint, property class 10.9	148 ± 12 Nm
D	Attachment bolt M16 for air bellows, property class 8.8 or 10.9	195 Nm(1)
E	U-bolt nut	
	- if black high hexagonal nut M24 with black washer	770 ± 60 Nm(2)
	- if yellow zinc-plated hexagonal nut M24, property class 10 with black washer	615 ± 50 Nm(3)
F	Attachment bolt M16 for shock absorber, property class 10.9	200 ± 25 Nm

Notes:
1. Air bellows must be tightened on the chassis side first.
2. The high hexagonal nut can be recognised by its height being 1.5 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.
3. Evenly tighten the two U-bolt nuts alternately.

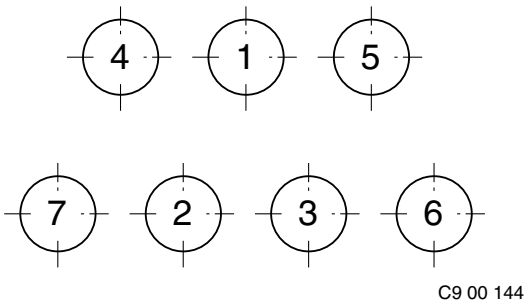
Tandem axle, leaf suspension, trapezoidal leaf spring version



A	Attachment bolt M14 for ball joint, property class 10.9	148 ± 12 Nm
B	Attachment bolt M18 for triangular link, clamping flange bolt	460 ± 40 Nm
C	Attachment bolt M8 for cover, property class 10.9	30 ± 2 Nm
D	U-bolt nut	
	- if black high hexagonal nut M20 with yellow washer	520 ± 40 Nm(1)
	- if flange nut M20	450 ± 40 Nm(2)
	- if yellow zinc-plated hexagonal nut M20, property class 10 with black washer	400 ± 40 Nm(3)
E	Locking bolt M14 for shackle, property class 10.9	170 ± 15 Nm(4)
F	Pull rod nut	
	- if black high hexagonal nut M22 with yellow washer	555 ± 45 Nm(1)
	- if flange nut M22	650 ± 50 Nm(2)
	- if yellow zinc-plated hexagonal nut M22, property class 10 with black washer	480 ± 40 Nm(3)

0

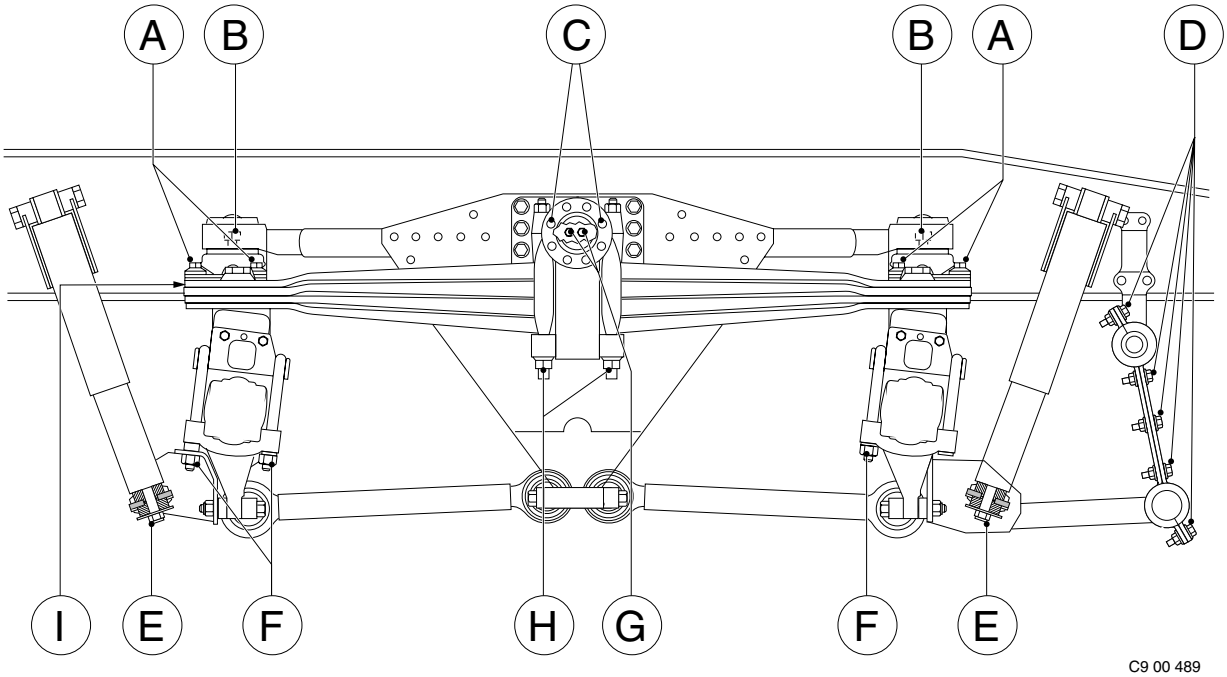
G Tighten the M16 attachment bolts for the brake cylinder bracket according to the standard torque, in the order shown.



C9 00 144

Notes:
1. The high hexagonal nut can be recognised by its height being 1.5 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.
2. Evenly tighten the two U-bolt nuts alternately.
3. The yellow zinc-plated hexagonal nut can be recognised by its height being 1 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.
4. Use Loctite 243

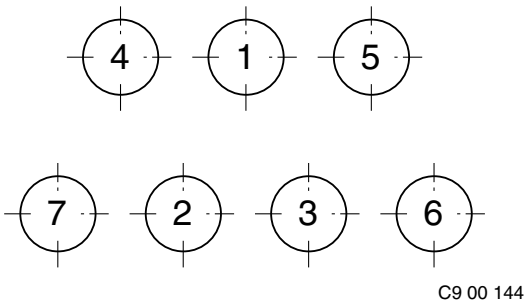
Tandem axle, leaf suspension, parabolic leaf spring version



A	Attachment bolt M18 for triangular link, clamping flange bolt	460 ± 40 Nm
B	Attachment bolt M14 for ball joint, property class 10.9	148 ± 12 Nm
C	Attachment bolt M8 for cover, property class 10.9	30 ± 2 Nm
D	Attachment bolt/nut M14 for stabiliser bar bracket, property class 10.9/10	170 ± 15 Nm
E	Self-locking nut M16 for shock absorber	65 Nm
F	U-bolt nut	
	- if black high hexagonal nut M20 with yellow washer	520 ± 40 Nm(1)
	- if flange nut M20	450 ± 40 Nm(2)
	- if yellow zinc-plated hexagonal nut M20, property class 10 with black washer	400 ± 40 Nm(3)
G	Locking bolt M14 for shackle, property class 10.9	170 ± 15 Nm(4)
H	Pull rod nut	
	- if black high hexagonal nut M22 with yellow washer	555 ± 45 Nm(1)
	- if flange nut M22	650 ± 50 Nm(21)
	- if yellow zinc-plated hexagonal nut M22, property class 10 with black washer	480 ± 40 Nm(3)

0

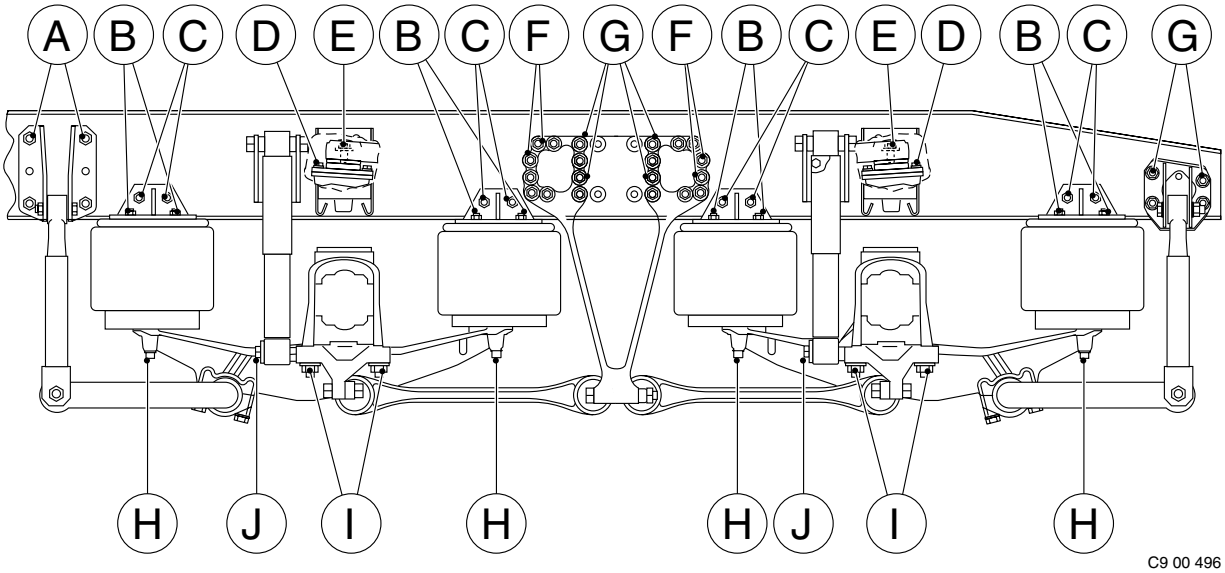
I Tighten the M16 attachment bolts for the brake cylinder bracket according to the standard torque, in the order shown.



C9 00 144

Note:
1. The high hexagonal nut can be recognised by its height being 1.5 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.
2. Evenly tighten the two U-bolt nuts alternately.
3. The yellow zinc-plated hexagonal nut can be recognised by its height being 1 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.
4. Use Loctite 243

Tandem axle, air suspension, DAF tandem axle version



A	Attachment bolt M16 for stabiliser bracket, property class 10.9	260 ± 20 Nm
B	Attachment nut M10 for air bellows, property class 8.8 or 10.9	46 Nm(1)
C	Attachment bolt M10 for air bellows bracket, property class 10.9	60 ± 4 Nm
D	Attachment bolt M18 for triangular link, clamping flange bolt	460 ± 40 Nm
E	Attachment bolt M14 for ball joint, property class 10.9	148 ± 12 Nm
F	Attachment bolt M18 for torque rod yoke, property class 10.9	360 ± 30 Nm
G	Attachment bolt M16 for torque rod yoke, property class 10.9	260 ± 20 Nm
H	Attachment bolt M16 for air bellows, property class 8.8 or 10.9	195 Nm(1)
I	U-bolt nut	
	- if black high hexagonal nut M24 with black washer	770 ± 60 Nm(2)
	- if yellow zinc-plated hexagonal nut M24, property class 10 with black washer	615 ± 50 Nm(3)
J	Attachment bolt M16 for shock absorber, property class 10.9	200 ± 25 Nm

Note:
1. Air bellows must be tightened on the chassis side first.
2. The high hexagonal nut can be recognised by its height being 1.5 times the thread diameter. Evenly tighten the two U-bolt nuts alternately.
3. Evenly tighten the two U-bolt nuts alternately.

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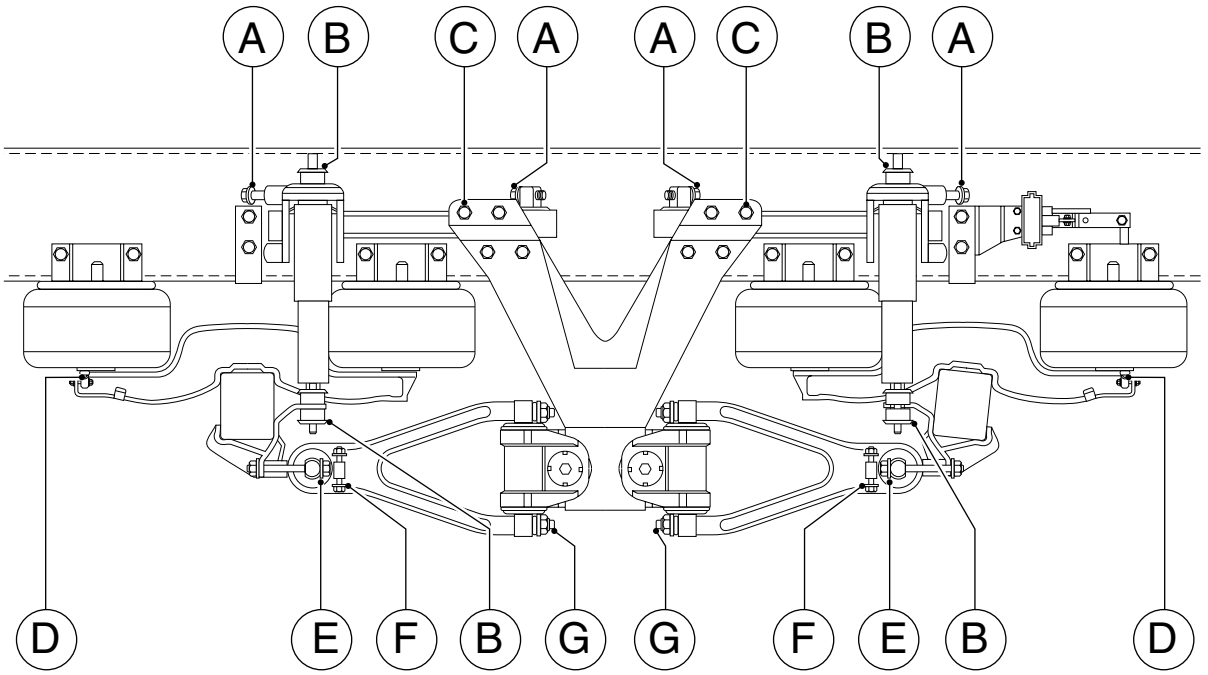
Tandem axle, air suspension, Meritor tandem axle version



C9 00 404

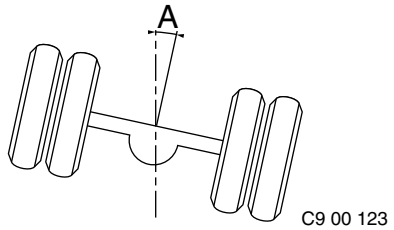
A	Attachment bolt/nut M16 for torque rod, property class 10.9	260 ± 60 Nm
B	Tighten the shock absorber attachment nut until the rubber bush has the same diameter as the steel ring.	
C	Attachment bolt/nut M22 for yoke, property class 10.9	750 Nm
D	Attachment bolt 1/2″ UNC for air bellows	34 ± 7 Nm
E	Attachment bolt/nut M16 for torque rod, property class 10.9	260 ± 60 Nm
F	Attachment bolt/nut M10 for torque rod, property class 10.9	60 ± 4 Nm
G	Attachment nut M20 for torque rod, property class 10.9	520 ± 40 Nm

3. REAR AXLE ALIGNMENT

3.1 GENERAL

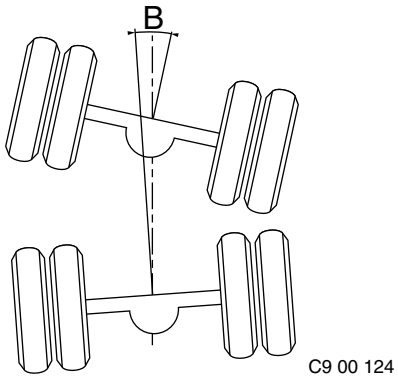
Rear axle misalignment standard
The angle made by the driven rear axle in relation to the vehicle centreline is calculated from the angles made by both wheels on this axle in relation to the vehicle centreline. See “Rear axle alignment”.

Driven axle in relation to the vehicle centreline:
- max. 4 mm/m (angle A in illustration)
  This value also applies to the individual tandem axles and the driven axle of the trailing axle suspension.



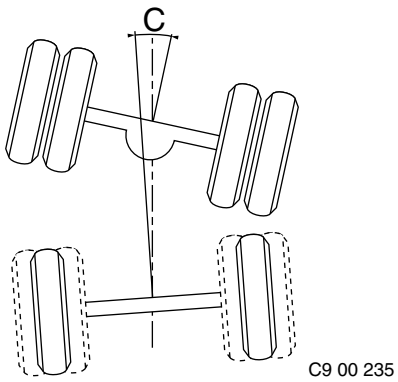
C9 00 123

Non-parallelism of the rear tandem axle in relation to the front tandem axle:
- max. 2 mm/m (angle B in illustration)



C9 00 124

Non-parallelism of the trailing axle in relation to the driven axle:
- max. 2 mm/m (angle C in illustration)



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CONTENTS

1

1. SHOCK ABSORBERS

1.1 FAULT-FINDING TABLE

SYMPTOM: SHOCK ABSORBER PRODUCES NOISE (CHATTERING, BUMPING ETC.)	
Possible cause	**Remedy**
Shock absorber is loose.	Tighten the shock absorber.
Attachment rubbers too soft.	Fit new rubbers.
Shock absorber comes into contact with other components.	Remove components or fasten them.
Shock absorber cover is loose.	Tighten cover or replace shock absorber.

SYMPTOM: SHOCK ABSORBER DOES NOT FUNCTION	
Possible cause	**Remedy**
Internal shock absorber defect.	Replace the shock absorber.
Shock absorber leaks oil.	Replace the shock absorber.

SYMPTOM: LEAKY SHOCK ABSORBER	
Possible cause	**Remedy**
Defective piston rod sealing. Caution: a thin, greasy layer is normal.	Replace the shock absorber.

SYMPTOM: SHOCK ABSORBER TOO HARD	
Possible cause	**Remedy**
Incorrect shock absorber type fitted.	Fit correct shock absorber type.
Internal shock absorber defect.	Check shock absorber using a test bench and replace, if required.

SYMPTOM: SHOCK ABSORBER TOO SOFT	
Possible cause	**Remedy**
Incorrect shock absorber type fitted.	Fit correct shock absorber type.
Internal shock absorber wear.	Check shock absorber using a test bench and replace, if required.
Shock absorber leaks oil.	Replace the shock absorber.
Vehicle overloaded.	Adjust vehicle loading.

SYMPTOM: INADEQUATE DRIVING CHARACTERISTICS/FLAT WEAR SPOTS ON THE TYRES	
Possible cause	**Remedy**
Incorrect damping.	Check shock absorbers using a test bench and replace, if required.
Vehicle overloaded.	Adjust vehicle loading.

SYMPTOM: SHOCK ABSORBER HITS END STOP	
Possible cause	**Remedy**
Defective stop rubber.	Replace stop rubber.
Insufficient damping.	See under: Shock absorber too soft.
Vehicle overloaded.	Adjust vehicle loading.

2. LEAF SUSPENSION

2.1 FAULT-FINDING TABLE

SYMPTOM: LOOSE U-BOLTS	
Possible cause	**Remedy**
Use of a U-bolt or nut of an incorrect property class.	Use U-bolts and nuts of the correct property class.
The tightening torque used for the U-bolt nut was too low.	Tighten the U-bolt to the specified torque.
Reuse of a U-bolt with corroded or damaged thread.	Fit new U-bolt.
No or inadequate cleaning of the thread (which includes removal of paint) before reuse of the U-bolt.	Thoroughly clean the thread when reusing it.
No oil or faulty application of oil on the thread and the bearing surface of the nut.	Apply the oil as prescribed.
The nut has been tightened using a tool rotating too fast. There is a risk of the nut being welded to the thread.	Tighten the nut slowly.
Coating (i.e. paint) on the contact faces of the connection.	Clean the contact faces before assembly.
Inadequate retorquing of the U-bolt nut or no retorquing.	Tighten the U-bolt nut as specified.

