



	Job No.
<b>Rear axle</b>	
Removal and installation of complete rear axle	35-010
Removal and installation of front and rear rubber mounts of rear axle suspension	040
<b>Wheel alignment</b>	
Removal and Installation of camber strut	110
Removal and Installation of pulling strut	111
Removal and installation of track rod, renewing rubber mounts	112
Removal and Installation of pushing strut	113
Removal and Installation of springlink, renewing rubber mounts and supporting joint.	114
Removal and installation of wheel carrier	115
Removal and installation of rear axle shaft flange with angular ball bearing	130
<b>Rear axle center piece</b>	
Removal and Installation of rear axle center piece	520
Renewing radial sealing ring on drive pinion (rear axle center piece installed)	530
Renewing radial sealing ring on connecting flange of rear axle shaft (rear axle center piece removed)	540
Disassembly and assembly of rear center piece, adjustment of wheel set	550
Reconditioning of differential	560
Removal and Installation of rear axle shaft	620
Renewing rubber sleeve on rear axle shaft	660
Removal and Installation of connecting flange of rear axle shaft (rear axle center piece removed)	670

## 35-010 Removal and installation of complete rear axle

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### Oil type and filling capacity

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Hypoid gear oil SAE 90	refer to Specifications for service products page 235
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Filling capacity	0.7 liter
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### Tightening torques

Nm

Hex. head screws (self-locking) for fastening front and rear rubber mount to frame floor

70

Clamping nut of propeller shaft

30-40

Hex. head screws for fastening propeller shaft intermediate bearing to frame floor

25

### Special tools

Torque wrench 25 – 130 Nm with plug-in ratchet 1/2" square



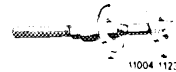
001 589 66 21 00

Open-end wrench 41 mm for torque wrench for clamping nut of propeller shaft



201 589 00 01 00

Spring tensioner (complete)



201 589 00 31 00

Socket wrench element 32 mm 1/2" square for spring tensioner



201 589 01 09 00

Tensioning plates for spring tensioner for removal and installation of rear spring

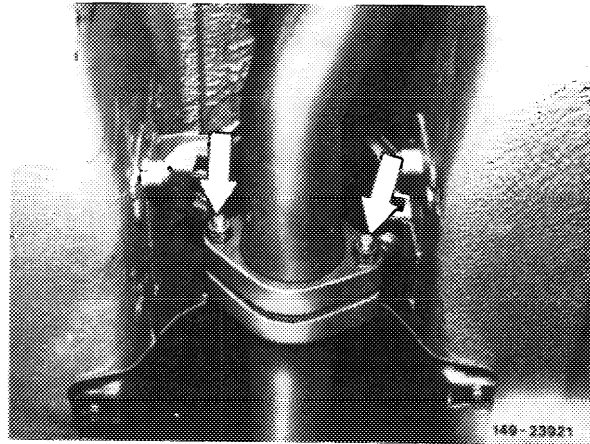


201 589 00 63 00

## Removal

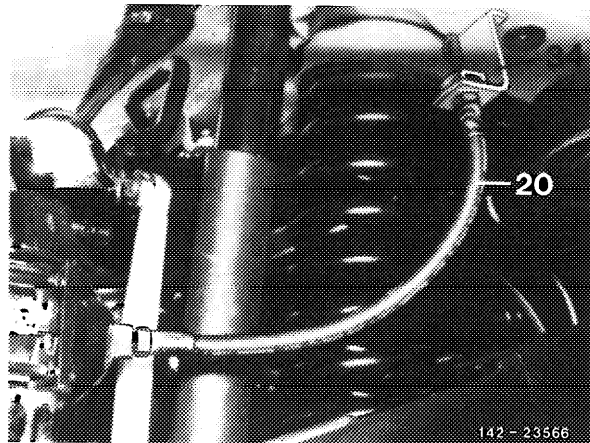
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1 Remove exhaust system starting at flange connection.



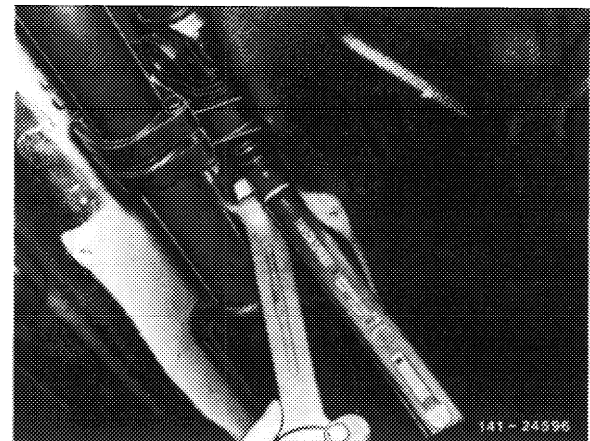
2 Unscrew exhaust shielding plate.

3 Remove intermediate lever of parking brake and disconnect cable controls (42-525).



4 Unscrew both brake hoses and close brake lines against penetration of dirt.

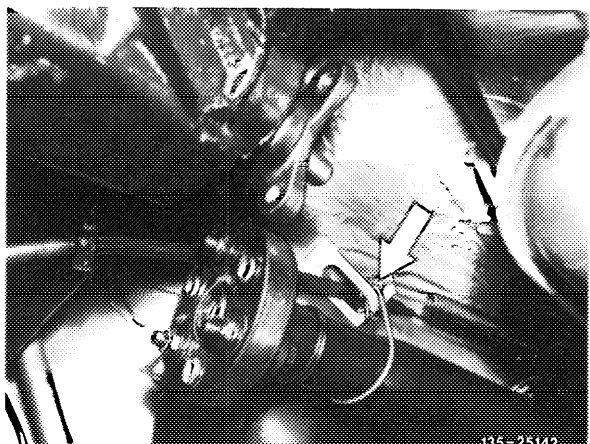
5 Loosen clamping nut of propeller shaft, also loosen hex. head screws of propeller shaft intermediate bearing on frame floor and remove.



6 Unflange propeller shaft at the rear.

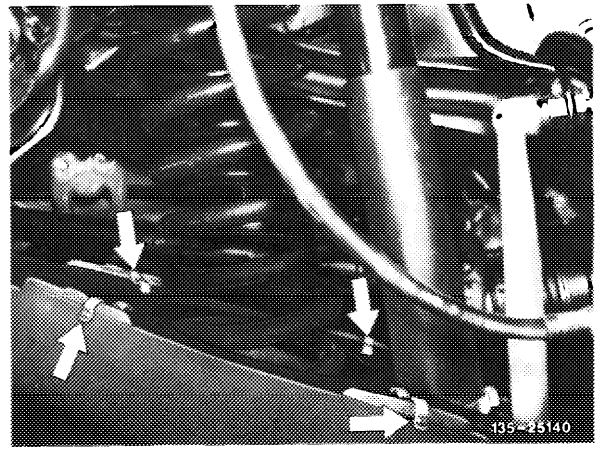
7 Slide propeller shaft out of center in forward direction.

**Note.:** Tie propeller shaft with a wire to holder of brake cable control, so that shaft will not fall down.

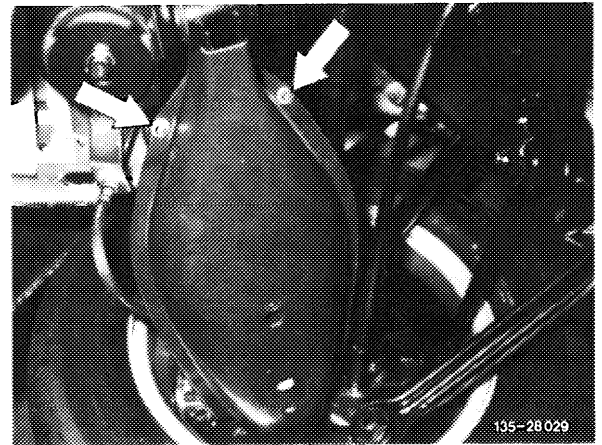


8 Remove holding clamps on 1st version or unscrew sheet metal screw on 2nd version and remove spring link covering.

1st version  
up to December 1983



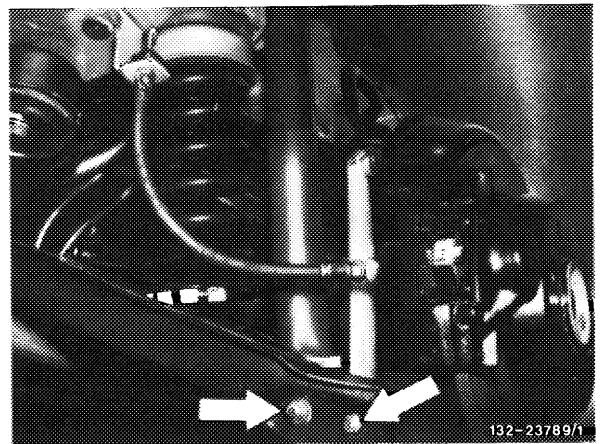
2nd version  
starting January 1984



9 Remove shock absorbers or spring struts (32-1 10 or 32-6 10).

10 Remove rear springs (32-230).

11 Loosen torsion bar connection toward rear axle and remove (32-310 or 32-320).

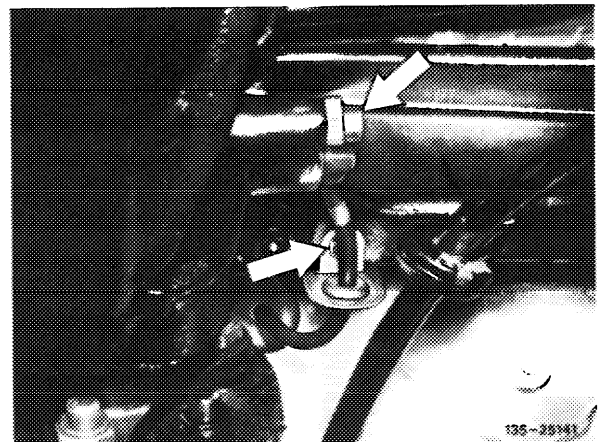


12 On vehicles with ABS

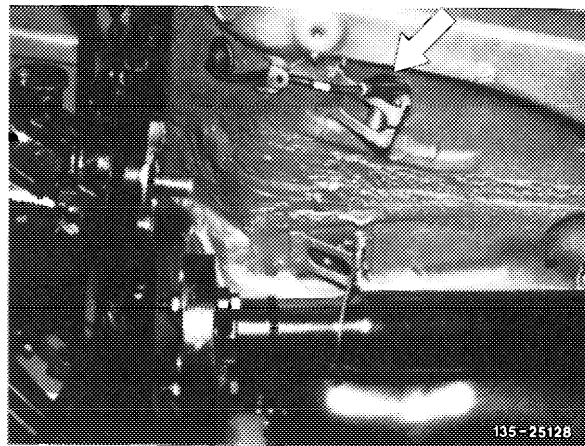
a) Drain rear axle oil.

b) Unscrew hex. socket screw and take rpm sensor out of rear axle housing (arrow).

c) Unscrew sheet metal screw for holder on rear axle carrier and **remove (arrow)**.

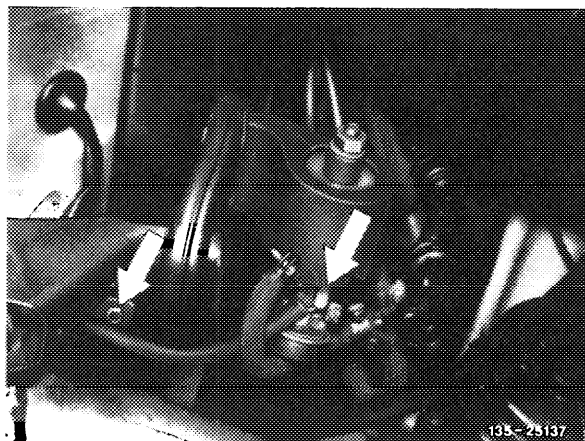


d) Cover magnetic edge of rpm sensor and introduce into holder of brake cable (arrow).



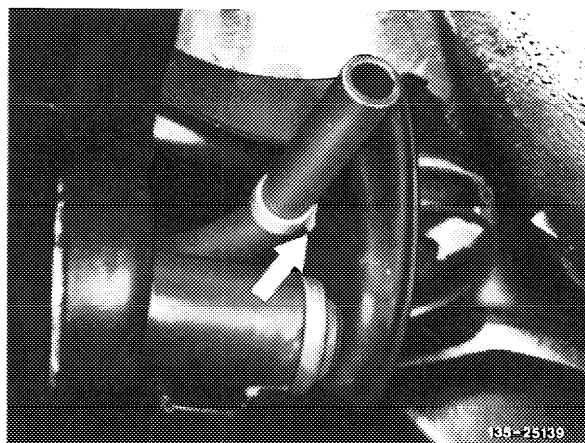
### 13 On vehicles with auxiliary heater

Loosen hex. head screws for fastening holder of electric gasoline pump and suspension plate of exhaust suspension and remove. Also remove cable connector and unscrew sheet metal screw from rear axle cross member (arrows).



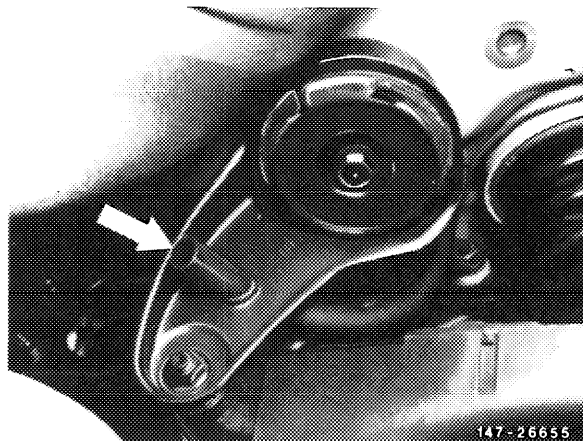
14 Slip vehicle jack or pit lift under rear axle and lift up to stop.

15 On 1st version, force fastening clamp of water drain hose out of rear axle carrier and remove (arrow).



1st version  
up to April 1983

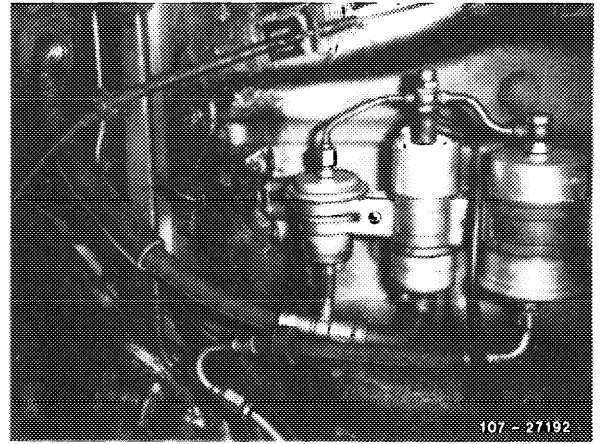
16 On 2nd version, force water drain hose out of rear axle carrier (arrow).



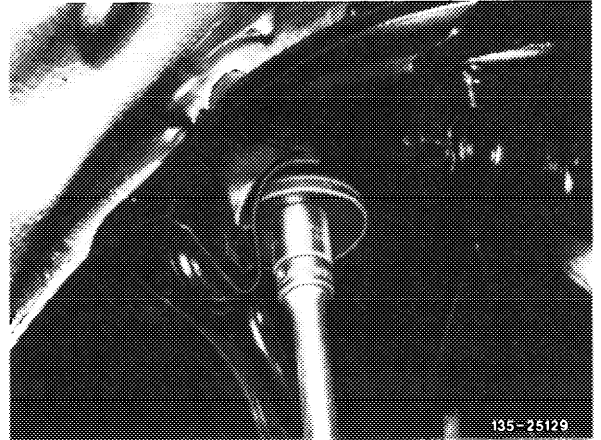
2nd version  
starting May 1983

**17 On vehicles with CIS-E injection system starting September 1983**

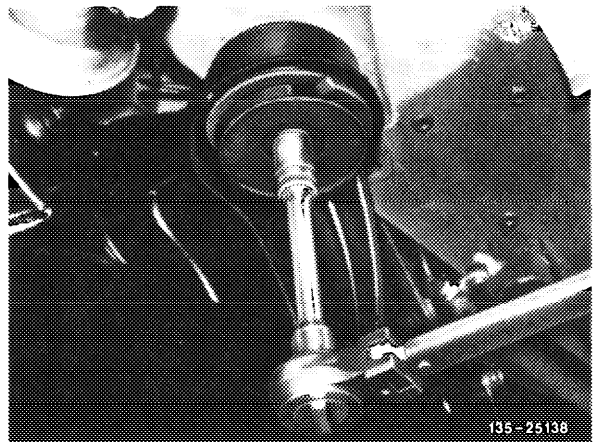
Pinch fuel suction hose between fuel tank and fuel pump with a clip. Loosen clamp on fuel hose to accumulator and to pump and pull off.



18 Unscrew self-locking hex. head screws of front rubber mounts on frame floor and remove with stop plate.



19 Unscrew self-locking hex. head screws of rear rubber mounts on frame floor and remove with stop plate.

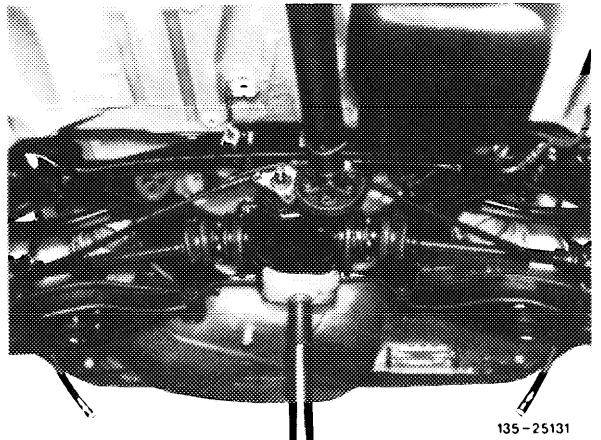


20 Carefully lower rear axle.

**Attention!**

When lowering and transporting rear axle, do not damage cover plates of brake disks.

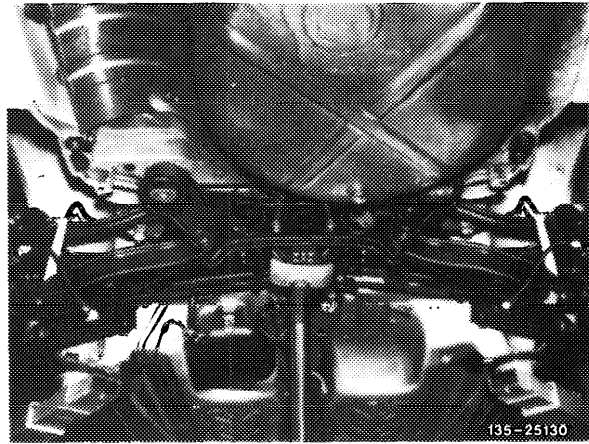
21 Check front and rear rubber mounts and renew, if required.



## Installation

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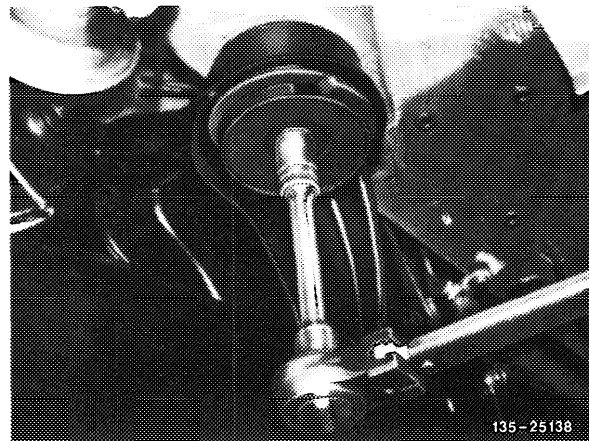
22 Lift rear axle with vehicle jack or pit lift up to guide bolts.



23 Mount self-locking hex. head screws with stop plate of front and rear suspension on frame floor. Tightening torque of self-locking hex. head screws 70 Nm.

### Attention!

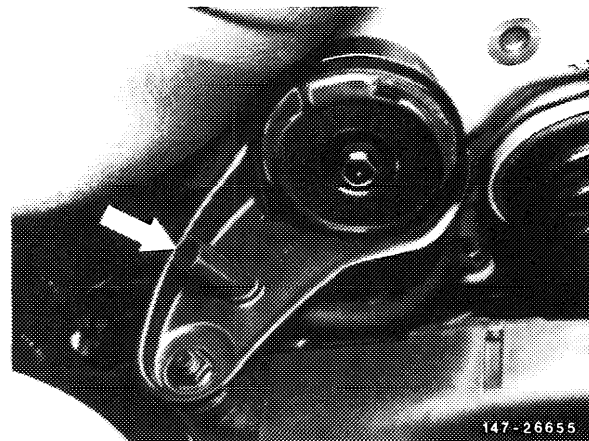
Use self-locking hex. screws with plastic coating (micro-encapsulated) only once. Refinish threads with tap prior to screwing in self-locking hex. screws.



24 Remove vehicle jack top.

25 On 1st version, mount water drain hose with fastening clamp.

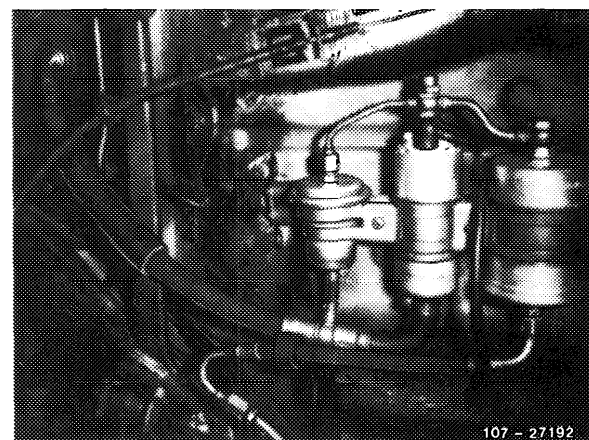
26 On 2nd version, insert water drain hose through bore on rear axle carrier (arrow).



2nd version  
starting May 1983

27 **On vehicle with CIS-E injection system starting September 1983**

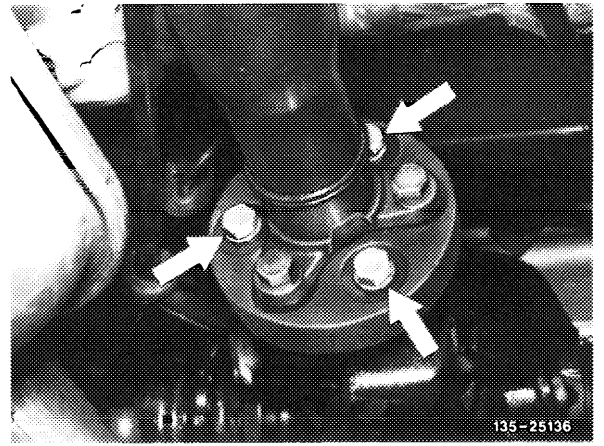
Mount fuel suction hose for fuel pump and accumulator. Remove clamp from fuel suction hose,





28 Flange propeller shaft to rear axle (arrows).

**Note:** Renew self-locking hex. nuts on principle.

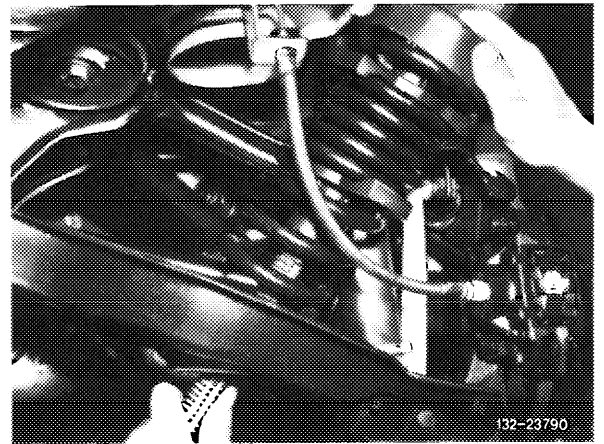


29 Mount torsion bar connection for rear axle (32-310).

30 Install rear springs (32-230).

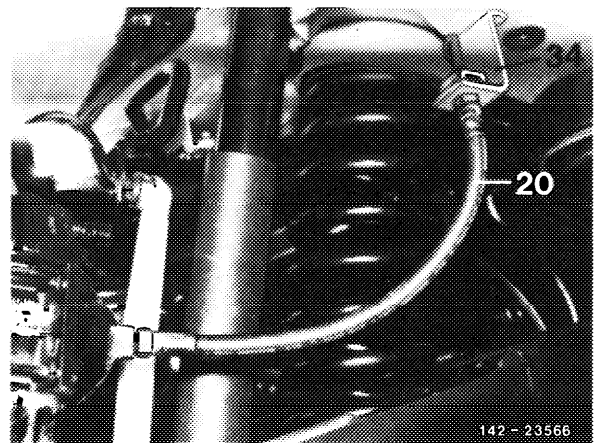
31 Install shock absorbers or spring struts (32-110 or 32-610).

32 Mount spring link lining.



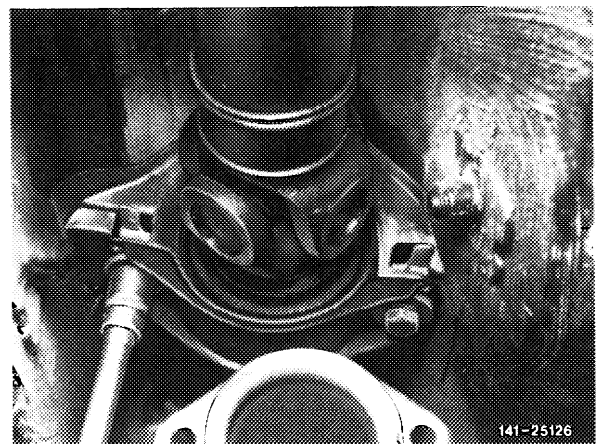
33 Connect both brake hoses (20) and bleed brake system (42-010).

34 Connect cable controls of parking brake and mount holder. Adjust parking brake (42-525).



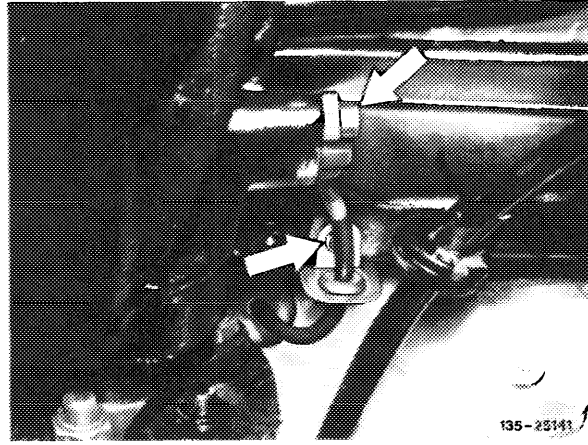
35 Tighten clamping nut on propeller shaft to 30-40 Nm.

36 Tighten propeller shaft intermediate bearing to 25 Nm.



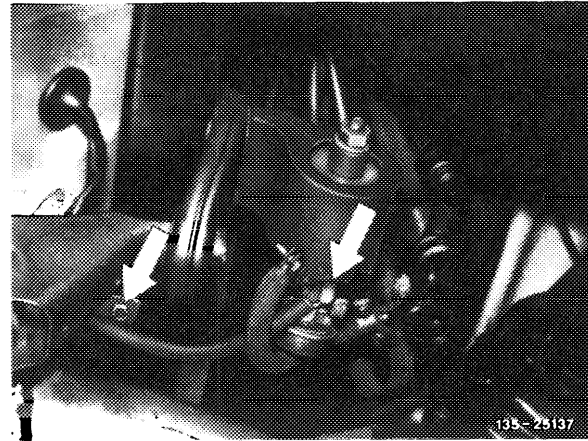
**37 On vehicles with ABS**

- a) Introduce rpm sensor into axle housing. Make sure that there is no metallic residue on magnetic edge.
- b) Use new self-locking hex. socket screw (arrow).
- c) Fasten holder for cable to rear axle cross member with sheet metal screw (arrow).



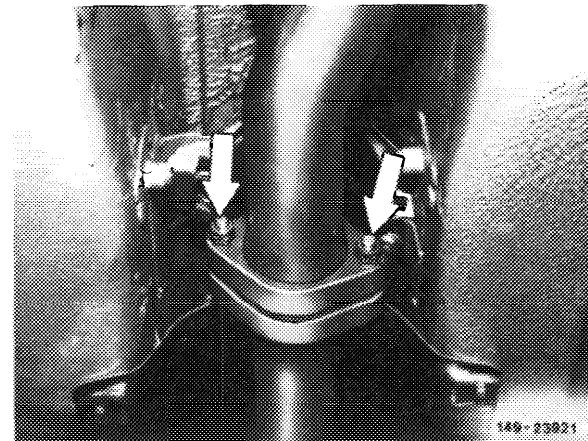
**38 On vehicles with auxiliary heater**

- a) Mount electric gasoline pump with suspension plate of exhaust suspension (arrow).
- b) Fasten holder for cable on rear axle cross member with sheet metal screw and connect cable (arrow).

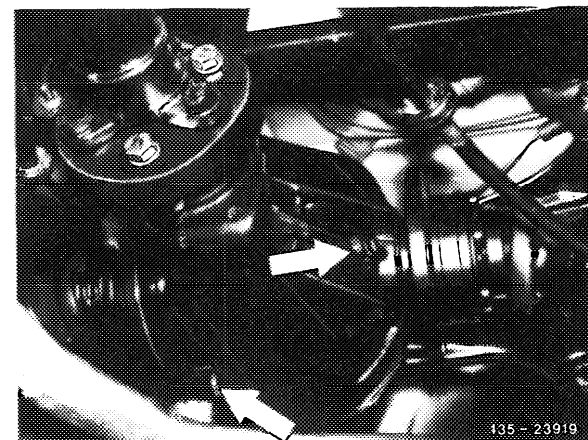


**39 Mount shielding plate.**

**40 Install exhaust system (49-100).**

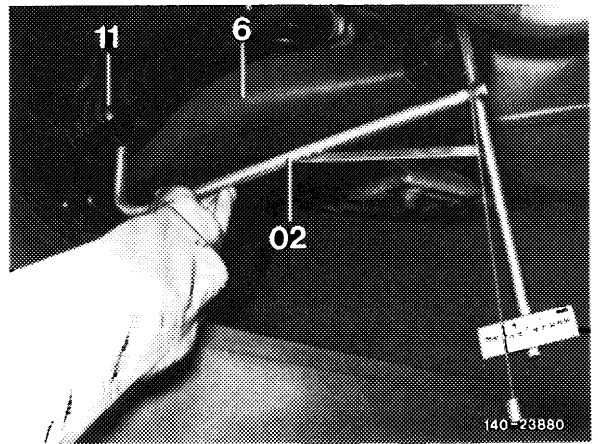


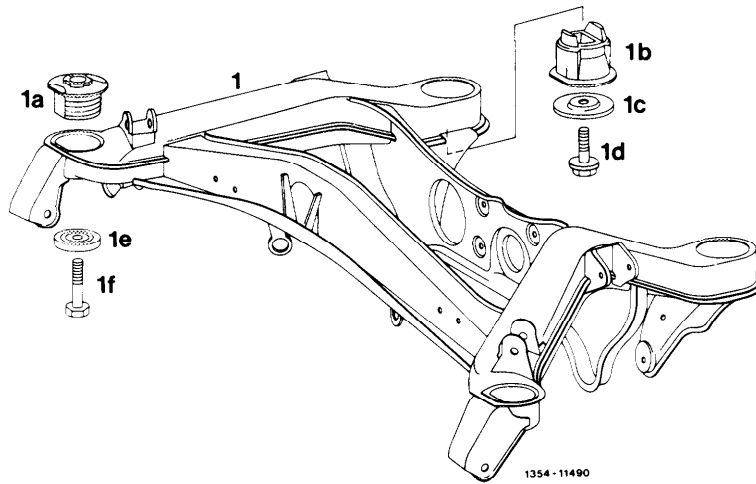
**41 Check oil level in rear axle, if required, fill-in up to level of filler hole.**



42 Check vehicle level on rear axle (40-300).

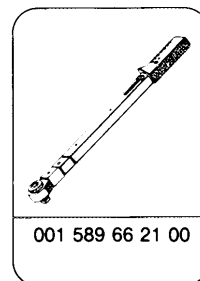
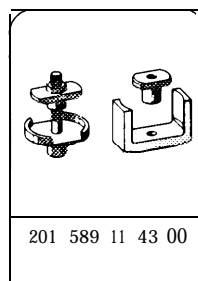
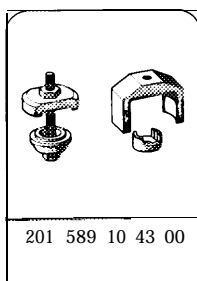
43 Check headlamp adjustment.





1	Rear axle carrier	
1a	Front rubber mount	Check for damage and wear, prior to pressing in, rub with slide fluid Naphtolen H or coat with Fahr slide paste 0009890860 Special tool: Remover and installer 201 589 10 43 00
1b	Rear rubber mount	Check for damage and wear, prior to pressing in, rub with slide fluid Naphtolen H or coat with Fahr slide paste 0009890860 Special tool: Remover and installer 201 589 11 43 00
1c	Stop plate rear	
1d	Locking screw	Renew, tightening torque 70 Nm
1e	Stop plate front	
1f	Locking screw	Renew, tightening torque 70 Nm

**Special tools**



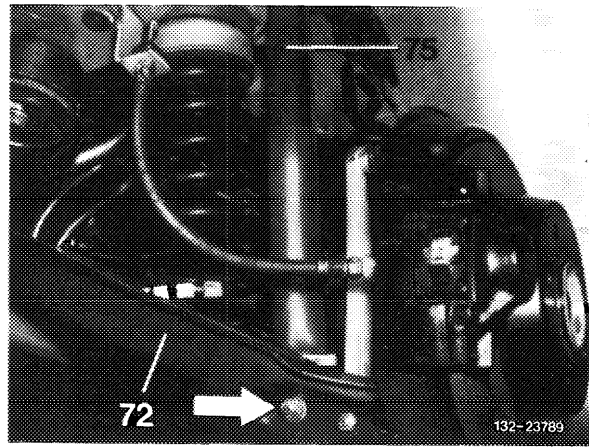
**Note**

Removal and installation of rubber mounts is possible also with rear axle installed. Exchange rubber mount in sets only. Renew penetrated or damaged rubber mounts.

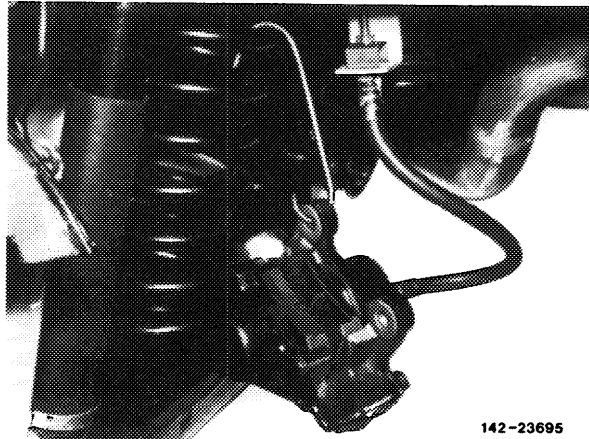
## Removal

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- 1 Remove holding clamps or sheet metal screws for spring link covering and remove together with spring link covering.
- 2 Loosen lower shock absorber fastening and remove, while supporting spring link (arrow).

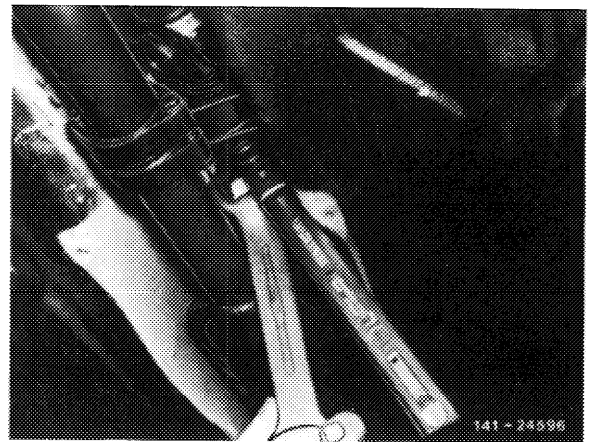


- 3 Remove brake caliper and suspend with a hook.

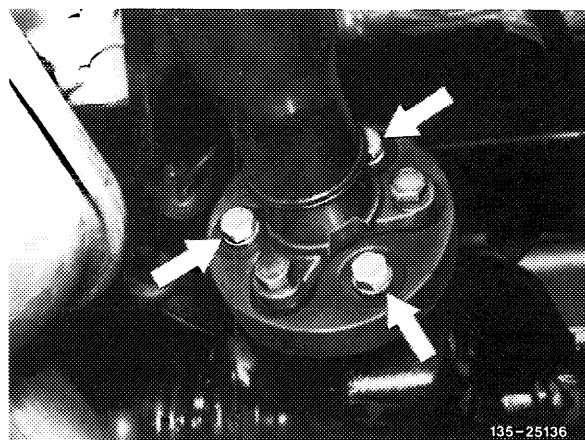


- 4 Remove exhaust shielding plate.

