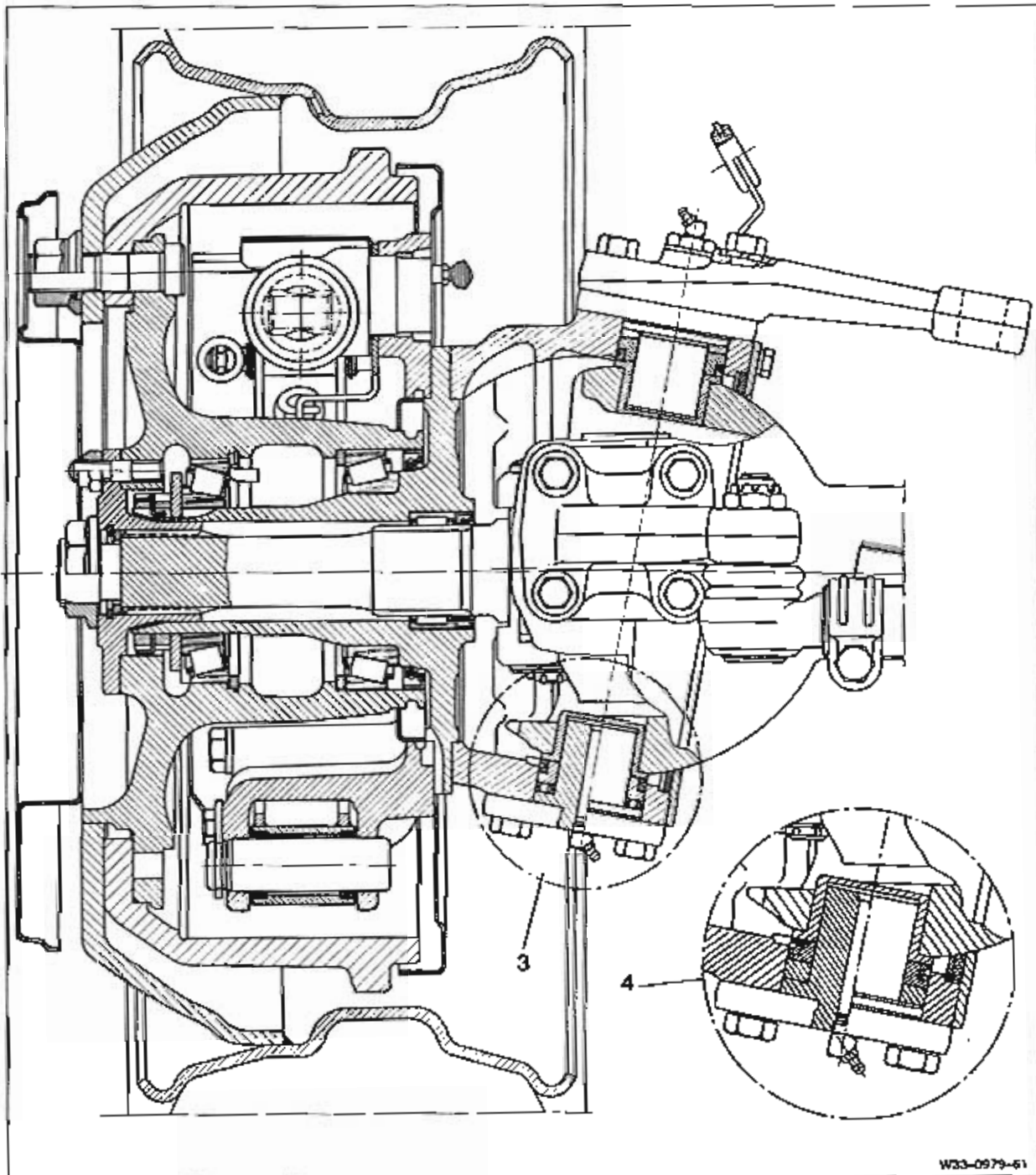


Front axle AL 3/7-4.3



Front axle AL 3/7-4.3

3 Roller bearing on steering side

4 Roller bearing on opposite side up to axle no. 2 343 639, thrust washer as of axle no. 2 343 640

33.6-004 Special tools

Designation	Part number
Open-end wrench WAF 17	000 589 21 01 00
Square mandrel	312 589 04 07 00
Serrated wrench	360 589 03 07 00
Claw wrench	731 589 00 07 00
Socket wrench insert WAF 50	000 589 12 09 00
Stud wrench insert	001 589 61 09 10
Socket wrench insert WAF 41	001 589 74 09 00
Socket wrench insert	352 589 01 09 00
Sleeve	317 589 00 14 00
Drift	305 589 00 15 00
Drift	312 589 08 15 00
Drift	312 589 13 15 00
Drift	312 589 15 15 00
Drift	314 589 03 15 00
Drift	314 589 04 15 00
Drift	337 589 00 15 00
Drift	343 589 06 15 00
Drift	360 589 00 15 00
Drift	363 589 03 15 00
Drift	387 589 02 15 00
Drift	387 589 05 15 00
Drift	389 589 00 15 00
Drift	730 589 00 15 00
Toe gauge	000 589 34 21 00
Dial gauge 1/1000 mm graduation	001 589 32 21 00
Torque wrench handle	001 589 44 21 00
Dial gauge 1/100 mm graduation	001 589 53 21 00
Measuring stock	354 589 00 21 00
Dial gauge holder	363 589 02 21 00
Extension	366 589 00 21 05
Adjusting equipment	380 589 00 21 00

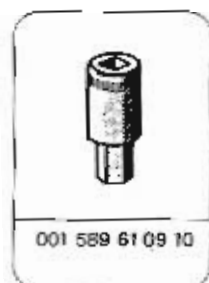
33.6-010 Oil change

Oil capacities

Hypoid gear oil SAE 90
(refer to Specifications for Service Products,
sheet 235)

5.0 l

Special tool



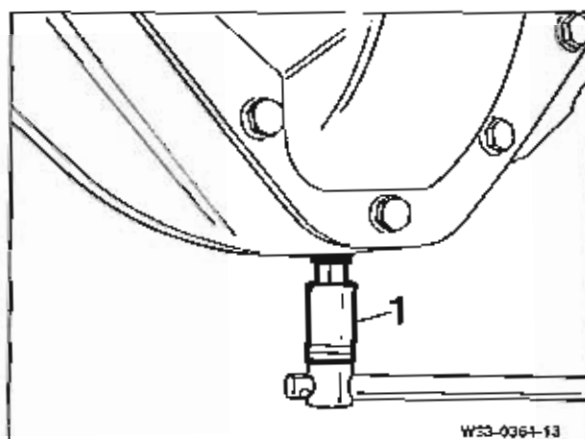
Draining oil

- 1 Drive front axle until it is warm.
- 2 Unscrew oil drain plug and drain oil.



Danger of scalding with hot oil.

- 3 Tighten oil drain plug, 100 Nm.



- 1 Saeid wrench insert 001 589 61 09 10

Repairs to axle parts

Axle parts and parts of the wheel brake are safety parts. Therefore the following work is not permitted:

- welding
- build-up welding
- heating up and straightening
- hard chrome plating
- other similar work

Stress cracks which cannot be detected externally can occur which can result in fractures and accident damage.

Mercedes-Benz cannot be held responsible for repairs which have not been carried out properly and resultant damage.

33.6-015 Adjusting wheel stop bolts

Adjustment values

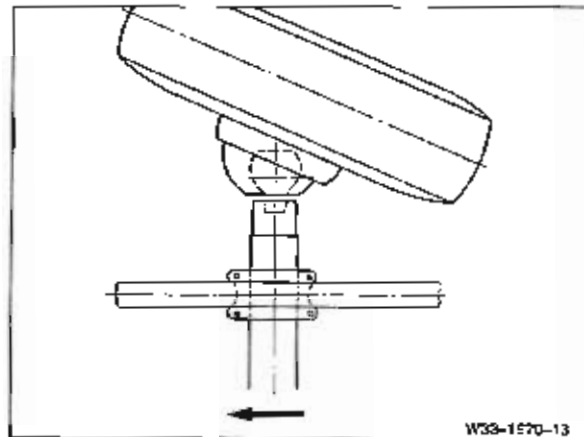
	Distance Front spring – tire	Distance Drag link – tire
Left-hand drive vehicle Right lock		min. 20 mm
Left-hand drive vehicle Left lock	min. 20 mm	
Right-hand drive vehicle Right lock	min. 20 mm	
Right-hand drive vehicle Left lock		min. 20 mm

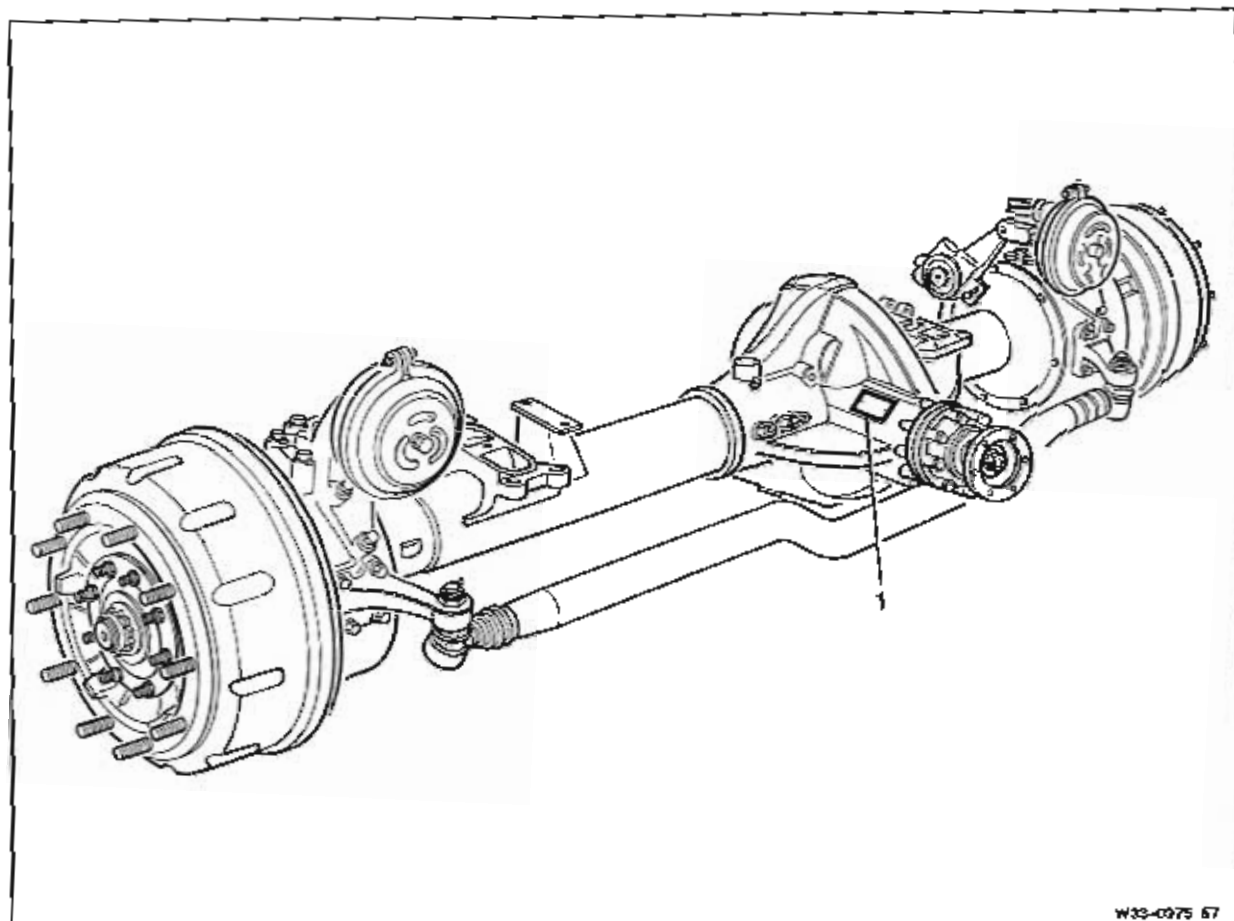
Procedure (left-hand drive vehicle)

Note

Check wheel lock each time the tires are changed and the axle is repaired.

- 1 Drive vehicle onto a flat level surface.
- 2 Position wheels in straightahead position on turntable with graduated scale.
- 3 Turn steering to the right as far as the stop on the wheel stop bolt and hold in this position.





W33-0975 57

Front axle AL 3/7 D-4.3

1 Maker's plate

Maker's plate

i = number of teeth on crown wheel/bevel
pinion = gear ratio

Typ = front axle designation

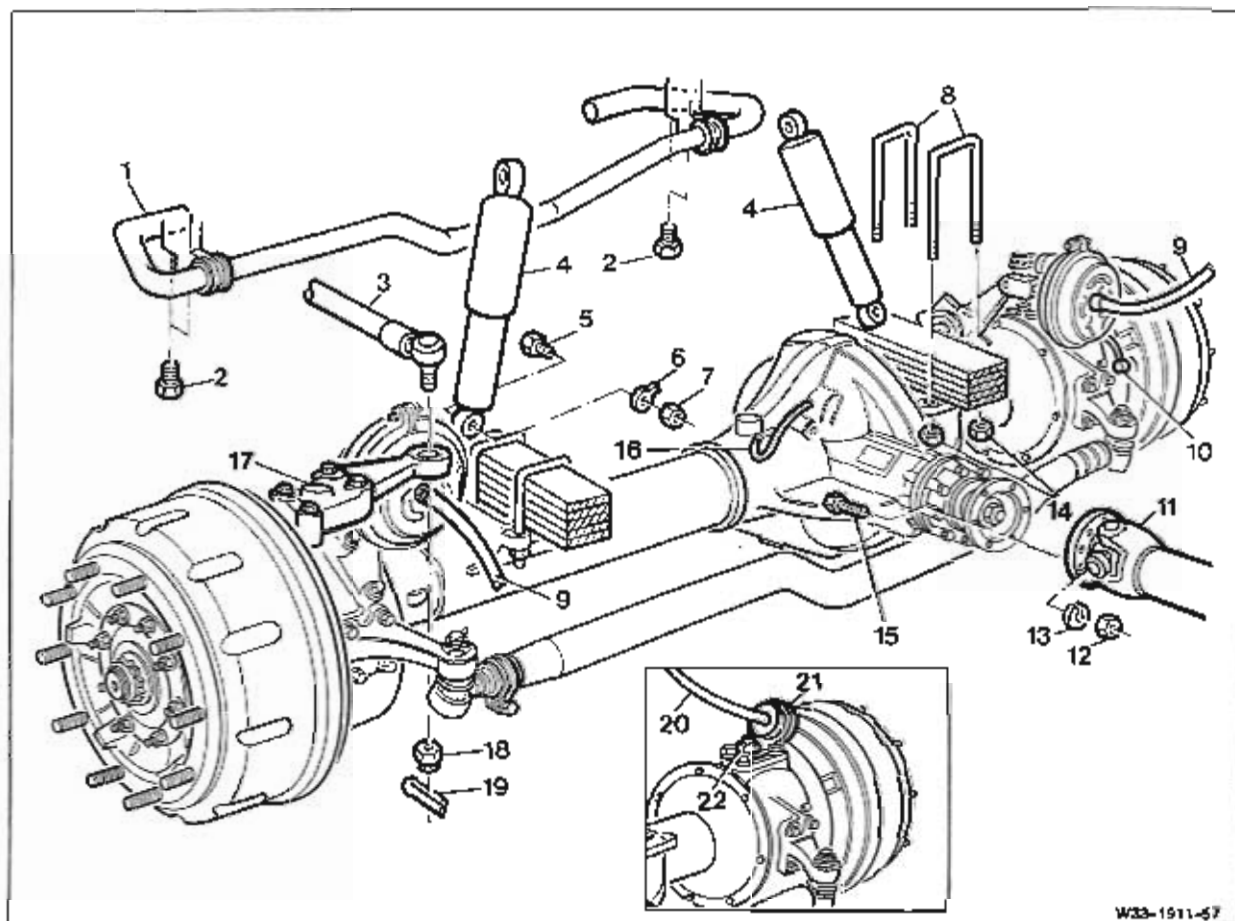
Var. = variant number

Fz = axle number



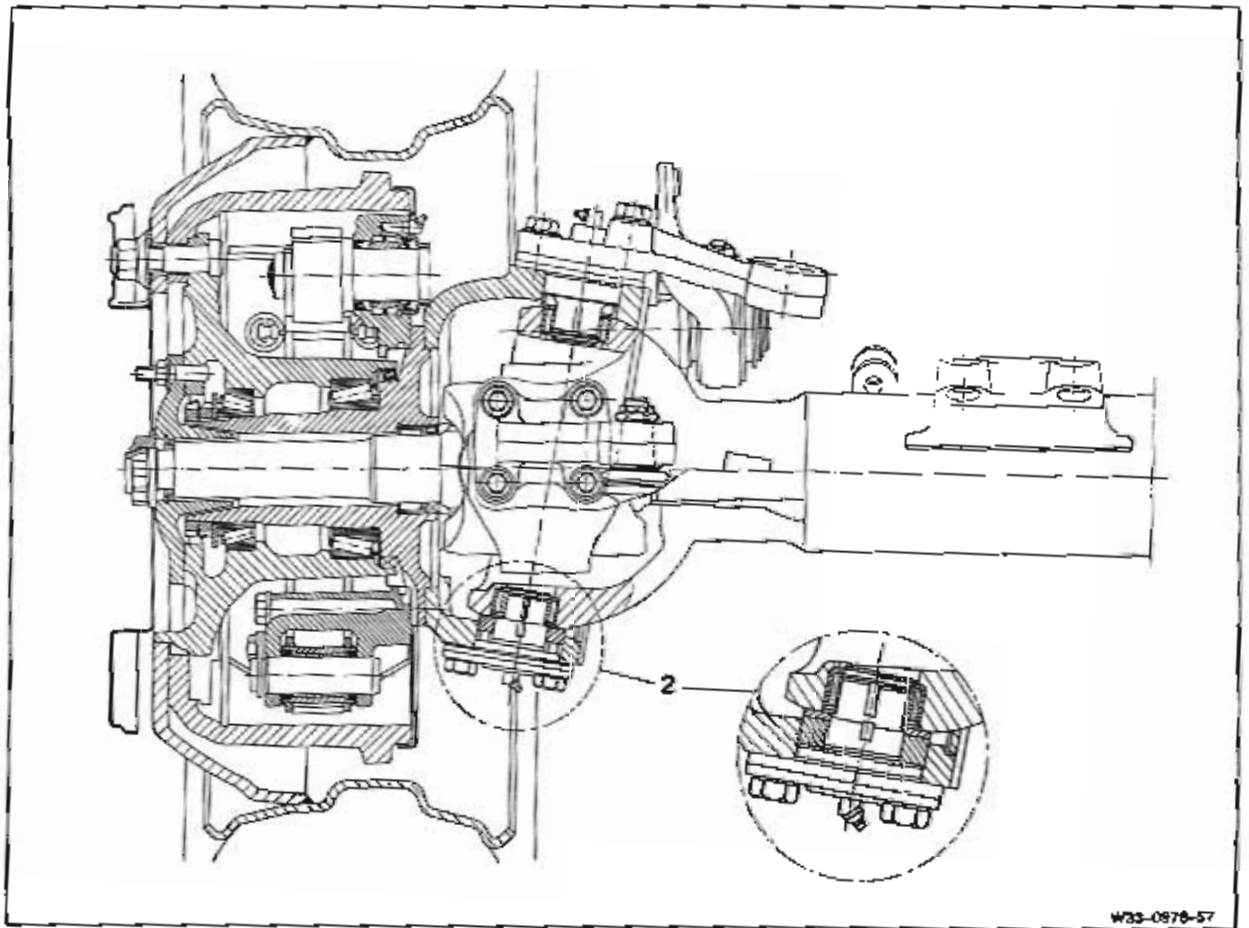
W33-0975-16

33.6-020 Removal and installation of front axle



W33-1911-57

- | | | |
|----|----------------------------|---|
| 1 | Stabilizer | |
| 2 | Hexagon bolts | |
| 3 | Drag link | Puller 318 589 00 35 00 (cone connections M24 x 1.5), puller 601 589 04 33 00 (cone connections M20 x 1.5). |
| 4 | Shock absorber | |
| 5 | Hexagon bolts | |
| 6 | Tab washers | Replace. |
| 7 | Hexagon nuts | |
| 8 | U-bolts | |
| 9 | Brake lines | |
| 10 | Sensor (vehicles with ABS) | Lubricate with Molykote 44 light silicone grease. |
| 11 | Propeller shaft | |
| 12 | Hexagon nuts | 59 Nm, open-end wrench WAF 17 mm 000 589 21 01 00, torque wrench handle 001 589 44 21 00. |
| 13 | Spring washers | Replace. |
| 14 | Hexagon nuts | 200 Nm. |
| 15 | Hexagon bolts | |
| 16 | Bleed hose | |
| 17 | Steering arm | |
| 18 | Castle nut | M24 x 1.5 = 294 Nm, M20 x 1.5 = 250 Nm. |



Front axle AL 3/7 D-4.3

2 Roller bearing on steering side, thrust washer on the opposite side

Removal, installation

- 1 Place chocks in front of and behind the rear wheels.
- 2 Loosen wheel fixing nuts slightly.
- 3 Raise the vehicle on axle tubes, as close as possible to the area of the spring support (not in the center beneath the axle casing), until the wheels are clear of the ground and support vehicle.
- 4 Remove wheels.

Installation notes

Install wheels (refer to tightening torque table).

Re-tighten wheel fixing nuts after the first 50 – 100 km.

Check toe-in, adjust if required (33.6-100).

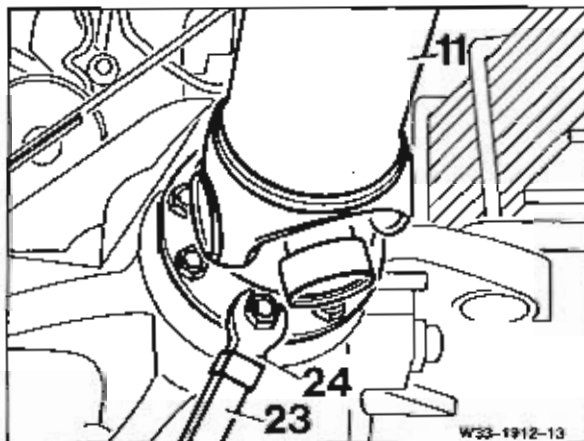
- 5 Remove propeller shaft (11) at coupling flange of bevel pinion and support.

Installation note

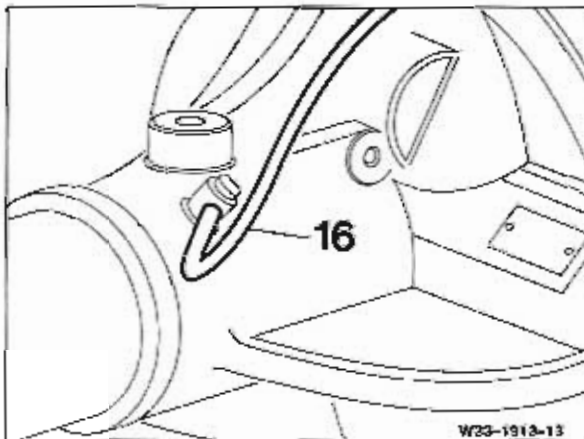
Replace spring washers, tighten hexagon nuts, 59 Nm.

23 Torque wrench handle 001 589 44 21 00

24 Open-end wrench WAF 17 mm 000 589 21 01 00



- 6 Disconnect bleed hose (16).



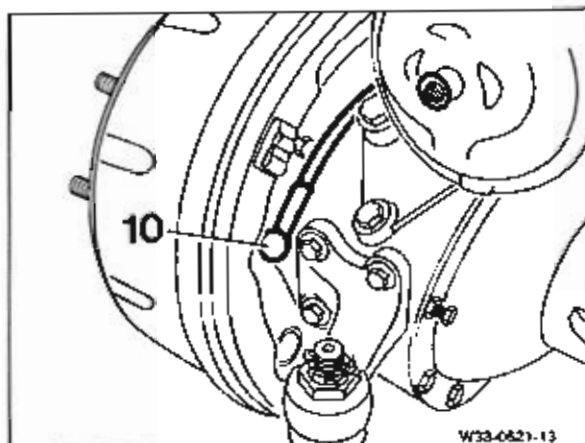
Designation	Part no.
Tester	000 589 01 23 00
Locator	337 589 02 31 00
Supporting wrench	717 589 00 31 00
Extractor	000 589 16 33 00
Internal extractor	000 589 29 33 00
Internal extractor	000 589 30 33 00
Steady	000 589 34 33 00
Steady	000 589 35 33 00
Puller	000 589 45 33 00
Internal extractor	000 589 68 33 00
Puller	001 589 19 33 00
Puller	001 589 40 33 00
Puller	035 589 01 33 00
Puller	601 589 04 33 00
Clamping ring	000 589 25 34 00
Puller	318 589 00 35 00
Pliers	360 589 01 37 00
Ratio wrench	000 589 78 63 00
Thrust piece	360 589 02 63 00

11 On vehicles with anti-lock braking system:

Withdraw sensor (10) of anti-lock braking system from brake anchor plate.

Installation note

Lubricate sensor of anti-lock braking system with Molykote 44 light silicone grease, and press into the bush as far as the stop without using impact tools.

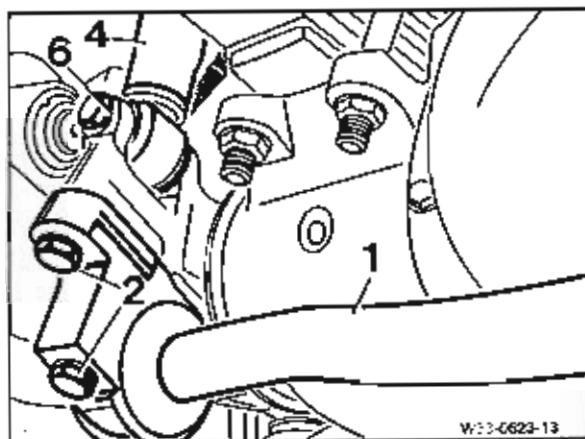


12 Remove shock absorber (4) on the front axle.

Installation note

Replace tab washers (6).

13 Unscrew hexagon bolts (2), remove stabilizer (1).

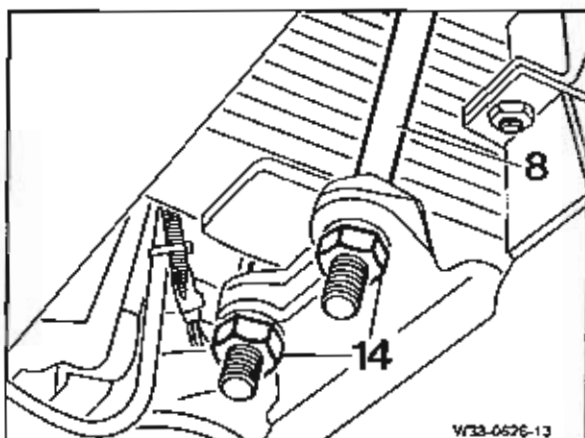


14 Unscrew hexagon nut (14) and remove U-bolts (8).

Installation note

Tighten hexagon nuts (14), 200 Nm.

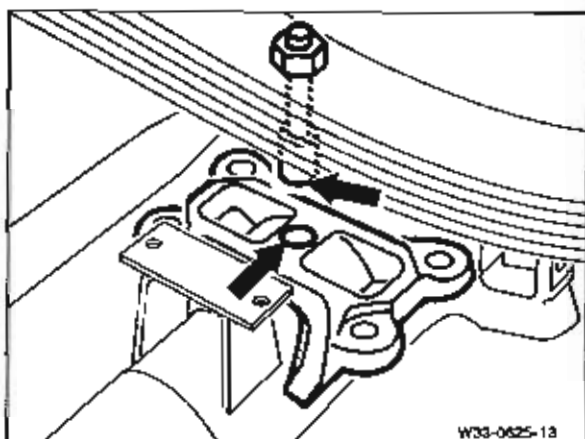
15 Lower front axle and remove from under the vehicle.



Installation notes

Raise front axle so that the center bolts of the front springs are seated in the locator bores of the spring saddles (arrows).

16 Install in reverse sequence.



Guidelines for dealing with friction linings

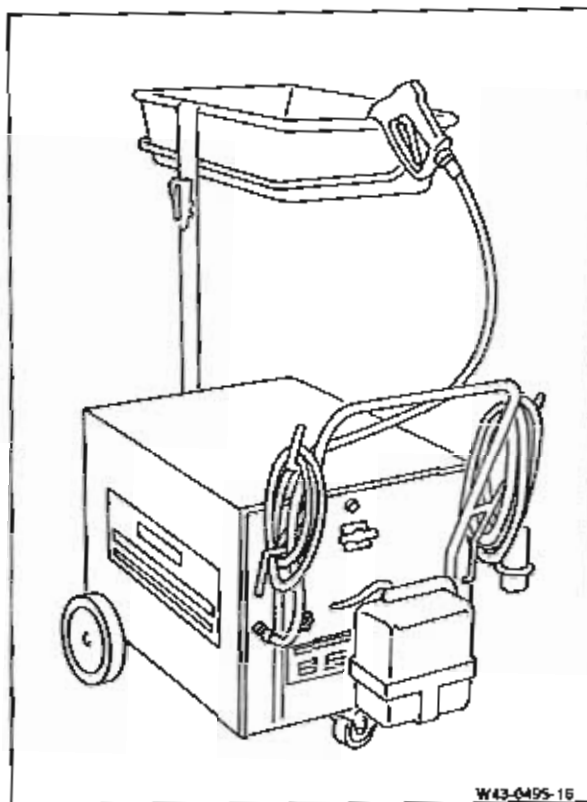
Elimination of friction lining dust

There are no longer any harmful asbestos fibers to be found in friction lining dust since they have been destroyed by thermal and mechanical loading.

In spite of this we recommend that dismantled brake and clutch parts (e.g. after removing a brake drum) are not cleaned with compressed air but the dust is to be bound and rinsed off with clear hot water at low pressure.

Non-sealed brake shoe bearings should be lightly lubricated after cleaning. If the brake drum hub is removed, rub the wheel bearing seats and the race for the sealing ring dry after rinsing and lubricate lightly.

Hot-water brake cleaner



There are no additional conditions for disposal of the contaminated water.

Notes

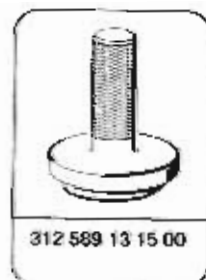
Cleaning brake linings with detergent is not permissible.

However, to clean the brake plate and small parts and in the event of subsequent replacement of the brake linings, detergent can be added to the hot-water brake cleaner via a change-over switch.

However, no high-pressure cleaner effect is to be expected from the equipment stated. It should bind the brake dust and at the same time spray the workplace as little as possible.

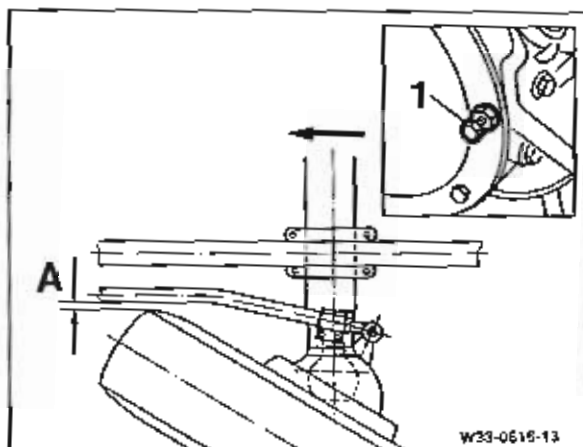
6	Shim	
7	Circlip	Pliers 360 589 01 37 00
8	External outer race	Drift 387 589 05 15 00, drift 314 589 03 15 00.
9	Outer tapered roller bearing	Wheel bearing play 0.02 – 0.04 mm, lubricate with multipurpose grease, dial gauge 001 589 53 21 00, dial gauge holder 383 589 02 21 00, extension 366 589 00 21 05.
10	Thrust washer	
11	Adjusting spindle	
12	Measuring ring (vehicles with ABS)	Axial runout max. 0.15 mm.
13	Wheel hub	Pack with 600 g multipurpose grease, puller 035 589 01 33 00.
14	Stud bolt	Check, replace if required 60 Nm
15	Internal inner slotted round nut	300 Nm, claw wrench 731 589 00 07 00.
16	Tab washer	Replace, lubricate with transmission oil.
17	External inner slotted round nut	400 Nm, claw wrench 731 589 00 07 00.
18	Driver	Coat with Omnifit FD 10 sealing compound.
19	Twelve-point nut	Replace, 250 Nm, socket wrench insert 000 589 12 09 00.
20	Brake drum	Check, turn out if required, replace, lubricate centering seat with long-life grease.
21	Self-locking hexagon nuts	
	M 12 × 1.5 N 13 001-10	85 Nm.
	or	
	M 12 × 1.5 N 13 004-10	80 Nm.
22	Wheel fixing bolts	
23	Adjusting eccentric (vehicles with hydraulic brakes)	

Tightening torques:		Nm
Disk wheels with central centering		
Flat collar nut with thrust plate (10-hole)	M 22 × 1.5	600
Disk wheels with ball centering		
Flat collar nut (10-hole)	M 22 × 1.5	450
Trilix wheels		
Round-head bolts	M 18 × 2	300
	M 20 × 2	350
Trilix rim on wheel sprocket	M 18 × 2	250
	M 20 × 2	350
Wheel sprocket to hub	M 22 × 1.5	450



4 Measure distance between tire and drag link.
Nominal value: Dimension A min. 20 mm.

If the nominal value is not attained, readjust wheel stop bolt (1), tighten hexagon nut, 95 Nm and check axle and axle parts (33.6-100).



5 Turn steering to the left as far as the stop on the wheel stop bolt and hold in this position.

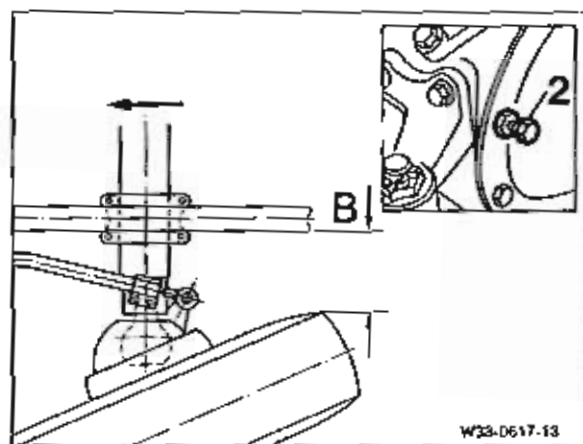
6 Measure distance between tire and front spring.
Nominal value: Dimension B min. 20 mm.

If the nominal value is not achieved, readjust wheel stop bolt (2), tighten hexagon nut, 95 Nm and check axle and axle parts (33.6-100).

Notes

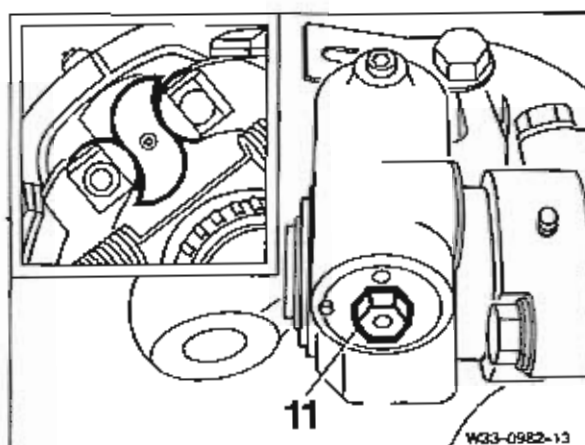
Check the hydraulic travel limiter of the power steering each time the axle stop is changed and check the clearance between the tie rod and front axle casing.

Proceed in opposite sequence on right-hand drive vehicles.

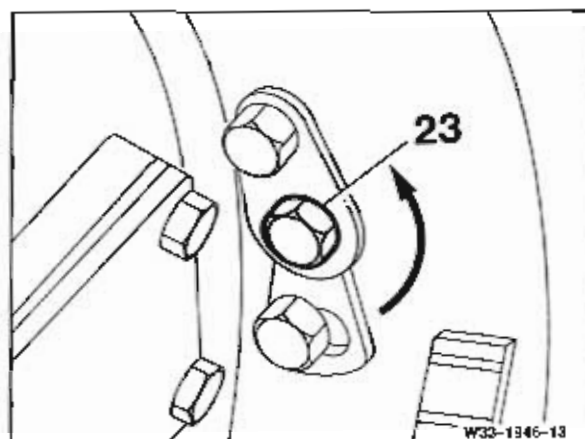


Removal

- 1 Place chocks in front of and behind the rear wheels.
- 2 Loosen wheel fixing nuts.
- 3 Raise vehicle on axle tubes, as close as possible to area of the spring support (not in the center beneath the axle casing) until wheels are clear of the ground and support vehicle.
- 4 Remove wheels.
- 5 Turn adjusting spindle (11) until the brake cams are in the zero position.



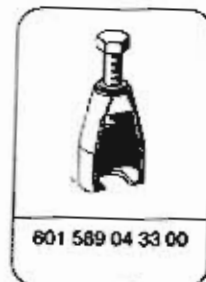
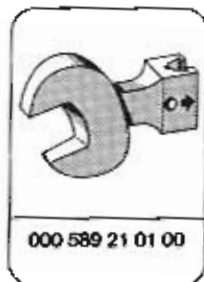
- 6 On vehicles with hydraulic brakes:
Turn adjusting eccentric (23) in the direction of the arrow until the brake drum can be turned freely.



- 19 Split pin Replace.
- 20 Brake line
(Vehicles with hydraulic brakes)
- 21 Brake line holder
(Vehicles with hydraulic brakes)
- 22 Grease nipple
(Vehicles with hydraulic brakes)

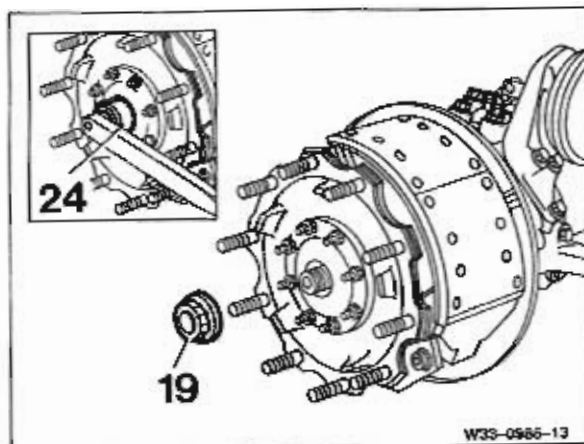
Tightening torques:		Nm
Disk wheels with central centering		
Flat collar nut with thrust plate (10-hole)	M 22 x 1.5	600
Disk wheels with ball centering		
Flat collar nut (10-hole)	M 22 x 1.5	450
Trillex wheels		
Round-head bolts	M 18 x 2	300
	M 20 x 2	350
Trillex rim on wheel sprocket	M 18 x 2	250
	M 20 x 2	350
Wheel sprocket to hub	M 22 x 1.5	450

Special tools

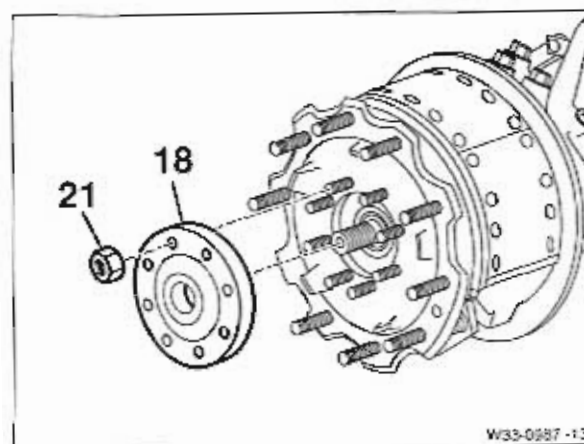


12 Unlock twelve-point nut (19) on wheel hub and unscrew.

24 Socket wrench insert 000 589 12 09 00

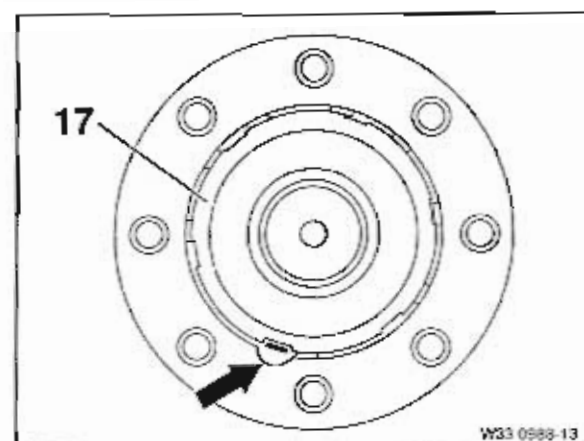


13 Unscrew self-locking hexagon nuts (21) and remove with driver (18).



14 Turn wheel hub so that the recess in the wheel hub and the bent locking tab align (arrow).

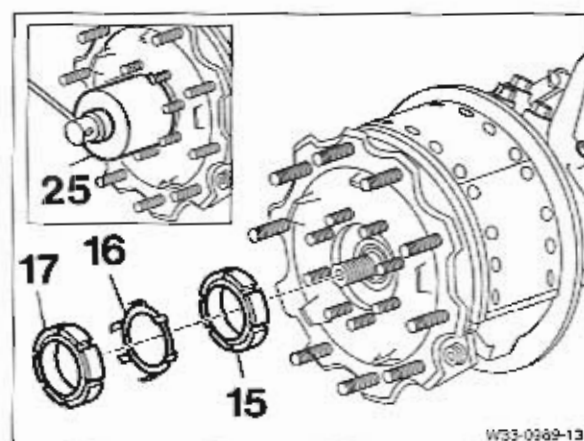
15 Unlock external inner slotted round nut (17).



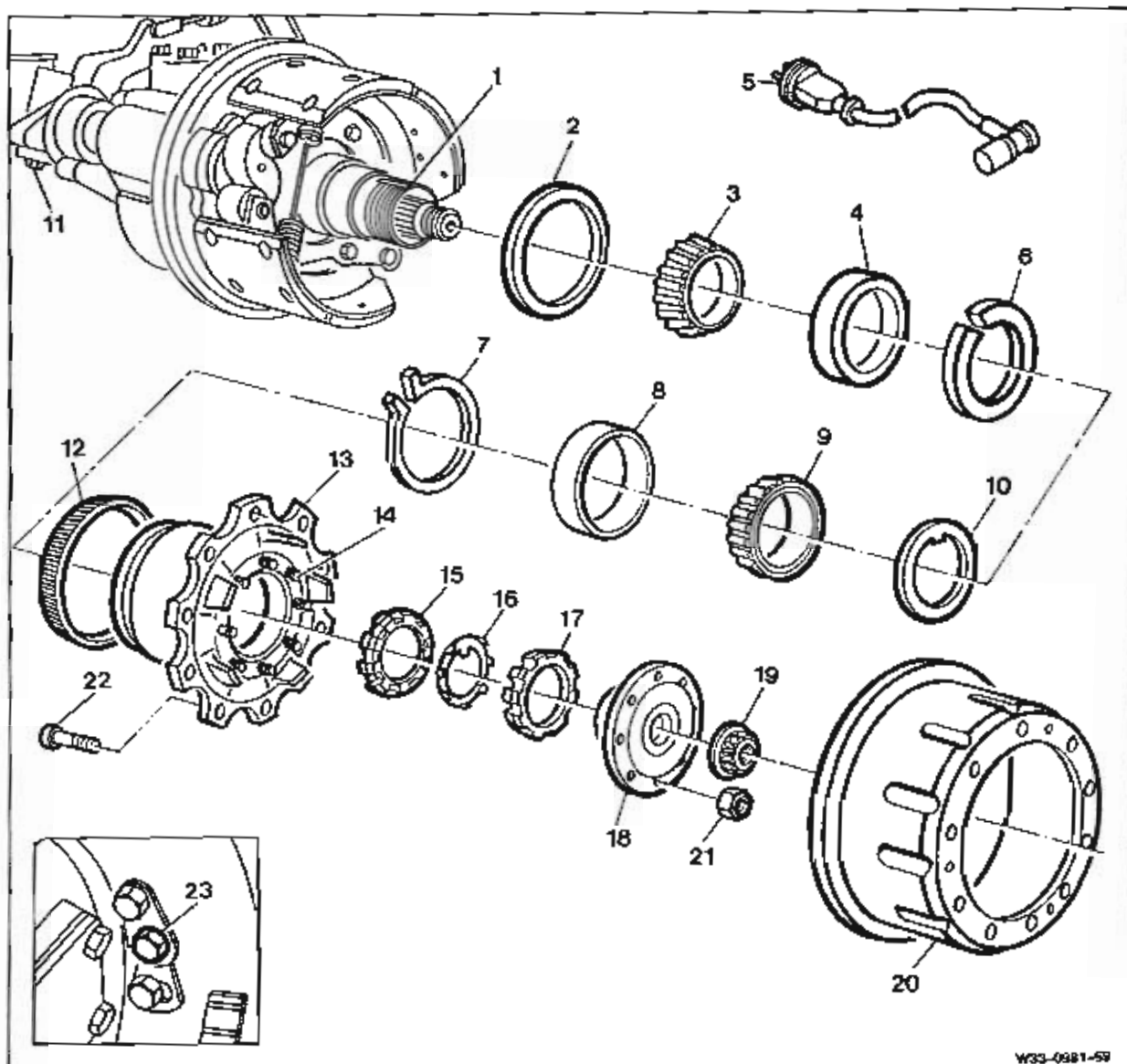
16 Unscrew external inner slotted round nut (17).

17 Remove tab washer (16) and unscrew internal inner slotted round nut (15).

25 Cls/w wrench 731 589 00 07 00



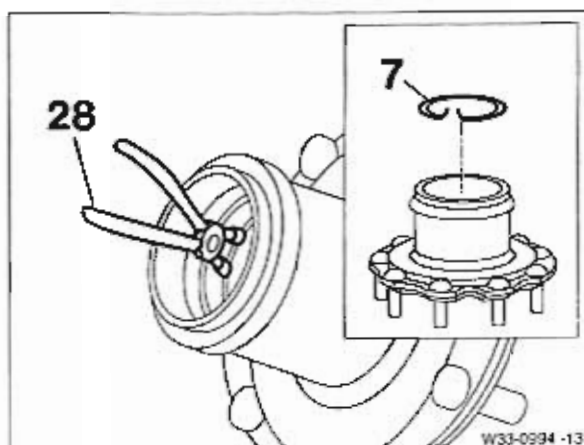
33.6-025 Removal, dismantling, assembly and installation of wheel hub



- | | | |
|---|------------------------------|---|
| 1 | Support sleeve | |
| 2 | Radial sealing ring | Replace, coat non-rubberized outer surface with Omnifit FD 10 sealing compound, drift 389 589 00 15 00. |
| 3 | Inner tapered roller bearing | Wheel bearing play 0.02 - 0.04 mm, lubricate with multipurpose grease, dial gauge 001 589 53 21 00, dial gauge holder 363 589 02 21 00, extension 366 589 00 21 05. |
| 4 | Internal outer race | Puller 000 589 18 33 00, drift 312 589 13 15 00. |
| 5 | Sensor (vehicles with ABS) | Lubricate with Molykote 44 light silicone grease. |

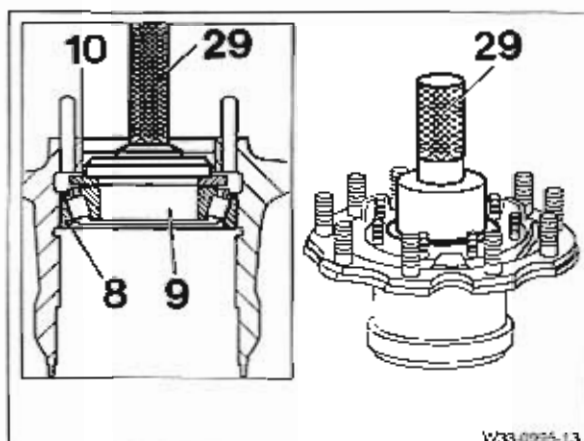
- 3 Disengage circlip (27) using pliers (28).