1

SYMPTOM: BROKEN SPRING	
Possible cause	**Remedy**
Regular overloading.	Adjust vehicle loading.
Driving too fast over bad roads.	Adjust speed when the road is bad.
Notching effect due to welding or grinding activities.	Cover spring assembly when welding or grinding.
Spring damaged due to impact of a steel hammer.	Never hit the springs using a steel hammer or some other hard tool.
Incorrect repair of a spring leaf which has broken before.	When replacing a broken spring leaf, always replace the leaf above and below the broken leaf, or replace the entire spring assembly.
Spring has been heated.	Replace spring assembly. Springs should never be heated.

SYMPTOM: SPLAYING OF THE SPRING ASSEMBLY (BROKEN SPRING CLAMPS)	
Possible cause	**Remedy**
Incorrect pre-tension of the U-bolts.	See symptom: Loose U-bolts.

SYMPTOM: SPRING HITS END STOP	
Possible cause	**Remedy**
Vehicle overloaded.	Adjust vehicle loading.
Sagged spring assembly.	Check spring opening of both spring assemblies. Replace spring assemblies.
Broken spring.	See symptom: Broken spring.

SYMPTOM: SHIFTING OR BREAKING OF CENTRE BOLT	
Possible cause	**Remedy**
Incorrect pre-tension of the U-bolts.	See symptom: Loose U-bolts.

SYMPTOM: BUMPING OR CHATTERING OF THE SPRING	
Possible cause	**Remedy**
Shackle pin bearing play at air-sprung front axle.	Replace shackle pin/bearing bush.
Loose U-bolts.	See symptom: Loose U-bolts.
Loose shackle pin locking at air-sprung front axle.	Secure the shackle pin locking.
Spring bracket is loose.	Secure the spring bracket.
Spring comes into contact with other components during spring action.	Check freedom of movement of spring.

1

3. REAR AXLE ALIGNMENT

3.1 FAULT-FINDING TABLE

SYMPTOM: AXLE MISALIGNMENT	
Possible cause	**Remedy**
Axle suspension clearance.	Check the axle suspension. Replace the worn parts.
Loose U-bolts.	Check the tightening torques of the U-bolts. Tighten the nuts to the specified tightening torques.
Shifted centre bolt.	Check the centre bolt. Check the tightening torques of the U-bolts.
Loose or shifted front spring bracket.	Check the spring brackets. Fit the spring bracket as specified.
Incorrect spring bracket fitted.	Fit the spring bracket as specified.
Sagged spring assembly or spring assembly with broken spring leaves.	Check opening of both spring assemblies. Replace spring assemblies.
Difference in length between the spring assemblies.	Measure the centre-to-centre distance between shackle pin and centre bolt. Adjust the alignment or replace the spring assemblies.
Misalignment of the vehicle due to wrongly adjusted or defective height adjustment.	Check / replace sensor. Recalibrate.
Bent torque rod (air suspension and tandem axle).	Check the torque rods. Replace if necessary.
Incorrectly fitted torque rods (air suspension and tandem axle).	Check the torque rods. Fit the torque rods correctly.
Difference in length between the torque rods at the vehicle's left and right sides (air suspension and tandem axle).	Measure the length of the torque rods. Adjust the difference in length.
Bent axle housing.	Check the straightness of the axle housing. If possible, adjust by changing the axle alignment.

SYMPTOM: AXLE MISALIGNMENT	
Possible cause	**Remedy**
Bent leaf-sprung trailing axle yoke.	Replace the trailing-axle yoke.
Misalignment of the vehicle because the superstructure is heavier on one side.	Measure the wheel pressure. Distribute the weight more evenly.
Inadequate alignment of axle suspension.	Check the alignment. Adjust the axle alignment.
Bent chassis.	Measure the chassis. Straighten the chassis, if possible.
Chassis side members have shifted in relation to one another.	Measure the chassis. Straighten the chassis, if possible. Align the axle.

CONTENTS

2

1. GENERAL

1.1 REPAIRS TO THE CHASSIS

- Any welding, aligning, drilling and wheelbase alteration activities that are not described in this workshop manual, or in any of the latest releases of DAF's Chassis Guidelines, must be authorised by DAF.

- Following chassis repair, the cause of the chassis damage should be rectified.

Welding

- Chassis welding may only be carried out by welders holding a valid EN 287-1 certificate.

- For welding operations on steel grade KF 375 chassis, the welding electrode must meet one of the following standards:
  ISO 2560 : E 515 B24 (H)
  DIN 1913
  (January 1976) : E 5155 B10
  EN 499

- Slag inclusions and other contaminations in the weld are totally unacceptable.

  Note:
  Welding on chassis constructed of high-tensile strength steel grades KF 420, KF 500 en KF 600 is not recommended. If, however, you do wish to weld a high-tensile strength steel chassis, contact must always first be sought with DAF. The welding electrode must meet the DIN 8529 standard:
  EY 5066 1.5 NiNoB

To repair cracks in the chassis, proceed as follows, taking account of the guidelines given above:

1. Remove all parts restricting a clear working area.
2. Thoroughly clean the crack so that the course of the crack is clearly visible.
3. Drill a small hole at the end of the crack (Fig. 1). This will prevent the crack continuing.

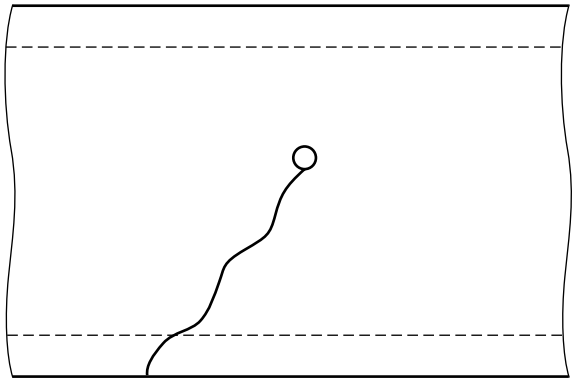

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Fig. 1

4. Thoroughly grind out the crack on both sides (Fig. 2).
5. Take the necessary precautions to prevent damage to electronic components. Place the earth clamp as close as possible to the weld and avoid bridges.

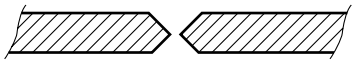

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Fig. 2

6. Lay a bead on one side of the ground-out crack (Fig. 3).
7. Gouge or grind off the material at the back of the bead (see the arrow in Fig. 3) so that the new weld material is clearly visible.
8. Finish welding the X-seam in the usual manner.
9. Fill in the drilled hole.
10. Grind down the new weld so that it is flush. Take care not to grind the chassis flange in the process.

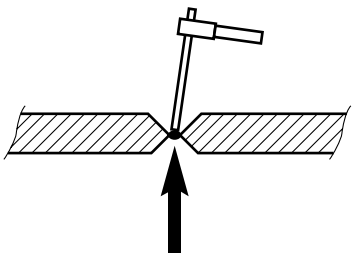

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Fig. 3

11. The beginning and end of a weld should not curve inwards (Fig. 4).

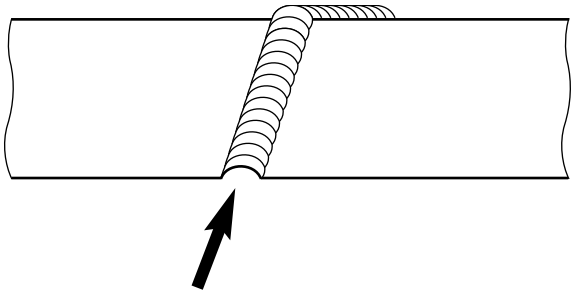

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Fig. 4

12. Round off the weld at the edge of the chassis flange (Fig. 5).

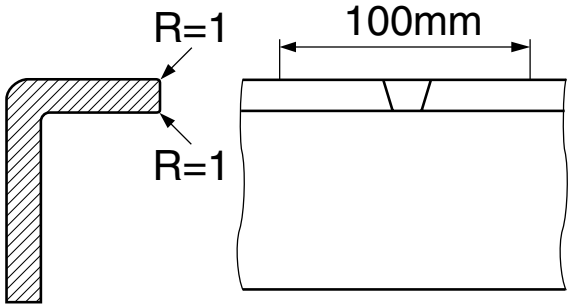

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Fig. 5

Straightening

Do not forget your own safety during straightening activities. When working with presses, take care that parts cannot fly out.

The straightening of a chassis demands a high degree of craftsmanship; as in every case of damage, an individual assessment must be made to establish whether or not straightening would be a sensible measure.
Deformations found after accidents will mainly be of the following 6 types:
- chassis is bent sideways
- chassis has a double sideways bend ("S-bend")
- chassis sags
- chassis bulges upwards
- chassis is twisted
- chassis is out of square.

In many cases, the damage will be a combination of two or more of these basic deformations.
In general, the deformations should be dealt in the sequence shown above, although some combinations can be dealt with in one straightening operation.

When deciding whether or not to it would be viable to straighten a chassis, you must consider not only the degree to which the chassis is bent but also the angle of a bend.
If there is a sharp angular bend or fold in the chassis, it is likely that the material in that area is severely weakened.
If such a chassis were to be realigned to its original form, there would be a strong possibility of overstretching the already weakened material and causing a crack to develop.

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“Cold” straightening
The general rule for cold straightening of a chassis is that the degree to which the chassis should be forced back beyond the straight line is equal to the degree to which the chassis is bent.
For example, if a chassis is bent by 10°, the chassis should be forced back by an additional 10° beyond the straight line.
This means that in total the chassis is forced back 20°.
“Cold” straightening is done with forces ranging from 40 to 100 tonnes. Therefore, work as safely as possible.
Particularly when working with auxiliary tools and aids, you are advised - from a safety point of view - to attach them temporarily using an electric welding tool.

“Warm” straightening
Note the following points when applying heat in the straightening process:
- The forces required are considerably lower than those for “cold” straightening.
- A chassis made of cold-drawn steel must not be heated.
- A chassis made of high-tensile strength steel must on no account be heated.
- With uncontrolled heating, grain growth can occur within the material. Just as with ageing which can occur as a result of prolonged heating, this will adversely affect the material properties.
- Most hot-drawn steel types (such as KF 375) can be heated for straightening purposes.

General
For every straightening operation, all stresses in the stiffer parts of the chassis, for example in the tandem axle attachment cross member, should be relieved. If this is not done, these stresses will later cause distortions or cracks in the chassis.

The above points will make it clear that straightening is a job which requires highly specialised skills, and for which the specialist on the spot bears full responsibility. Always contact DAF when in doubt about complicated “straightening operations”.

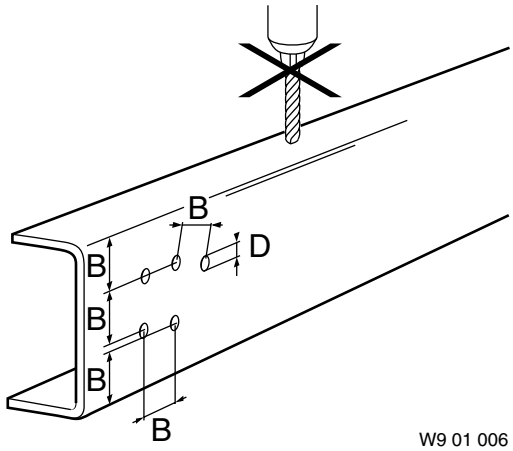
1.2 DRILLING IN THE CHASSIS

If holes must be drilled in the chassis frame, note both the above and the following points:
- Drilling holes in the flanges of the chassis side members is not permitted. The only exception is the drilling of holes for the attachment of rear bumper brackets.

Note:
There are several stress zones in a chassis. Working on the chassis without proper knowledge (and not according to DAF instructions) may cause irreversible damage to the chassis. The repair shop or bodybuilder would be held fully responsible for such work and for the superstructure fitted.
- It is on no account permitted to drill holes in the tapered ends at the rear of a tractor chassis.
- The maximum diameter for drilled holes is 17 mm (dimension D in the opposite drawing).
- The distance between the holes, and between the holes and the side member flange, must be at least 4xD - with a minimum of 30 mm (dimension B in the opposite drawing).

Wheelbase alteration
Any alteration to the wheelbase or changes to the rear overhang should be done in accordance with the latest DAF Trucks Bodybuilders' Guidelines.

Note:
When using the Bodybuilders' Guidelines, you are advised to first read the "General" section.



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CONTENTS

3

1. GENERAL

1.1 OPERATION OF A SHOCK ABSORBER

The function of the shock absorber is twofold:
- to control the movements of chassis and superstructure in relation to the axle. Optimum comfort is achieved when the chassis and superstructure remain exactly horizontal and are not subjected to any vertical accelerations when moving.
- to control the movements of the wheels on the road. Optimum handling is achieved when all of the wheels remain in constant contact with the road surface.

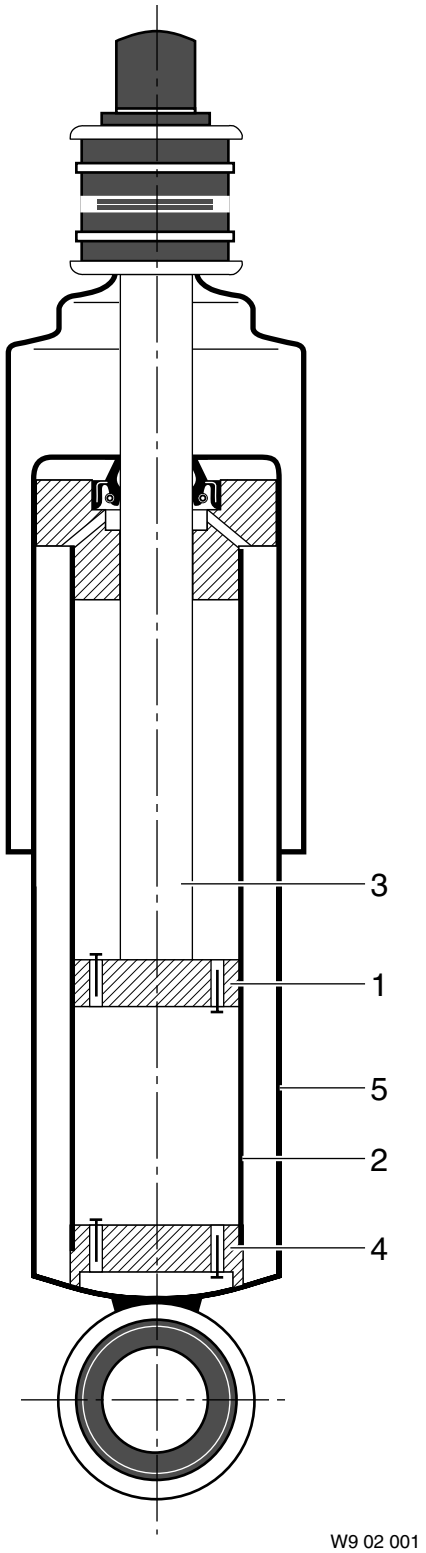
The amplitude of the above-mentioned movements depends on the available spring travel. The available spring travel is the difference in height between an unloaded spring and a fully loaded spring.
A well-functioning shock absorber with characteristics appropriate to the operating conditions will be the best possible compromise to fulfil the above-mentioned functions.

DAF only uses double acting type shock absorbers.
On vehicles with air suspension, hydraulic stroke limitation is used.

The shock absorber consists of:
- an operating cylinder, in which the actual damping is done by a piston with piston rod of which the valve unit damps the rebound stroke;
- a bottom valve which, in combination with the piston valve unit, damps the bump stroke.
- a reservoir tube which draws in the surplus of oil (result of the volume taken up by the piston rod) via the bottom valve;
- a dust cover, attached to the piston rod.

Double acting shock absorbers
The operation of the shock absorber is as follows:
the bump stroke moves the cylinder (1) down in relation to the operating cylinder (2).
Subsequently, oil flows from the bottom chamber of the piston (1) through the piston holes and valves to the top chamber where the volume increases. The oil pressure is equal on either side of the piston (1).

To compensate for the volume taken up by piston rod (3) in the upper chamber, oil flows from under piston (1), via the bottom valve (4), to reservoir tube (5).
The resistance the oil meets during this movement, damps the bump stroke of the shock absorber.
The rebound stroke moves the cylinder (1) up in relation to the operating cylinder (2).
Subsequently, pressure is exerted on the oil in the upper chamber of the piston (1) causing the oil to flow to the bottom chamber under piston (1).
The resistance the oil meets during this movement, damps the bump stroke of the shock absorber.
To compensate for the volume taken up by the piston rod (3) in the upper chamber, oil flows via bottom valve (4) from the reservoir tube (5) to the bottom chamber under the piston (1).



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2. REMOVAL AND INSTALLATION

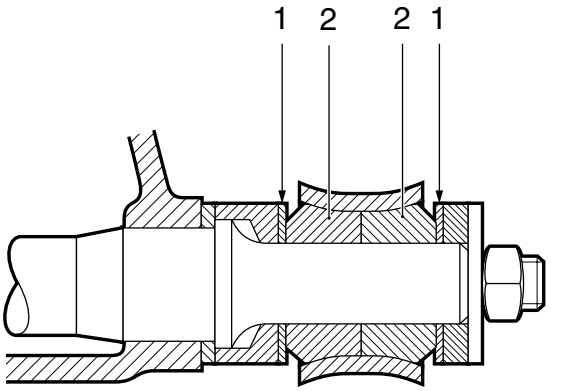
2.1 REMOVAL AND INSTALLATION OF SHOCK ABSORBERS

Removal of shock absorbers

1. Remove the attachment nuts and/or bolts.
2. Mark the exact positions and location of the mounting rubbers.
3. Remove the shock absorber from under the vehicle.

Shock-absorber installation

1. Check the shock-absorber mountings for hair-line cracks.
2. If the old rubbers are to be re-used, check them for hair-line cracks and ageing. Install the rubbers in the original locations and positions.
3. When replacing the rubbers, use only the specified types.
4. When installing the shock absorbers on a leaf-sprung trailing axle, bearing rings (1) have to be used with the treated (blackened) side facing away from the shock absorber rubbers (2).
5. Replace the self-locking nuts and tighten the attachment bolts.