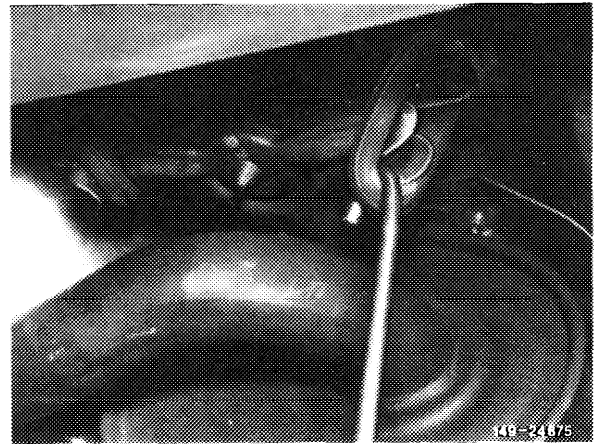
- 5 Loosen clamping nut on propeller shaft, unscrew hex. head screws of propeller shaft intermediate bearing on frame floor and remove.



- 6 Remove propeller shaft on universal flange of drive pinion and slide forward (arrows).

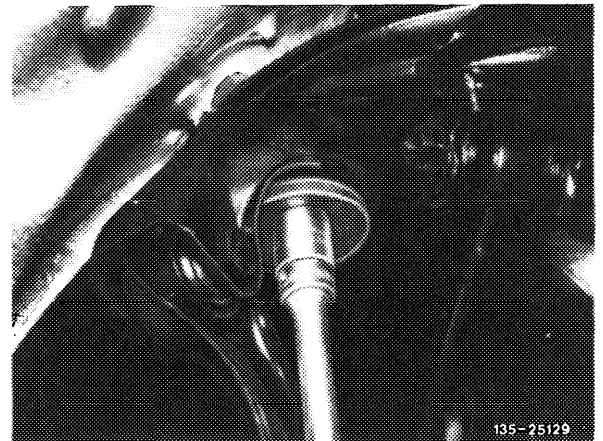


7 Unhook rubber rings on end muffler and support exhaust system.

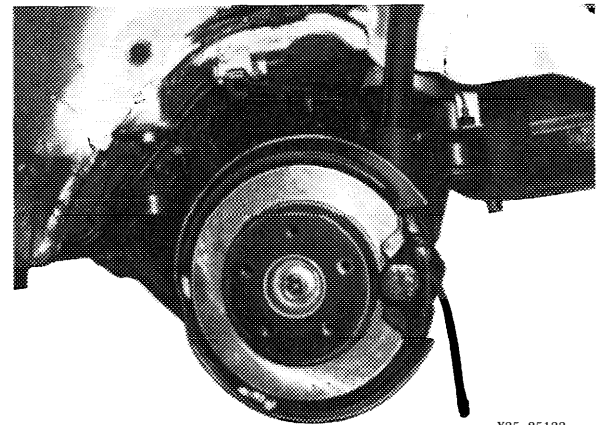


8 Support rear axle center piece with a vehicle jack or pit lift.

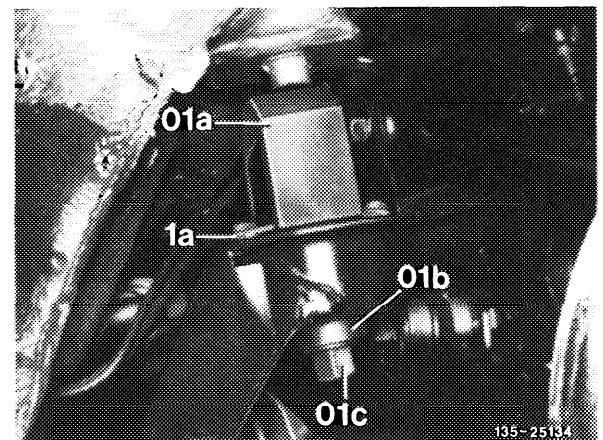
9 Unscrew self-locking hex. head screws of front and rear suspension on one side of rear axle carrier on frame floor, and remove with stop plates.



10 Lower rear axle on one side (left or right) until the puller can be positioned.

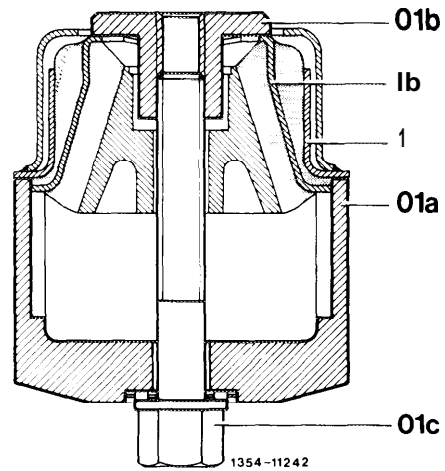


11 Force front rubber mount out of rear axle carrier. Remove rubber mount with puller.



1a Rubber mount  
01a Clamp  
01b Thrust ring  
01c Hex, head screw

12 Pull rear rubber mount out of rear axle carrier.  
Remove rubber mount with puller.



- 1 Rear axle carrier
- 1b Rubber mount
- 01a Clamp
- 01b Thrust piece
- 01c Hex. head screw

### Checking

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13 Check rubber mounts. Renew cracked, depressed or damaged rubber mounts.

### Installation

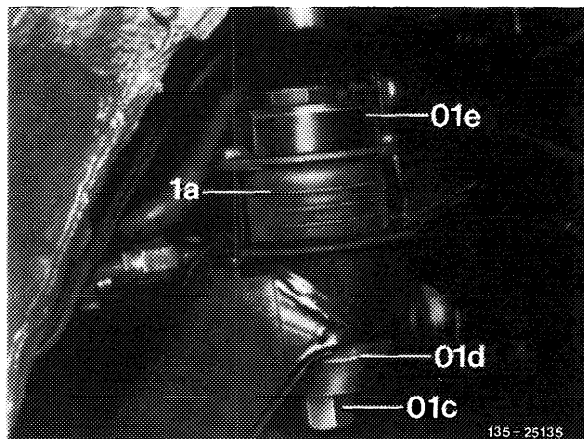
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14 Rub rubber mounts with slide fluid.

#### Attention!

Prior to inserting rubber mounts into rear axle carrier, refinish threads for fastening rear axle carrier to frame floor with a tap.

15 Insert front rubber mounts into rear axle carrier.  
Remove insertion tool.

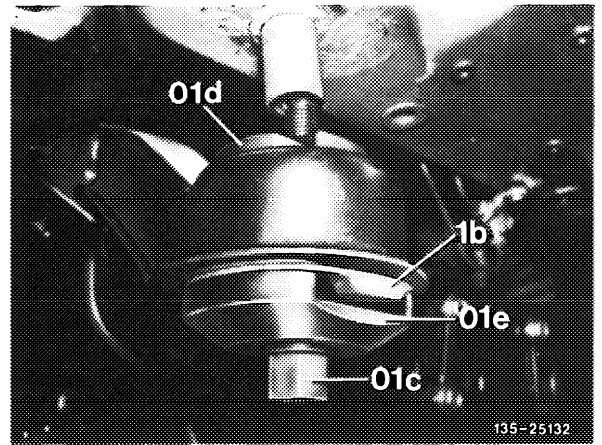


- 1a Rubber mount
- 01c Head head screw
- 01d Thrust piece
- 01e Clamp

16 Insert rear rubber mounts into rear axle carrier. Remove insertion tool.

**Note:** Position clamp (01e) on rubber mount (1 b) in such a manner that the projections are not damaged during insertion.

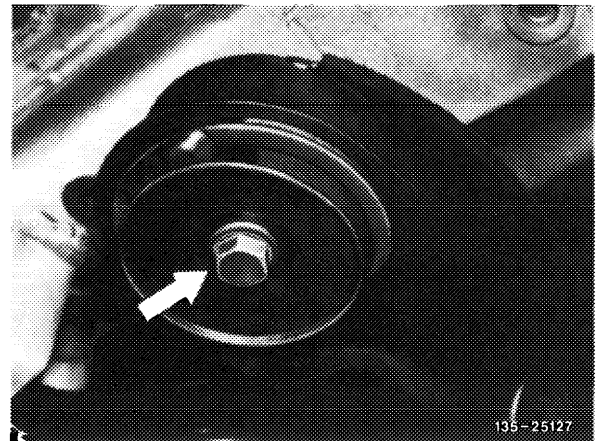
1 b Rubber mount  
01c Hex. head screw  
01d Thrust piece  
01e Clamp



17 Lift rear axle. Mount self-locking hex. head screws with stop plate of front and rear rear-axle suspension and tighten to 70 Nm.

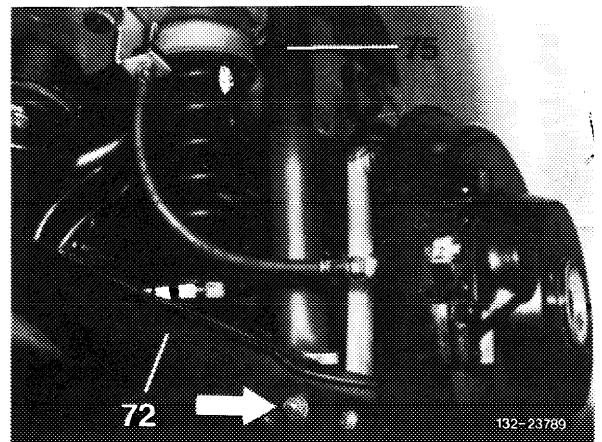
**Attention!**

Renew self-locking hex. head screws on principle.



18 Mount lower shock absorber suspension and tighten to 65 Nm.

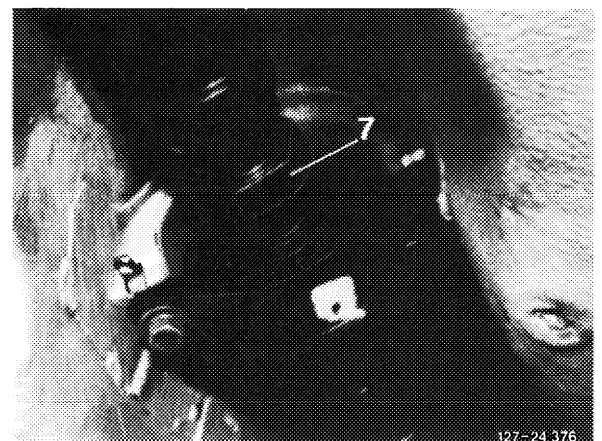
19 Mount brake caliper to wheel carrier (42-120).



20 Plug propeller shaft on centering at drive pinion and mount on propeller flange.

21 Tighten clamping nut on universal shaft to 30-40 Nm. Special tool: Open end wrench 41 mm 201 589 00 01 00.

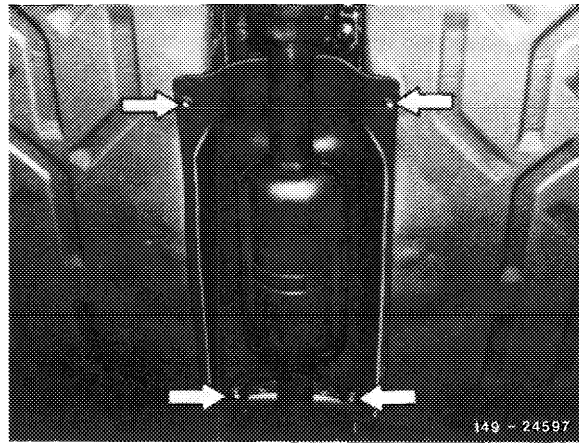
22 Tighten propeller shaft intermediate bearing to 25 Nm.



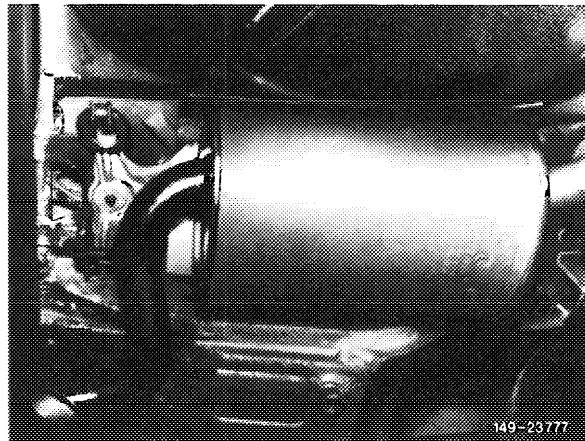


23 Apply spring link covering and fasten with holding clips.

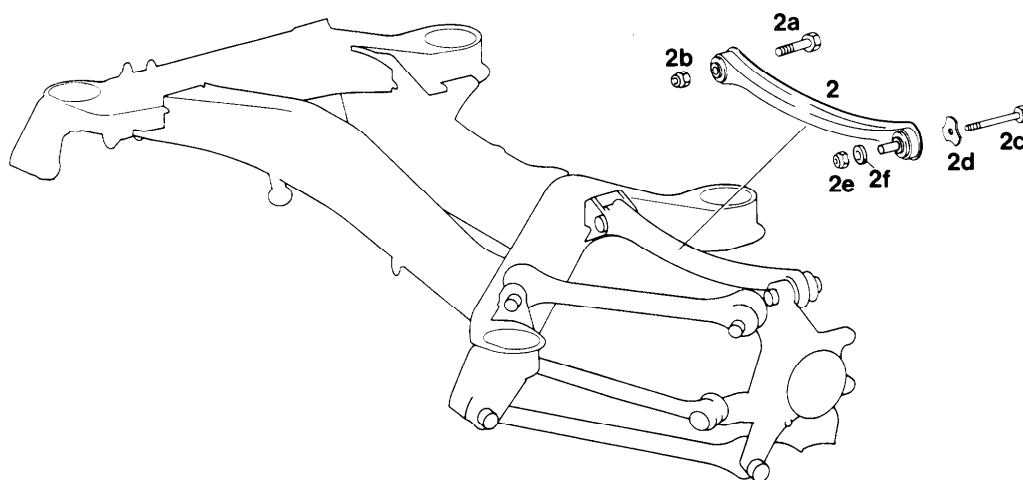
24 Mount exhaust shielding plate.



25 Hang up rubber rings on end muffler.



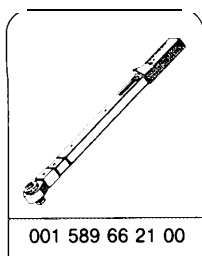
**35-I 10 Removal and installation of camber strut**



1353 - 11484

2	Camber strut	.....	Check camber strut and rubber mount for damage
2a	Hex. head screw		
2b	Self-locking hex. nut	.....	Renew, tightening torque 70 Nm
2c	Hex. head screw		
2d	Contour disk		
2e	Self-locking hex. nut	.....	Renew, tightening torque 40 Nm
2f	Washer		

**Special tool**



001 589 66 21 00

## Note

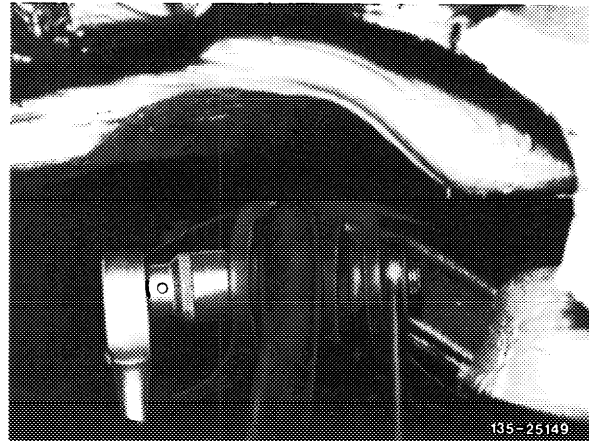
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Rubber mounts of camber strut cannot be individually exchanged. Camber strut is available only with rubber mount as a spare part. Removal and installation with rear axle installed is possible.

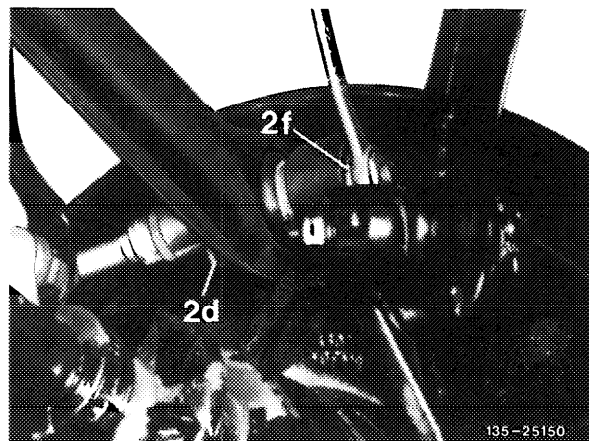
## Removal

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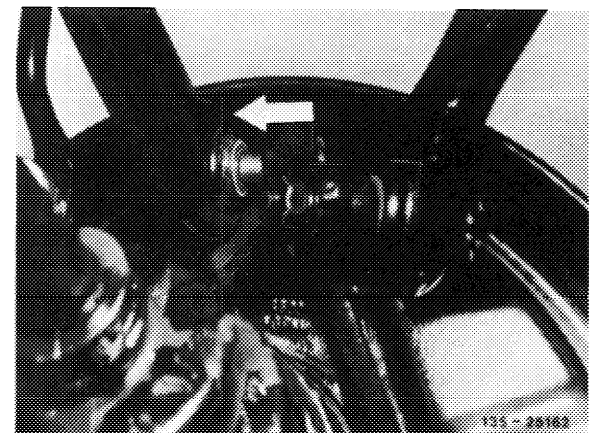
1 Unscrew self-locking hex. nut of camber strut on rear axle carrier and remove together with hex. head screw.



2 Unscrew self-locking hex. nut of camber strut on wheel carrier and remove together with contour disk (2d), washer (2f) and hex. head screw.

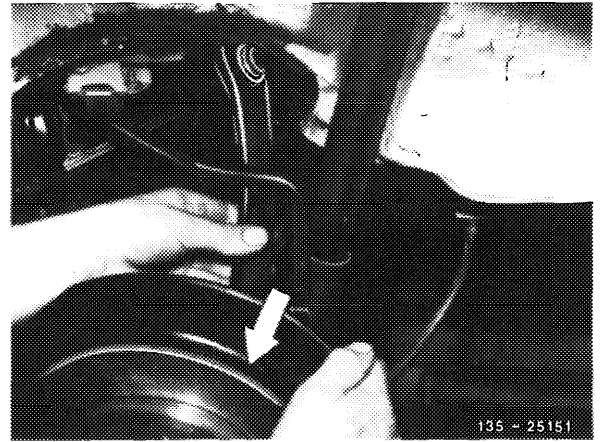


3 Force clamping sleeve of camber strut out of wheel carrier.



4 Force camber strut at rear axle carrier bearing out in upward direction while pulling wheel carrier slightly in outward direction and remove camber strut in downward direction.

Note.: If rubber mounts are damaged, renew complete camber strut.



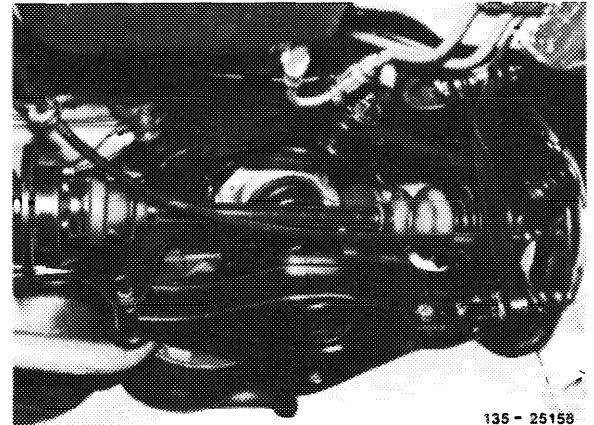
### Installation

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5 Install in vice versa sequence. Pay attention to the following items:

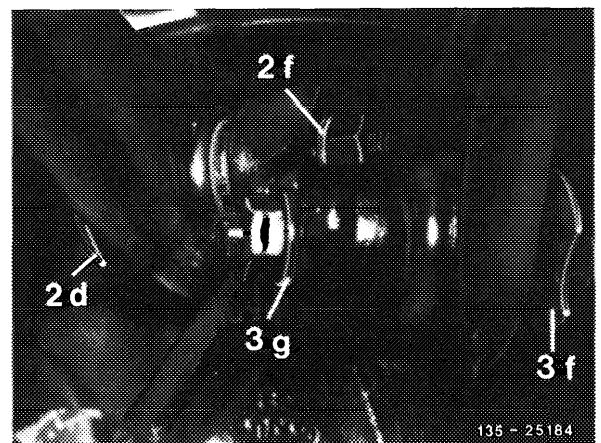
a) The tightening torque of self-locking hex. nut is 70 Nm on rear axle carrier and 45 Nm on wheel carrier.

b) Rear axle shaft must be horizontal prior to tightening self-locking hex. nut.

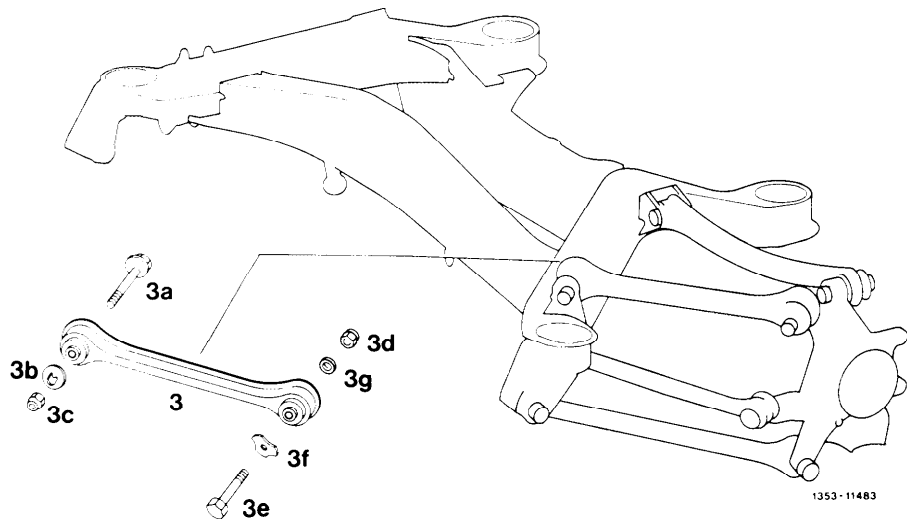


c) Remove self-locking hex. nut on principle.

d) Mount contour disk (2d) at rubber mount end and washer (2f) at wheel carrier end.

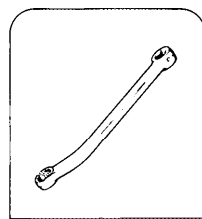
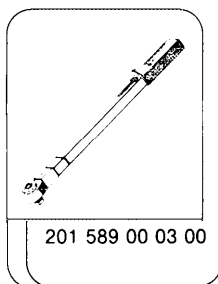


## 35-I 11 Removal and installation of pulling strut



3	Pulling strut	.....	Check pulling strut and rubber mount for damage
3a	Eccentric screw		
3b	Eccentric disk		
3c	Self-locking hex. nut	.....	Renew, tightening torque 70 Nm with rear axle removed or 50 Nm with rear axle installed and use of special tool: Special box end wrench 201 589 00 03 00
3d	Self-locking hex. nut	.....	Renew, tightening torque 40 Nm
3e	Hex. head screw		
3f	Contour disk		
3g	Washer		

### Special tools



## Note

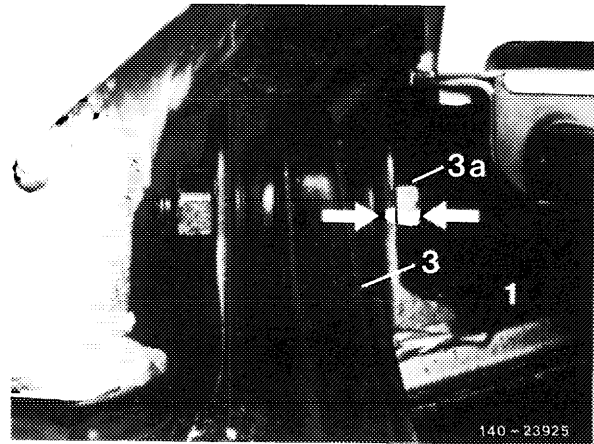
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Rubber mounts of pulling strut cannot be individually exchanged. Pulling strut is available only with rubber mount as spare part. Removal and installation with rear axle installed is possible.

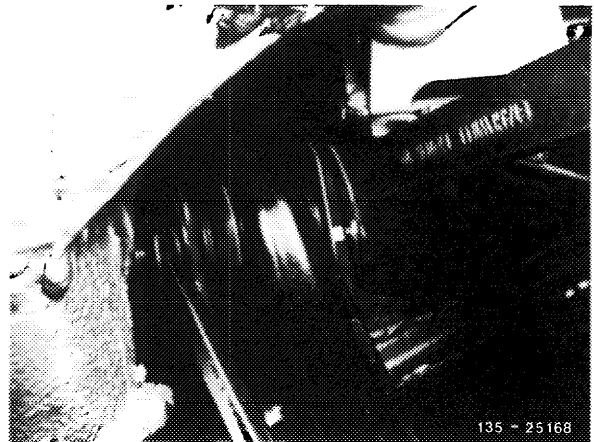
## Removal

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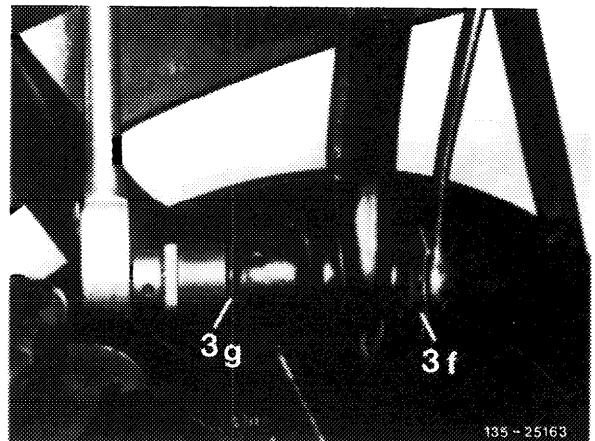
1 Mark position of eccentric screw in relation to rear axle carrier (arrows).



2 Unscrew self-locking hex. nut and remove together with cam disk and eccentric screw. Prior to pulling out eccentric screw, push wheel carrier in forward direction — slacken.

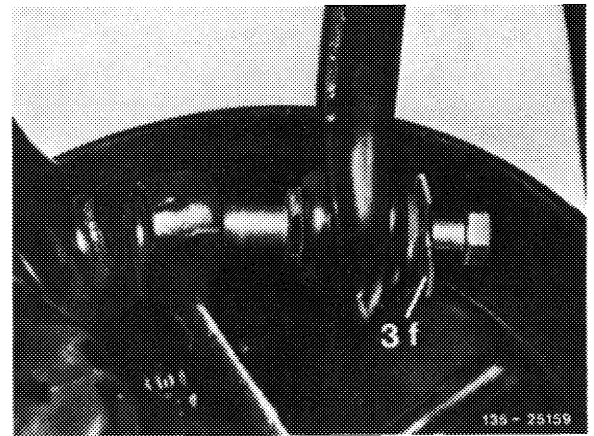


3 Unscrew self-locking hex. nut and remove with washer (3g).



4 Force clamping sleeve of pulling strut out of wheel carrier and remove together with contour disk (3f) and hex. head screw.

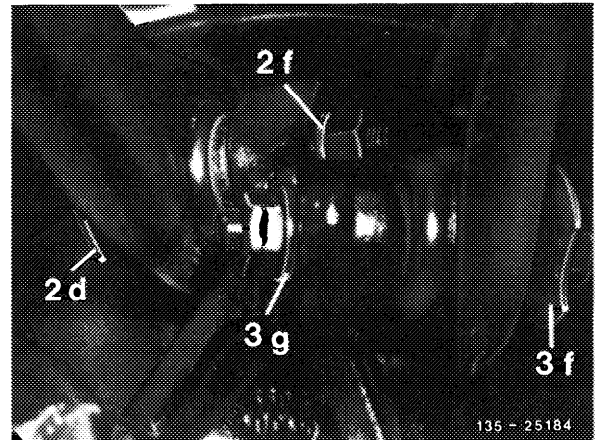
**Note.:** If rubber mounts are damaged, renew complete pulling strut.



### Installation

5 Install in vice versa sequence. Pay attention to the following items:

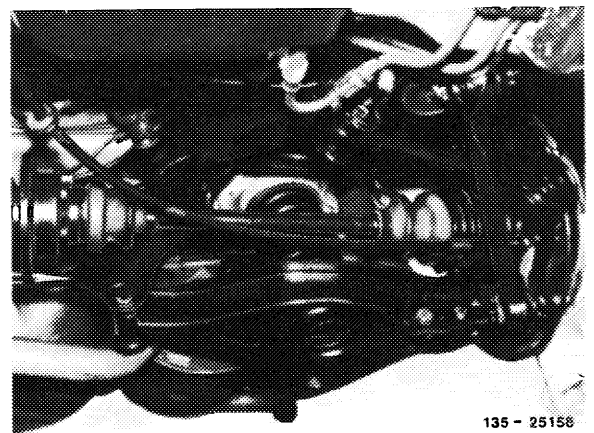
a) Mount contour disk (3f) on rubber mount end and washer (3g) on wheel carrier end.



b) Mount eccentric screw in position as marked.

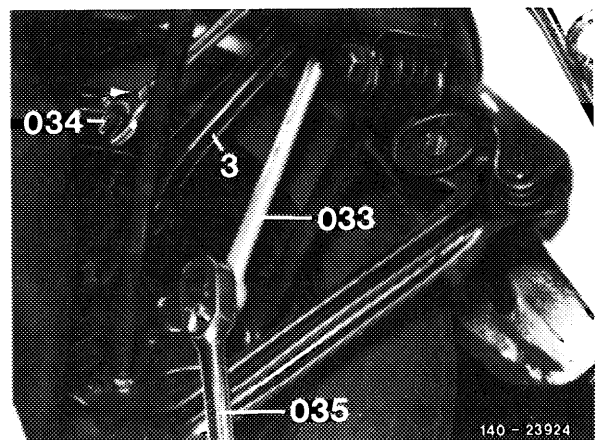
c) Rear axle shaft must be horizontal prior to tightening self-locking hex. nut.

d) Renew self-locking hex. nuts on principle.

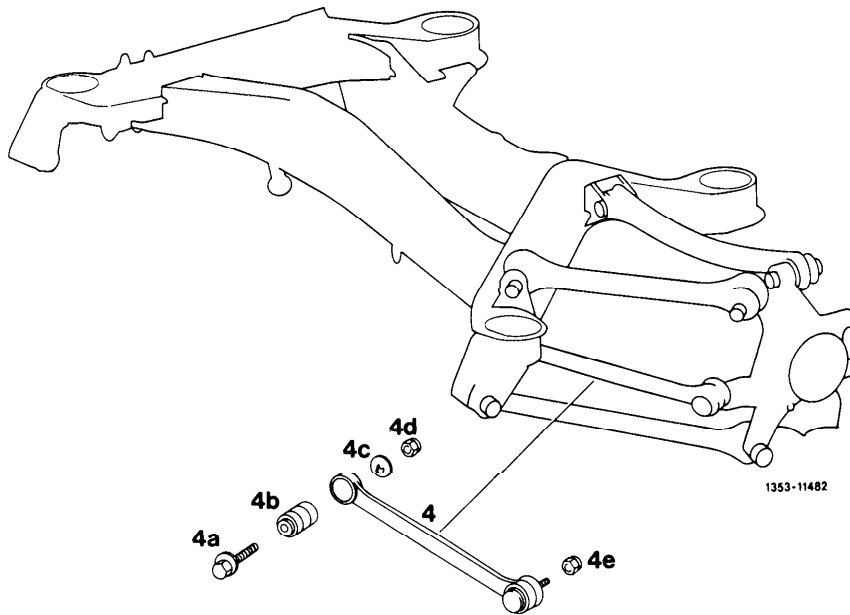


e) Tightening torque of self-locking hex. nut is 70 Nm on rear axle carrier with rear axle removed or 50 Nm with rear axle installed by means of special box-end wrench (033) offset by 19 mm, and 45 Nm on wheel carrier.

f) Check tilt of wheel carrier and toe-in of rear axle and adjust, if required (40-330).

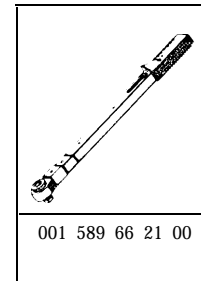
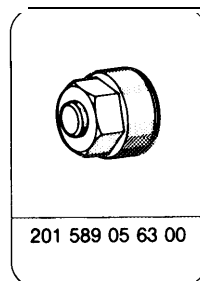
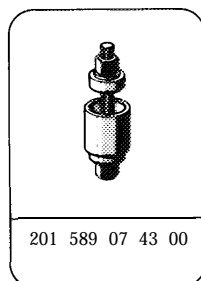
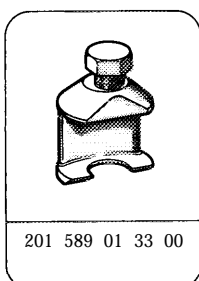


## 35-I 12 Removal and installation of track rod, renewing rubber mounts



<p>4 Track rod .....</p> <p>4a Eccentric screw. ....</p> <p>4b Rubber mount .....</p> <p>4c Eccentric disk</p> <p>4d Self-locking hex. nut .....</p> <p>4e Self-locking hex, nut .....</p>	<p>Check ball head for play. Special tool: Puller 201 589 01 33 00 with thrust piece 201 589 05 63 00</p> <p>Check for damage. Special tool: Remover and installer 201 589 07 43 00</p> <p>Renew, tightening torque 70 Nm</p> <p>Renew, tightening torque 35 Nm</p>
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### Special tools

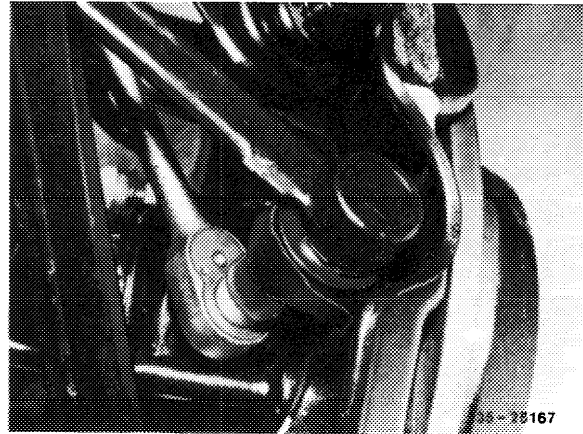




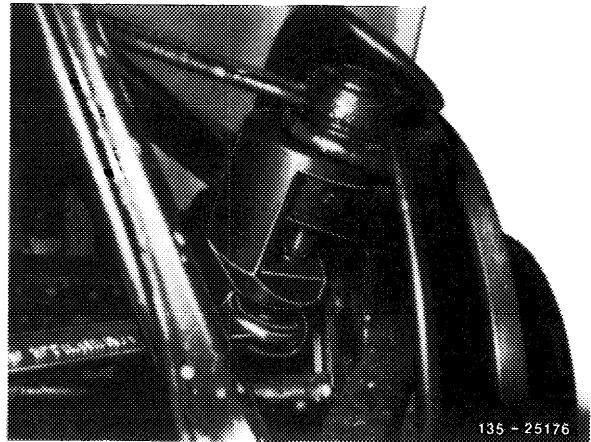
## Removal

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1 Unscrew self-locking hex. nut of track rod on wheel carrier and remove.

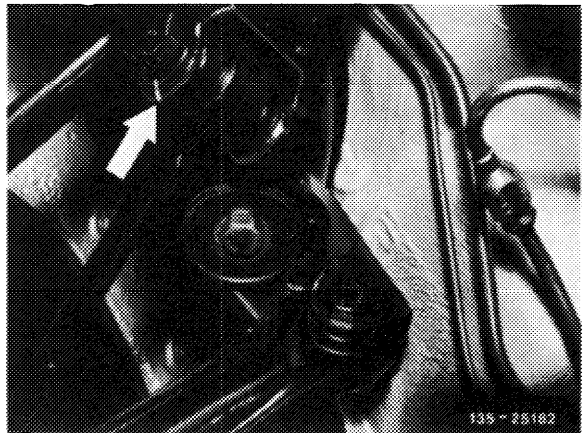


2 Force track rod from wheel carrier by means of puller, using thrust piece, so that the threads on ball pin are not damaged.