28 Pliers 360 589 01 37 00



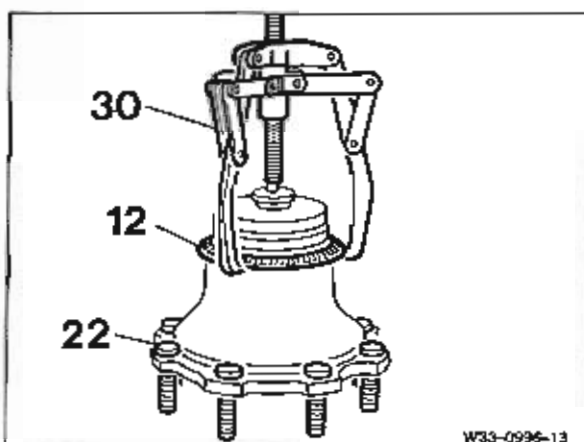
- 4 Drive out external outer race (8) with tapered roller bearing (9) and thrust washer (10).

29 Drift 387 589 05 15 00



- 5 On vehicles with anti-lock braking system:
Using 3-arm puller (30) pull off measuring ring (12).

- 6 Using a soft drift, drive out wheel fixing bolts (22).

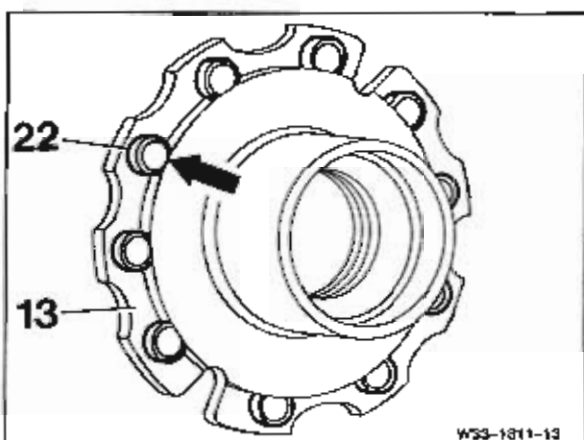


Assembly

- 1 Drive home wheel fixing bolts (22) in the wheel hub (13).

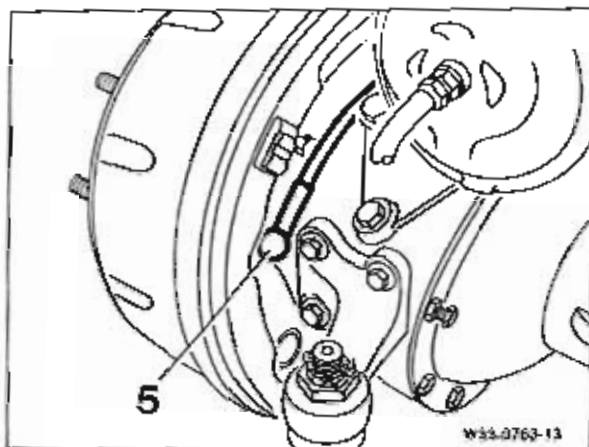
Note

When driving home, pay attention to the flat on the wheel fixing bolts (22) (arrow).

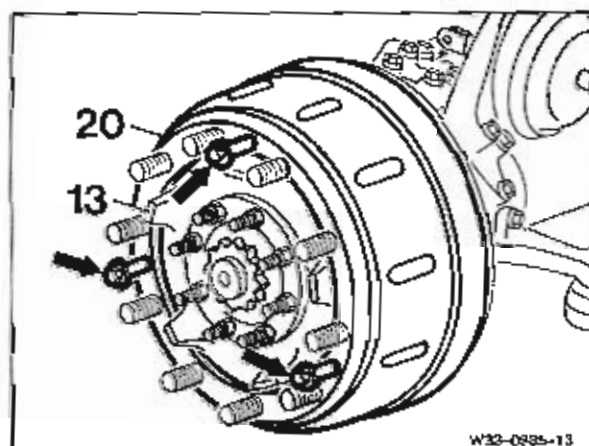


7 On vehicles with anti-lock braking system:

Withdraw sensor (5) of anti-lock braking system from brake anchor plate.



8 Press brake drum (20) off wheel hub (13) using 3 press-off bolts M 12 X 1.5 (arrows) and remove.



9 Clean brake drum and brake linings (33.6-011).



Observe safety regulations when cleaning.

10 Check brake drum for abrasion and wear, turn out both brake drums of an axle to the next oversize if required. Install new brake drums if the diameter is greater than 414.5 mm.



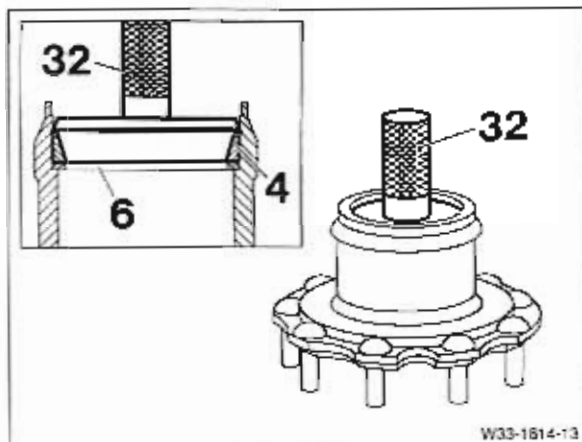
Always turn out or replace both brake drums on an axle. After turning out or replacing the brake drums, replace brake linings.

11 Check brake linings for wear and abrasion, replace if required (33.6-045).

8 Insert shim (6) and drive home internal outer race (4) into wheel hub.

32 Dr./t 312 589 13 15 00

9 Pack inner tapered roller bearing with max. 300 g multipurpose grease and insert in the wheel hub.



Installation

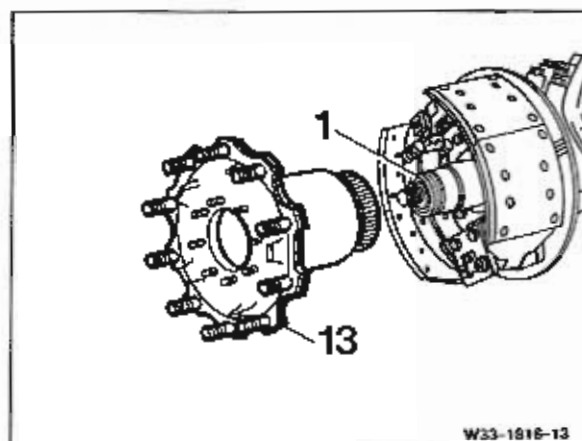
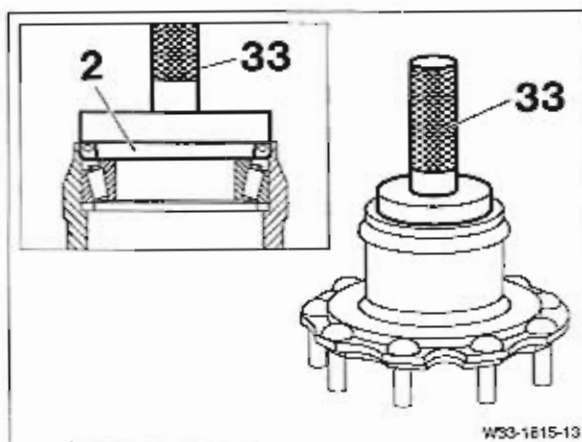
1 Coat new radial sealing ring (2) with non-rubberized outer surface with Omnifit FD 10 sealing compound.

2 Drive home new radial sealing ring (2) flush (max. 0.3 mm lower) into the wheel hub.

33 Dr./t 389 589 00 15 00

3 Coat sealing lip of radial sealing ring with multipurpose grease and opposite contact surface with transmission oil.

4 Push wheel hub (13) onto the support sleeve (1) so that the sealing lip of the radial sealing ring is not damaged.



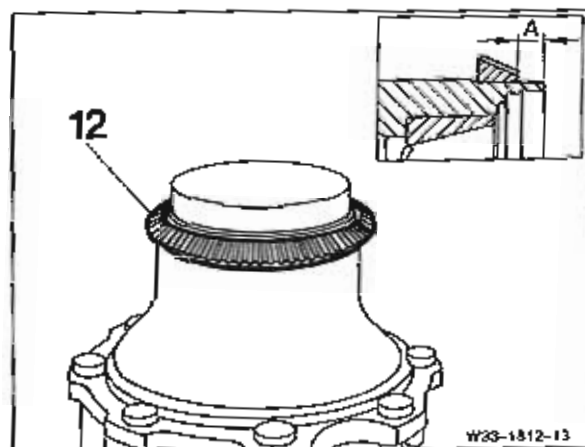
2 On vehicles with anti-lock braking system:

Using assembly plate, press measuring ring (12) onto wheel hub whilst noting dimension (A).

Nominal value: $A = 17.0_{-0.5}$ mm.

Note

Permissible runout of measuring ring = 0.13 mm.

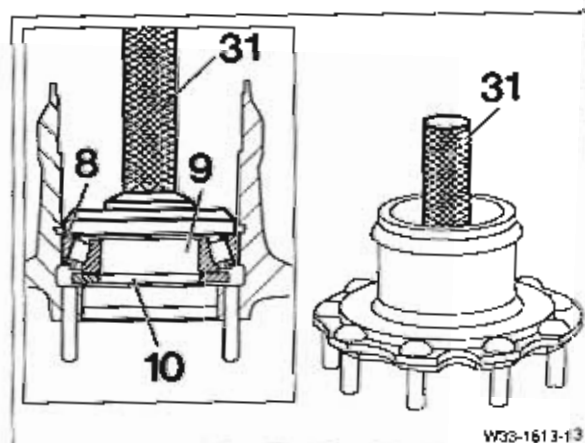


3 Insert thrust washer (10).

4 Pack outer tapered roller bearing (9) with max. 300 g multipurpose grease and install.

5 Drive home external outer race (8) using drift (31).

31 Drift 914 589 03 15 00

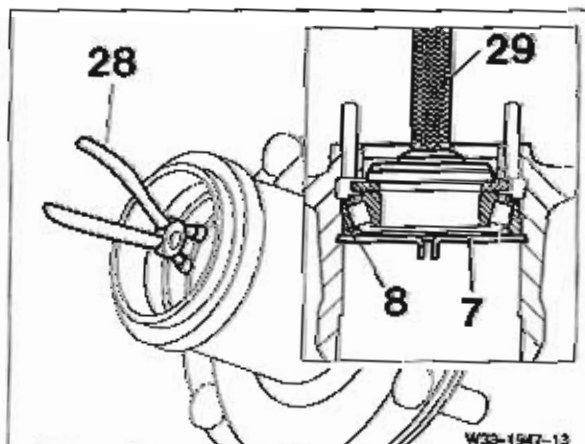


6 Using pliers (28), engage circlip (7).

28 Pliers 360 589 01 37 00

7 Drive back external outer race (8) in the direction of the circlip (7).

29 Drift 387 589 05 15 00

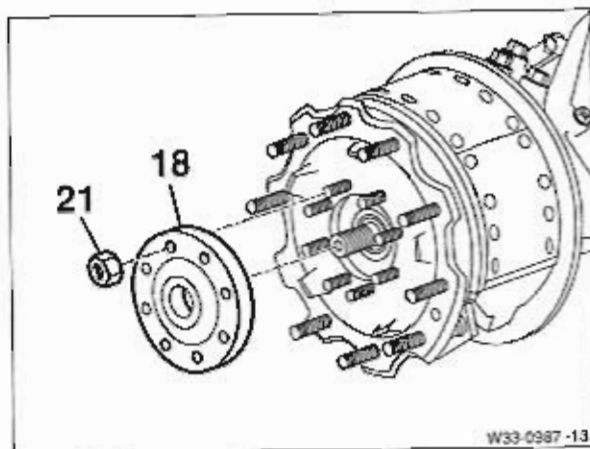


12 Coat driver (18) on the contact surface to the wheel hub with Omnifit FD 10 sealing compound and push onto the greased splined piece of the drive shaft.

13 Tighten new self-locking hexagon nuts (21).
M 12 x 1.5 N 13 001-10 = 85 Nm.
M 12 x 1.5 N 13 004-10 = 80 Nm.

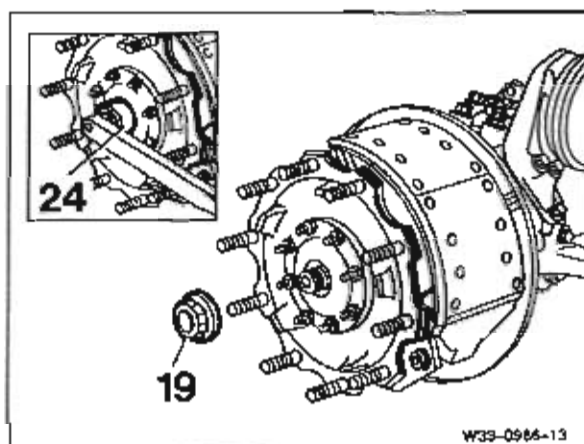
Note

Only use self-locking hexagon nuts of one type on each axle.

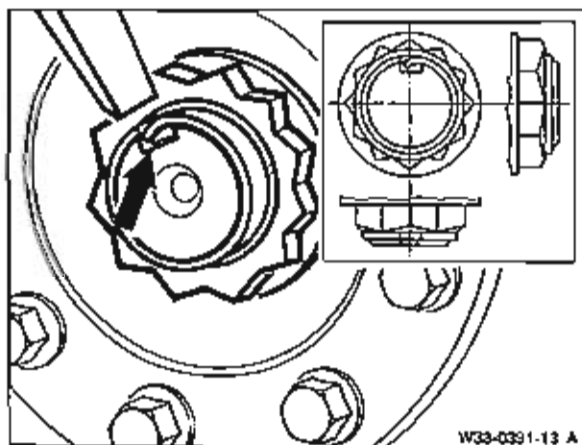


14 Tighten new twelve-point nut (19), 250 Nm.

24 Socket wrench insert 000 589 12 09 00



15 Shear off collar on new twelve-point nut axially and bend in to the base of the groove so that the locking tab (arrow) abuts the left flank of the locking groove.



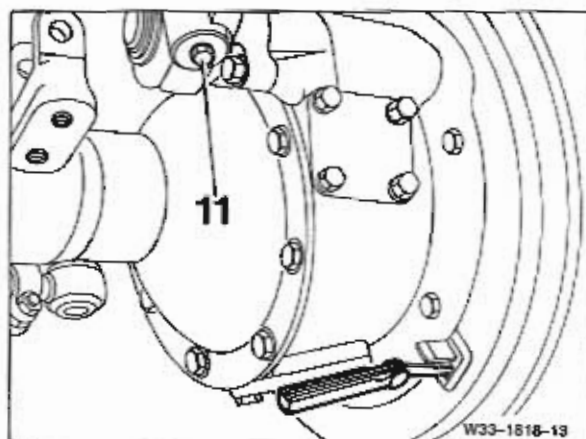
16 On vehicles with anti-lock braking system:

Lubricate sensor of anti-lock braking system with Molykote 44 light silicone grease and press into the bush as far as the stop without using impact tools.

17 Coat centering seat of brake drum on the wheel hub with long-life grease and push brake drum on.

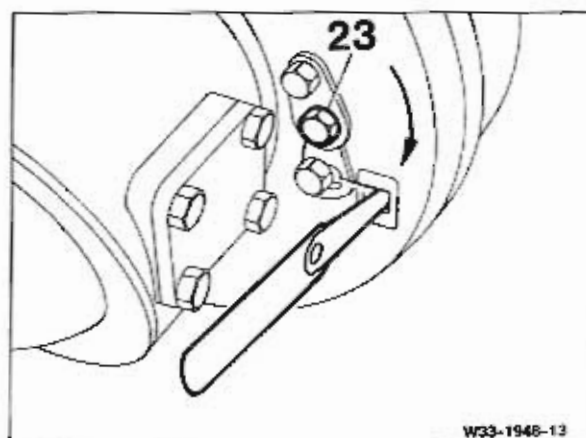
18 Adjusting brake shoe clearance:

Turn adjusting spindle (11) until the clearance in the center of the brake shoe of the primary shoe is 0.7 mm.



19 On vehicles with hydraulic brakes:

Turn adjusting eccentric (23) in direction of arrow until the clearance in the center of the brake shoe of the primary and secondary shoes is 0.4 – 0.6 mm.

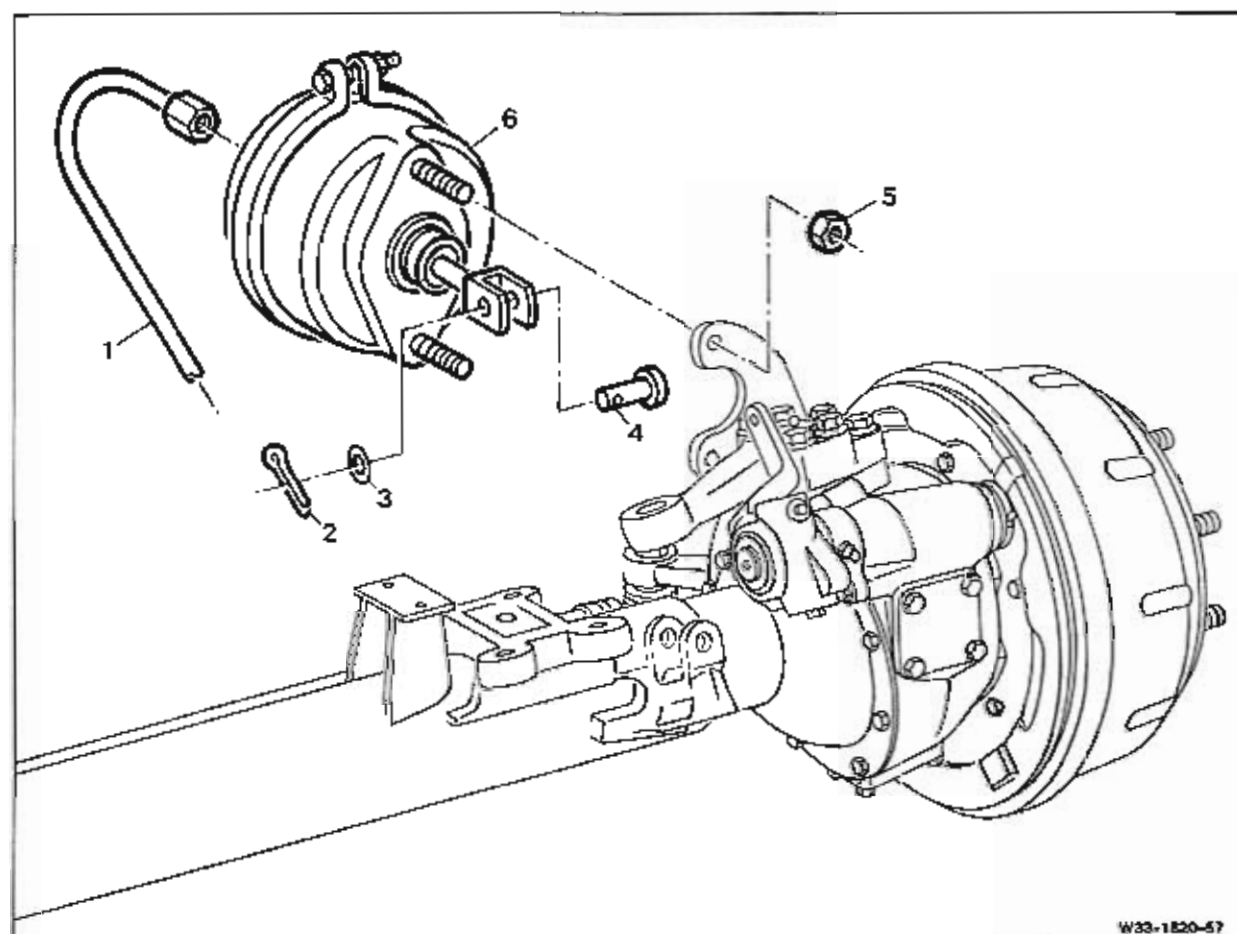


20 Install wheels (refer to table of tightening torques).

Note

The wheel fixing nuts are to be retightened after the first 50 – 100 km.

A. Vehicles with pneumatic brakes



- | | | |
|---|---------------------------|---------------------------------|
| 1 | Brake line | |
| 2 | Split pin | Replace. |
| 3 | Plain washer | |
| 4 | Pin | Lubricate with long-life grease |
| 5 | Self-locking hexagon nuts | Replace, 220 Nm. |
| 6 | Brake cylinder | |

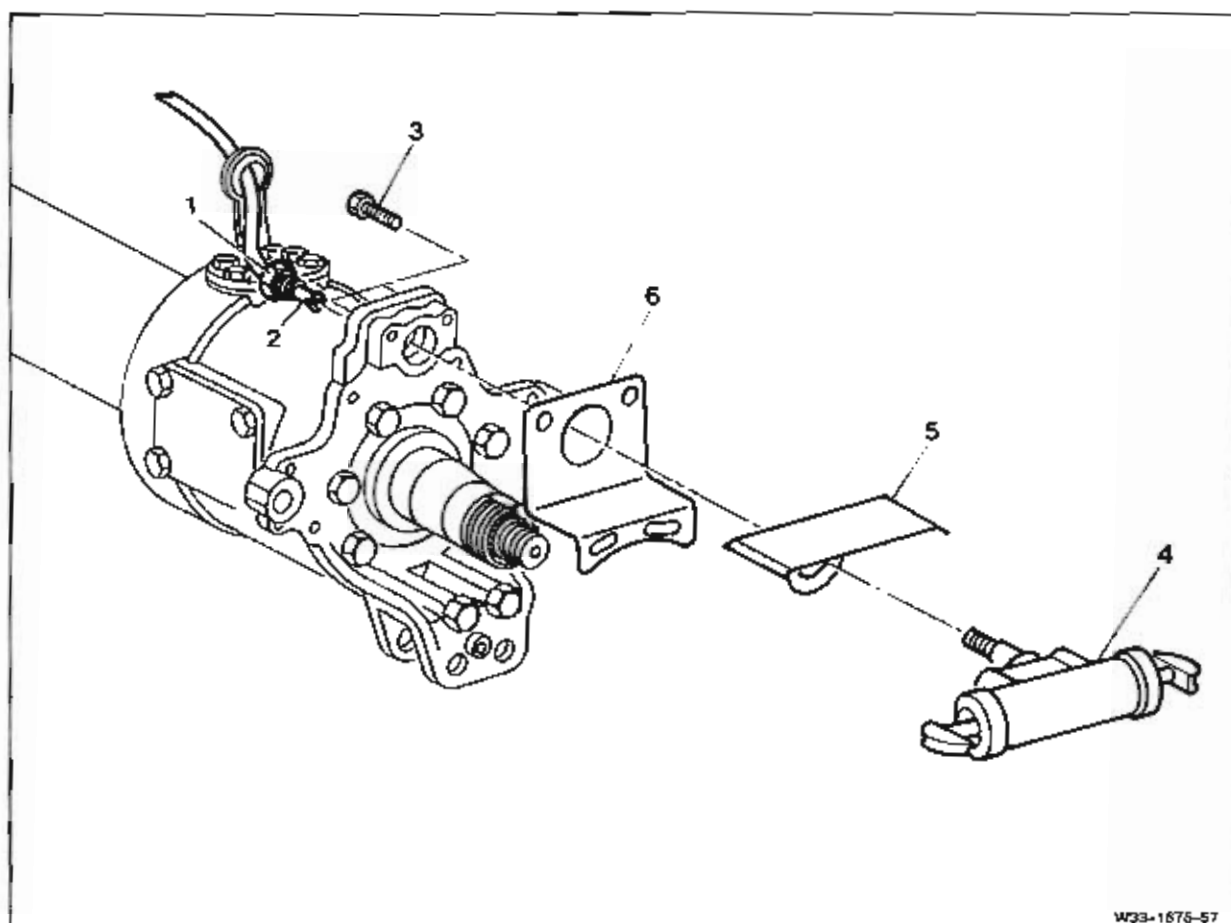
Note

Remove parts in the sequence of the local numbers.

B. Vehicles with hydraulic brakes

Preceding work

Brake shoes removed (33.6-035).



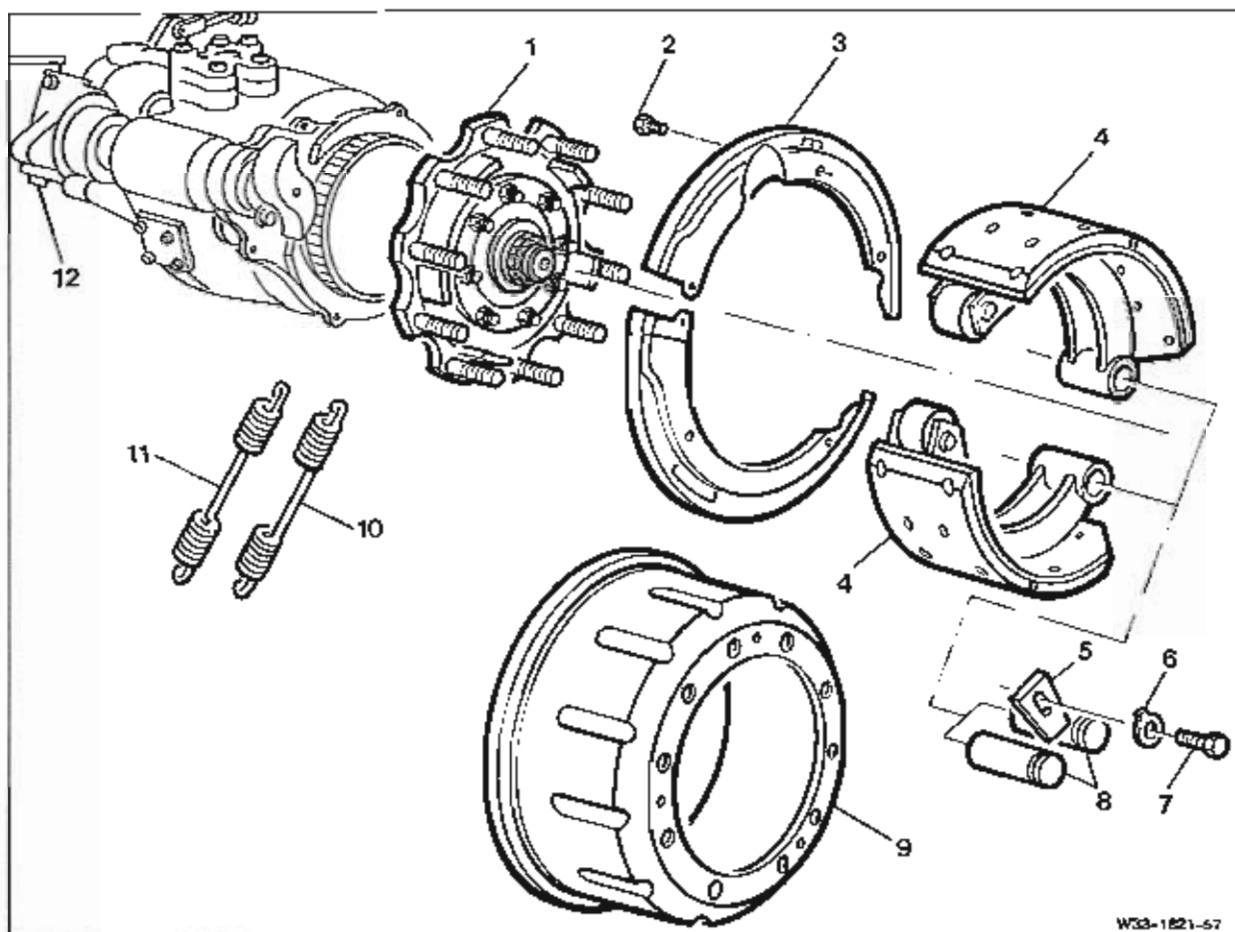
W33-1676-57

- 1 Union nut
- 2 Brake line
- 3 Hexagon bolts 50 Nm.
- 4 Brake cylinder
- 5 Shield
- 6 Bracket for return springs

Note

Install parts in the sequence of local numbers.

A. Vehicles with pneumatic brakes



- | | | |
|----|---------------------|--|
| 1 | Wheel hub | |
| 2 | Hexagon bolts | 50 Nm. |
| 3 | Shields | |
| 4 | Brake shoes | |
| 5 | Pin locking device | |
| 6 | Tab washer | Replace. |
| 7 | Hexagon bolt | 50 Nm. |
| 8 | Pin | Lubricate with long-life grease |
| 9 | Brake drum | Check, turn out if necessary, replace, lubricate centering seat with long-life grease. |
| 10 | Outer return spring | |
| 11 | Inner return spring | |
| 12 | Adjusting spindle | |

Tightening torques:		Nm
Disk wheels with central centering		
Flat collar nut with thrust plate (10-hole)	M 22 x 1.5	600
Disk wheels with ball centering		
Flat collar nut (10-hole)	M 22 x 1.5	450
Trillex wheels		
Round-head bolts	M 18 x 2	300
	M 20 x 2	350
Trillex rim on wheel sprocket	M 18 x 2	250
	M 20 x 2	350
Wheel sprocket to hub	M 22 x 1.5	450

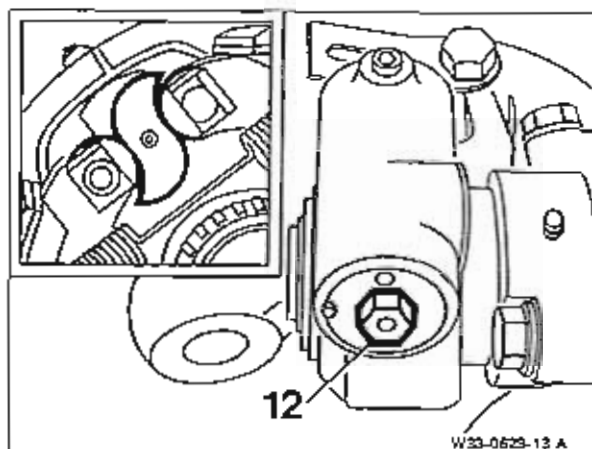
Commercially available tools

Brake spring hook	e.g. Fritz Wegener GmbH und Co Stormsweg D-22086 Hamburg Order no.. 470 452 55
Hot-water brake cleaner (with collecting pan and baffle plate)	e.g. Paul Banhart KG Model 1000 S Theodor-Heuss-Str. 14 D-70736 Fellbach
Hot-water brake cleaner (with collecting pan and baffle plate)	e.g. Alfred Kärcher GmbH Model BTW 20 Leutenbacher Str. 30 – 40 D-71364 Winnenden
Brake lining turning equipment	e.g. Kindermann Geretsrieder Str. 6 D-81379 München Model: APD 1 universal
Brake lining turning equipment	e.g. Hunger Lechstraße 26 D-86916 Kaufering Model: F 306 t/SU

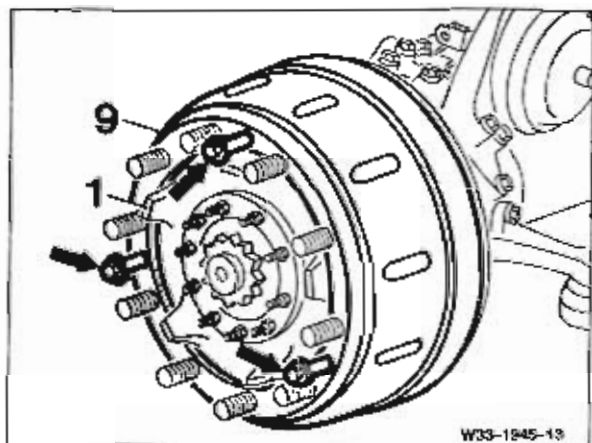
For equipment and tools, also refer to Service Equipment Manual.

Removal

- 1 Place checks in front of and behind the rear wheels.
- 2 Loosen wheel fixing nuts.
- 3 Raise the vehicle on axle tubes, as close as possible to the area of the spring support (not in the center beneath the axle casing), until the wheels are clear of the ground and support vehicle.
- 4 Remove wheels.
- 5 Turn adjusting spindle (12) until the brake cams are in the zero position.



- 6 Using three press-off bolts M 12x1.5 (arrows) press brake drum (9) off wheel hub (1) and remove.



7 Clean brake drum and brake linings (33.6-011).



Comply with safety regulations when cleaning.

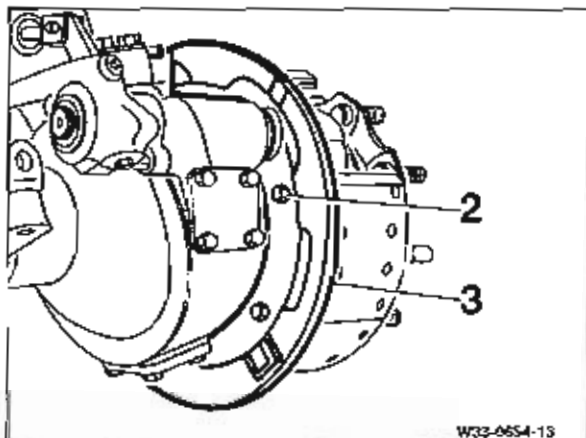
8 Check brake drum for abrasion and wear, turn out both brake drums of an axle to the next oversize if required. Install new brake drums if the diameter is greater than 414.5 mm.



Always turn out or replace both brake drums on an axle. After turning out or replacing the brake drums, replace brake linings.

9 Check brake linings for wear and abrasion, replace if required (33.6-045).

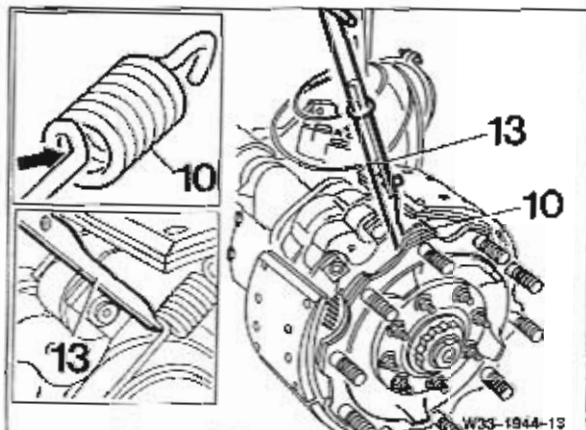
10 Unscrew hexagon bolts (2) on upper and lower shield (3) and remove both shields.



11 Mark outer return spring (10) and unhook using brake spring hook (13).

Notes

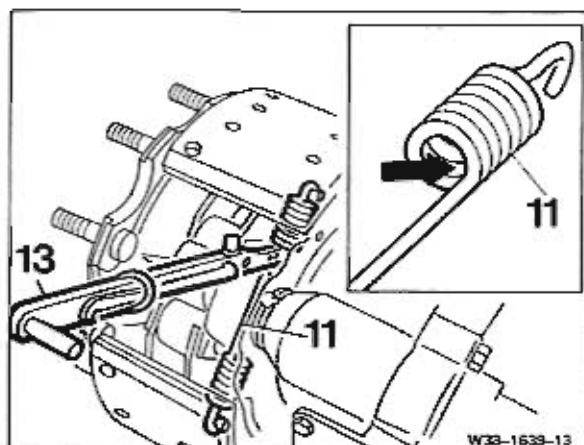
Spring web is central (arrow).



12 Mark inner return springs (11) and unhook using brake spring hook (13).

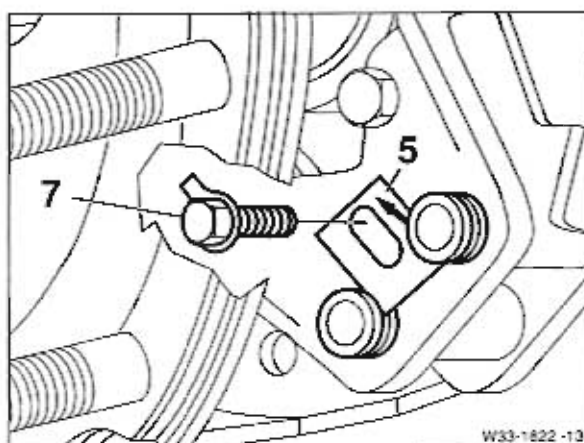
Note

Spring web is outside (arrow).

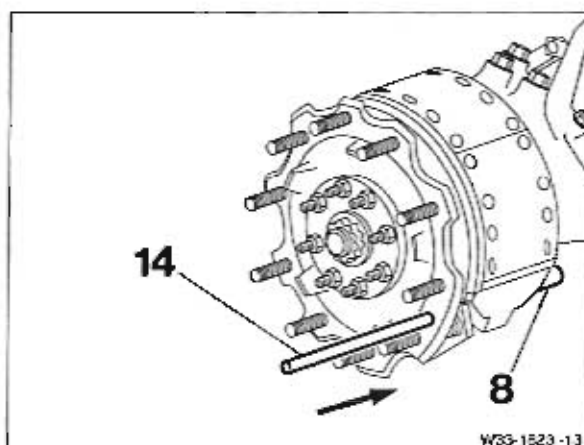


13 Unlock hexagon bolt (7) and unscrew.

14 Press out pin locking device (5) in the direction of the arrow.

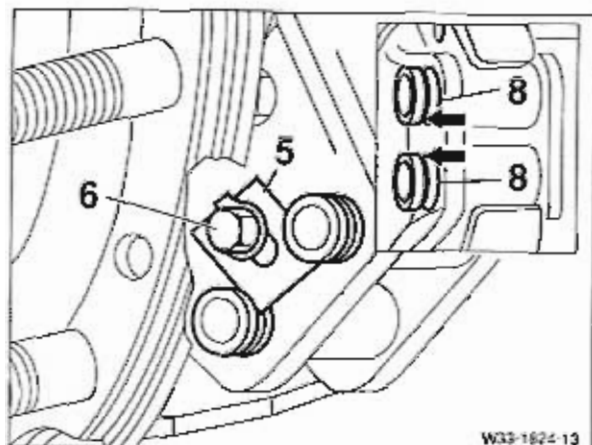


15 Using a suitable drift (14) drive both pins (8) from outside inwards (arrow) and remove brake shoes.

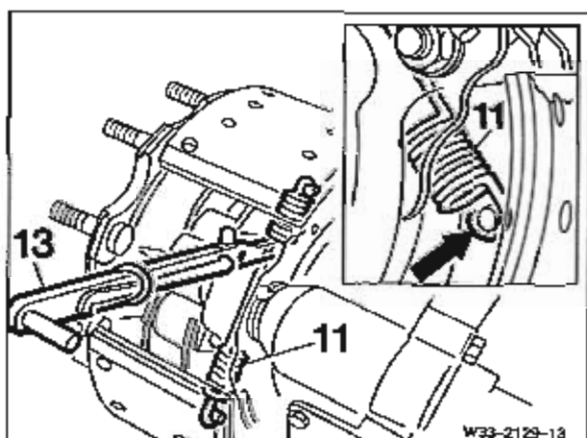


Installation

- 1 Install brake shoes and using a plastic hammer drive home lubricated pins (8) from inside outwards.
- 2 Turn pins (8) so that the grooves (arrows) are opposite.
- 3 Install pin locking device (5) with new tab washer (6), 50 Nm, bend over tab washer.



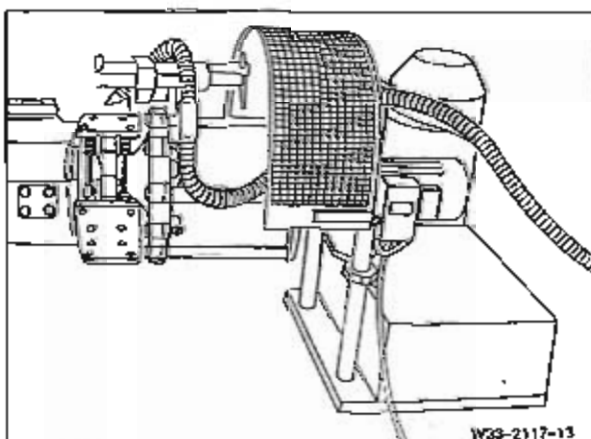
- 4 Hook in outer and inner return spring (11) in accordance with the marking with the open side of the spring eye (arrow) towards the front steering knuckle using brake spring hook (13).



Note

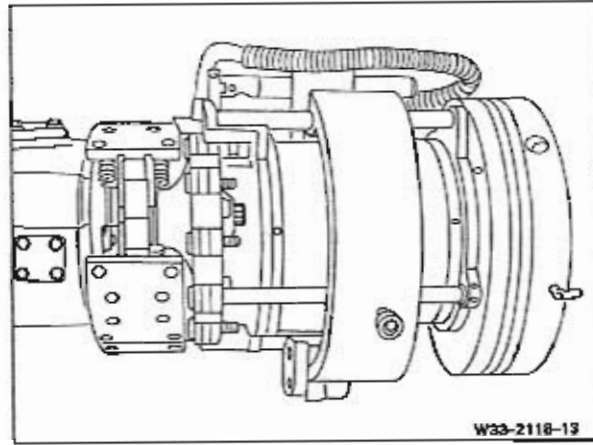
If the brake linings have been replaced, they must be turned to the outside diameter on the axle.

The operation of the brake lining turning equipment is explained in the operating instructions supplied with it.

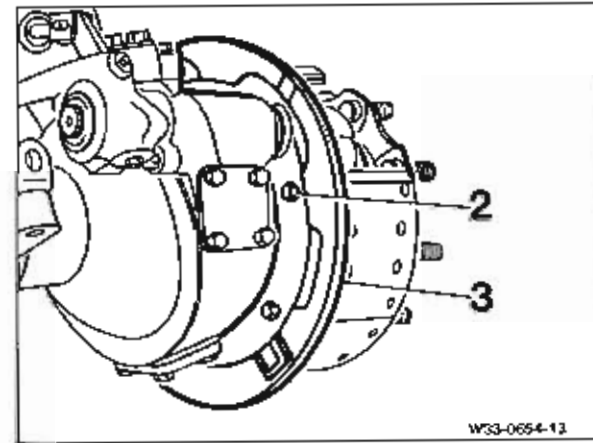


Brake lining turning equipment produced by Kindermann.

Brake lining turning equipment produced by Hungor

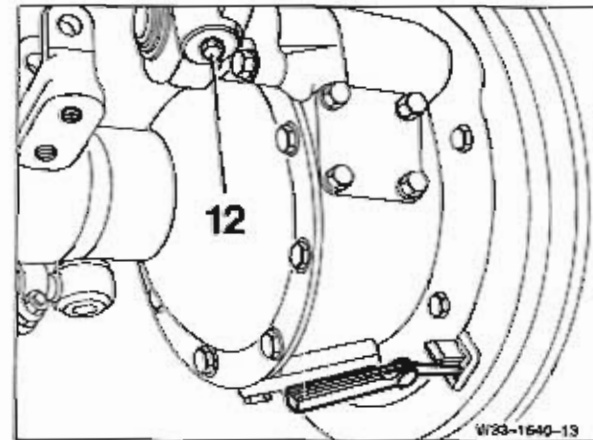


5 Install shields (3) and tighten hexagon bolts (2), 50 Nm.



6 Coat centering seat of brake drum on the wheel hub with long-life grease and push on brake drum.

7 Adjusting brake shoe clearance:
Turn adjusting spindle (12) until the clearance in the center of the brake shoe of the primary shoe is 0.7 mm.



8 Install wheels (refer to table of tightening torques).

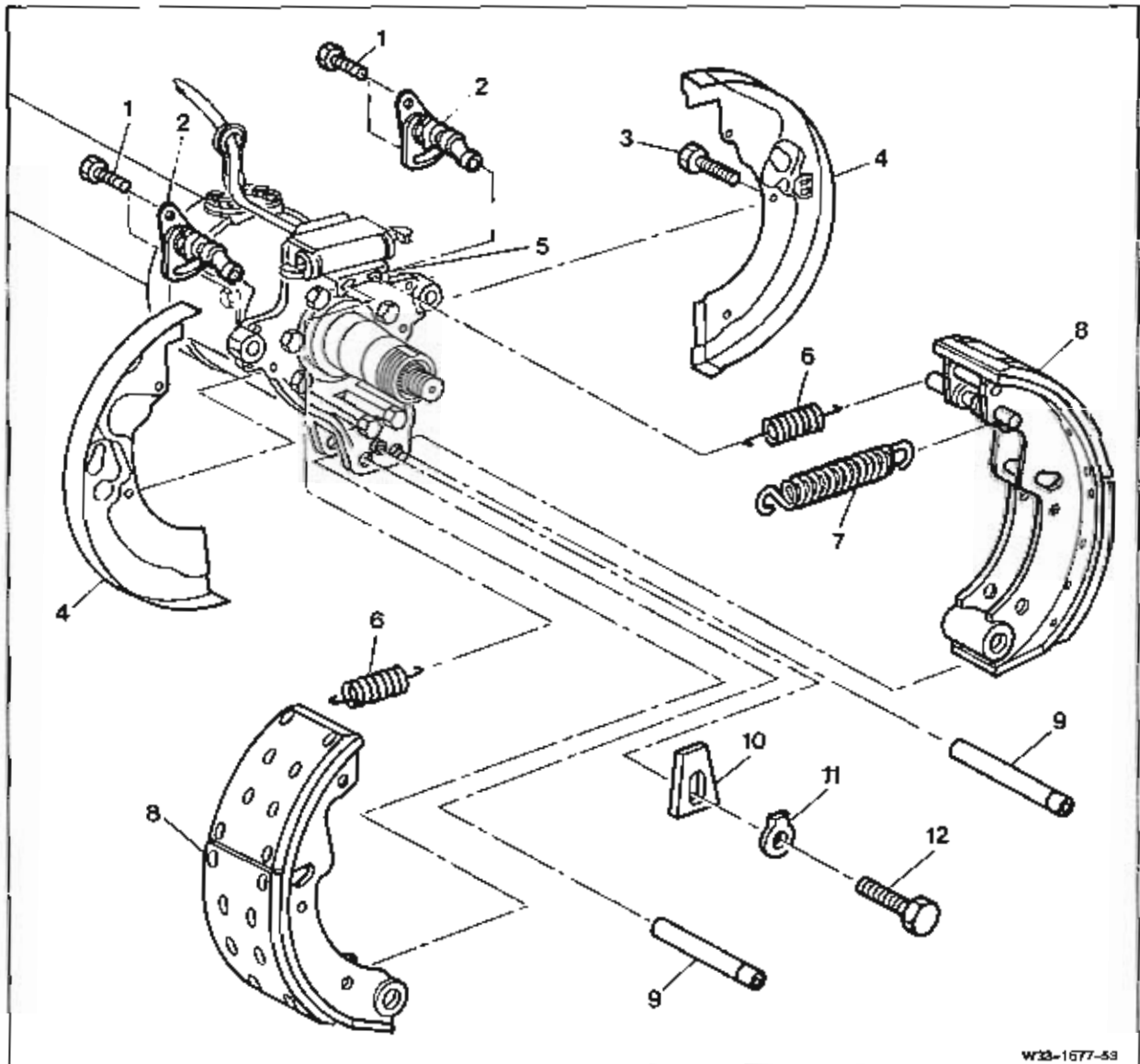
Note

The wheel fixing nuts are to be retightened after the first 50 – 100 km.

B. Vehicles with hydraulic brakes

Preceding work

Wheel hub removed (33.6-025).



W33-1677-53

- | | | |
|----|----------------------|----------------------------------|
| 1 | Hexagon bolts | |
| 2 | Adjusting eccentric | |
| 3 | Hexagon bolts | 50 Nm. |
| 4 | Shields | |
| 5 | Bracket | |
| 6 | Inner return springs | |
| 7 | Outer return spring | |
| 8 | Brake shoes | |
| 9 | Pin | Lubricate with long-life grease. |
| 10 | Pin locking device | |
| 11 | Tab washer | Replace. |
| 12 | Hexagon bolt | |

Tightening torques		Nm
Disk wheels with central centering		
Flat collar nut with thrust plate (10-hole)	M 22 × 1.5	600
Disk wheels with ball centering		
Flat collar nut (10-hole)	M 22 × 1.5	450
Trilex wheels		
Round-head bolts	M 18 × 2	300
	M 20 × 2	350
Trilex rim on wheel sprocket	M 18 × 2	250
	M 20 × 2	350
Wheel sprocket to hub	M 22 × 1.5	450

Commercially available tools

Brake spring pliers	e.g. Hazet Model 797
Hot water brake cleaner (with collector pan and baffle)	e.g. Paul Banhart KG Model 1000 S Theodor-Heuss-Str. 14 D-70736 Fellbach
Hot water brake cleaner (with collector pan and baffle)	e.g. Alfred Kärcher GmbH Model BTW 20 Leutenbacher Str. 30 – 40 D-71346 Winnenden
Brake lining turning equipment	e.g. Kindermann Geretsrieder Str. 6 D-81379 München Model: APD 1 universal
Brake lining turning equipment	e.g. Hunger Lechstraße 26 D-86916 Kaufering Model: F 306 t/SU

For equipment and tools, also refer to Service Equipment Manual.