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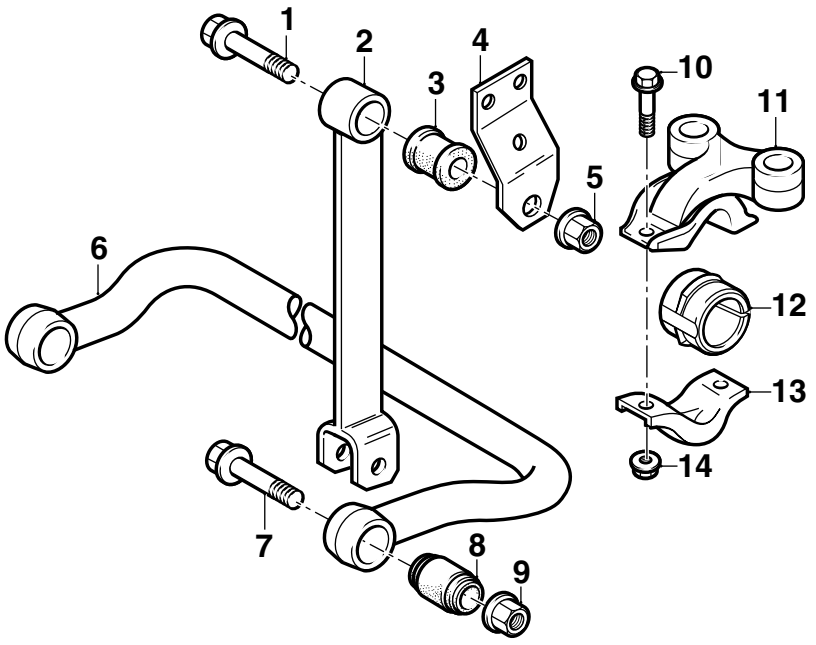
CONTENTS

4

1. GENERAL

1.1 OVERVIEW DRAWING, FRONT-AXLE STABILISER



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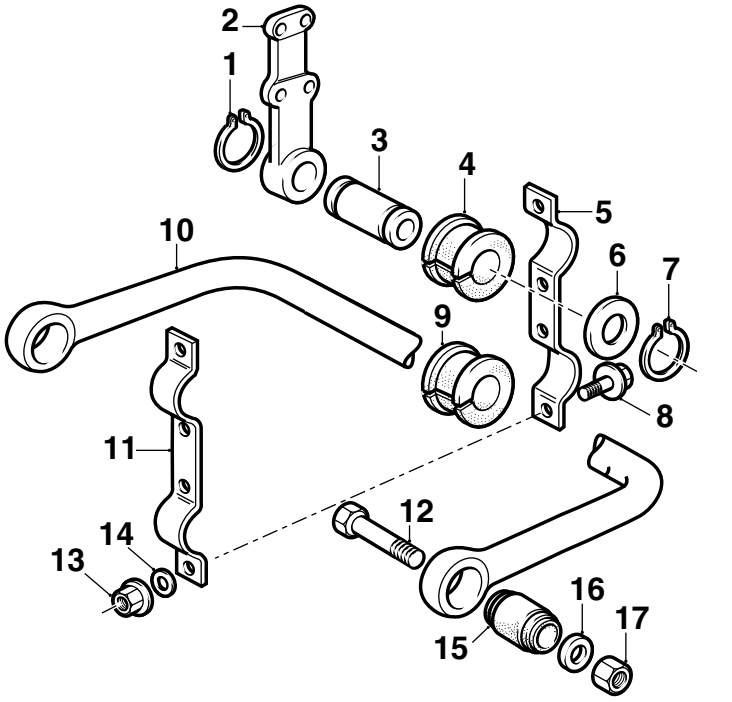
1. Flange bolt
2. Shackle
3. Silentbloc
4. Bracket
5. Flange nut
6. Stabiliser
7. Flange bolt
8. Silentbloc
9. Flange nut
10. Flange bolt
11. Bracket
12. Silentbloc
13. Bracket
14. Flange nut

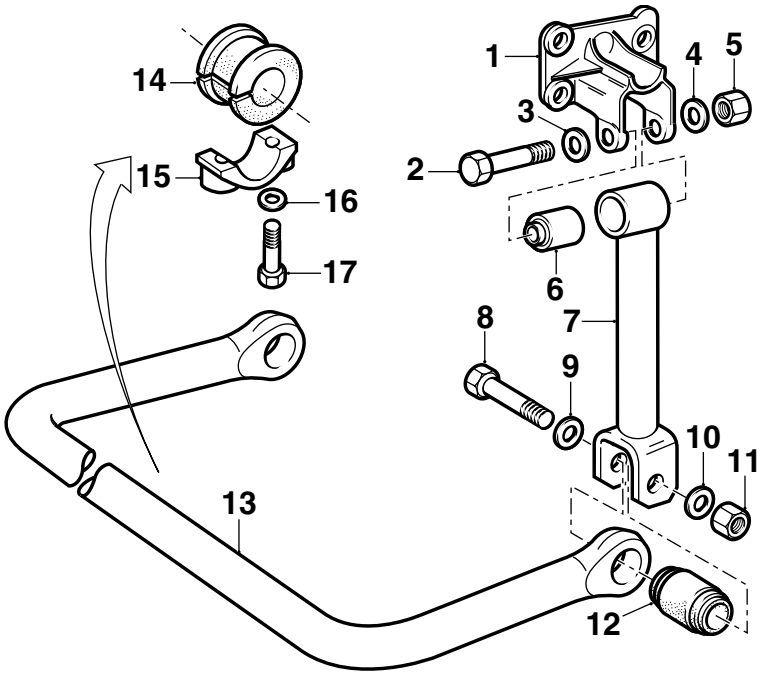
4

1.2 OVERVIEW DRAWING, LEAF-SPRUNG REAR-AXLE STABILISER



1. Circlip
2. Bracket
3. Axle
4. Bearing bush
5. Bracket
6. Ring
7. Circlip
8. Flange bolt
9. Bearing bush
10. Stabiliser
11. Bracket
12. Bolt
13. Nut
14. Ring
15. Silentbloc
16. Ring
17. Nut

1.3 OVERVIEW DRAWING, AIR-SPRUNG REAR-AXLE STABILISER



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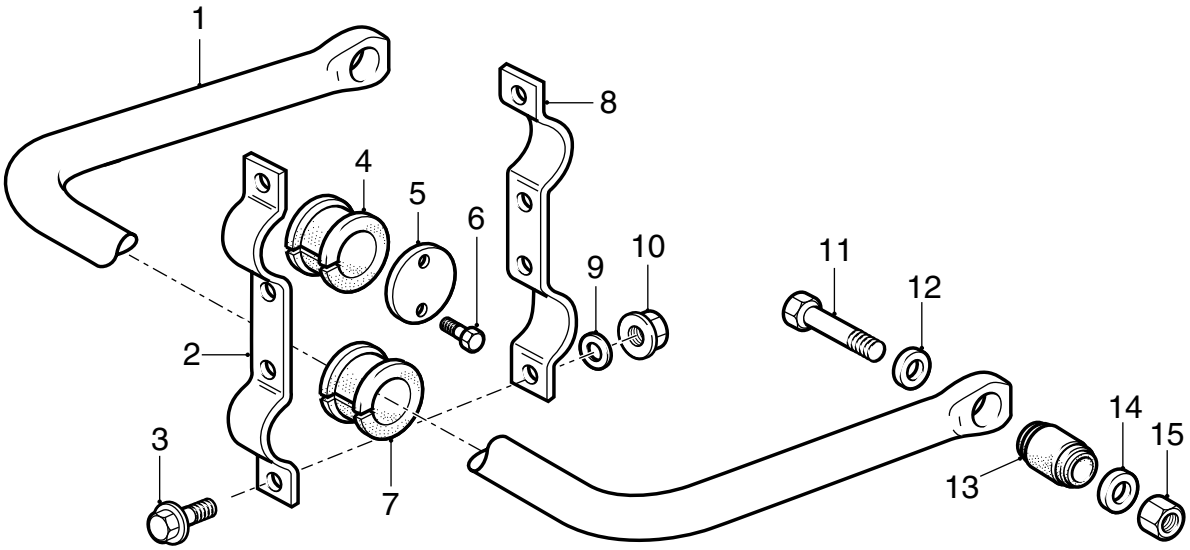
1. Bracket
2. Bolt
3. Ring
4. Ring
5. Nut
6. Silentbloc
7. Shackle
8. Bolt
9. Ring
10. Ring
11. Nut
12. Silentbloc
13. Stabiliser
14. Bearing bush
15. Bearing-bush cover
16. Ring
17. Bolt

1.4 OVERVIEW DRAWING, SECOND-STEERED AXLE STABILISER

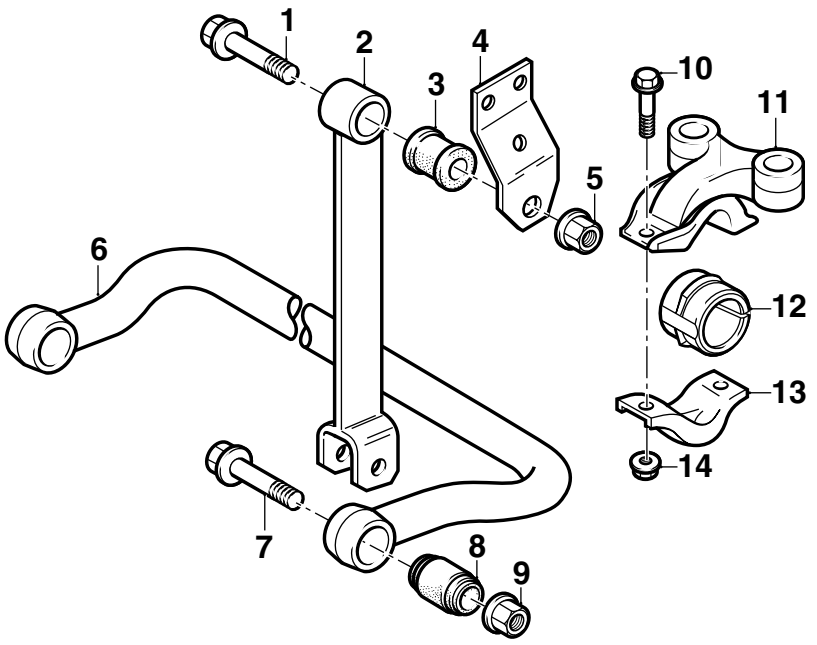


C9 00 157

1. Stabiliser
2. Bracket
3. Bolt
4. Bearing bush
5. Locking plate
6. Bolt
7. Bearing bush
8. Bracket
9. Ring
10. Nut
11. Bolt
12. Ring
13. Silentbloc
14. Ring
15. Nut

2. REMOVAL AND INSTALLATION

2.1 REMOVAL AND INSTALLATION, FRONT-AXLE STABILISER



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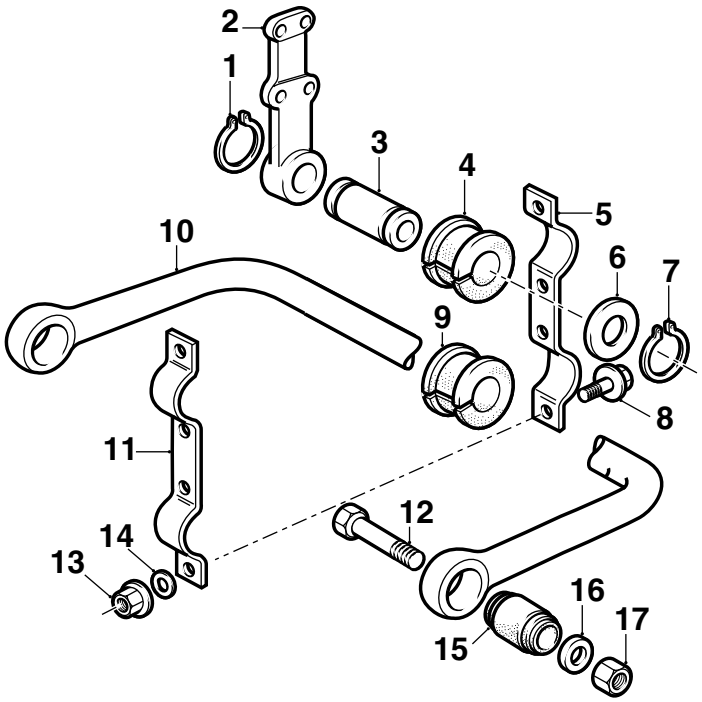
Removal of the front-axle stabiliser

1. Remove the brackets (13).
2. Remove the bolts (7).
3. Remove the stabiliser (6) from under the vehicle.
4. Remove the silentblocs (12) from the stabiliser (6).
5. Remove the bolts (1) and the shackles (2).

Installation of the front-axle stabiliser

1. Check the condition of the silentblocs (3, 8 and 12).
2. Fit the shackles (2).
3. Turn the silentbloc (12) so that the edges come to rest in the support (11) and the bracket (13).
4. Install the brackets (13).
5. Install the stabiliser (6) in the shackles (2).
6. Fit the bolts (7) with the heads facing towards the chassis.

2.2 REMOVAL AND INSTALLATION, LEAF-SPRUNG REAR-AXLE STABILISER



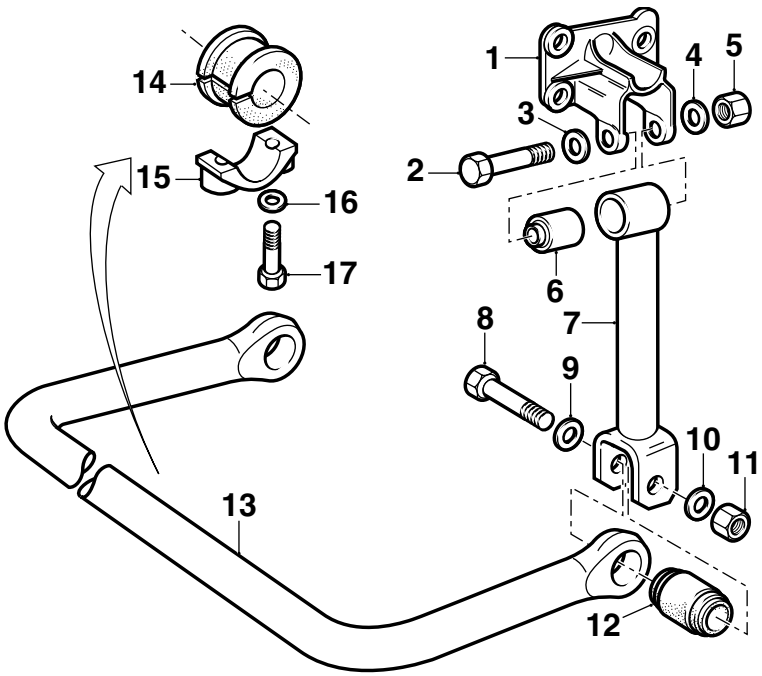
Removal of the leaf-sprung rear-axle stabiliser

1. Remove the brackets (5 and 11)
2. Remove the bolts (12).
3. Remove the stabiliser (10) from under the vehicle.
4. Remove the bearing bushes (9) from the stabiliser (10).
5. Remove the lock ring (7) with the retainer ring (6) and remove the bearing bush (4) from the axle (3).

Installation of the leaf-sprung rear-axle stabiliser

1. Check the condition of the silentbloc (15) and the bearing bushes (4 and 9).
2. Fit bearing bush (4), using a new lock ring (7).
3. Fit the bearing bushes (9) to the stabiliser (10).
4. Turn the bearing bushes (4 and 9) such that the opening is located at the side.
5. Fit the brackets (5 and 11)
6. Fit the bolts (12) with the heads facing towards the chassis.

2.3 REMOVAL AND INSTALLATION, AIR-SPRUNG REAR-AXLE STABILISER



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Removal of the air-sprung rear-axle stabiliser

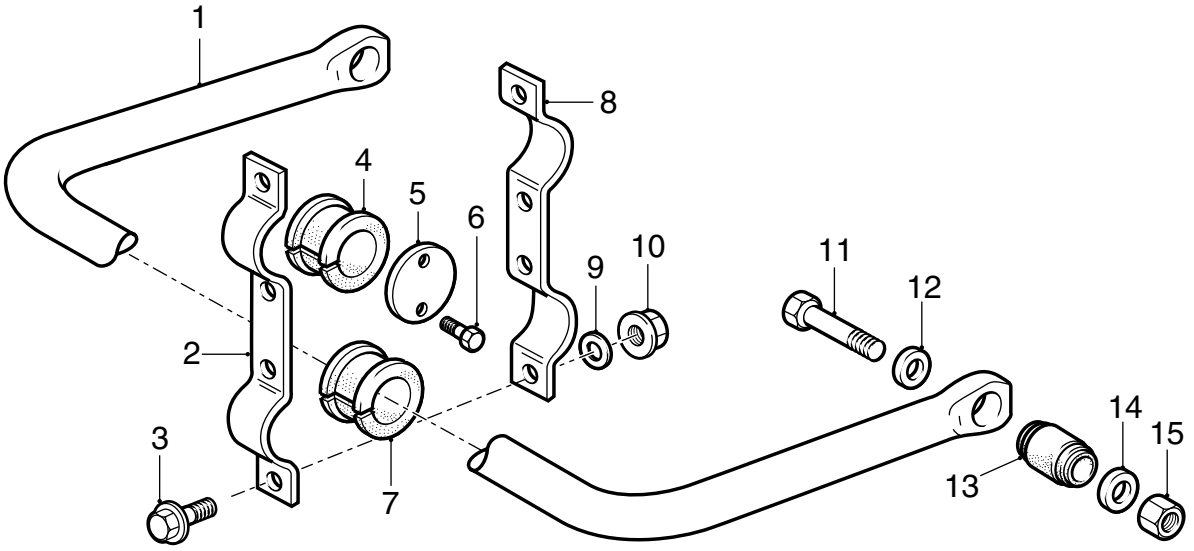
1. Remove the bearing-bush covers (15).
2. Remove the bolts (8).
3. Remove the stabiliser (13) from under the vehicle.
4. Remove the bearing bushes (14) from the stabiliser (13).
5. Remove the bolts (2) and remove the shackle (7) from the support (1).

Removal of the air-sprung rear-axle stabiliser

1. Check the condition of the bearing bush (14) and the silentblocs (6 and 12).
2. Fit the shackle (7).
3. Turn the bearing bushes (14) such that the opening is located at the side.
4. Fit the bearing-bush covers (15).
5. Fit the bolts (8) with the heads facing towards the chassis.

4

2.4 REMOVAL AND INSTALLATION, SECOND-STEERED AXLE STABILISER



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Removal of the second-steered axle stabiliser

1. Remove the brackets (2 and 8)
2. Remove the bolts (11).
3. Remove the stabiliser (1) from under the vehicle.
4. Remove the bearing bushes (7) from the stabiliser (1).
5. Remove the locking plate (5) and remove the bearing bush (4) from the axle.

Installation second-steered axle stabiliser

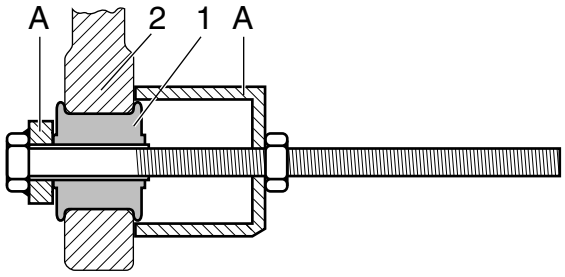
1. Check the condition of the silentbloc (13) and the bearing bushes (4 and 7).
2. Fit bearing bush (4), using the locking plate (5).
3. Fit the bearing bushes (7) to the stabiliser (1).
4. Turn the bearing bushes (4 and 7) such that the opening is located at the side.
5. Fit the brackets (2 and 8)
6. Fit the bolts (11) with the heads facing towards the chassis.