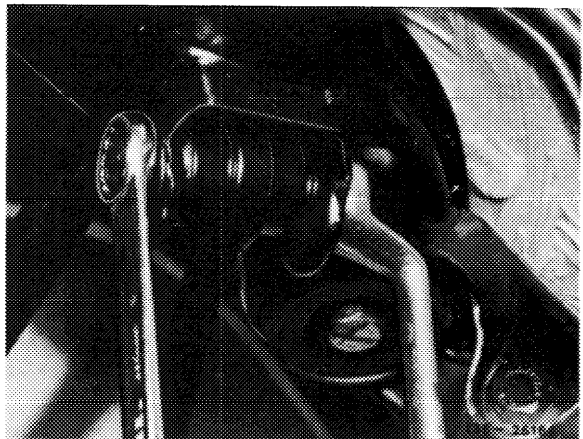
3 Remove puller.

4 Mark position of eccentric screw in relation to rear axle carrier (arrow).



5 Unscrew self-locking hex. nut and remove complete with cam disk, eccentric screw and track rod.

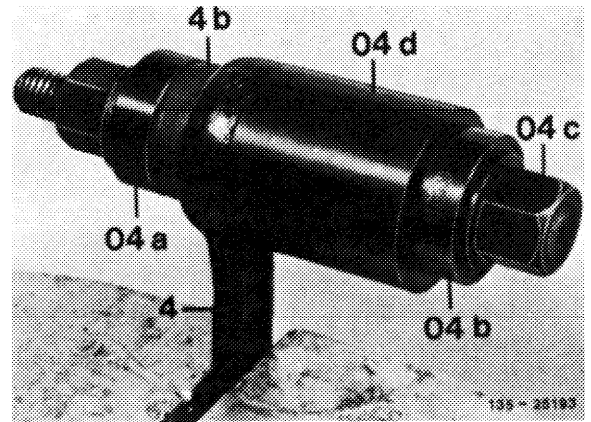
**Note:** Renew damaged rubber mounts and renew track rod if rubber sleeve is damaged or ball joint is worn out.



## Renewing rubber mounts

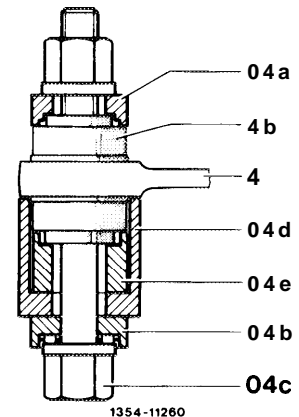
6 Pull rubber mount (4b) out of track rod (4) with puller (04a–04d).

- 4 Track rod
- 4b Rubber mount
- 04a Thrust ring
- 04b Thrust washer with axial needle bearing
- 04c Hex. head screw with hex. nut
- 04d Sleeve



7 Insert rubber mount with installer into track rod until it rests against spacing member (04e).

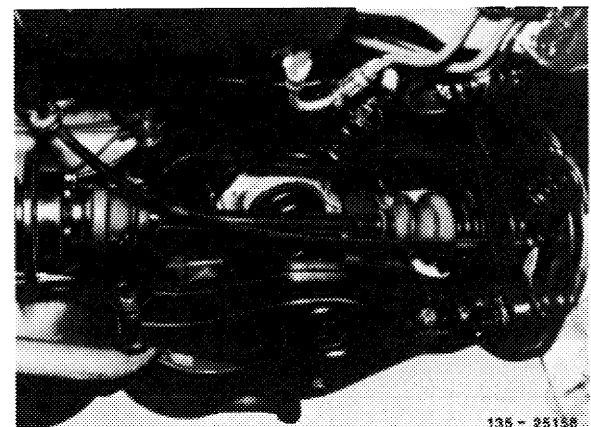
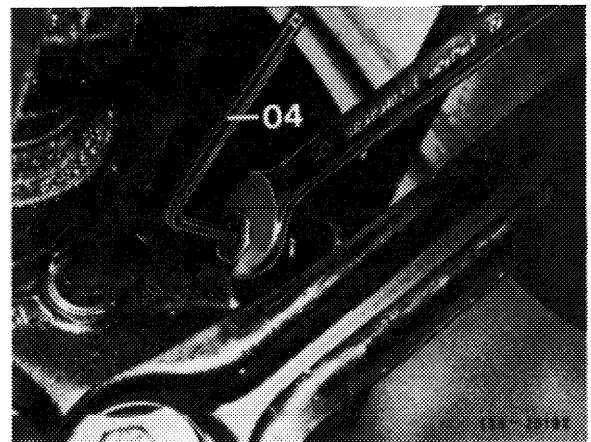
- 4 Track rod
- 4b Rubber mount
- 04a Thrust ring
- 04c Hex. head screw with hex. nut
- 04d Sleeve
- 04e Spacing member

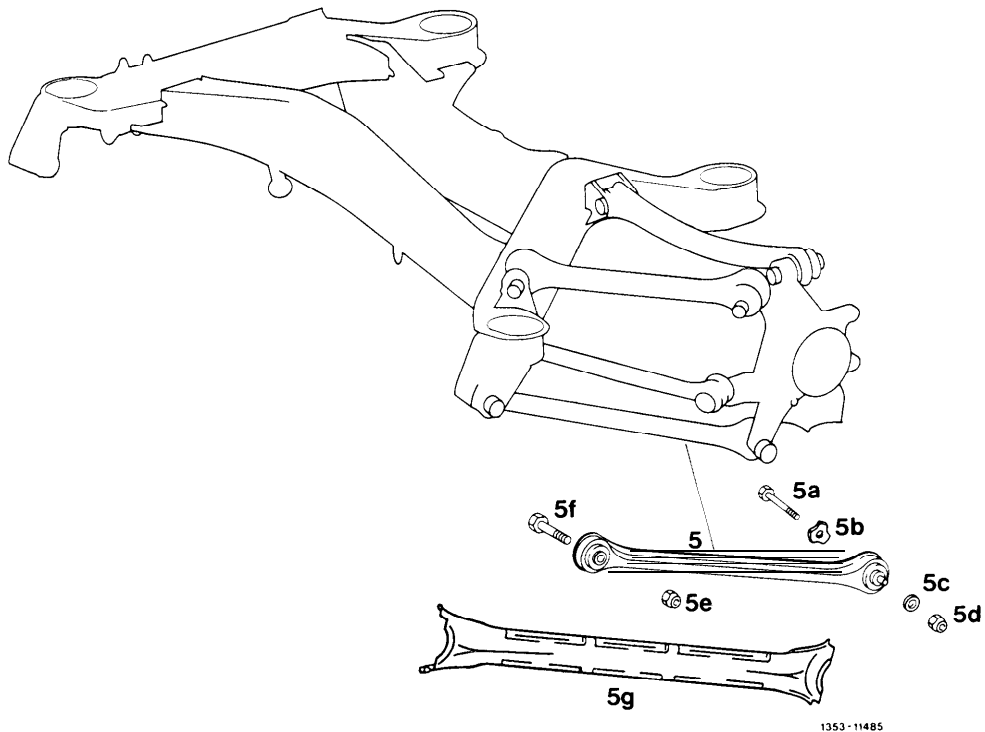


## Installation

8 Install in vice versa sequence. Pay attention to the following items:

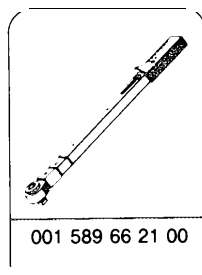
- a) Mount eccentric screw in position as marked.
- b) Clean ball pin as well as conical seat in wheel carrier from grease. Push ball pin tightly into cone of wheel carrier, screw on self-locking hex. nut while applying counterhold to ball pin with hex. socket wrench (04). Tightening torque 35 Nm.
- c) Prior to tightening self-locking hex. nut on rear axle carrier, the rear axle shaft should be in horizontal position. Tightening torque is 70 Nm.
- d) Renew self-locking hex. nuts on principle,
- e) Check toe-in of rear axle and adjust, if required (40-330).





5	Pushing strut. ....	Check pushing strut and rubber mount for damage
5a	Hex. head screw	
5b	Contour disk	
5c	Washer	
5d	Self-locking hex. nut .....	Renew, tightening torque 45 Nm
5e	Self-locking hex. nut .....	Renew, tightening torque 70 Nm
5f	Hex. head screw	
5g	Pushing strut covering. ....	Check for damage

Special tool



## Note

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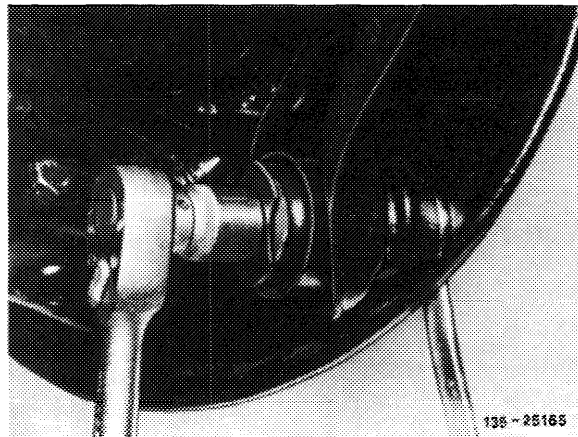
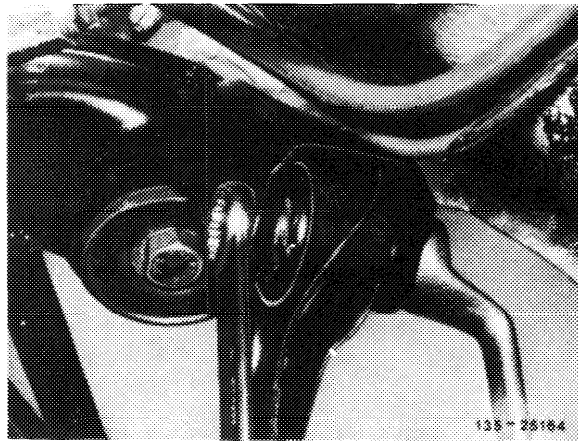
Rubber mounts of pushing strut cannot be individually exchanged. Pushing strut is available only with rubber mount as a spare part. Removal and installation with rear axle installed is possible.

## Removal

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- 1 Remove pushing strut cover.
- 2 Loosen self-locking hex. nut of pushing strut on rear axle carrier and remove with hex. head screw.
- 3 Unscrew self-locking hex. nut on wheel carrier and remove with washer, hex. head screw and contour disk.
- 4 Turn pushing strut on rear axle carrier in downward direction, then force clamping sleeve out of wheel carrier and remove.

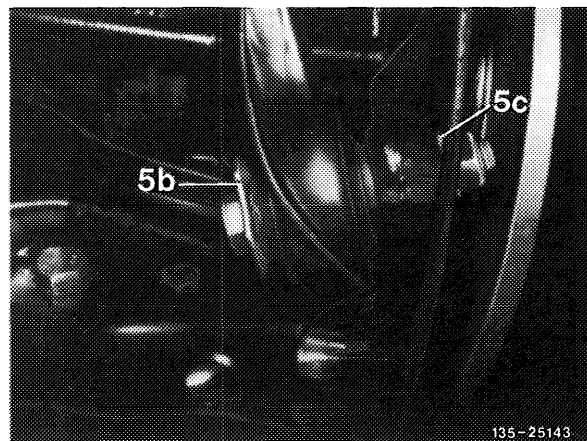
**Note.:** Renew pushing strut if rubber mounts are damaged.

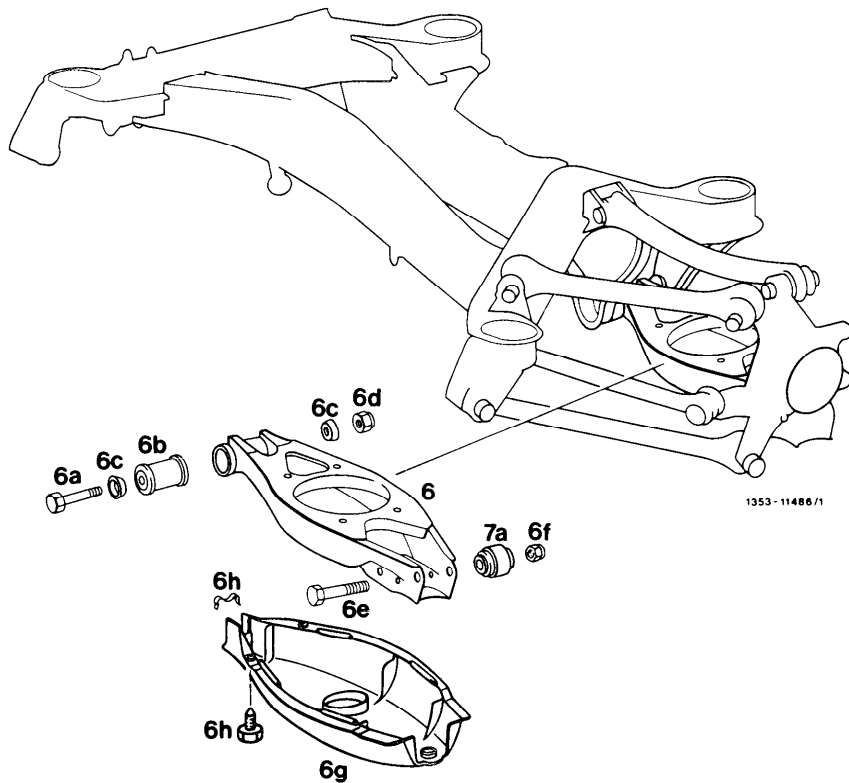


## Installation

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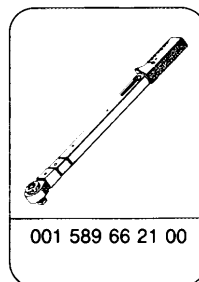
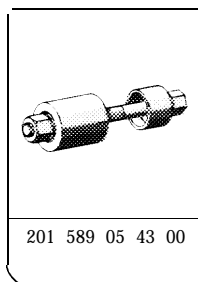
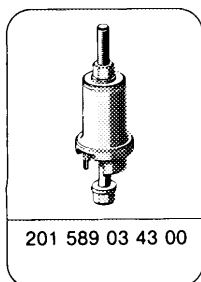
- 5 Install in vice versa sequence, pay attention to the following items:
  - a) Mount contour disk (5b) on rubber mount end and washer (5c) at wheel carrier end.
  - b) Rear axle shaft must be horizontal prior to tightening self-locking hex. nuts.
  - c) Renew self-locking hex. nuts on principle,
  - d) The tightening torque of self-locking hex. nuts on rear axle carrier amounts to 70 Nm and on wheel carrier to 45 Nm.





- 6 Spring link ..... Check for damage
- 6a Hex. head screw
- 6b Rubber mount ..... Check for damage, prior to pressing-in, coat with slide fluid (Naphtolen H or Fahr slide paste 000 989 08 60), special tool: Remover and installer 201 589 03 43 00
- 6c Washer
- 6d Self-locking hex. nut ..... Renew, tightening torque 70 Nm
- 6e Hex. head screw
- 6f Self-locking hex. nut ..... Renew, tightening torque 120 Nm
- 6g Spring link covering ..... Check for damage
- 6h Holding clip or sheet metal screw
- 7a Supporting joint ..... Check for damage, special tool: Remover and installer 201 589 05 43 00

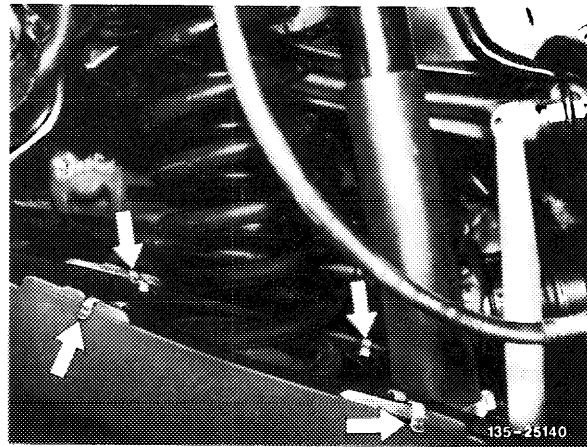
**Special tools**



## Removal

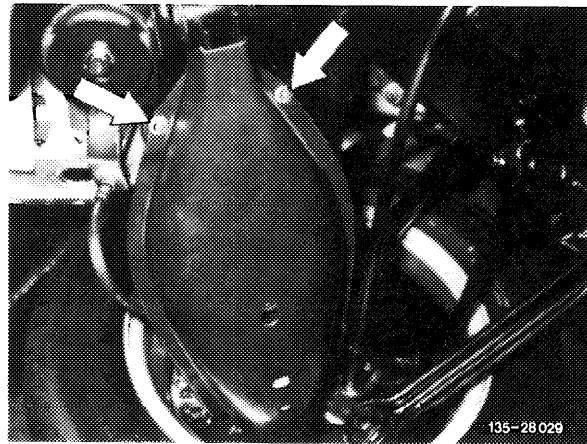
1 On 1 st version, remove holding clips and remove spring link covering (arrows).

1 st version



2 On 2nd version, unscrew sheet metal screws and remove spring link covering (arrows).

2nd version

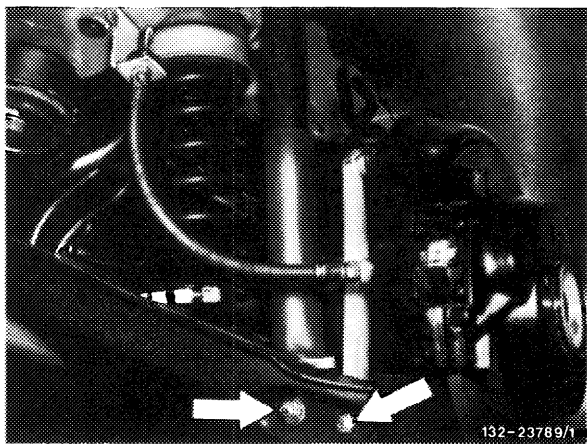


3 Unscrew self-locking hex. nut of shock absorber fastening and remove with washer (arrow).

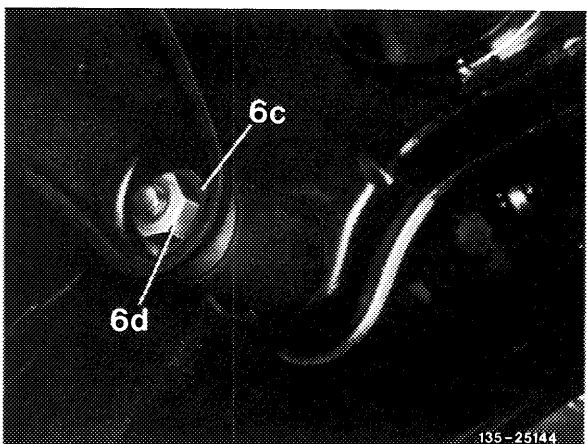
4 Slightly lift spring link and pull out hex. head screw.

5 Unscrew lower torsion bar fastening on spring link and remove (arrow).

6 Remove rear spring (32-230).

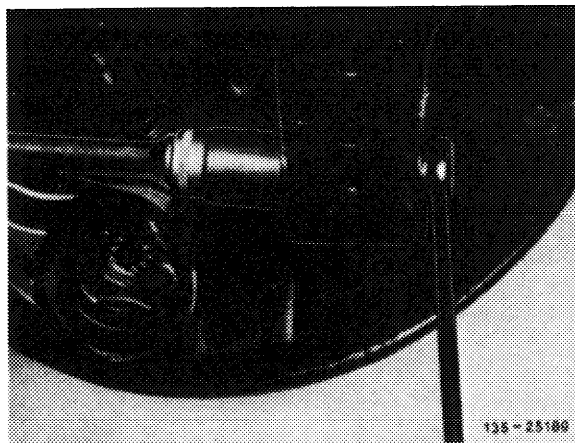


7 Unscrew self-locking hex. nut (6d) of spring link on rear axle carrier and remove with washers (6c) and hex. head screw.



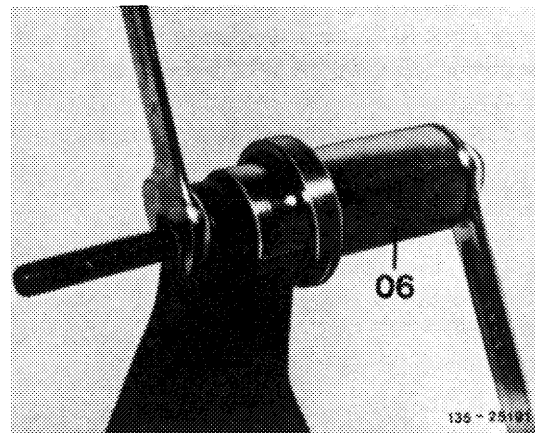
8 Unscrew self-locking hex. nut of spring link on wheel carrier and remove with hex. head screw.

9 Remove spring link.



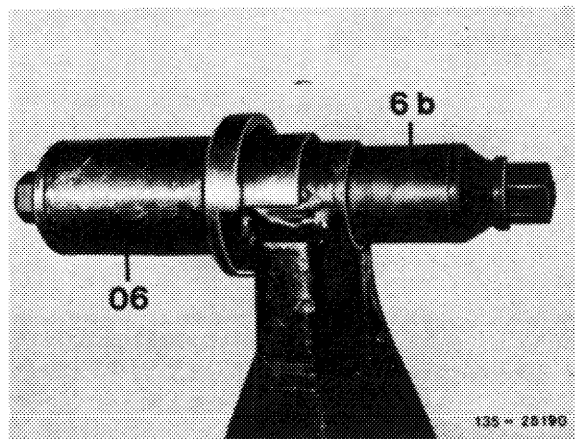
#### Renewing rubber mount

10 Pull rubber mount out of spring link by means of puller (06).



11 Rub rubber mount with slide fluid.

12 Install rubber mount(6b) by means of installer (06) into spring link until both ends are at the same distance from spring link bushing.

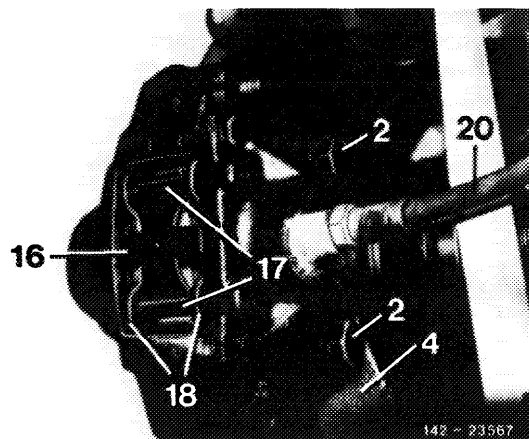


#### Removing and installing supporting joint on wheel carrier

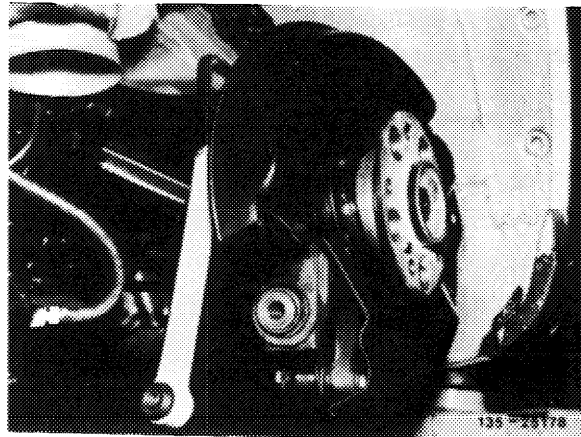
13 Remove brake caliper on wheel carrier and suspend by means of a hook.

14 Remove brake disk.

15 Remove brake shoes of parking brake(42-530).

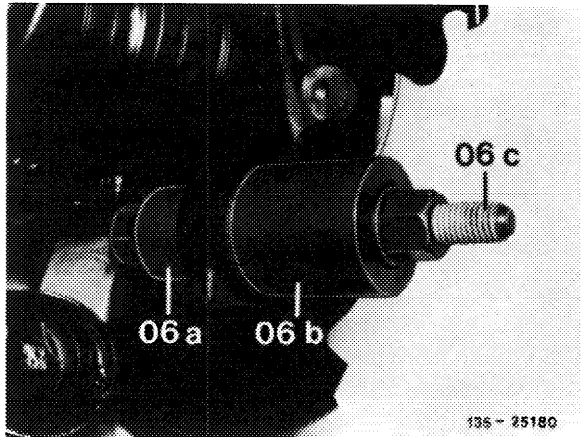


16 Unscrew hex. head screws for fastening cover plate and turn cover plate in such a manner that the cutout rests against supporting joint.



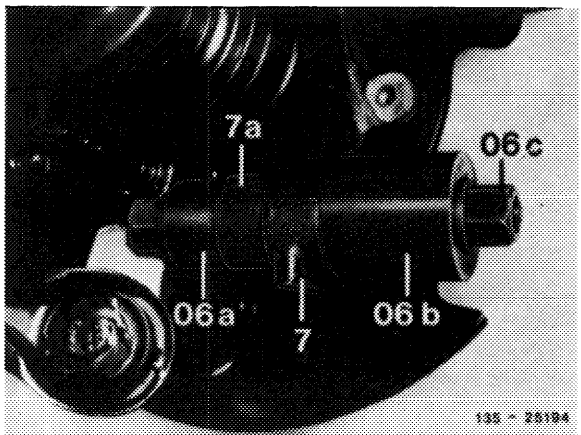
17 Pull supporting joint with remover, comprising thrust piece (06a), counterhold bushing (06b) and tensioning screw (06c) from wheel carrier.

18 Take away remover with supporting joint.



19 Insert supporting joint (7a) with installer (06a–06c) into wheel carrier.

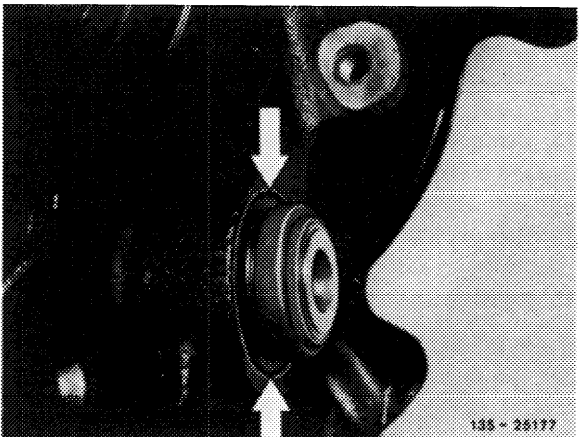
06a Thrust piece  
 06b Counterholding bushing  
 06c Tensioning screw with hex. nut  
 7 Wheel carrier  
 7a Supporting joint



**Attention!**

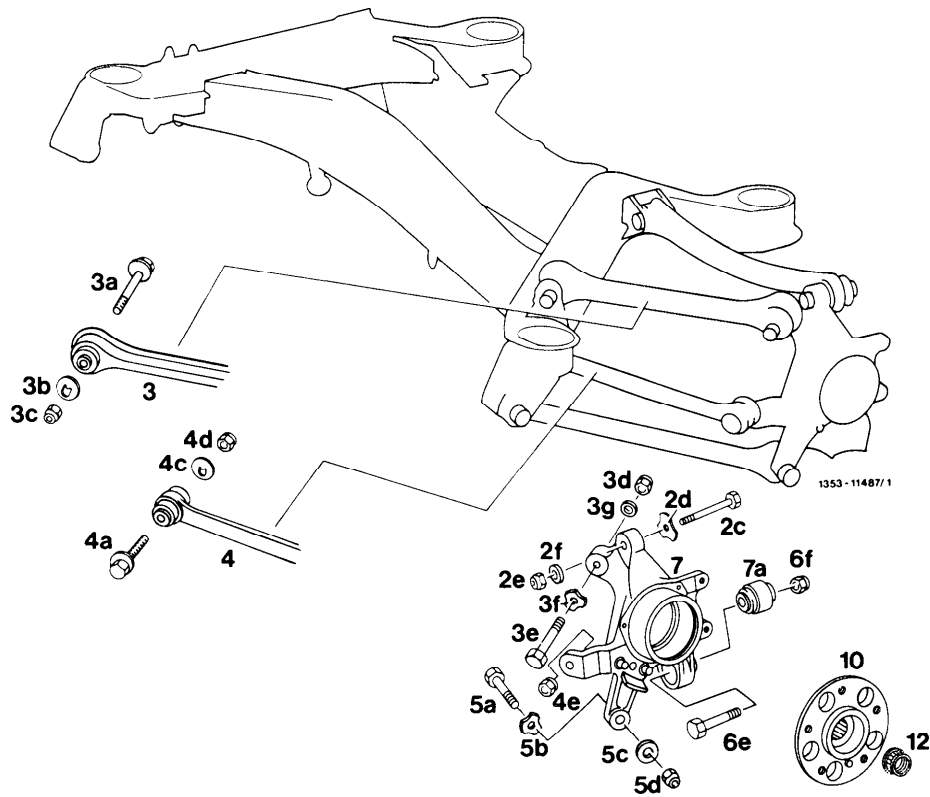
The supporting joint is correctly seated in wheel carrier when the supporting joint is flush with chamfer on wheel carrier (arrows).

20 Fasten cover plate to wheel carrier by means of hex. head screws.





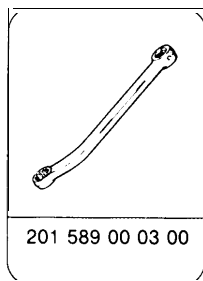
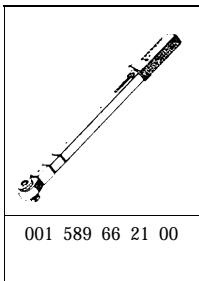
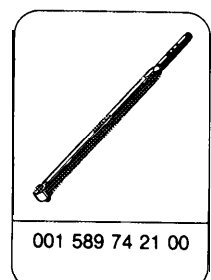
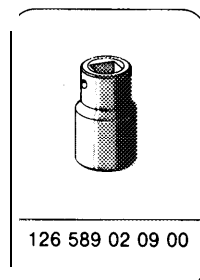
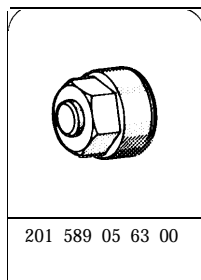
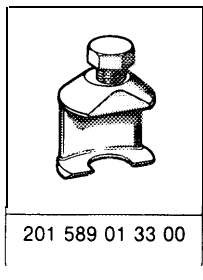
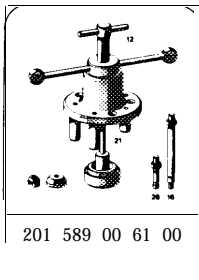
## 35-I 15 Removal and installation of wheel carrier



2c	Hex. head screw — fastening of camber strut	
2d	Contour disk	
2e	Self-locking hex. nut	Renew, tightening torque 40 Nm
2f	Washer	
3	Pulling strut	
3a	Eccentric screw	
3b	Eccentric disk	
3c	Self-locking hex. nut	Renew, tightening torque with rear axle removed 70 Nm or 50 Nm with rear axle installed and use of special tool: Special box end wrench 201 589 00 03 00
3d	Self-locking hex. nut	Renew, tightening torque 40 Nm
3e	Hex. head screw—fastening of pulling strut	
3f	Contour disk	
3g	Washer	
4	Track rod	Check ball head for play. Special tool: Puller 201 589 01 33 00 and thrust piece 201 589 05 63 00
4a	Eccentric screw	
4c	Eccentric disk	
4d	Self-locking hex. nut	Renew, tightening torque 70 Nm
4e	Self-locking hex. nut — fastening of track rod	Renew, tightening torque 35 Nm
5a	Hex. head screw — fastening of pushing strut	
5b	Contour disk	
5c	Washer	
5d	Self-locking hex. nut	Renew, tightening torque 40 Nm

- 6e Hex. head screw
- 6f Self-locking hex. nut ..... Renew, tightening torque 120 Nm
- 7 Wheel carrier. .... Check for damage
- 7a Supporting joint ..... Check for damage, insert supporting joint flush with wheel carrier
- 12 Double hex. collar nut ..... Renew, tightening torque 280-320 Nm, special tool:  
Socket wrench element 30 mm 126 589 02 09 00 and  
remover and installer 201 589 00 61 00

**Special tools**



**Note**

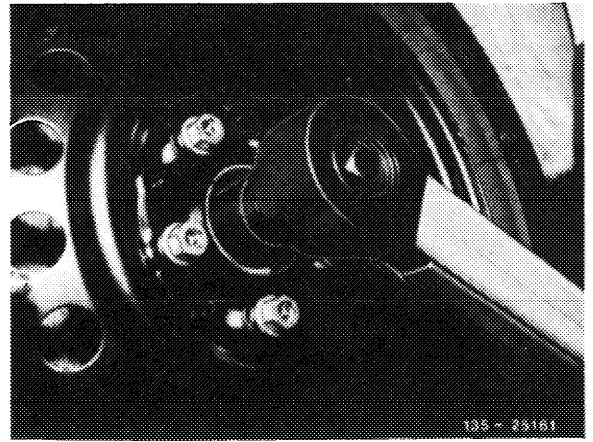
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Removal and installation of complete wheel carrier with rear axle installed is possible.

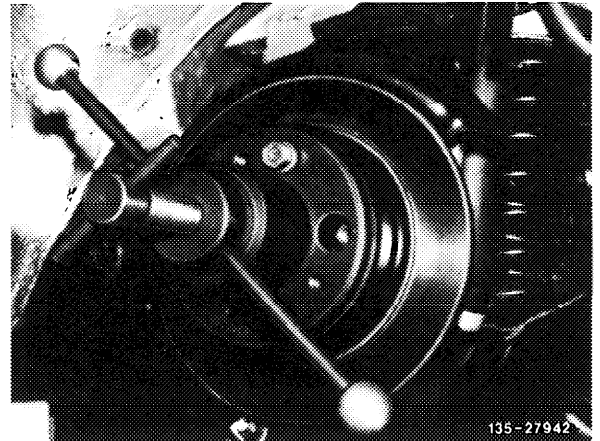
## Removal

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1 Unscrew double hex. collar nut for fastening rear axle shaft prior to lifting vehicle and removing wheel.

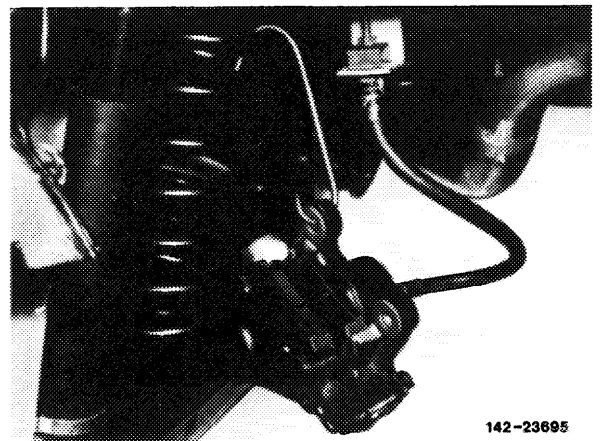


2 Force stuck rear axle shafts out of rear axle shaft flange by means of remover.



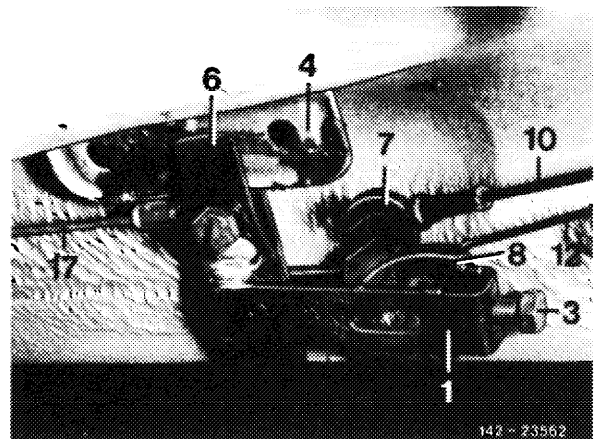
3 Remove brake caliper and suspend by means of a hook.

4 Remove brake disk.



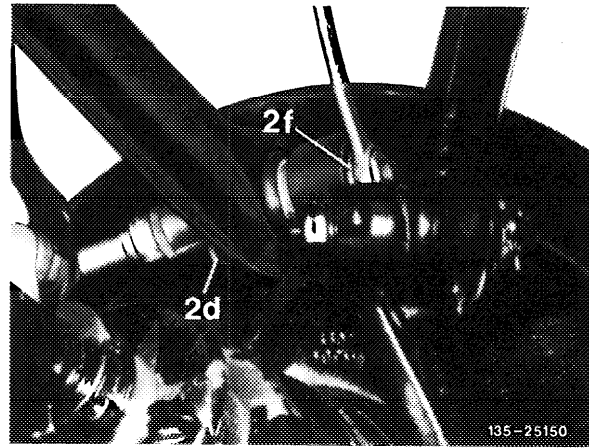
5 Remove intermediate lever of parking brake and disengage cable control (10) (42-525).