Removal

- 1 Clean brake drum and brake linings (33.6-0.11).

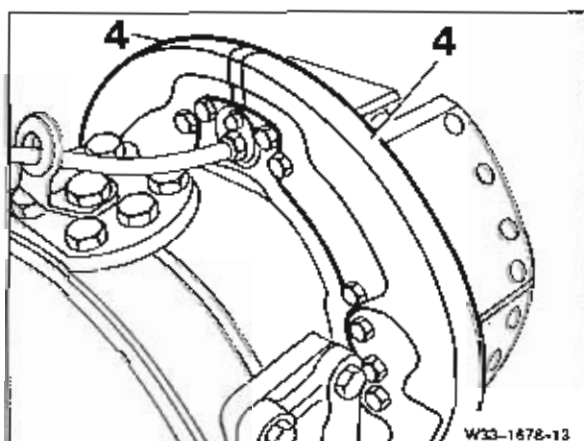


Observe safety regulations when cleaning.

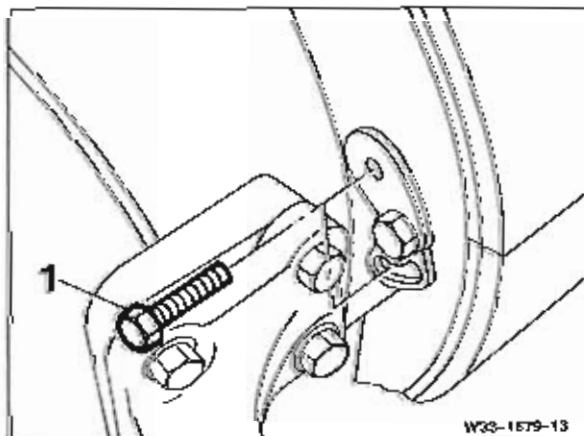
- 2 Check brake drum for abrasion and wear, turn out both brake drums of an axle to the next oversize if required. Install new brake drums if the diameter is greater than 414.5 mm.

- 3 Check brake linings for wear and abrasion, replace if required (33.6-045).

- 4 Remove shields (4).



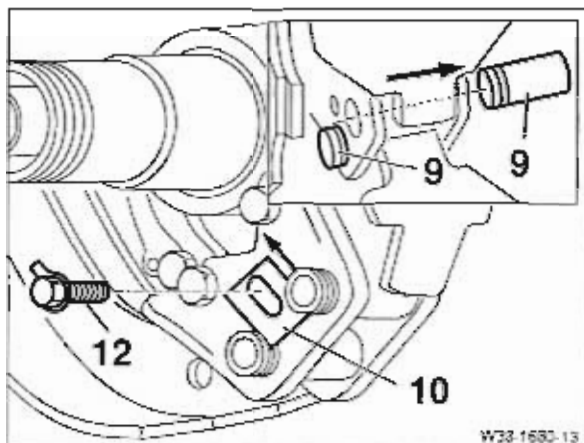
- 5 Unscrew hexagon bolts (1).



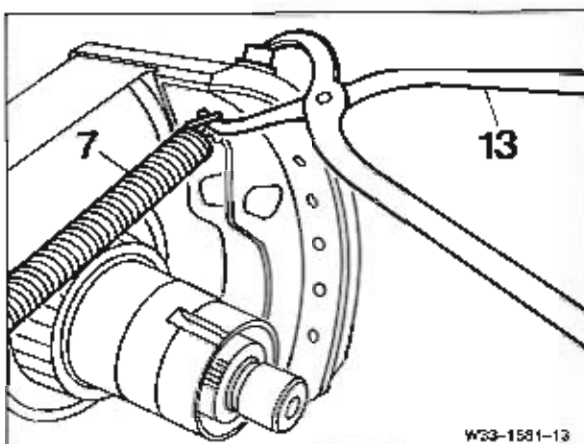
6 Unlock hexagon bolt (12) and unscrew.

7 Press out pin locking device (10) in direction of arrow.

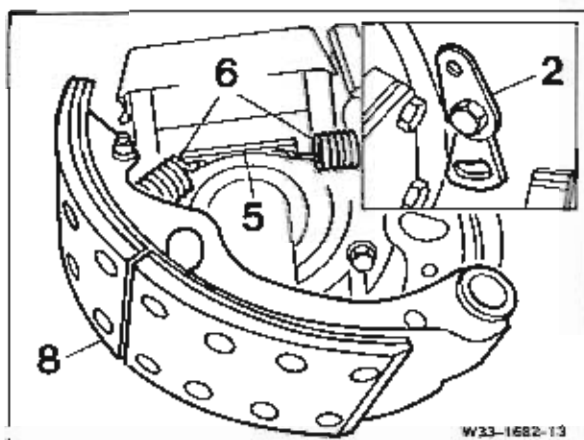
8 Using a suitable drift drive out both pins (9) from outwards inwards (arrow) and remove brake shoes.



9 Unhook outer return spring (7) using brake spring pliers (13).



10 Pull brake shoe (8) outwards, remove adjusting eccentric (2) and tilt the brake shoe (8) inwards until the inner return spring (6) can be unhooked. Remove brake shoe (8).



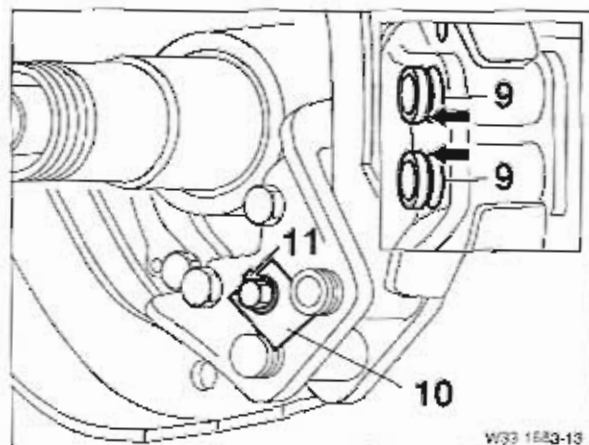
Installation

1 Hook inner return spring (6) into bracket (5) and brake shoe (8), insert brake shoe (8) downwards and simultaneously insert adjusting eccentric (2). Insert brake shoe (8) in brake anchor plate.

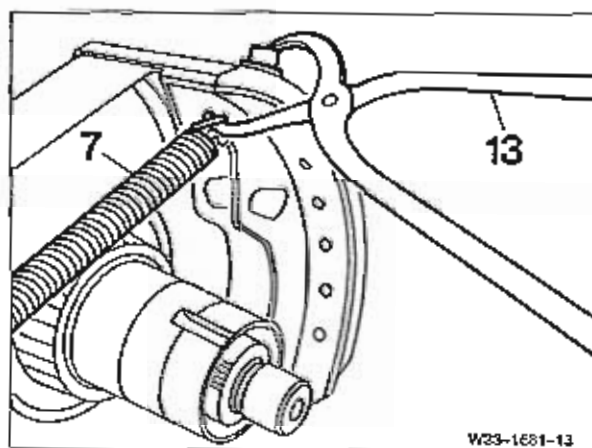
2 Using a plastic hammer drive home lubricated pins (9) from inside outwards.

3 Turn pin (9) so that the grooves (arrows) are opposite.

4 Install pin locking device (10) with new tab washer (11), bend over tab washer.



5 Install outer return spring (7) using brake spring pliers (13).

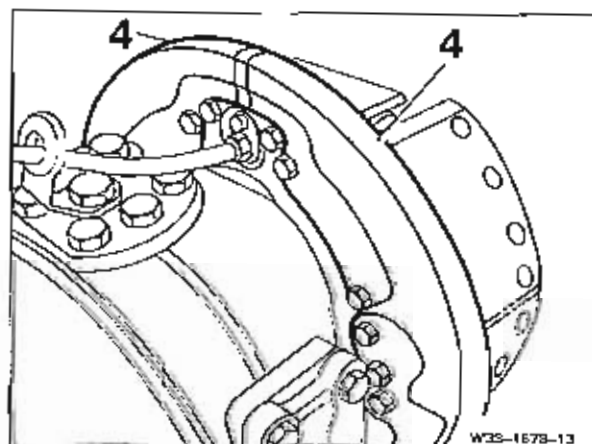


Note

If the brake linings have been replaced, they must be turned to the outside diameter on the axle.

The operation of the brake lining turning equipment is explained in the operating instructions supplied with it.

6 Install both shields (4), 50 Nm.

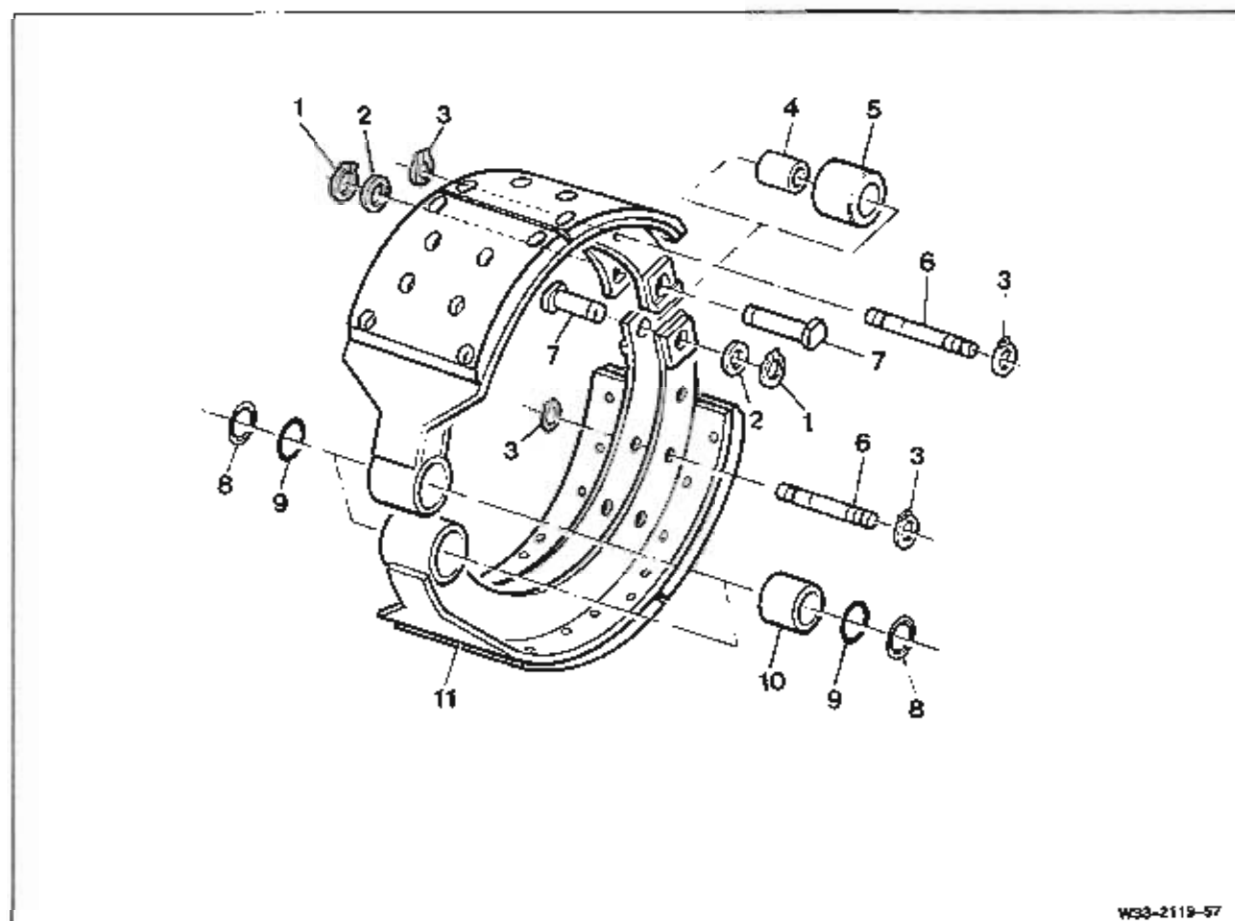


33.6-040 Dismantling and assembling brake shoes

Preceding work

Brake shoes removed (33.6-035).

A. Vehicles with pneumatic brakes



- | | | |
|----|----------------------------------|---|
| 1 | Circlips | |
| 2 | Shims | |
| 3 | Circlips | |
| 4 | Bushes | |
| 5 | Brake shoe roller | Lubricate with long-life grease. |
| 6 | Pin for return springs | Lubricate with long-life grease. |
| 7 | Pin for brake shoe roller | Lubricate with long-life grease. |
| 8 | Shims (up to axle no. F 013 059) | |
| 9 | O-rings | Replace. |
| 10 | Bushes | Lubricate with long-life grease,
drift 363 589 03 15 00. |
| 11 | Brake shoes | |

Special tools



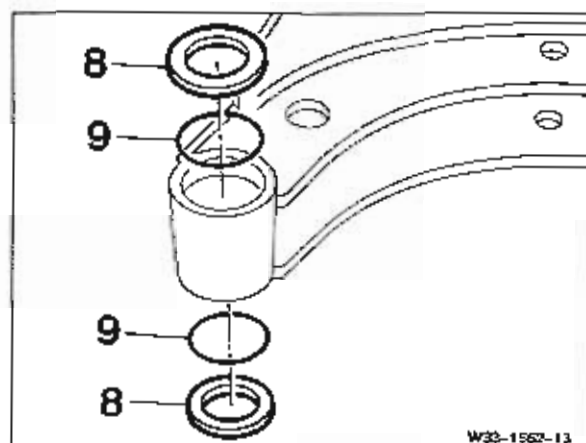
Dismantling

- 1 Remove shims (8), if required.

Note

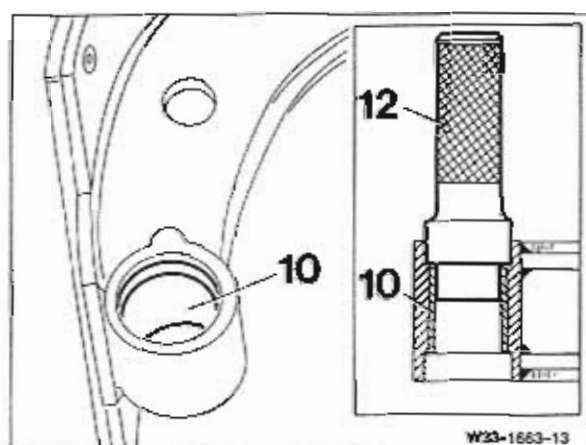
As of axle no. F 013 060, modified brake shoes have been installed, the shims (8) are omitted.

- 2 Remove O-rings (9).

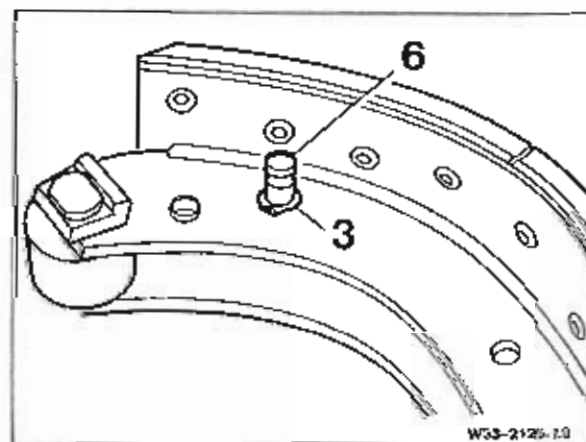


- 3 Using drift (12) press out bush (10).

12 Drift 363 589 03 15 00



- 4 Unhook circlip (3) and remove pin (6) for return springs.



5 Unhook circlip (1), remove shim (2), pin (7) and brake shoe roller (5).

6 Using a suitable drift, press out bush (4) in the brake shoe roller (5).

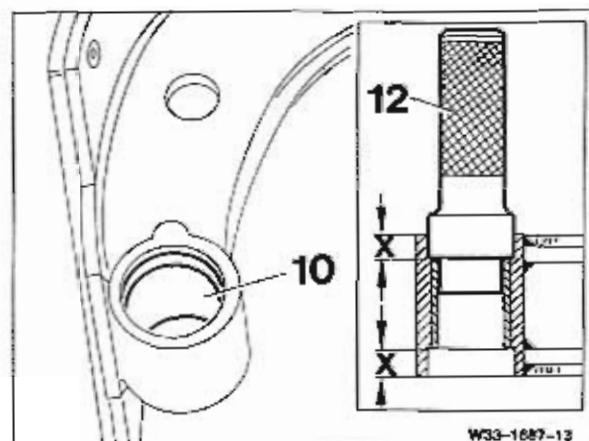
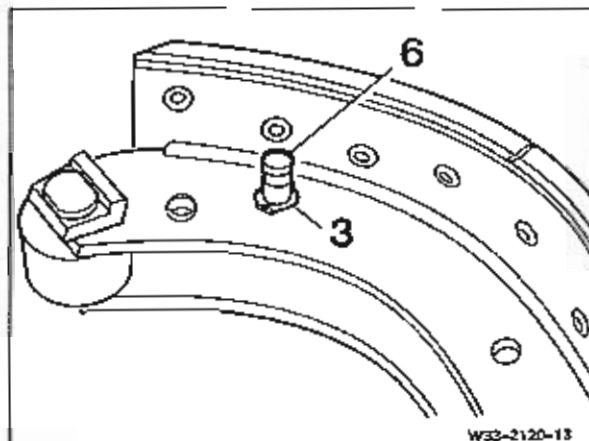
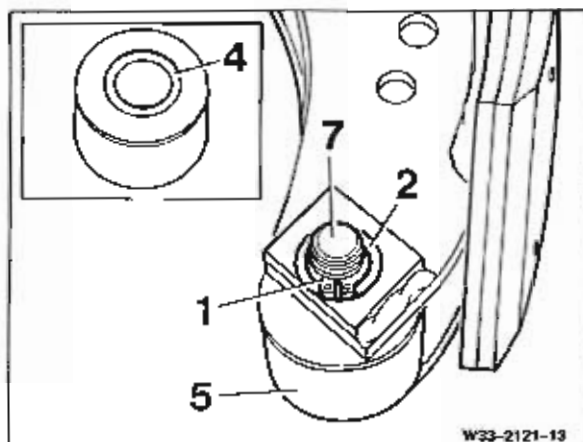
Assembly

1 Using a suitable drift, press new bush (4) in flush with the brake shoe roller (5).

2 Insert brake shoe roller (5), lubricate pin (7) and push in, insert shim (2), engage circlip (1) and lightly lubricate brake shoe roller with long-life grease.

3 Push in pin (6) for return springs and engage circlip (3).

4 Press bush (10) into the brake shoes, whilst ensuring that the distances (X) are equal, center bush if required and lubricate with long-life grease.



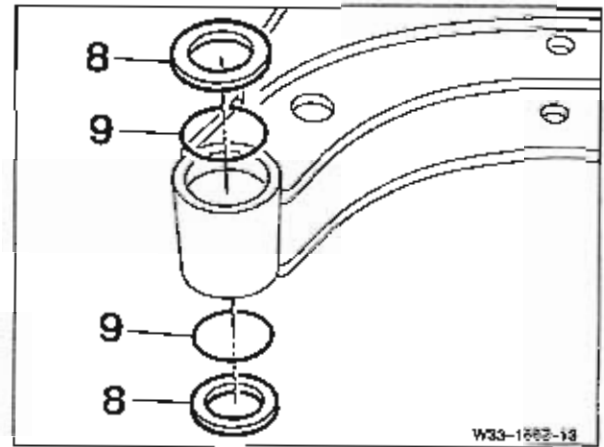
12 Dr-It 363 589 03 15 00

5 Install new O-rings (9).

6 Mount shims (8), if required.

Note

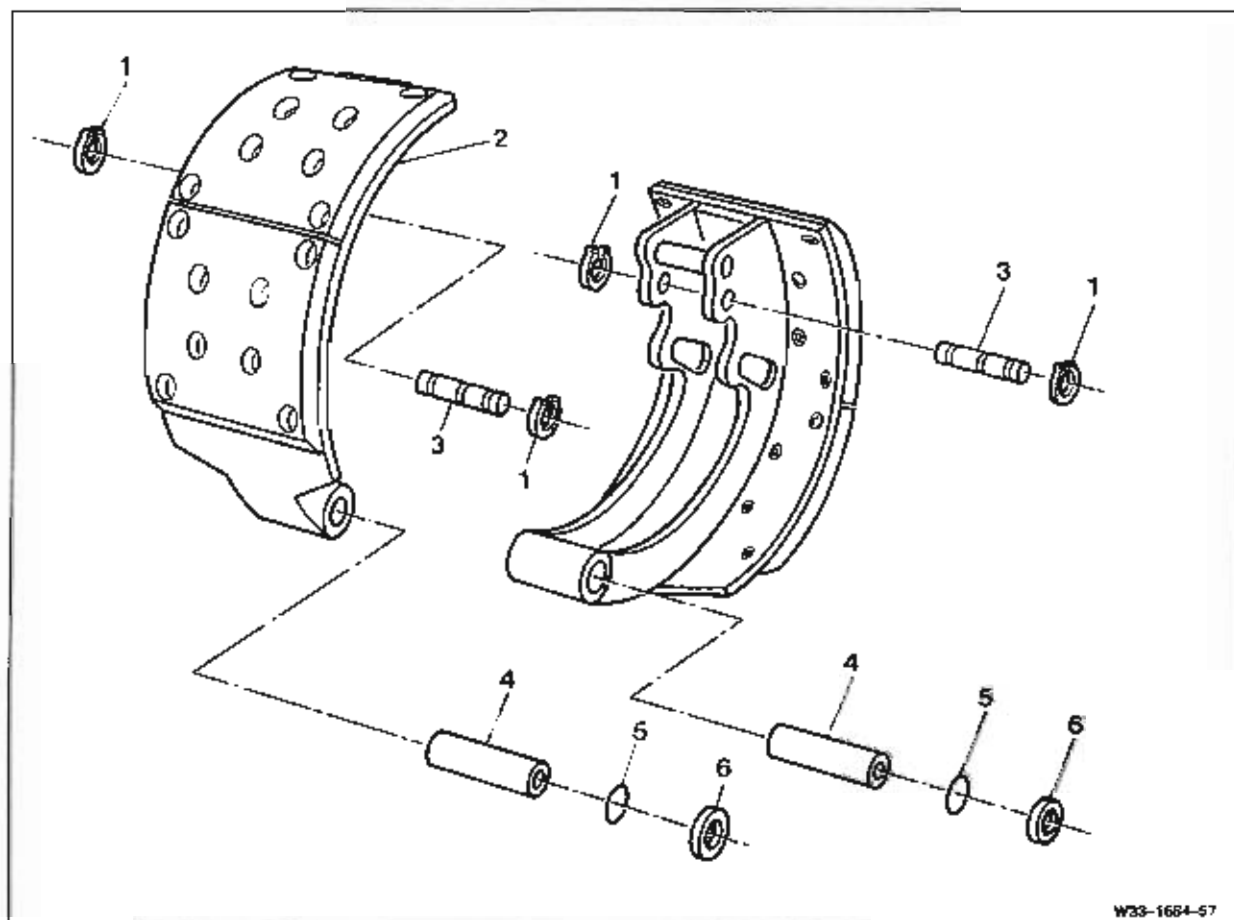
As of axle no. F 013 060, modified brake shoes have been installed, the shims (8) are omitted.



B. Vehicles with hydraulic brakes

Preceding work

Brake shoes removed (33.6-034).



W33-1684-57

- 1 Circlips
- 2 Brake shoes
- 3 Pins for return springs
- 4 Bushes
- 5 O-rings
- 6 Shims (up to axle no. F 013 059)

Lubricate with long-life grease,
drit 363 589 03 15 00.
Replace.

Special tool



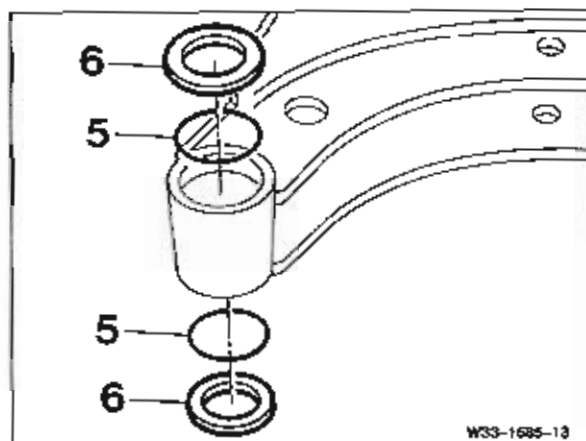
Dismantling

- 1 Remove shims (6), if required.

Note

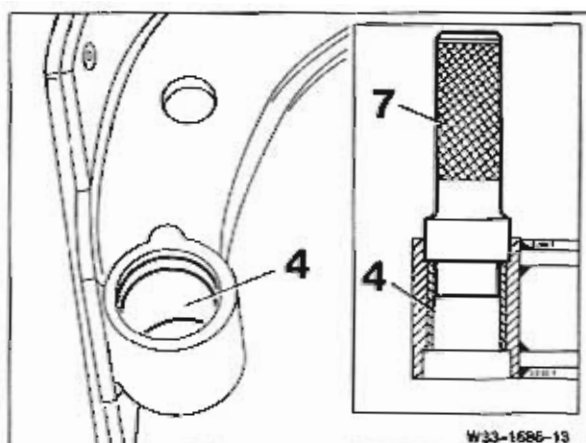
As of axle no. F 013 060, modified brake shoes have been installed, the shims (6) are omitted.

- 2 Remove O-rings (5).

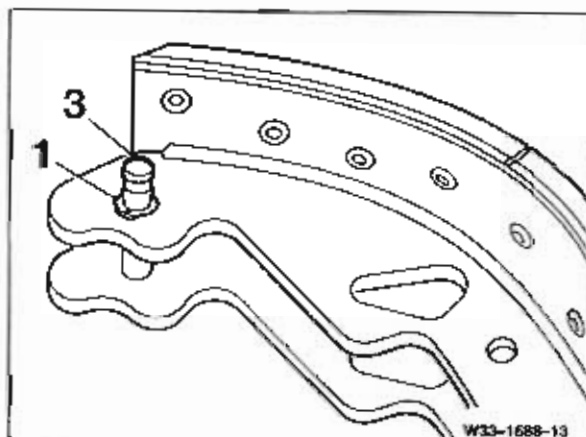


- 3 Press out bush (4) with drift (7).

7 Drift 363 589 03 15 00

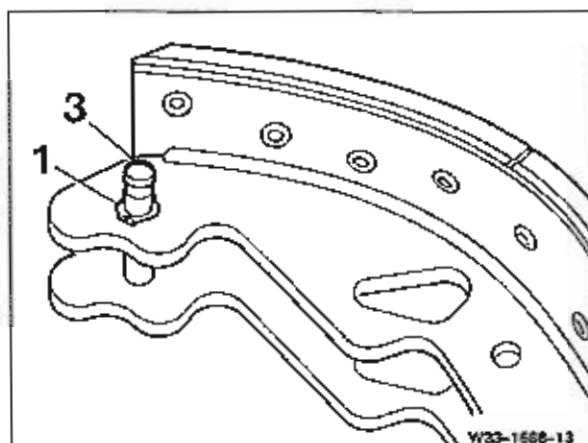


- 4 Unhook circlip (1) and remove pin (3) for return springs.



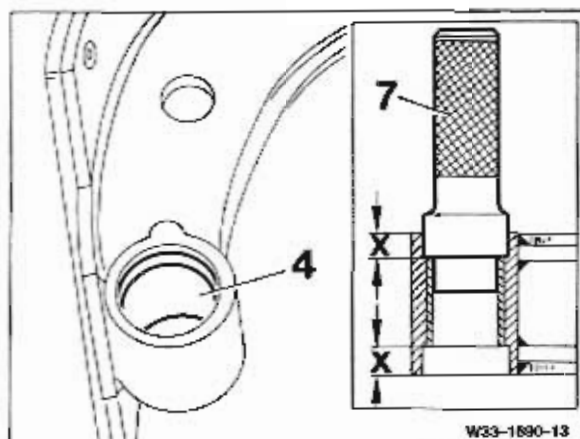
Assembly

1 Press in pin (3) for return springs and engage circlip (1).



2 Press bush (4) into the brake shoes, whilst ensuring that the distances (X) are equal, center bush if required and lubricate with long-life grease.

7 Drift 363 589 03 15 00

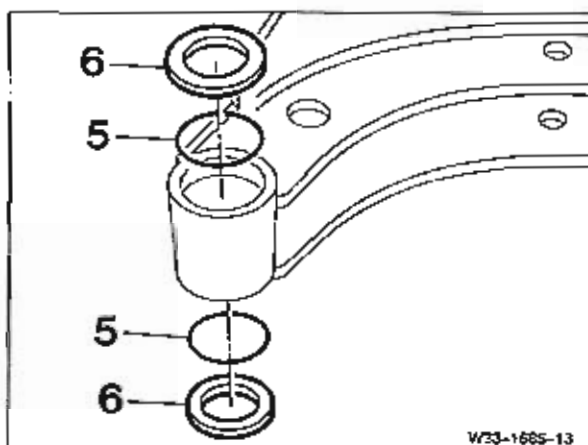


3 Install new O-rings (5).

4 Mount shims (6), if required.

Note

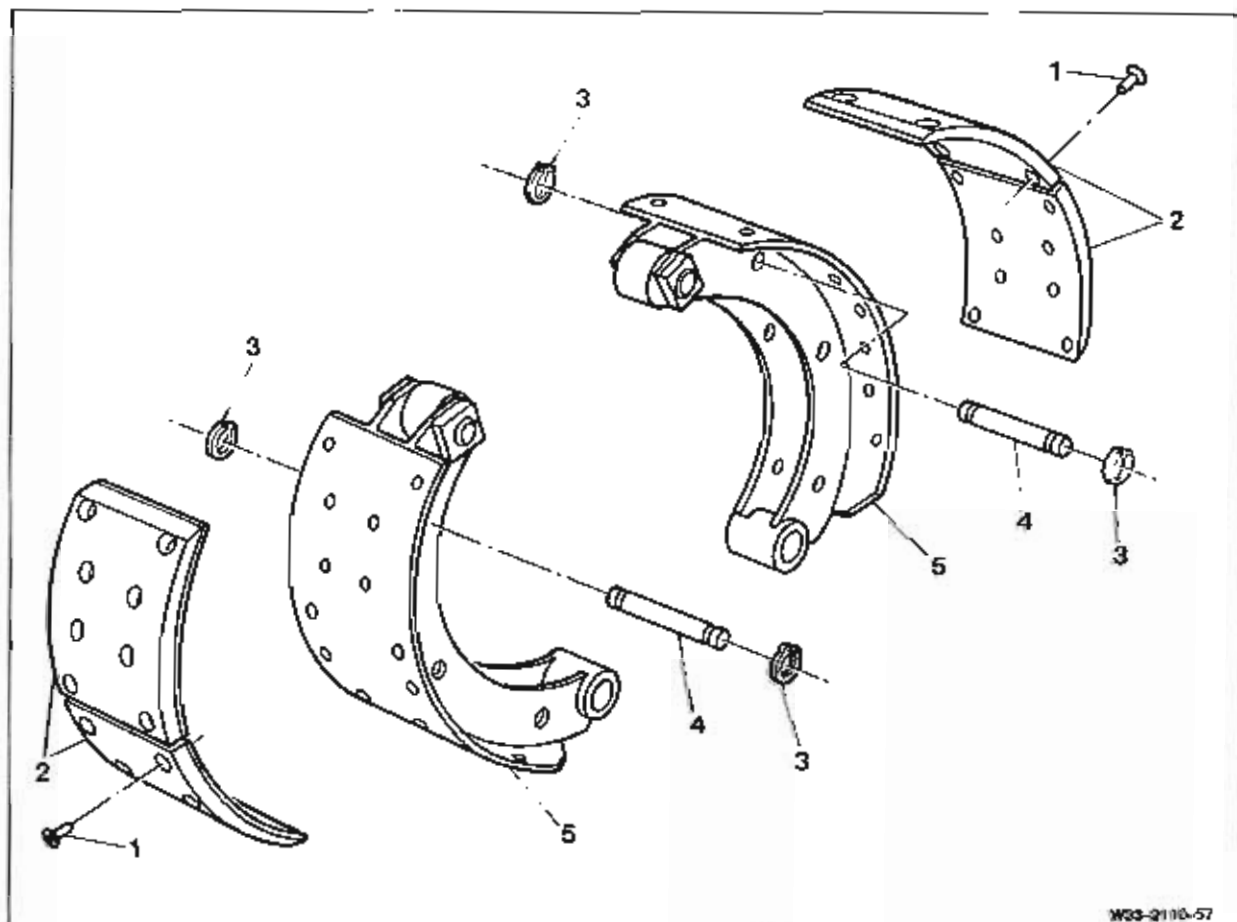
As of axle no. F 013 060, modified brake shoes have been installed, the shims (6) are omitted.



33.6-045 Replacing brake linings

Preceding work

Brake shoes removed (33.6-035).



- 1 Rivets
- 2 Brake linings
- 3 Circlips
- 4 Pin for return springs
- 5 Brake shoes

Repair size brake-drum - brake lining

	Standard	Repair size I	Repair size II
Brake drum dia. in mm	410 +0.2	411.5 +0.2	413 +0.2
Brake lining thickness in mm	18	18.8	19.5
Brake lining width in mm	140 -1	140 -1	140 -1

Commercially available tools

Riveting tool for 8 mm hollow rivet

e.g. Wilhelm Bäcker GmbH & Co KG
Postfach 14 05 80
D-42826 Remscheid
Order no. 6053 (8 mm)

Riveting machine

e.g. Scledum/Kindermann
Geretsnieder Straße 6
D-81379 München
Model: RC 19/S

Riveting machine

e.g. Jurid
Postfach 12 01
D-21504 Glinde
Model: NP 3-81

For equipment and tools, also refer to Service Equipment Manual.

Note

The sequence of operations when replacing the brake linings on vehicles with hydraulic brakes corresponds to that on vehicles with pneumatic brakes.

Replacement

Notes

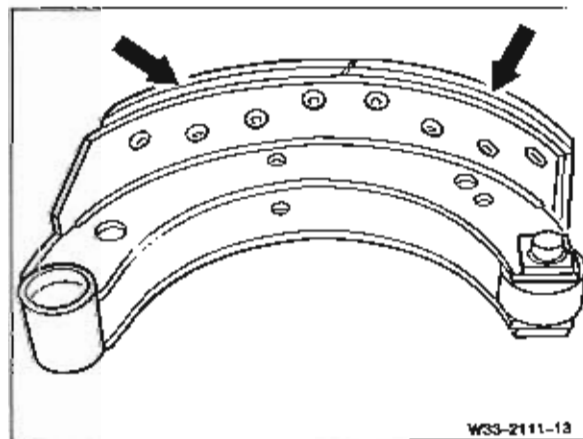
The stepped edge (arrows) on both sides of the brake linings means minimum lining thickness. If the brake lining is worn, always replace all brake linings on an axle.

If the brake linings are contaminated by oil or hardened always replace all brake linings on an axle.

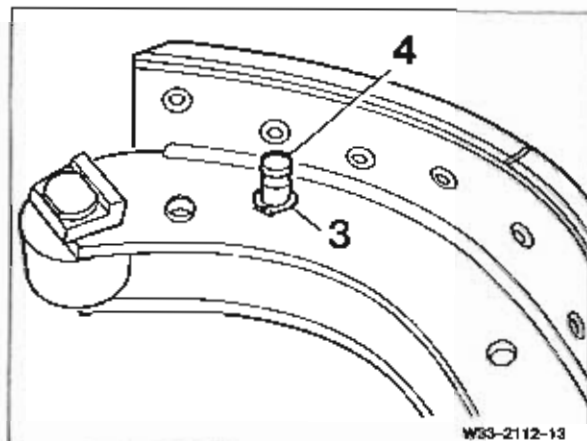
Only brake linings of the same quality may be installed on an axle.

The rivet dimensions are the same for all brake lining repair sizes.

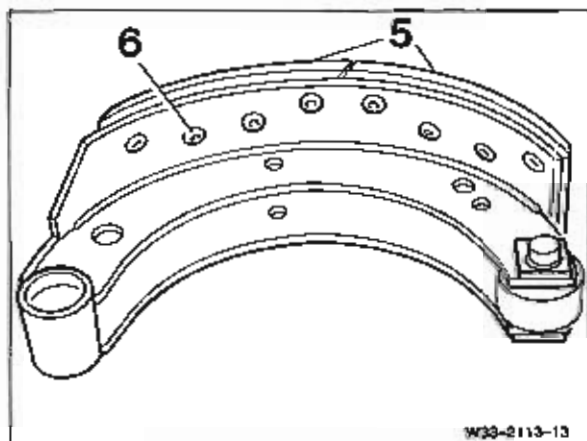
Wherever possible, use a riveting machine for riveting.



1 Unhook circlip (3) and remove pin (4) for return springs.



2 Drill out rivet heads (6) and remove brake linings (5).



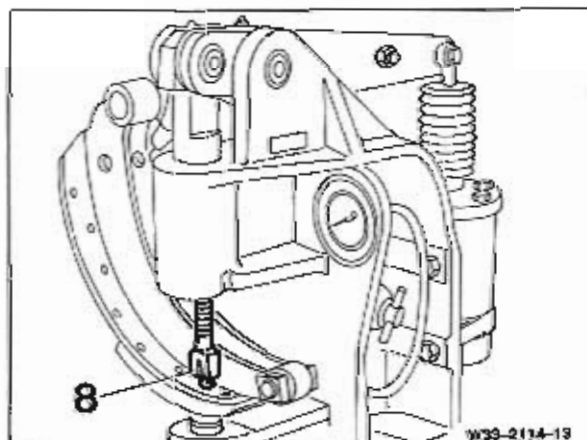
3 Check contact surface of brake linings on the brake shoes, rework or replace brake shoes if required.

4 Adjust riveting machine to a rivet force of $24\,000 \pm 2\,000$ N.

5 Select and rivet on new brake linings depending on the repair sizes of the brake drums.

Note

For satisfactory rivet head formation, lightly lubricate the rivet header (8) from time to time.



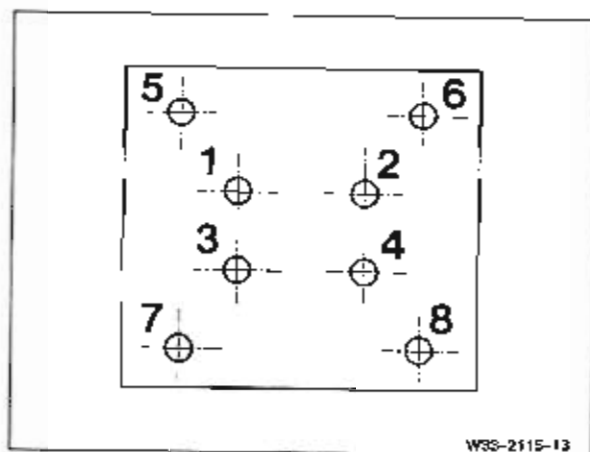
Riveting sequence for one lining half

Always rivet from the center of the brake lining outwards towards the end of the lining.

Riveting: diagonally or in pairs.

It is expedient to locate the brake lining and brake shoe by two rivets.

The brake lining must contact the entire surface.
The corners of the lining must not be broken and the lining must not be cracked at the rivets.



Riveting instructions for brake shoes

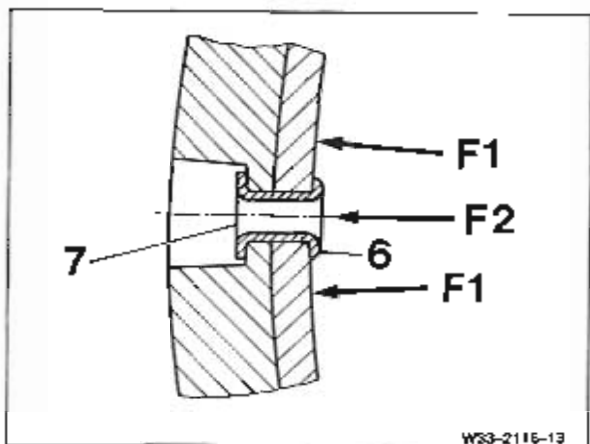
Rivet dia. 8 mm

1st rivet stage

Compress rivet, brake shoe and brake lining with a preload force (F1) of 300 ± 100 N. Maintain preload force (F1) up to the end of the 2nd rivet stage.

2nd Rivet stage

To form the rivet head, press the rivet punch with a rivet force (F2) of 24000 ± 2000 N on the rivet head (rivet head side).



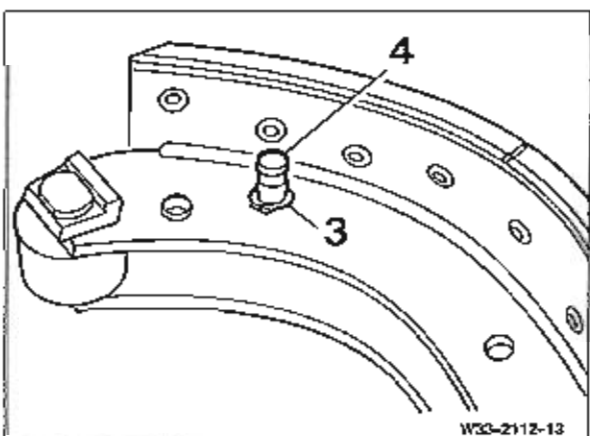
Force introduction: Rivet head (6)

Force offtake: Swage-head (7).

6 Push in the pin (4) for return springs and engage circlip (3).

Note

So that the brake linings support immediately, they must be turned to diameter after installation. For this, refer to the notes on the next page.

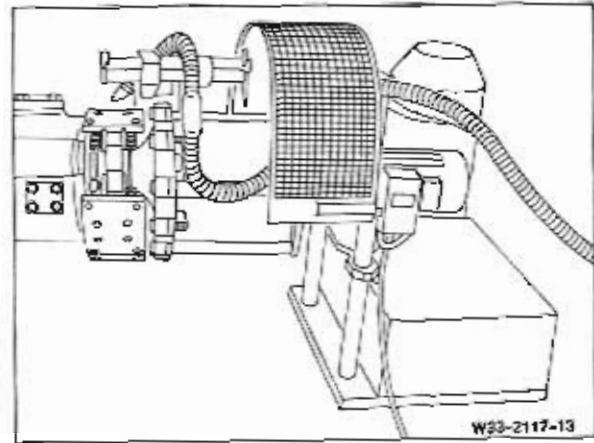


Notes on turning brake linings

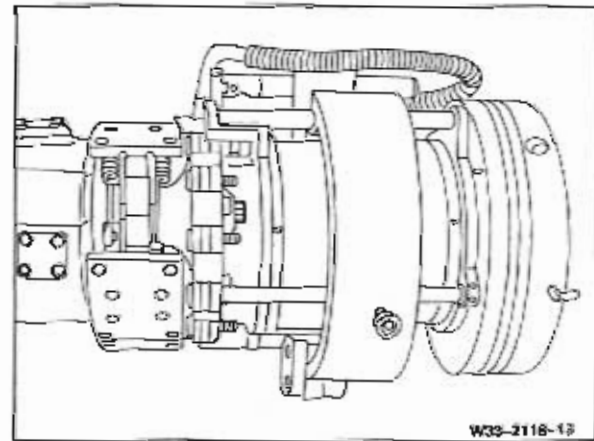
Extraction of dust and swarf during the brake lining machining:

The Hunger F 306 t/SU and Kindermann APD 1 brake lining turning equipment approved by us are equipped with dust and swarf extraction. Turning equipment without extraction can be retrofitted by the manufacturer.

Brake line turning equipment produced by Kindermann



Brake line turning equipment produced by Hunger



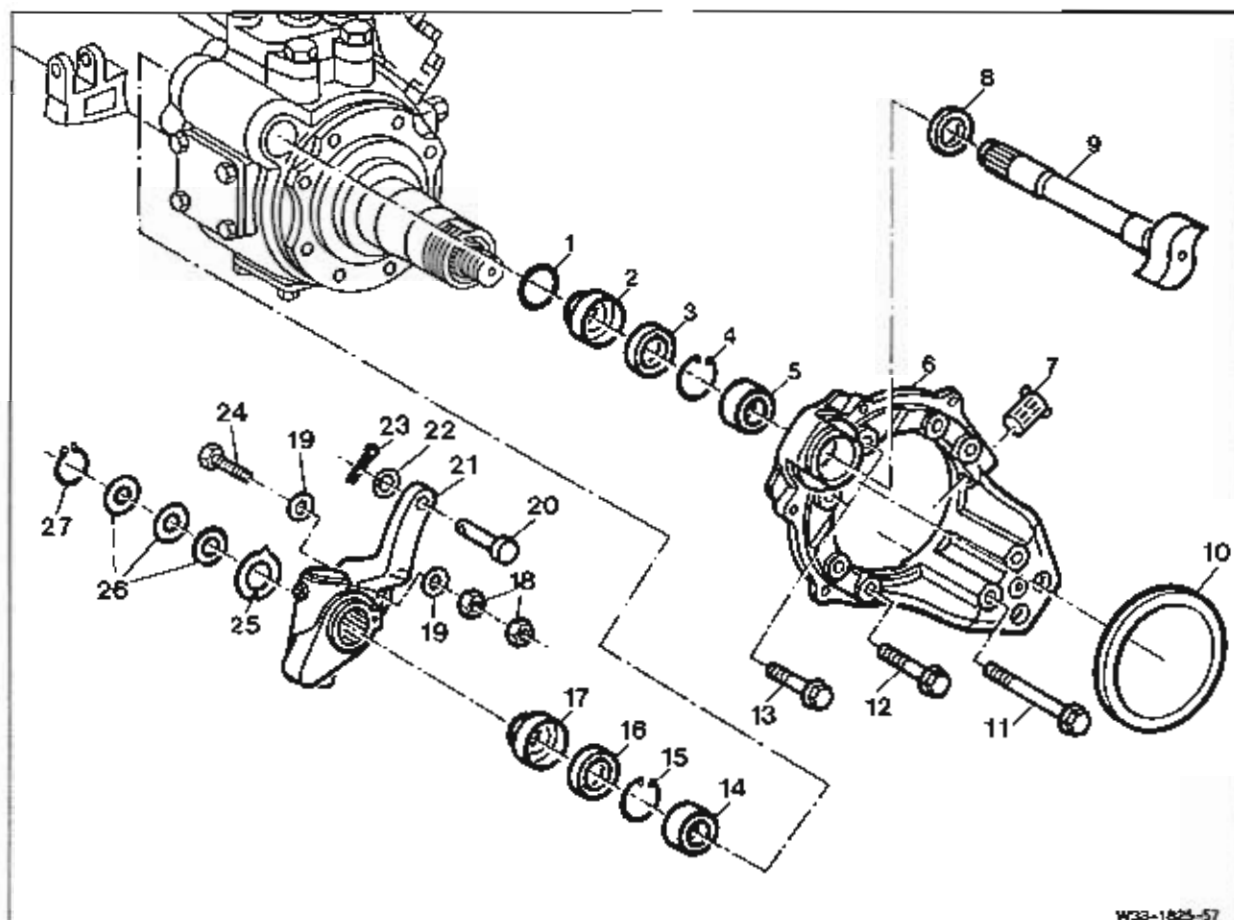
Requirements on the dust extractor for asbestos dust extraction:

To eliminate asbestos dust in machining brake linings, dust extractors are to be used which have been checked and approved by the Dust Research Institute. In addition a dust collector bag (one-way bag) should be fitted in the collecting container of the dust extractor for eliminating asbestos dust.

33.6-050 Removal, dismantling, assembly and installation of brake camshaft and brake anchor plate (Vehicles with pneumatic brakes)

Preceding work:

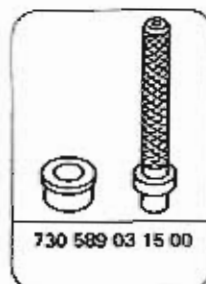
Wheel hub removed (33.6-025).
Brake shoes removed (33.6-035).