2.5 REMOVAL AND INSTALLATION, SILENTBLOC WITH RUBBER CASING

Notes:
- The silentblocs for the stabiliser and the stabiliser shackle are identical to one another.
- The silentbloc should be fitted using special tool (DAF no. 1310476). It is not possible to install the silentbloc undamaged without using this puller.
- The stabiliser need not be removed when replacing the silentblocs on the stabiliser.

Removal of the silentbloc with rubber casing

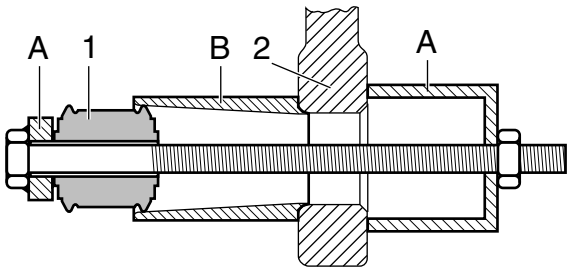
1. Force the silentbloc (1) - using the puller (A), special tool (DAF no. 1310476) - from the stabiliser (2) or the stabiliser shackle (2).
   Before fitting the puller, apply a lubricant to the contact surface of the puller/silentbloc, for example tyre grease.



C9 00 134

Installation of the silentbloc with rubber casing

1. Before fitting the puller, apply plenty of lubricant to the circumference of the new silentbloc (1) and the contact surface of the puller/silentbloc, for example tyre grease. Never apply any grease or oil product to the new silentbloc.

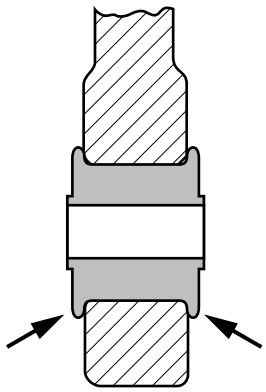


C9 00 135

2. Place the guide sleeve (B), which forms part of the puller, on the stabiliser or the shackle.

3. Place the new silentbloc (1) on guide sleeve (B) and pull - using puller (A), special tool (DAF no. 1310476), the silentbloc (1) into the stabiliser (2) or the shackle (2).

4. The collar of the silentbloc must protrude fully from the eye of the stabiliser or shackle.
   Remove the guide sleeve (B), and if necessary, force the silentbloc backwards a short distance so that the collars of the silentbloc protrude from both sides of the stabiliser or the shackle.



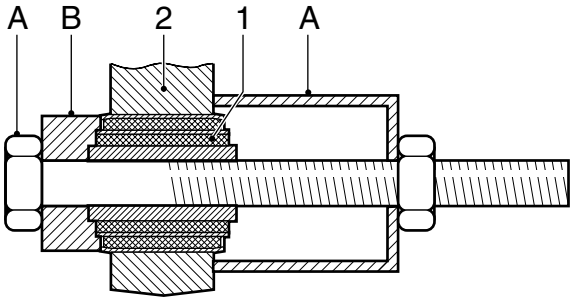
C9 00 148

2.6 REMOVAL AND INSTALLATION, SILENTBLOC WITH STEEL CASING

Notes:
- With the exception of the silentbloc located in the shackle of the air-sprung rear axle, silentblocs equipped with a steel casing must be fitted using the special tool (DAF no. 1310479). It is not possible to install the silentbloc undamaged, without using this puller.
- The stabiliser need not be removed when replacing the silentblocs.

Removal of the silentbloc with steel casing

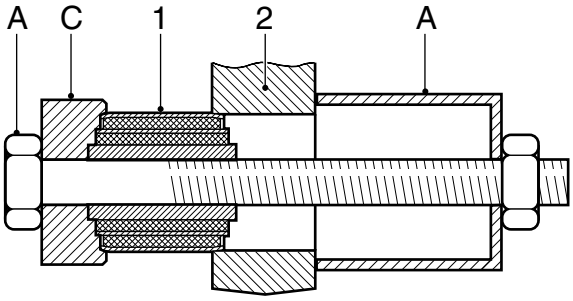
1. Fit the thrust piece with the smallest diameter (B in the drawing) on the puller (A), see special tools (DAF no. 1310479).
2. Apply a lubricant to the thrust piece, for example tyre grease, and fit the puller.
3. Using the puller, force the silentbloc from the stabiliser.



C9 00 149

Installation of the silentbloc with steel casing

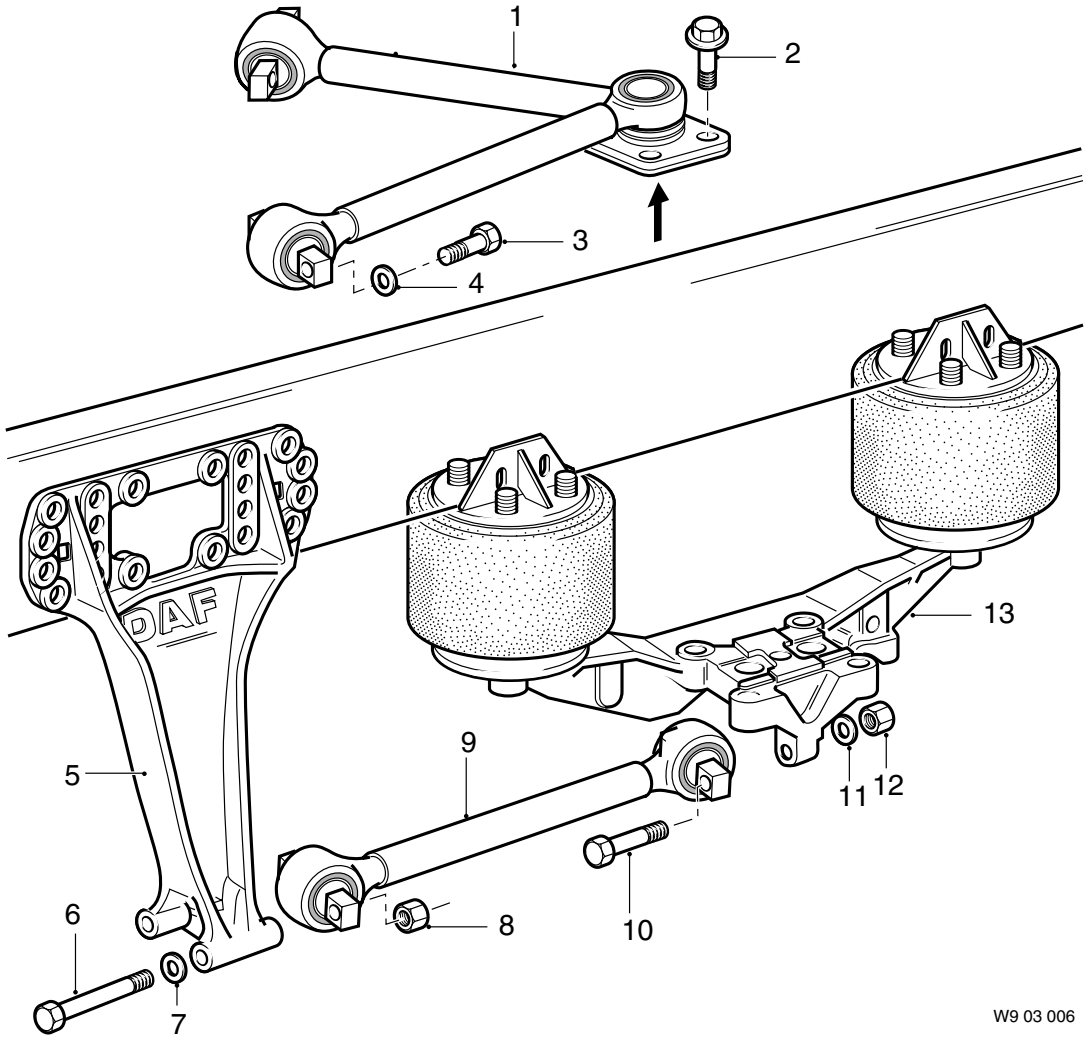
1. Place the thrust piece with the largest diameter (C in the drawing) on the puller (A).
2. Apply, for example, tyre grease to the thrust piece, and place the puller (A) with the silentbloc (1) on the stabiliser (2).
3. Force the silentbloc into the stabiliser using the puller. The thrust piece (C) must just touch the stabiliser.
4. Check whether the two sides of the silentbloc protrude equally out of the stabiliser.



C9 00 150

Note:
The silentbloc in the shackle of the stabiliser used in the air-sprung rear-axle suspension can be fitted without using special tools.
Force the silentbloc into the shackle eye in such a way that the silentbloc protrudes an equal distance on both sides of the support.

2.7 REMOVAL AND INSTALLATION, AIR-SPRUNG REAR-AXLE STABILISER



Removal of the torque rod, axle top

1. Remove the bolts (2).
2. Remove the bolts (3) and remove the torque rod (1).

Installation of the torque rod, axle top

1. Before installation, check the rubber bushes of the torque rods for hair-line cracks and wear.
   Check if the contact surface of the torque-rod flange (1) (see arrow) and the contact surface on the axle housing are free from grease and paint.
2. Fit the torque rod (1) with the bolts (2 and 3).
3. Tighten the bolts (2) evenly to the specified torque, see main group “Technical Data”.

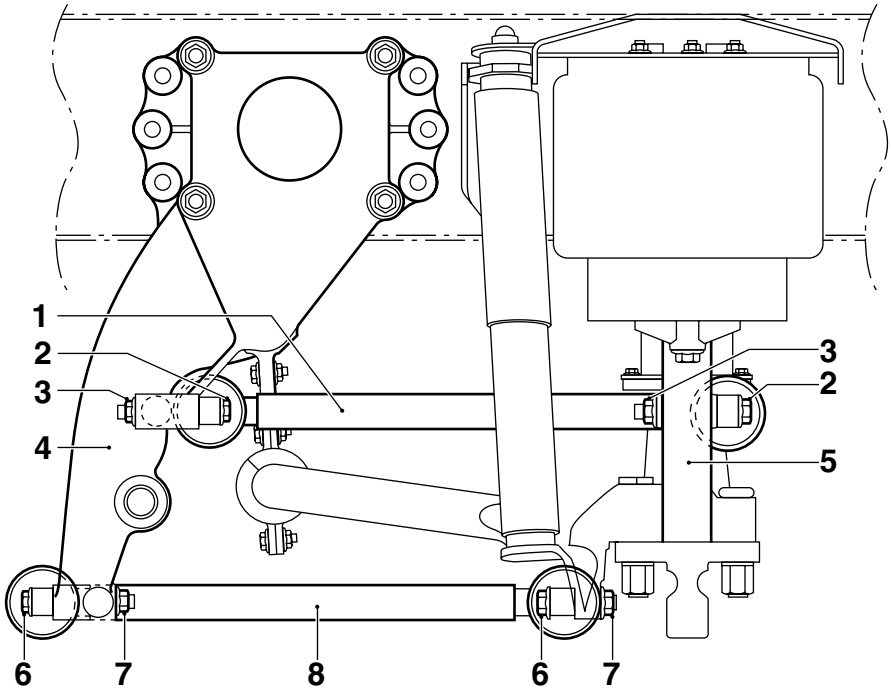
Removal of the torque rod, axle bottom

1. Remove the bolts (6 and 10) and remove the torque rod (9).

Installation of the torque rod, axle bottom

1. Before installation, check the rubber bushes of the torque rod (9) for hair-line cracks and wear.
2. Fit the torque rod (9) between the torque-rod support (5) and the yoke (13).
3. Fit bolts (6 and 10) with the heads facing towards the front of the vehicle.
4. Insert the ring (11) with the chamfered edge against the yoke.
5. Tighten the bolts (6 and 10).

2.8 REMOVAL AND INSTALLATION, SECOND-STEERED AXLE STABILISER



C9 00 161

Removal of the upper torque rod

1. Remove both bolts (2) and remove the torque rod (1).

Installation of the upper torque rod

1. Before installation, check the rubber bushes of the torque rod (1) for hair-line cracks and wear.
2. Install the torque rod (1) as shown.
3. Fit the bolts (2) with the heads facing towards the rear of the vehicle.

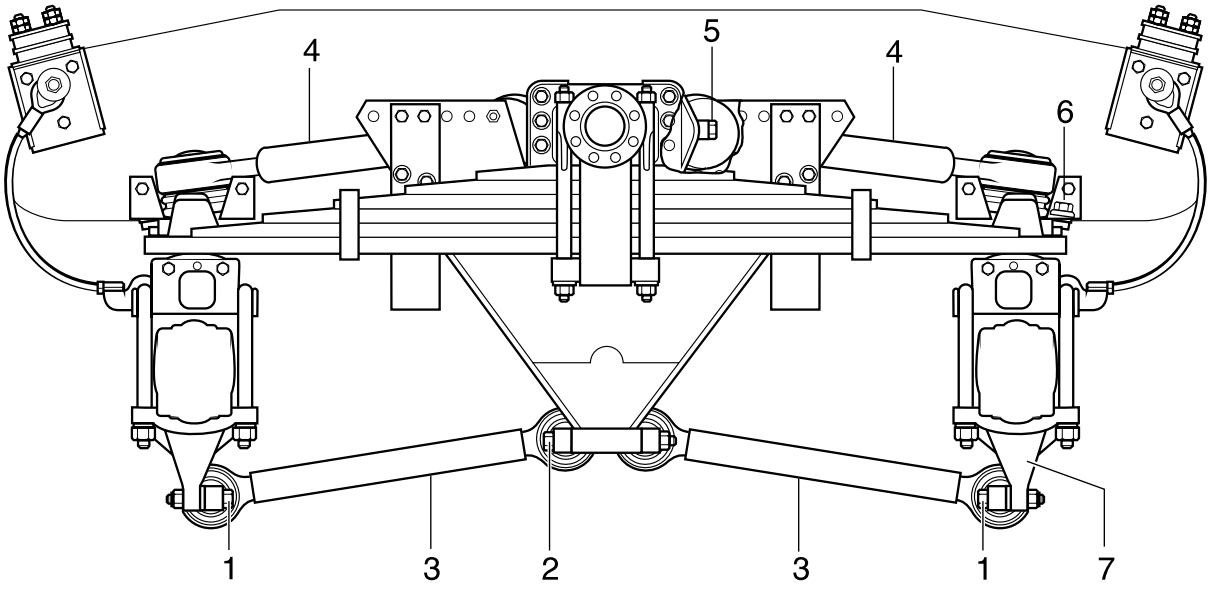
Removal of the lower torque rod

1. Remove both bolts (6) and remove the torque rod (8).

Installation of the upper torque rod

1. Before installation, check the rubber bushes of the torque rod (8) for hair-line cracks and wear.
2. Install the torque rod (8) as shown.
3. Fit the bolts (6) with the heads facing towards the front of the vehicle.

2.9 REMOVAL AND INSTALLATION, SECOND-STEERED AXLE TORQUE RODS



w9 03 011

Note:
If both the lower and upper torque rods are removed, the axles should be adequately supported, as the axles may tip over.

Removal of the torque rod, axle top

1. Remove the bolts (6).
2. Remove the bolts (5) and remove the torque rod (4).

Installation of the torque rod, axle top

1. Before installation, check the rubber bushes of the torque rods for hair-line cracks and wear.
   Check if the contact surface of the torque-rod flange and the contact surface on the axle housing are free from grease and paint.
2. Fit the torque rod (4) with the bolts (5 and 6).
3. Tighten the bolts (6) evenly to the specified torque, see main group “Technical Data”.

Removal of the torque rod, axle bottom
1. Remove the bolts (1 and 2) and remove the torque rod (3).

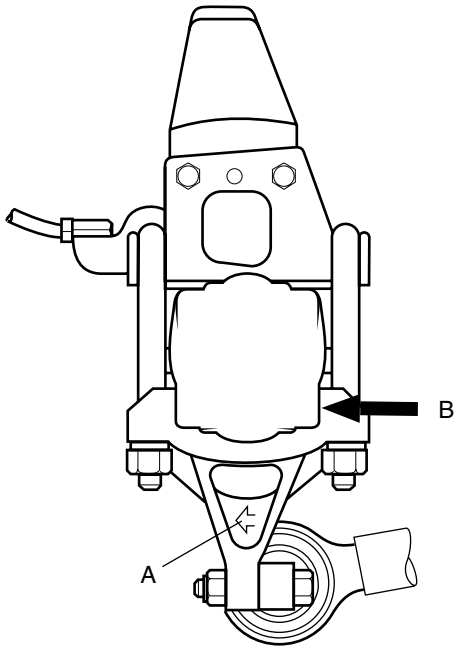
Installation of the torque rod, axle bottom
1. Before installation, check the rubber bushes of the torque rod (3) for hair-line cracks and wear.

2. Install the torque rod (3) between the brackets.

Note:
If torque-rod bracket (7) has been removed, it must be reinstalled with the arrow (A) on the bracket facing towards the front of the vehicle.

If there were any filler plates (B) previously between the torque-rod bracket and the axle housing, they must be returned to the same position. The clearance between axle housing and bracket should not exceed 0.5 mm.

3. Tighten the bolts (1).



w9 03 008

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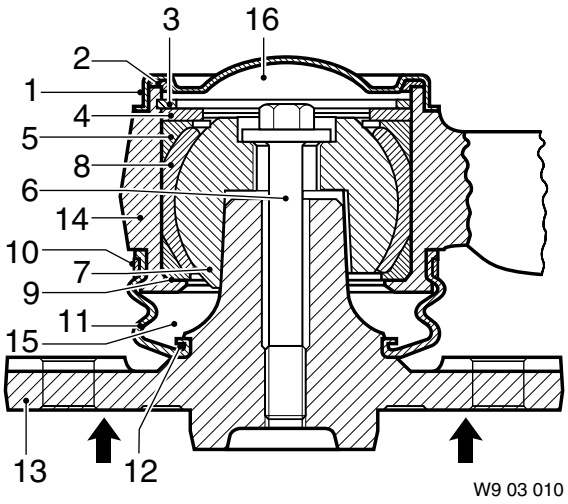
3. DISASSEMBLY AND ASSEMBLY

3.1 DISASSEMBLY AND ASSEMBLY, BALL JOINT

Disassembly of the ball joint

1. Carefully grind away the tack welds on the cover (1) and remove the cover and felt ring (2).
2. Remove the circlip (3), the steel washer (4) and the triangular spacer ring (5).
3. Remove the attachment bolt (6).
4. Screw a bolt M20 x 1,5 into the ball (7). This will drive the ball and the bearing shell (8) out of the housing (14).
5. Remove the triangular spacer ring (9).
6. Remove the clip (10) to replace the cuff (11). The torque rod can now be separated from the pin.
7. Remove the clip (12) to replace the cuff (11).