6 Pull out lock on hand brake cable.



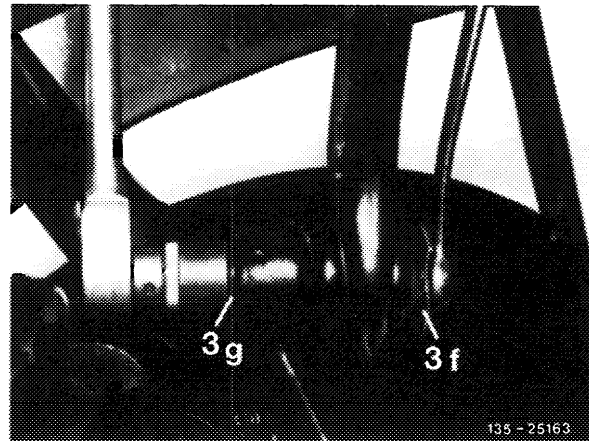
7 Unscrew self-locking hex. nut of camber strut on wheel carrier. Remove washer (2f), contour disk (2d) and hex. head screw.

8 Force clamping sleeve of rubber mount out of wheel carrier.



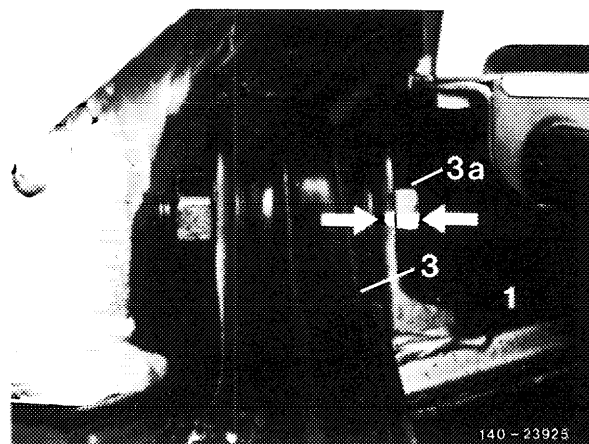
9 Unscrew self-locking hex. nut of pulling strut on wheel carrier and remove washer (3g), contour disk (3f) and hex. head screw.

10 Force clamping sleeve of rubber mount out of wheel carrier.



11 Mark position of eccentric screw of pulling strut in relation to rear axle carrier (arrows).

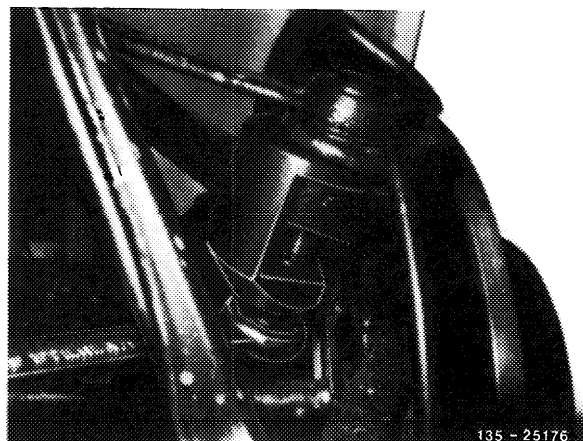
12 Unscrew self-locking hex. nut of pulling strut on rear axle carrier and remove together with cam disk and eccentric screw.



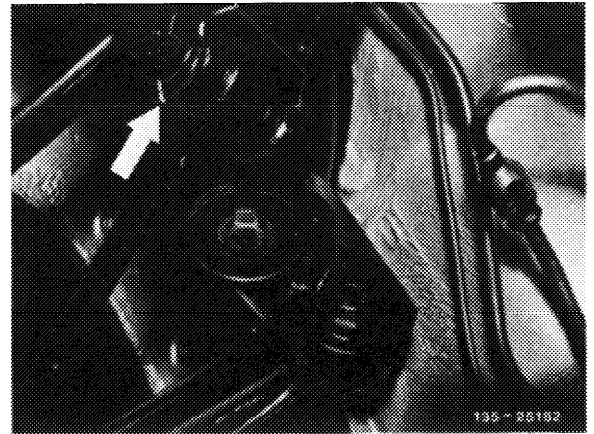
13 Unscrew self-locking hex. nut of track rod on wheel carrier and remove.

14 Force track rod from wheel carrier by means of puller, while using thrust piece, so that threads on ball pin are not damaged.

15 Remove puller and thrust piece.

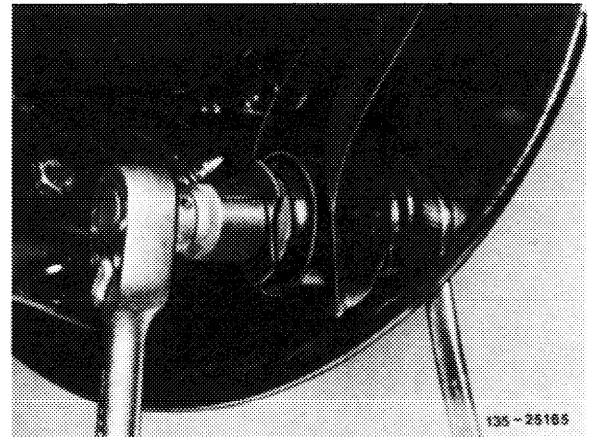


16 Mark position of eccentric screw of track rod in relation to rear axle carrier (arrow).



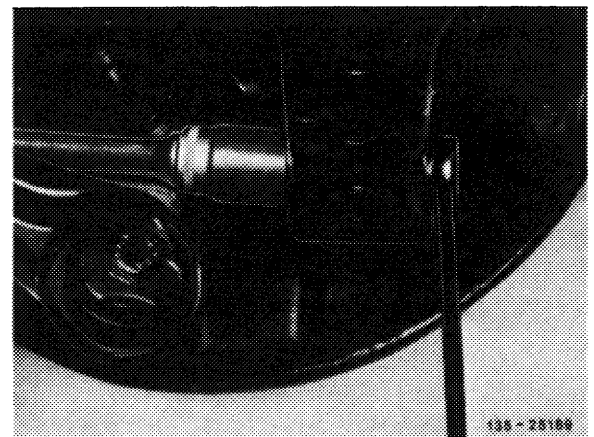
17 Unscrew self-locking hex. nut and completely remove.

18 Unscrew self-locking hex. nut of pushing strut on wheel carrier and remove together with washer, contour disk and hex. screw.

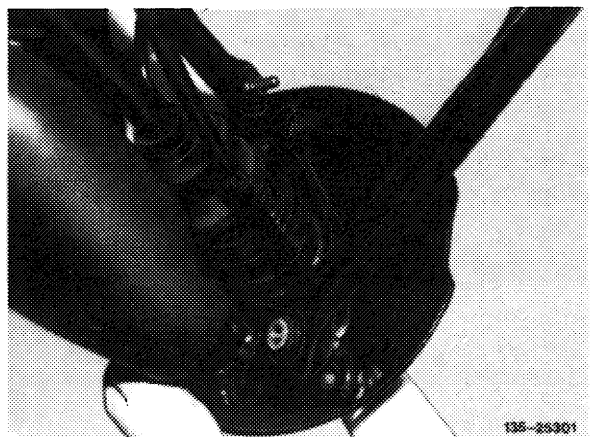


19 Force clamping sleeve out of wheel carrier.

20 Unscrew self-locking hex. nut on spring link and remove together with hex. screw.



21 Pull complete wheel carrier from rear axle shaft and remove.

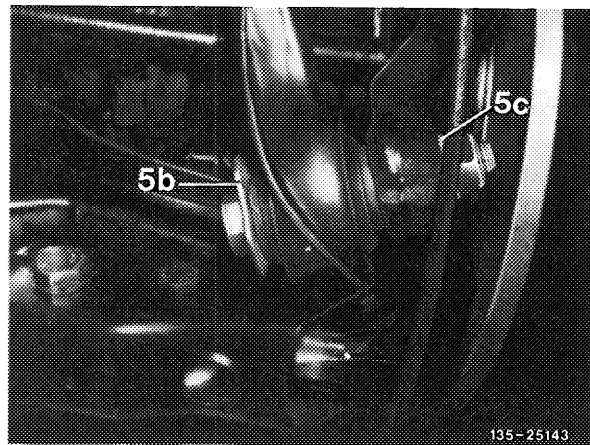


## Installation

22 For installation proceed vice versa. Pay attention to the following items:

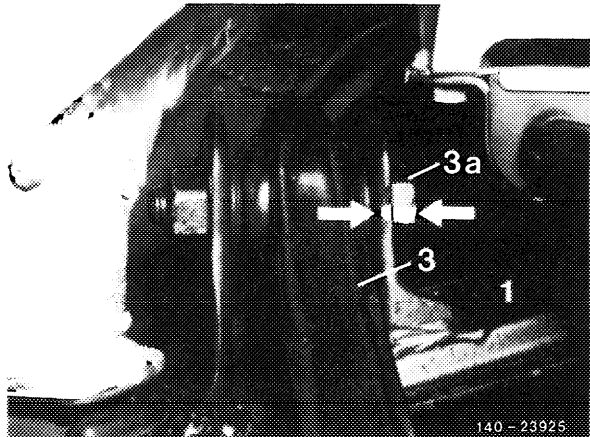
a) Mount contour disk (5b) on rubber mount end and washer (5c) on wheel carrier end.

Fastening pushing strut to wheel carrier



b) Pay attention to position of eccentric screw of pulling strut and of track rod.

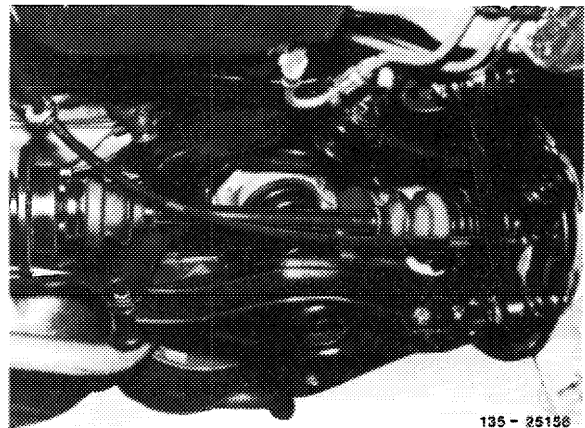
**Note:** If position of eccentric screw of pulling strut is not marked, mount eccentric screw in center position.



c) Prior to tightening self-locking hex. nuts on wheel carrier or rear axle carrier, rear axle shaft should be in horizontal position.

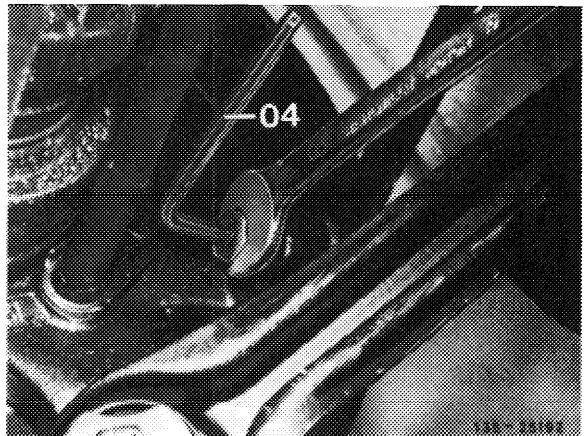
d) Renew self-locking hex. nuts on principle.

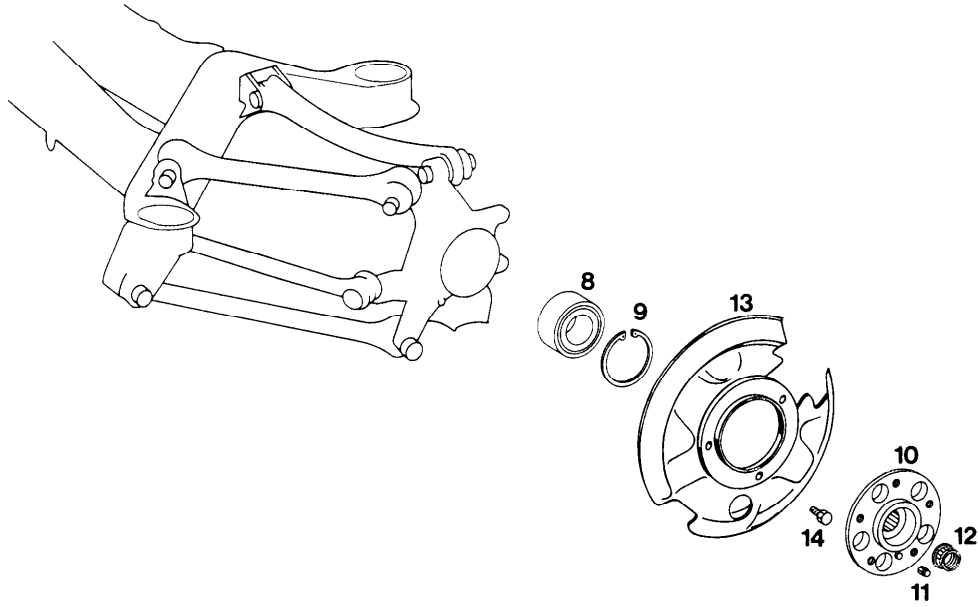
e) Pay attention to tightening torque of self-locking hex. nuts and hex. head screws, as well as double hex. collar nut.



f) Clean ball pin of track rod, as well as conical seat in wheel carrier from grease. Push ball pin tightly into cone of wheel carrier, screw on self-locking hex. nut while applying counterhold to ball pin by means of hex. socket wrench (04).

g) Check toe-in and track angle change of rear wheels, adjust, if required (40-330).

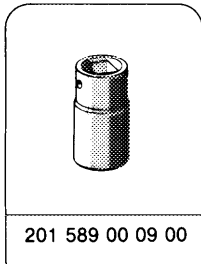




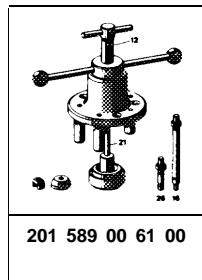
1353-11400

8	Angular ball bearing .....	Renew, special tool: Remover and installer 201 589 04 43 00
9	Locking ring .....	Pay attention to perfect seat, special tool: Pliers 1 2 6 5 8 9 0 0 3 7 0 0
10	Rear axle shaft flange .....	Check for damage, radial runout installed: 0.12 mm, removed: 0.02 mm, axial runout installed: 0.12 mm, pilot bore (dia.) for brake disk 67.00 mm — 66.97 mm, double row angular ball bearing dia 45.020 mm — 45.011 mm Special tool: Remover and installer 201 589 04 43 00, remover and installer 201 589 00 61 00, puller 001 589 36 33 00, collet, 201 589 00 34 00, thrust piece 0 0 0 5 8 9 0 3 3 4 0 0
11	Cyl. pin. ....	Check for correct seat
12	Double hex. collar nut. ....	Renew, tightening torque 280-320 Nm, special tool: Socket wrench element 30 mm 126 589 02 09 00
13	Cover plate	
14	Hex. head screw	

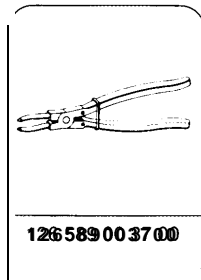
## Special tools



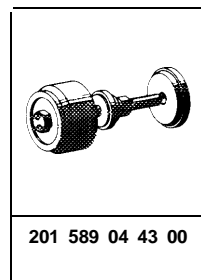
201 589 00 09 00



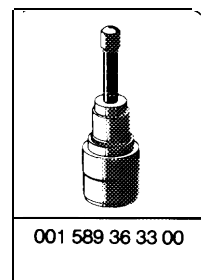
201 589 00 61 00



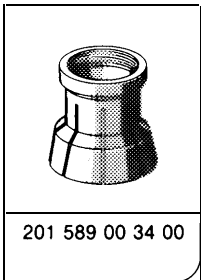
126589003700



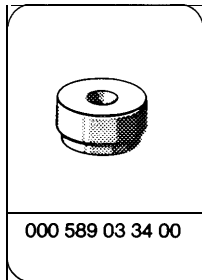
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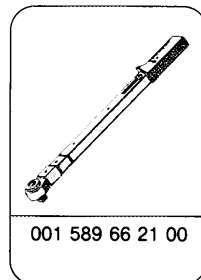
001 589 36 33 00



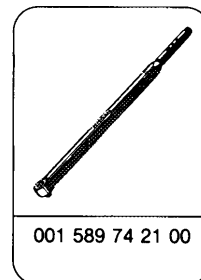
201 589 00 34 00



000 589 03 34 00



001 589 66 21 00

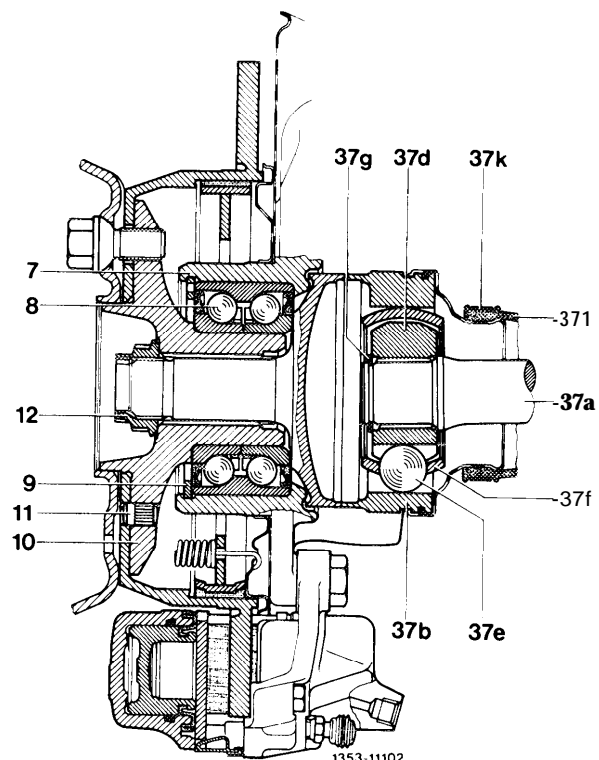


001 589 74 21 00

## Note

Jobs on bearing of rear axle shaft flange can also be performed with rear axle installed.

- 7 Wheel carrier
- 8 Double-row angular ball bearing
- 9 Locking ring
- 10 Rear axle shaft flange
- 11 Cyl. pin
- 12 Double hex. collar nut
- 37a Rear axle shaft
- 37b Universal joint ring, outer
- 37d Joint hub
- 37e Ball
- 37f Ball cage
- 37g Locking ring
- 37k Hose clamp
- 371 Rubber sleeve

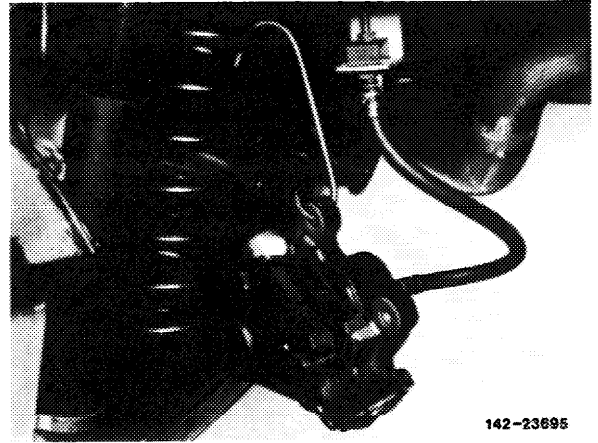


1353-11102



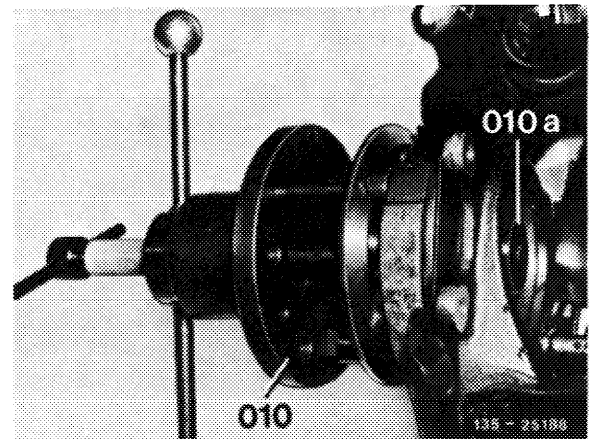
## Removal

- 1 Remove rear axle shaft (35-620).
- 2 Remove brake caliper and suspend with a hook.
- 3 Remove brake disk.

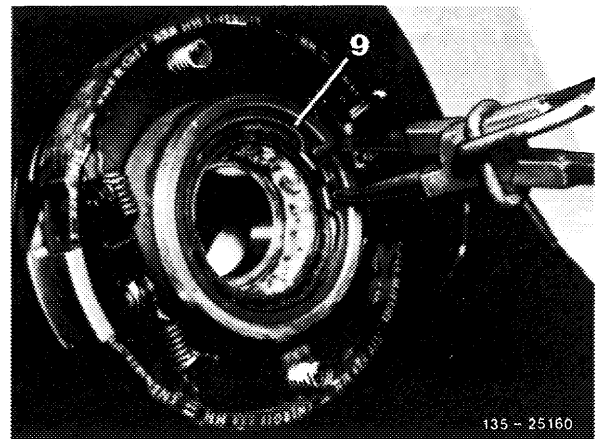


142-23695

- 4 Mount remover (010) with thrust piece (010a, 201 589 00 61 29) on rear axle shaft flange. Pull remover out of angular ball bearing and remove.



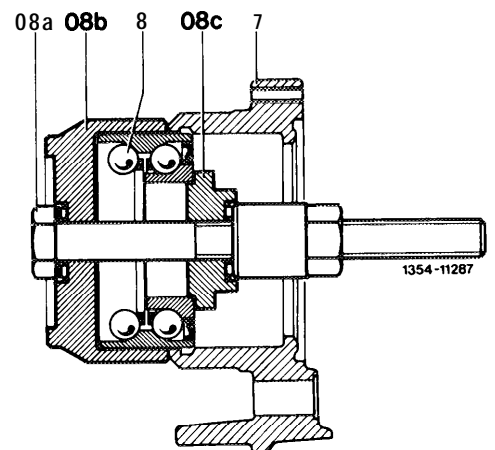
- 5 Remove locking ring (9) with pliers from wheel carrier.



135 - 25160

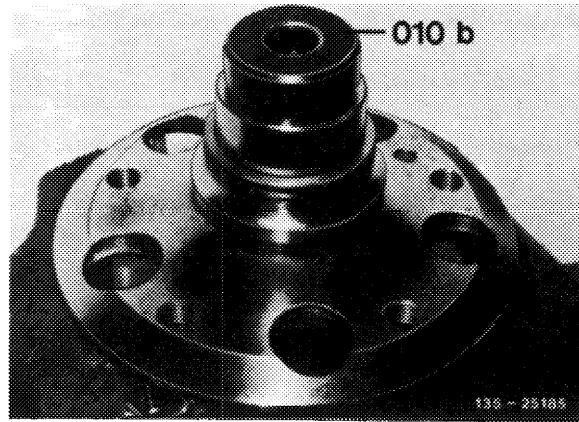
- 6 Pull double-row angular ball bearing (8) with puller (08a-08c) out of wheel carrier and remove.

- 7 Wheel carrier
- 8 Double-row angular ball bearing
- 08a Hex.head screw with collar nut
- 08b Removing and installing sleeve
- 08c Thrust washer (small)

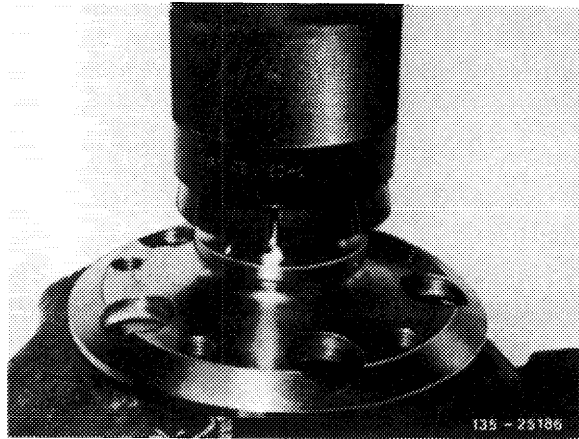


1354-11287

7 Clamp rear axle shaft flange with aluminum jaws into vise. Mount thrust piece (010b).



8 Pull bearing inner race with puller from rear axle shaft flange and remove.

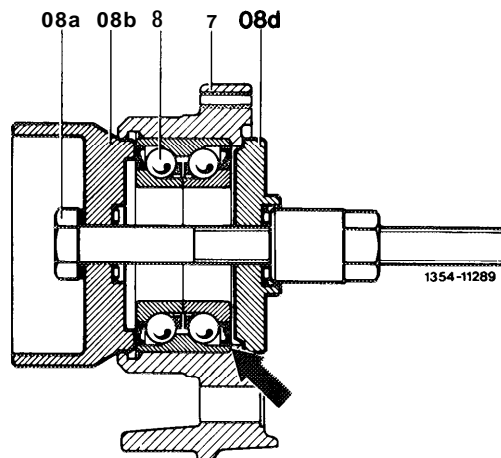


9 Check parts for re-use. Check radial and axial run-out of rear axle shaft flange. Renew double-row angular ball bearing on principle after one-time installation.

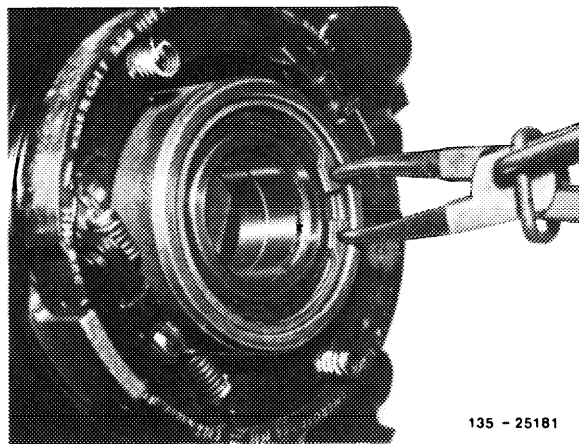
**Installation**

10 Install double-row angular ball bearing (8) with installer (08a, 08b and 08d) in wheel carrier up to stop (arrow).

- 7 Wheel carrier
- 8 Double-row angular ball bearing
- 08a Hex. head screw with collar nut
- 08b Removing and installing sleeve
- 08d Pulling disk (large)



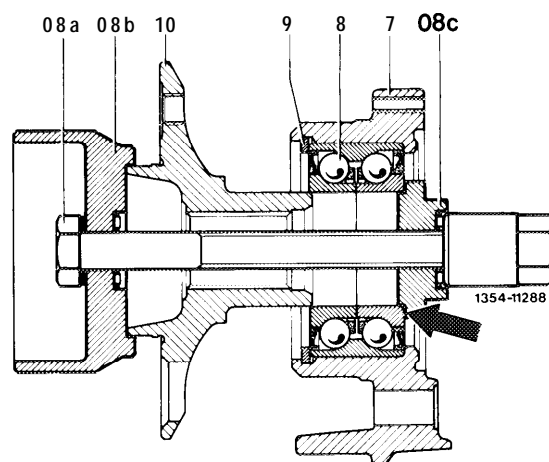
11 Insert locking ring with pliers into wheel carrier, paying attention to correct seat.



135 - 25181

12 Install rear axle shaft flange (10) with installer (08a, 08b and 08c) into double-row angular ball bearing (8). Make sure that the thrust washer (small 08c) rests well against bearing inner race during insertion (arrow).

- 7 Wheel carrier
- 8 Double-row angular ball bearing
- 9 Locking ring
- 10 Rear axle shaft flange
- 08a Hex. head screw with collar nut
- 08b Removing and installing sleeve
- 08c Thrust washer (small)

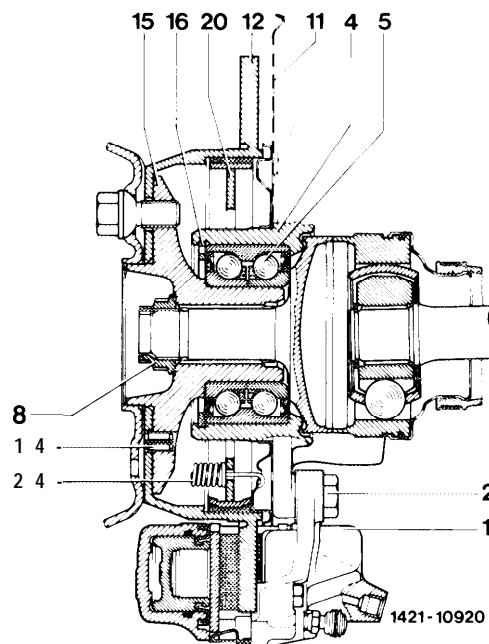


13 Place brake disk (12) on rear axle shaft flange.

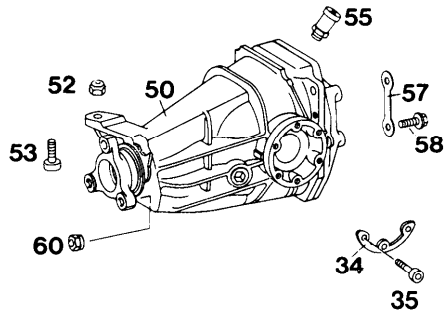
14 Mount brake caliper (1) on wheel carrier (4) (42-120).

15 Install rear axle shaft (35-620).

- 1 Brake caliper
- 2 Self-locking hex. head screw
- 4 Wheel carrier
- 5 Double-row angular ball bearing
- 8 Double hex. collar nut
- 11 Cover plate
- 12 Brake disk
- 14 Cyl. pin
- 15 Rear axle shaft flange
- 16 Locking ring
- 20 Brake shoes
- 24 Spring



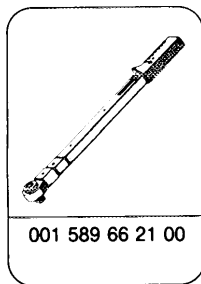
## 35-520 Removal and installation of rear axle center piece



1354 - 11491

34	Washer	
35	Locking screw	Renew, tightening torque 70 Nm, threads and screw head contact surface lubricated
50	Rear axle center piece, complete	Oil type hypoid gear oil SAE 90, filling capacity 0.7 liter
52	Self-locking hex. nut, front	Renew
53	Hex. socket screw, front	Tightening torque 45 Nm
55	Vent	Renew dirty vent
57	Locking plate	Renew
58	Locking screw, rear	Renew, tightening torque 50 Nm
60	Self-locking hex. nut for propeller shaft	Renew, tightening torque 40-50 Nm

### Special tools



### Conventional tools

Screw driver element for multi-tooth screws M 10 (XZN) 1/2" square

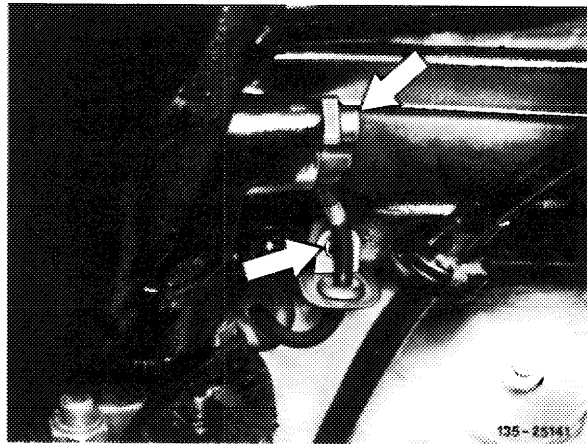
e.g. Hazet  
D-5630 Remscheid  
Order No. 990 Ig-10

## Removal

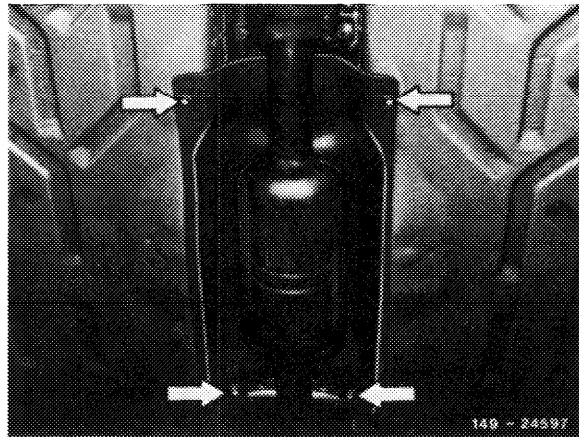
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### 1 Only on vehicles with ABS

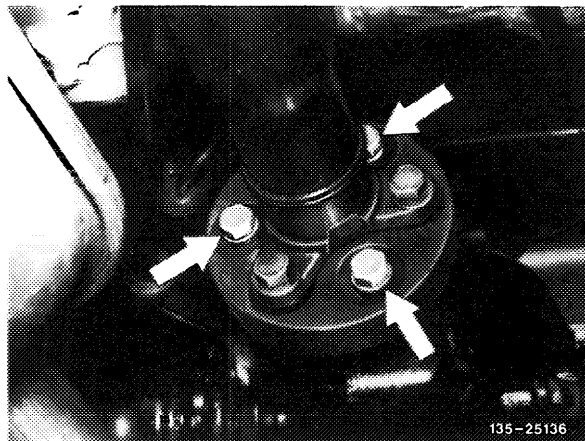
- a) Drain oil from rear axle.
- b) Loosen hex. socket screw and remove rpm sensor from rear axle housing (arrow).
- c) Cover magnetic edge of rpm sensor and protect against damage.



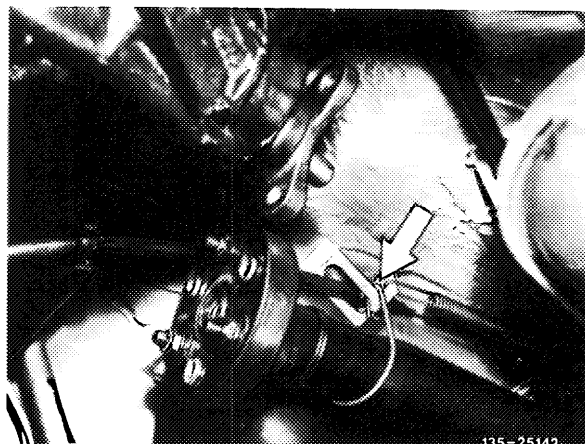
- 2 Unscrew exhaust shielding plate and remove.
- 3 Loosen clamping nut on propeller shaft.



- 4 Unscrew hex. head screws of propeller shaft intermediate bearing on frame floor and remove (arrows).
- 5 Remove propeller shaft on universal flange of drive pinion and push in forward direction.



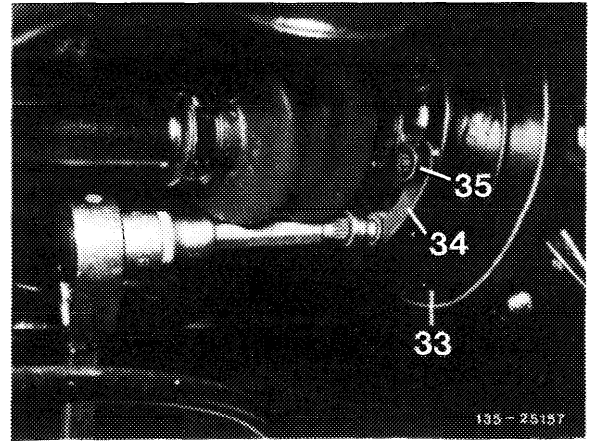
- 6 Tie propeller shaft with a wire to holder of brake cable control to protect shaft against falling down.



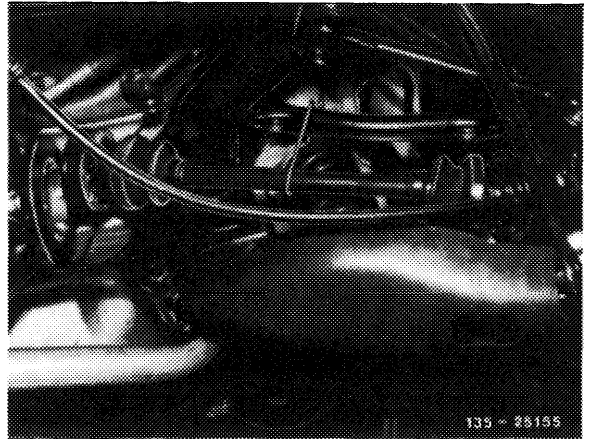
7 Remove rear axle shafts on connecting flange (33) and remove together with locking screws (35) and washers (34).

**Attention!**

**Make** sure that the screw driver element is **completely inserted in multi-tooth profile** when loosening locking screws – clean screw head, if required.