1	O-ring	.....	Replace.
2	Sealing ring holder	.....	Internal extractor 000 589 29 33 00, steady 000 589 34 33 00.
3	Radial sealing ring	.....	Replace, coat non-rubberized outer surface with Omnifit FD 10 sealing compound, drift 360 589 00 15 00.
4	Circlip	.....
5	Pivoting bearing	.....	Drift 730 589 03 15 00, sleeve 317 589 00 14 00.
6	6	.....	Brake anchor plate
7	Bush (on vehicles with ABS)	.....	Lubricate with Molykote 44 light silicone grease.
8	Radial sealing ring	.....	Replace, coat non-rubberized outer surface with Omnifit FD 10 sealing compound, drift 360 589 00 15 00.
9	Brake camshaft	.....	Check axial play, adjust if required max. 0.1 - 0.5 mm.
10	Oil retainer	.....	Coat with Omnifit FD 10 sealing compound.

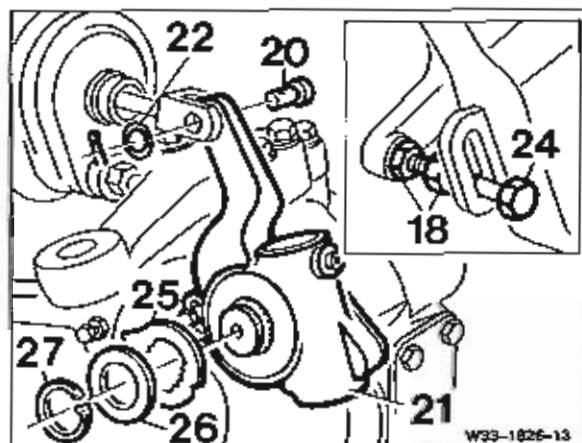
11	Hexagon bolts	280 Nm.
12	Hexagon bolts	280 Nm.
13	Hexagon bolts	280 Nm.
14	Pivoting bearing	Drift 730 589 03 15 00, sleeve 317 589 00 14 00.
15	Circlip	
16	Radial sealing ring	Replace, coat non-rubberized outer surface with Omnifit FD 10 sealing compound, sleeve 317 589 00 14 00.
17	Sealing ring holder	Internal extractor 000 589 29 33 00, steady 000 589 34 33 00.
18	Lock nuts	
19	Plain washers	
20	Pin	Lubricate with long-life grease.
21	Linkage adjuster	
22	Plain washer	
23	Split pin	Replace.
24	Adjusting screw	25 Nm.
25	Display disk	
26	Shims	
27	Circlip	

Special tools

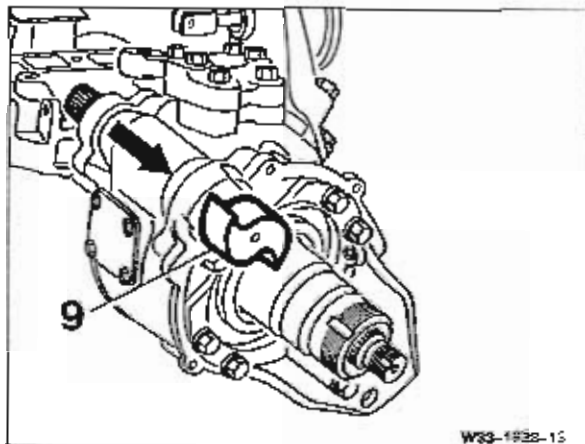


Removal

- 1 Remove split pin from pin (20) and remove with plain washer (22).
- 2 Loosen lock nuts (18) and unscrew adjusting screw (24).
- 3 Unhook circlip (27), remove shims (26), display disk (25) and linkage adjuster (21).

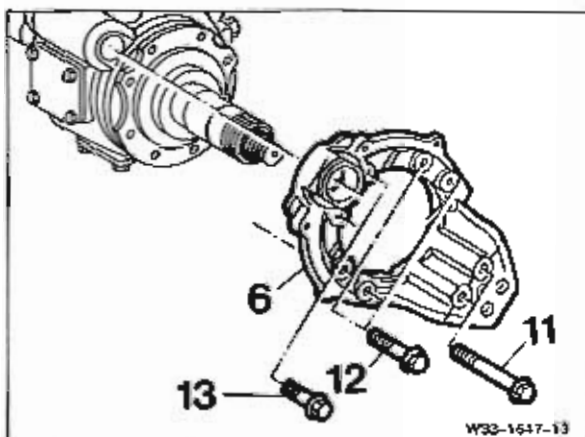


- 4 Pull out brake camshaft (9) in direction of arrow.



- 5 Mark installation point of hexagon bolts (11, 12 and 13) and unscrew hexagon bolts.

- 6 Remove brake anchor plate (6).



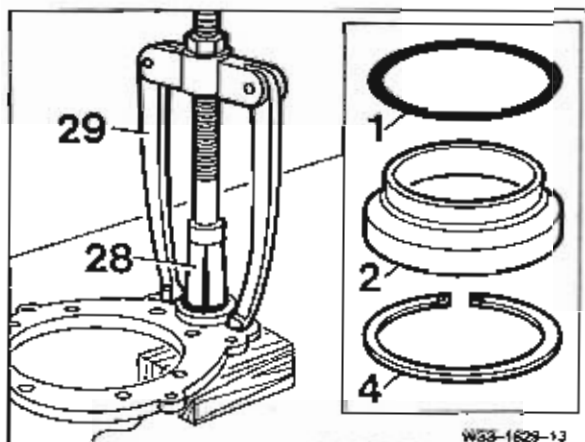
Dismantling

A Brake anchor plate

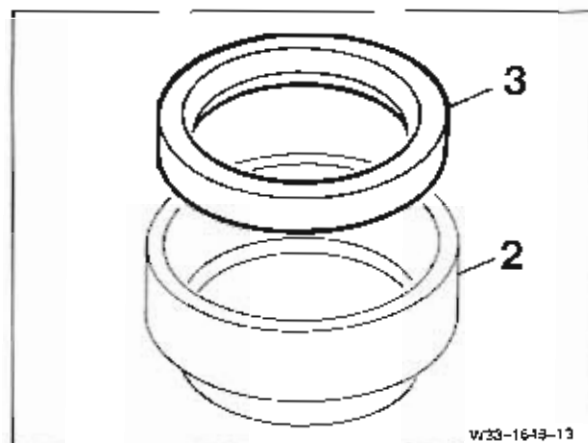
- 1 Remove O-ring (1).
- 2 Using internal extractor (28) and steady (29) pull out sealing ring holder (2).

28 Internal extractor 000 589 29 33 00
29 Steady 000 589 34 33 00

- 3 Disengage circlip (4).

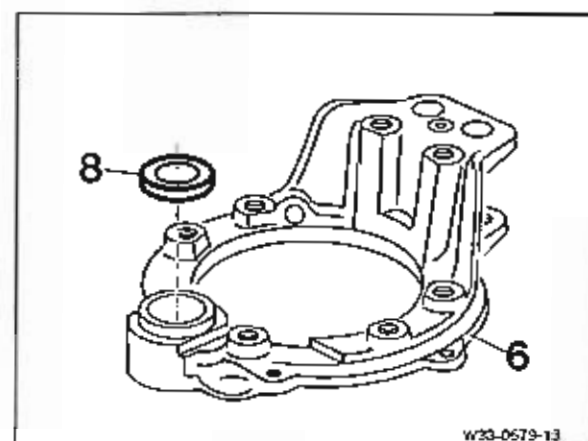


4 Remove radial sealing ring (3) from sealing ring holder (2).



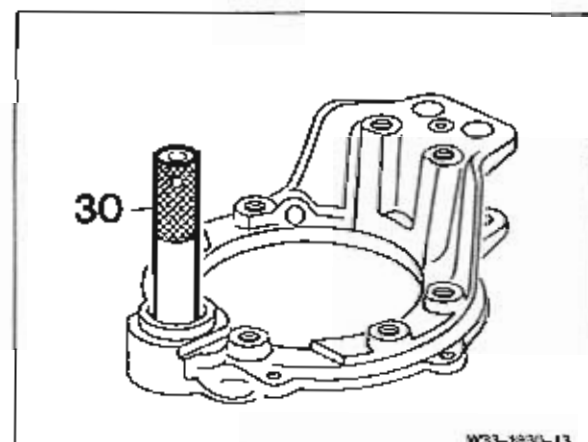
5 Turn round brake anchor plate (6).

6 Remove radial sealing ring (8).



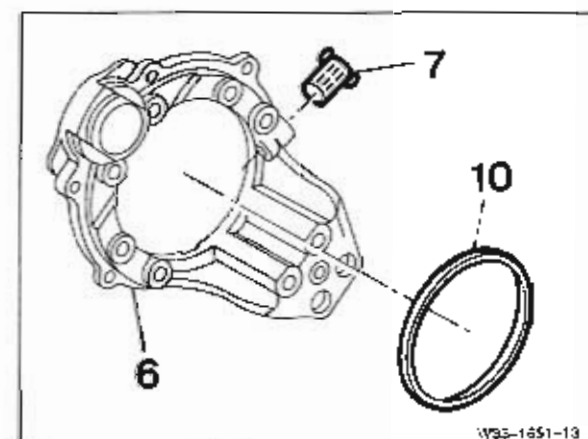
7 Drive out pivoting bearing.

30 Drift 730 589 03 15 00



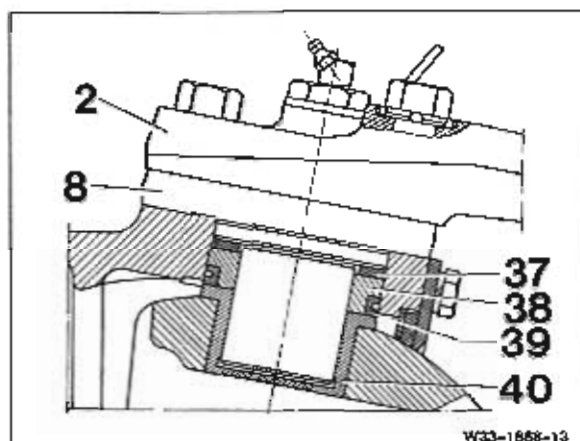
8 On vehicles with anti-lock braking system:
Remove bush (7) for sensor of anti-lock braking system from brake anchor plate (6).

9 Remove oil retainer (10).



Location of upper steering knuckle mount on steering side (up to axle no. 2 699 965):

- 2 Steering arm
- 8 Steering knuckle pin
- 37 Thrust washer
- 38 Thrust collar
- 39 Sealing ring
- 40 Bush



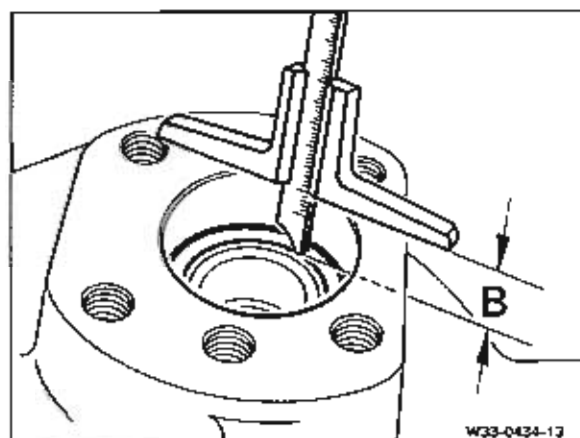
Note

The joint housing is to be installed without axial play. This is achieved by installing thrust washers at the upper steering knuckle pin. Thrust washers are available in thicknesses of 3.7 to 4.9 mm in increments of 0.1 mm.

10 Determining thickness of thrust washer:

10.1 Measure distance from end face of joint housing to bush.

Dimension B = e.g. 24.2 mm.



Assembly

A Brake anchor plate

1 Coat new radial sealing ring with non-rubberized outer surface with Omnifit FD 10 sealing compound.

2 Drive home new radial sealing ring flush with the sealing lip inwards. Coat sealing lip with multipurpose grease.

31 Drift 360 589 00 15 00

3 Turn round brake anchor plate (6).

4 Drive home pivoting bearing up to the stop in the brake anchor plate (6).

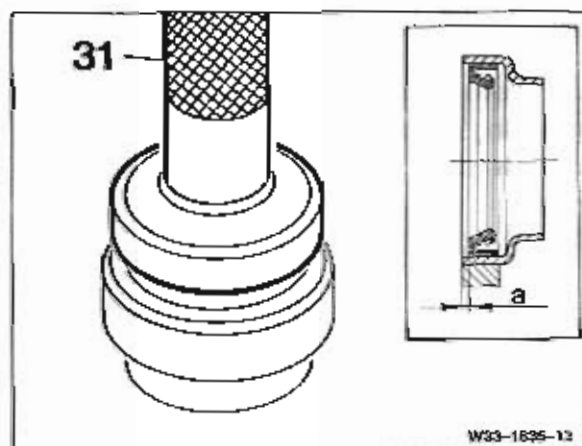
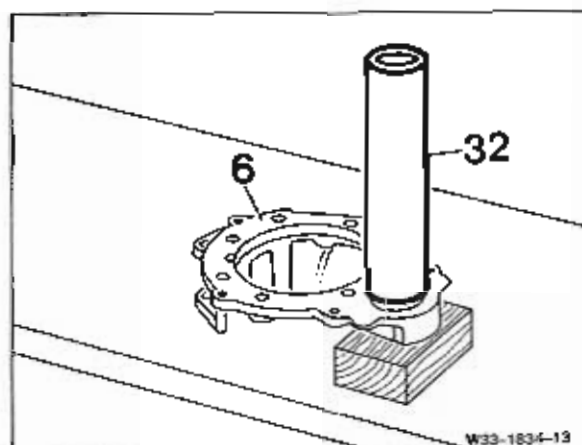
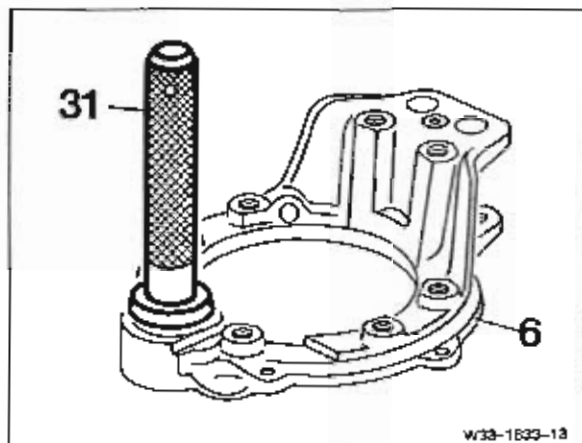
32 Sleeve 317 589 00 14 00

5 Engage circlip.

6 Coat new radial sealing ring with non-rubberized outer surface with Omnifit FD 10 sealing compound.

7 Drive home new radial sealing ring into the sealing ring holder with the sealing lip outwards, observing the installed depth (dimension a). Coat sealing lip with multipurpose grease.
Nominal value: 1.5 mm.

31 Drift 360 589 00 15 00



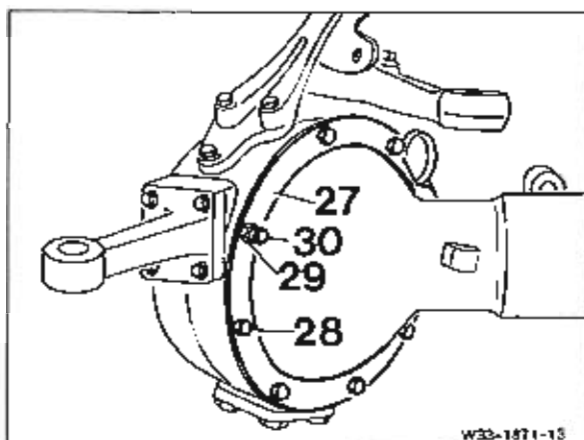
13 Insert inner sealing ring holder and new gasket in joint housing.

14 Mount outer sealing ring holder (27) with new seal, tighten hexagon bolts (28).

M 8 = 25 Nm.

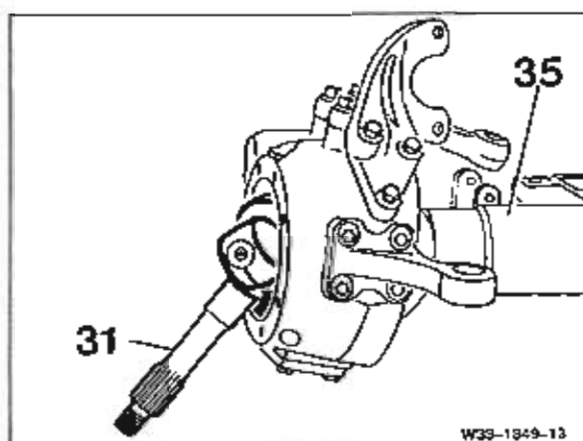
M 12 = 95 Nm.

15 Screw in wheel stop bolt (30) and tighten hexagon nut (29).

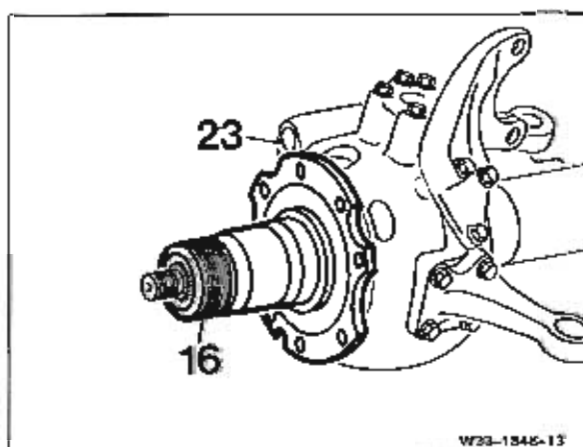


16 Pack joint housing with 1500 g multipurpose grease.

17 Carefully push drive shaft (31) into the axle tube (35) whilst avoiding damaging the sealing lip of the radial sealing ring.



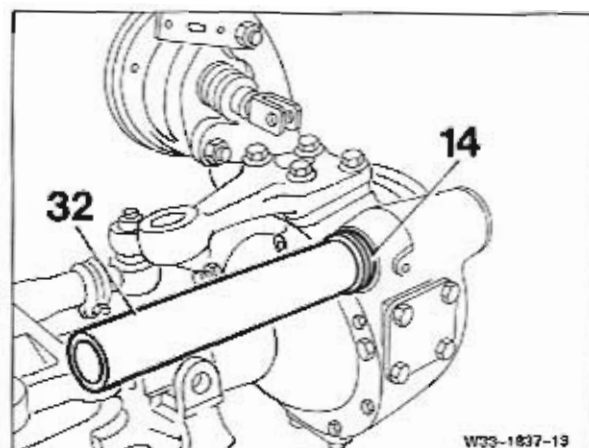
18 Pack supporting sleeve (16) with 100 g multipurpose grease and put on the joint housing (23) in accordance with the marking, avoiding damaging the sealing lip of the radial sealing ring.



14 Drive home pivoting bearing (14) up to the stop in the joint housing.

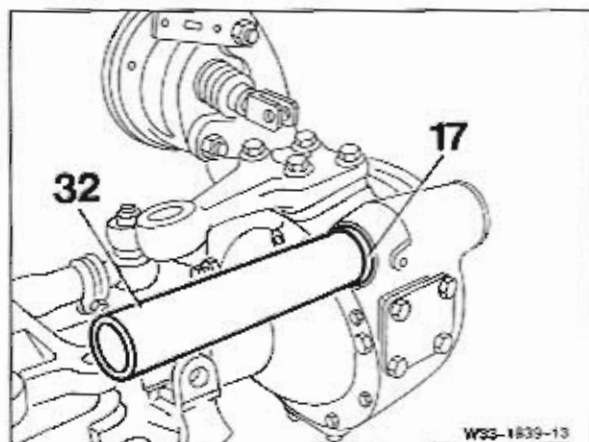
32 Sleeve 317 589 00 14 00

15 Engage circlip.



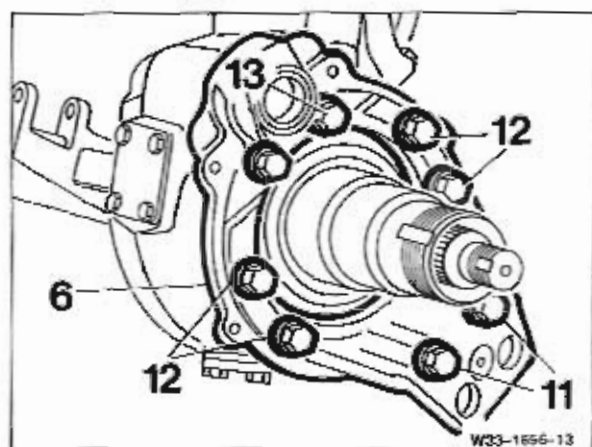
16 Drive home sealing ring holder (17) in the joint housing.

32 Sleeve 317 589 00 14 00

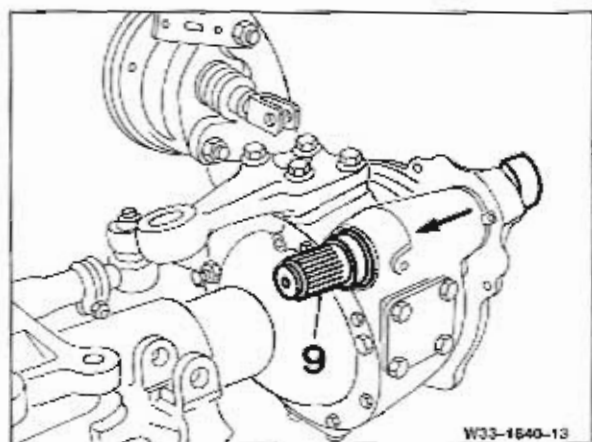


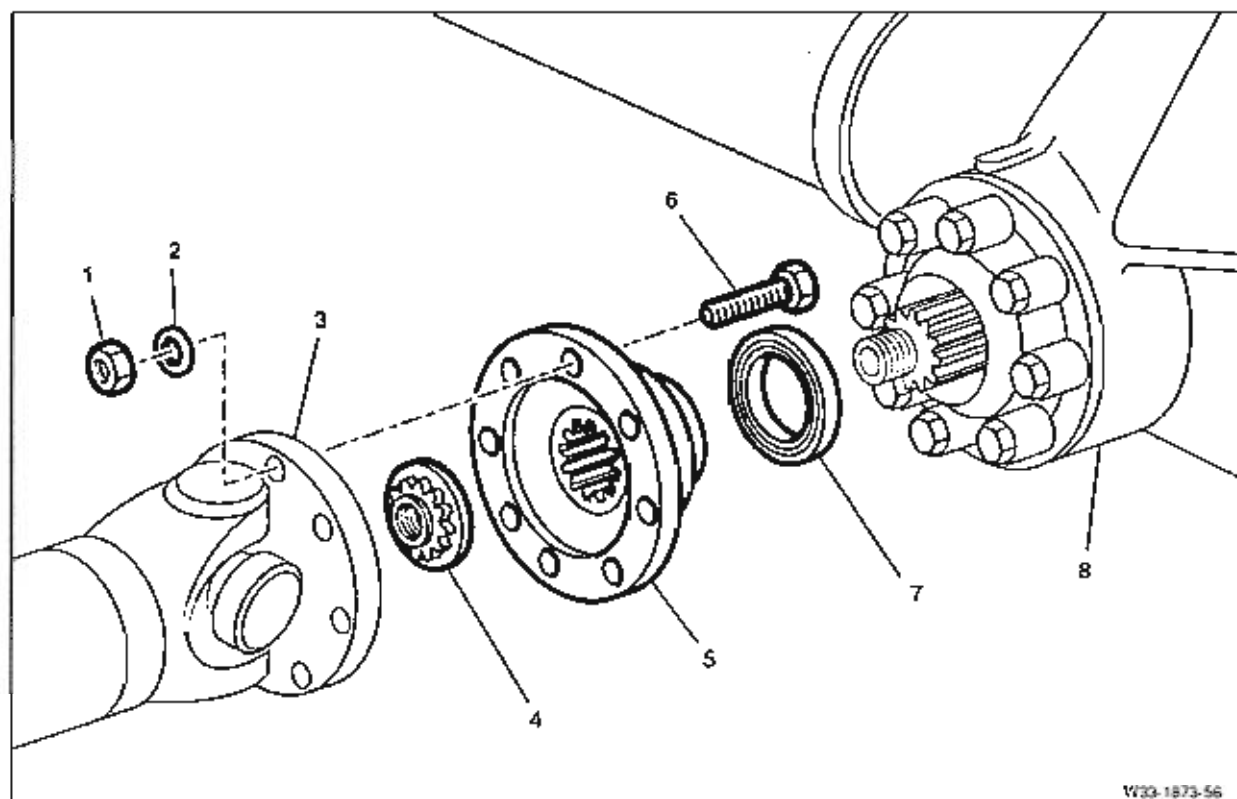
Installation

1 Mount brake anchor plate (6) on joint housing, tighten hexagon bolts (11, 12 and 13) in accordance with the marking, 280 Nm.



2 Push in brake camshaft (9) in direction of arrow.





W33-1873-56

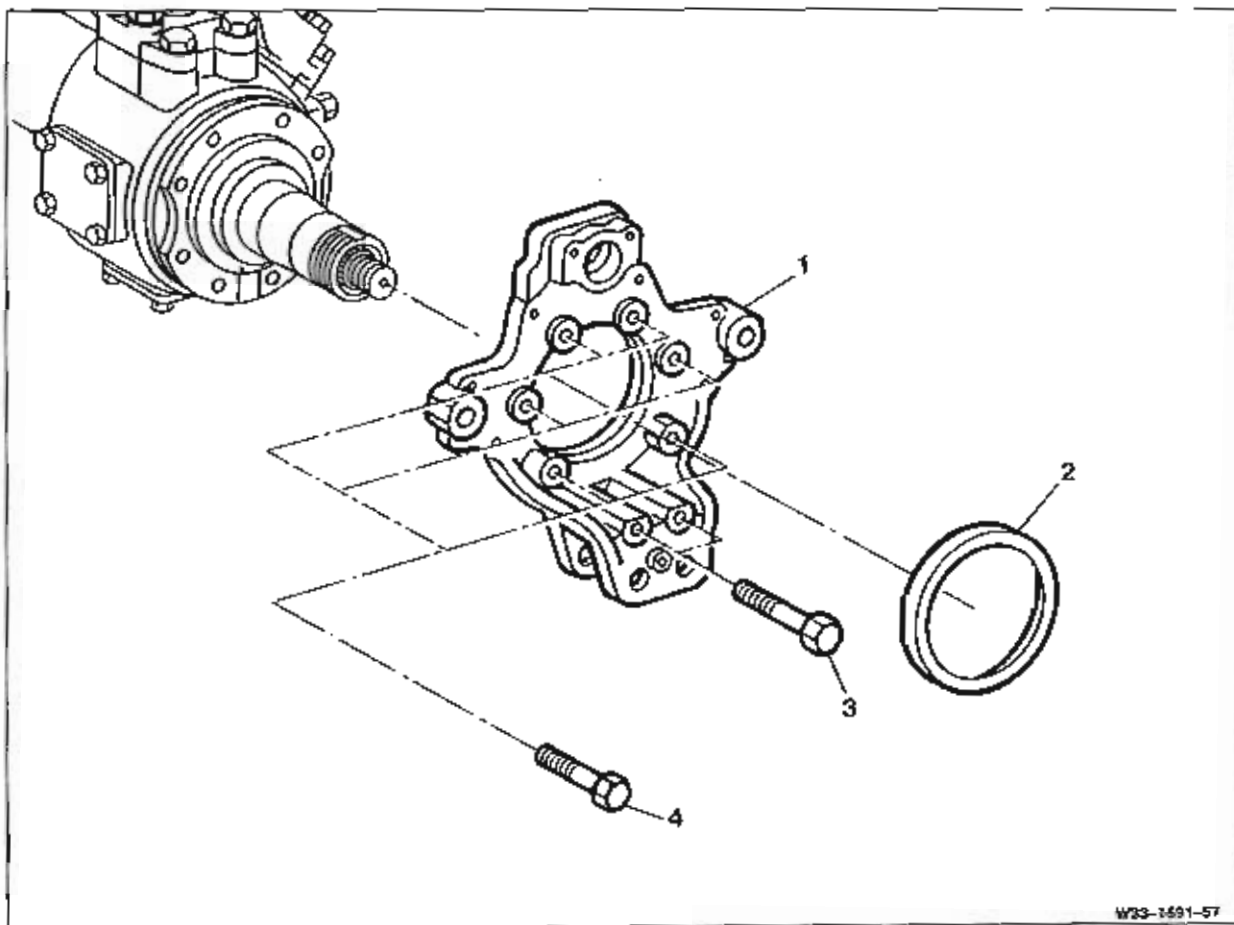
- | | | |
|---|-----------------------------|---|
| 1 | Hexagon nuts | 59 Nm, open-end wrench WAF 17 000 589 21 01 00, torque wrench handle 001 589 44 21 00. |
| 2 | Spring washers | Replace. |
| 3 | Propeller shaft | |
| 4 | Collar nut | Replace, 300 Nm, socket wrench insert 001 589 74 09 00. |
| 5 | Flange | Check, replace if required, puller 035 589 01 33 00. |
| 6 | Hexagon bolts | |
| 7 | Radial sealing ring | Replace, coat non-rubberized outer surface with Omnifit FD 10 sealing compound, drill 387 589 05 15 00. |
| 8 | Axle casing with axle tubes | |

33.6-055 Removal and installation of brake anchor plate (vehicles with hydraulic brakes)

Preceding work:

Brake shoes removed (33.6-035).

Brake cylinder removed (33.6-030).

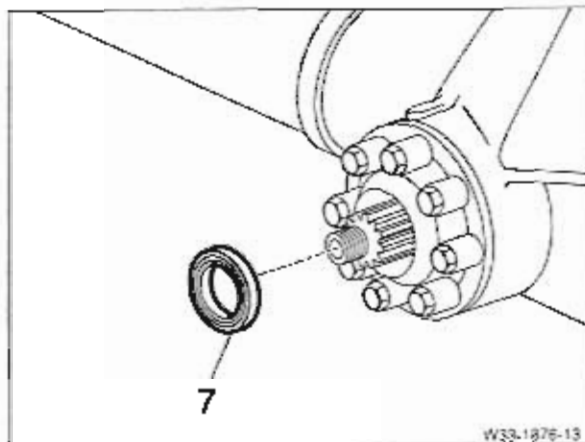


- | | | |
|---|--------------------|---|
| 1 | Brake anchor plate | |
| 2 | Oil retainer | Coat with Omnifit FD 10 sealing compound. |
| 3 | Hexagon bolts | 280 Nm. |
| 4 | Hexagon bolts | 280 Nm. |

Note

Microencapsulated hexagon bolts must be replaced.

4 Remove radial sealing ring (7).

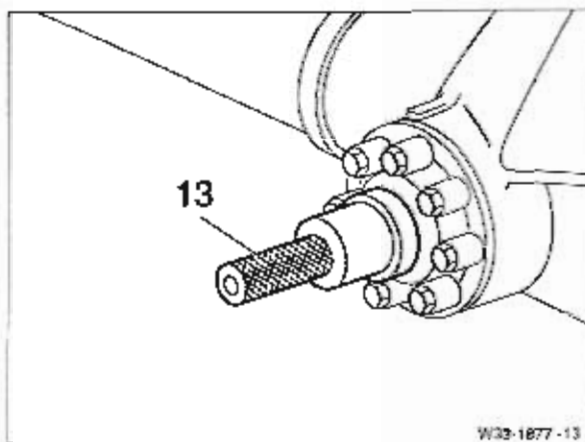


5 Coat new radial sealing ring with non-rubberized outer surface with Omnifit FD 10 sealing compound.

6 Drive home new radial sealing ring flush with sealing lip towards the axle casing (max. 0.3 mm lower).

13 Drib 387 589 05 15 00

7 Check contact surface of radial sealing ring for scores, replace flange if required.

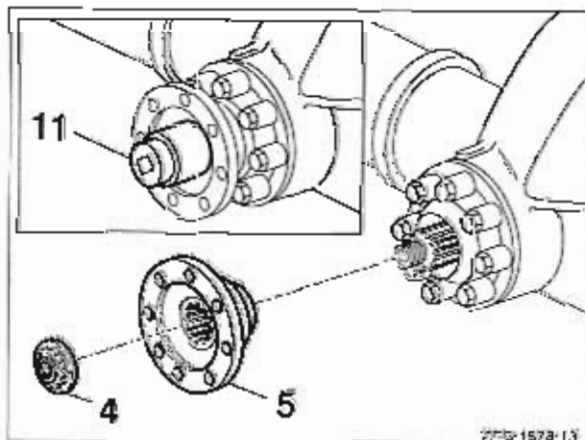


8 Pack space between dust and sealing lip with multipurpose grease, coat sealing lip and opposing contact surface of radial sealing ring with hypoid gear oil SAE 90.

9 Push flange (5) onto the bevel pinion so that the sealing lip of the radial sealing ring is not damaged.

10 Tighten new collar nut (4), 300 Nm.

11 Socket wrench insert 001 589 74 09 00

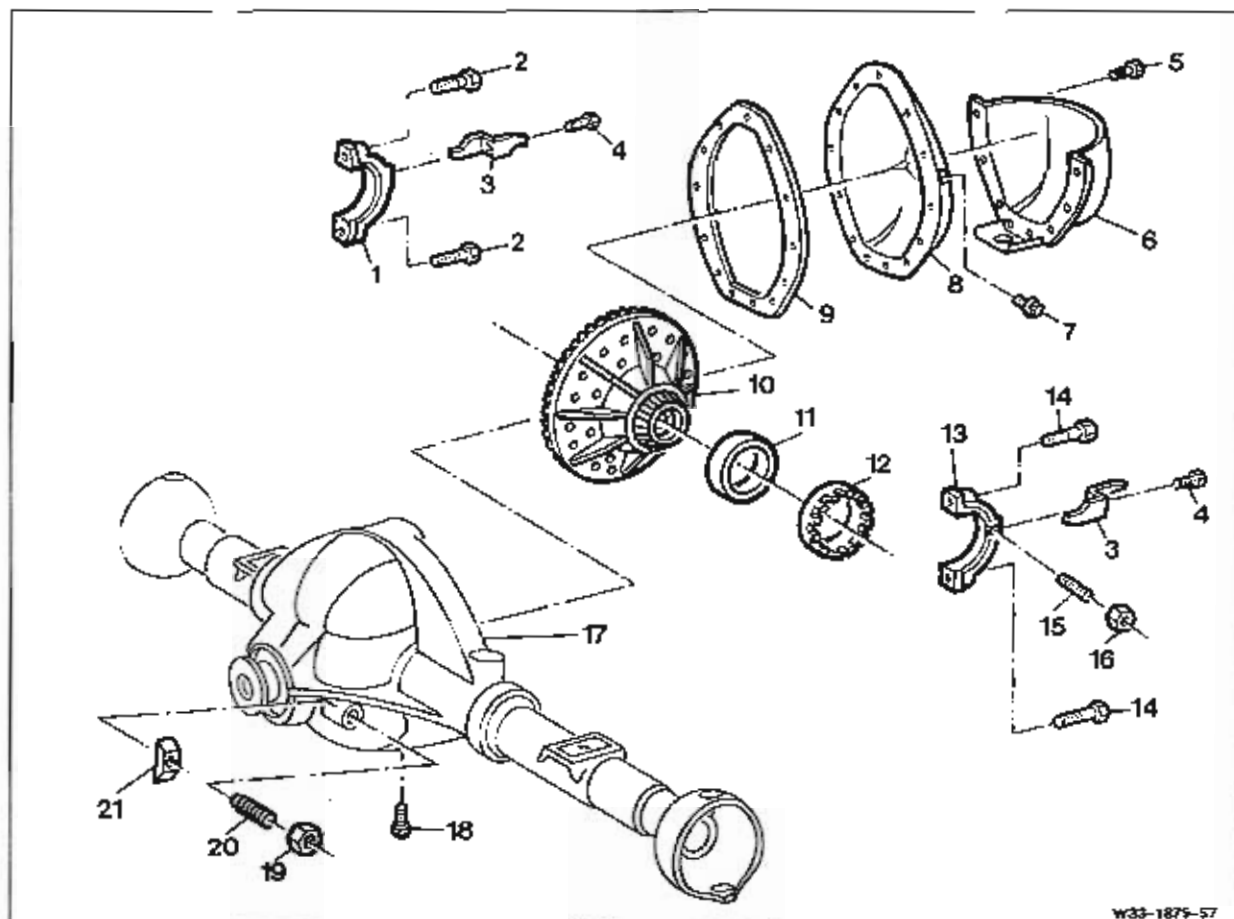


7	Hexagon bolts	M 14×1.5-10.9 = 210 Nm, M 14×1.5-12.9 = 280 Nm, (replace serrated bolts).
8	Upper steering knuckle pin, on steering side	
9	Intermediate ring	
10	Serrated bolt	Replace, M 16×1.5 = 320 Nm.
11	Serrated bolt	Replace, M 14×1.5 = 200 Nm.
12	Serrated bolt	Replace, M 16×1.5 = 320 Nm.
13	Brake cylinder bracket	
14	Hexagon bolts	170 Nm, (replace serrated bolts).
15	Steering knuckle arm	
16	Supporting sleeve	Pack with 100 g multipurpose grease.
17	Needle bearing	Internal extractor 000 589 30 33 00, steady 000 589 35 33 00, drift 387 589 02 15 00.
18	Radial sealing ring	Replace, coat non-rubberized outer surface with Omnifit FD 10 sealing compound, drift 343 589 06 15 00.
19	Hexagon bolts	210 Nm, (replace microencapsulated hexagon bolts).
20	Lower steering knuckle pin	
21	Roller bearing	
22	Thrust collar	
23	Joint housing	Install without axial play (up to axle no.2 599 965), install with 0.05 – 0.15 mm preload, pack with 1500 g multipurpose grease.
24	Inner sealing ring holder	
25	Gasket	Replace.
26	Seal	Replace.
27	Outer sealing ring holder	
28	Hexagon bolts	M 8 = 25 Nm, M 12 = 95 Nm.
29	Hexagon nut	95 Nm.
30	Wheel stop bolt	
31	Drive shaft	
32	Radial sealing ring	Replace, coat non-rubberized outer surface with Omnifit FD 10 sealing compound, internal extractor 000 589 30 33 00, steady 00 589 35 33 00, drift 343 589 06 15 00.
33	Needle bearing	Internal extractor 000 589 30 33 00, steady 000 589 35 33 00, drift 387 589 02 15 00.
34	Lower needle bearing	Drift 314 589 04 15 00.
35	Axle tube	
36	Upper needle bearing	Drift 314 589 04 15 00.
37	Thrust washer (up to axle no. 2 599 965)	
38	Thrust collar (up to axle no. 2 599 965)	
39	Sealing ring (up to axle no. 2 599 965)	
40	Bush (up to axle no. 2 599 965)	Drift 360 589 00 15 00.
41	Bush (up to axle no. 2 599 965)	Drift 360 589 00 15 00.
42	Sealing ring (up to axle no. 2 599 965)	

33.6-070 Removal and Installation of crown wheel with differential

Preceding work:

Supporting sleeve and joint housing removed (33.6-060).



W33-1879-57

- | | | |
|----|-----------------------------------|---|
| 1 | Bearing cap | |
| 2 | Hexagon bolts | Coat with Omnifit FD 10 sealing compound,
M 18 - 10.9 = 230 Nm, M 16 - 12.9 = 270 Nm. |
| 3 | Tab washers | |
| 4 | Hexagon bolts | M 8 - 8.8 = 30 Nm. |
| 5 | Hexagon bolts | M 10 - 8.8 = 50 Nm, M 10 - 12.9 = 130 Nm,
(replace serrated bolts). |
| 6 | Shield (up to axle no. 2 397 321) | |
| 7 | Sealing plug | 100 Nm |
| 8 | Axle casing cover | |
| 9 | Gasket | |
| 10 | Crown wheel with differential | Backlash 0.20 - 0.28 mm,
square mandrel 312 589 04 07 00,
dial gauge 001 589 32 21 00,
measuring stop 354 589 00 21 00,
dial gauge holder 363 589 02 21 00,
dial gauge 001 589 53 21 00. |
| 11 | Outer race | |
| 12 | Ring nuts | Square mandrel 312 589 04 07 00. |
| 13 | Bearing cap | |
| 14 | Hexagon bolt | Coat with Omnifit FD 10 sealing compound,
M 16 - 10.9 = 230 Nm, M 16 - 12.9 = 270 Nm. |
| 15 | Carrying bolt | |

Special tools



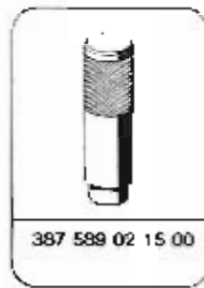
314 589 04 15 00



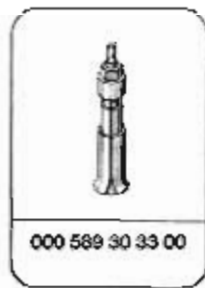
343 589 06 15 00



360 589 00 15 00



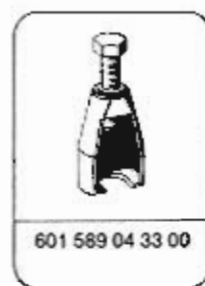
387 589 02 15 00



000 589 30 33 00



000 589 35 33 00



601 589 04 33 00

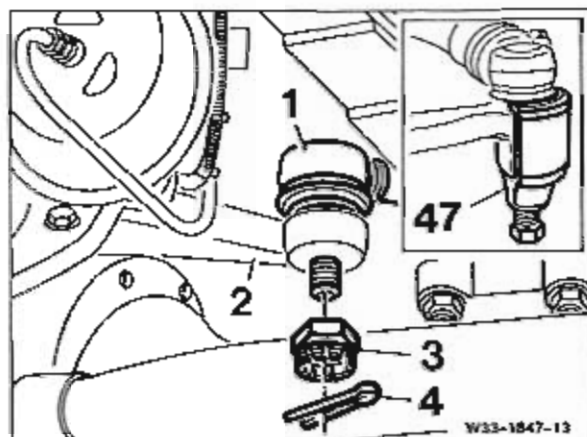


318 589 00 35 00

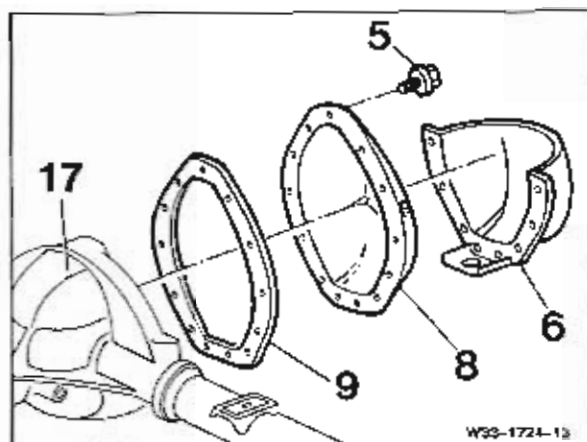
Installation

- 1 Remove split pin (4) and unscrew castle nut (3).
- 2 Press drag link (1) out of steering arm (2).

- 47 Puller 318 589 00 35 00 (cone connections M 24 x 1.5)
47 Puller 601 589 04 33 00 (cone connections M 20 x 1.5)

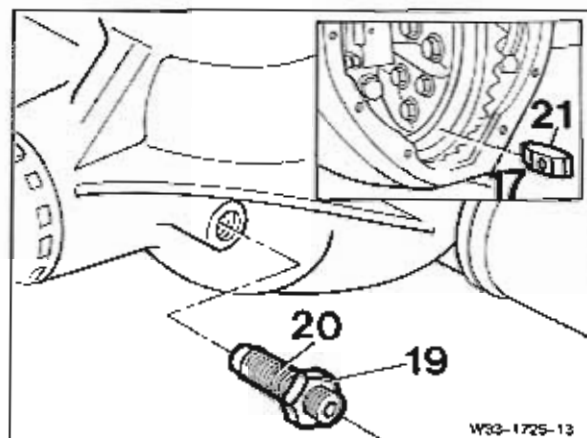


4 Unscrew hexagon bolts (5) and remove axle casing cover (8) with gasket (9) from axle casing (17).

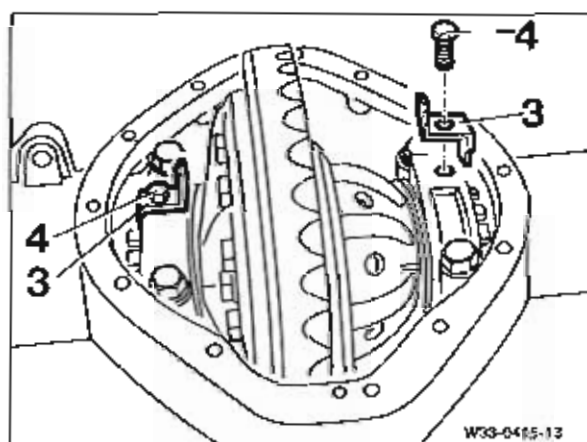


5 Up to axle no. 2 397 321:
Unscrew hexagon bolts (5), remove shield (6) and axle casing cover (8) with gasket (9) from axle casing (17).

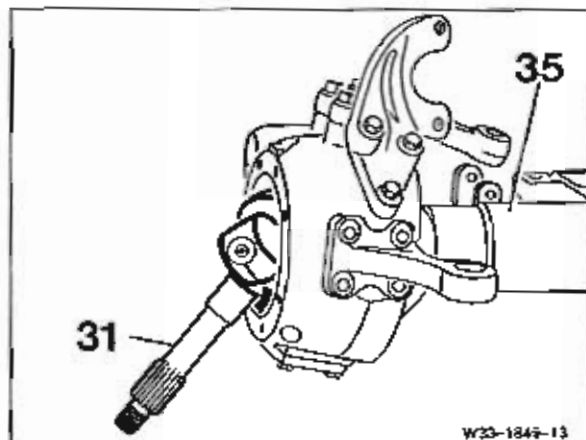
6 Loosen lock nut (19), unscrew adjusting screw (20) and remove sliding block (21) from axle casing (17).



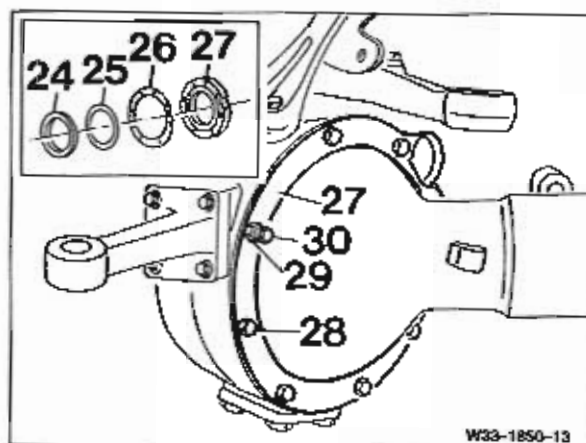
7 Unscrew hexagon bolts (4) and remove tab washers (3).



7 Withdraw drive shaft (31) from the axle tube (35).



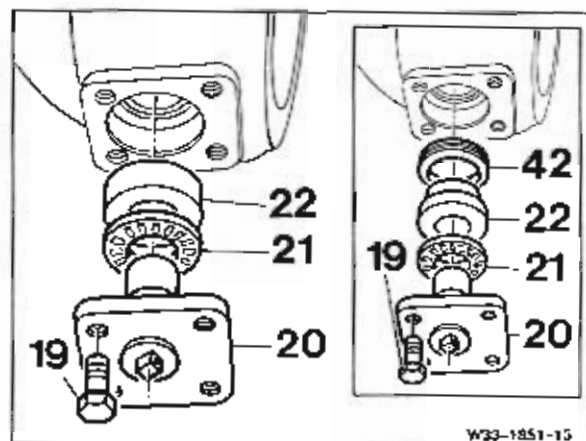
8 Loosen hexagon nut (29) and unscrew wheel stop bolt (30).



9 Unscrew hexagon bolts (28), remove outer sealing ring holder (27) with seal (26), gasket (25) and inner sealing ring holder (24).

10 On the steering side:

Unscrew hexagon bolts (19), remove lower steering knuckle pin (20), roller bearing (21) and thrust collar (22) or lower steering knuckle pin (20), roller bearing (21), thrust collar (22) and sealing ring (42) (up to axle no. 2 599 965).