W9 03 010

Note:
It is not necessary to take the ball out of the housing if only the cuff (11) has to be replaced. Remove the bolt (6) and the clamping strip (10). By screwing an M20 x 1,5 bolt into ball (7), the torque rod is separated from flange (13), and the cuff can be replaced.

Assembly of the ball joint

1. Before assembly, thoroughly clean all parts to be re-used.
2. Fit the cuff (11) with the clip (12) onto the flange (13). Repack the cuff (space 15) with approx. 125 cc of grease.
3. Fit the triangular spacer ring (9).
4. Grease the ball (7) and the bearing shell (8) and insert them into the housing (14).

4

5. Then fit the triangular spacer ring (5), the steel washer (4) and the circlip (3), in this order. Make sure that circlip (3) is correctly fitted in the groove of the housing.
6. Fit the ball (7) which is installed in the housing onto the pin of flange (13), using the bolt (6). Tighten the bolt (6) to the specified torque, see main group “Technical Data”.
7. Attach the cuff (11) to the housing (14) with the U-bolt (10).
8. Pack the space (16) on top of ball (7) with approx. 35 cm3 of grease.
9. Carefully tap cover (1) and felt ring (2) into place with a plastic mallet.
10. Secure the cover with tack welds (3).

Note:
When flange (13) has been removed and repainted, the contact surface of the flange (see arrows on drawing) should be made free of paint before the flange is reinstalled.

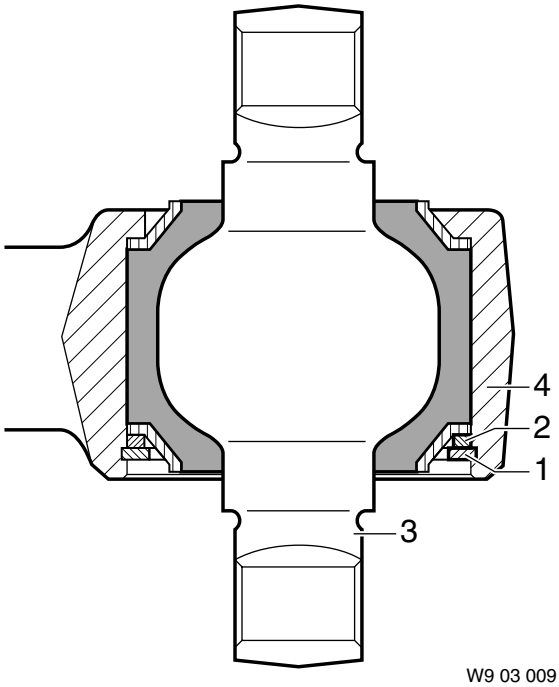
3.2 DISASSEMBLY AND ASSEMBLY, MOUNTING RUBBER

Disassembly of the mounting rubber

1. Remove the circlip (1) and the spacer ring (2).
2. Drive the pin and rubber bush unit (3) from the torque-rod housing (4).

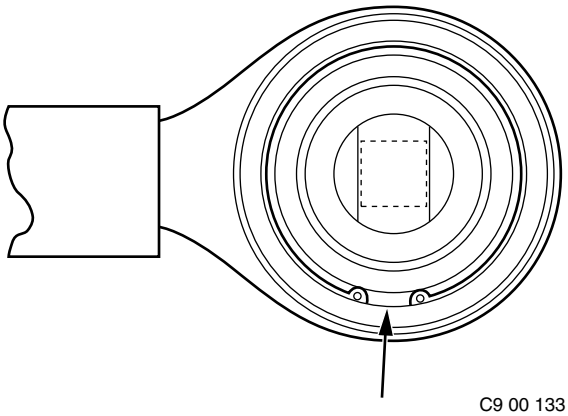
Assembly of the mounting rubber

1. Apply a thin film of acid-free vaseline or tyre grease onto the rubber.
2. Push the pin (3) from the housing (4). Make sure that the bolt holes are parallel with the torque rod.
3. Fit the spacer ring (2).



W9 03 009

4. Fit circlip (1) so that the aperture is at the bottom (see arrow in the drawing). Ensure that the circlip is correctly fitted into the groove of the housing.


C9 00 133

4

CONTENTS

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5

1. SAFETY REGULATIONS

Spring leaves
- Spring leaves should not be submitted to blasting. Blasting will cause indentations in the leaf surface which could lead to pitting corrosion.
- Corrosion should be prevented as this will considerably shorten the service life of the spring.
- Every type of damage should be prevented. Damage will considerably shorten the service life of a spring leaf.
- Spring leaves should not be heated.
- Bear this in mind when welding at the vehicle. Take precautionary measures against weld and fire damage (notching effect).
- Never hit a parabolic spring leaf with a hammer. This could cause the leaf to break.
- Replacing only the broken leaf within a spring assembly will substantially shorten the service life of the other spring leaves.

Spring brackets
Spring brackets should be removed, when:
- there is doubt about the dimensional accuracy after having been subjected to a heavy load (e.g. a collision). The spring bracket should be magnaflux tested.
  If cracks are detected, the spring bracket should be replaced. If it is not possible to magnaflux test the spring bracket, the spring bracket should always be replaced.
- such a degree of wear has occurred, that replacing is required.

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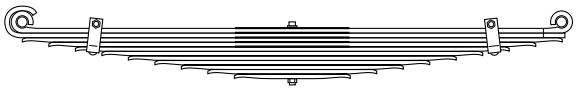
2. GENERAL

2.1 DESCRIPTION, LEAF SUSPENSION

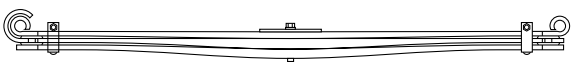
DAF uses two different types of spring assemblies on its vehicles:
trapezoidal/semi-elliptic and parabolic leaf spring assemblies.

The trapezoidal/semi-elliptic leaf spring assembly consists of a number of spring leaves of different lengths, fitted on top of each other.



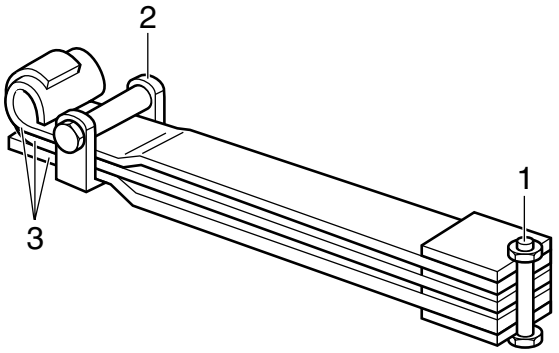
w9 04 001

The parabolic leaf spring assembly, which has fewer spring leaves than the trapezoidal/semi-elliptic leaf spring assembly, consists of several spring leaves of equal length whereby the thickness of each leaf follows a parabolic curve in relation to its length.
Except at the centre clamping and at the spring-leaf ends, the spring leaves of a parabolic leaf spring assembly should not come into contact. To that end spacer plates have been fitted between the spring leaves.
As the leaves of a parabolic leaf spring assembly do not slide over each other, they are subjected to less friction than a trapezoidal/semi-elliptic leaf spring assembly. Consequently, they give a better ride under similar stiffness conditions.



w9 04 002

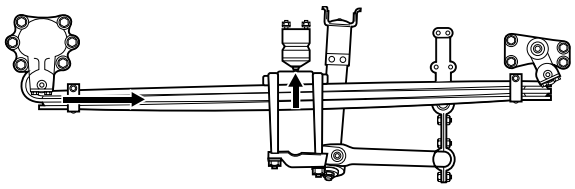
On both types of leaf spring assembly, a helper spring can be fitted.
The spring leaves (3) of both types of assembly are held together by a centre bolt (1) and spring clamps (2).
The head of the centre bolt (1) is used to centre the spring assembly.
At the front, the spring assembly is connected to the spring bracket with a shackle pin.
At the rear, the spring assembly is connected to the spring bracket with either a shackle or a slipper seat, depending on the type of vehicle.
The spring assembly is clamped to the axle housing using U-bolts. Between the spring assembly and the axle housing a wedge and/or filler block can be fitted.
The U-bolts clamp the spring leaves together as well as securing the spring assembly to the axle. The forces on the axle are therefore passed on to the spring brackets via the spring assembly.



w9 04 003

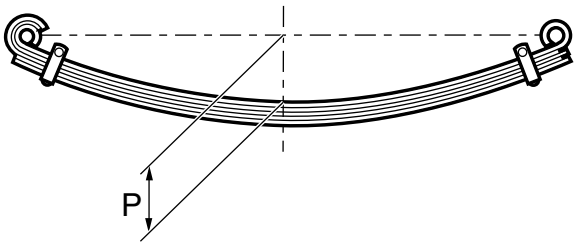
Apart from the spring function, the leaf spring assemblies also have the task of guiding the axle. This means that braking, driving and lateral forces are, via the spring assembly and the front spring bracket, passed on to the chassis.

During fierce braking on a rough road surface, the leaf spring and the spring attachment have to deal with the forces of the weight of the vehicle (which is increased by driving over holes) and with the braking forces at the same time. This results in a considerable total force on the spring assembly and the spring attachment.



w9 04 004

The sagitta
The sagitta (P in the drawing) indicates the deflection of the spring.
The spring assembly is tailored to the optimum sagitta for a laden vehicle. If possible, check the sagitta on both sides of an evenly laden vehicle.
As a result of tolerances in the manufacturing process, it is possible that the sagittas differ from each other when the springs are unloaded, but are equal when the springs are loaded.
When spring assemblies are new, the difference in sagitta is small. As a result of the settling of the spring assembly, the difference in sagitta can increase.
When the springs are loaded they become longer and the axle will move backwards. If the left and right sagittas of one axle differ too much, the result will be misalignment of both the vehicle and the axle.



W9 04 005

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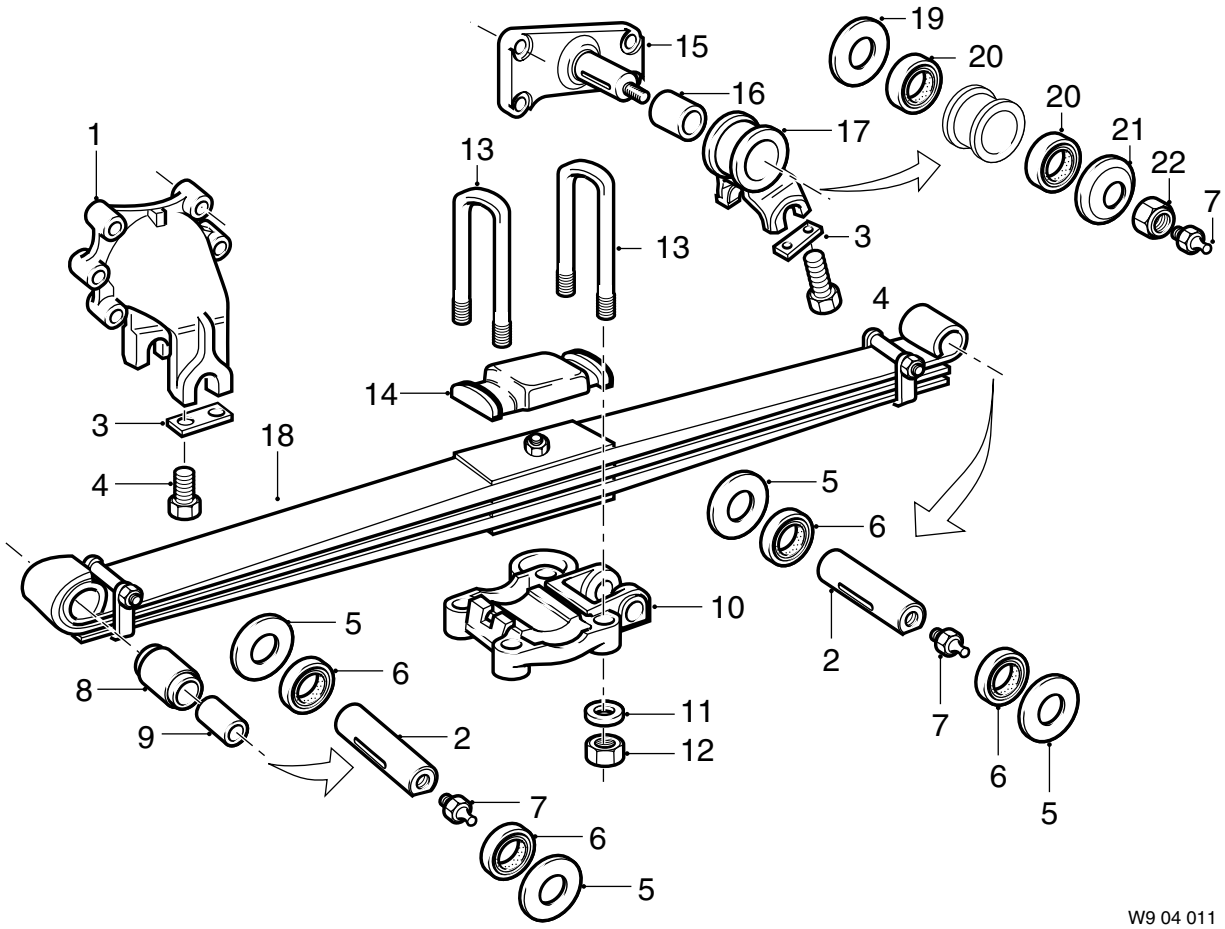
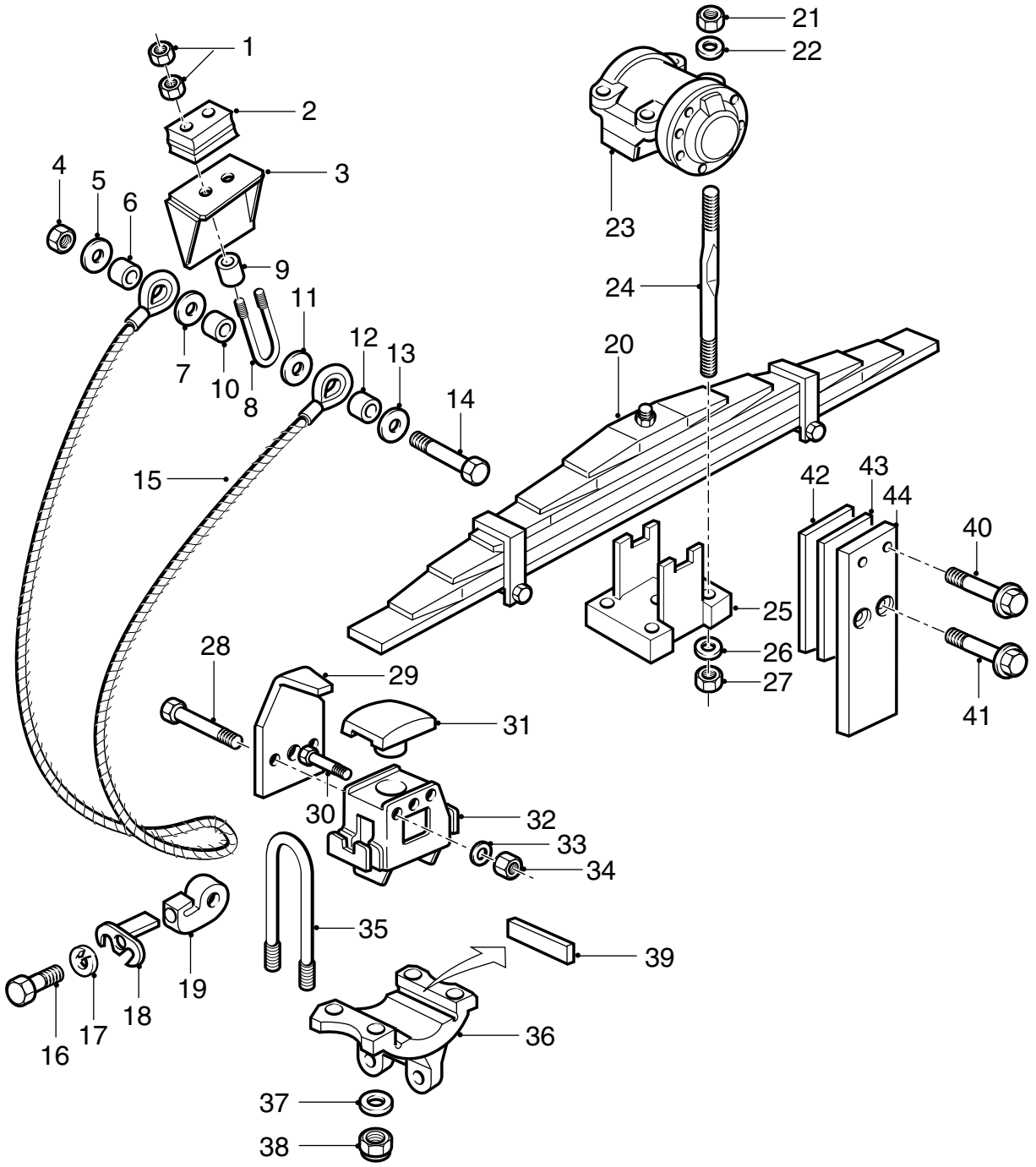
2.2 OVERVIEW DRAWING, SINGLE-AXLE SUSPENSION

Note:
This drawing gives a general view and could differ from the actual situation as found on the vehicle.



1. Spring bracket
2. Shackle pin
3. Locking plate
4. Bolt
5. Washer
6. Sealing ring
7. Lubricating nipple
8. Shackle bush
9. Bearing bush
10. Lower spring seat
11. Hardened steel washer
12. U-bolt nut
13. U-bolt
14. Upper spring seat
15. Spring shackle bracket
16. Bearing bush
17. Spring shackle
18. Leaf spring
19. Washer
20. Sealing ring
21. Closing plate
22. Self-locking nut

2.3 OVERVIEW DRAWING, TANDEM-AXLE SUSPENSION



1. Nut
2. Bump stop
3. Bracket
4. Nut
5. Ring
6. Bush
7. Ring
8. U-bolt
9. Bush
10. Bush
11. Ring
12. Bush
13. Ring
14. Bolt
15. Cable
16. Bolt
17. Ring
18. Bracket
19. Attachment block
20. Spring assembly
21. Nut
22. Ring
23. Bearing support
24. Trailing rod
25. Lower spring seat
26. Ring
27. Nut
28. Bolt
29. Plate
30. Bolt
31. Spring buffer
32. Bracket
33. Ring
34. Nut
35. U-bolts
36. Bracket
37. Ring
38. Nut
39. Filler plate
40. Clamping flange bolt
41. Clamping flange bolt
42. Plate
43. Spacer
44. Alignment plate

5

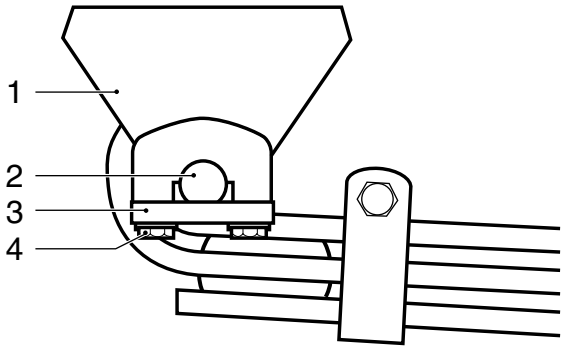
3. REMOVAL AND INSTALLATION

3.1 REMOVAL AND INSTALLATION, SINGLE AXLE SPRING ASSEMBLY

Support the vehicle securely and work safely.