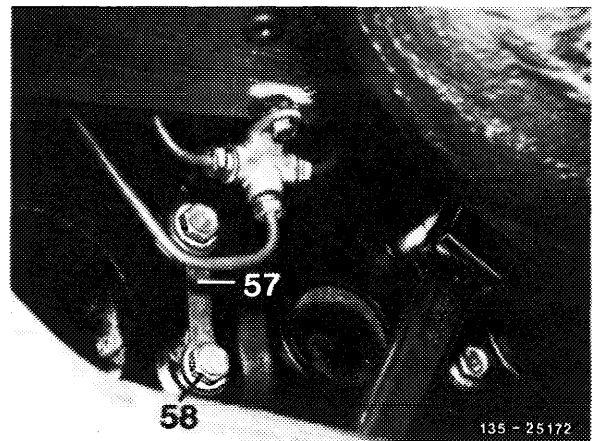


8 Compress rear axle shafts and fasten with a wire to camber strut.

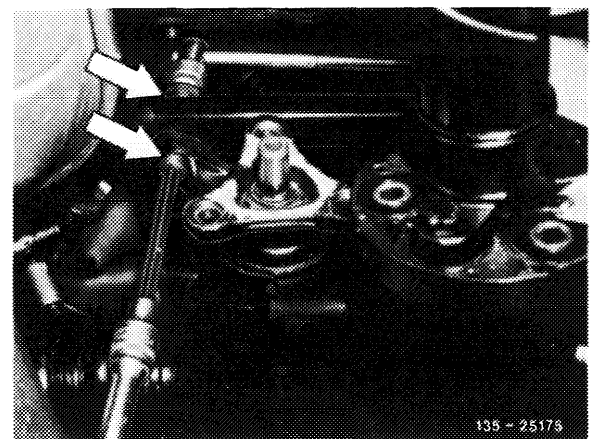


9 Support rear axle center piece.

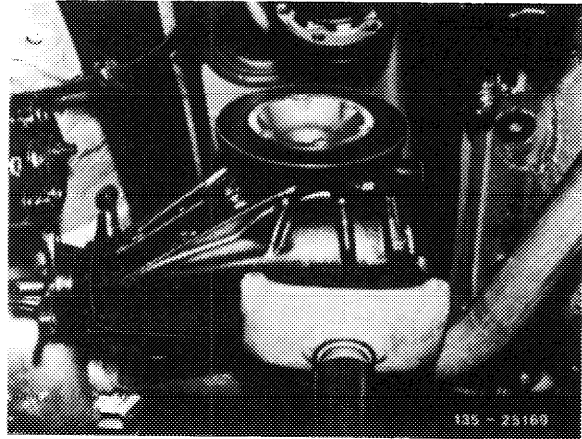
10 Unscrew locking screws (58) on rear axle carrier for end cover and remove together with locking plate (57).



11 Loosen front hex. socket screw for fastening rear axle center piece to rear axle carrier and remove (arrows).



12 Lower rear axle center piece and remove.

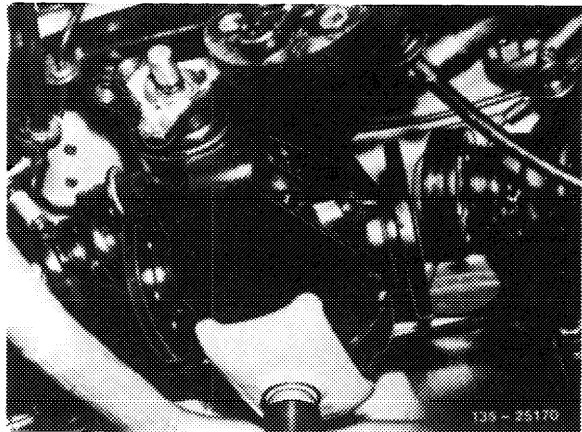


### Installation

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13 Place rear axle center piece on vehicle jack top and move into installation position.

14 Position front hex. socket screw with self-locking hex. nut, but do not yet tighten.

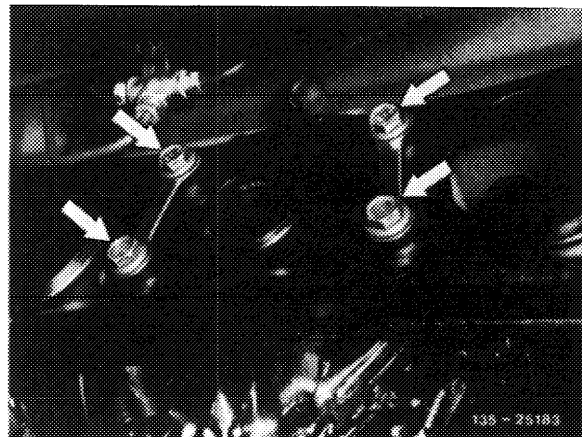


15 Mount locking screws with locking plate and tighten to 50 Nm (arrow).

16 Tighten front hex. socket screw to 45 Nm.

#### Attention!

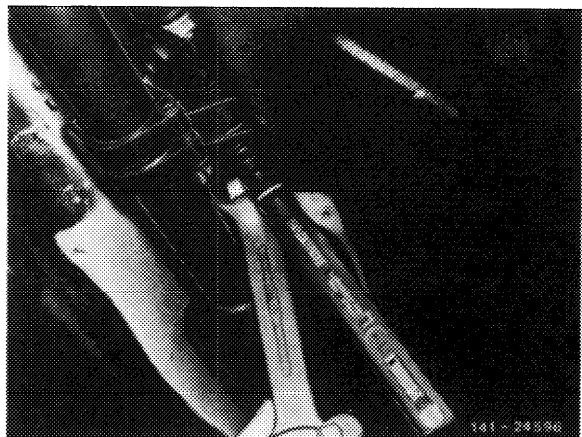
Renew self-locking hex. nut, locking screws and locking plates on principle.



17 Mount propeller shaft on universal flange of drive pinion,

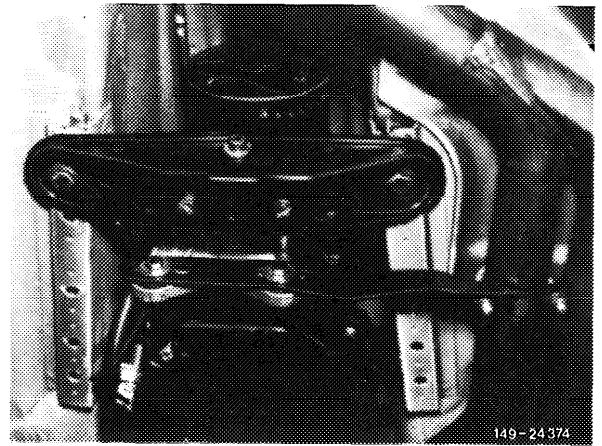
18 Fasten propeller shaft intermediate bearing on frame floor, but do not yet tighten.

19 Tighten clamping nut of propeller shaft to 30-40 Nm. Special tool: Open end wrench 41 mm, 201 589 00 01 00.



20 Tighten hex. screws for fastening propeller shaft intermediate bearing to 25 Nm.

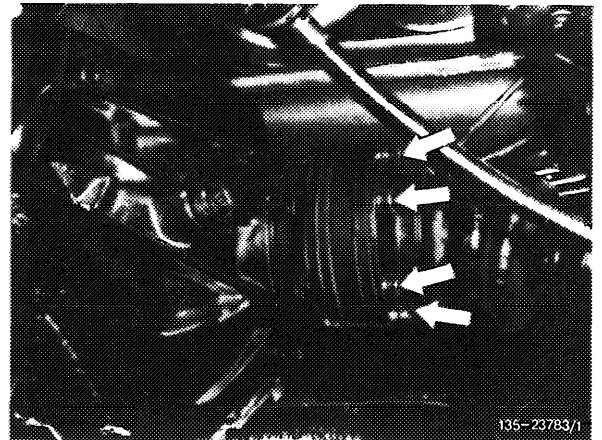
21 Mount exhaust shielding plate.



22 Mount rear axle shafts with washers and locking screws (arrows). Tightening torque 70 Nm, **moisten threads and screw head contact surface with oil.**

**Attention!**

Renew locking screws on **principle**.

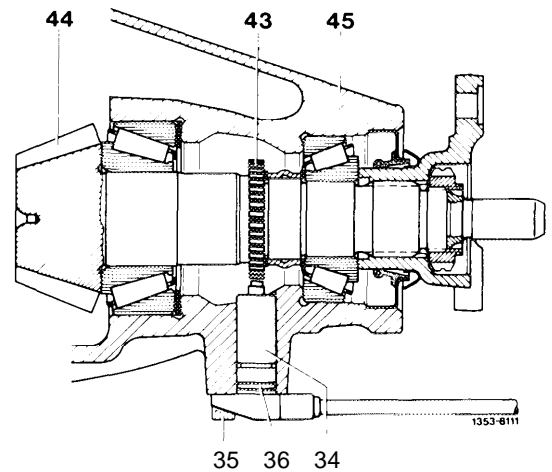


**23 Vehicles with ABS**

**Note:** Prior to installation make sure that no metallic foreign bodies remain on magnetic edge of rpm sensor.

a) Insert new O-ring (36) for rpm sensor (34)

- 34 Rpm sensor
- 35 Hex. socket screw
- 36 O-ring
- 43 Gear wheel (rotor)
- 44 Drive pinion
- 45 Rear axle housing

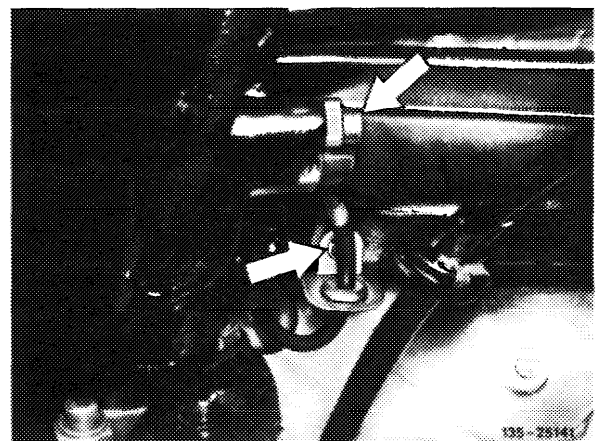


b) Insert rpm sensor (34) into rear axle housing (45) making sure that O-ring (36) is not damaged.

**Note:** Use self-locking hex. head screw only once.

c) Fasten rpm sensor with new. hex. socket screw to rear axle housing (arrow).

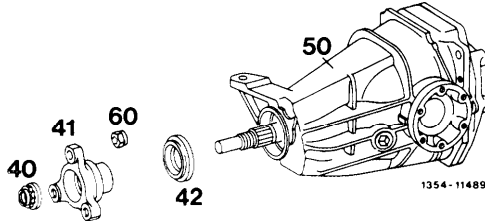
24 Check oil in rear axle and fill up to filler hole, if required.





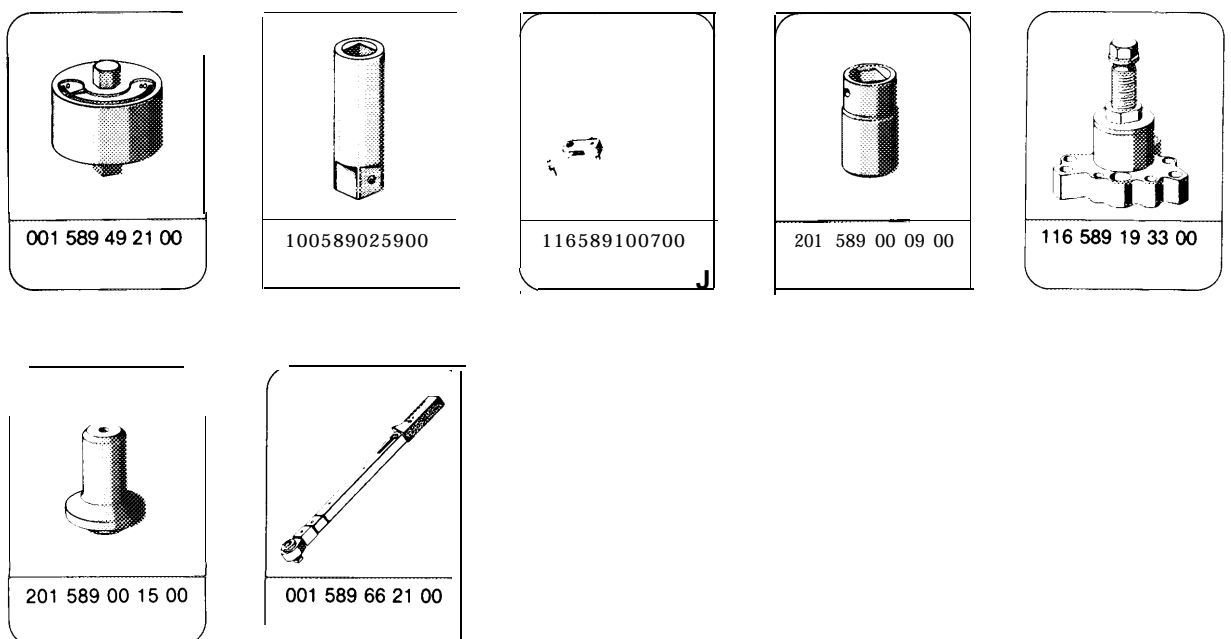
## 35-530 Renewing radial sealing ring on drive pinion

Rear axle center piece installed



40 Double hex. collar nut.. . . . .	Renew, refer to item 5 and 11, secure by knocking in collar, special tools: Torque measuring instrument 001 589 49 21 00, socket wrench element 27 mm 201 589 00 09 00 and connection 3/4" 10058902 5900
41 Universal flange: ..... . . . . .	Renew, if score marks of radial sealing ring are showing up, special tool: Holding wrench 116 589 10 07 00, puller 116 589 19 33 00
42 Radial sealing ring . . . . .	Renew, special tool: Knocking-in punch 201 589 00 15 00
50 Rear axle center piece . . . . .	Oil type hypoid gear oil SAE 90, correct oil level, filling capacity 0.7 liter
60 Self-locking hex. nut for propeller shaft . . . . .	Renew, tightening torque 40-50 Nm

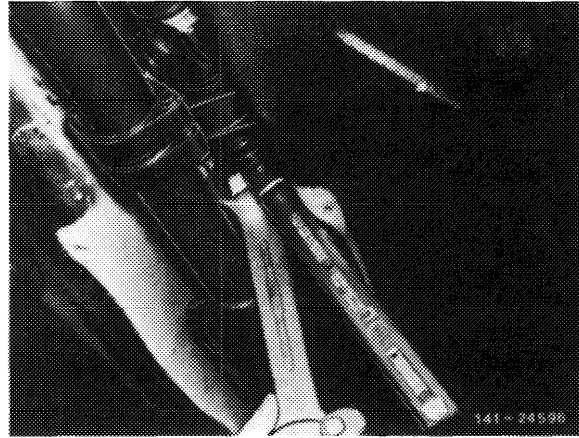
### Special tools



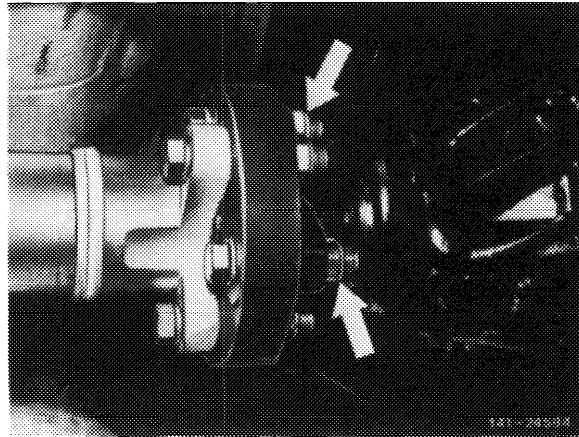
## Removal

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- 1 Remove exhaust shielding plate.
- 2 Loosen clamping nut and unscrew propeller shaft intermediate bearing on frame floor.



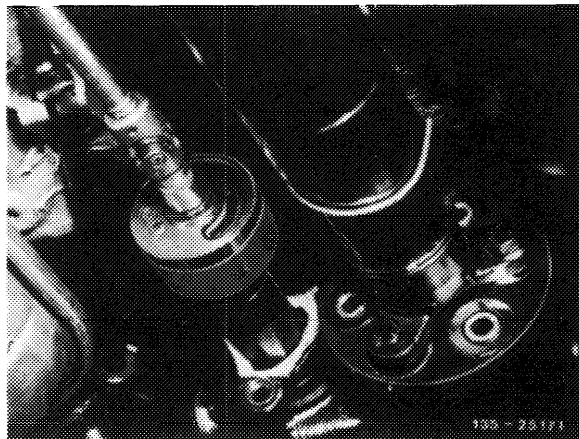
- 3 Unflange propeller shaft on rear axle and push forward from centering (arrows).
- 4 Tie propeller shaft with a wire to frame floor.



- 5 Measure friction torque of entire rear axle drive and note.

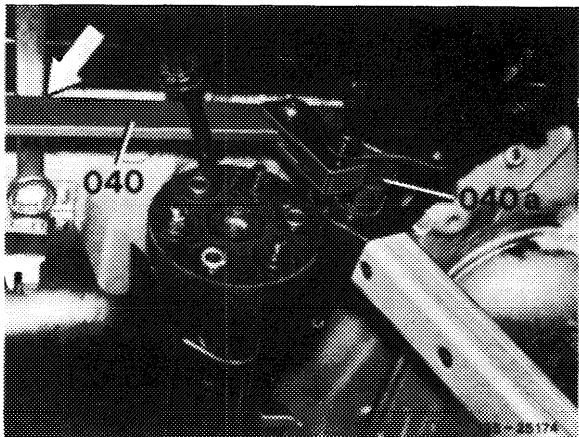
### Attention!

When measuring friction torque, make sure that the rear axle shafts are approximately horizontal, and that neither the brake pads are wiping against brake disks nor the brake shoes of the parking brake against drum.

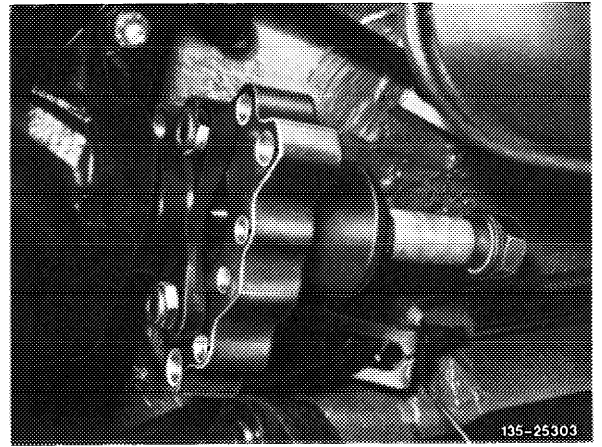


- 6 Position holding wrench (040) on universal flange and loosen double hex. collar nut with double hex. socket wrench element (040a). Use suitable box-end wrench for supporting holding wrench (arrow).

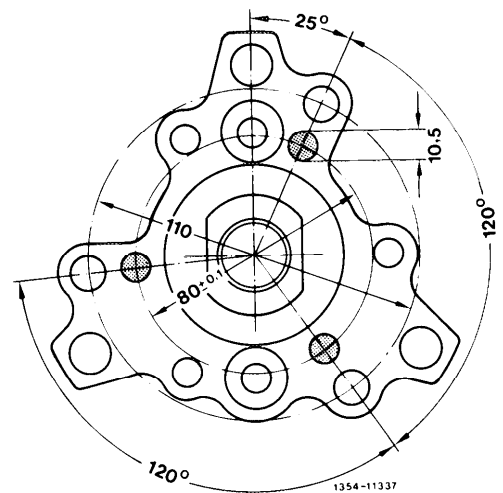
**Note:** Do not unlock double hex. collar nut with crush lock, but just loosen.



7 Pull universal flange from drive pinion, with puller if required, and remove.

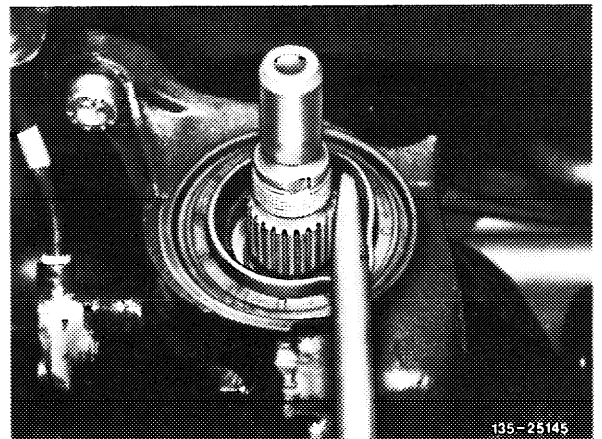


**Note:** Modify formerly supplied puller 116 589 19 33 00 according to drawing, that ist, drill an additional 3 holes of 10.5 mm in a bolt hole circle dia. of 80 mm (hatched holes).



8 Force radial sealing ring out of rear axle housing by means of a screwdriver.

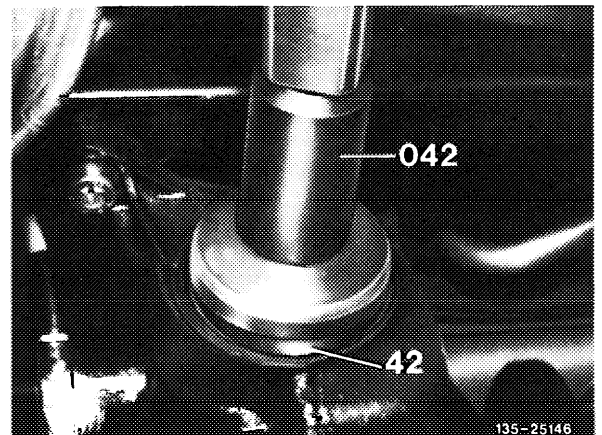
9 Check running surface for radial sealing ring on universal flange. Renew universal flange if running surface is worn out.



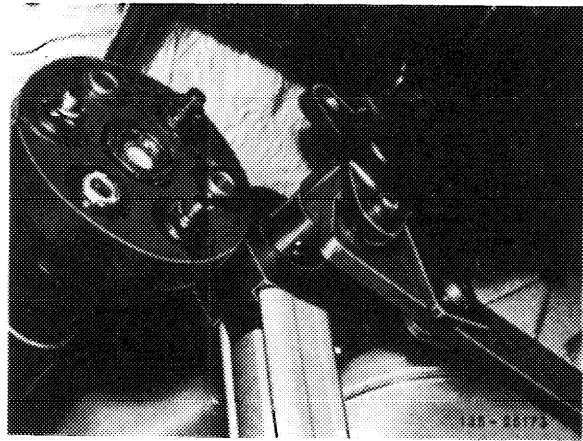
#### Installation

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10 Knock radial sealing ring (42) up to stop into rear axle housing by means of a punch (042).



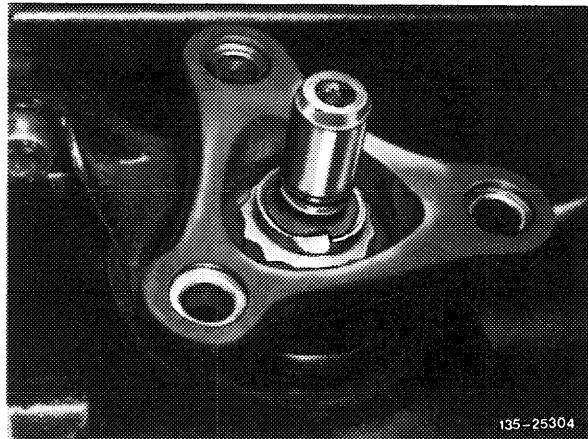
11 Mount universal flange and carefully tighten with a new double hex. collar nut until the measured or noted friction torque is attained. Tightening torque of double hex. collar nut should be at least 180 Nm. If this minimum tightening torque is not attained, re-new elastic spacing sleeve.



12 Peen double hex. collar nut with a peening tool into one of the two grooves of the drive pinion in such a manner that there is no gap between groove and locking tab.

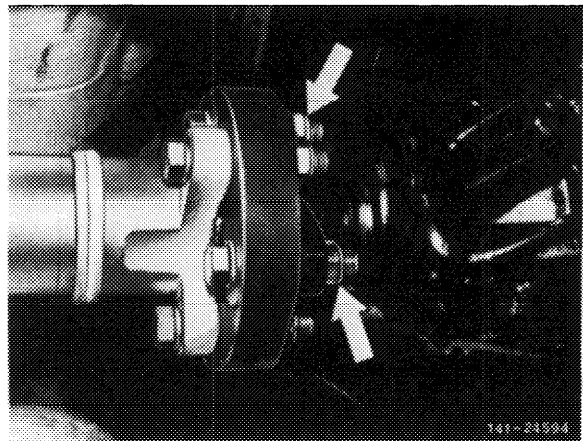
**Attention!**

No hard blows in axial direction.



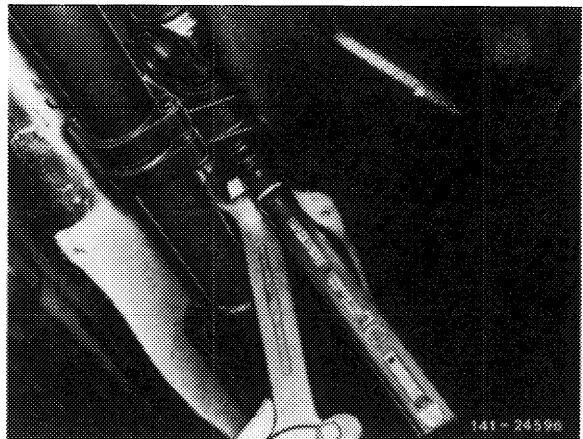
13 Mount propeller shaft to universal flange of drive pinion.

14 Fasten propeller shaft intermediate bearing, but do not yet tighten.



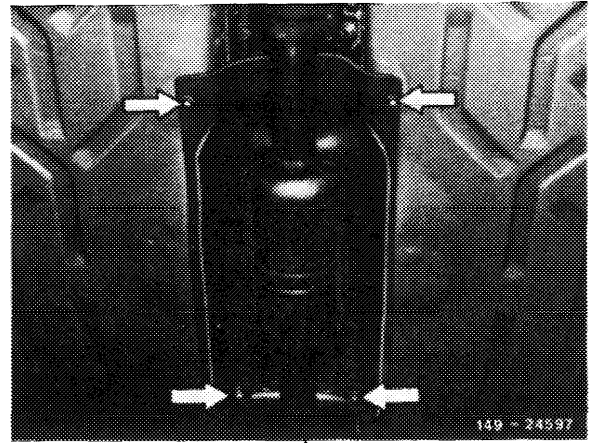
15 Tighten clamping nut on propeller shaft to 30-40 Nm. Special tool: Open end wrench 41 mm, 201 589 00 01 00.

16 Tighten hex. head screw for fastening propeller shaft intermediate bearing to 25 Nm.



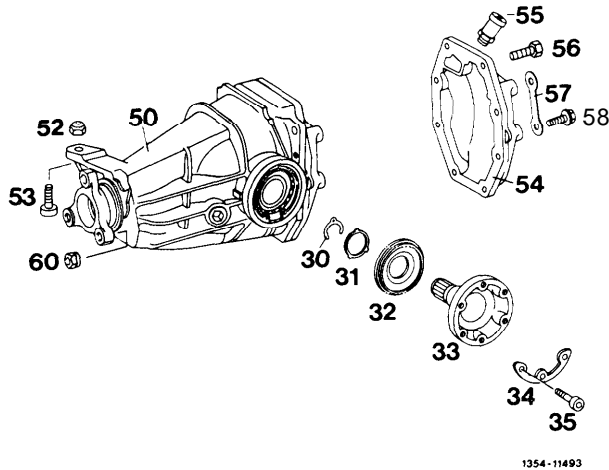
17 Install exhaust shielding plate.

18 Fill rear axle housing up to level of filler hole with hypoid gear oil.



## 35-540 Renewing radial sealing ring on connecting flange of rear axle shaft

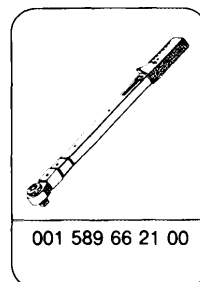
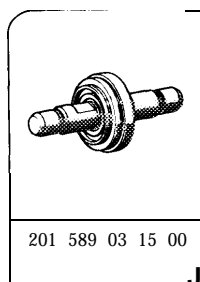
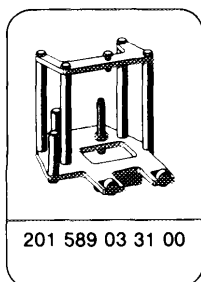
Rear axle center piece removed



1354-11493

30	Locking ring..	Renew, thickness from 1.2 to 1.8 mm — steps: 0.05 to 0.05
31	Compensating washer	
32	Radial sealing ring	Renew, coat OD with rubber sliding compound, special tool: Punch 201 589 03 15 00
33	Connecting flange without ring-shaped weight, ....	Renew, when heavy score marks of radial sealing are showing up
34	Washer	Renew
35	Locking screw.	Renew, tightening torque 70 Nm, threads and screw head contact surface lubricated
50	Rear axle center piece.	Clean sealing surface, oil type hypoid gear oil SAE 90, filling capacity 0.7 liter, special tool: Clamping device 201 589 03 31 00
52	Self-locking hex. nut, front	Renew
53	Hex. socket screw, front	Tightening torque 45 Nm
54	Rear axle end cover	Sealing surface clean and coat with sealing compound
55	Vent	Renew contaminated vent, tightening torque 25 Nm
56	Hex. screw	Tightening torque 45 Nm
57	Locking plate	Renew
58	Locking screw, rear	Renew tightening torque 50 Nm
60	Self-locking hex. nut, propeller shaft	Renew, tightening torque 40-50 Nm

### Special tools



## Conventional **tool**

Screw driver element for **multi-tooth**  
screws M 10 (XZN)1/2" square

e.g. Hazet  
D-5630 Remscheid  
Order No. 990 Ig-10

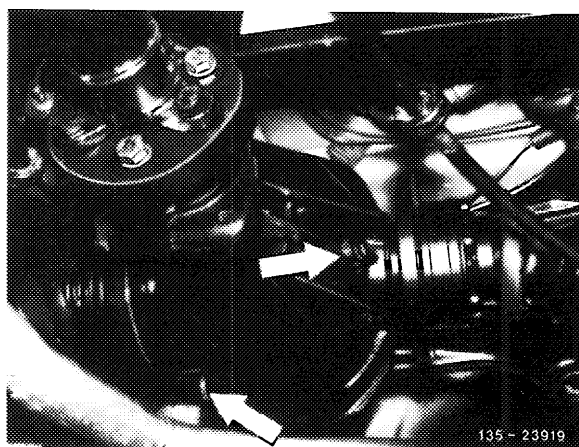
## Note

Replacement of a leaking radial sealing ring can be performed only with rear axle center piece removed. Thoroughly clean rear axle center housing in range of bearing cap so that no dirt can enter rear axle housing.

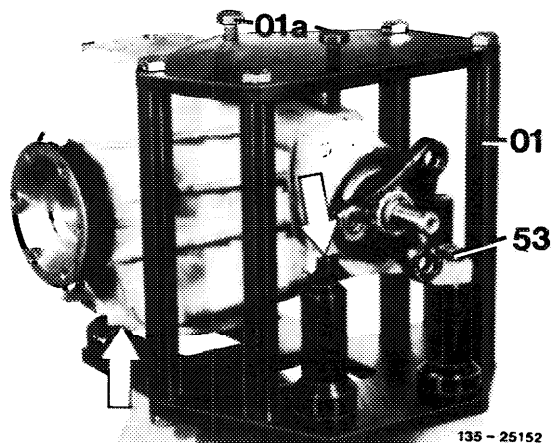
## Removal

Drain rear axle oil.

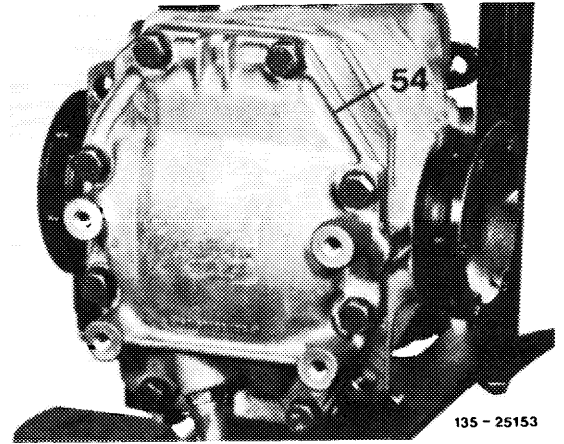
2 Remove rear axle center piece (35-520).



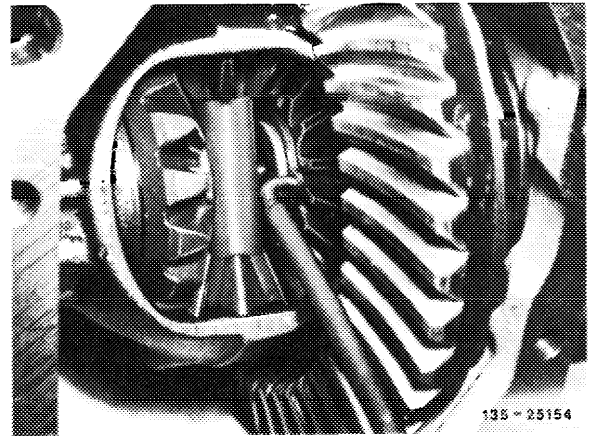
3 Place rear axle center piece into clamping fixture (01) and tighten with hex. socket screw (53) and hex. head screws (01 a). Pay attention to good seat of center piece in clamping fixture (arrows).



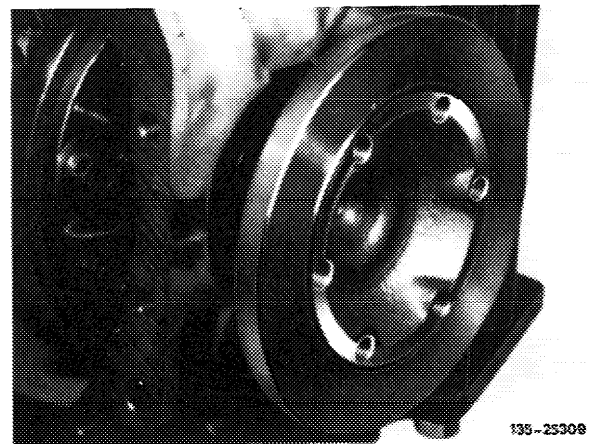
- 4 Unscrew rear axle end cover (54) and remove.



- 5 Pull locking ring from connecting flange with pliers or suitable hook and take from housing.

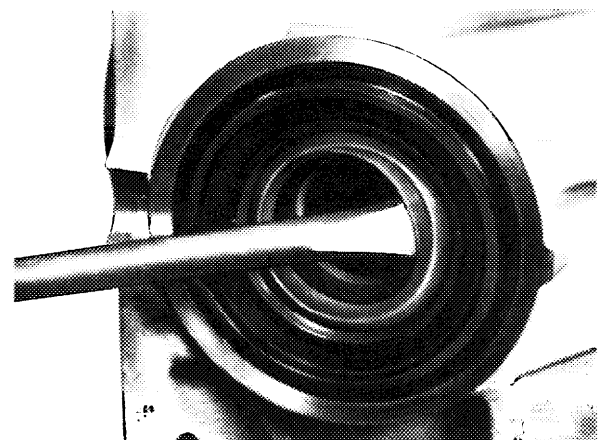


- 6 Pull connecting flange from rear axle side gear and remove.



Connecting flange with annular weight

- 7 Force radial sealing ring out of housing by means of a screwdriver.





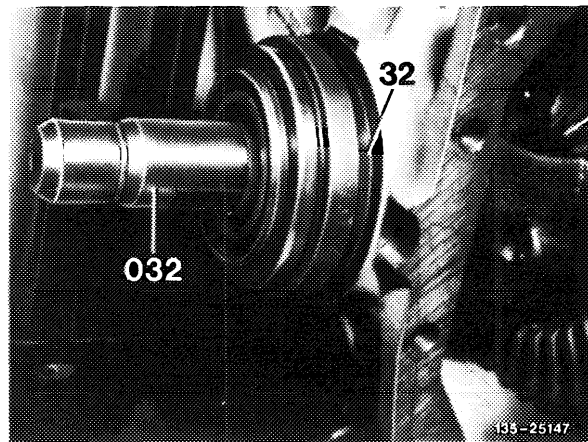
8 Check running surface for radial sealing ring on connecting flange and renew connecting flange, if required, if running surface is badly worn out.

#### Installation

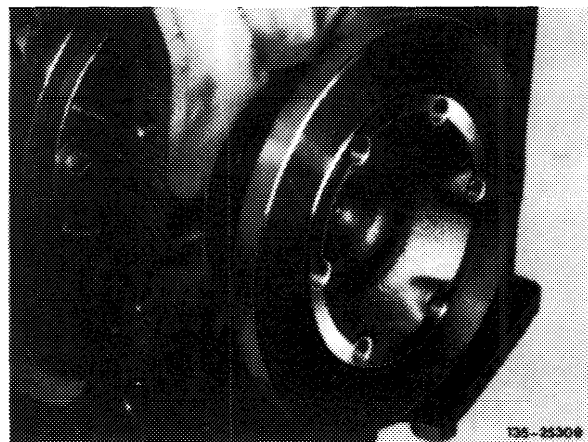
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9 Knock in radial sealing ring (32) with mandrel (032) until mandrel rests against rear axle housing.