7 On opposite side:

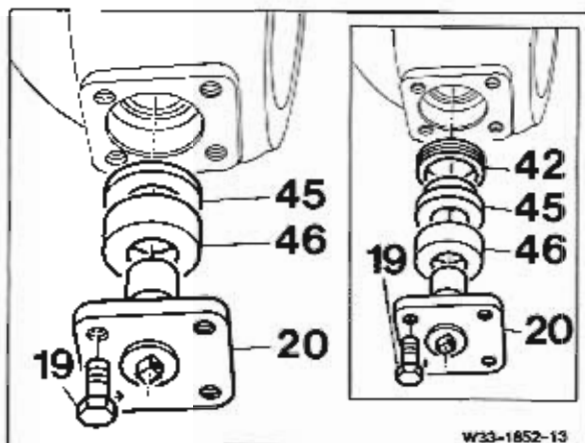
7.1 Place thrust collar (46) with the grooves upwards on the lower steering knuckle pin (20).

7.2 Lay thrust washer (45) and sealing ring (42) (up to axle no. 2 599 965) in place.

7.3 Install lower steering knuckle pin (20) and tighten hexagon bolts (19), 210 Nm.

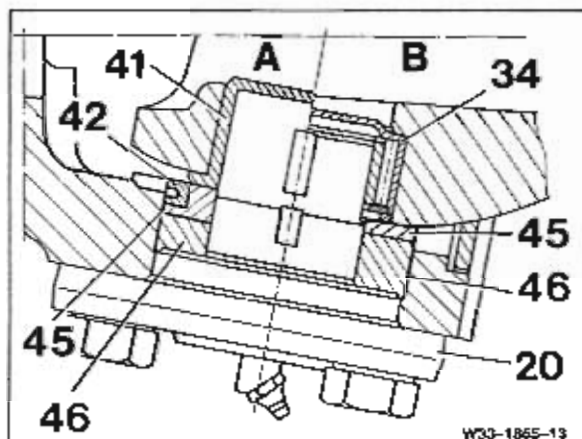
Notes

Up to axle no. 2 343 639, a roller bearing has been installed instead of the thrust collar (46).
Replace microencapsulated hexagon bolts.

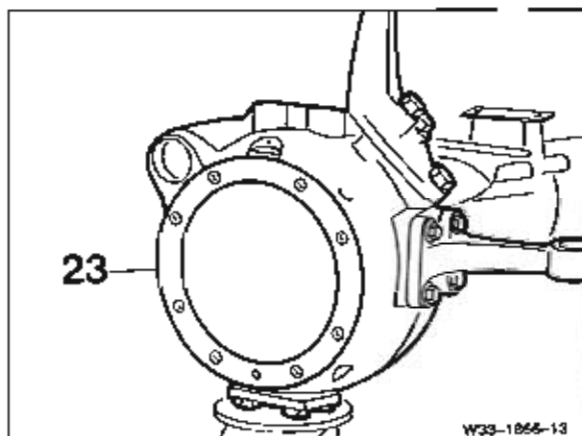


Arrangement of lower steering knuckle mount on opposite side:

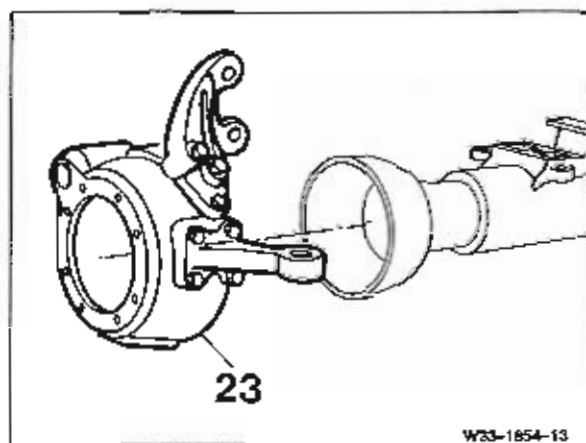
- 20 Steering knuckle pin
- 45 Thrust washer
- 46 Thrust collar
- A
- 41 Bush (up to axle no. 2 599 965)
- 42 Sealing ring (up to axle no. 2 599 965)
- B
- 34 Needle bearing



8 Raise joint housing (23) and support so that the lower steering knuckle pin abuts without any play.



14 Remove joint housing (23).

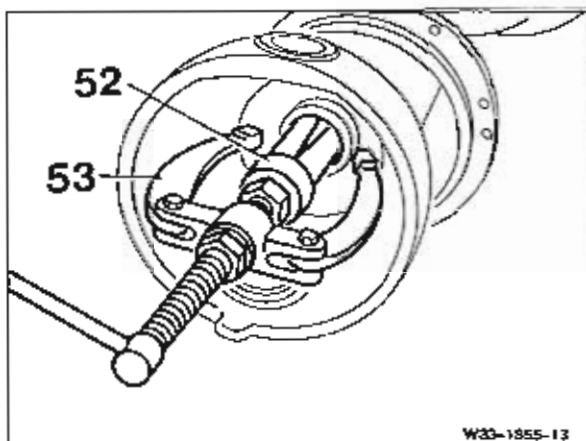


15 Using internal extractor (52) and steady (53) withdraw radial sealing ring from axle tube.

16 Check needle bearing, replace if required (refer to dismantling).

Dismantling

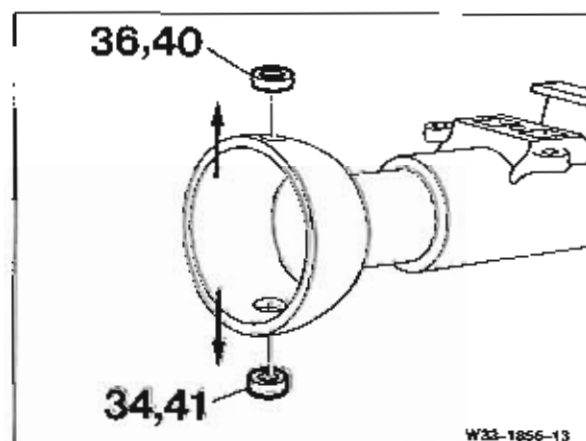
1 Using internal extractor (52) and steady (53) withdraw needle bearing from axle tube.



52 Internal extractor 000 589 30 33 00
53 Steady 000 589 35 33 00

2 Using a suitable drift, drive out upper needle bearing (36) or upper bush (40) (up to axle no. 2 599 965) in direction of arrow.

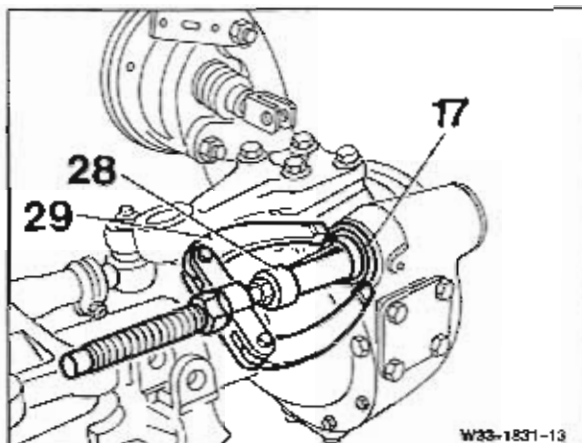
3 Using a suitable drift, drive out lower needle bearing (34) or lower bush (41) (up to axle no. 2 599 965) in direction of arrow.



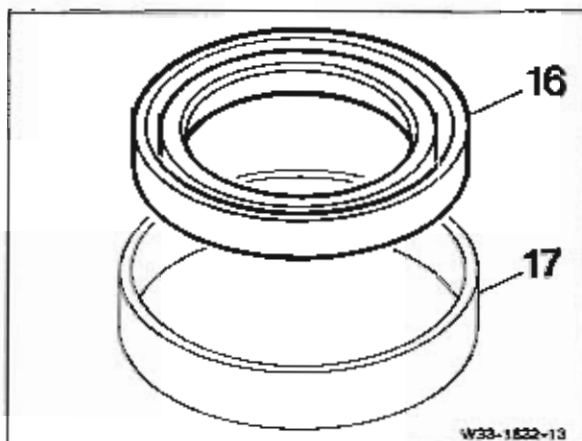
B Joint housing:

10 Using internal extractor (28) and steady (29) pull out sealing ring holder (17).

28 Internal extractor 000 589 29 33 00
29 Steady 000 589 34 33 00



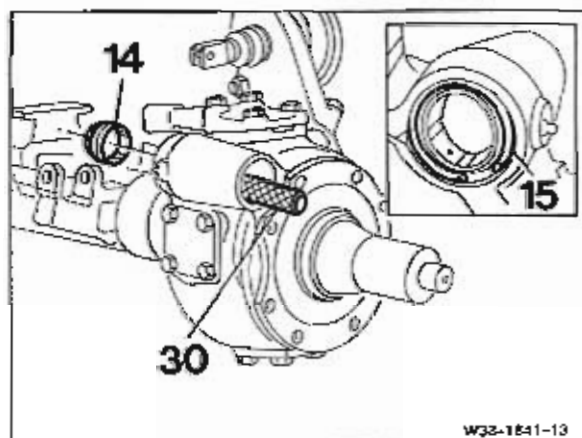
11 Remove radial sealing ring (16) from the sealing ring holder (17).



12 Disengage circlip (15).

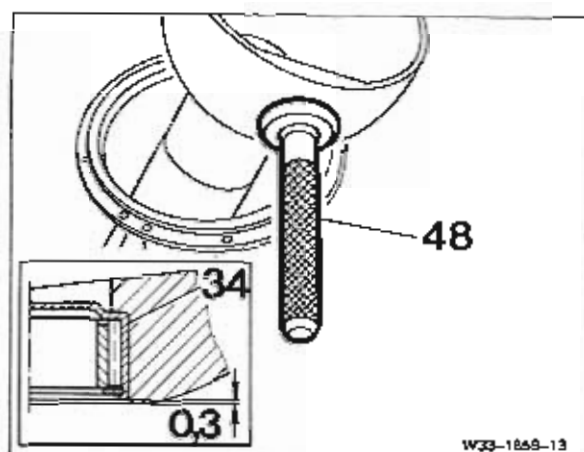
13 Drive pivoting bearing (14) out of joint housing.

30 Drift 730 589 03 15 00



4 Drive lower needle bearing (34) flush into the joint ball (max. 0.3 mm lower).

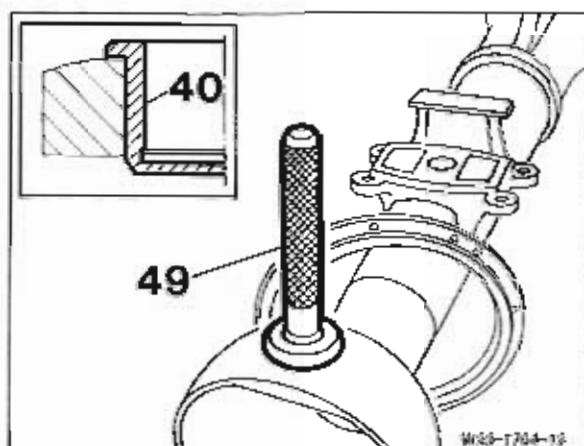
48 Drift 314 589 04 15 00



5 Up to axle no. 2 599 965:

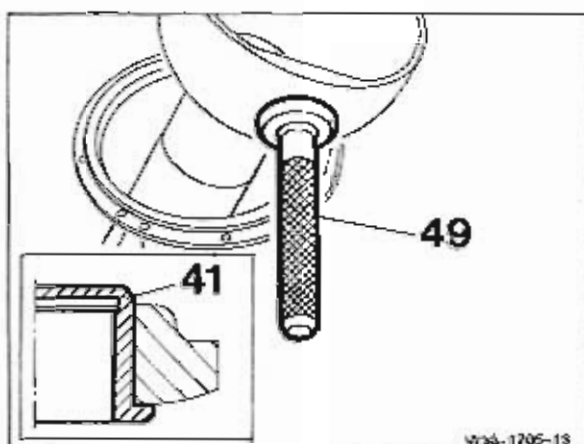
5.1 Drive upper bush (40) into the joint ball.

49 Drift 360 589 00 15 00



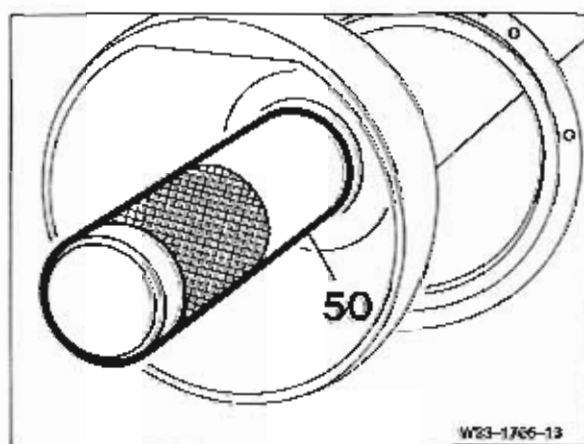
5.2 Drive lower bush (41) into the joint ball.

49 Drift 360 589 00 15 00



6 Lubricate needle bearing with multipurpose grease and drive into the axle tube.

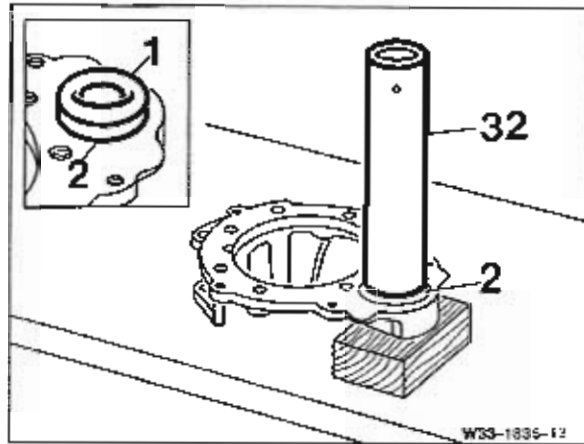
50 Drift 387 589 02 15 00



8 Drive home sealing ring holder (2) with new radial sealing ring up to the stop.

32 Sleeve 317 589 00 14 00

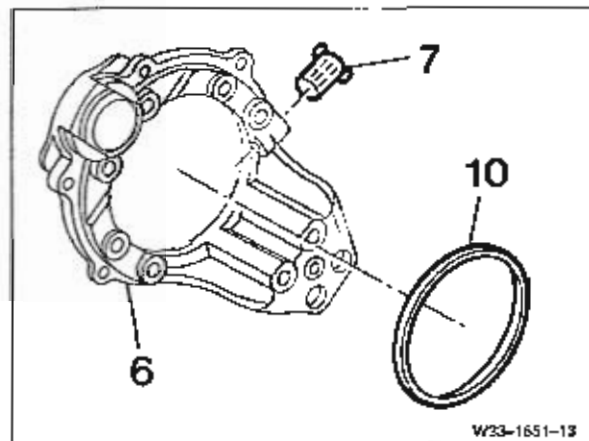
9 Mount new O-ring (1).



10 Coat oil retainer (10) with Omnifit FD 10 sealing compound and install in the brake anchor plate (6).

11 On vehicles with anti-lock braking system:

Lubricate new bush (7) of the sensor for the anti-lock braking system with Molykote 44 light silicone grease and install in the brake anchor plate.

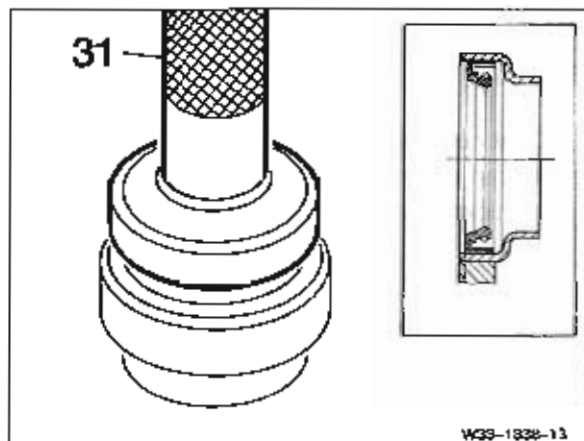


B Joint housing:

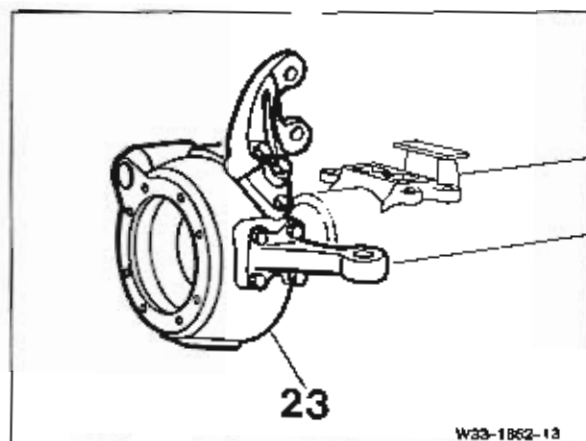
12 Coat new radial sealing ring with non-rubberized outer surface with Omnifit FD 10 sealing compound.

13 Drive home new radial sealing ring flush in the sealing ring holder with the sealing lip outwards. Coat the sealing lip with multipurpose grease.

31 Drift 360 589 00 15 00



5 Mount joint housing (23) on axle tube.



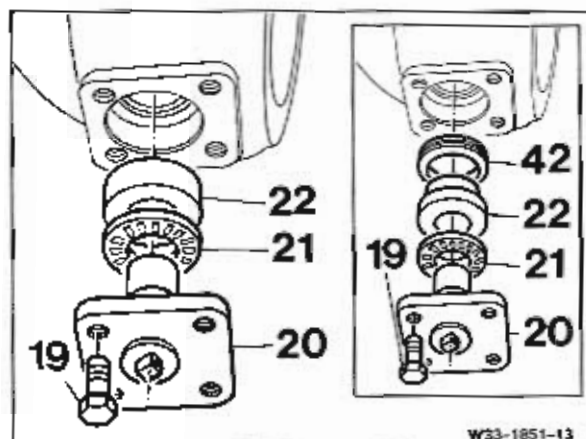
6 On the steering side:

6.1 Mount roller bearing (21) and thrust collar (22) or roller bearing (21), thrust collar (22) and sealing ring (42) (up to axle no. 2 599 965) on the lower steering knuckle pin (20).

6.2 Install lower steering knuckle pin (20) and tighten hexagon bolts (19), 210 Nm.

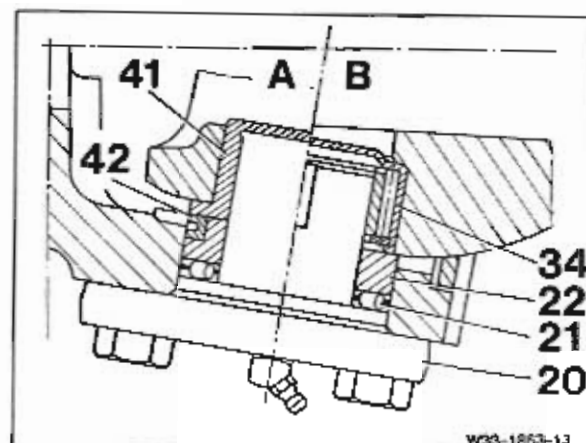
Note

Replace microencapsulated hexagon bolts.

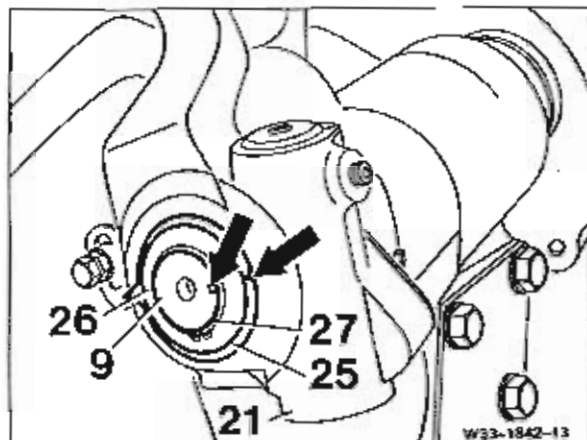


Arrangement of lower steering knuckle mount on the steering side:

- 20 Steering knuckle pin
- 21 Roller bearing
- 22 Thrust collar
- A
- 41 Bush (up to axle no. 2 599 965)
- 42 Sealing ring (up to axle no. 2 599 965)
- B
- 34 Needle bearing



- 3 Push linkage adjuster (21) on to the brake camshaft (9).
- 4 Push display disk (25) on to the brake camshaft whilst observing the markings (arrows).
- 5 Push on spacers (26) and engage circlip (27).
- 6 Check brake camshaft (9) for ease of movement and axial play, adjust if required.
Nominal value: 0.1 - 0.5 mm.



If the nominal value is not achieved, compensate axial play by adding or subtracting the appropriate spacers (26).

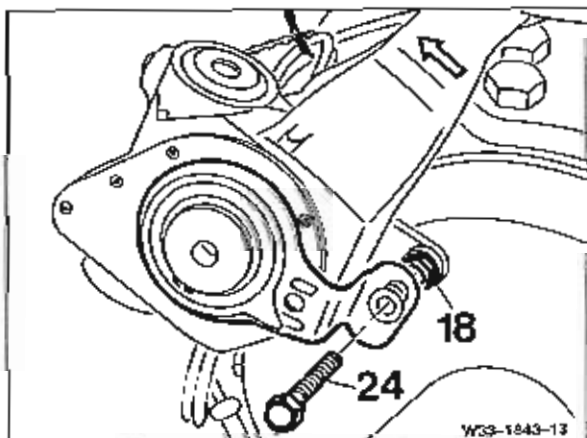
- 7 Install lubricated pin and plain washer and lock with new split pin.

- 8 Move control arm in direction of rotation of the linkage adjuster (arrow on linkage adjuster) as far as the stop without using force.

- 9 Tighten adjusting screw (24), 25 Nm.
- 10 Tighten the lock nuts (18) without bending the control arm.

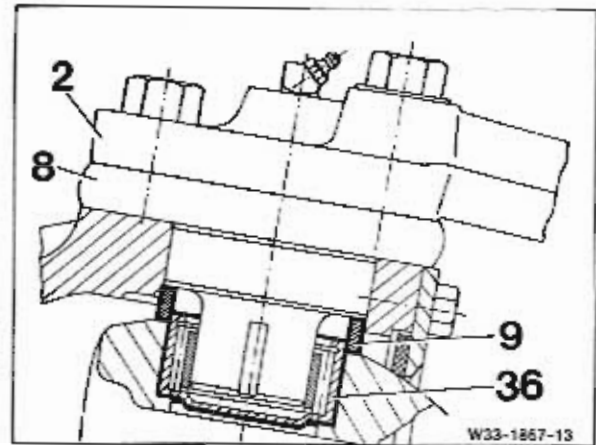
Note

Use plain washers as required.



Arrangement of upper steering knuckle mount on steering side:

- 2 Steering arm
- 8 Steering knuckle pin
- 9 Intermediate ring
- 36 Needle bearing



Note

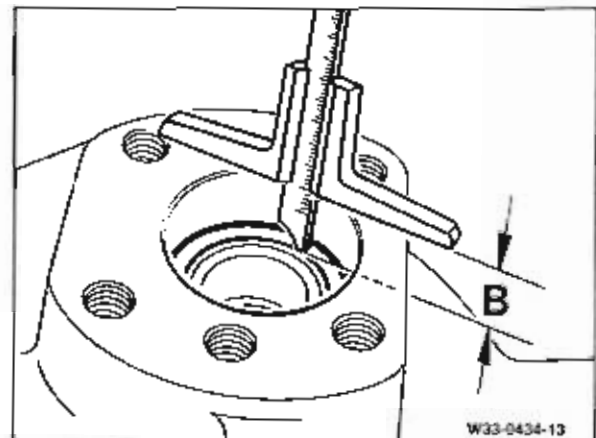
The joint housing to be installed with a preload of 0.05 – 0.15 mm. This is achieved by installing an intermediate ring on the upper steering knuckle pin.

Intermediate rings are available in thicknesses of 9.9 to 10.9 mm in increments of 0.2 mm.

9 Determining thickness of Intermediate ring:

9.1 Measure distance of end face of joint housing to axle tube.

Dimension B = e.g. 27.2 mm.



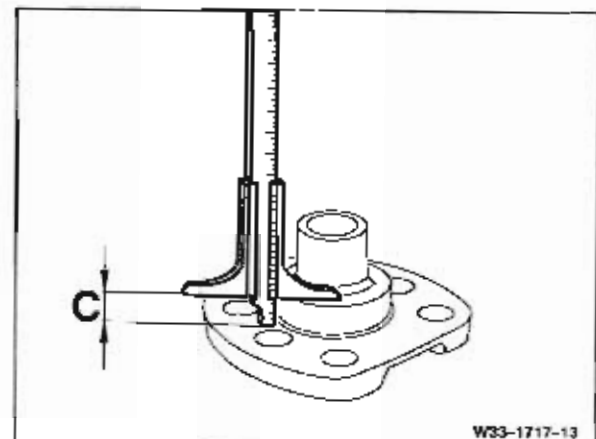
9.2 Measure distance from bearing surface of intermediate ring to bearing surface of steering knuckle pin.

Dimension C = e.g. 16.8 mm.

Dimension A = Dimension B - Dimension C + preload.

Dimension A = 27.2 mm - 16.8 mm + 0.10 mm = 10.5 mm.

Thickness of intermediate ring = 10.5 mm.



33.6-060 Removal, dismantling, assembly and installation of supporting sleeve and joint housing

Preceding work:

Tie rod removed (33.6-095).

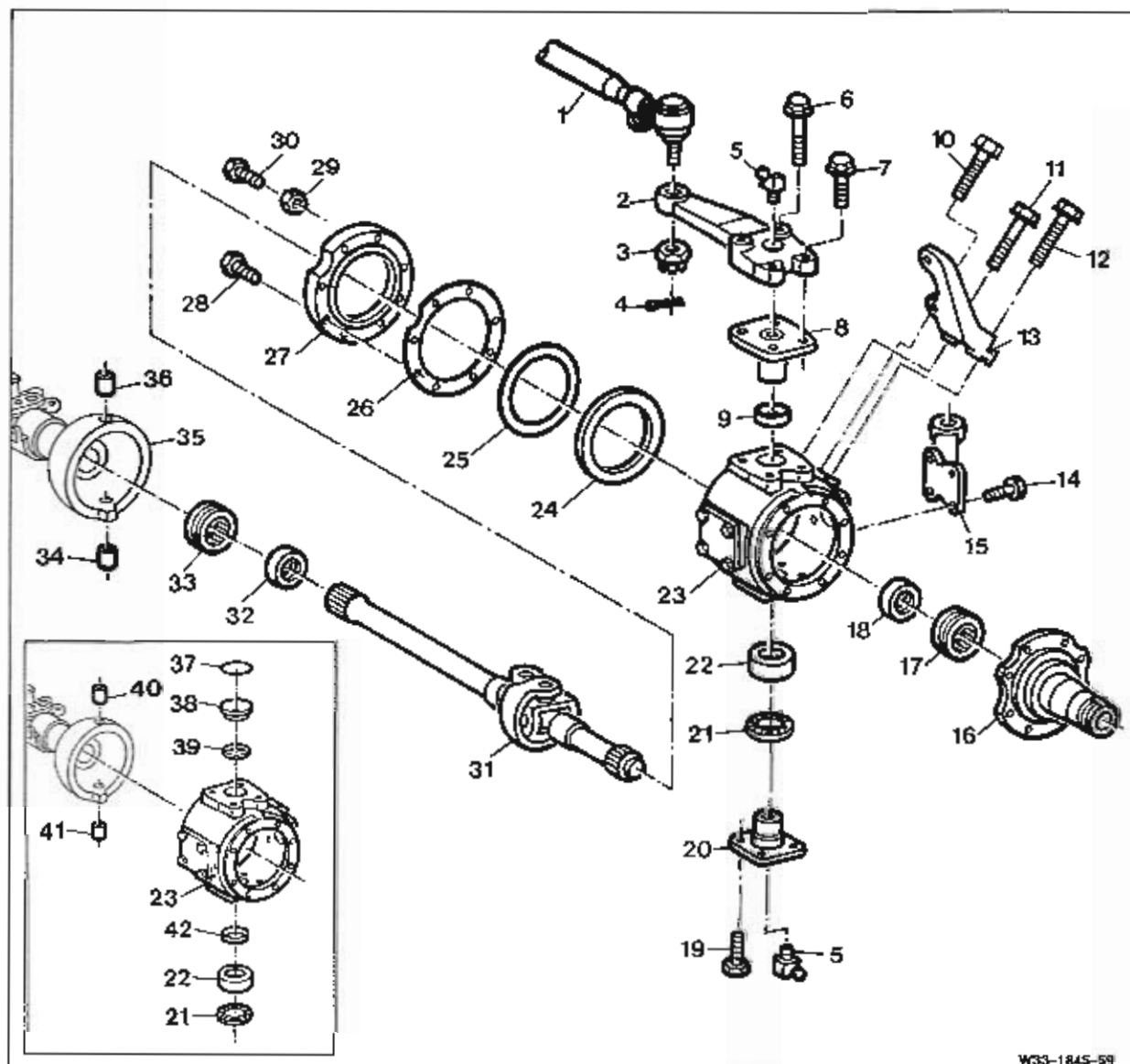
Brake cylinder removed (33.6-030).

Brake camshaft and brake anchor plate removed (33.6-050).

On vehicles with hydraulic brakes:

Tie rod removed (33.6-095).

Brake anchor plate removed (33.6-055).



W33-1845-99

- | | | |
|---|---------------|---|
| 1 | Drag link | Puller 318 589 00 35 00 (turn connections M 24 x 1.5), puller 601 589 04 33 00 (cone connections M 20 x 1.5). |
| 2 | Steering arm | |
| 3 | Castle nut | M 24 x 1.5 = 294 Nm, M 20 x 1.5 = 250 Nm . |
| 4 | Split pin | Replace. |
| 5 | Grease nipple | |
| 6 | Hexagon bolts | M 14 x 1.5-10.9 = 210 Nm,
M 14 x 1.5-12.9 = 280 Nm.
(replace serrated bolts). |

10.2 Place thrust collar with sealing ring on steering knuckle pin.

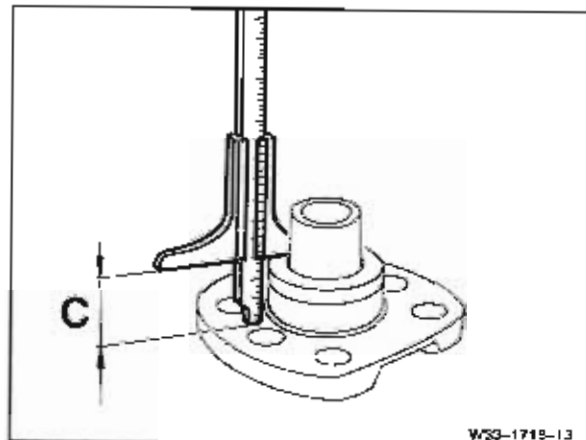
10.3 Measure distance of bearing surface of thrust collar to bearing surface of steering knuckle pin.

Dimension C = e.g. 19.8 mm.

Dimension A = Dimension B - Dimension C.

Dimension A = 24.2 mm - 19.8 mm = 4.4 mm.

Thickness of thrust collar = 4.4 mm.



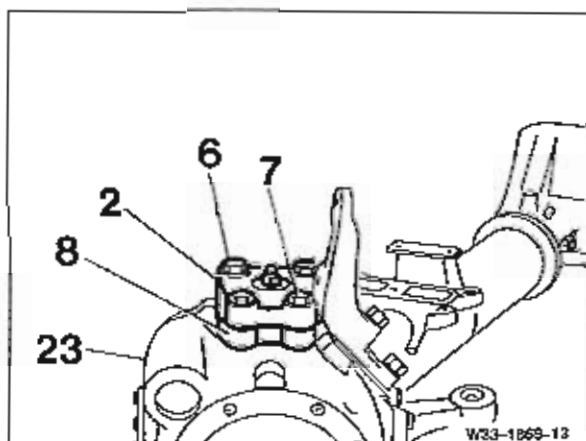
11 On the steering side:

11.1 Insert the upper steering knuckle pin (8) with the selected intermediate ring or thrust collar (up to axle no. 2 599 965) in joint housing (23).

11.2 Mount steering arm (2) and tighten hexagon bolts (6 and 7), 320 Nm.

Note

Replace serrated bolts.



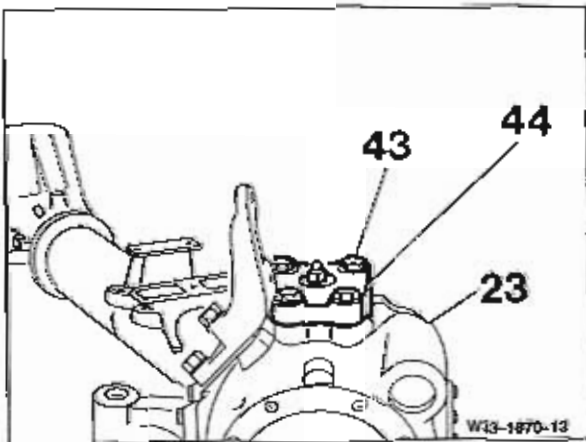
12 On opposite side:

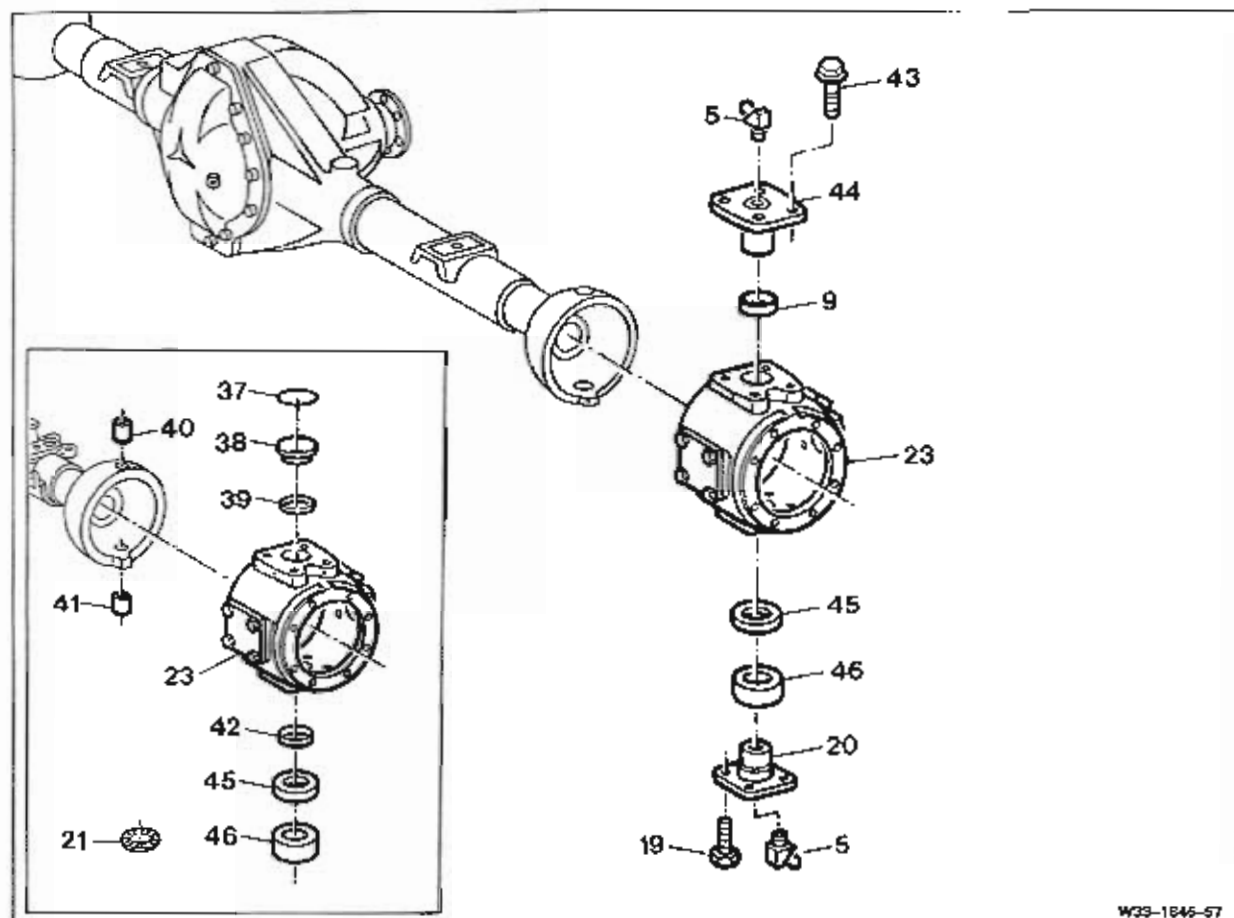
12.1 Insert upper steering knuckle pin (44) with selected intermediate ring or thrust collar (up to axle no. 2 599 965) in joint housing (23).

12.2 Tighten hexagon bolts (43), 300 Nm.

Note

Replace microencapsulated hexagon bolts.





W33-1645-57

- | | | |
|----|---|---|
| 5 | Grease nipple | |
| 9 | Intermediate ring | |
| 19 | Hexagon bolts | 210 Nm, (replace microencapsulated hexagon bolts). |
| 20 | Lower steering knuckle pin | |
| 21 | Roller bearing (up to axle no. 2 343 639) | |
| 23 | Joint housing | Install without axial play (up to axle no. 2 599 965),
install with 0.05 – 0.15 mm preload, pack with 1500 g
multipurpose grease. |
| 37 | Thrust washer (up to axle no. 2 599 965) | |
| 38 | Thrust collar (up to axle no. 2 599 965) | |
| 39 | Sealing ring (up to axle no. 2 599 965) | |
| 40 | Bush (up to axle no. 2 599 965) | Drift 360 589 00 15 00. |
| 41 | Bush (up to axle no. 2 599 965) | Drift 360 589 00 15 00. |
| 42 | Sealing ring (up to axle no. 2 599 965) | |
| 43 | Hexagon bolts | M 14 × 1.5 = 210 Nm, (replace microencapsulated
hexagon bolts). |
| 44 | Upper steering knuckle pin | |
| 45 | Thrust washer | |
| 46 | Thrust collar | |

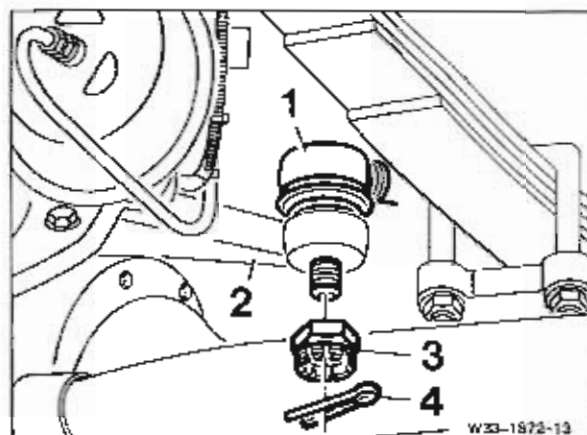
19 Insert drag link (1) in the steering arm (2).

20 Tighten castle nut (3) and lock with a new split pin (4).

M 20 × 1.5 = 250 Nm.

M 24 × 1.5 = 294 Nm.

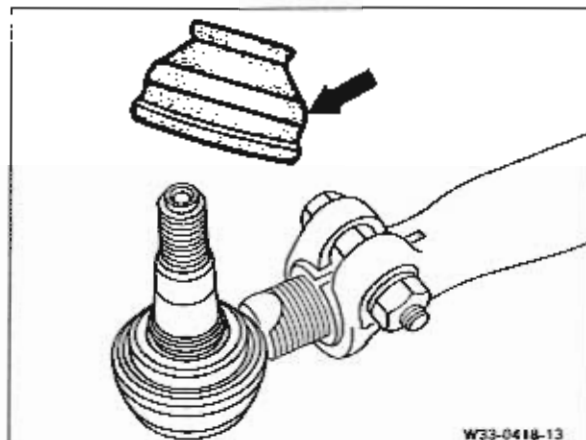
21 Adjust wheel stop bolts (33.6-015).



Note

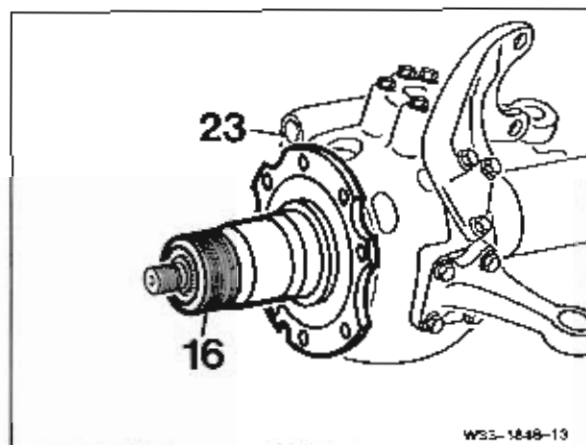
If a damaged sealing bellows (arrow) has been found on a used joint, the joint concerned is to be replaced completely. If the sealing bellows has been damaged when removing or installing the tie rod, it is sufficient for the sealing bellows to be replaced.

Check ball ends for play and for evidence of rust by lifting the sealing bellows, replace ball end or tie rod if required.



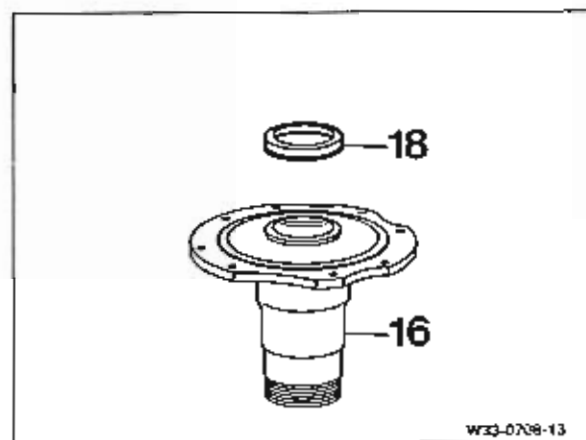
3 Mark supporting sleeve (16) in relation to joint housing (23).

4 Remove supporting sleeve (16).



5 Remove radial sealing ring (18) from supporting sleeve (16).

6 Check needle bearing, replace if required (refer to dismantling).

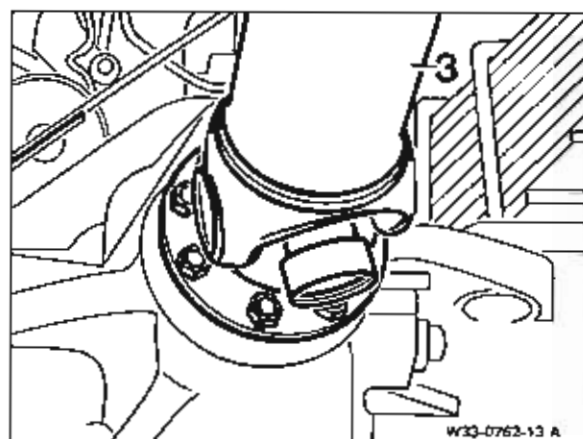


Special tools



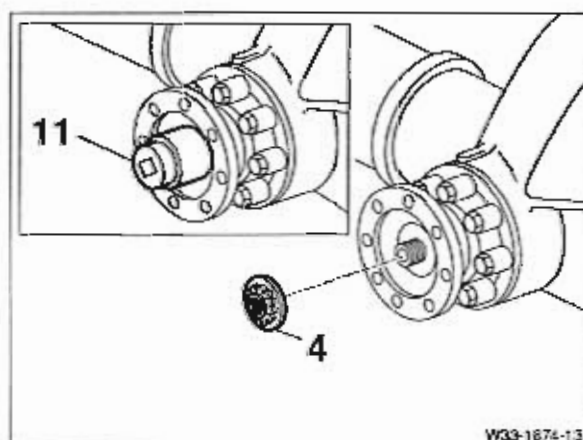
Procedure

1 Remove propeller shaft (3) at flange of bevel pinion and support.



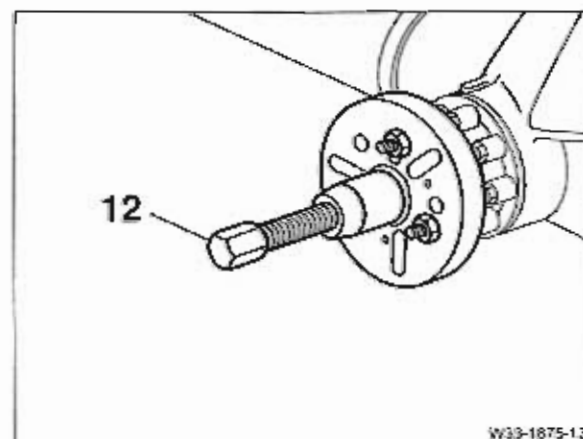
2 Unlock collar nut (4) and unscrew.

11 Socket wrench insert 000 589 74 09 00



3 Fasten puller (12) with three hexagon screw fittings on flange and pull off flange.

12 Puller 035 589 01 33 00

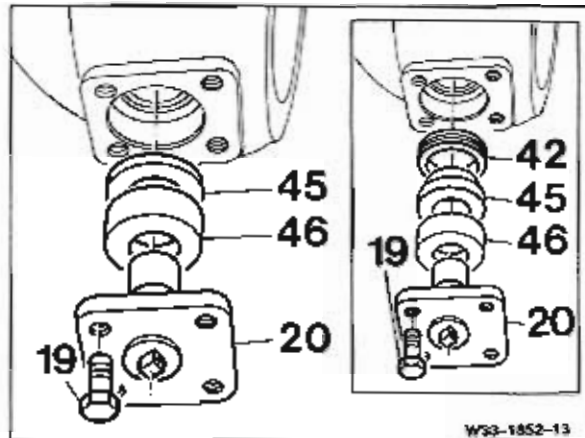


11 On opposite side:

Unscrew hexagon bolts (19), remove lower steering knuckle pin (20), thrust collar (46) and thrust washer (45) or lower steering knuckle pin (20), thrust collar (46), thrust washer (45) and sealing ring (42) (up to axle no. 2 599 965).

Note

Up to axle no. 2 343 639, a roller bearing has been installed instead of the thrust collar (46).

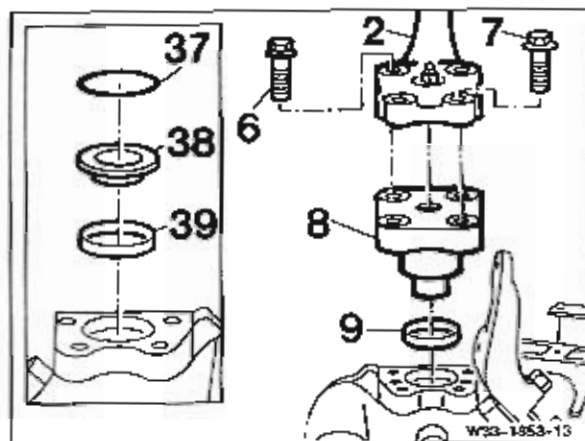


12 On the steering side:

12.1 Unscrew hexagon bolts (6 and 7).

12.2 Remove steering arm (2) and upper steering knuckle pin (8).

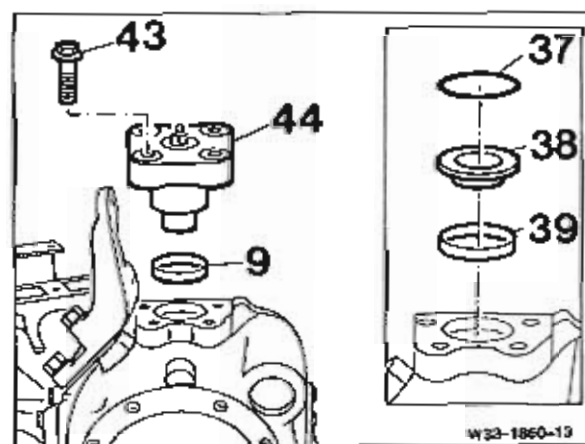
12.3 Remove intermediate ring (9) or thrust washer (37), thrust collar (38) and sealing ring (39) (up to axle no. 2 599 965).



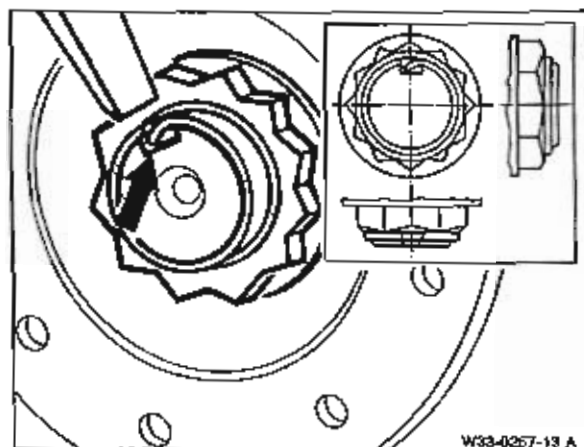
13 On opposite side:

13.1 Unscrew hexagon bolts (43), remove upper steering knuckle pin (44).

13.2 Remove intermediate ring (9) or thrust washer (37), thrust collar (38) and sealing ring (39) (up to axle no. 2 599 965).