Removal of the single-axle spring assembly

1. Check whether, as a result of wear, play has arisen between the side of the spring and the spring bracket.
   If there is additional play, when inserting the spring, insert oversize washers between the spring and the spring bracket.
2. Remove the U-bolt nuts.
3. Disconnect the shock absorber and stabiliser connections.
4. Jack up the chassis until the spring assembly is free of stress.
5. Secure the axle in such a way that it will stay in place when the spring assembly is removed.
6. Remove the lock bolts (4) and lock plates (3) from the front spring bracket.
7. If the spring assembly has a slipper seat connection to the chassis, remove the retaining bolt from the rear spring bracket.
8. If the spring assembly has a swinging shackle connection to the chassis, remove the locking bolts (4) and the lock plates (3) from the lower shackle pivot point.
9. Note the position of the lubricating nipple on the shackle pins.
10. To release the shackle pins, carefully jack up the chassis.
11. Remove the washers from the shackle pins and remove the shackle pins from the spring.
12. Remove the U-bolts.
13. Mark the position of the filling blocks and wedges, if any.
14. Remove the spring from under the vehicle.



W9 04 013

Installation of the single-axle spring assembly

1. Thoroughly clean and check the spring buffer and shackle bush. If necessary, replace. Check that all contact faces are free of dirt, grease and paint. Tighten the centre bolt and the spring clamp bolts.

2. Install the wedges and filler blocks (if applicable), in the correct position. When installing the spring assembly to the axle, check that the centre bolt is correctly positioned in the appropriate recess.

3. When reusing the U-bolts, check for corrosion and damage. If necessary, replace. If they are to be re-used, thoroughly clean the thread and remove any paint.
   Tighten the U-bolts provisionally. Do not forget the hardened steel washers.

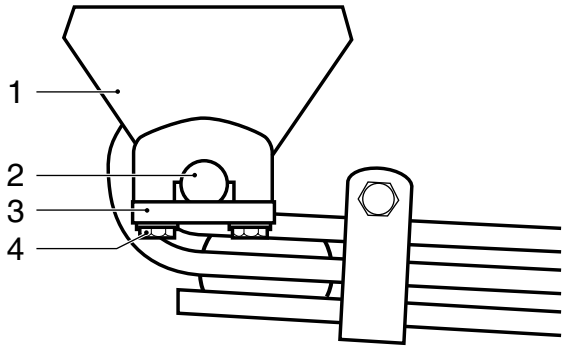
4. Before installation, thoroughly clean the shackle pins and shackle bushes.
   Apply lubrication grease to the shackle pins, shackle bushes and shackle-bush sealing rings.

5. Fit the shackle pin in the correct position (lubricating nipples on the correct side). Take care not to damage the sealing rings and washers in the process.

6. Fit a steel ring on either side of the spring. In the event of play between the side of the spring and the spring bracket, oversized washers must be inserted. For the oversizes available, see the main group “Technical Data”.
   If possible, to the left and right of the spring (or of the spring shackle) fit washers of the same thickness.

7. Lower the chassis until the shackle pin (2) just touches the spring bracket (1), but can still be rotated. Then rotate the shackle pin until its flat side is parallel with the bottom of the spring bracket.

8. Secure the lock plates (3) with the locking bolts (4). The lock plates (3) should rest against the flat side of the shackle pin (2).

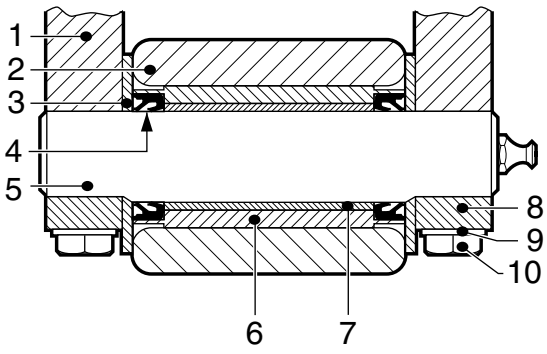


W9 04 013

9. Tighten locking bolts (4) evenly on both sides of the spring, until the shackle pin fits properly in the spring bracket.
10. Check again that the flat side of the shackle pin is parallel with the bottom of the spring bracket and tighten the lock bolts.
11. Thoroughly lubricate the shackle pins while they are in unloaded condition.
12. Lower the chassis and tighten the U-bolt nuts evenly on both sides to the specified torque, see the main group “Technical Data”.
13. Apply grease to the threaded ends of the U-bolts.
14. Install the shock absorbers and the stabiliser.
15. **Retorque the U-bolt nuts after 2500 km.**

3.2 REMOVAL AND INSTALLATION, SEALING RINGS

Removal of the sealing rings
1. Remove the spring from the spring bracket.
2. Remove the washers (3) from the shackle pin (5) and remove the shackle pin (5) from the spring (2).
3. Carefully remove the sealing rings (4) from the shackle bush (6), for example with a screwdriver.



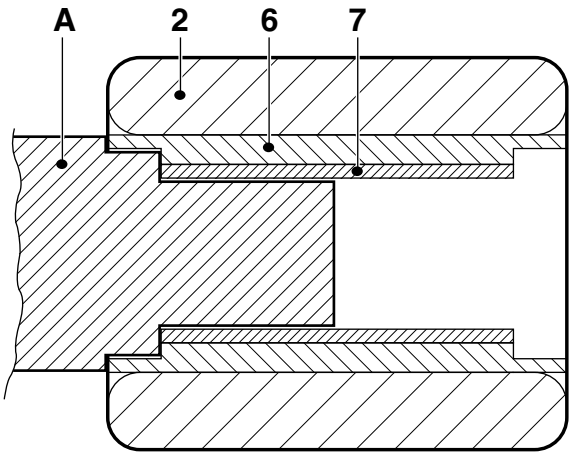
W9 04 012

Installation of the sealing rings
1. Install the sealing rings (4) with their open side at the outside (see the drawing). Grease the lips of the sealing rings.
2. Install the spring.
3. Thoroughly lubricate the shackle pins while they are in unloaded condition.
4. **Retorque the U-bolt nuts after 2500 km.**

3.3 REMOVAL AND INSTALLATION, SHACKLE BUSH

Removal of the shackle bush

1. Remove the spring from the spring bracket.
2. Remove the shackle pin from the spring.
3. Remove the sealing rings from the shackle bush.
4. If there is sufficient space under the vehicle, remove the shackle bush (6) with the bearing bush (7) from the spring eye (2) using a soft driver (A), special tool (DAF no. 0694949), for the front-axle spring and special tool (DAF no. 0694951) for rear-axle spring.
   The complete leaf spring assembly will have to be removed if either the shackle bush (6) sits too tightly in the spring eye (2), or there is insufficient space to use the proper driver.
   Use a press to the remove shackle bush (6) from the spring assembly.



C9 00 160

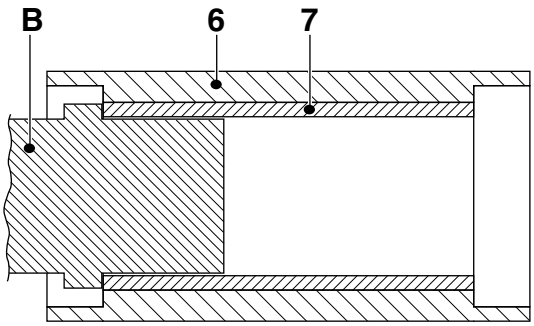
Installation of the shackle bush

1. Tap or drive the shackle bush (6) with the bearing bush (7) into the spring eye using driver (A), special tool (DAF no. 0694949), for the front-axle spring and special tool (DAF no. 0694951) for the rear-axle spring.
2. Fit new sealing rings.
3. Install the spring.
4. Thoroughly lubricate the shackle pins while the springs are in unloaded condition.
5. **Retorque the U-bolt nuts after 2500 km.**

3.4 REMOVAL AND INSTALLATION, BEARING BUSH

Removal of the bearing bush

1. Remove the spring from the spring bracket.
2. Remove the shackle pin from the spring.
3. Remove the sealing rings from the shackle bush (6).
4. Remove the shackle bush (6) with the bearing bush (7) from the spring eye.
5. Drive the bearing bush (7) from the shackle bush (6) using driver (B), special tool (DAF no.0694948), for the front-axle spring and special tool (DAF no. 06949501).



C9 00 159

Installation of the bearing bush

1. Drive the bearing bush (7) in the shackle bush (6) using driver (B), special tool (DAF no. 0694948) for the front-axle spring and special tool (DAF no. 06949501) for the rear-axle spring. The bearing bush (7) should be driven into the spring shackle (6) to the correct depth, see the drawing.
2. Fit the spring shackle in the spring eye.
3. Fit new sealing rings.
4. Install the spring.
5. Thoroughly lubricate the shackle pins while the springs are in unloaded condition.
6. **Retorque the U-bolt nuts after 2500 km.**

5

3.5 REMOVAL AND INSTALLATION, SPRING BRACKET

Removal of the spring bracket

1. Jack up the chassis until the spring assembly is free of stress.
2. Remove the lock bolts and plates from the shackle pin.
3. Jack up the chassis until the shackle pin has been removed from the spring bracket.
4. Watch the position of the attachment bolts (in view of the difference in length). Remove the attachment bolts and take off the spring bracket.

Note:
The rear spring bracket forms a whole with the cab-suspension support.

Installation of the spring bracket

1. Install the spring bracket in the same position as before removing it. Place the spring bracket at the spring-bracket outline on the chassis.
2. Check the contact surfaces of spring bracket, chassis and stiffening plates. These should be absolutely free from dirt and grease.
3. Fit the attachment bolts in the correct position and the correct location.
4. Tighten the spring-bracket attachment bolts to the specified torque, see main group “Technical Data”.

Note:
At the rear spring bracket of the front-axle spring assembly, tighten the bolts attaching the cab suspension to the spring bracket to the specified tightening torque, see main group “Technical Data” of “Group 1”.

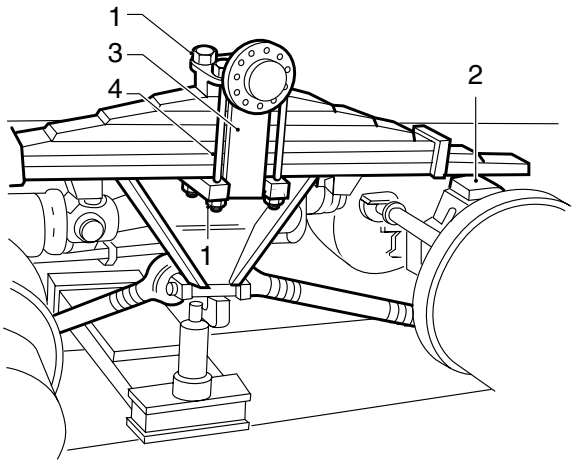
5. Fit the shackle pin.

3.6 REMOVAL AND INSTALLATION, TANDEM-AXLE SPRING ASSEMBLY

Support the vehicle securely and work safely.

Removal of the tandem-axle spring assembly

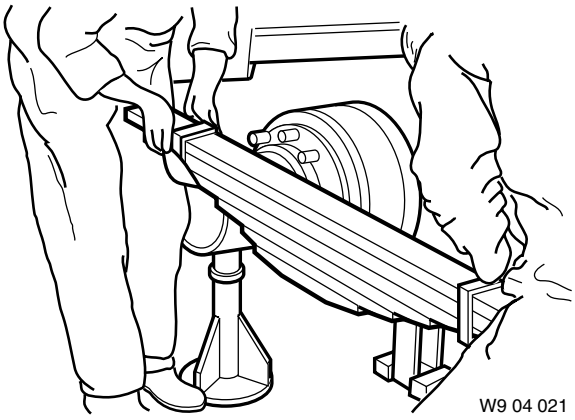
1. Support both axles and remove the wheels.
2. Jack up the chassis under the central suspension.
3. Loosen the nuts (1) of the tie rods (4) until the centre bolt comes off the shackle pivot pin.
4. Lower the chassis until the spring assembly rests on spring buffers (2).
5. Remove the tie rods (4) and the bottom spring plate (3). The spring assembly is now ready to be taken off.



W9 04 017

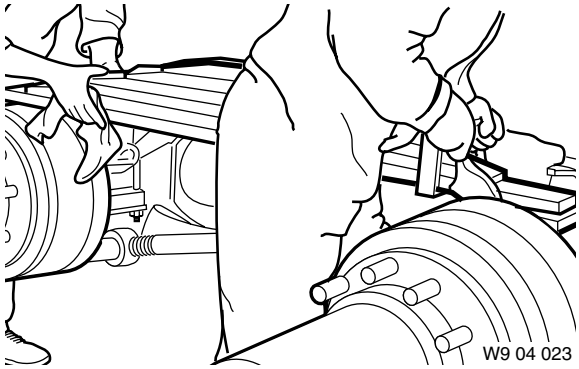
The spring assembly must be turned upside-down before taking it off. If this is not done, it might fall over when picked up.

6. Turn the spring assembly upside-down and take it off.

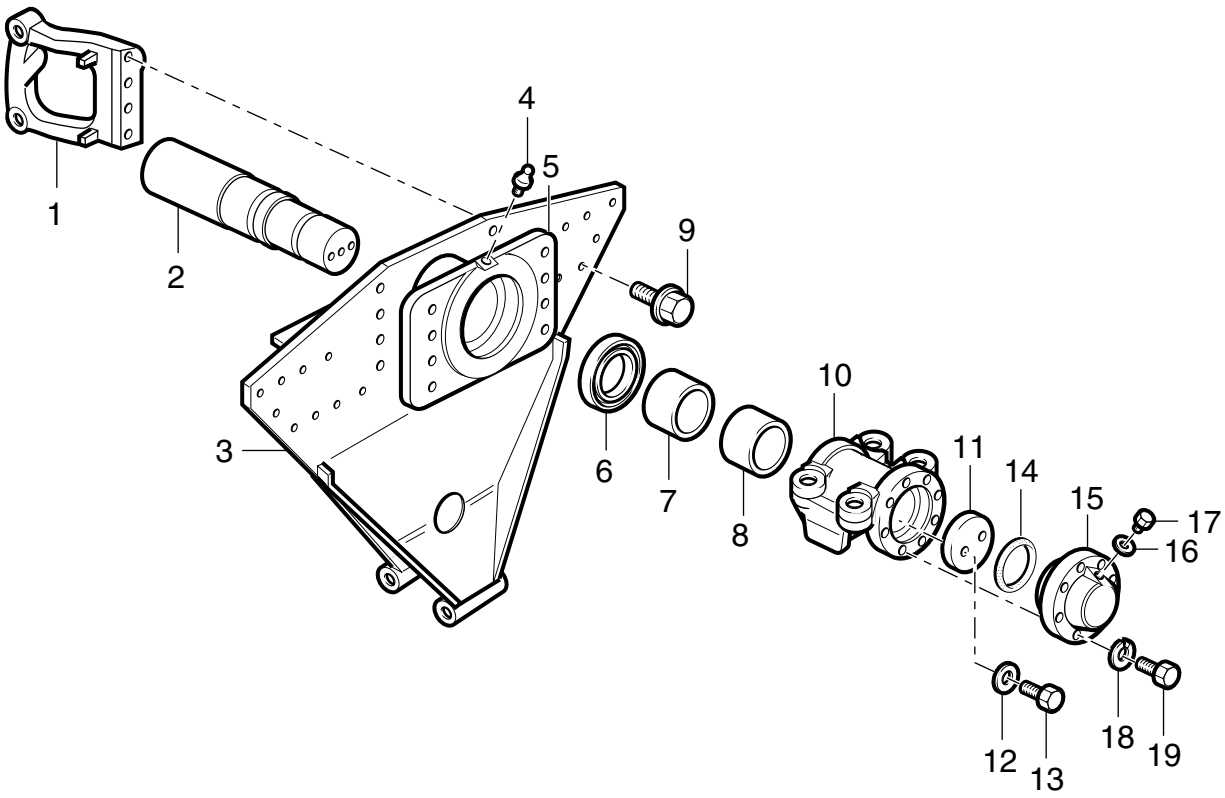

W9 04 021

Installation of the tandem-axle spring assembly

1. Put the spring assembly on the brake drums. Turn the spring assembly right side up again, so that the short side is on top again.
2. Put the front of the spring assembly on the spring buffers. This will prevent the spring assembly from tipping over.
3. Install the tie rods and the bottom spring plate.
   When tightening, check that the centre-bolt head is located in the recess of the bearing support and that the alignment plates fit onto the cams of the bearing support.
4. Lower the chassis.
5. Tighten the tie rods to the specified tightening torque, see main group “Technical Data”.
   Make sure that the nut fully engages the tie rod.
6. Apply grease to the threaded ends of the tie rods (sticking out above the nuts).
7. Put the wheels back on.
8. **Retorque the tie-rod after 2500 km.**



3.7 REMOVAL AND INSTALLATION, PIVOT PIN



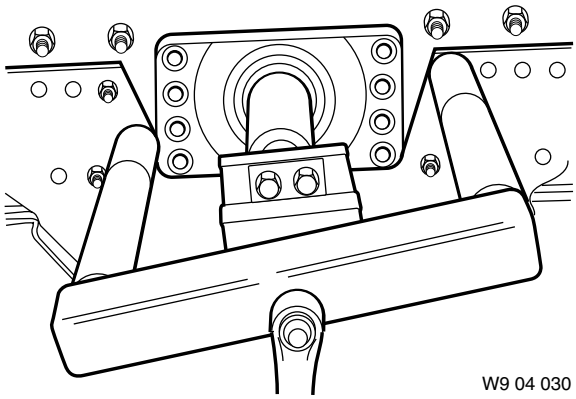
W9 04 025

Removal of the pivot pin

1. Remove the spring assembly.
2. Remove the pivot-pin cover (15) and collect the oil.
3. Remove the O-ring (14).
4. Remove the two bolts (13) from the locking plate (11).
5. Remove the locking plate (11).
6. Take bearing support (10) off the pivot pin (2).
7. Take the oil seal (6) out of the bearing support (10).
8. Remove the bearing bushes (7 and 8) from the bearing support (10), using a suitable driver.