Note: Coat radial sealing ring with rubber-coated sheet metal jacket on OD with rubber sliding compound „Naphtolen or hypoid gear oil”.



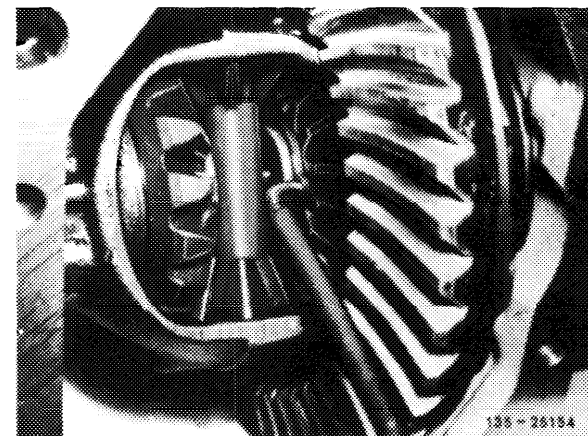
10 Install connecting flange. For this purpose, use a new locking ring of similar thickness between connecting flange and rear axle side gear.



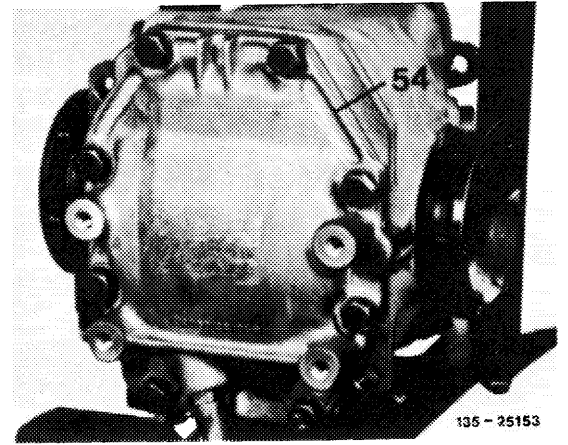
Connecting flange with annular weight

11 Check end play between connecting flange and rear axle side gear.

There should be no noticeable end play; rotation of locking ring in groove should be just barely possible. If required, mount a thicker or a thinner locking ring.



12 Clean sealing surface on rear axle end cover and on rear axle housing and coat with sealing compound. Mount rear axle end cover (54) end tighten hex. head screws to 45 Nm.

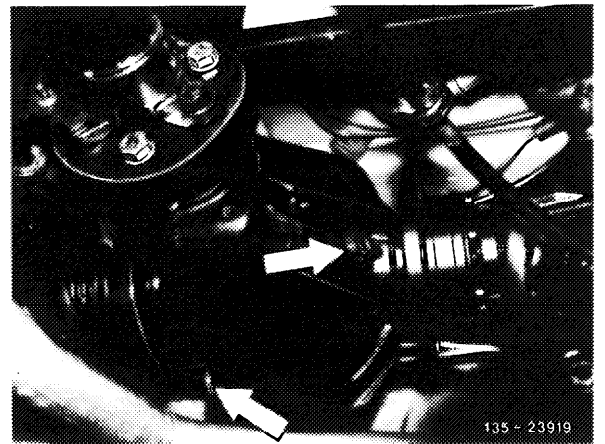


135 - 25153

13 Remove rear axle center piece from clamping fixture.

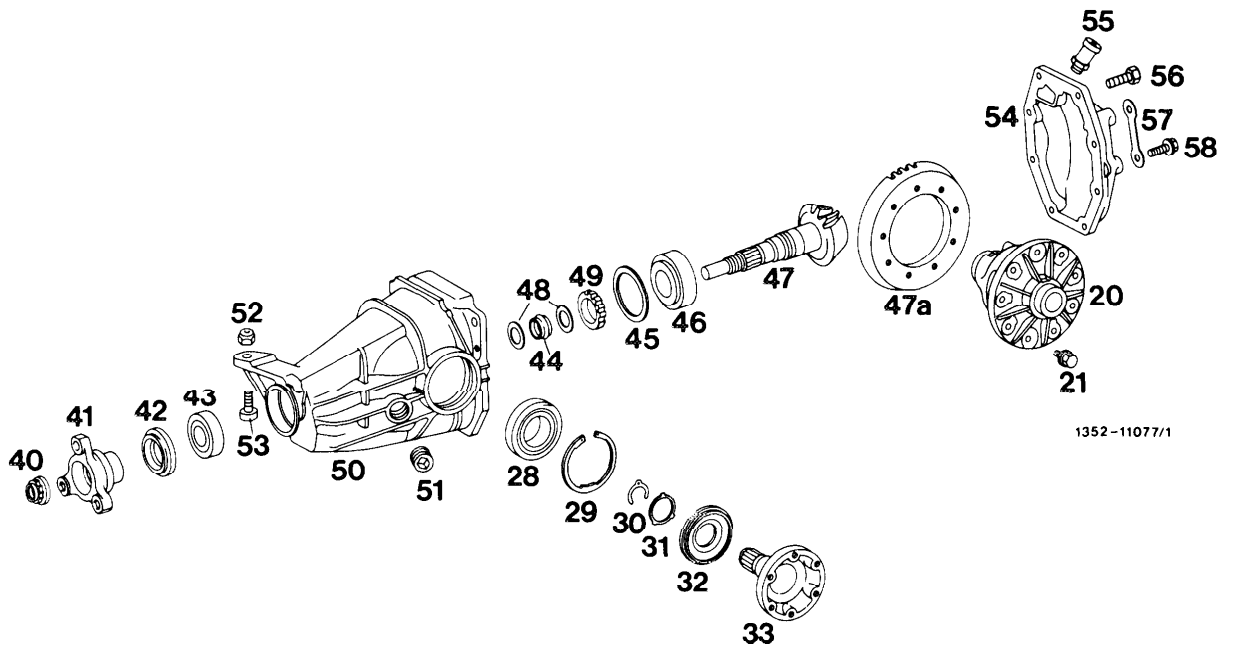
14 Install rear axle center piece(35-520).

15 Fill-in hypoid gear oil up to bottom edge of oil filler hole.



135 - 23919

**35-550 Disassembly and assembly of rear axle center piece, adjustment of wheel set**



20	Differential cage . . . . .	Check for damage
21	Hex. screw, self locking . . . . .	Renew, tightening torque 105 Nm, length 18 mm
28	Tapered roller bearing (differential) . . . . .	Check for damage and wear
29	Locking ring. . . . .	Pay attention to perfect seat, thickness from 3.3 to 4.1 mm steps 0.05 to 0.05 mm
30	Locking ring . . . . .	Renew, pay attention to perfect seat, determine thickness in such a manner that no end play shows up on connecting flange, thickness from 1.20 to 1.80 mm, steps 0.05 to 0.05 mm
31	Compensating washer . . . . .	Thickness 1.5 mm
32	Radial sealing ring. . . . .	Renew
33	Connecting flange without ring-shaped weight . . . . .	Renew, if heavy score marks of radial sealing ring are showing up
40	Double hex. collar nut . . . . .	Renew, secure by knocking in collar
41	Universal flange . . . . .	Check, renew, if radial runout exceeds 0.06 mm after several displacements
42	Radial sealing ring. . . . .	Renew
43	Small tapered roller bearing (drive pinion) . . . . .	Check for damage and wear
44	Spacing sleeve . . . . .	Renew
45	Compensating washer. . . . .	Thickness from 1.10 to 1.7 mm, Steps 0.05 to 0.05, grind to a required thickness, if required
46	Large tapered roller bearing (drive pinion) . . . . .	Check for damage and wear
47	Drive pinion . . . . .	Pay attention to mating number, check for damage and wear. Refer to Note: At item 39
47a	Ring gear . . . . .	Check for damage and wear, heat to 60–70 °C and mount
48	Thrust washer. . . . .	Renew
49	ABS gear wheel (rotor) . . . . .	Check for damage and pay attention to number of teeth

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50	Rear axle housing . . . . .	Check for damage, clean sealing surface. Oil type: Hypoid gear oil SAE 90, filling capacity 0.7 liter Specs, for Service Products sheet no. 235
51	Closing plug. . . . .	Tightening torque 50 Nm
54	End cover . . . . .	Check for damage, clean parting surface and coat with sealing compound
55	Vent. . . . .	Renew, tightening torque 25 Nm
56	Hex.screw.. . . . .	Tightening torque 45 Nm
57	Locking plate. . . . .	Renew
58	Locking screw . . . . .	Renew, tightening torque 50 Nm

### Installation survey – rear axle ratio

Model	Vehicle version	Ratio	Number of teeth
201.022 201.024 201.122	Standard	3.23	42:13
201.122 (USA)		3.42	41:12

### Gear wheel (rotor) for rpm sensor on vehicles with ABS

Part number	Ratio	Number of teeth
1243530585	3.23	30
1243530285	3.42	28

### Adjusting data of wheel set

Backlash of wheel set		0.08-0.14 mm
Adjustment of tapered roller bearings for differential: The tapered roller bearings are provided with the required pre-load by widening (spreading dimension) rear axle housing by		0.10-0.15 mm
Permissible tolerance of adjusting dimension "A" of drive pinion		+ 0.01 - 0.02
Adjustment of tapered roller bearing for drive pinion by measuring friction torque when rotating drive pinion with friction torque wrench <sup>1)</sup>	new tapered roller bearings	120– 140 Ncm
	used tapered roller bearings	50-100 Ncm

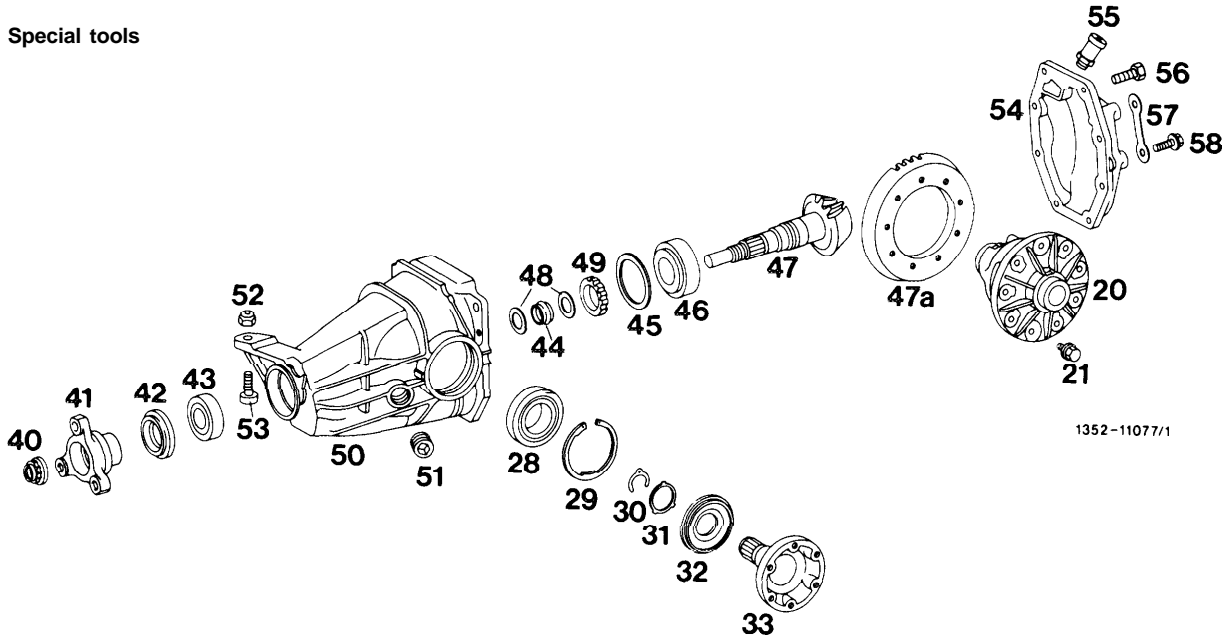
<sup>1)</sup> For corrected adjustment of tapered roller bearings tighten double hex. (twelve-point) collar nut on flexible coupling in such a manner that the specified friction torque when rotating drive pinion is attained. To check friction torque while rotating drive pinion, make sure that the differential with ring gear is not installed.

### Flexible coupling on drive pinion

Diameter of running surface for radial sealing ring on flexible coupling	new	37.00-o. 16
	minimum dia. in the event of repairs <sup>1)</sup>	36.6
Running surface of flexible coupling		no thread
Permissible radial runout of sealing surface of flexible coupling		0.06

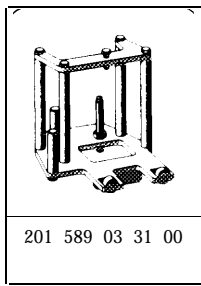
<sup>1)</sup> Machine running surface for sealing in an emergency only.

Special tools

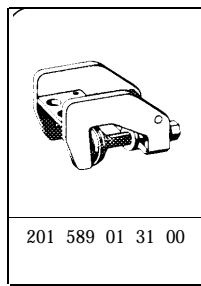


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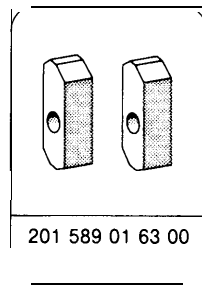
20	Differential cage .....	Assembly mandrel 201 589 01 15 00
28	Tapered roller bearing (differential) .....	Puller 001 589 36 33 00, collet 201 589 01 23 00, thrust piece 000 589 03 34 00, mandrel 201 589 03 15 00
29	Locking ring .....	Pliers 126 589 00 37 00, mandrel 201 589 03 15 00
32	Radial sealing ring .....	Mandrel 201 589 03 15 00
40	Double hex. collar nut .....	Socket element 27 mm 201 589 00 09 00
41	Flexible coupling .....	Holding wrench 116 589 10 07 00, puller 116 589 19 33 00
42	Radial sealing ring .....	Knocking-in punch 201 589 00 15 00
43	Small tapered roller bearing (drive pinion) .....	Remover 201 589 02 43 00, installer 201 589 00 43 00
46	Large tapered roller bearing (drive pinion) .....	Remover 201 589 02 43 00, installer 201 589 00 43 00, puller 001 589 36 33 00, extension 000 589 35 34 00, collet 201 589 02 34 00
47	Drive pinion .....	Remover and installer 201 589 02 43 00, measuring device 201 589 05 2 1 00, 201 589 04 21 00, measuring plate 601 589 00 23 00, dial gauge holder 363 589 02 21 00, dial gauge 000 589 38 19 00, torque measuring instrument 001 589 49 21 00
47a	Ring gear .....	Backlash measuring instrument 201 589 03 21 00
49	ABS gear wheel (rotor) .....	Puller 000 589 88 33 00
50	Rear axle housing .....	Clamping fixture 201 589 03 31 00, spreader 201 589 01 31 00, measuring bracket 126 589 08 21 00, stop 201 589 01 63 00



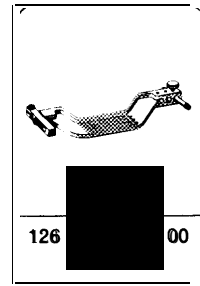
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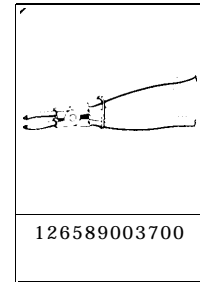
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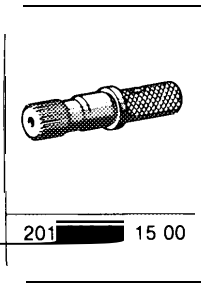
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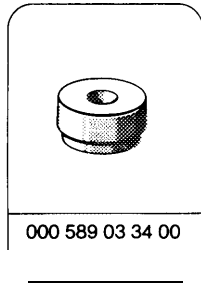
126 [REDACTED] 00



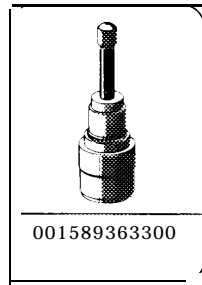
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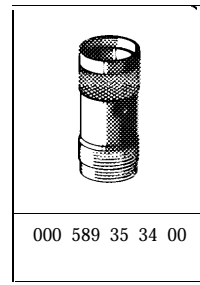
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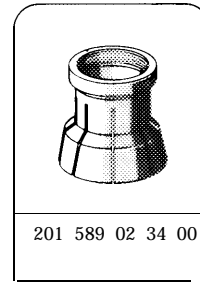
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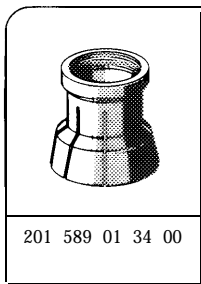
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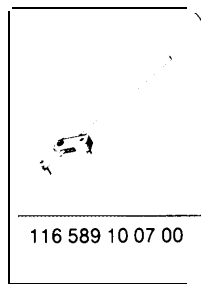
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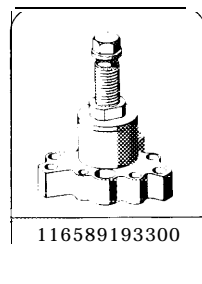
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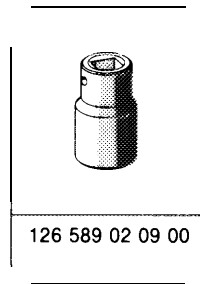
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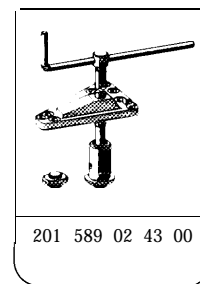
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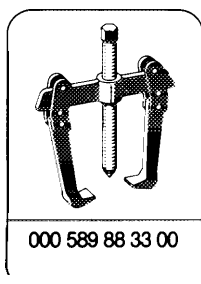
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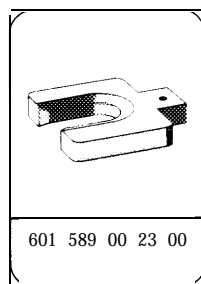
126 589 02 09 00



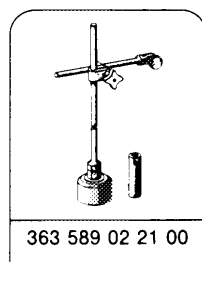
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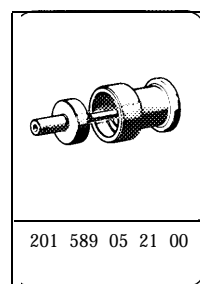
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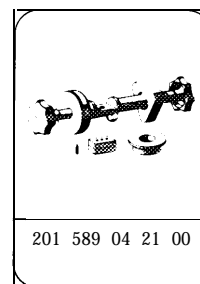
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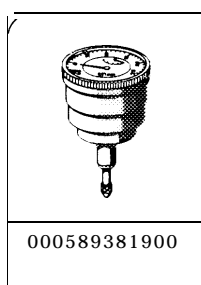
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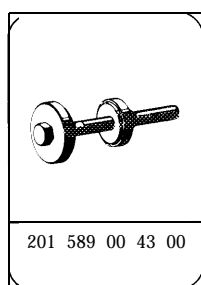
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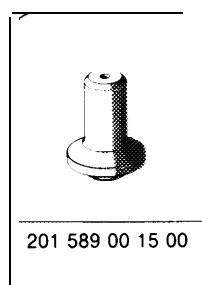
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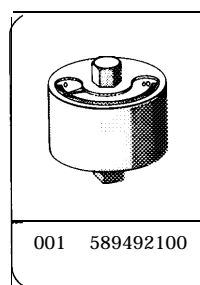
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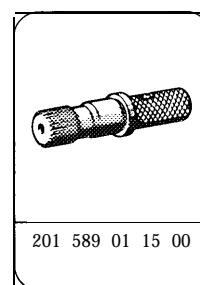
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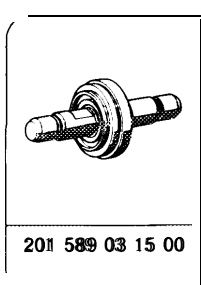
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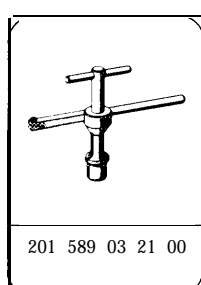
001 589492100



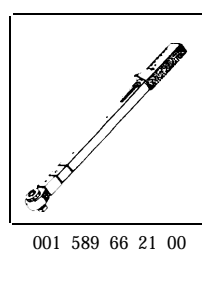
201 589 01 15 00



201 589 03 15 00



201 589 03 21 00



001 589 66 21 00

**Conventional tools**

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Two-arm puller

e.g. Nexus, D-5630 Remscheid  
Order no. 100 Gr. 2

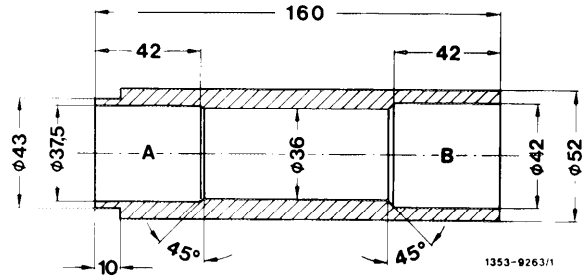
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**Self-made tools**

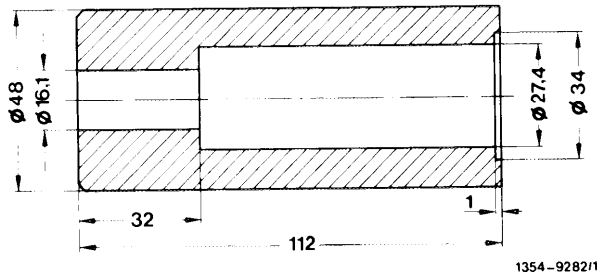
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Pressinpon sleeve for tapered roller bearing on drive pinion.

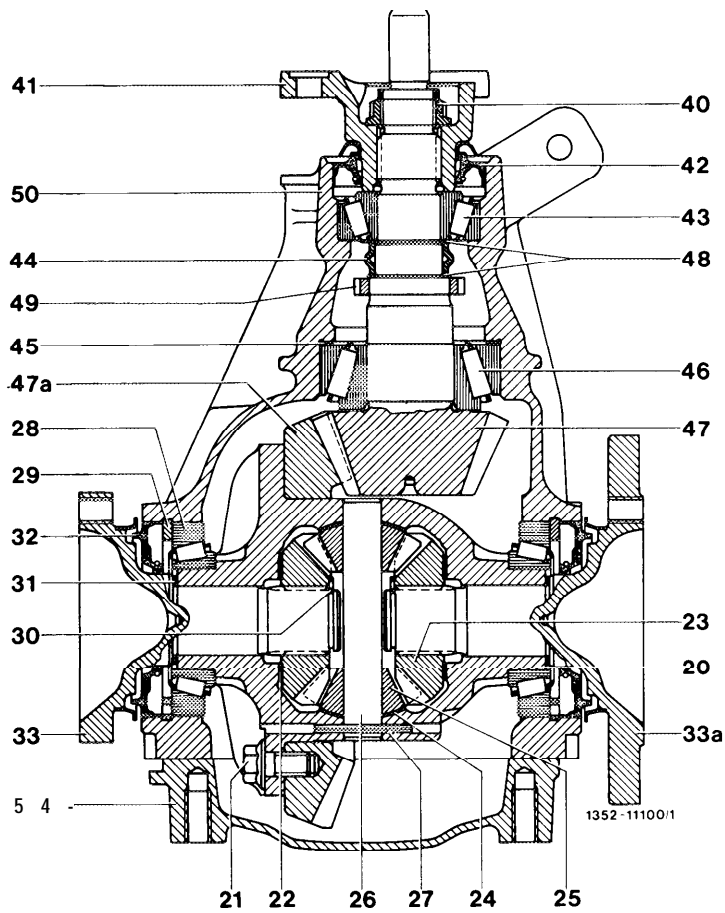
A = Small drive pinion  
B = Large drive pinion



Pressingon sleeve for gear wheel on drive pinion on vehicles with ABS





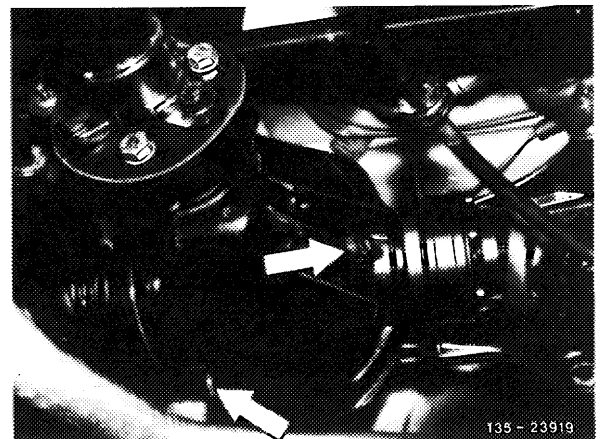


- 20 Differential cage
- 21 Hex. head screw, self-locking
- 22 Thrust washer
- 23 Differential side gear
- 24 Spherical washer
- 25 Differential pinion
- 26 Differential pinion shaft
- 27 Clamping sleeve
- 28 Tapered roller bearing
- 29 Locking ring for bearing outer race
- 30 Locking ring for connecting flange
- 31 Compensating washer
- 32 Radial sealing ring
- 33 Connecting flange without ring-shaped weight

- 33a Connecting flange with ring-shaped weight
- 40 Double hex. collar nut
- 41 Flexible coupling
- 42 Radial sealing ring
- 43 Tapered roller bearing, small
- 44 Spacing sleeve
- 45 Compensating washer
- 46 Tapered roller bearing, large
- 47 Drive pinion
- 47a Ring gear
- 48 Thrust washer
- 49 Gear wheel for ABS
- 50 Rear axle housing
- 54 End cover

## Removal

- 1 Drain rear axle oil.
- 2 Remove rear axle center piece (35-520).

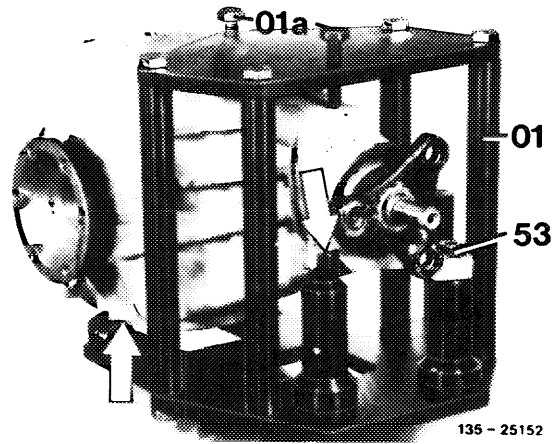


135 - 23919

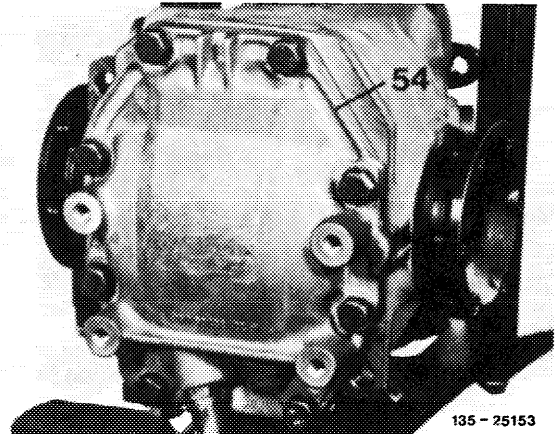
## Disassembly

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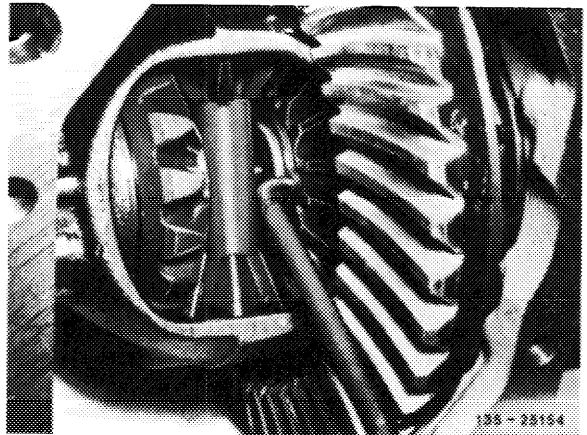
3 Insert rear axle center piece into clamping fixture (01) and tighten with hex. socket screw (53) and hex. head screws (01a). Pay attention to good seat of center piece in clamping fixture (arrows).



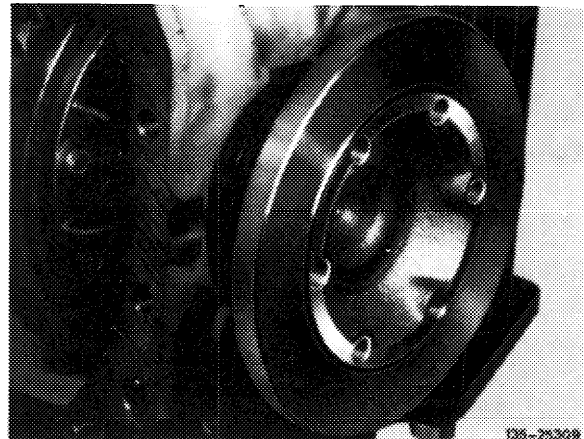
4 Unscrew rear axle end cover (54) and remove.



5 Pull locking ring from connecting flange with pliers or suitable hook and remove from housing.

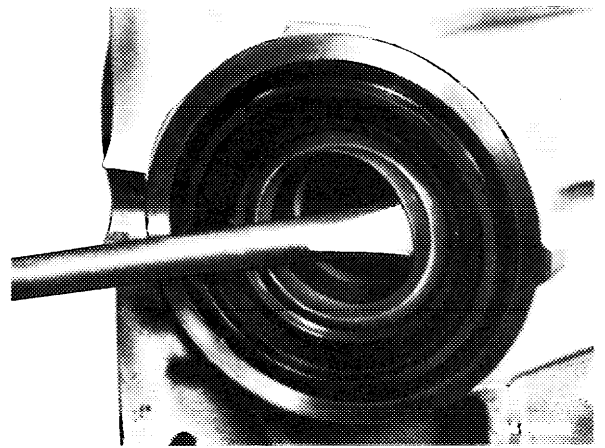


6 Pull connecting flange out of differential side wheel and remove.

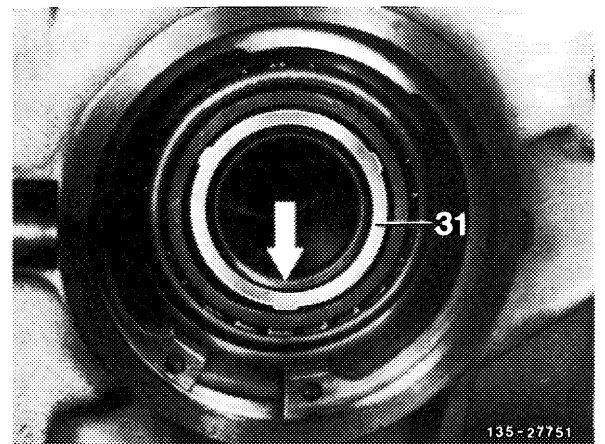


Connecting flange with ring-shaped weight

7 Force both radial sealing rings out of rear axle housing by means of a screw driver.

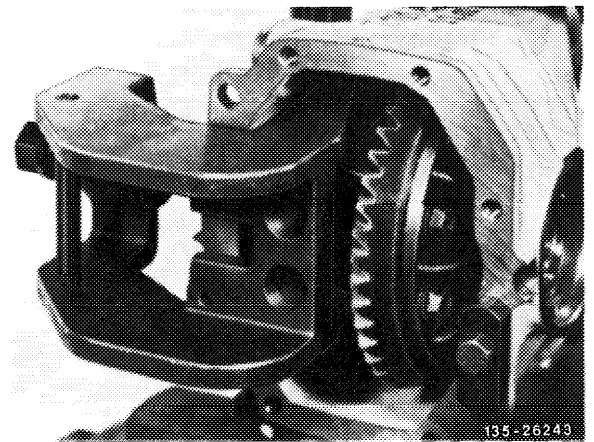


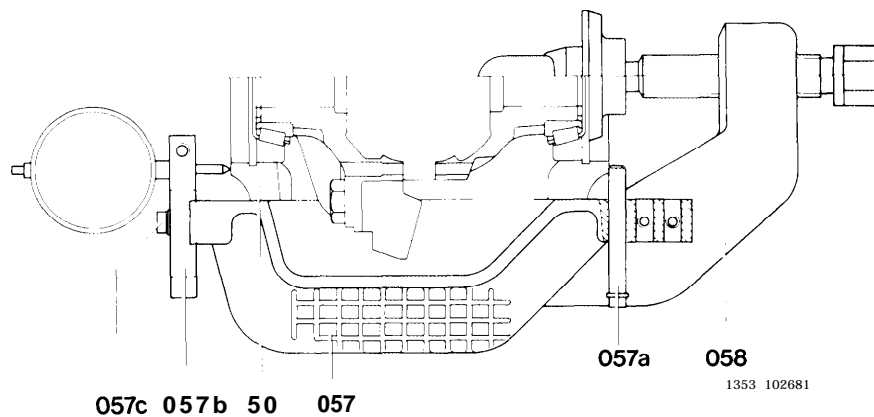
8 Remove compensating washer (31) on face of differential cage.



9 Fasten spreader to rear axle housing and manually move screw spindle up to contact surface on bearing outer race.

10 Fasten stop for supporting measuring bracket on rear axle housing.





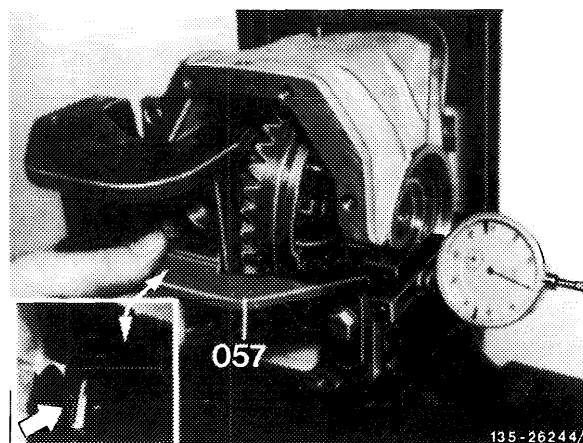
11 Insert stop bolt (057a) into inside bore of measuring bracket (057) and clamp down with knurled screw.

12 Adjust dial gauge holder (057b) lengthwise in such a manner (front notch), that the dial gauge tip rests against rear axle housing (50). Clamp down dial gauge holder (057b) with hex, socket screw(057c).

13 Place spread measuring instrument on installation and set dial gauge to 0 at 3 mm preload.

**Attention!**

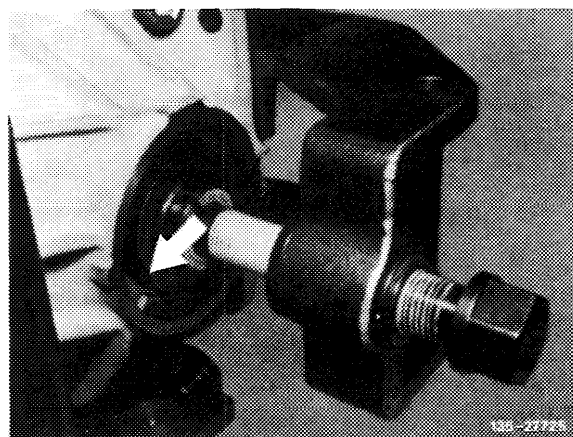
Make sure that the stop bolt of the measuring instrument rests against contact surface on rear axle housing (refer to cutout, arrow).



14 Turn one surface of thrust piece toward opening of locking ring (arrow) and preload (spread) rear axle housing by screwing threaded spindle of spreader to 0.20 mm.

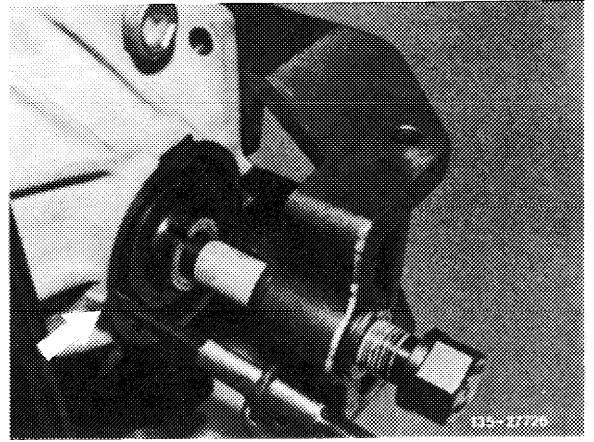
**Attention!**

When spreading, do not exceed 0.20 mm.