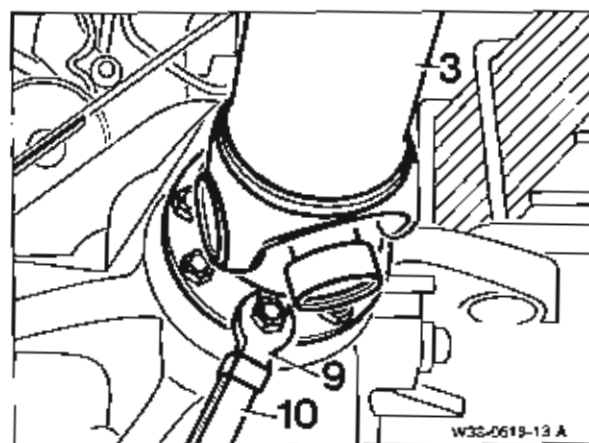


11 Shear off collar on new collar nut axially in the area of the locking groove so that the locking tab (arrow) abuts the left flank after it is bent into the locking groove.



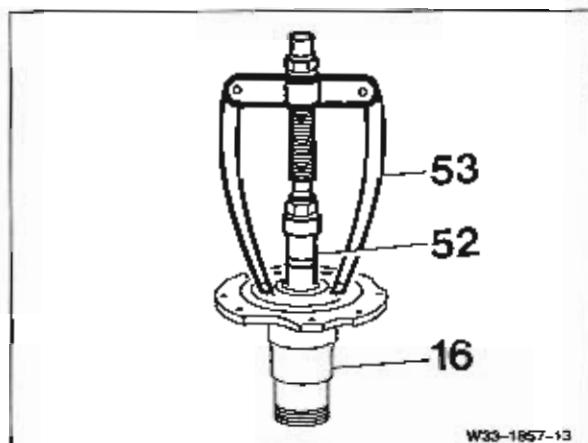
12 Install propeller shaft (3) with new spring washers, 59 Nm.

- 9 Open-end wrench WAF 17 mm 000 589 21 01 00
- 10 Torque wrench handle 001 589 44 21 00



4 Using internal extractor (52) and steady (53) withdraw needle bearing from supporting sleeve (16).

- 52 Internal extractor 000 589 30 33 00
- 53 Steady 000 589 35 33 00



5 Unscrew hexagon bolts (14) and remove steering knuckle arm (15).

6 Unscrew serrated bolts (10, 11 and 12) and remove brake cylinder bracket (13).

Assembly

1 Install steering knuckle arm (15) in joint housing and tighten hexagon bolts (14), 170 Nm.

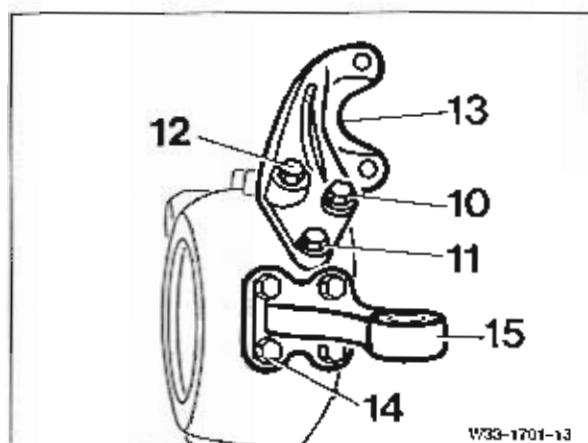
Note

Replace serrated bolts.

2 Install brake cylinder bracket (13) on joint housing and tighten new serrated bolts (10, 11 and 12).

M 14 × 1.5 = 200 Nm.

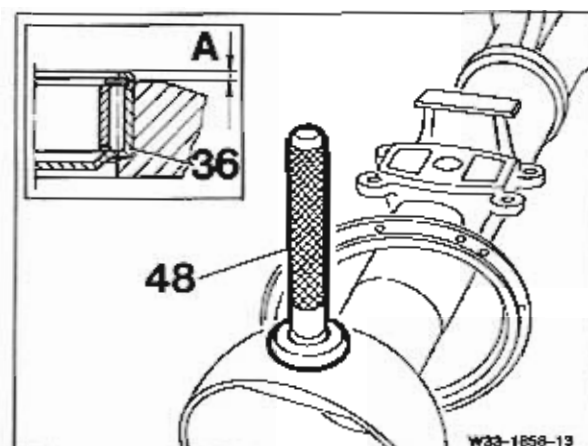
M 16 × 1.5 = 320 Nm.



3 Drive upper needle bearing (36) into the joint ball, observing dimension (A).

Nominal value: 2.5 mm.

48 Drift 314 589 04 15 00



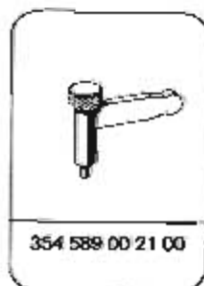
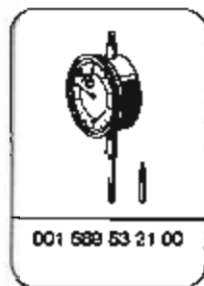
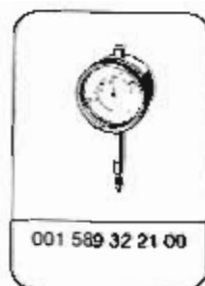
16	Lock nut	180 Nm.
17	Axle casing with axle tubes	
18	Oil drain plug	100 Nm, stud wrench insert 001 589 61 09 10.
19	Lock nut	M 28 × 1.5 = 700 Nm.
20	Adjusting screw	Coat with long-life grease.
21	Sliding block	

Oil capacities

Hypoid gear oil SAE 90
(refer to Specifications for Service Products, sheet 235).

5,0 l

Special tools



Removal

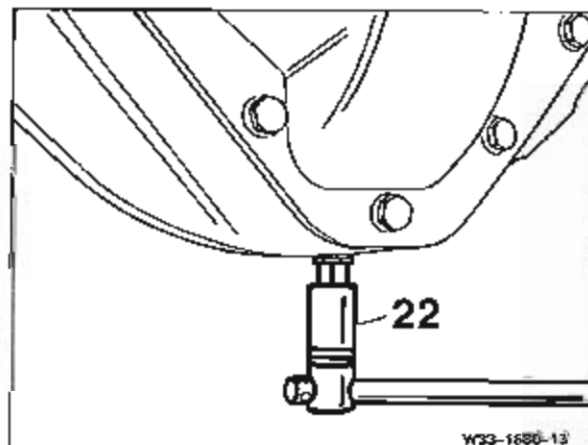
- 1 Drive front axle until it is warm.
- 2 Unscrew oil drain plug and drain oil.



Danger of scalding with hot oil.

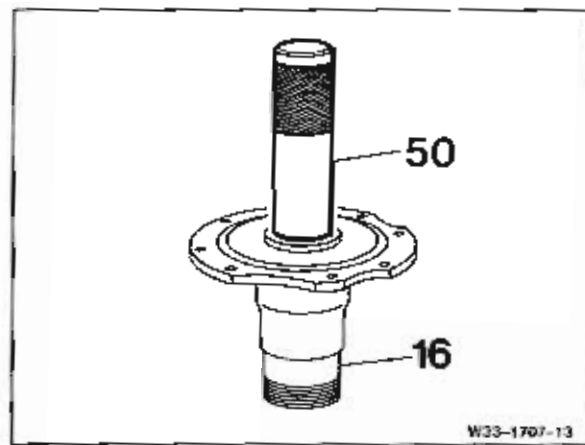
- 3 Tighten oil drain plug, 100 Nm.

22 Stud wrench insert 001 589 61 09 10



7 Lubricate needle bearing with multipurpose grease and drive into the supporting sleeve (16).

50 Drift 387 589 02 15 00

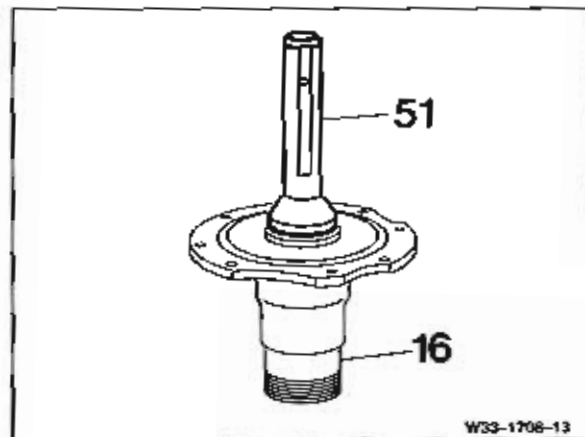


Installation

1 Coat new radial sealing ring with non-rubberized outer surface with Omnifit FD 10 sealing compound.

2 Drive home new radial sealing ring flush with the sealing lip towards the supporting sleeve (16) (max. 0.2 mm lower). Coat sealing lip with multipurpose grease.

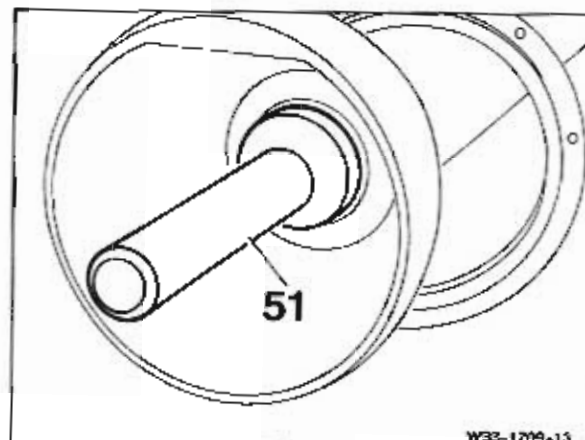
51 Drift 343 589 06 15 00



3 Coat new radial sealing ring with non-rubberized outer surface with Omnifit FD 10 sealing compound.

4 Drive home new radial sealing ring flush with the sealing lip towards the axle center (max. 0.3 mm lower). Coat sealing lip with multipurpose grease.

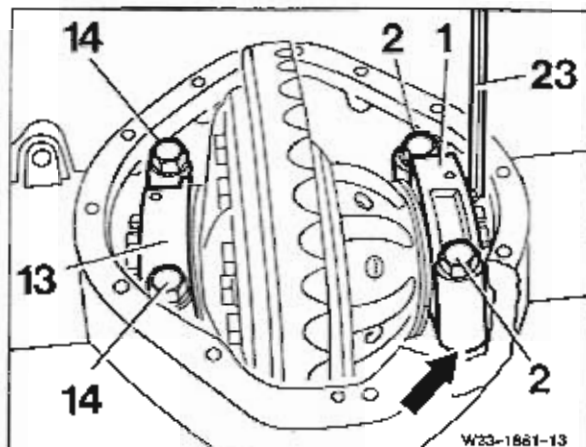
51 Drift 343 589 06 15 00



8 Mark bearing cap in relation to axle casing (arrow).

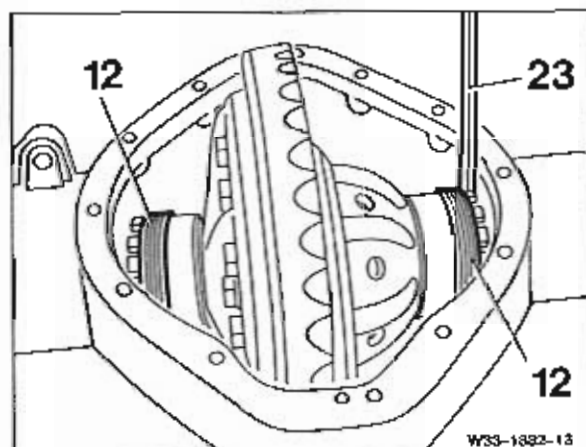
9 Unscrew hexagon bolts (2 and 14). By light blows with a plastic hammer and by turning the ring nuts, loosen bearing caps (1 and 13) and remove.

23 Square mandrel 312 589 04 07 00



10 Remove both ring nuts (12).

23 Square mandrel 312 589 04 07 00



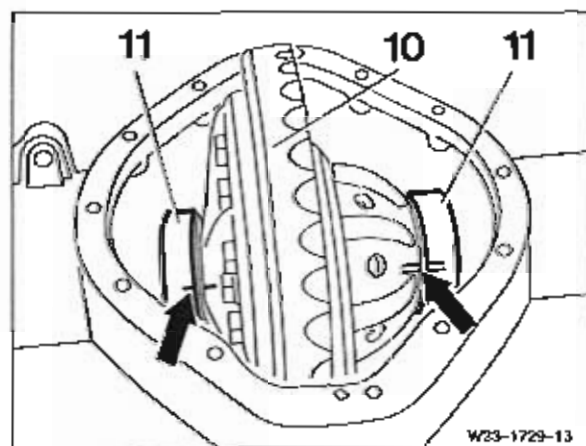
11 Mark outer races (11) (arrows).

12 Hold crown wheel with differential (10) somewhat at an angle so that it can slide past the web of the rear bevel pinion mount.

13 Check tapered roller bearing and replace if required (36.6-075).

Installation

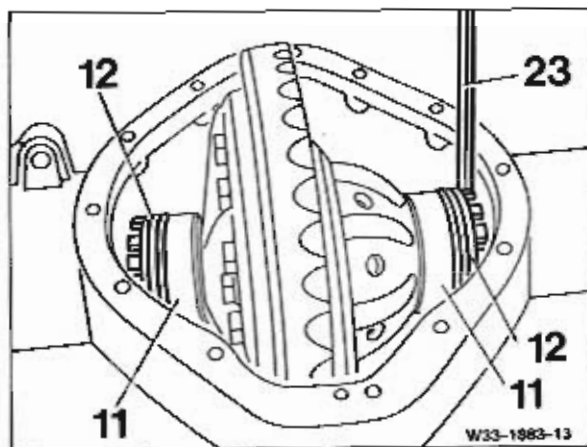
1 Install crown wheel with differential (10) in axle casing whilst noting the marking on the outer races (11) (arrow).



2 Insert ring nuts (12) in the thread of the axle casing so that they make positive contact with the thread in the axle casing and turn until they abut the outer races (11).

23 Square mandrel 312 589 04 07 00

3 Lubricate ring nuts (12) with hypoid gear oil.

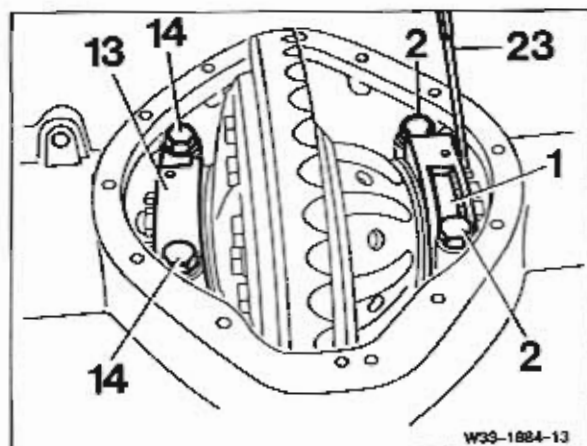


4 Insert bearing caps (1 and 13) in accordance with the marking whilst noting the centering pins.

5 Tighten hexagon bolts (2 and 14) so that the ring nuts can still turn easily.

6 Using a plastic hammer carefully drive bearing cap towards the axle casing whilst turning the ring nuts towards the tapered roller bearings with the square mandrel (23).

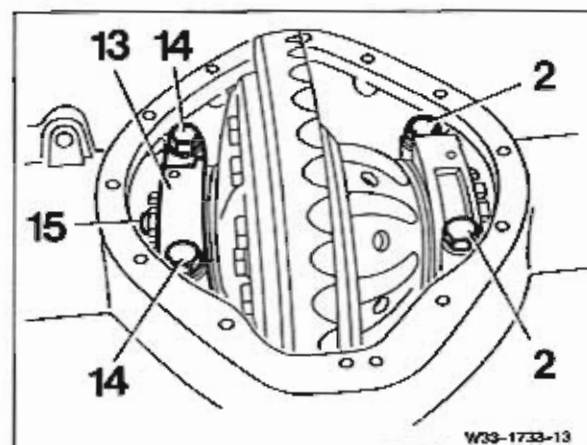
23 Square mandrel 312 589 04 07 00



7 Screw in hexagon bolts (2 and 14) somewhat further.

8 Turn ring nuts backwards and forwards again until the tapered roller bearing move without play and the crown wheel with differential can no longer pivot. The carrying bolt (15) of the bearing cap (13) must not abut the axle casing.

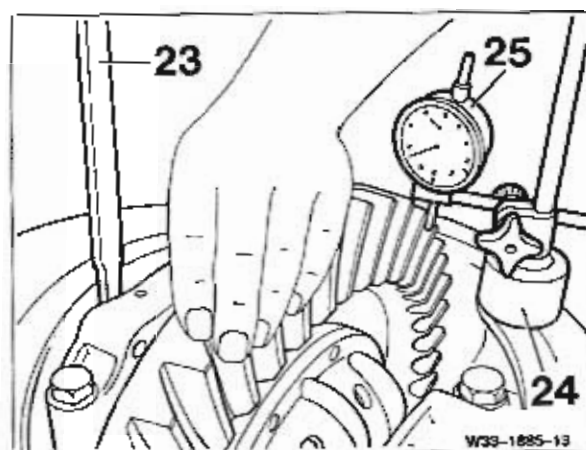
Square mandrel 312 589 04 07 00



9 Fasten dial gauge holder (24) and dial gauge (25) to the axle casing and set up the feeler perpendicular to one crown wheel tooth with approx. 1 mm preload.

10 Lock bevel pinion and measure the backlash by moving the crown wheel to and fro, adjust by turning the ring nuts if required.
Nominal value: 0.20 – 0.28 mm.

11 Perform the measurement at at least three points on the crown wheel circumference.



- 23 Square mandrel 312 589 04 07 00
- 24 Dial gauge holder 363 589 02 21 00
- 25 Dial gauge 001 589 53 21 00

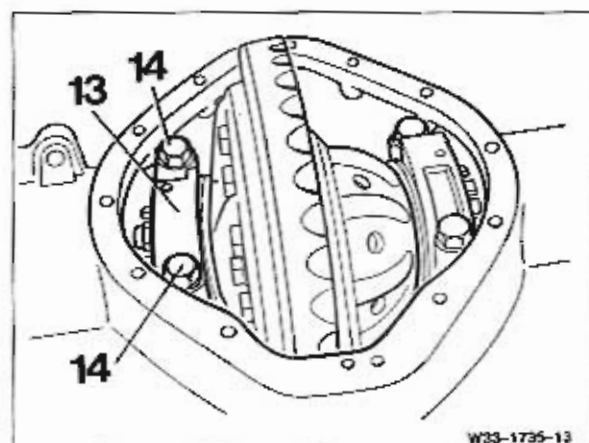
12 Tighten hexagon bolts (14) of the bearing cap (13) on the crown wheel side.

M 16 - 10.9 = 230 Nm.

M 16 - 12.9 = 270 Nm.

Note

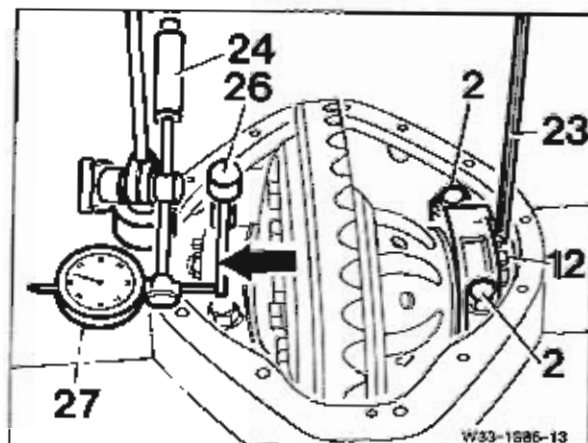
The carrying bolt of the bearing cap and the sliding block must not abut the axle casing or the crown wheel.



13 Fasten the measuring stop (26) on the bearing cap on the crown wheel side. Align lug (arrow) parallel to the crown wheel.

14 Fasten dial gauge holder (24) and dial gauge (27) to axle casing and set up feeler perpendicular to lug (arrow) with approx. 1 mm preload.

- 23 Square mandrel 312 589 04 07 00
- 24 Dial gauge holder 353 589 02 21 00
- 26 Measuring stop 354 589 00 21 00
- 27 Dial gauge 001 589 32 21 00



15 Tighten opposite ring nut (12) until the dial gauge (27) deflects 0.005 – 0.02 mm (preload of tapered roller bearing).

During the adjustment process, the crown wheel is to be turned continuously at least three times whilst applying some blows to the bearing cap and to the crown wheel from both sides using a rubber hammer (to settle and align the tapered roller bearing).

16 Tighten hexagon bolts (2).

M 16 - 10.9 = 230 Nm.

M 16 - 12.9 = 270 Nm.

17 Turn crown wheel at least 10 times.

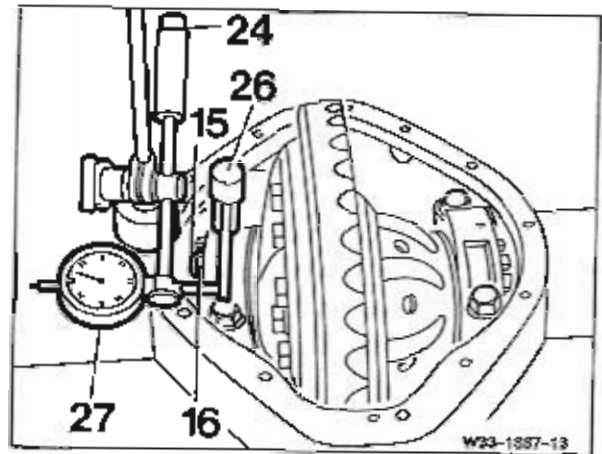
Measure backlash again at three points on the crown wheel circumference, correct if required.

Note

When the bearing cap is tightened, the preload must be 0.02 – 0.04 mm (aim for lower value for used tapered roller bearings and upper value for new tapered roller bearings).

18 Turn carrying bolt (15) towards the axle casing until the resultant value of the bearing cap (measuring stop) is between 0.01 and 0.25 mm. Tighten lock nut (16).

- 24 Dial gauge holder 363 589 02 21 00
- 26 Measuring stop 354 589 00 21 00
- 27 Dial gauge 001 589 32 21 00



19 Check contact pattern.

Note

Bevel pinion and crown wheel are manufactured to production tolerances such that an adjustment of the installed dimension and backlash is adequate for correct operation.

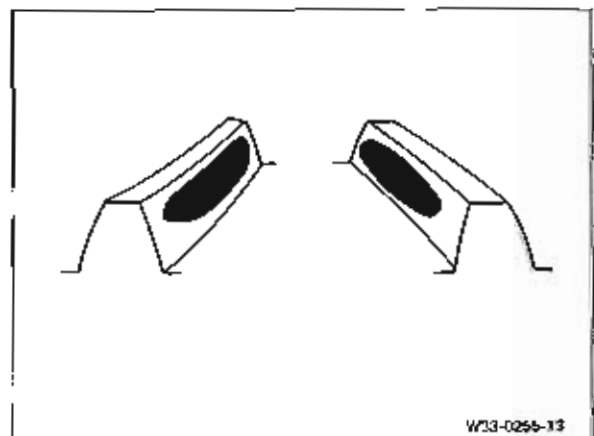
Independently of this, the contact pattern of the crown wheel/pinion can be checked.

To do this, coat two crown wheel teeth lying 180° opposite to one another with Prussian blue. Brake crown wheel in a holding fixture then turn the bevel pinion gear forwards and backwards.

Correct contact pattern:
(under load, crown wheel braked)

Note

Such an ideal contact pattern is unlikely to be achieved in actual practice. It is however important that the contact pattern at no point be on the outer edge of the tooth surface.



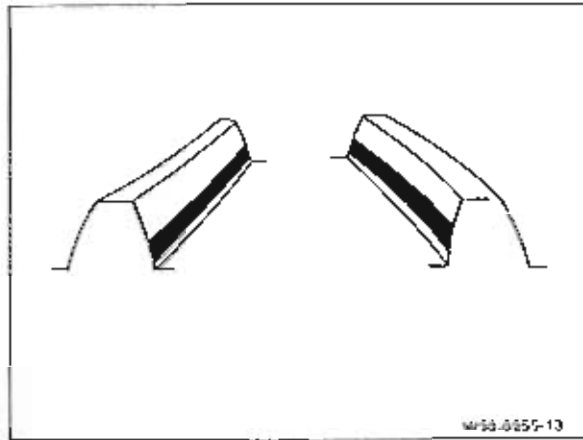
Incorrect contact patterns:

Contact pattern at foot of tooth flank

Increase installed dimension of bevel pinion.

Correcting

Increase the installation distance between the bevel pinion and crown wheel slightly (shim for bevel pinion too thin). Install thicker shim (33.6-080). Check backlash and adjust if required.

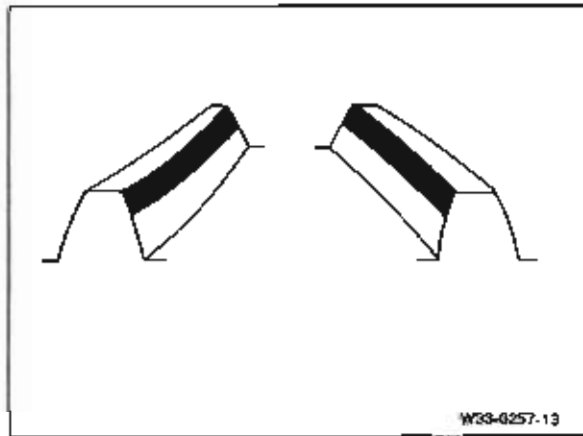


Contact pattern at tooth tip

Reduce installed dimension of bevel pinion.

Correcting

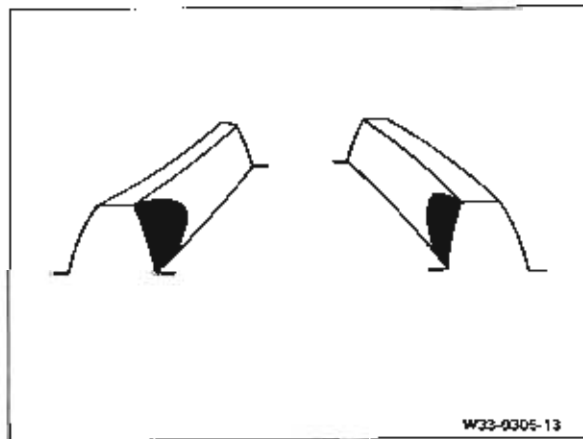
Reduce the installation distance between the bevel pinion and crown wheel slightly. (Shim for bevel pinion too thick). Install thinner shim (33.6-080). Check backlash and adjust if required.



Contact pattern at tooth heel

Correcting

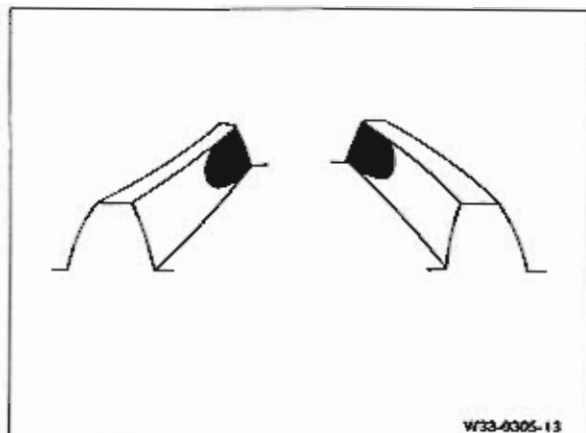
Position crown wheel nearer to the bevel pinion by turning the ring nuts. Check backlash and adjust if required.



Contact pattern on tooth toe

Correcting

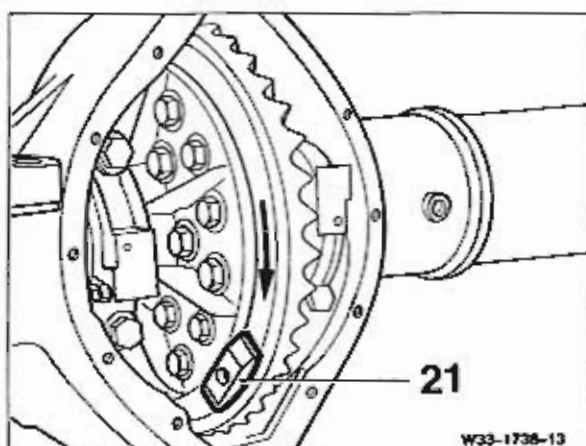
Position crown wheel further away from bevel pinion by turning the ring nuts. Check backlash and adjust if required.



20 Stick sliding block (21) to crown wheel with multipurpose grease, turn crown wheel so that bore of the sliding block aligns with the bore of the adjusting screw. Coat adjusting screw with long-life grease and screw in.

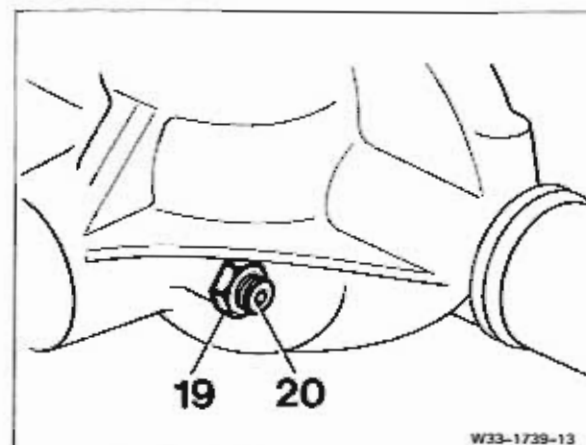
Note

During the setting work, the adjusting screw may be turned out a maximum of two revolutions, otherwise the sliding block can fall into the axle casing.



21 Screw in adjusting screw (20) and sliding block to support the crown wheel as far as the stop on the crown wheel; turn back adjusting screw 1/8 turn. Tighten lock nut (19).
 $M 26 \times 1.5 = 700 \text{ Nm}$.

22 Push tab washers into a suitable groove in the ring nuts and tighten hexagon bolts with new tooth lock washers.
 $M8 - 8.8 = 30 \text{ Nm}$.



23 Install axle casing cover (8) with new gasket (9) on the axle casing (17) and tighten hexagon bolts (5).

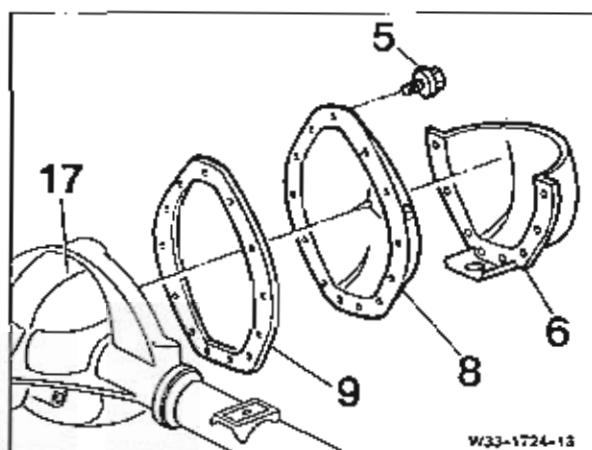
24 Up to axle no. 2 397 321:
Install axle casing cover (8) with new gasket (9) and shield (6) on axle casing (17) and tighten hexagon bolts (5).

Note

M 10 - 8.8 = 50 Nm.

M 10 - 12.9 = 130 Nm.

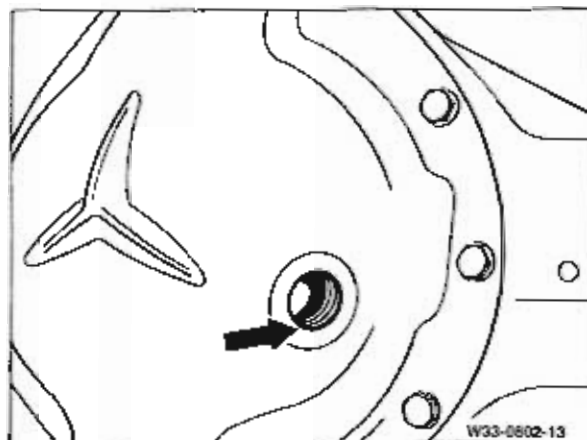
Replace serrated bolts.



25 Carefully clean surroundings of sealing plug and unscrew sealing plug.

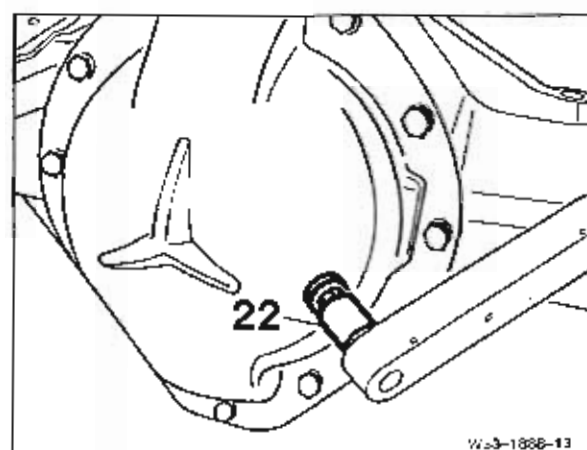
Stud wrench insert 001 589 61 09 10

26 Pour in hypoid gear oil up to the lower edge of the oil filler opening (arrow).



27 Tighten sealing plug in oil filler opening, 100 Nm.

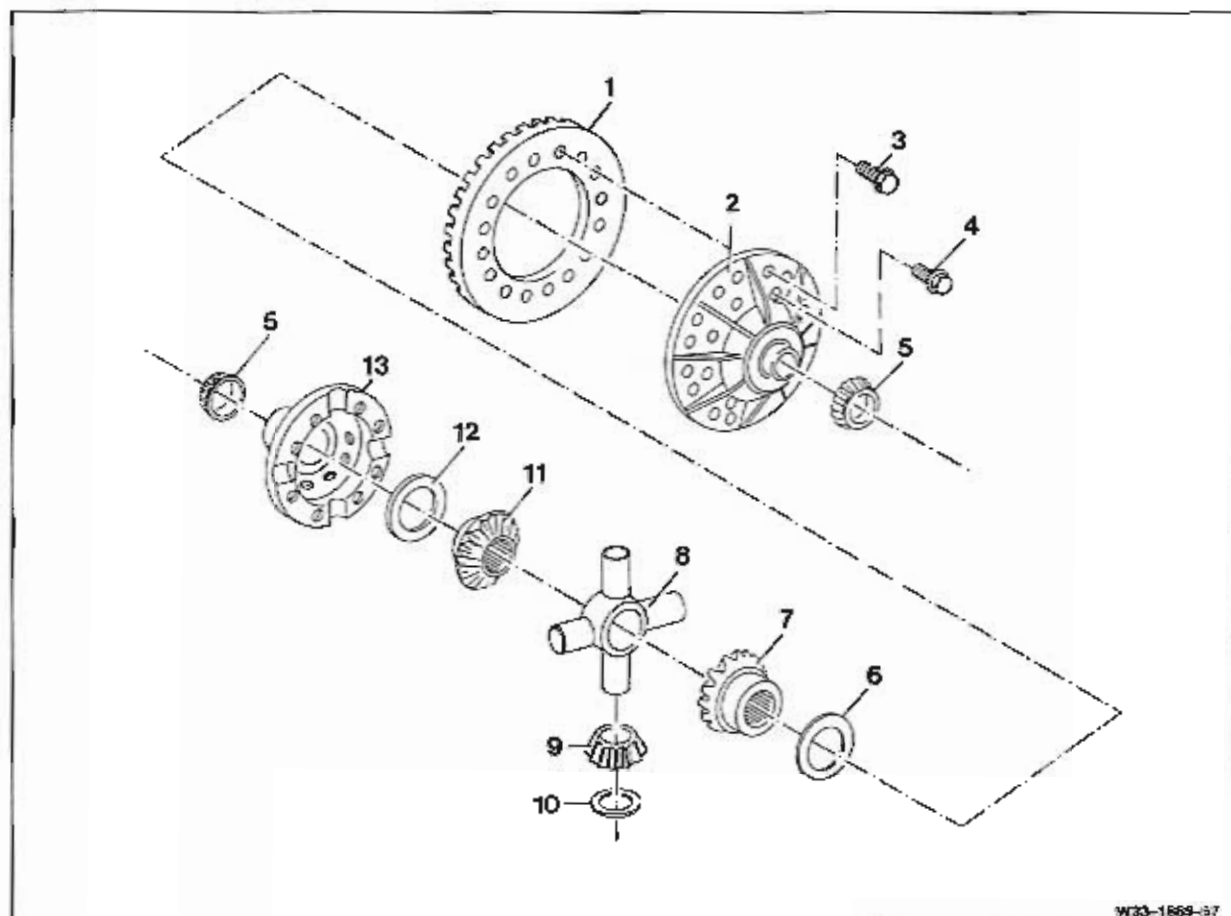
22 Stud wrench insert 001 589 61 09 10



33.6-075 Dismantling and assembling differential

Preceding work

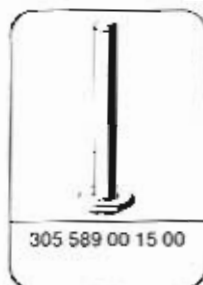
Crown wheel with differential removed (33.6-070).



W33-1669-37

1	Crown wheel	Locator 337 589 02 31 00.
2	Upper half of differential housing	
3	Hexagon bolts (crown wheel)	300 Nm, socket wrench insert 352 589 01 09 00, (replace serrated bolts).
4	Hexagon bolts (differential housing)	280 Nm, socket wrench insert 352 589 01 09 00, (replace serrated bolts).
5	Tapered roller bearing	Heat up to approx. 80°C, puller 001 589 40 33 00 (up to axle no. 2 384 800), clamping ring 000 589 25 34 00 (up to axle no. 2 384 800), puller 001 589 19 33 00 (as of axle no. 2 384 801), thrust pad 360 589 02 63 00, drift 312 589 08 15 00 (up to axle no. 2 384 800), drift 305 589 00 15 00 (as of axle no. 2 384 801). Lubricate with hypoid gear oil SAE 90.
6	Thrust washer	
7	Differential side gear	
8	Differential spider	Lubricate with Hypoid gear oil SAE 90.
9	Differential bevel gears	Lubricate with hypoid gear oil SAE 90.
10	Spherical washers	Lubricate with hypoid gear oil SAE 90.
11	Differential side gear	
12	Thrust washer	Lubricate with hypoid gear oil SAE 90.
13	Lower half of differential housing.	

Special tools

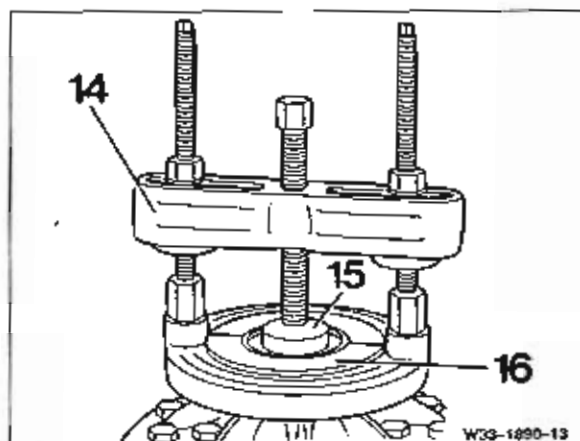


Dismantling

1 Up to axle no. 2 384 800:

Using puller (14), thrust pad (15) and clamping ring (16), pull off both tapered roller bearings.

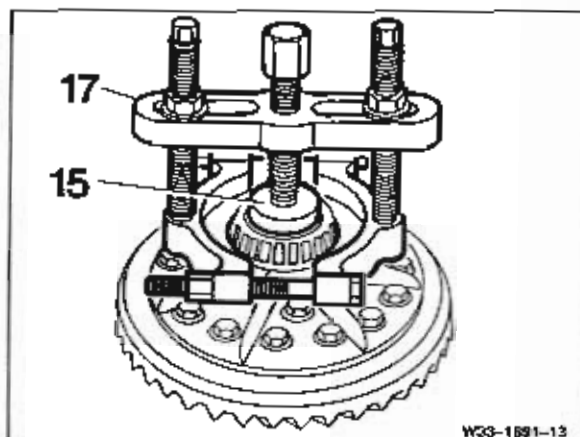
- 14 Puller 001 589 40 33 00
- 15 Thrust pad 360 589 02 63 00
- 16 Clamping ring 000 589 25 34 00



2 As of axle no. 2 384 801:

Using puller (17) and thrust pad (15), pull off both tapered roller bearings.

- 15 Thrust pad 360 589 02 63 00
- 17 Puller 001 589 19 33 00

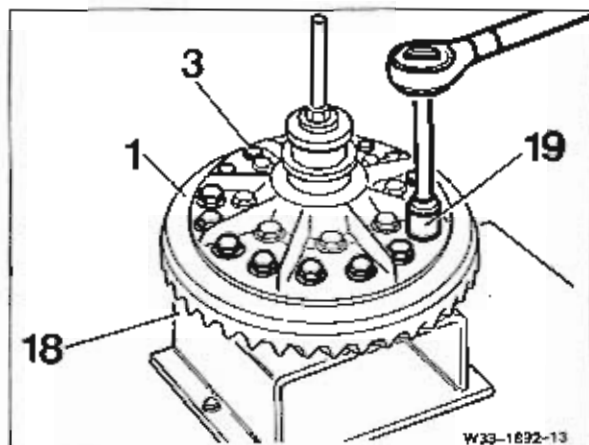


3 Place differential in locator (18) and clamp using suitable thrust pad.

4 Unscrew hexagon bolts (3) and using a soft hammer drive down crown wheel (1), press off if required.

18 Locator 337 589 02 31 00

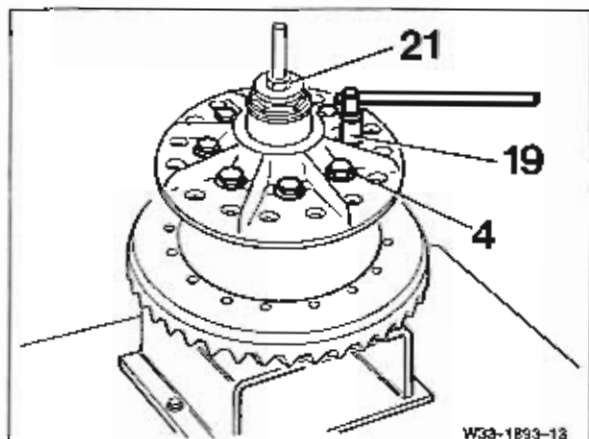
19 Socket wrench insert 352 589 01 09 00



5 Unscrew hexagon bolts (4).

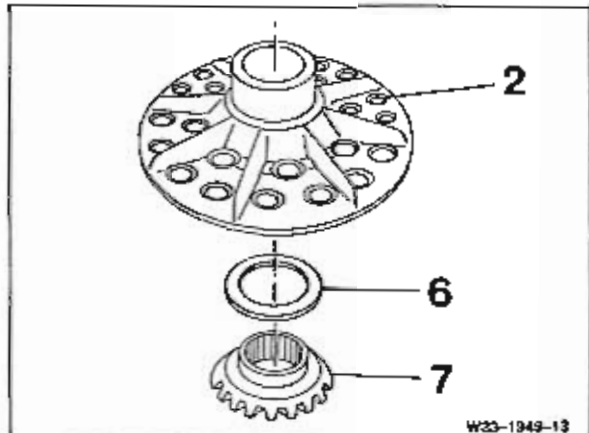
6 Mark both halves of differential housing in relation to each other and unscrew hexagon nut (21).

19 Socket wrench insert 352 589 01 09 00



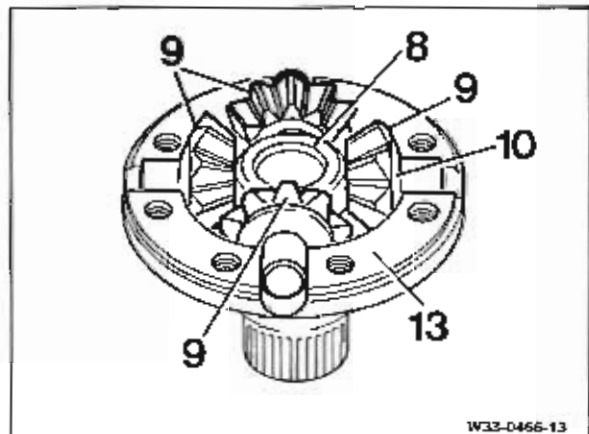
7 Remove upper half of differential housing (2), thrust washer (6) and differential side gear (7) from lower half of differential housing.

8 Remove crown wheel and lower half of differential housing from the locator.



9 Remove differential spider (8) with differential bevel gears (9) and spherical washers (10) from the lower half of the differential housing (13).

10 Remove differential bevel gears (9) and spherical washers (10) from differential spider (8).



11 Remove differential side gear (11) and thrust washer (12) from the lower half of the differential housing (13).

Assembly

1 Lubricate thrust washer (12) on both sides and place on the differential side gear (11) so that the lubrication groove points towards the differential side gear.

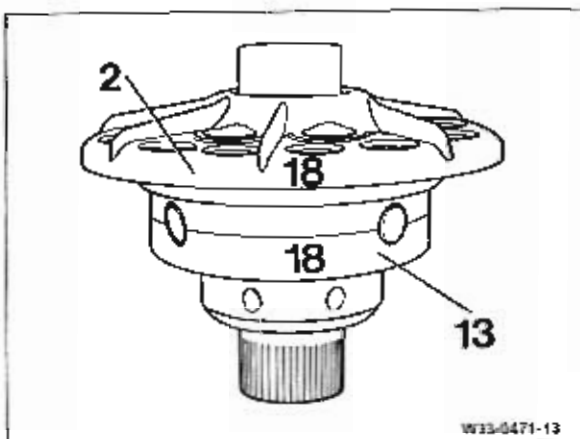
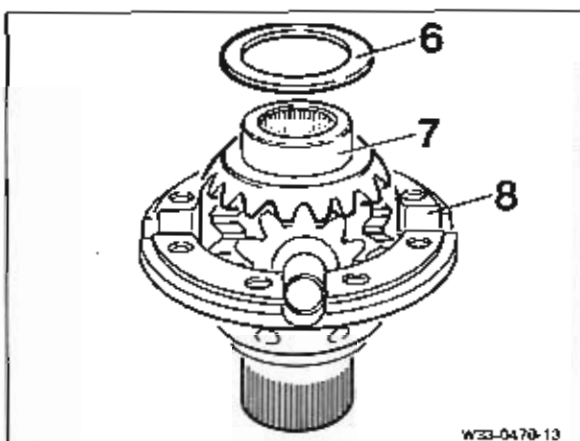
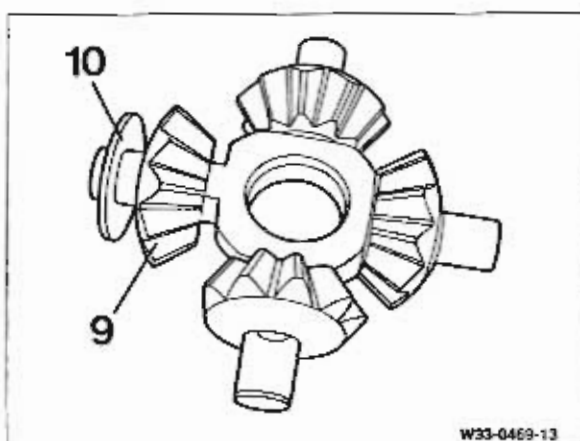
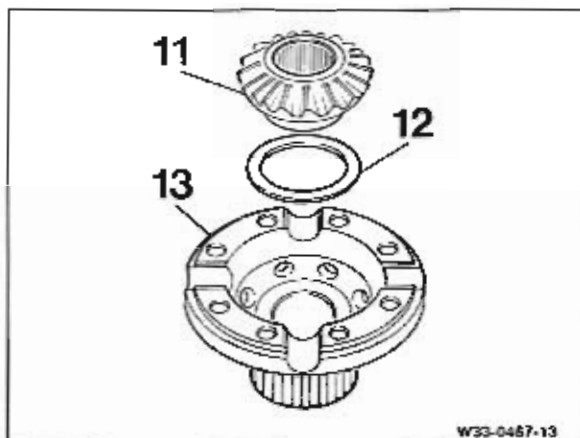
2 Lubricate differential bevel gears (9) and spherical washers (10) and push onto the lubricated differential spider.