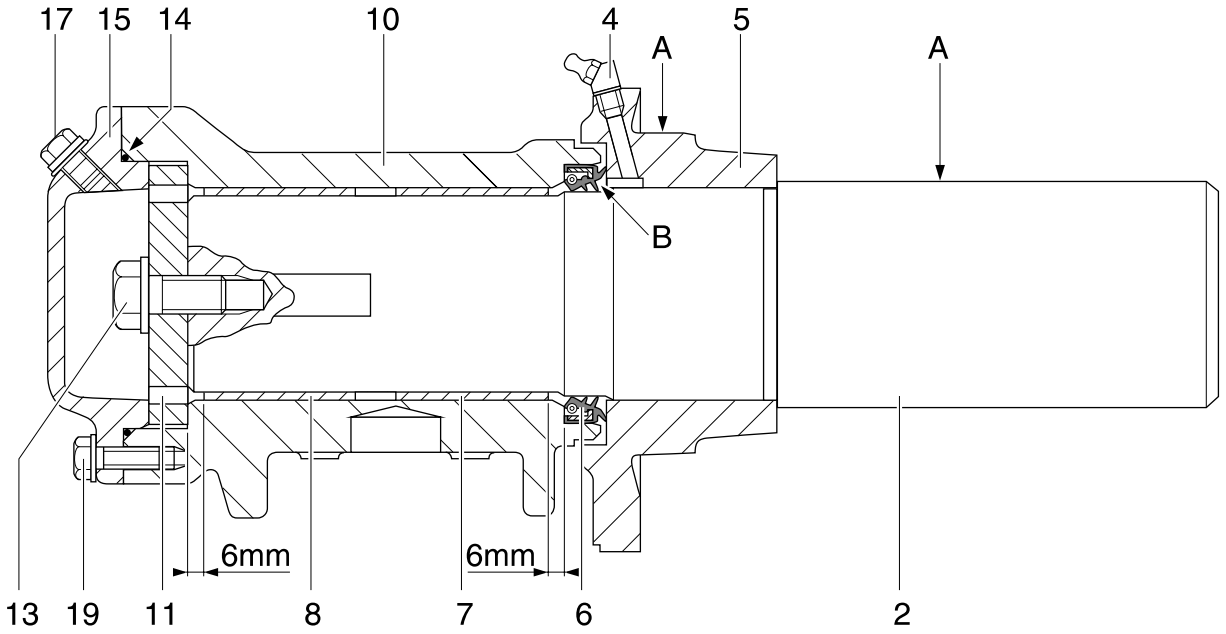
9. Remove the flange bolts (9) from the pivot-pin flange (5) and use a suitable puller to pull the pivot pin flange together with the pivot pin (2) out of the chassis.

10. Drive the pivot pin (2) out of the pivot-pin flange (5).



W9 04 030

Installation of the pivot pin



W9 04 035

1. Check the oil-seal chamber in the bearing support for damage.
   Check the pivot pin for damage to the oil seal running surface.

2. Drive pivot pin (2) into pivot-pin flange (5).

3. Apply a thin film of oil to surfaces (A) of pivot pin (2) and pivot-pin flange (5) and reinstall them in the chassis.

4. Fit the attachment bolts of the pivot-pin flange oil pump in a crosswise sequence and tighten them to the specified tightening torque, see main group “Technical Data”.

5. Drive the new bearing bushes (7 and 8) to the correct depth in bearing support (10).
6. Use a suitable driver to fit a new oil seal (6) in bearing support (10), with the open side facing the bearing bushes. When driving, avoid damaging the outer oil-seal lip.
7. Apply grease to the outside surface of the oil seal (6), area B in the drawing above.
8. Apply oil to the bearing bushes (7 and 8) and fit bearing support (10) onto the pivot pin. Avoid damaging the oil seal.
9. Apply Loctite 243 or an equivalent product to the attachment bolts (13), and install the locking plate (11).
10. Fit the cover (15), using a new O-ring (14).
11. Fill the pivot pin with the specified oil.
12. Lubricate the space between the bearing support (10) and the pivot-pin flange (5) with grease through the lubricating nipple. A collar of grease should be visible around the bearing support.

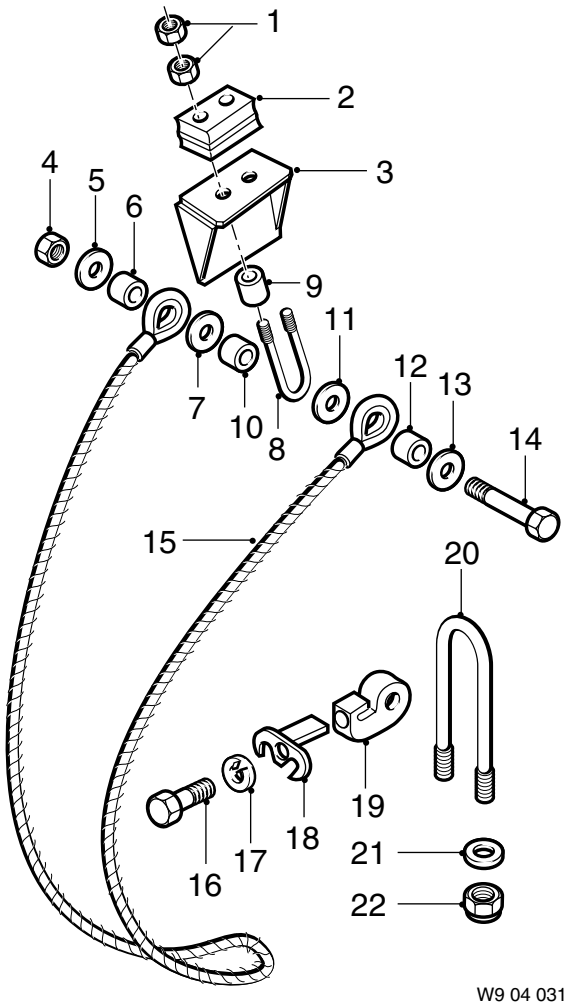
3.8 REMOVAL AND INSTALLATION, ARRESTING CABLE AND BUMP STOP

Removal of the arresting cable
1. Remove the bolt (16) and the lock plate (18).
2. Loosen the nuts (1) a little if necessary and remove the bolt (14). The cable can now be removed.

Installation of the arresting cable
1. Fit the cable to bump stop (2), using bolt (14).
2. Check if the rings (5, 7, 11 and 13) just touch the bracket (3). If not, tighten the nuts (1) until the rings just touch the bracket (3).
3. Make sure that the cable length is divided in two equal ends and fit the bolt (16) with lock plate (18). The difference in length between the two cable halves should not be more than 2 mm.
4. Grease the entire cable.

Removal of the bump stop
1. Remove the four nuts (1) and remove bump stop (2).

Installation of the bump stop
1. When reinstalling the bump stop, tighten the nuts (1) until the rings (5, 7, 11 and 13) just touch the bracket (3).



W9 04 031

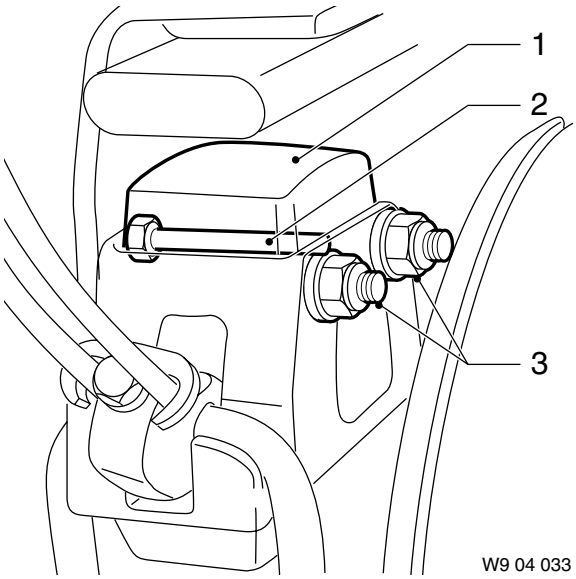
3.9 REMOVAL AND INSTALLATION, SPRING BUFFERS

Removal of the spring buffers

1. Jack up the vehicle until the spring-assembly ends are not resting on the spring buffers any more.
2. Support the vehicle securely with stands or blocks under the chassis side members.
3. Remove the two attachment bolts (3) and take off the catch plate.
4. Remove the locking bolt (2) - which lies loose in the bracket - and lift spring buffer (1) off the bracket.

Installation of the spring bracket

1. Put the spring buffer (1) on the bracket.
2. Fit the locking bolt (2) which lies loose in the bracket (1).
3. Install the attachment bolts (3) with the catch plate.
4. Remove the bracket.



5

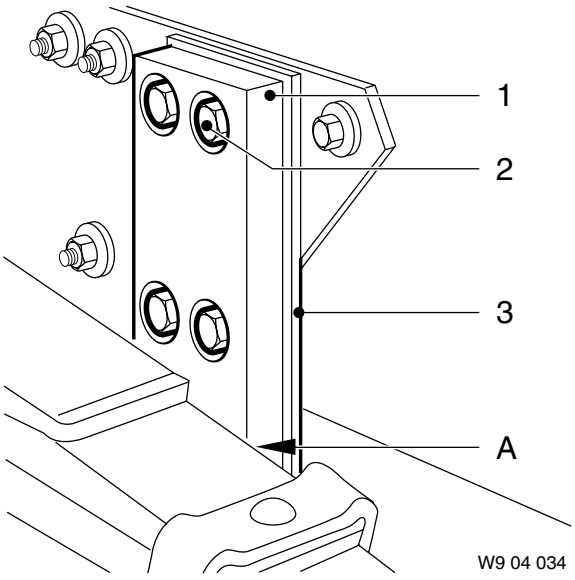
3.10 REMOVAL AND INSTALLATION, ALIGNMENT PLATES

Removal of the alignment plates

1. Remove the attachment bolts (2) and remove the alignment plate (1).

Installation of the alignment plates

1. The play (A) between the spring assembly and the alignment plate can be filled with filler plates (3) or by replacing the alignment plate.
2. Check the play after installing a new alignment plate. Adjust the play, if required.
3. Tighten the bolts (2).



5

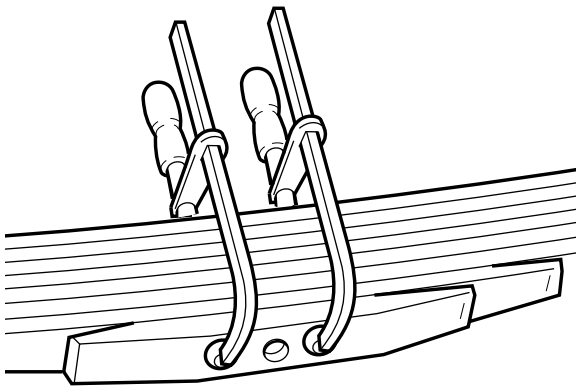
4. DISASSEMBLY AND ASSEMBLY

4.1 DISASSEMBLY AND ASSEMBLY, SPRING ASSEMBLY

Note:
Replacing only the broken spring leaf is not recommended. All spring leaves in the assembly were pre-settled together, to enable an even load distribution across all spring leaves.
A new spring leaf will not have been pre-settled and therefore does not carry an equal part (usually a larger part).
If the spring-leaf fracture was the result of ageing or overloading, it is recommended to replace the leaf spring assemblies on both sides. Otherwise, the difference in sagitta between the two sides could become too large, which would result in misalignment of both the vehicle and the axle.
We strongly advise against the renewal of parabolic spring leaves. Renewal is only allowed, if the supplier of the single spring leaf also is the supplier of the spring assembly.

Disassembly of the spring assembly

1. Disassemble the spring assembly.
2. Clamp the leaf-spring assembly in such a way, e.g. using two hand screws, that it will stay together when the centre bolt is removed (avoid damage to the surface of the spring leaves).
3. Remove the clamping bolt from both spring clamps.
4. Remove the centre bolt. Note the position of the centre bolt.
5. Carefully release the clamp pressure on the assembly.
6. The spring assembly has now been disassembled and the spring leaves can be replaced.



W9 04 006

Installation of the spring assembly

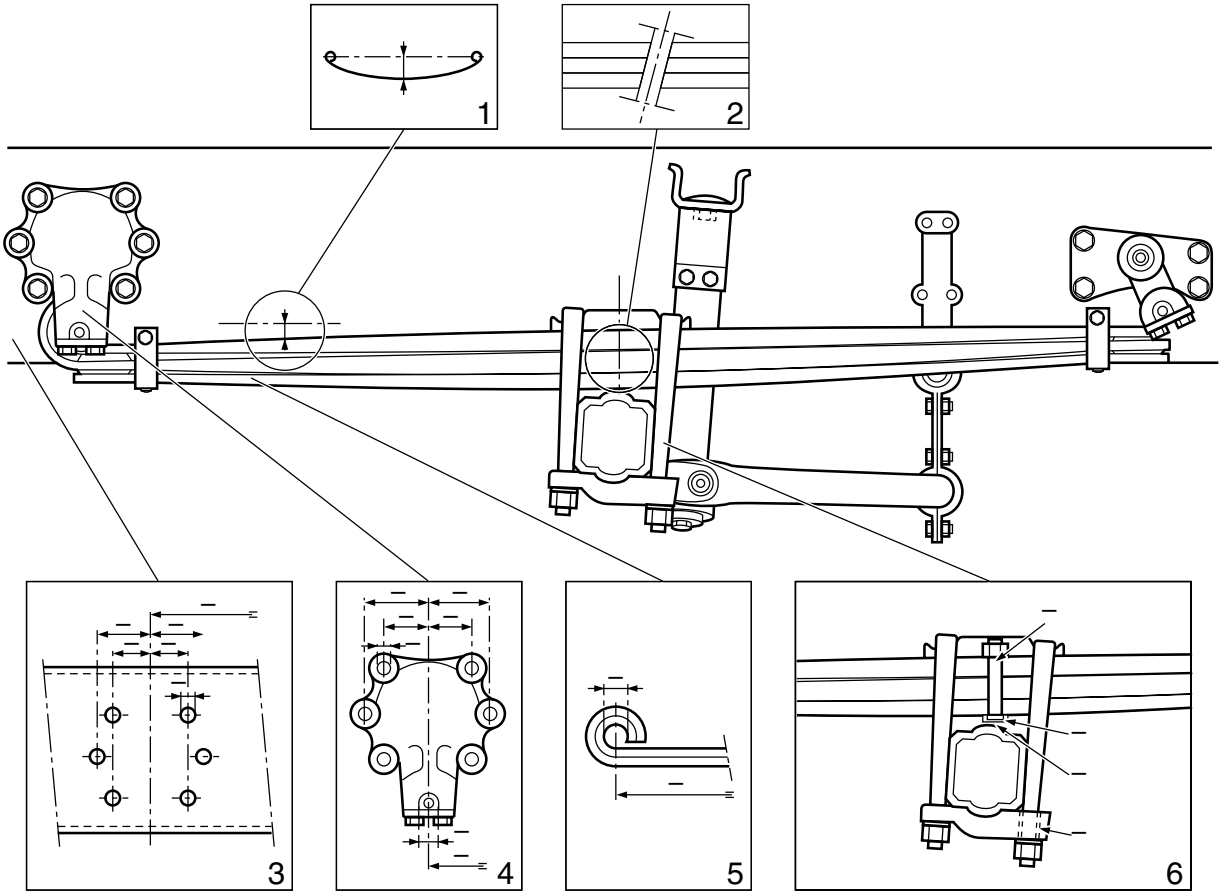
1. Neighbouring spring leaves should also be replaced if they are damaged. This means a complete assembly for a three-leaf parabolic spring assembly. Check the other spring leaves for damage. Replace these, if necessary.
2. Remove all rust from the remaining spring leaves and treat them with zinc primer.
3. Check the centre bolt for damage.
4. Put together the spring assembly. The centre bolt should not have any play in relation to the spring assembly.
5. Fit the centre bolt in the correct position and tighten it.
6. Fit the bolts of the spring clamps.

CONTENTS

6

1. GENERAL

1.1 DESCRIPTION OF POSSIBLE CAUSES OF REAR AXLE MISALIGNMENT



W9 08 001

The drawing above shows several factors which determine the position of the axle under the vehicle:

1. Difference in spring opening between the spring assemblies on the left and right due to the composition of the spring assemblies or an unbalanced vehicle load.
2. Play between the centre bolt and the spring assembly.
3. Location of the holes for attachment of the spring bracket to the chassis.
4. Dimensions of the spring bracket.
5. Dimensions of the spring eye.
6. Installation of spring assembly to the axle housing.

Points 2 to 6 are factors determined by the manufacturer. Generally, the manufacturer will ensure that the axle is positioned (within tight tolerances) at an angle of 90° in relation to the centreline of the chassis.
Point 1, however, cannot always be controlled by the manufacturer.
The difference in spring opening, which is minimal for new spring assemblies, may increase as a result of the “settling” of the spring assembly.
Furthermore, the superstructure and vehicle load may be the cause of a difference in spring opening and, consequently, misalignment of the axle.
During spring movement the axle moves backwards. If the springs on one side deflect more than on the other side because of an unbalanced vehicle or superstructure, this side of the axle will move further backwards than the other. This may cause misalignment of the axle.

The misalignment of the rear axle(s) may result in increased tyre wear.
In case of a combination (truck and trailer or a tractor and semi-trailer), a misaligned trailer or semi-trailer may cause increased tyre wear on the drawing vehicle.

2. INSPECTION AND ADJUSTMENT

2.1 INSPECTION AND ADJUSTMENT, AXLE POSITION

General

- Only use high-quality testing tools for measurements. They must be calibrated regularly and preferably be checked before every measurement.
- Position the vehicle on a flat and level surface during the measurement.
- Work with great accuracy.
- Check the position of each wheel in relation to the centreline of the vehicle (twin wheels are regarded as one wheel).
- The misalignment of a rear axle is equal to the average of the individual misalignments of the left and right wheels.
- In the case of a vehicle combination (truck with trailer or tractor with semi-trailer) the alignment of the combination as a whole must be checked. A misaligned trailer or semi-trailer may cause problems for the tractor.

Inspection of axle position

1. Make sure that the vehicle load is in accordance with the vehicle's normal load conditions. The load must be at least 40% of the permissible loading weight and be evenly distributed over the vehicle.
2. Drive the vehicle straight to the test location to avoid stresses in the chassis or in the axle suspension.

   Note:
   Avoid braking hard and do not put the vehicle on the parking brake.
3. Check the tyre pressure prior to the measurement. Adjust if necessary.
4. Check the spring opening of the spring assembly and check the axle suspension for play prior to the measurement. Any defects should be repaired first.

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5. Consult the measuring tool instructions for use and adhere to them.
6. Calibrate the measuring tool, if possible.
7. Use the tool to measure the position of each rear axle wheel in relation to the vehicle centreline in mm/m.
8. Determine the position of the rear axle in relation to the vehicle centreline on the basis of the position of the two wheels.
9. Check that the outcome is within the permitted tolerance limits. If the misalignment is beyond these limits, the axle position must be adjusted.
10. If two or more rear axles are fitted, determine the position (non-parallelism) of the rear axles in relation to each other.
11. Check that the outcome is within the permitted tolerance limits. If the misalignment (non-parallelism) of the axle is beyond these limits, the axle position must be adjusted.