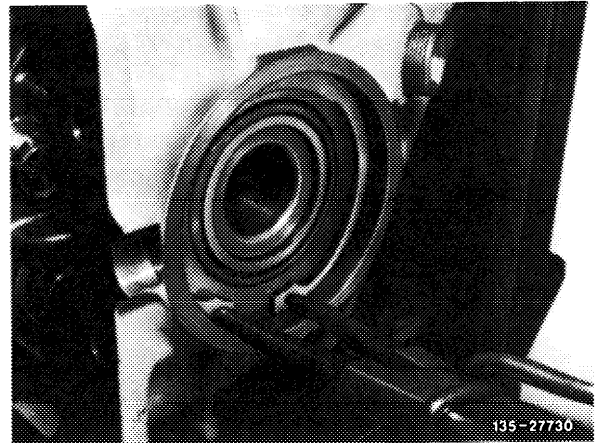
15 Remove spreader.

16 Take lefthand locking ring out of rear axle housing by means of pliers and mark.



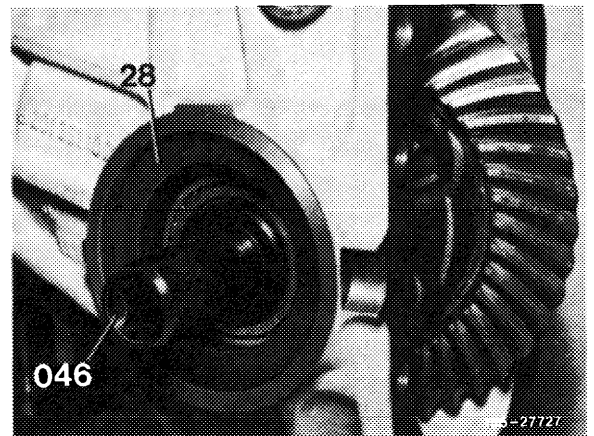
17 Unclamp rear axle housing and remove spreaders.

18 Remove righthand locking ring with pliers out of rear axle housing.

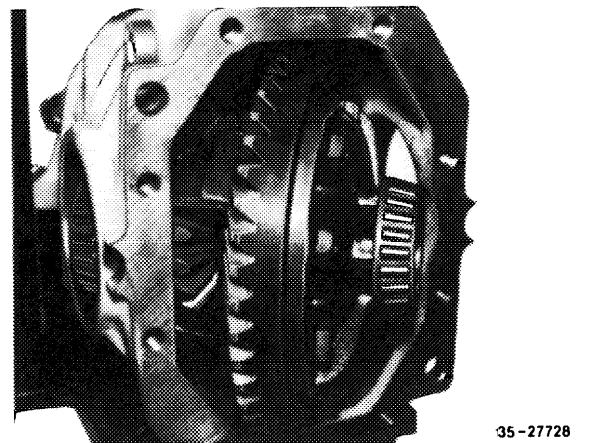


19 Remove both bearing outer races of tapered roller bearings (28) from rear axle housing and mark, to eliminate mistakes during reinstallation.

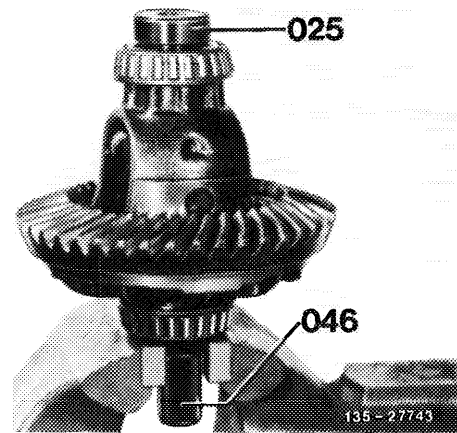
**Note:** For easier removal of bearing outer races, insert assembly mandrel for differential pinions (046) at the right and force complete differential to the left until it rests against rear axle housing. Remove left-hand and righthand bearing outer race.



20 Move differential into position shown and take out of rear axle housing,



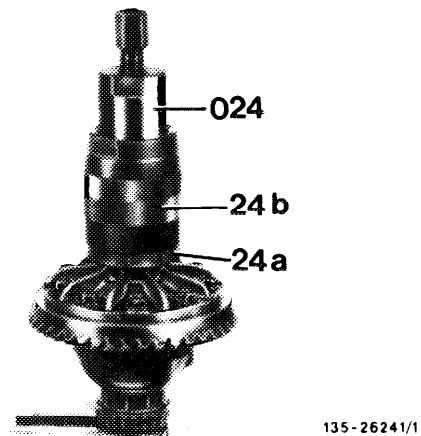
21 Place differential cage on assembly mandrel (046) and mount thrust piece (025).



22 Assemble pulling device (basic unit 024) with collet (24a).

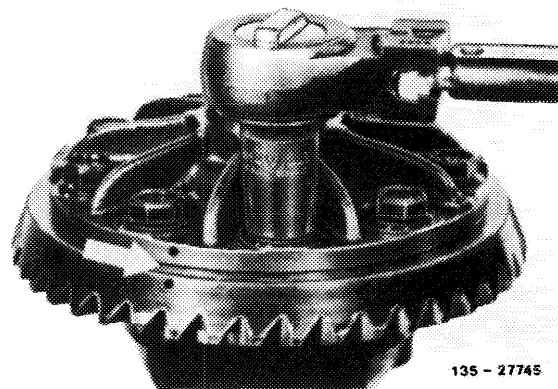
23 Slip pulling device with collet (24a) over tapered roller bearing and clamp collet behind rollers of tapered roller bearings by means of clamping sleeve (24b).

24 Pull both tapered roller bearings from differential cage and mark to eliminate mistakes during re-installation.



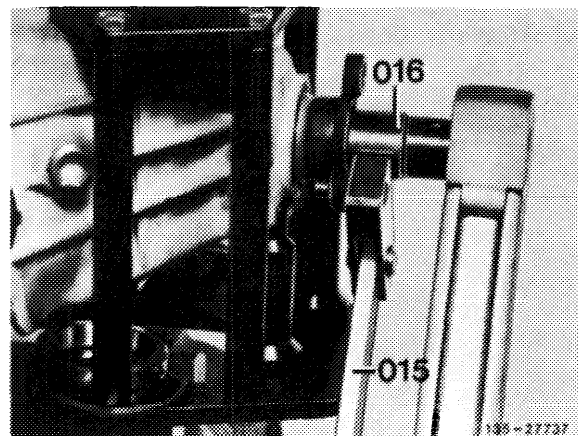
25 Unscrew ring gear from differential cage and carefully force off in direction of cage.

**Note:** If the wheel set is used again, mark position of ring gear in relation to differential cage (arrow).



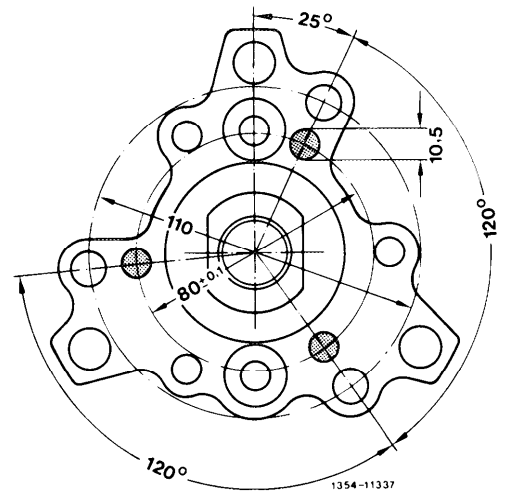
#### Removing and checking of drive pinion

26 Place holding wrench (015) on flexible coupling and loosen double hex. collar nut by means of double hex. socket wrench element (016).

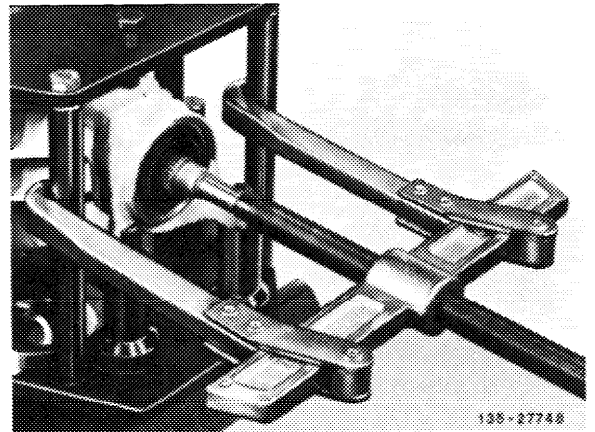


27 If required, pull flexible coupling from drive pinion by means of puller and remove.

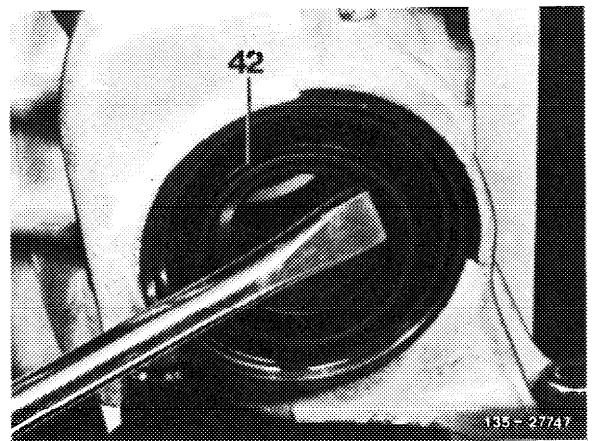
**Note:** Change puller 116 589 19 33 00 delivered up to now according to drawing, that is, drill 3 additional holes of 10.5 mm dia. in a hole circle dia. of 80 mm (hatched holes).



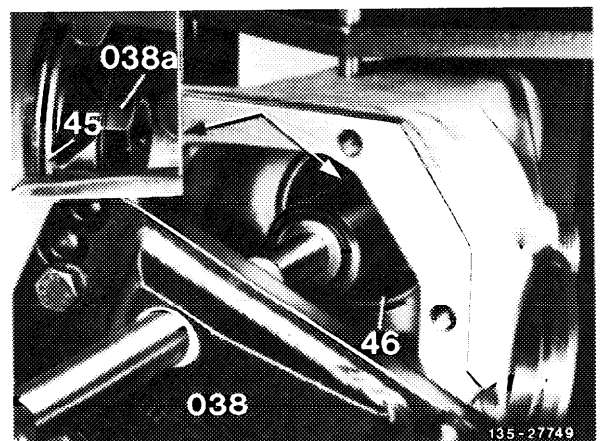
28 Force drive pinion out of rear axle housing by means of a conventional puller.



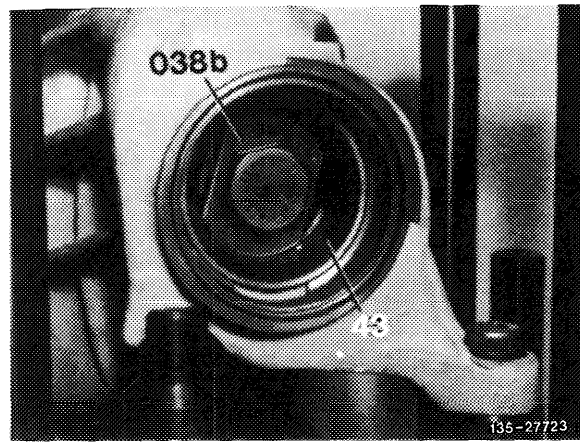
29 Force radial sealing ring (42) out of rear axle housing by means of a screw driver and remove tapered roller bearing inner race.



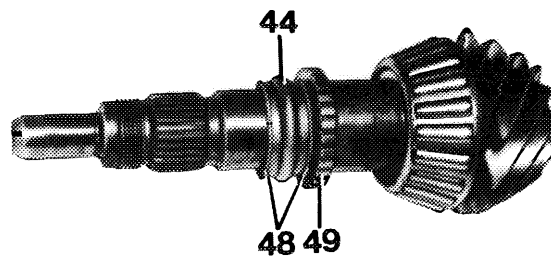
30 Screw installer and remover (038) to rear axle housing. Pull inner tapered roller bearing outer race (46) out of housing by means of pulling member (038a) and remove together with compensating washer (45).



31 Force outer tapered roller bearing outer race (43) out of the rear axle housing by means of pushing member (038b) and remove.



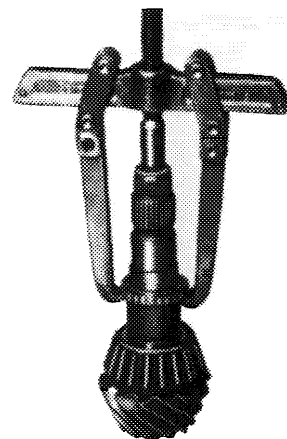
32 Remove spacing sleeve (44) together with thrust washers (48) from drive pinion.



- 44 Spacing sleeve
- 48 Thrust washer
- 49 Gear wheel (on vehicles with ABS only)

135-19634

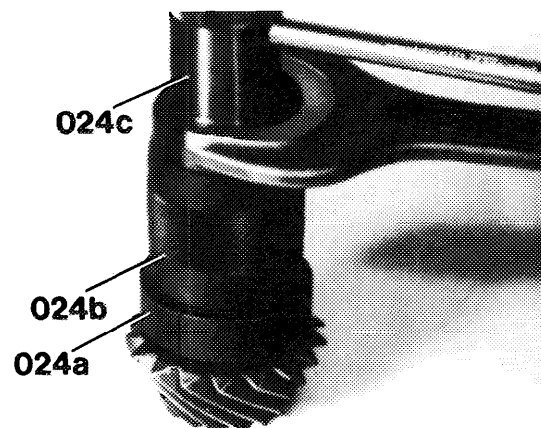
33 On vehicles with ABS, pull gear wheel (rotor) from drive pinion.



135-19665

34 Assemble puller (basic unit) with extension (024c) and collet (024a).

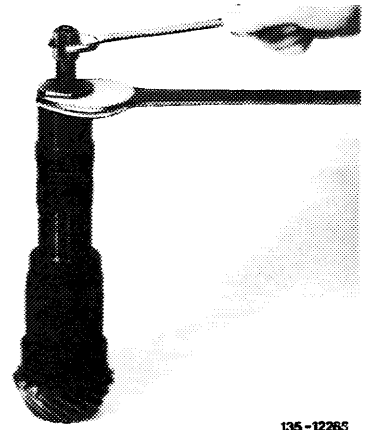
35 Slip puller with collet (024a) over tapered roller bearing and clamp collet behind rollers of tapered roller bearing by means of clamping sleeve (024b).



135-12264/1



36 Pull tapered roller bearing inner race from drive pinion by means of puller,



135-12265

### Checking

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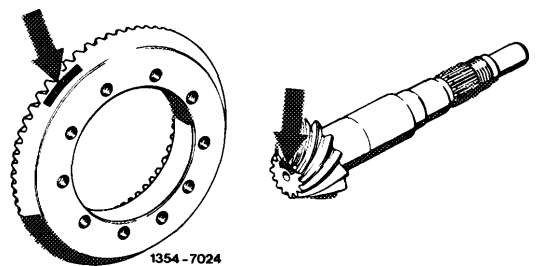
37 Check all parts for reuse. Check bearing seats on drive pinion for radial and axial runout.

38 Check running surface for radial sealing ring on flexible coupling. With score marks on running surface, renew flexible coupling.

39 Place flexible coupling on drive pinion and check radial runout of flexible coupling on running surface of radial sealing ring. If, in spite of several displacements of flexible coupling, the radial runout on splining is higher than 0.06 mm, renew flexible coupling.

**Note:** Each drive pinion and ring gear belonging to a wheel set is identified by a consecutive number written on both parts. In addition, the wheel distance for the respective wheel set in relation to each other is named on drive pinion.

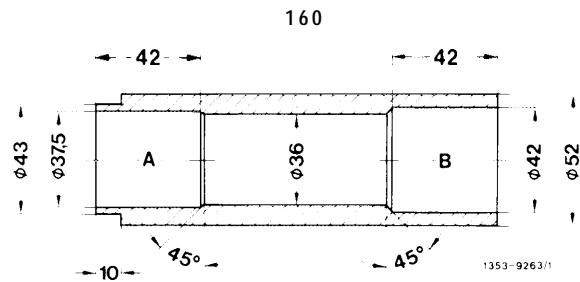
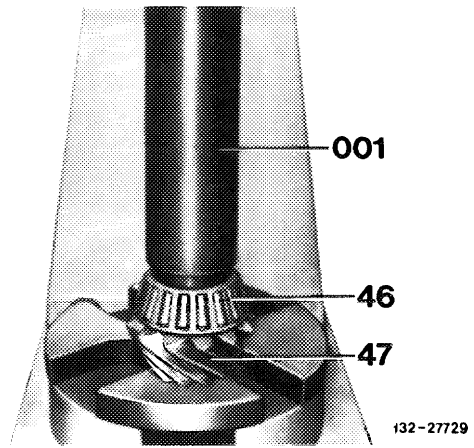
To calculate the thickness of the compensating washer required for adjustment of drive pinion, use a data sheet each time. A **sample data sheet is shown at end of this job number**. The measuring and calculating procedure of the example named there is described in detail in the following items.



1354-7024

**Assembly and adjustment of wheel set**

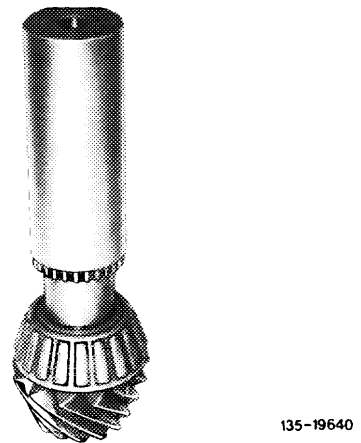
40 Press rear tapered roller bearing (46) with self-made pressing-on sleeve (001) on drive pinion (47). For this purpose, use side of sleeve identified with an "A".



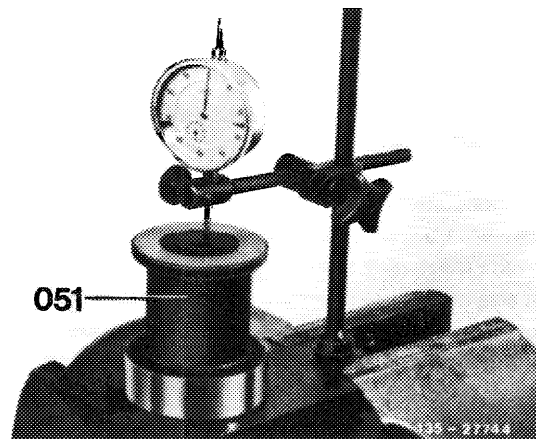
**Pressing-on sleeve (self-made)**

A = for vehicles with small and medium center piece  
 B = for vehicles with large center piece

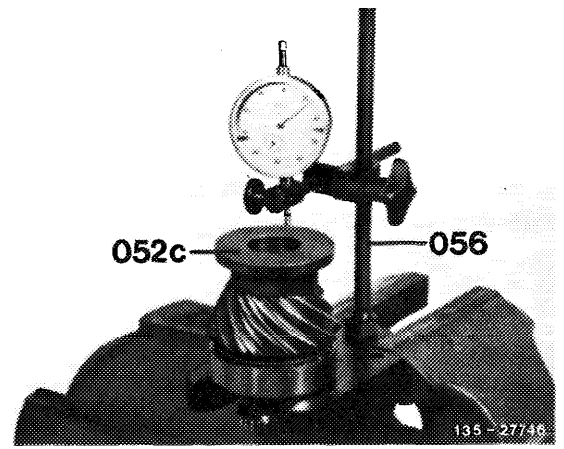
41 On vehicles with ABS gear wheel (rotor) press on by means of self-made pressing-on sleeve.



42 Adjust dial gauge at approx. 5 mm preload to 0 on measuring body (051) first.



43 Place outer bearing race on roller cage of drive pinion. Insert drive pinion into measuring device (056) and measure height of drive pinion with bearing and magnetic plate (052c). Read dimension, which shows the difference between height of measuring body "B1" and height of drive pinion "B" and enter into data sheet item 1.

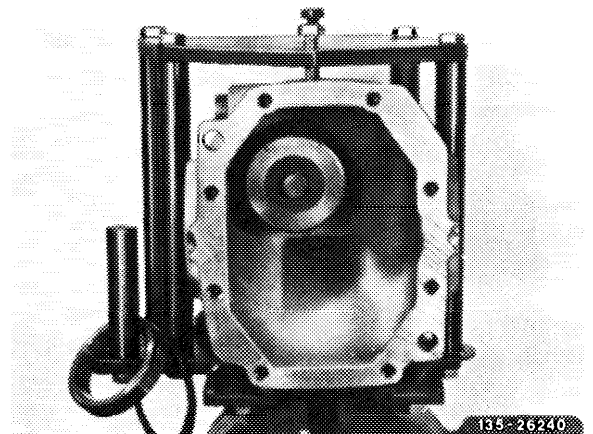


44 Enter basic deviation "a" of drive pinion (+ or -) under item 2 in data sheet.

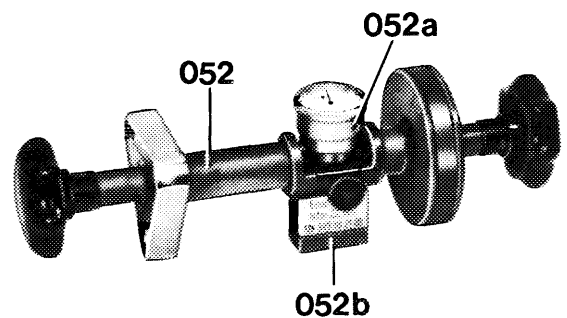
45 Add data of item 1 and 2 depending on prefix of value on drive pinion (+) or deduct (-).



46 Insert measuring body of measuring device into rear axle housing and screw on measuring body.



47 Insert dial gauge (052a) into measuring device (052). Push adjusting member (052b) against measuring device and adjust dial gauge to 0 at 2 mm preload. Tighten clamping screw while checking 0-position of dial gauge and realign, if required.

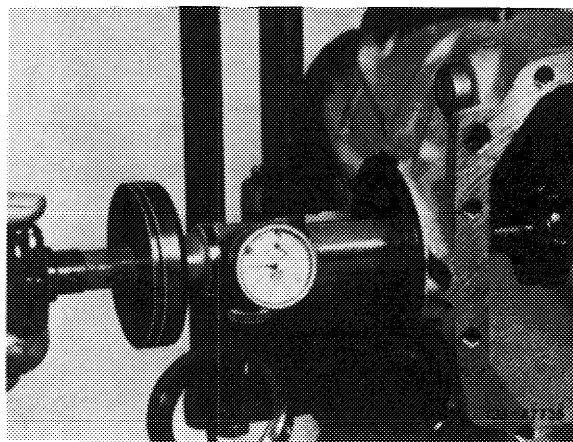


135-19645

48 Insert measuring device from direction of right-hand bore into rear axle housing.

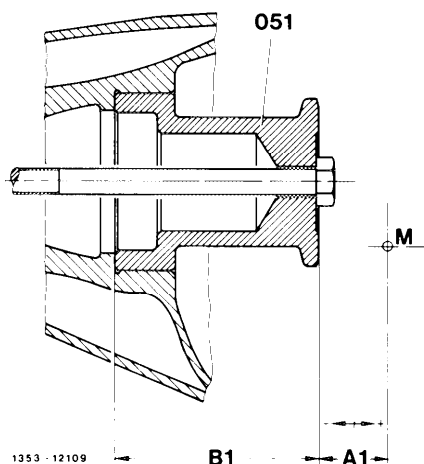
**Attention!**

When inserting measuring device into rear axle housing, make sure that the measuring pin of the dial gauge is not damaged on bore.



49 Read difference (A1) between preset gauge dimension and face of measuring body and enter into data sheet under item 3 in plus or minus direction.

**Note:** Naming the direction plus (+) or minus (-) is done with reference to turning direction of the dial gauge needle. A deviation from zero position in counterclockwise direction therefore means minus direction, in clockwise direction it means plus direction.



50 Add (+) or deduct (-) subtotal of values from item 1 and item 2, as well as value from item 3. This calculated value indicates the thickness of the compensating washer.

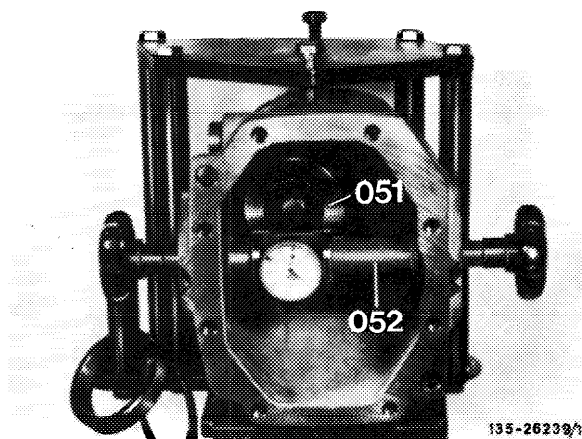
Example:

Item 1	=	0.88
Item 2	=	+0.37
	=	-
<hr/>		
Subtotal	=	1.25
Item 3	=	+0.28
Minus direction	=	-
Plus direction	=	-
<hr/>		
Thickness of compensating washer "S"	=	1.53
		=====

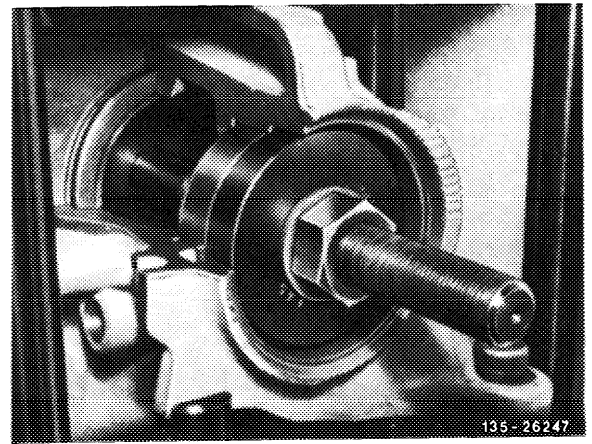
51 Remove measuring devices (051, 052) from rear axle housing.

52 Place compensating washer of calculated washer thickness "S" into rear axle housing (refer to example).

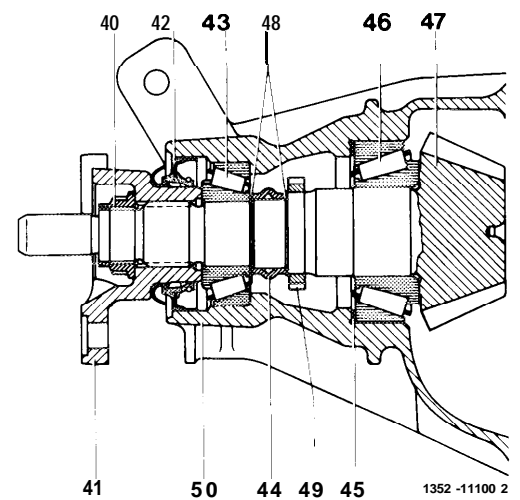
**Note:** Use hardened compensating washers only, they are available at varying thicknesses, If required, grind a compensating washer as required,



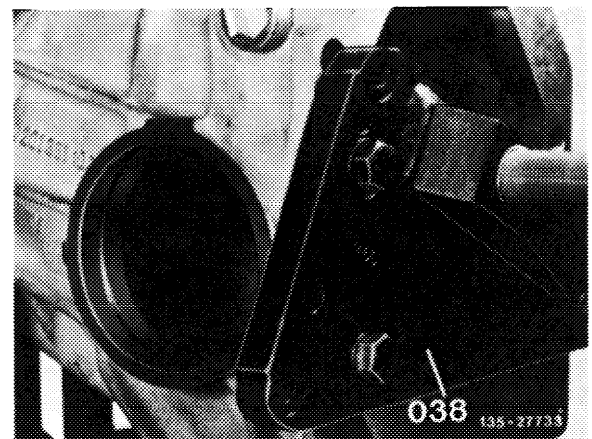
53 Insert outer races of front and rear tapered roller bearing into rear axle housing by means of inserting device.



54 Add one thrust washer (48) each on both sides of spacing sleeve (44) and place on drive pinion.



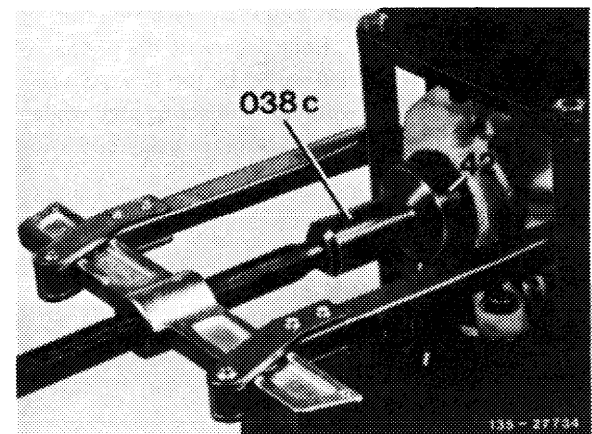
55 Insert drive pinion into rear axle housing and support with remover and installer (038).



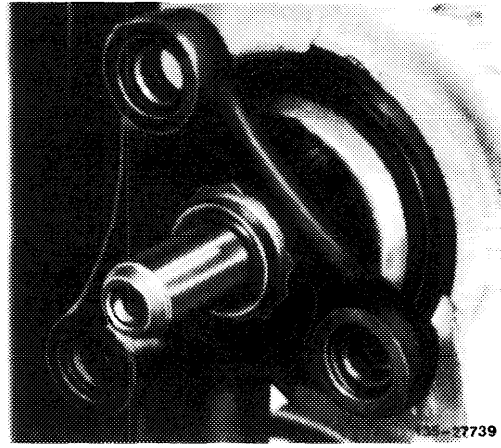
56 Insert inner race and sealing ring of front tapered roller bearing and force in with thrust piece (038c).

**Note:** Coat rubberized radial sealing ring (42) on circumference with hypoid gear oil or rubber sliding compound "Naphtolen H".

57 Take remover and installer from rear axle housing.



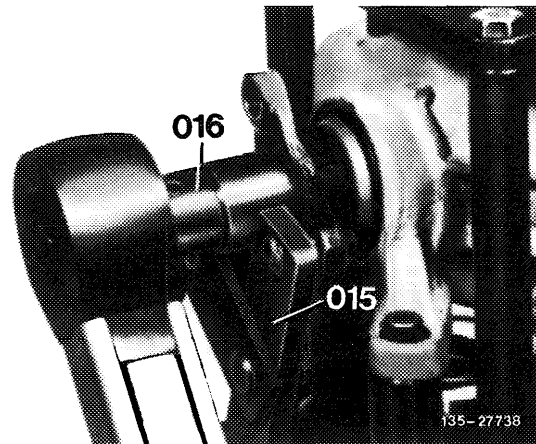
58 Coat running surface for radial sealing ring on flexible coupling with molybdenum disulfide paste and slip flexible coupling on drive pinion. Screw on new double hex. collar nut.



59 Place holding wrench (015) and double hex. socket (016) on flexible coupling and tighten nut carefully until a friction torque of 120-140 Ncm for new bearings and of 50-100 Ncm for used bearings is attained.

**Attention!**

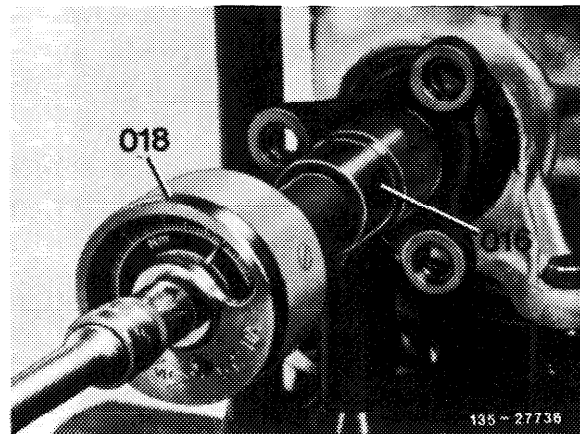
**When tightening double hex. collar nut rotate drive pinion several times and apply light blows against rear axle housing to make sure that the tapered rollers are easily rotating in races of ball bearings.**



60 To check, mount torque measuring instrument (018) with extension on double hex. socket (016) and rotate drive pinion.

**Note:** The tapered roller bearings of the drive pinion must be installed with a given preload. This preload is attained by compressing the spacing sleeve located between the bearing-inner race of front tapered roller bearing and drive pinion when tightening the double hex. collar nut,

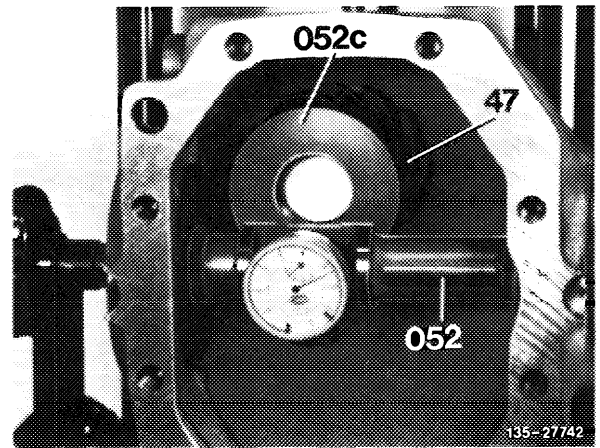
If the friction torque during rotation of drive pinion, that is, if the preload of the tapered roller bearing is too low, tighten double hex. collar nut again slightly. If the specified friction torque is exceeded, remove drive pinion once again and insert a new spacing sleeve. **Never reduce the friction torque by loosening the double hex. collar nut,** since otherwise the preload of the tapered roller bearing would be too low. As a result, the drive pinion would be subject to play while driving, which in turn would result in noisy operation of rear axle drive.



61 Place magnetic measuring plate (052c) on face of drive pinion (47) to measure adjusting dimension "A".

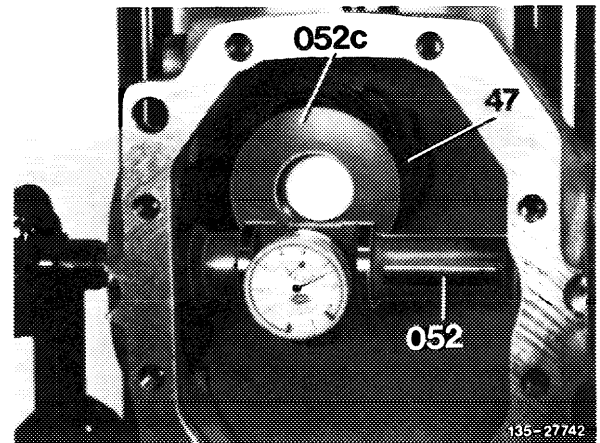
62 Insert measuring device (052) with dial gauge for checking adjustment once again into rear axle housing from direction of righthand bore.

On wheel set of the example named above, the dial gauge should indicate a deviation of 0.37 mm from basic dimension in plus direction; the same dimension which is written on face of drive pinion.



The permissible basic deviation of the adjusting dimension "A" may not exceed 0.01 mm in plus and 0.02 mm in minus,

If the deviation is higher, grind down installed compensating washer or install a new compensating washer of the required thickness. In such a case, be sure to use a **new spacing sleeve** for tapered roller bearing.



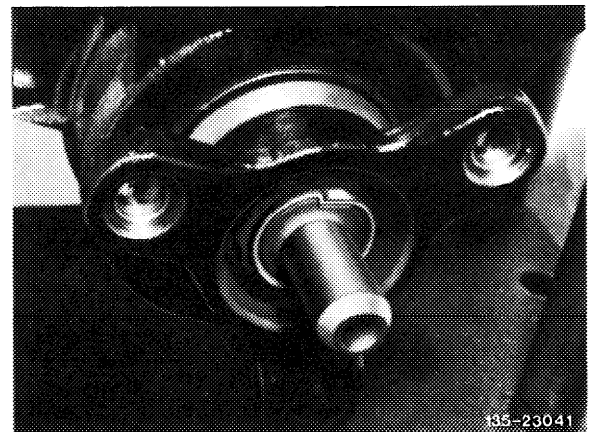
47 Drive pinion  
052 Measuring device  
052c Magnetic measuring plate

63 Remove measuring device with dial gauge and magnetic measuring plate from rear axle housing.

64 Peen double hex, collar nut with a peening tool into one of the two grooves of the drive pinion in such a manner that there will be no gap between the groove and the tab.

#### **Attention!**

Do not apply heavy axial blows.