3 Insert differential spider into the lower half of the differential housing.

4 Place differential side gear (7) onto the differential spider (8).

5 Lubricate thrust washer (6) on both sides and place on the differential side gear (7) so that the lubrication groove points towards the differential side gear.

6 Place upper half of the differential housing (2) onto the lower half of the differential housing (13) whilst noting the marking (same numbers).



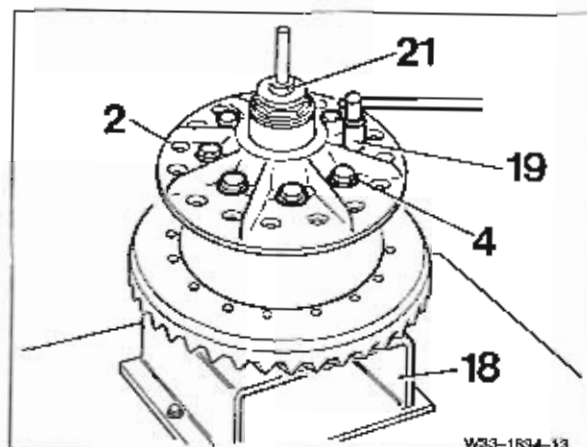
7 Place crown wheel and upper half of differential housing (2) in locator (18) and tighten hexagon nut (21).

8 Tighten hexagon bolts (4), 280 Nm.

Note

Replace serrated bolts.

- 18 Locator 337 589 02 31 00
- 19 Socket wrench insert 352 589 01 09 00



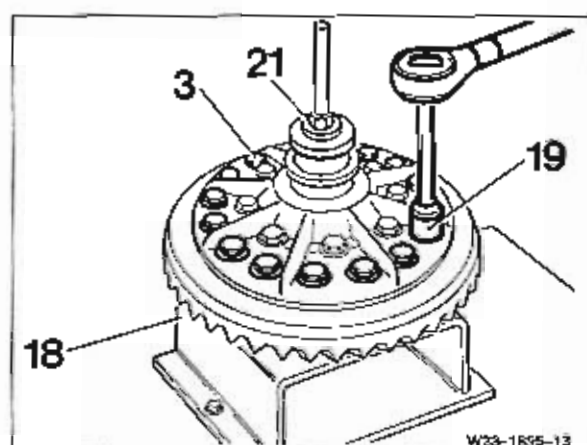
9 Tighten hexagon bolts (3), 300 Nm.

Note

Replace serrated bolts.

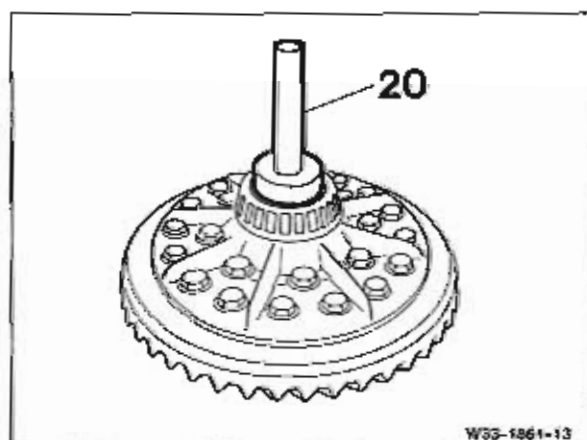
10 Unscrew hexagon nut (21) and remove differential housing from locator (18).

- 18 Locator 337 589 02 31 00
- 19 Socket wrench insert 352 589 01 09 00

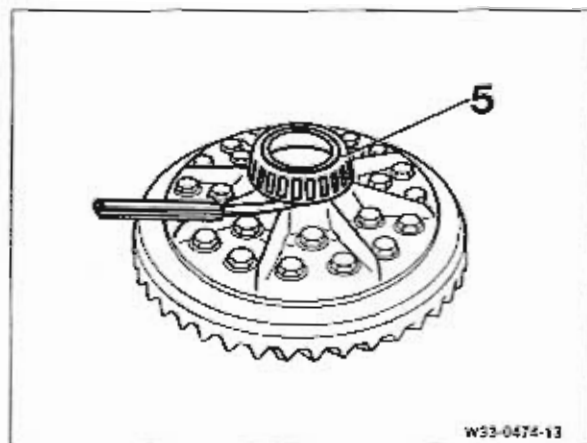


11 Heat up both tapered roller bearings to approx. 80°C and drive on.

- 20 Drift 312 589 08 15 00
(up to axle no. 2 384 800)
- 20 Drift 305 589 00 15 00
(as of axle no. 2 384 801)



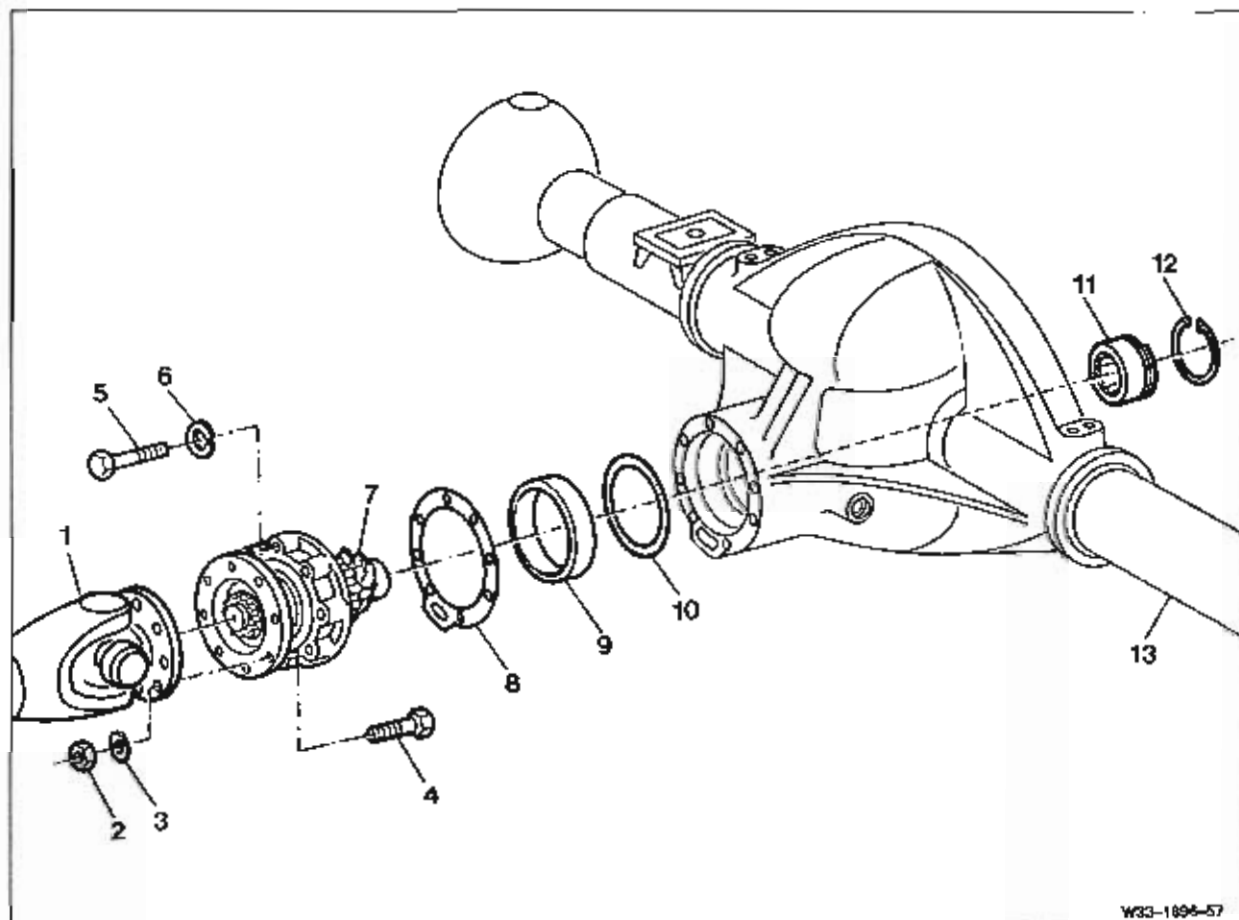
12 Using a feeler gauge, check that the tapered roller bearings (5) about the differential housing without any play.



33.6-080 Removal and installation of bevel pinion

Preceding work:

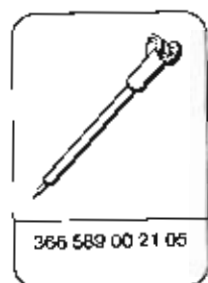
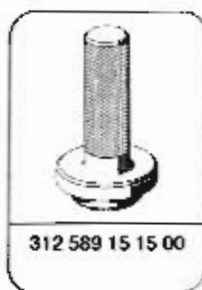
Crown wheel with differential removed (33.6-070).



W33-1895-57

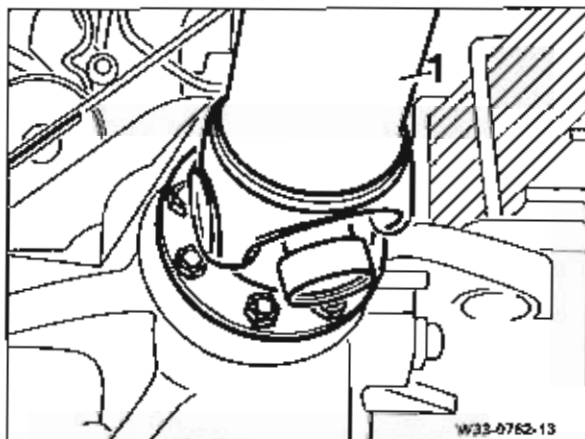
- | | | |
|----|---------------------------------------|---|
| 1 | Propeller shaft | |
| 2 | Hexagon nuts | 59 Nm, open-end wrench WAF 17 mm
000 589 21 01 00,
torque wrench handle 001 589 44 21 00.
Replace. |
| 3 | Spring washers | |
| 4 | Hexagon bolts | |
| 5 | Hexagon bolts | 50 Nm.
Replace. |
| 6 | Spring washers | |
| 7 | Bevel pinion | Coat contact surfaces with Omnifit FD 10 sealing
compound.
Dial gauge 001 589 53 21 00,
extension 386 589 00 21 05,
adjusting equipment 380 589 00 21 00. |
| 8 | Shims | |
| 9 | Cylindrical roller bearing outer race | Internal extractor 000 589 68 33 00,
steady 000 589 35 33 00, drift 312 589 15 15. |
| 10 | Inner shims | |
| 11 | Cylindrical roller bearing | Check, replace if required, drift 360 589 00 15 00. |
| 12 | Circlip | |
| 13 | Axle casing | Coat contact surfaces with Omnifit FD 10 sealing
compound. |

Special tools

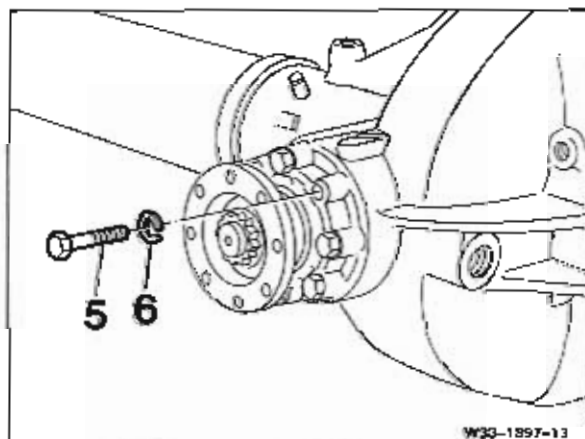


Removal

- 1 Remove propeller shaft (1) at coupling flange of bevel pinion and support.

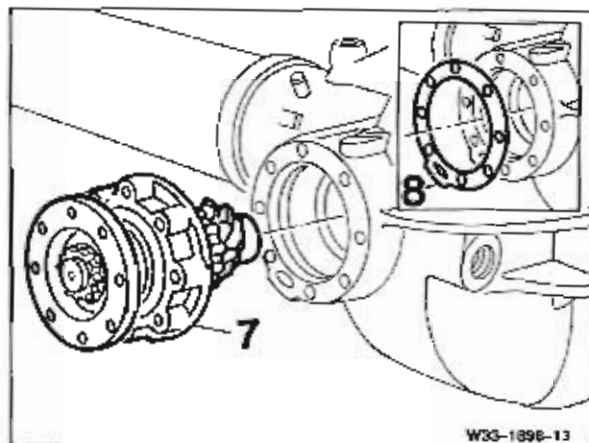


- 2 Unscrew hexagon bolts (5) and remove with spring washers (6).



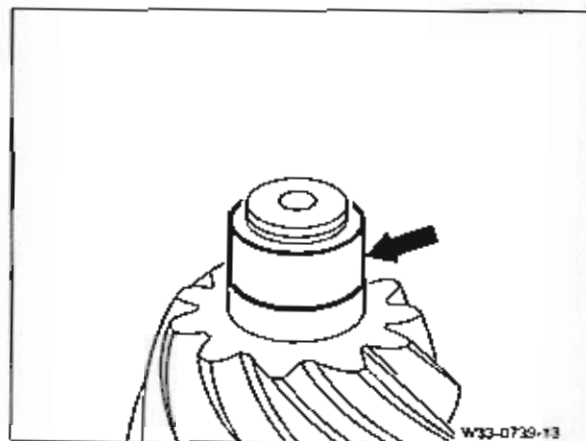
3 Loosen bevel pinion (7) with several blows from a soft hammer and remove.

4 Remove shims (8).



5 Check cylindrical roller bearing (pinion head bearing), replace if required.

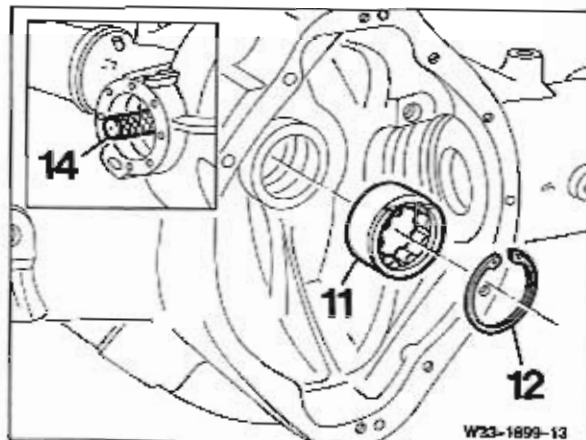
5.1 Replace inner race of pinion head bearing (arrow) (33.6-085).



5.2 Compress circlip (12) and simultaneously drive out cylindrical roller bearing (11).

14 Drift 360 589 00 15 00

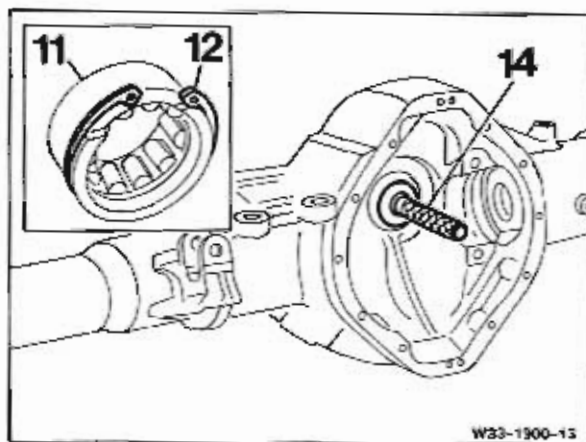
5.3 Disengage circlip from the cylindrical roller bearing.



5.4 Engage circlip (12) in groove of the new cylindrical roller bearing (11).

5.5 Compress circlip (12) and simultaneously drive in new cylindrical roller bearing (11), until the circlip has engaged in the groove provided.

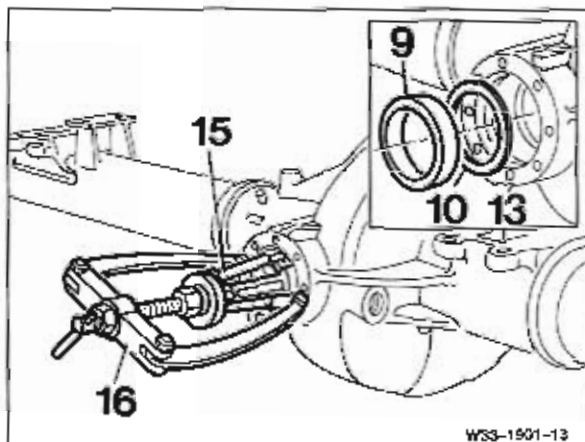
14 Drift 360 589 00 15 00



6 Using internal extractor (15) and steady (16) pull out cylindrical roller bearing outer race (9).

- 15 Internal extractor 000 589 68 33 00
- 16 Steady 000 589 35 33 00

7 Remove spacers (10) from the axle casing (13).



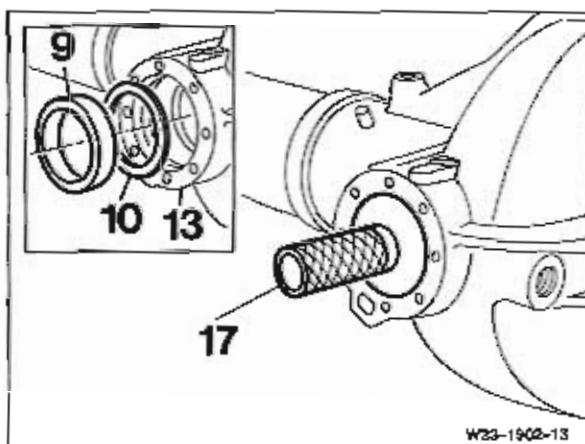
Installation

1 Insert inner spacers (10) in axle casing (13).

Note

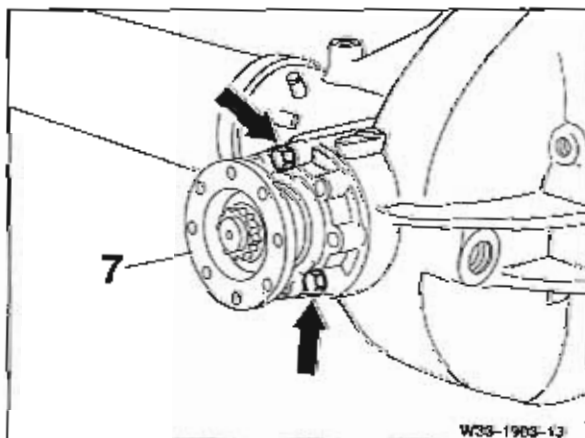
The bevel pinion is to be installed with the least possible quantity (max. 4) of spacers at the specified adjusting dimension from the axle center. The thickest spacer must abut the housing shoulder in each case.

2 Drive cylindrical roller bearing outer race (9) into the axle casing (13).



- 17 Drift 312 589 15 15 00

3 Install bevel pinion (7) without spacers in the axle casing and tighten with three hexagon bolts (arrows) distributed over the circumference.



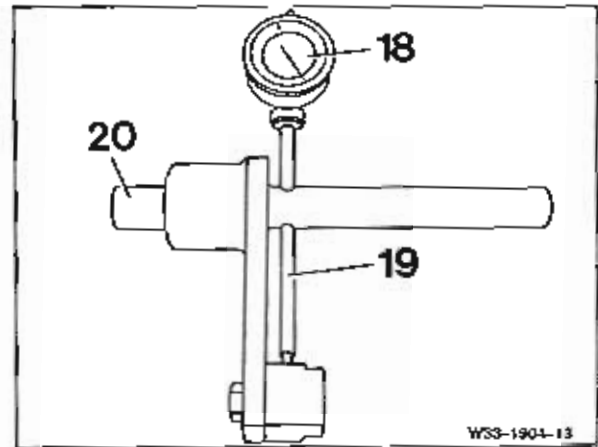
4 Measure basic dimension.
The basic dimension is 100.2 mm.

Note

The basic dimension is specified on the measuring stop.

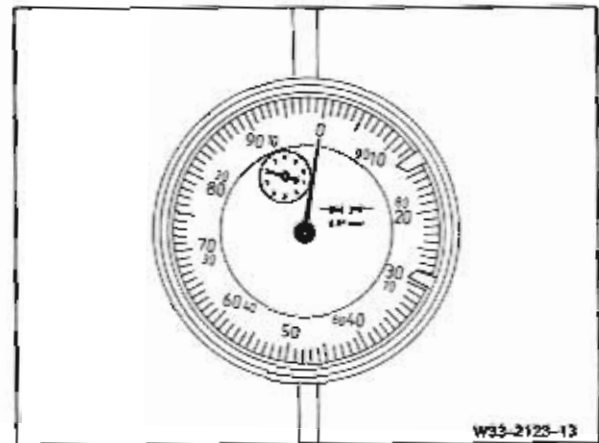
Place dial gauge (18) with extension (19) on the shaft of the adjusting equipment (20).
Provide dial gauge with 2 mm preload and set to zero position.

- 18 Dial gauge 001 589 53 21 00
- 19 Extension 366 589 00 21 05
- 20 Adjusting equipment 380 589 00 21 00



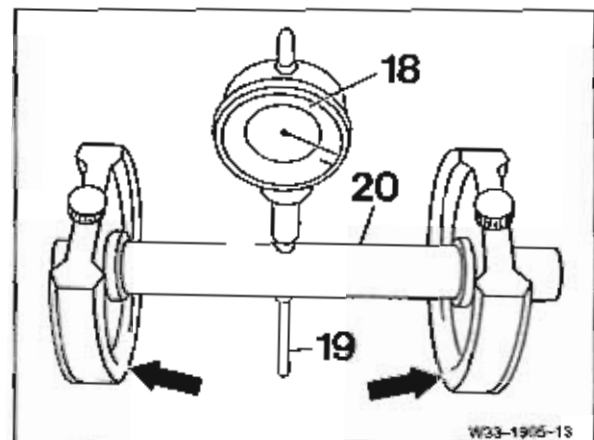
This adjustment corresponds to the basic dimension of 100.2 mm.

5 Remove measuring stop of adjusting equipment.



6 Push suitable bearing shells (arrows) onto the shaft of the adjusting equipment (20) with dial gauge (18) and extension (19).

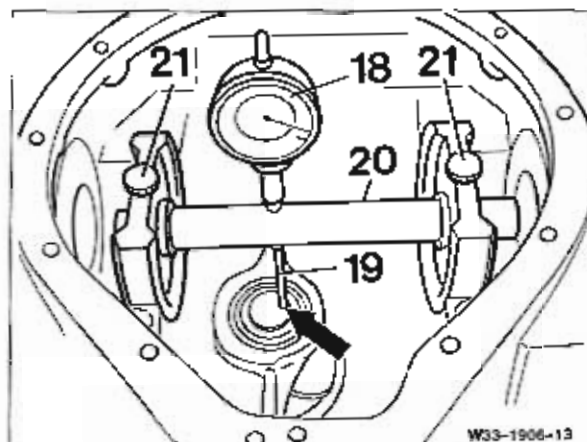
- 18 Dial gauge 001 589 53 21 00
- 19 Extension 366 589 00 21 05
- 20 Adjusting equipment 380 589 00 21 00



7 Place adjusting equipment (20) with dial gauge (18) and extension (19) in the bearing locators so that the extension (19) seats on the end face of the bevel pinion (arrow).

8 Tighten knurled bolts (21).

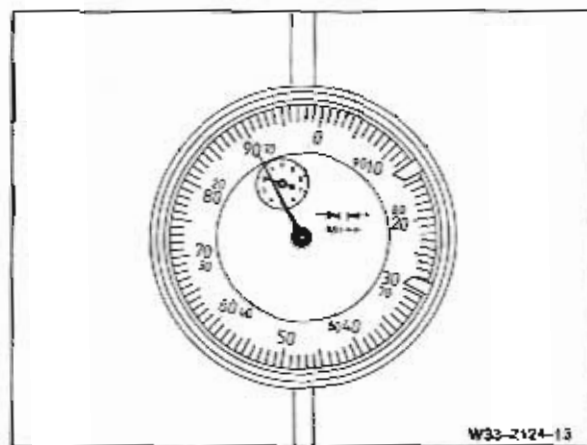
- 18 Dial gauge 001 589 53 21 00
- 19 Extension 366 589 00 21 05
- 20 Adjusting equipment 380 589 00 21 00



9 Read off dimensional difference.

10 Determine installed dimension:

Dimensional difference, e.g. + 0.1 mm + basic dimension 100.2 mm = 100.3 mm.

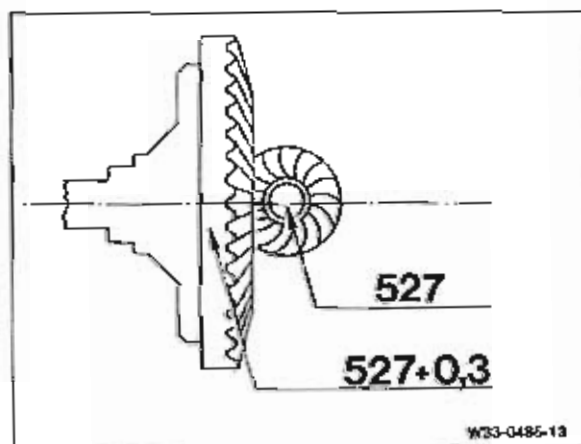


Notes

Each bevel pinion and crown wheel belonging to a crown wheel/pinion is marked by an electrically engraved number. Only crown wheel/pinions with the same number may be installed. The markings are located on the end face of the bevel pinion and on the inclined surface of the crown wheel.

Example of crown wheel/pinion designation
527 + 0.3.

The first number (527) is the number of the crown wheel/pinion (bevel pinion and crown wheel). The second number (+ 0.3) is the dimensional difference from the basic dimension in mm, thus + 0.3 mm.



Example of crown wheel/pinion 527 + 0.3

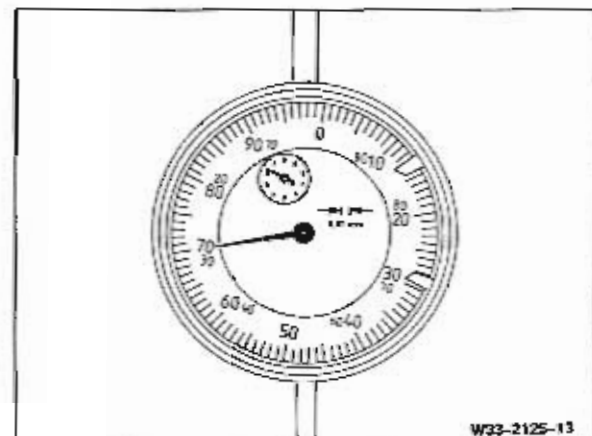
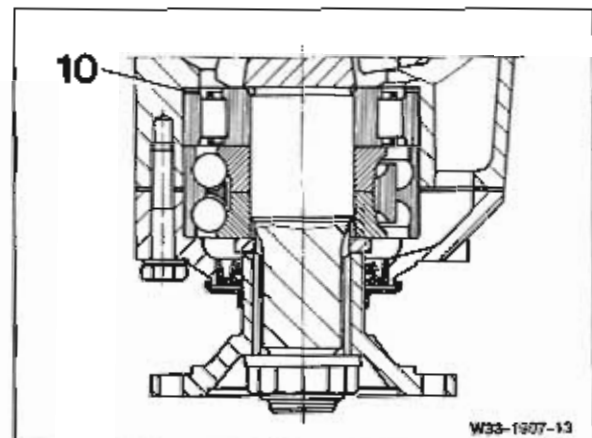
Basic dimension AL 3/7	100.2 mm
Dimensional difference on the crown wheel	+ 0.3 mm
Adjustment dimension for crown wheel/pinion 527 thus	100.5 mm
Measured installed dimension (basic dimension with dimension difference)	100.3 mm

In order to achieve the basic dimension, inner spacers (10) with a total thickness of 0.20 mm must be installed behind the cylindrical roller bearing outer race in the axle casing. This means the distance from the center of the crown wheel to the end face of the bevel pinion must be increased by 0.20 mm.

Spacers are available in thicknesses of 0.10 mm, 0.25 mm and 0.50 mm.

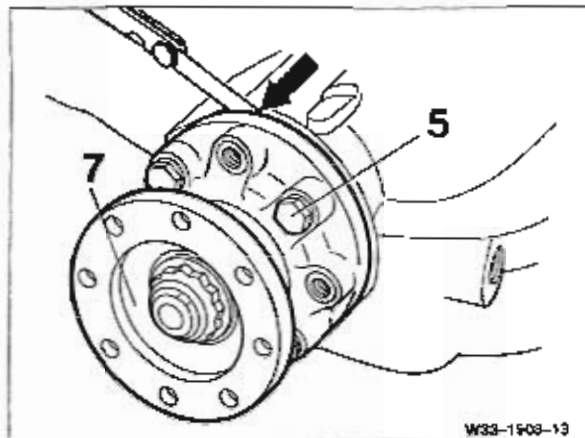
11 Remove bevel pinion and cylindrical roller bearing outer race again and insert selected inner spacers (10).

12 Reinstall bevel pinion and repeat measurement.



13 Install bevel pinion (7) without outer spacers in the axle casing and tighten with the four opposing hexagon bolts (5), 5 Nm.

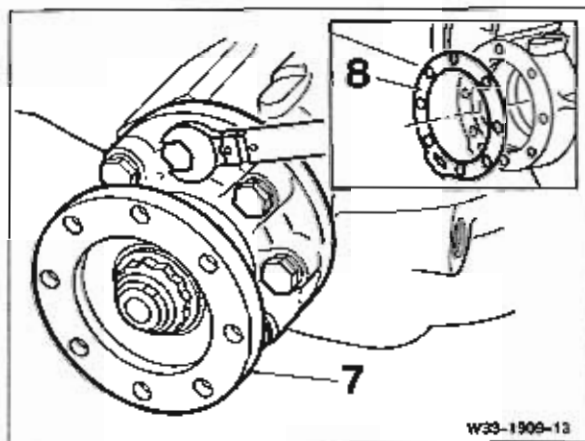
14 Rotate bevel pinion at least 3 times continuously and measure the gap between the flange and the axle casing with a feeler gauge (arrow).



15 Select spacers (8) which are 0.01 – 0.05 mm thinner (aim for lower value for used bearings, upper value for new bearings) than the value of the gap determined between the flange and the axle casing. (Preload of cylindrical roller bearing).

16 Remove bevel pinion (7).

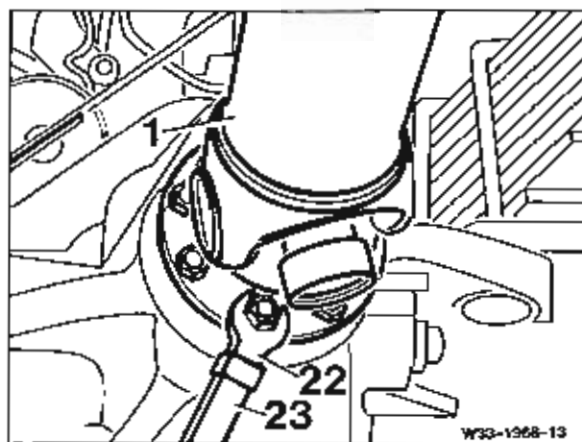
17 Lightly coat contact surfaces of flange and axle casing with Omnifit FD 10 sealing compound and install bevel pinion (7) with the selected spacers (8), 50 Nm.



18 Install propeller shaft (1) with new spring washers, 59 Nm.

22 Open-end wrench WAF 17 mm 000 589 21 01 00

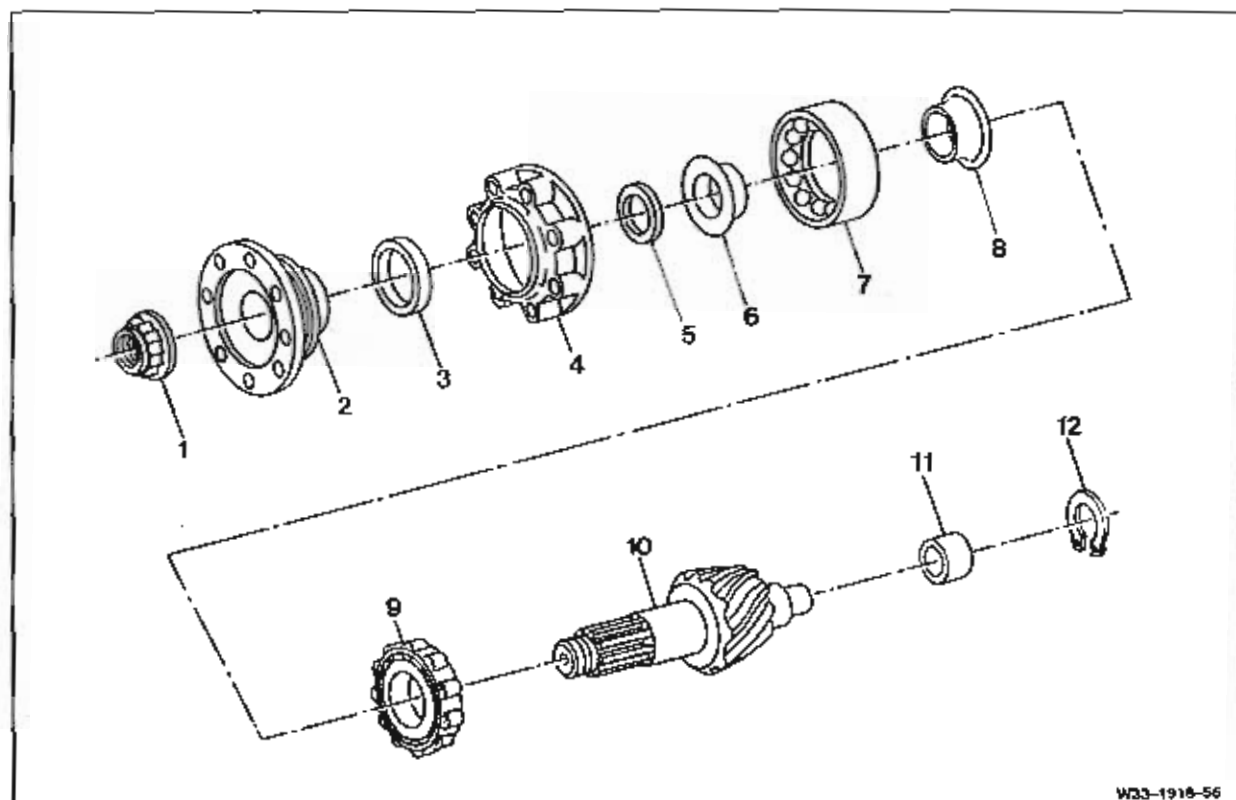
23 Torque wrench handle 001 589 44 21 00



33.06-085 Dismantling and assembling bevel pinion

Preceding work

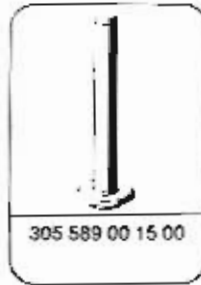
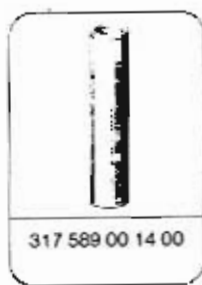
Bevel pinion removed (33.6-080).



W23-1918-56

- | | | |
|----|------------------------------|--|
| 1 | Collar nut | Replace, 300 Nm,
socket wrench insert 001 589 74 09 00,
supporting wrench 717 589 00 31 00,
ratio wrench 000 589 78 63 00. |
| 2 | Coupling flange | Puller 035 589 01 33 00. |
| 3 | Radial sealing ring | Replace, pack between the lips with multipurpose
grease, coat non-rubberized outer surface with
Omnifit FD 10 sealing compound,
drift 305 589 00 15 00. |
| 4 | Flange | |
| 5 | Thrust washer | |
| 6 | External inner race | Heat up to approx. 80°C, sleeve 317 589 00 14 00.
Lubricate with transmission oil. |
| 7 | Angular-contact ball bearing | Heat up to approx. 80°C, sleeve 317 589 00 14 00. |
| 8 | Internal inner race | Heat up to approx. 80°C, lubricate with transmission
oil, puller 000 589 45 33 00,
sleeve 317 589 00 14 00. |
| 9 | Cylindrical roller bearing | |
| 10 | Bevel pinion | |
| 11 | Inner race | Check, replace if required, puller 001 589 19 33 00,
drift 337 589 00 15 00. |
| 12 | Circlip | |

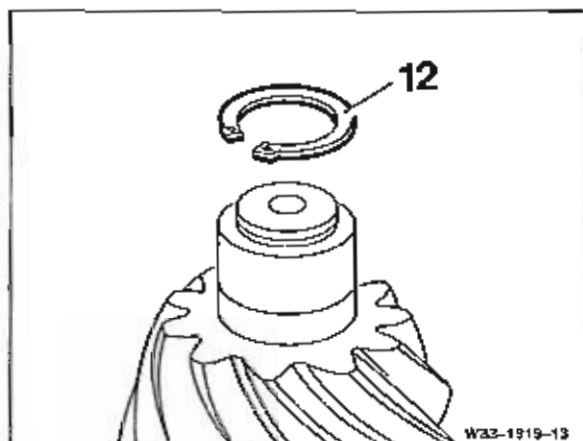
Special tools



Dismantling

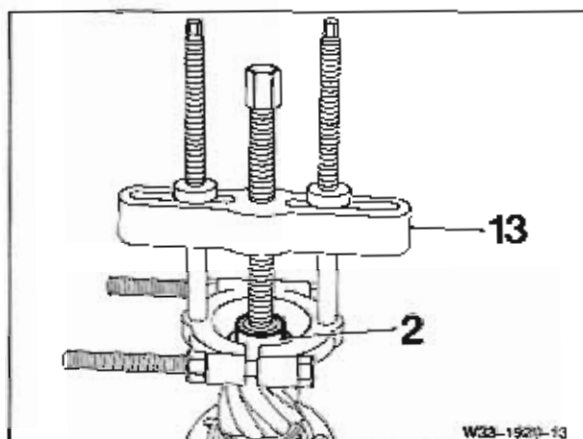
1 Check inner race of pinion head bearing, replace if required.

1.1 Disengage circlip (12) and remove.



1.2 Pull off inner race (2) of pinion head bearing.

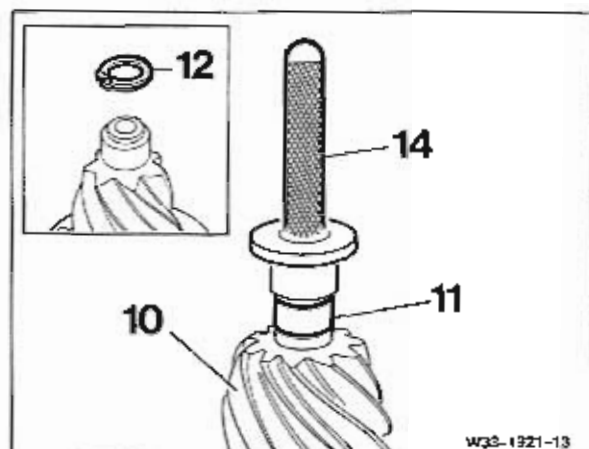
13 P. of 001 589 19 33 00



1.3 Heat up new inner race (11) of pinion head bearing to approx. 80°C and drive onto the bevel pinion (10) so that the larger inner chamfer points in the direction of the teeth.

1.4 Engage circlip (12).

14 Drill 337 589 00 15 00

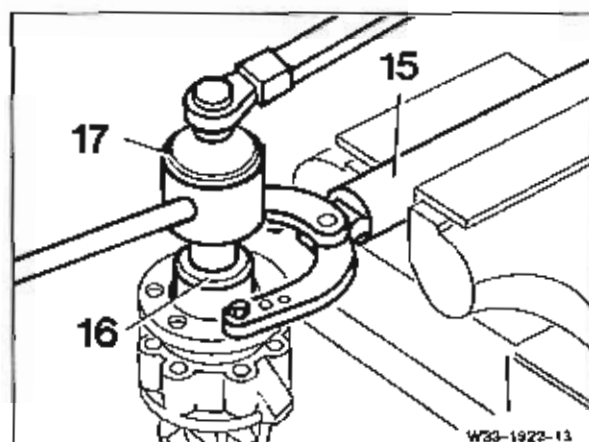


2 Install supporting wrench (15) on coupling flange.

3 Unlock collar nut, unscrew using socket wrench insert (16) and ratio wrench (17).

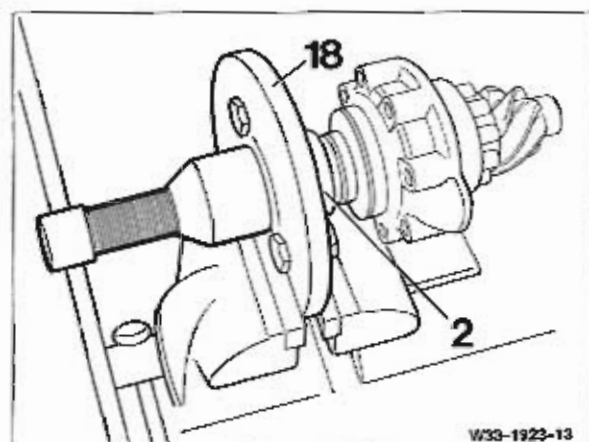
15 Supporting wrench 717 589 00 31 00
16 Socket wrench insert 001 589 74 09 00
17 Ratio wrench 000 589 78 63 00

4 Remove supporting wrench (15).

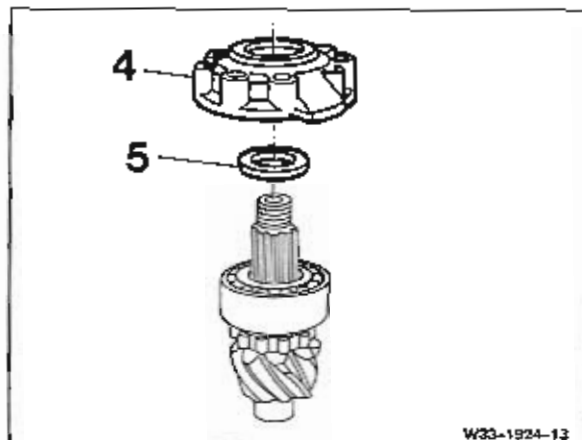


5 Fasten puller (18) with three hexagon screw fittings to coupling flange (2), pull coupling flange off bevel pinion.

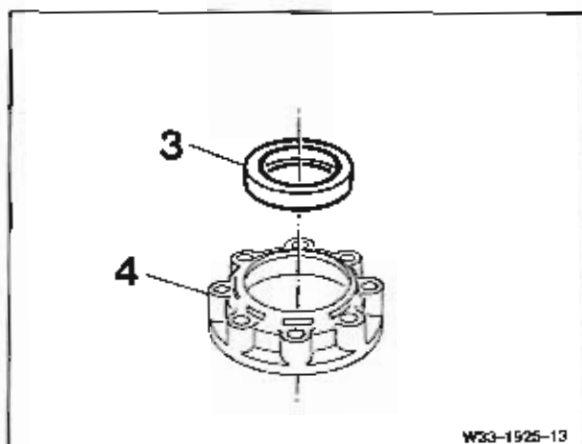
18 Puller 035 589 01 33 00



6 Remove flange (4) and spacer (5).

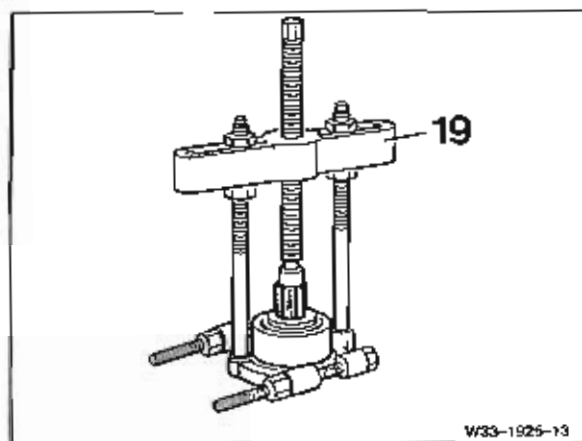


7 Press radial sealing ring (3) out of flange (4).



8 Pull off angular-contact ball bearing and cylindrical roller bearing.

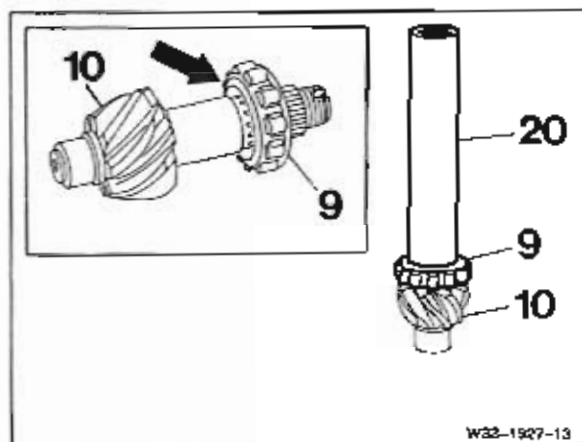
19 Puller 001 589 19 33 00



Assembly

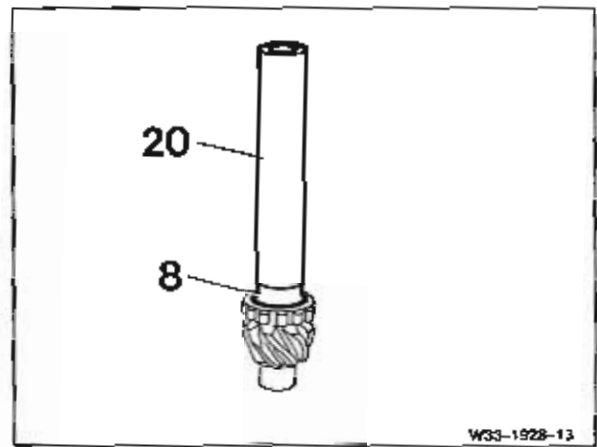
1 Heat up cylindrical roller bearing (9) to approx. 80°C and drive onto the bevel pinion (10) so that the side of the cylindrical roller bearing cage, rounded towards the inside (arrow), points towards the teeth.

20 Sleeve 317 589 00 14 00

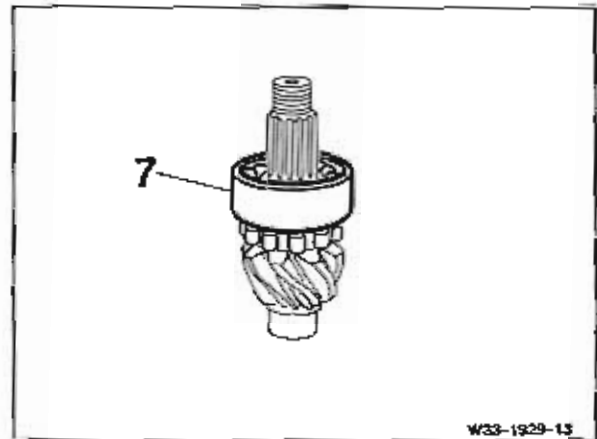


2 Heat up internal inner race (8) to approx. 80°C and drive on the bevel pinion.

20 Sleeve 317 589 00 14 00

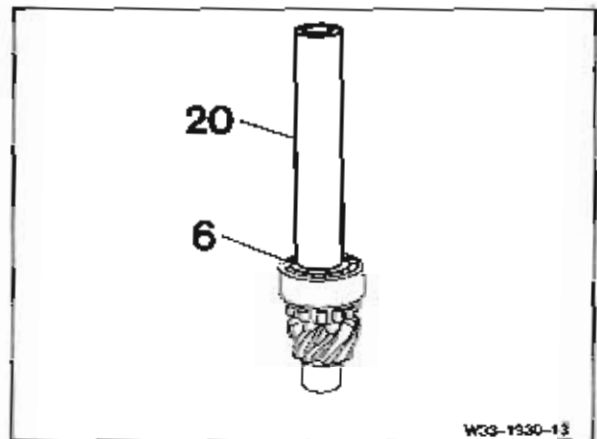


3 Mount angular-contact ball bearing (7).

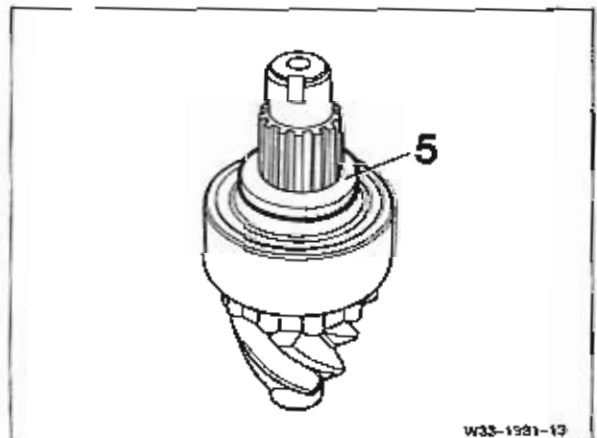


4 Heat up external inner race (6) to approx. 80°C and drive on the bevel pinion.

20 Sleeve 317 589 00 14 00



5 Mount thrust washer (5).

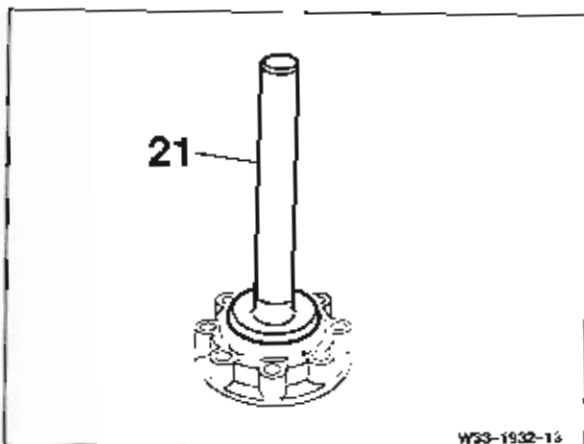


6 Coat new radial sealing ring with non-rubberized outer surface with Omnifit FD 10 sealing compound.

7 Drive home new radial sealing ring flush with the flange (max. 0.3 mm lower).

21 Drift 305 589 00 15 00

8 Pack space between the dust and sealing lip with multipurpose grease, coat opposing surface of radial sealing ring with transmission oil.