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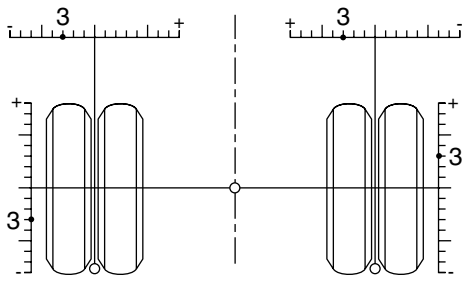
Determining the axle position
A practical aid to visualise the position of the axle is the measuring report at the end of this section.
Complete the measuring report as shown below.

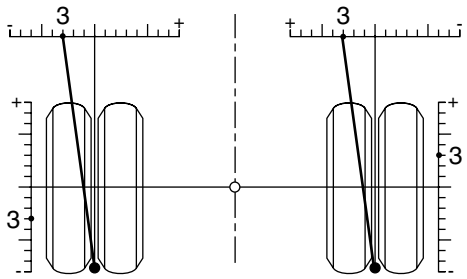
Example 1
1. Enter the measurement reading in the scales at the top and side of the measured wheel.
   In the example shown (illustration 1), the misalignment has been determined to be 3 mm/m toe-out in relation to the vehicle centreline for the left wheel and 3 mm/m toe-in relative to the vehicle centreline for the right wheel.



Afb. 1

w9 08 002

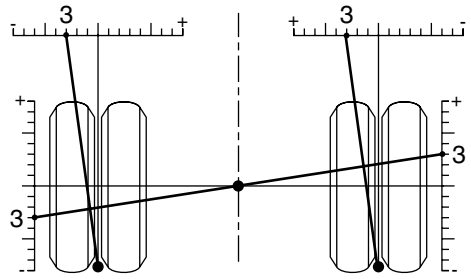
2. From the small circle at the bottom of the wheel, draw a straight line to the reading indicated on the wheel top scale. This should be done for both wheels (illustration 2).
   The wheel position in relation to the vehicle centreline is now visible.



Afb. 2

w9 08 003

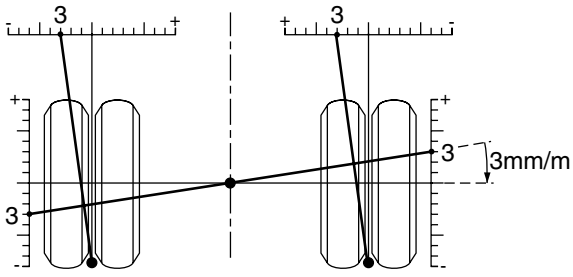
3. From the small circle in the middle between the wheels, draw a straight line to the reading on the scales at the side of the wheel. This should be done for both wheels (illustration 3).
   The axle position in relation to the vehicle centreline is now visible.



Afb. 3

W9 08 004

4. To realign the axle in this example, it would have to be rotated 3 mm/m to the right (illustration 4).

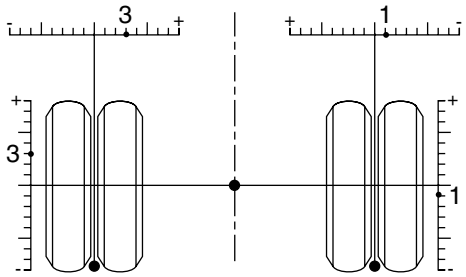


Afb. 4

w9 08 005

Example 2

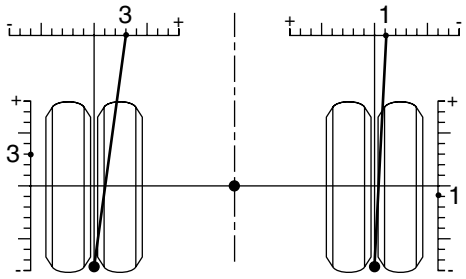
1. Enter the measurement reading in the scales at the top and side of the measured wheel.
   In the example shown (illustration 5), the misalignment has been determined to be 3 mm/m toe-in relative to the vehicle centreline for the left wheel and 1 mm/m toe-out in relation to the vehicle centreline for the right wheel.



Afb. 5

W9 08 006

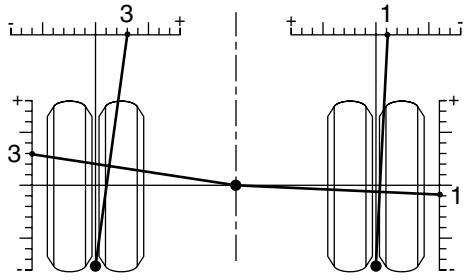
2. From the small circle at the bottom of the wheel, draw a straight line to the reading indicated on the wheel top scale. This should be done for both wheels (illustration 6).
   The wheel position in relation to the vehicle centreline is now visible.



Afb. 6

W9 08 007

3. From the small circle in the middle between the wheels, draw a straight line to the reading on the scales at the side of the wheel. This should be done for both wheels (illustration 7).
   The axle position in relation to the vehicle centreline is now visible.
   The illustration shows that this axle is not entirely straight. The wheels of this axle have a 2 mm/m toe-in in relation to each other.

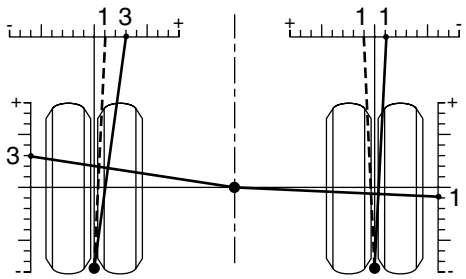


Afb. 7

W9 08 008

4. Divide the axle toe-in equally over the two wheels. The toe-in will then be 1 mm/m for each individual wheel.
   Enter this reading on the scales (illustration 8).

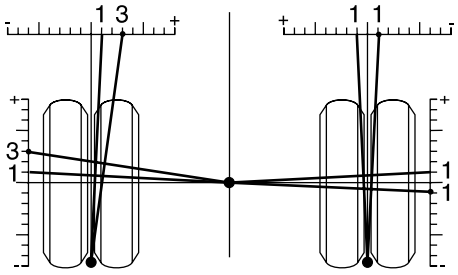
   From the small circles under the wheels, draw dotted lines to the 1 mm/m marking on the scales (illustration 8).



Afb. 8

W9 08 009

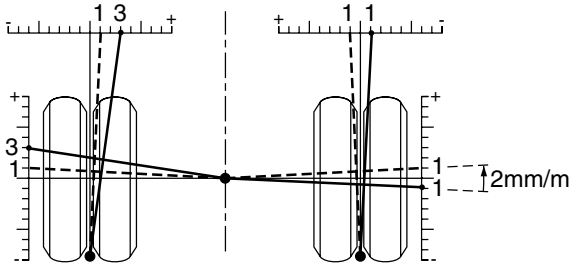
5. From the small circle in the middle between the wheels, draw a dotted line to the 1 mm/m marking on the scale at the side of the wheel. This should be done for both wheels (illustration 9).
   The ideal position of the rear axle is now shown by the dotted lines (illustration 9).



Afb. 9

W9 08 010

6. To realign the axle in this example, it would have to be rotated 2 mm/m to the left (illustration 10).



Afb. 10

W9 08 011

Example 3
This example refers to a vehicle with two rear axles.

1. The adjacent illustration shows the axles from the previous examples. The positions of the two axles in relation to the vehicle centreline have already been determined.

2. The angle (in mm/m) through which the axles should have to be rotated in order for them to be realigned in relation to the vehicle centreline, corresponds with the misalignment in relation to the vehicle centreline.
   Enter these values in the scale of the figure at the bottom of drawing 11. Take care to enter this value on the correct side (+ or – side) of the vehicle centreline indicated in this drawing.

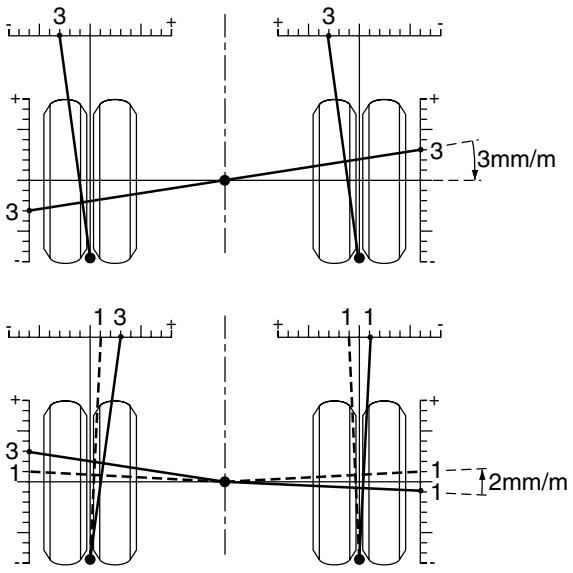
3. From the small circle in the left wheels, draw a straight line to the values on the scale (illustration 12).
   The position of the two axles in relation to each other is now visible. It can now be determined whether realigning is required and which axle must be realigned.

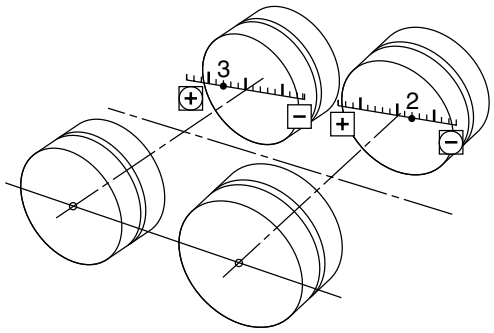
   If necessary, the required realignment can also be indicated as a dotted line in the figure.

   Note:
   Often it is only necessary to realign one of the axles to ensure that the non-parallelism of both axles in relation to each other is within the permitted tolerance limits.

4. The non-parallelism in this example is 5 mm/m. In this case it is therefore sufficient to realign the front axle only.

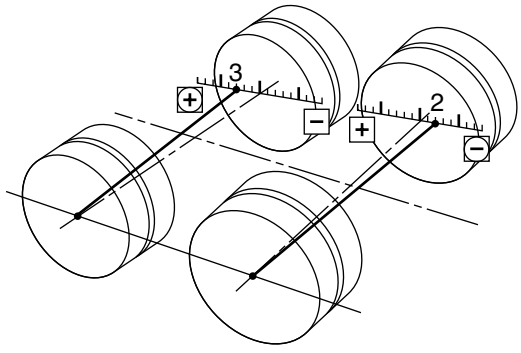
   Note:
   The realignment option depends on the type of axle suspension.





Afb. 11

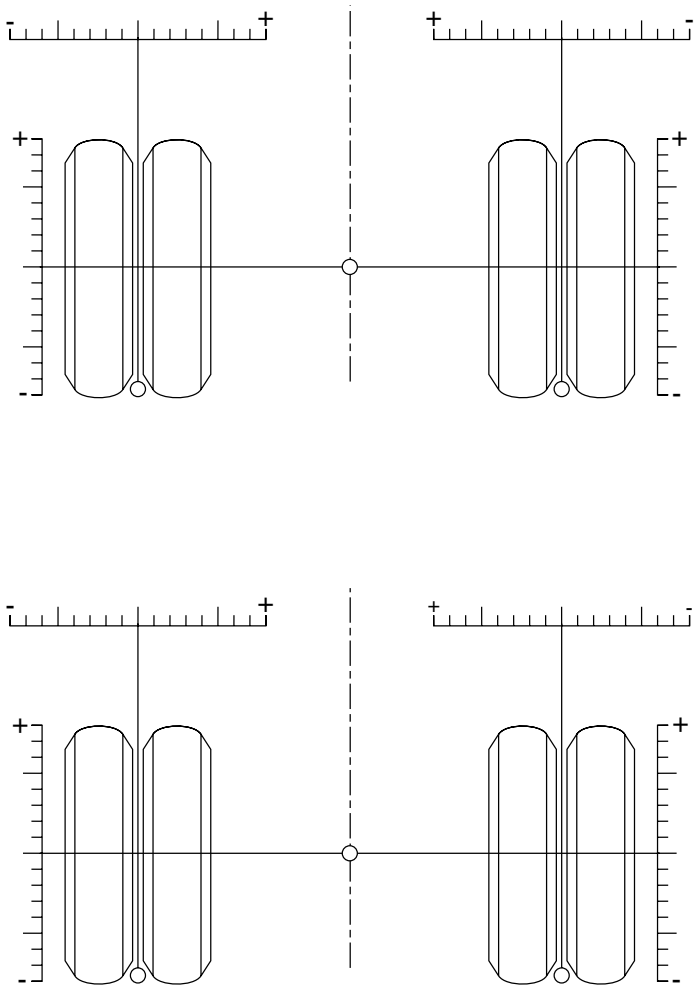
W9 08 012

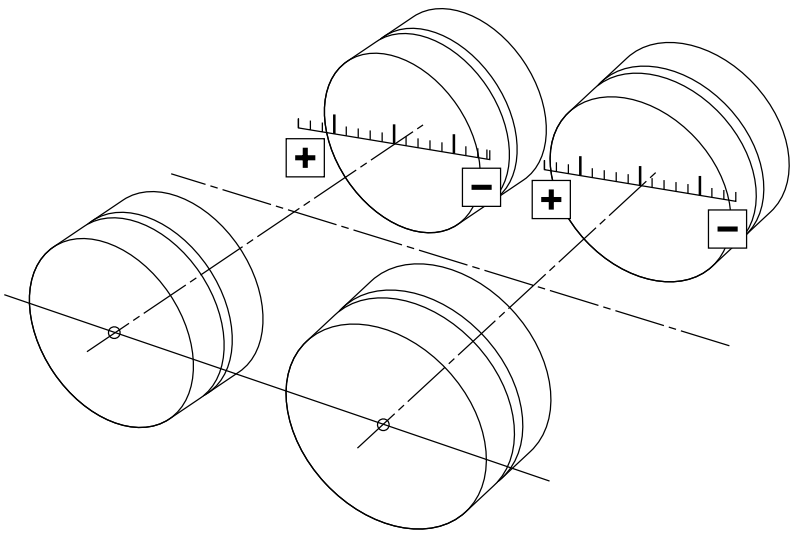


Afb. 12

W9 08 013

Measurement report

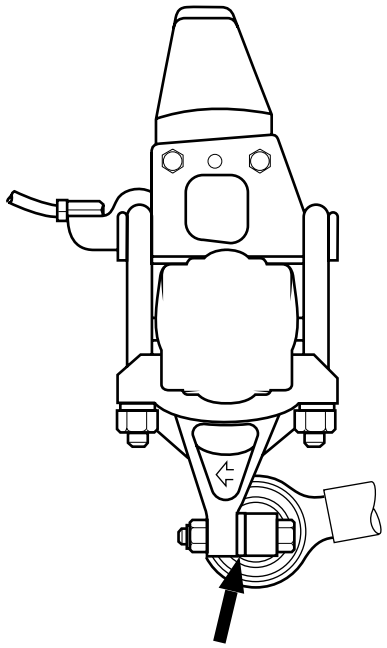




W9 08 014

Adjusting the position of the air-sprung axle(s) and tandem axle suspension

- The misalignment of the axle can be corrected by inserting a hardened steel ring (DAF no. 0202838) between the torque rod and the torque rod bracket. This ring is 3 mm thick. If necessary, grind down the ring. It is not allowed to use more than 1 ring per bolt. The use of several rings would increase the risk of a connection coming loose.
- The thickness of this shim in millimetres should be equal to the rear-axle misalignment in mm/m.

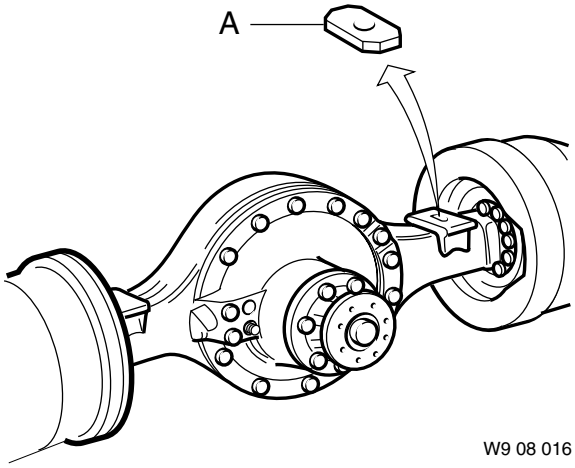


W9 08 015

Adjusting the axle position (leaf-sprung trailing axle suspension)

To allow correction of the misalignment of the driven axle in relation to the trailing axle (non-parallelism), the position of the driven axle can be adjusted.

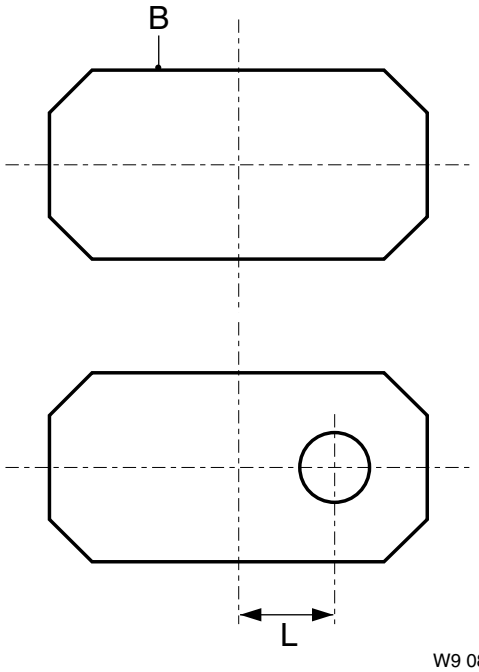
The position of the driven axle is determined by a metal block (A) placed in a recess of the axle seat.
This block contains a hole for the spring assembly centre bolt. Replacing this block with a block with the hole further to the front or the rear will cause the entire axle to shift forward or backward at that side.



W9 08 016

For correction purposes, blocks (B) without a hole can be ordered under DAF-no. 0893145. The hole must then be custom drilled in the correct position.

1. Have a block without a hole at hand.
2. Determine the misalignment of the driven axle in relation to the trailing axle in mm/m.
3. This misalignment value corresponds with the distance between the centre of the hole to be drilled and the centre of the block (distance L in the adjacent illustration).
4. Very accurately drill a ∅ 17.5 mm hole in the block in the correct place. Check the distance.
5. Remove the nuts from the U-bolts.
6. Jack up the chassis until there is sufficient clearance between the spring assembly and the axle seat. Support the chassis in a safe way.
7. Remove the metal block which is now loose in the axle seat.
8. Place the new block in the axle seat, making sure that the axle is realigned in the correct direction.
9. Fit the U-bolt nuts and tighten them to the specified torque. See “Technical data”.



W9 08 017

Adjusting the axle position, leaf-sprung axle suspension
The leaf-sprung axle suspension can only be corrected to a limited extent.
The only correction option available is to use the tolerances at the attachment of the spring bracket to the chassis.

1. To this end, loosen the spring bracket bolts and slide the bracket as far as possible in the correction direction.
2. If this is insufficient, the spring bracket on the other side of the chassis can be moved in the opposite direction.
3. Make sure that the contact surfaces between spring bracket and chassis are absolutely free from paint, grease and dirt. Tighten the spring-bracket attachment bolts to the specified torque. See “Technical data”.