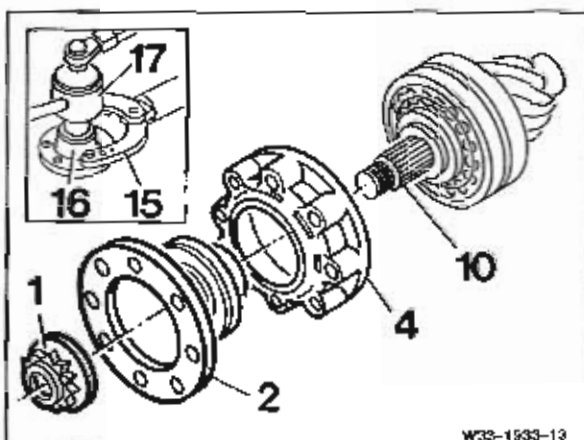


W33-1932-16

9 Place flange (4) on bevel pinion (10)

10 Lightly lubricate teeth of drive shaft with transmission oil and push coupling flange (2) on the drive shaft.

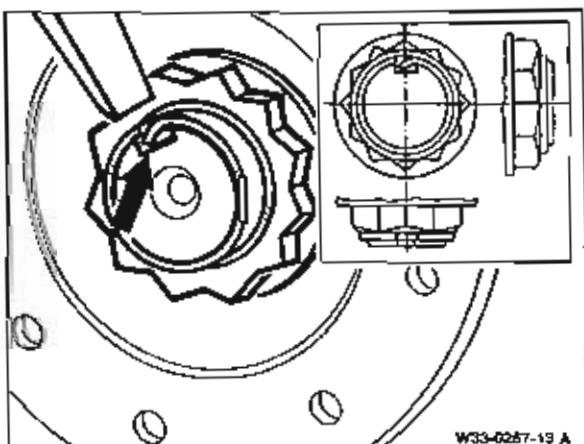
11 Adjust torque wrench to 75 Nm, tighten new collar nut (1) using supporting wrench (15), socket wrench insert (16) and ratio wrench (17), 300 Nm.



W33-1933-13

- 15 Supporting wrench 717 589 00 31 00
- 16 Socket wrench insert 001 589 74 09 00
- 17 Ratio wrench 000 589 78 63 00

12 Shear off collar on new collar nut axially in the area of the locking groove so that the locking tab (arrow) abuts the left flank after it is bent into the locking groove.

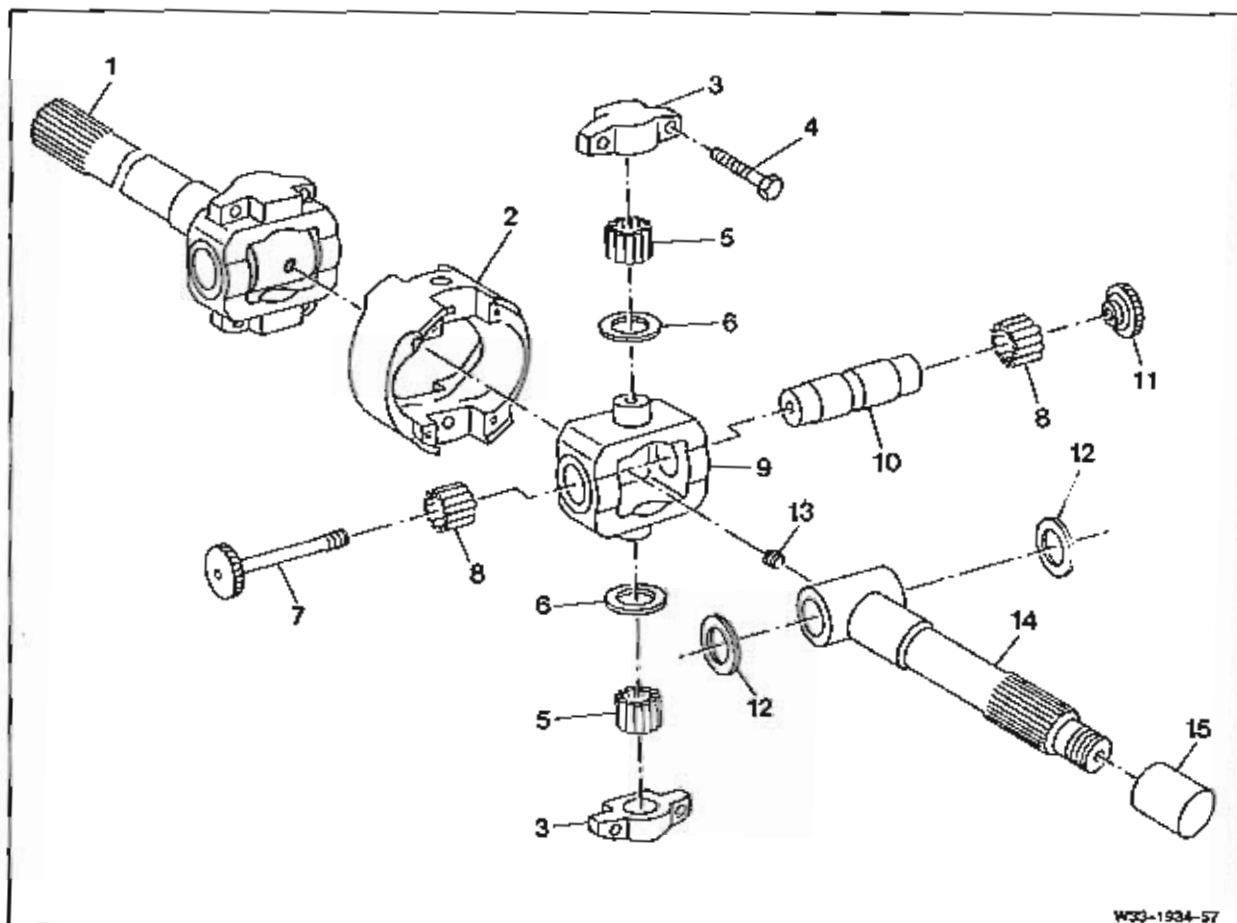


W33-0267-19 A

33.6-090 Dismantling and assembling drive shaft

Preceding work

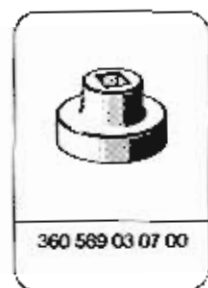
Supporting sleeve and joint housing removed (33.6-060).



W33-1934-57

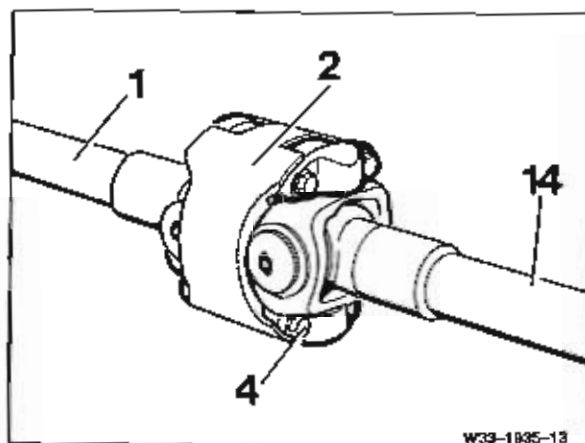
1	Inner section of drive shaft	
2	Driver	
3	Brackets	
4	Hexagon bolts	103 Nm.
5	Bearing needles	Lubricate with multipurpose grease
6	Sealing rings	Replace.
7	Central bolt	Serrated socket wrench 360 589 03 07 00.
8	Bearing needles	Lubricate with multipurpose grease.
9	Universal joint	
10	Bearing pin	
11	Cap	80 Nm, serrated socket wrench 360 589 03 07 00.
12	Sealing rings	Replace.
13	Hexagon socket bolt	
14	Outer section of drive shaft	
15	Race	Check, replace if required.

Special tool

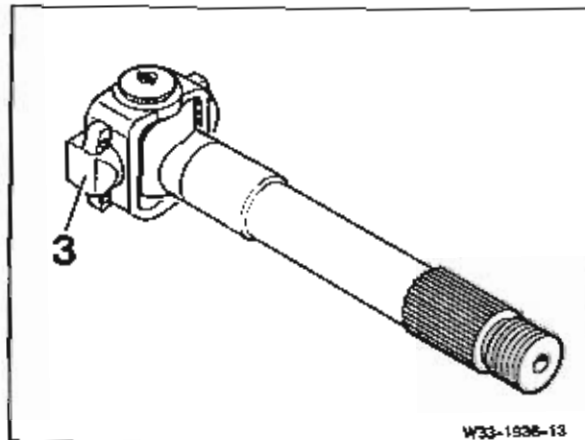


Dismantling

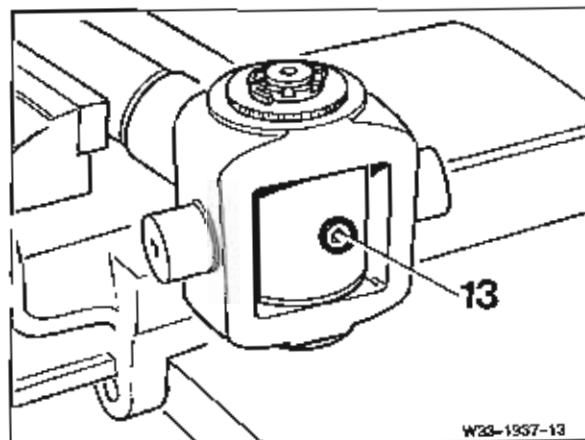
1 Unscrew hexagon bolts (4) and outer section of the drive shaft (14) and inner section of drive shaft (1) from the driver (2).



2 Remove brackets (3) with sealing rings and bearing needles.

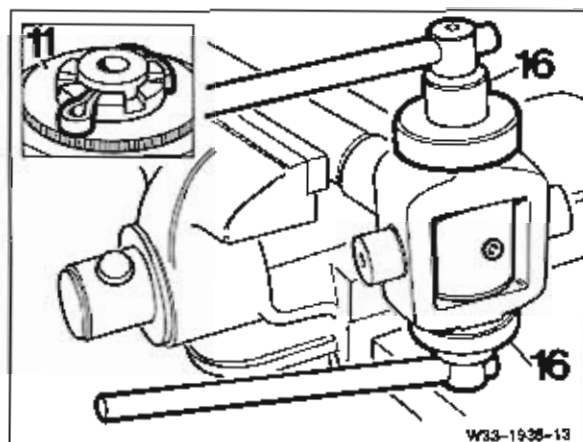


3 Unscrew hexagon socket bolt (13) from drive shaft.



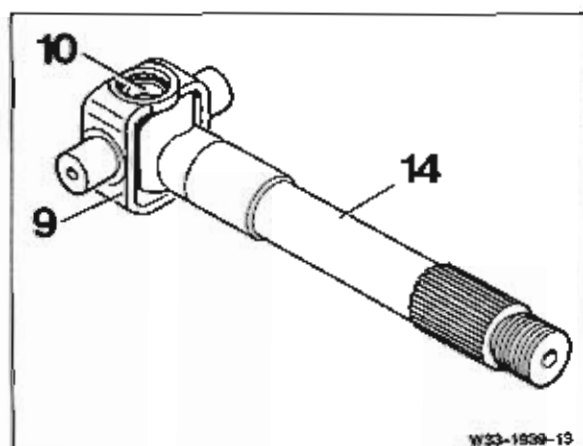
4 Remove split pin from cap (11) and unscrew central bolt.

16 Serrated socket wrench 360 589 03 07 00 (2x)



5 Remove bearing needles.

6 Press out bearing pin (10), remove universal joint (9) and sealing rings from outer section of drive shaft (14).



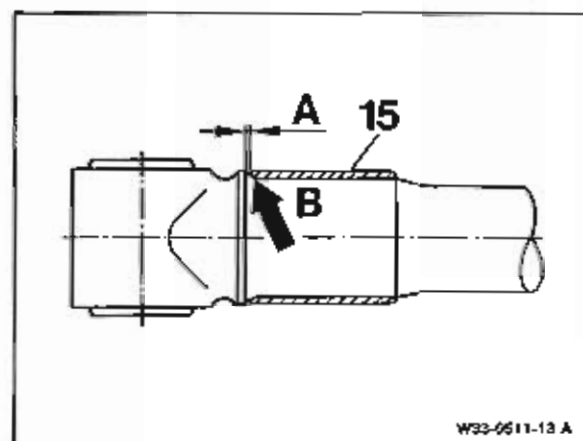
7 Check race (15) on the outer section or inner section of the drive shaft for wear, replace if required.

7.1 Grind race (15) and spring off with a blunt chisel so that the shaft is not damaged.

7.2 Heat up new race (15) to max. 110°C and push onto the shaft which is free from oil and grease so that the race inner chamfer points in the direction of the shaft stub (arrow).

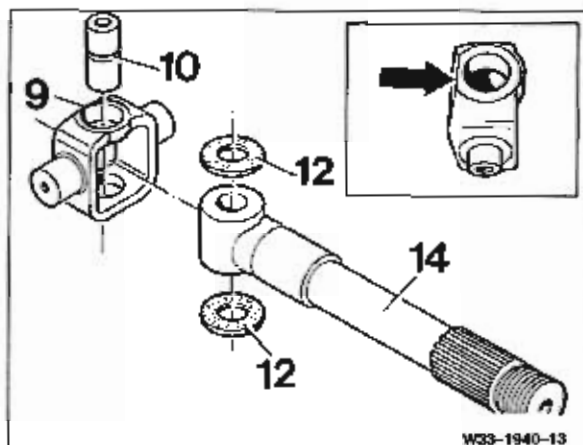
A = 0.2 – 0.5 mm distance to shaft collar.

B = race inner chamfer.



Assembly

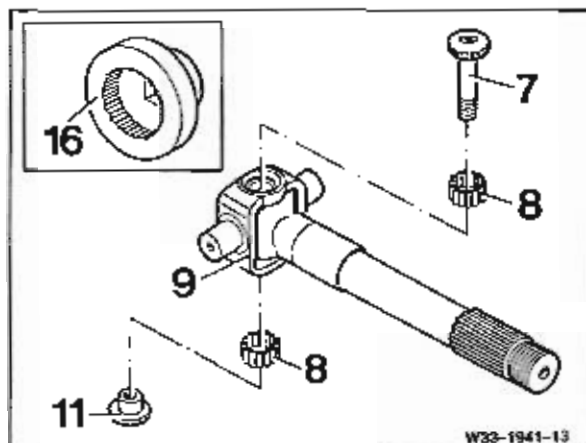
1 Insert outer section of drive shaft (14) into the universal joint (9) so that the machined side of the universal joint (arrow) points towards the driver, insert new sealing rings (12) and press in bearing pin (10).



2 Lubricate bearing needles (8) with multipurpose grease and install in the universal joint (9) on both sides.

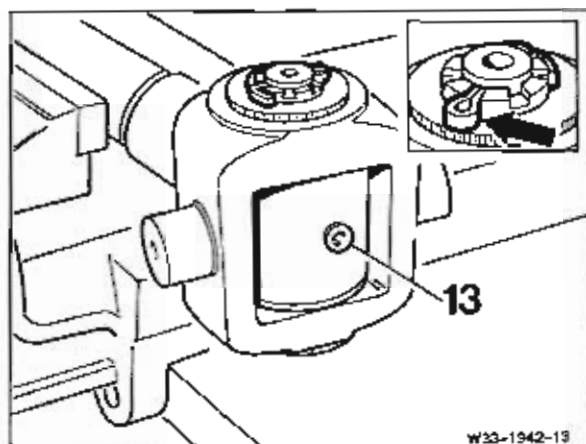
3 Insert central bolt (7) and tighten cap (11), 80 Nm.

16 Serrated socket wrench 360 589 03 07 00 (2x)



4 Lock cap with split pin (arrow).

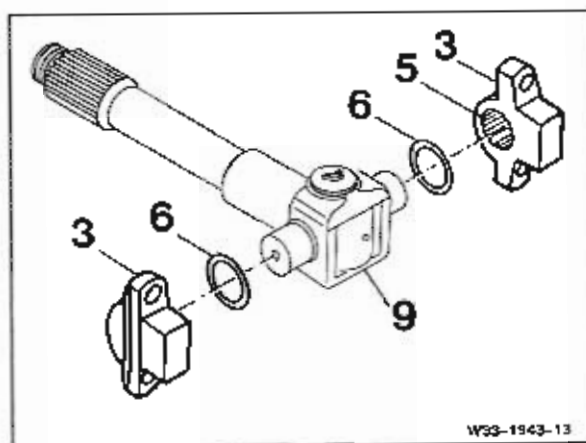
5 Tighten hexagon socket bolt (13).



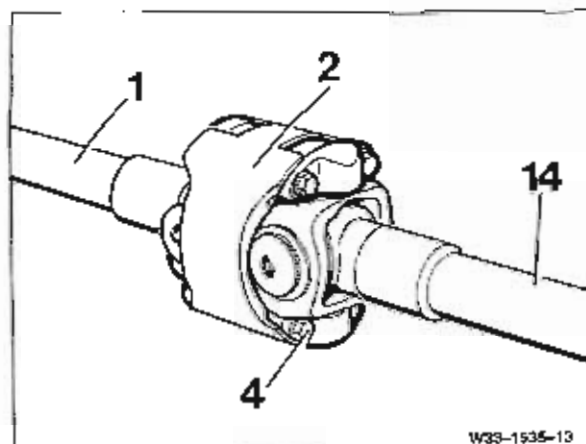
6 Lubricate bearing needles (5) with multipurpose grease and install in the brackets (3).

7 Place new sealing rings (6) on the brackets (3).

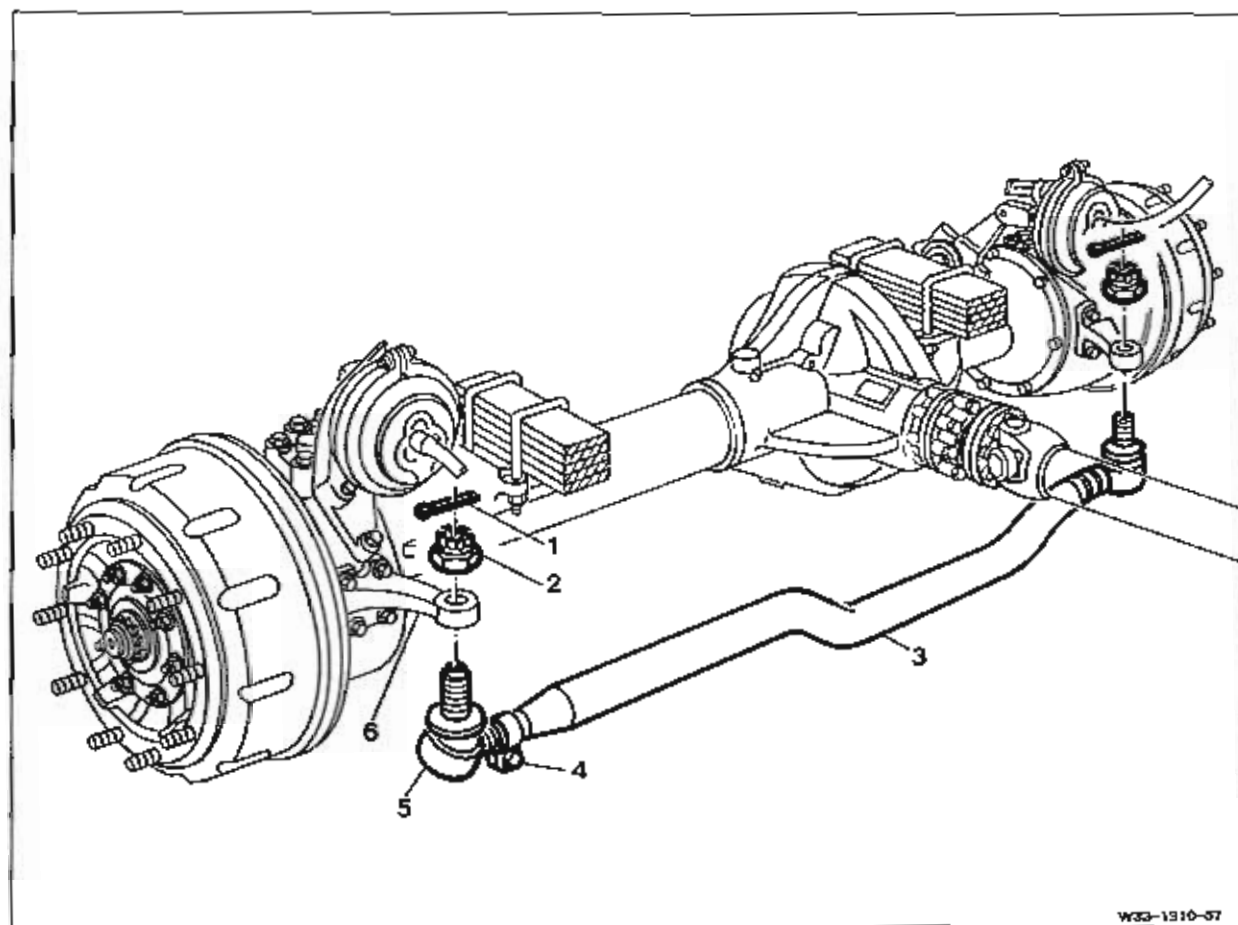
8 Carefully mount brackets (3) on the universal joint (9).



9 Place outer section of drive shaft (14) and inner section of drive shaft (1) in driver (2) and tighten hexagon bolts (4), 103 Nm.



33.6-095 Removal and Installation of tie rod



1	Split pin	Replace.
2	Castle nut	250 Nm.
3	Tie rod	Puller 601 589 04 33 00.
4	Clamp	100 Nm.
5	Tie rod end	
6	Steering knuckle arm	

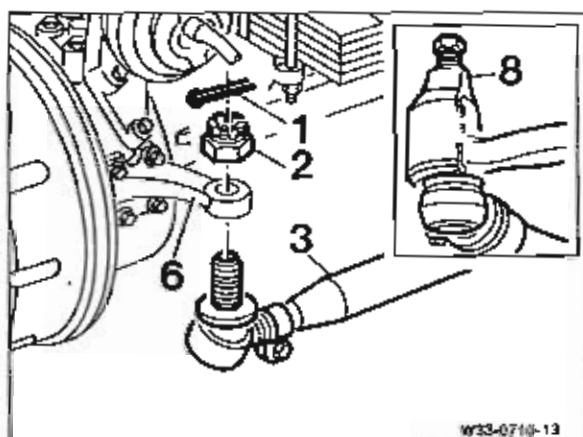
Special tool



Removal

- 1 Remove split pin (1) and unscrew castle nut (2).
- 2 Press tie rod (3) out of steering knuckle arm (6).

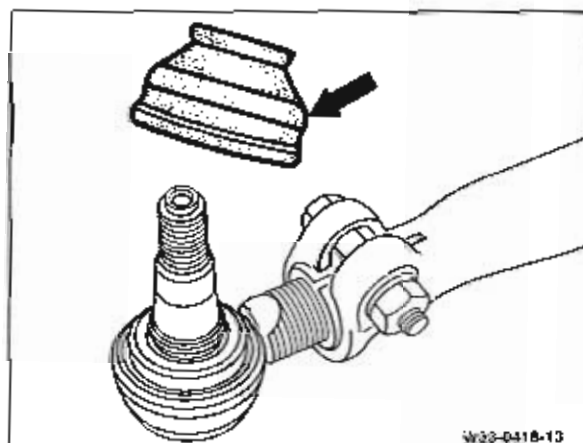
8 Puller 601 589 04 33 00



Note

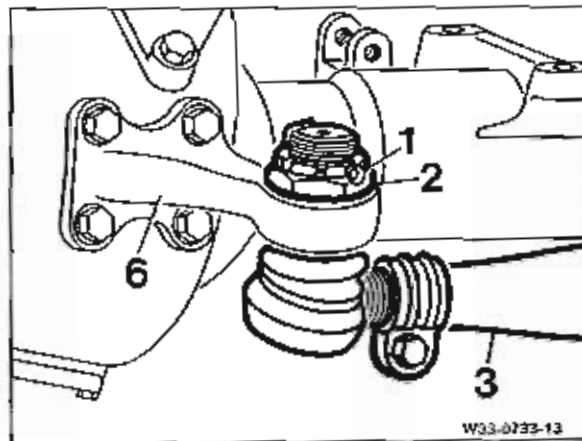
If a damaged sealing bellows (arrow) has been found on a used joint, the joint concerned is to be replaced completely. If the sealing bellows has been damaged when removing or installing the tie rod, it is sufficient for the sealing bellows to be replaced.

Check ball ends for play and for evidence of rust by lifting the sealing bellows, replace ball end or tie rod if required.

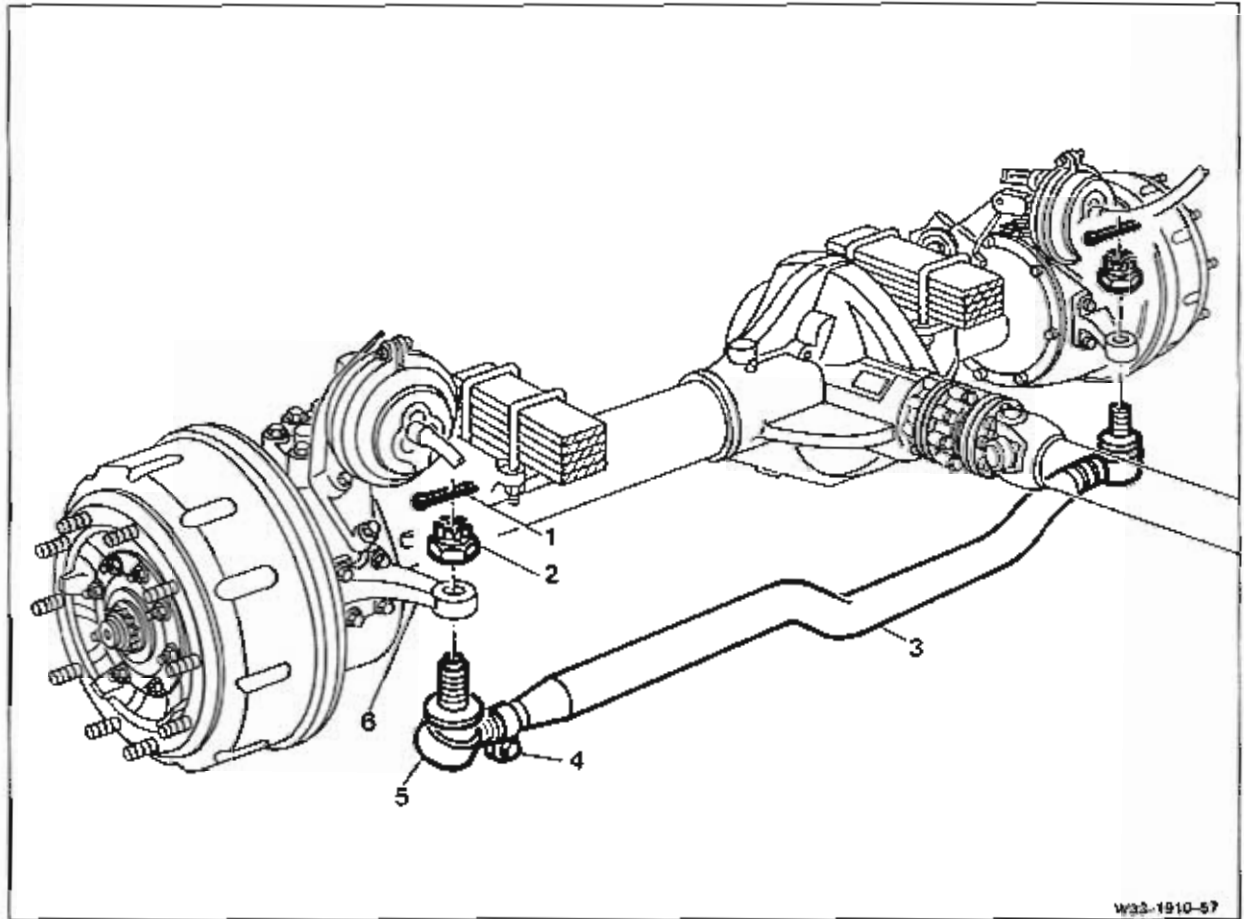


Installation

- 1 Degrease tapered shank of tie rod end and bore of steering knuckle arm.
- 2 Insert tie rod (3) in the steering knuckle arm (6) and tighten castle nut (2), 250 Nm.
- 3 Lock castle nut (2) with new split pin (1).
- 4 Check toe-in, adjust if required (33.6-100).

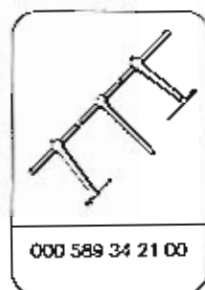


A. Checking toe-in



- | | | | |
|---|----------------------|-------|--------------------------|
| 1 | Split pin | ..... | Replace. |
| 2 | Castle nut, | ..... | 250 Nm. |
| 3 | Tie rod | ..... | Puller 801 589 04 33 00. |
| 4 | Clamp | ..... | 100 Nm. |
| 5 | Tie rod end | | |
| 6 | Steering knuckle arm | | |

Special tools



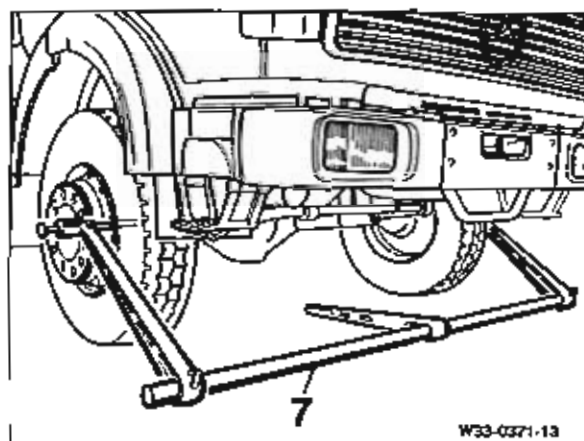
Checking

1 Drive vehicle onto a level, horizontal surface (measuring pit if available). Correct air pressure in tires and move the wheels of the front axle to the straightahead position. Steering gear must be in the center position, adjust to center if required.

2 Check toe-in.

Nominal value: 0 ± 1.5 mm.

If the nominal value is not attained, adjust toe-in.



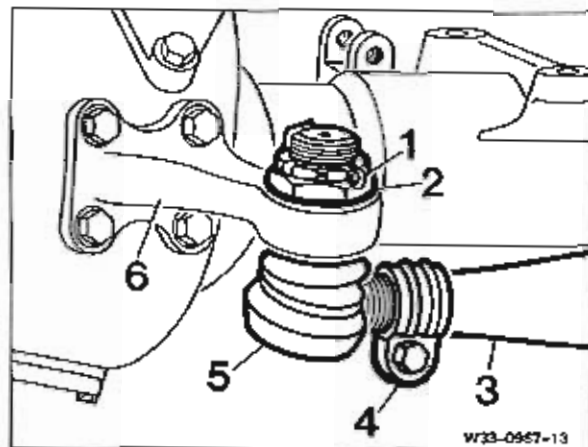
7 Toe gauge 000 589 34 21 00

Adjustment

- 1 Remove tie rod (3) on one side.

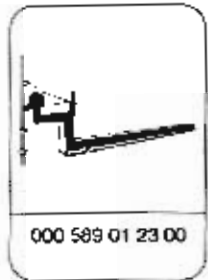
Puller 601 589 04 33 00

- 2 Loosen clamp (4).
- 3 Turn tie rod end (5) until the required value is attained.
- 4 Tighten clamp (4), 100 Nm.
- 5 Grease conical shank of tie rod end and bore of steering knuckle arm.
- 6 Install tie rod (3) in the steering knuckle arm (6) and tighten castle nut (2), 250 Nm.
- 7 Lock castle nut (2) with new split pin (1).



B. Checking axle parts

Special tool



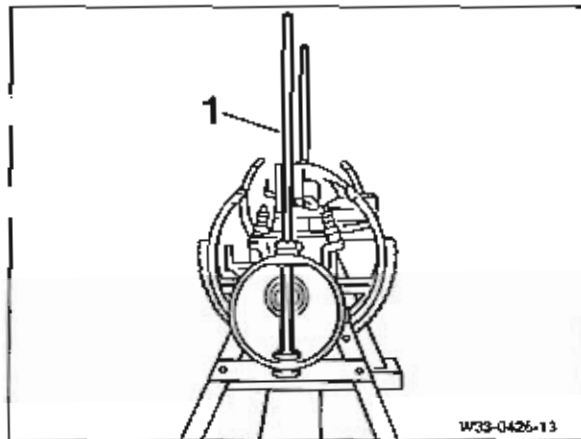
Checking

1 Measure or check axle casing with axle tubes.

Distortion:

Fasten both sighting devices to the joint balls and check alignment by visual examination.

1 Tester 000 589 01 23 00

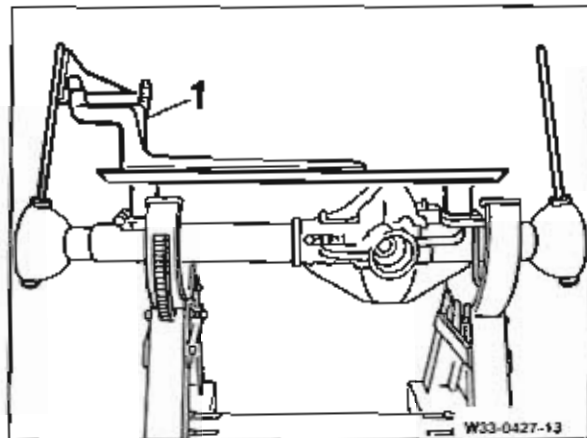


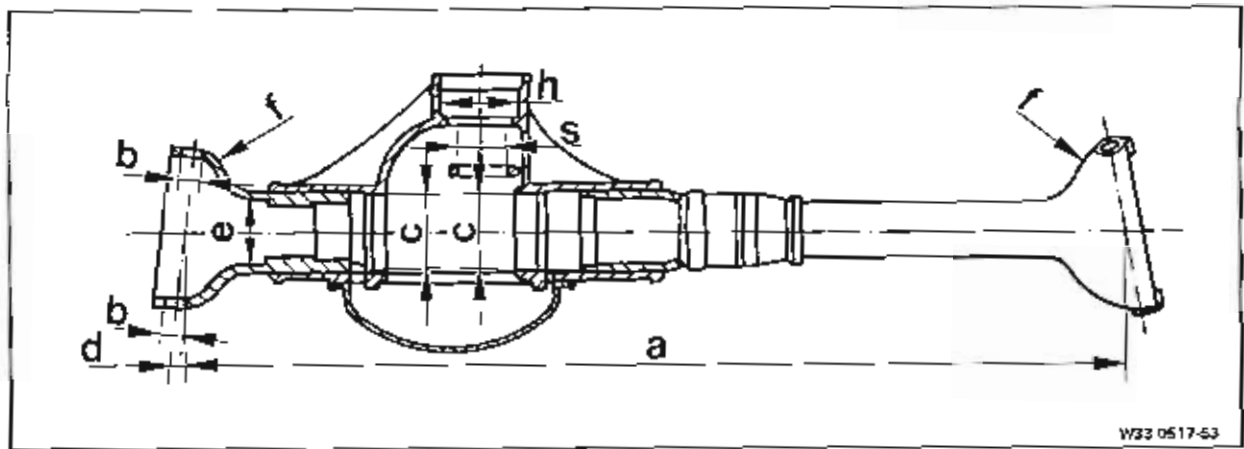
Kingpin inclination:

Place rule with 2 equal height blocks and tester (1) on the spring support and measure kingpin inclination.

Nominal value: $9^{\circ}30'$.

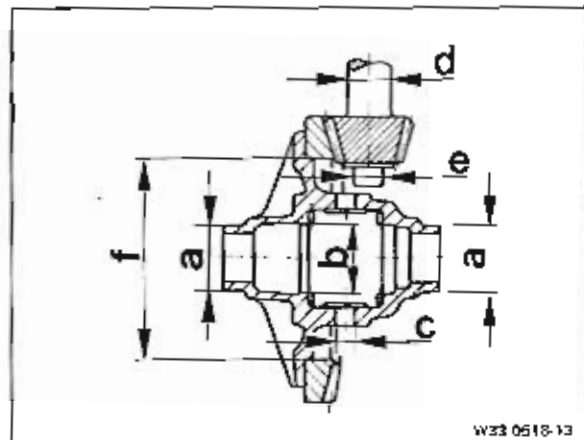
1 Tester 000 589 01 23 00





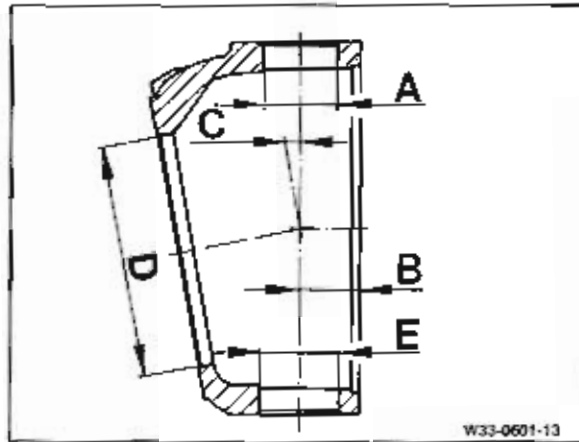
Axle casing with axle tubes

Part no.	a	b dia.	c dia.	d	e dia.	f	h dia.	s dia.
650 330 01 05	1770 ± 1	$\frac{51.991}{51.961}$	$\frac{110.034}{110.012}$	$9^{\circ}30' \pm 10'$	$\frac{65.018}{64.988}$	0.2 max. eccentricity at the balls	$\frac{100.016}{99.994}$	$\frac{61.995}{61.976}$



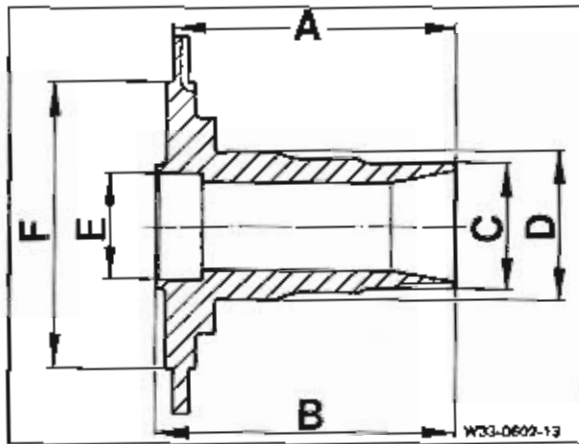
Differential housing with bevel pinion and crown wheel

	Differential housing				Bevel pinion and crown wheel			
	a dia.	b dia.	c dia.	f dia.	Part no.	e dia.	d dia.	f dia.
385 335 00 01	$\frac{70.056}{70.043}$	$\frac{67.046}{67.000}$	$\frac{25.052}{25.000}$	$\frac{205.016}{204.987}$	383 335 03 10	$\frac{25.011}{25.002}$	$\frac{45.013}{45.002}$	$\frac{205.029}{205.000}$
					383 335 03 12			
383 330 00 27	$\frac{66.731}{66.718}$	$\frac{67.046}{67.000}$	$\frac{25.025}{25.000}$	$\frac{205.016}{204.987}$	383 330 03 39	$\frac{25.011}{25.002}$	$\frac{45.013}{45.002}$	$\frac{205.029}{205.000}$
					383 330 04 39			
					383 330 16 39			
					383 330 18 39			



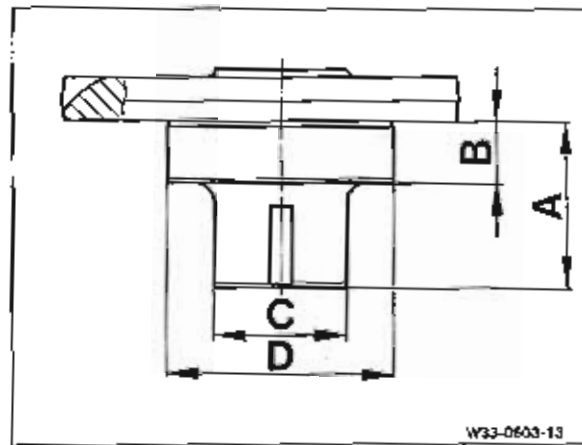
Joint housing

Part no.	A dia.	B	C	D dia.	E dia.
381 337 02 06 lt.	<u>60.030</u>	44 - 0.5	10°30'	<u>192.072</u>	<u>60.030</u>
381 337 03 06 rt.	60.000			192.000	60.000
381 337 01 06	<u>60.030</u>	44 - 0.5	10°30'	<u>192.072</u>	<u>60.030</u>
	60.000			192.000	60.000



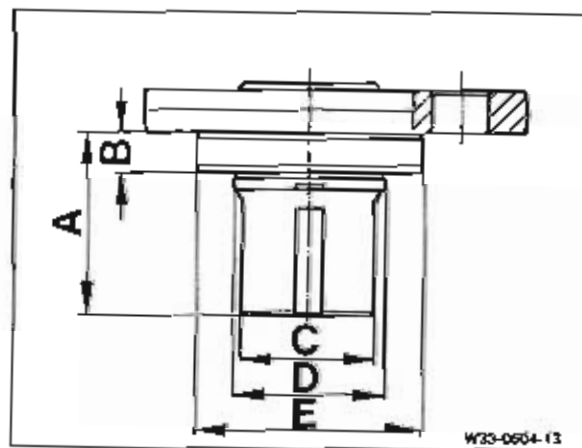
Supporting sleeve

Part no.	A	B	C dia.	D dia.	E dia.	F dia.
383 332 00 16	177 + 0.3	190	<u>69.990</u>	85.72 ± 0.025	<u>65.018</u>	<u>192.000</u>
			69.977		64.988	191.928



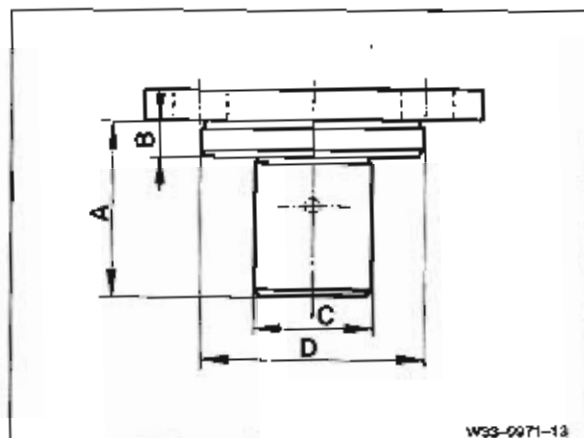
Upper steering knuckle pin (as of axle no. 2 599 966)

Part no.	A	B	C dia.	D dia.
383 332 00 06	44.5 - 0.3	16.7 - 0.2	<u>34.975</u> 34.959	<u>60.000</u> 59.981



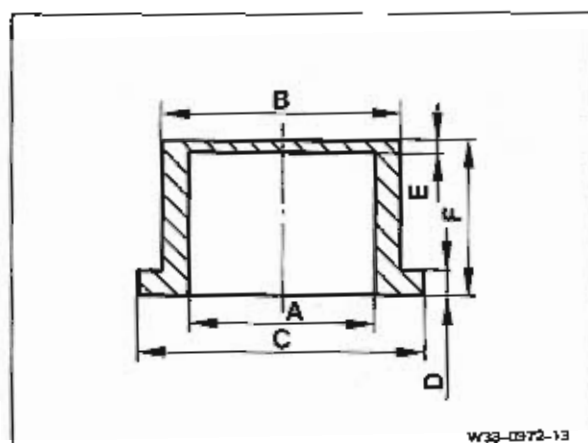
Lower steering knuckle pin (as of axle no. 2 599 966)

Part no.	A	B	C dia.	D dia.	E dia.
676 332 05 06	47.5	10.5 - 0.2	<u>34.975</u> 34.959	<u>39.975</u> 39.950	<u>60.000</u> 59.981



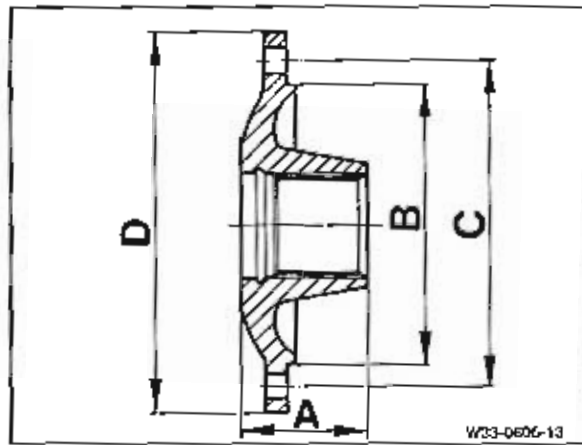
Steering knuckle pin (up to axle no. 2 599 965)

Part no.	A	B	C dia.	D dia.
360 332 02 06	48	$B - 0.2$	$\frac{39.975}{39.950}$	$\frac{60.000}{59.981}$



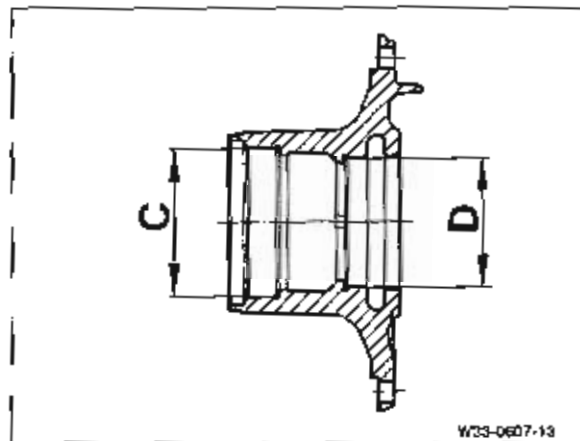
Steering knuckle pin bush (up to axle no. 2 599 965)

Part no.	A dia. after pressing in	B dia.	C dia.	D	E	F
360 331 00 50	$\frac{40.025}{40.000}$	$\frac{48.050}{48.034}$	59.5	$\frac{4.000}{3.925}$	$2.5 + 0.2$	$29 + 0.2$



Driver

Part no.	A	B dia.	C dia.	D dia.	Permissible eccentricity when located in groove section
322 337 04 17	58	$\frac{92.000}{91.946}$	112	137	0.05



Wheel hub

Part no.	C dia.	D dia.
352 334 05 01	$\frac{124.952}{124.912}$	$\frac{133.314}{133.274}$



Handwritten text at the top of the page, possibly a title or header, which is mostly illegible due to blurring. Some faint characters like 'Page' and 'Date' are visible.

...

-

-

○