### **Adjustment of backlash**

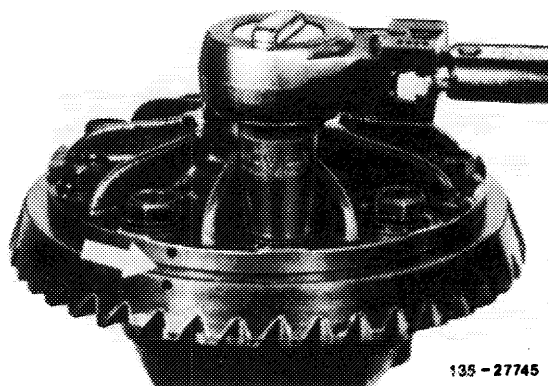
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**Note:** The backlash of the wheel set and the required preload of the tapered roller bearings in relation to bearing of differential is obtained by means of the locking rings inserted in rear axle housing. Locking rings of different thickness are available for this purpose. For assembly, the previously removed locking rings are most suitably installed again on respective side to obtain a basic adjustment.

65 Disassemble and assemble differential (35-560).

66 Carefully clean bore of ring gear and seat on differential cage. Heat ring gear to approx. 60-70 °C and place on differential cage. If applicable, pay attention to identification of ring gear and differential cage, if applied (arrow).

If the ring gear cannot be placed on differential cage, assist by means of light hammer blows (rubber hammer).



67 Tighten self-locking hex. screws for fastening ring gear uniformly and crosswise to 105 Nm.

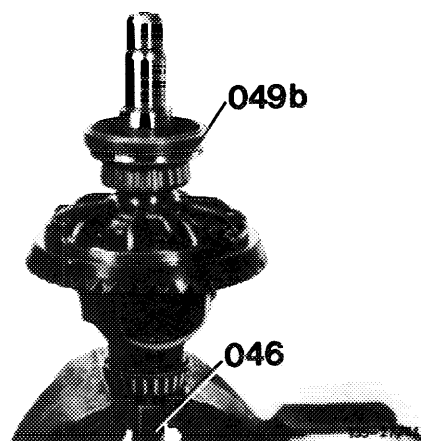
**Attention!**

Renew ring gear screws on principle after one-time use.

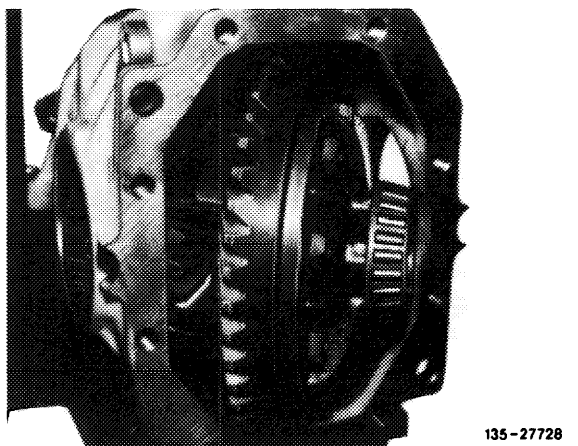
68 Press inner races of tapered roller bearings on differential cage by means of assembly mandrel (049b),

**Attention!**

Use assembly mandrel (046) to prevent damage to roller cage when pressing on second inner race.



69 Insert differential with lefthand end first into bore of rear axle housing, until the differential can be introduced at the right.

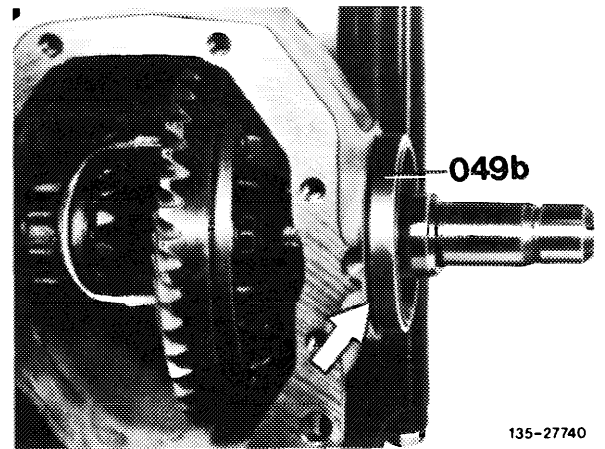




Note: Use two assembly mandrels for better assembly of outer bearing races,

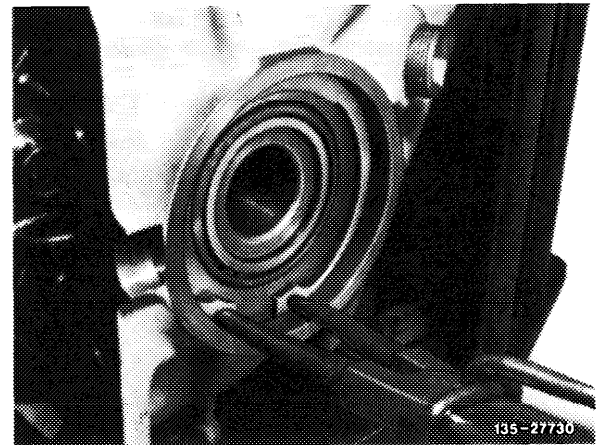
70 Locate differential with assembly mandrel (049b) in relation to rear axle housing.

71 Remove righthand assembly mandrel and again introduce with bearing outer race into rear axle housing until the assembly mandrel rests against housing (arrow).



135-27740

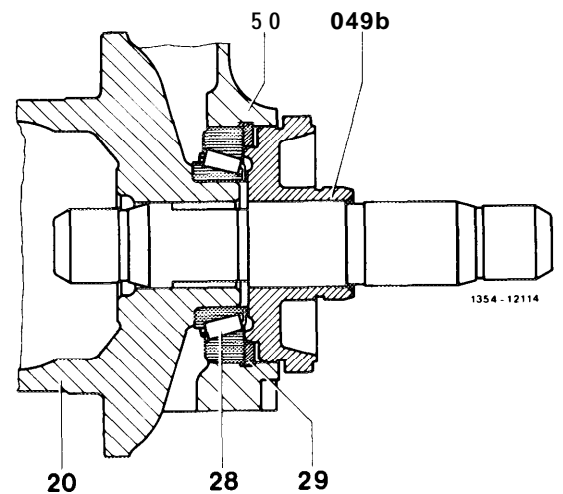
72 Remove assembly mandrel at the right. Insert previously removed locking ring into groove,



135-27730

73 Check locking ring (29) for correct seat by means of assembly mandrel (049b).

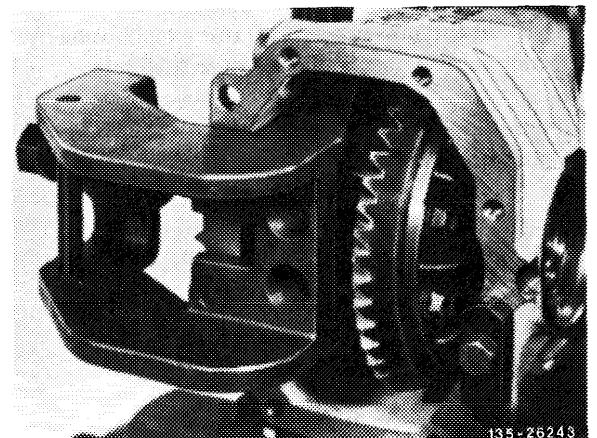
74 Introduce lefthand outer race into rear axle housing until it rests against tapered roller bearing inner race (28).



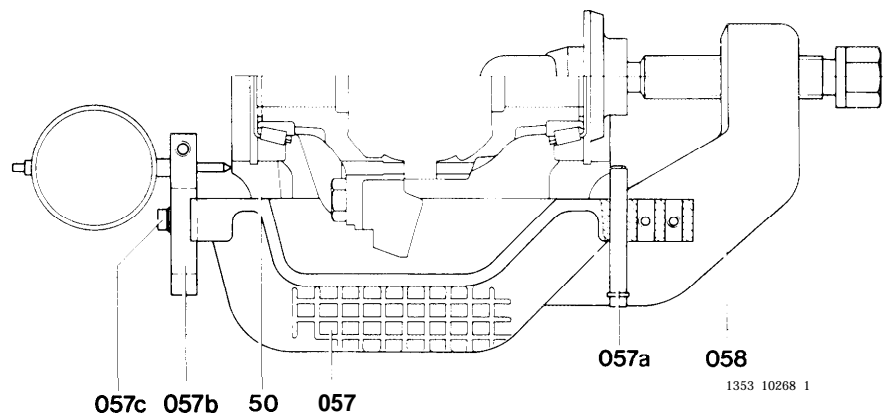
1354-12114

75 Fasten spreader to rear axle housing and manually position screw spindle up to contact surface on bearing outer race,

76 Fasten stop for supporting measuring bracket on rear axle housing.



135-26243



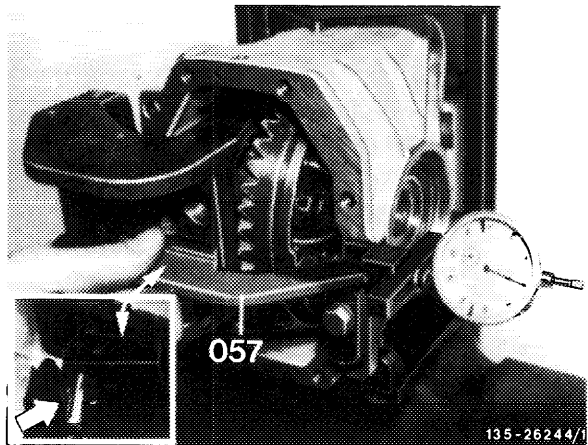
77 Insert stop bolt (057a) into inner bore of measuring bracket (057) and clamp down with knurled screw,

78 Adjust dial gauge holder (057b) lengthwise in such a manner (front notch), that the dial gauge tip comes to rest against rear axle housing (50). Clamp down dial gauge holder (057b) with hex. socket screw (057c).

79 Position spreader (057) and adjust dial gauge to 0 under 3 mm preload.

**Attention!**

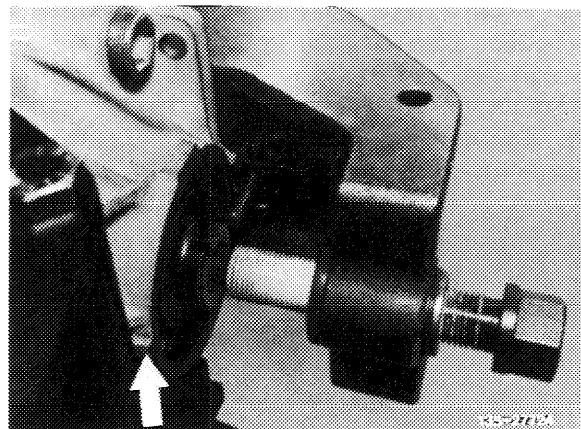
Make sure that the stop pin of the measuring instrument rests well against contact surface on rear axle housing (refer to cutout, arrow).



80 Turn one surface of thrust piece toward front rib (arrow) and preload (spread) rear axle housing by screwing spindle of spreader down to 0.25 mm.

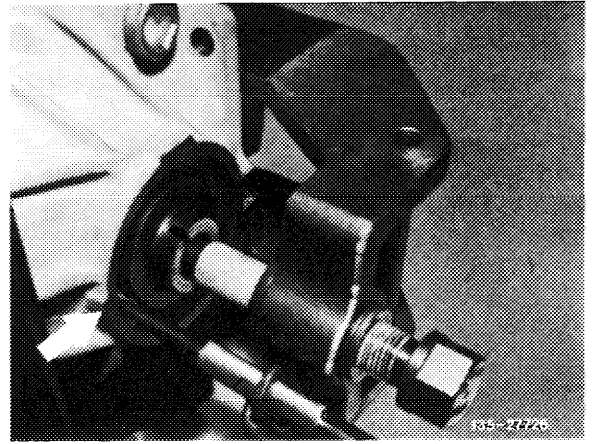
**Attention!**

Do not exceed 0.25 mm while spreading.



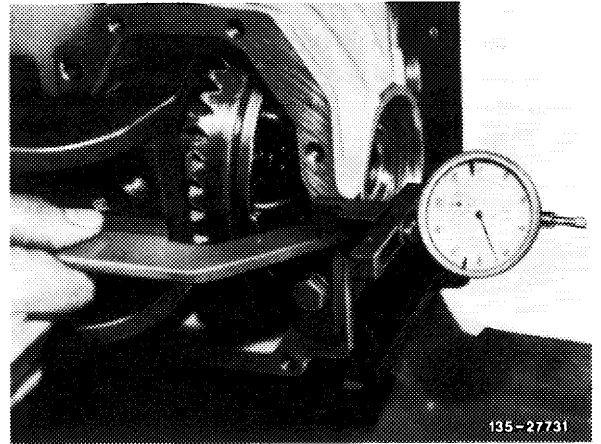
81 Insert locking ring installed up to now within range of front rib (arrow),

82 Slacken rear axle housing.



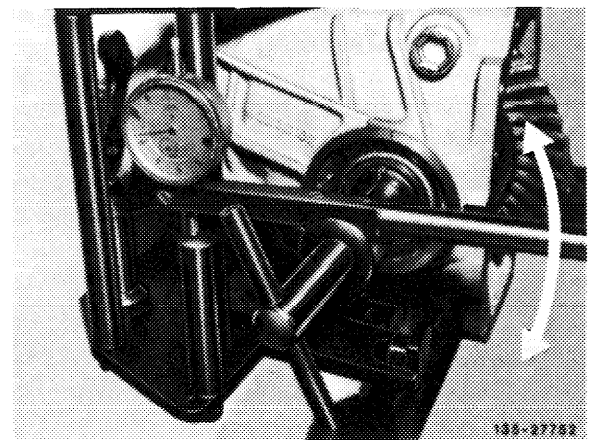
83 Measure spread dimension (widening) of rear axle housing with spreader. The required spread of rear axle housing and thereby the correct preload of tapered roller bearing on differential is attained when the spread is in range between 0.10 – 0.15 mm.

84 Remove spread measuring instrument.

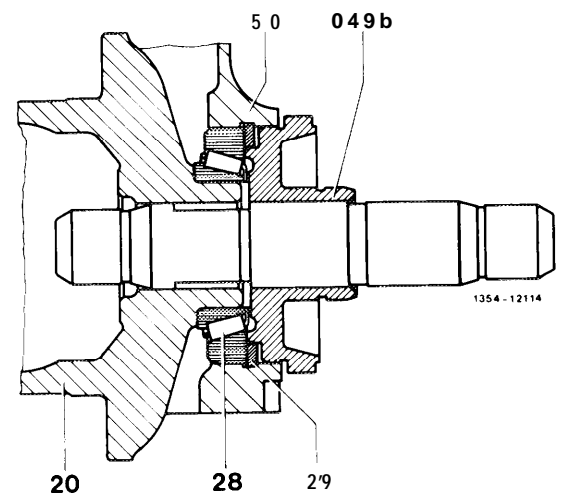


85 Insert backlash measuring instrument into left-hand bore of differential cage and clamp down.

86 By moving dial gauge holder, measure backlash at four points, with reference to circumference of ring gear. The minimum play is decisive. **Backlash should amount to 0.08 – 0.14 mm**, When measuring, always hold drive pinion in place at flexible coupling.

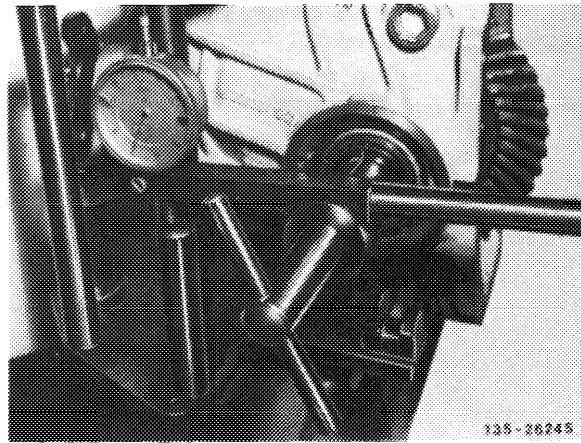


**Note:** Adjustment of tapered roller bearings and of wheel set is in order when the spread (widening) of the rear axle housing and the backlash are in range of nominal values. If these values are not attained, repeat adjustment by using locking rings (29) which are pertinently thicker or thinner.



**Example 1:** if the backlash is in order, but the spread of the rear axle housing is too low, mount \*thicker locking rings for the two locking rings which are each thicker by the same amount.

If the measured value is e.g. 0.05 mm, also increase the thickness of the locking ring at left and right by 0.05 mm. This may lead to a change of backlash!

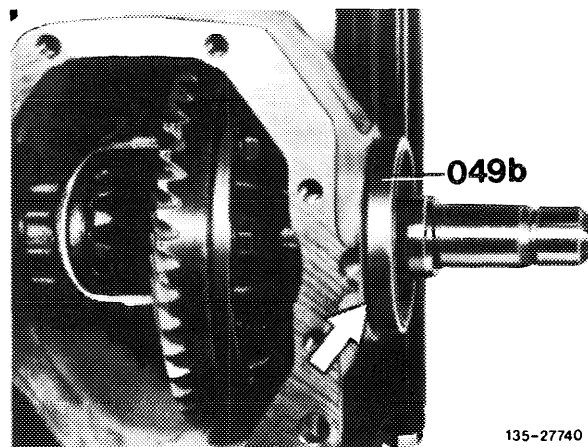


**Example 2:** If the spread is in order, but the backlash is too high, reduce the thickness of the locking ring from left assembly side by the lesser amount, and add the same amount at righthand assembly side (ring gear side). If the backlash is too low, proceed vice versa.

87 Remove backlash measuring instrument and spreader,

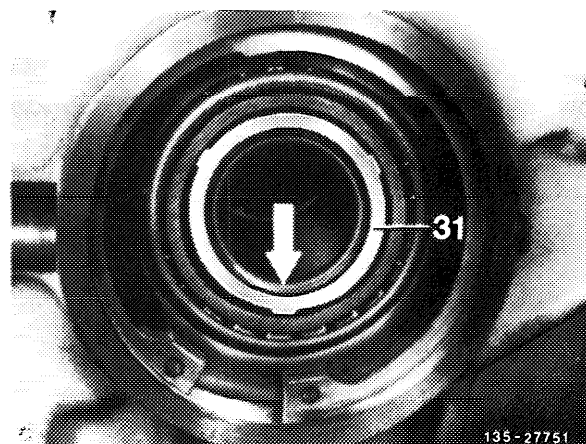
88 Check locking ring for correct seat by means of assembly mandrel (049b).

**Note:** If correctly seated, a gap of approx. 1 mm must show up between the rear axle housing and the assembly mandrel (arrow).

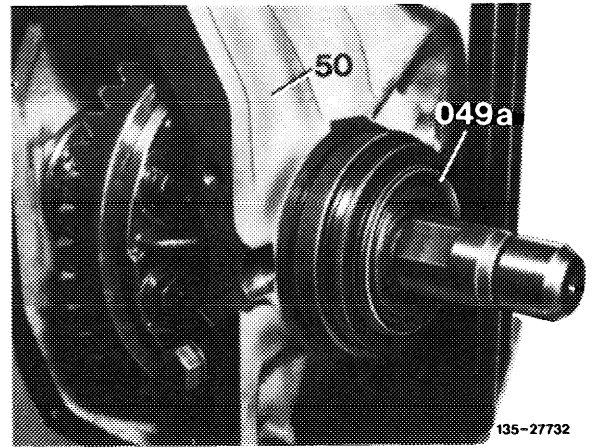


89 Insert compensation washer in differential cage (31).

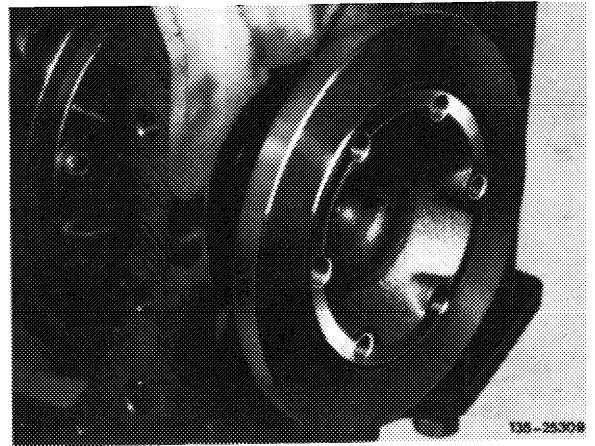
**Note:** Compensating washer should rest tightly against face of differential cage (arrow).



90 Coat rubberized radial sealing ring on OD with hypoid gear oil or rubber sliding compound "Naph-tolenH" and force into rear axle housing (50) with assembly mandrel (049a).

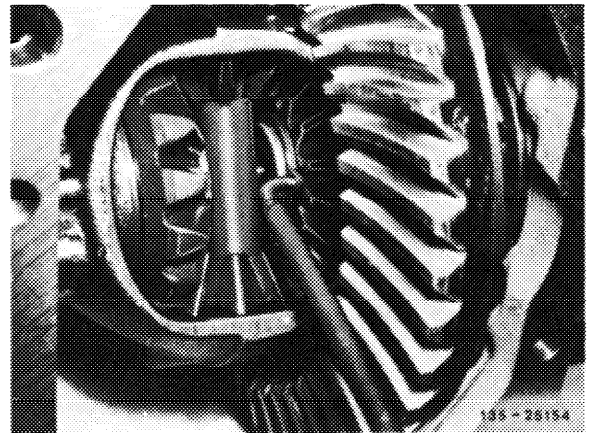


91 Slip lefthand and righthand connecting flange into differential side gear,



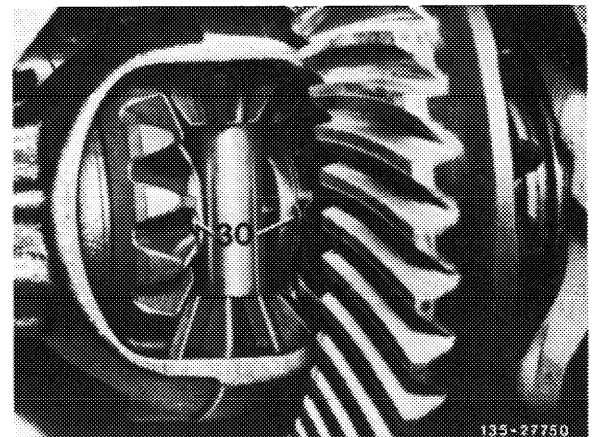
Connecting flange with ring-shaped weight

92 Use new locking ring of similar thickness between connecting flange and differential side gear and force in.



93 Check end play between connecting flange and differential side gear. There should be no noticeable end play; the locking ring (30) in groove should still be able to rotate. If required, mount locking ring thicker or thinner as required

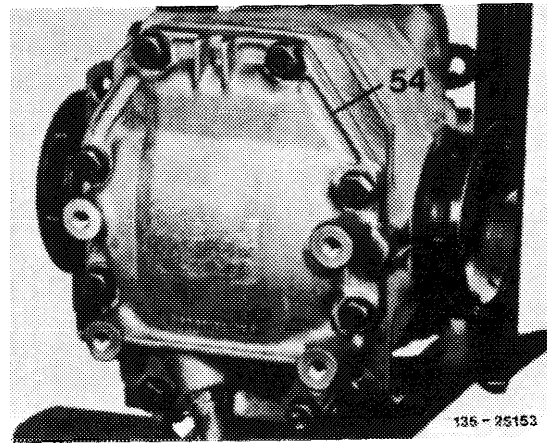
**Attention!**  
Renew locking ring after one-time use.



94 Clean sealing surface on end cover and on rear axle housing and coat with sealing compound, Mount rear axle end cover (54). Tightening torque of hex. head screws 45 Nm.

95 Fill in hypoid gear oil up to lower edge of oil filler bore. Tightening torque of closing plug 50 Nm.

96 Renew vent on rear axle end cover.



# Data sheet

## Adjustment of rear axle gears

Type **124, 201**



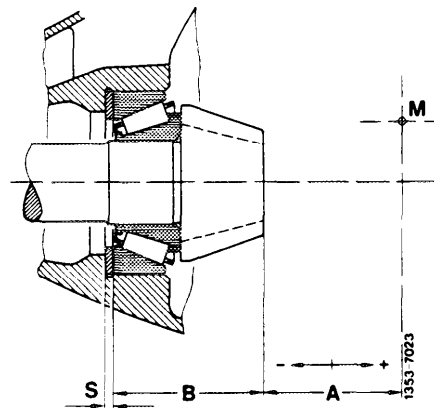
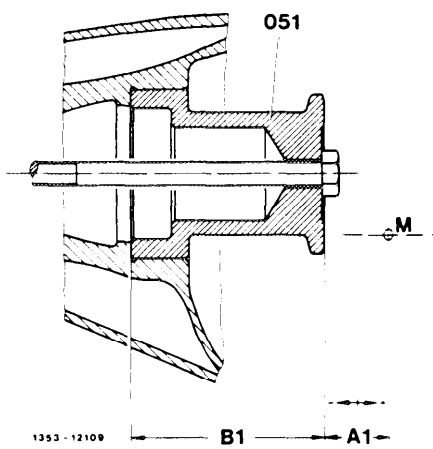
Branch/Agency \_\_\_\_\_

Customer \_\_\_\_\_

Chassis No. \_\_\_\_\_ Repair Order No \_\_\_\_\_

Measurement carried out: Date/Name \_\_\_\_\_ Date \_\_\_\_\_

License Plate No \_\_\_\_\_ Original Registration Date \_\_\_\_\_ Type \_\_\_\_\_ Odometer Reading km/miles \_\_\_\_\_



- A ≡ Basic adjusting dimension
- B ≡ Pinion height plus height of tapered roller bearing
- A1 ≡ Distance from face of measuring body to center of ring gear
- B1 ≡ Height of measuring body
- s ≡ Thickness of compensating washer
- M ≡ Center of ring gear
- 051 ≡ Measuring body

### Computation of washer thickness "S"

1. Difference between measuring body height "B1" and pinion height with bearing "B".

≡

2. Basic deviation "a" read on pinion (+ or -)

≡ +

≡ -

### Subtotal

≡

3. Difference between adjusting gauge and depth of rear axle housing "A1 "

minus direction  
plus direction

≡ +

≡ -

### Thickness of compensating washer "S"

≡

**Explanations and instructions**

a) Each drive pinion and ring gear of a gear assembly is identified by a consecutive number written on both components.

b) Measure difference between measuring body height "B1" and height of pinion plus height of tapered roller bearing "B" and enter into table under item 1.

c) Read basic deviation "a" on drive pinion and enter into column of table with respective prefix (+ or -) under item 2.

d) Add (+) or subtract (-) data of item 1 and item 2.

e) Measure difference between adjusting gauge dimension and depth of rear axle housing "Al " and enter into respective column of table (plus or minus direction) under item 3.

The directional data plus (+) or minus (-) refer to direction of rotation of dial gauge needle. A deviation from zero position in anti-clockwise direction means minus direction, in clockwise direction plus direction.

f) Only the basic adjustment dimension "A" is decisive for adjustment of the drive pinion. When checking the basic adjusting dimension "A" the drive pinion must be completely installed together with the spacing sleeve and the friction torque should amount to 120-140 Ncm for new tapered roller bearings and to 50-100 Ncm for used roller bearings. If the limit of 0.01 mm in plus direction and of 0.02 mm in minus direction from basic adjusting dimension "A" is exceeded, grind down compensating washer or install another compensating washer of appropriate thickness. In doing this it is imperative that a **new spacing sleeve** is used.

**Example**

**Computation of washer thickness "S" with small center piece.**

1. Difference between measuring body height "B1" and pinion height with bearing "B" (measured valve only).

= 0.88

2. Basic deviation "a" read on pinion (+ or -)

= + 0.37

= -

**Subtotal**

1.25

3. Difference between adjusting gauge dimension and depth of rear axle housing "Al "

minus direction  
plus direction

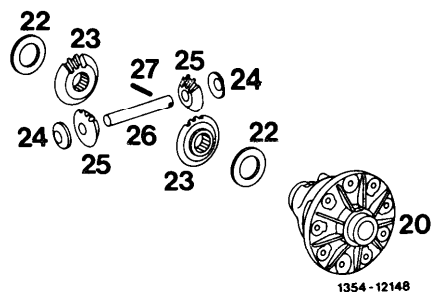
= + 0.28

= -

**Thickness of compensating washer "S"**

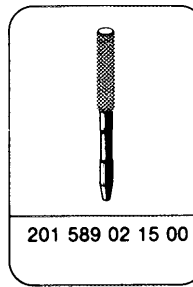
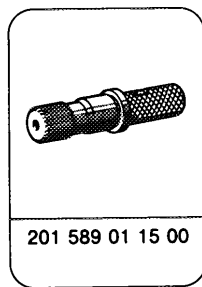
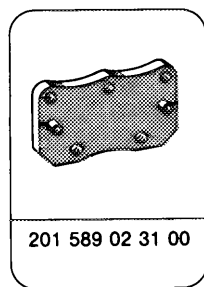
= **1.53**





20	Differential cage .....	Check radial and axial runout at pilot bore for ring gear max. 0.02 mm, special tool: Clamping plate 201 589 02 31 00
22	Thrust washer .....	Renew, selecting thickness in such a manner that a friction torque of 40-90 Nm is attained, thickness from 1.25 to 1.65 mm, steps 0.1 to 0.1 mm
23	Differential side gear. ....	Check for damage, special tool: Assembly mandrel 201 589 01 15 00
24	Spherical washer .....	Renew
25	Differential pinion .....	Check for damage, special tool: Assembly mandrel 201 589 02 15 00
26	Pinion shaft .....	Check for wear
27	Clamping sleeve .....	Renew

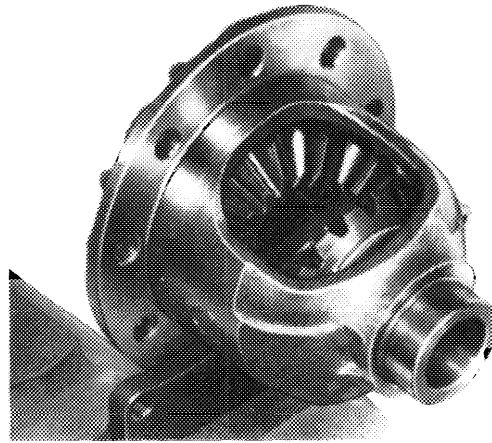
**Special tools**



## Disassembly

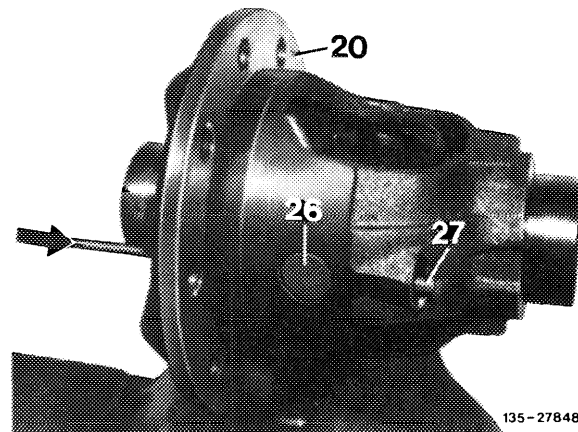
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1 Fasten differential on clamping plate and clamp into vise.



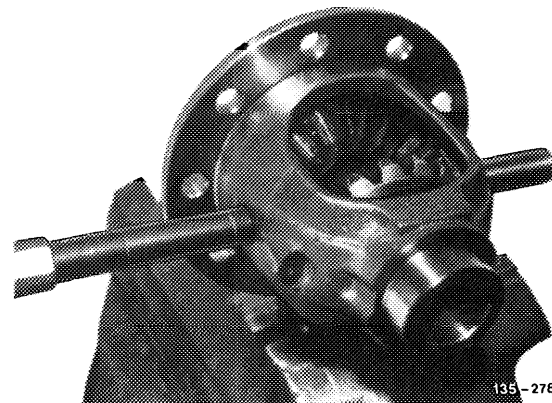
135-27855

2 Knock clamping sleeve (27) for pinion shaft (26) out of differential cage (20) (arrow) by means of a suitable mandrel.



135-27848

3 Push out pinion shaft and remove differential pinions, differential side gears, thrust washers and spherical washers.



135-27847

4 Check individual parts for reuse. Renew all differential pinions, thrust washers and spherical washers, running hot or seizing, on principle,

5 Check bores in differential cage, Check pilot bore and contact surface for ring gear for radial and axial runout,

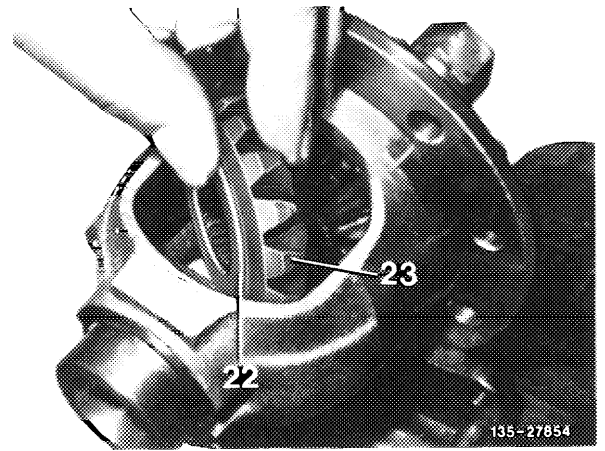
## Assembly

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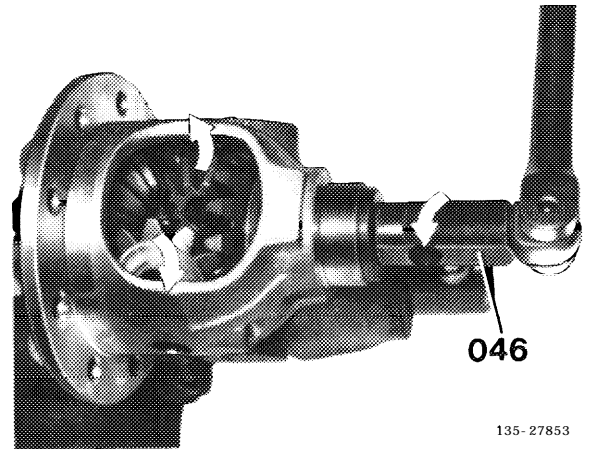
6 Insert both assembly mandrels into bores of differential cage,

7 Place thrust washer (22) on differential side gears (23).

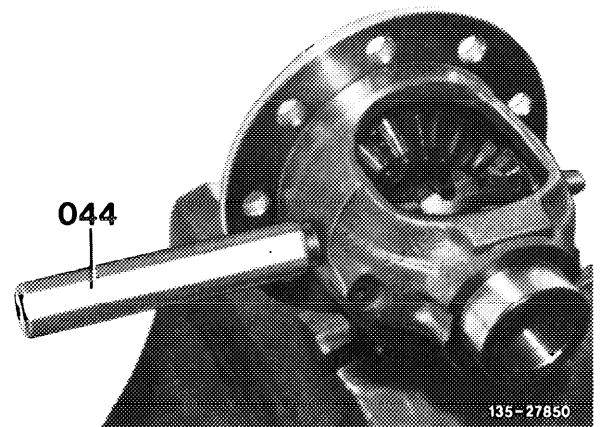
8 Place both differential side gears (23) with thrust washers (22) on assembly mandrels in differential cage.



9 Rotate and insert both differential pinions and spherical washers together into differential cage by means of assembly mandrel (046).

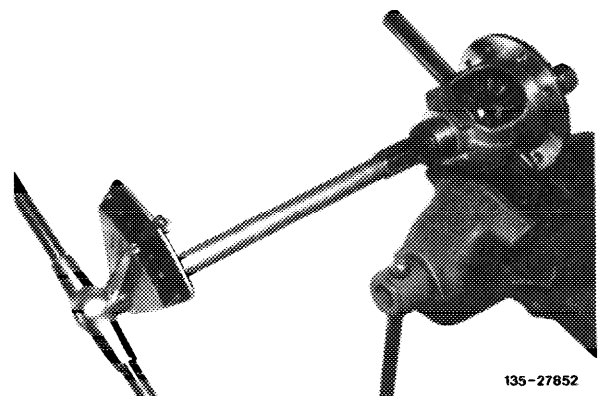


10 Slip assembly mandrel (044) into differential cage instead of pinion shaft to locate differential pinions and spherical washers.

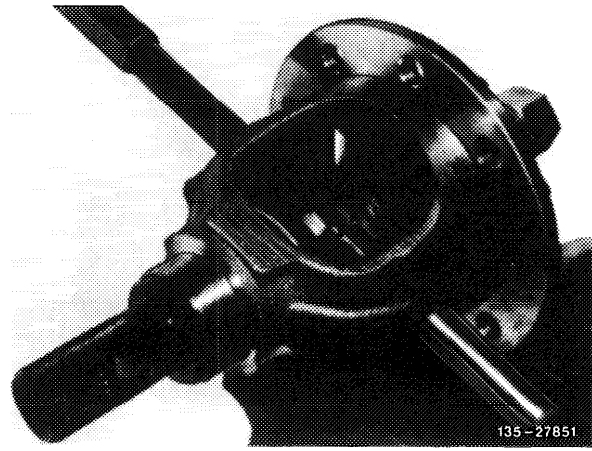


11 Check friction torque. Friction torque should amount to 40-90 Nm; up to 100 Nm are permitted when retarded.

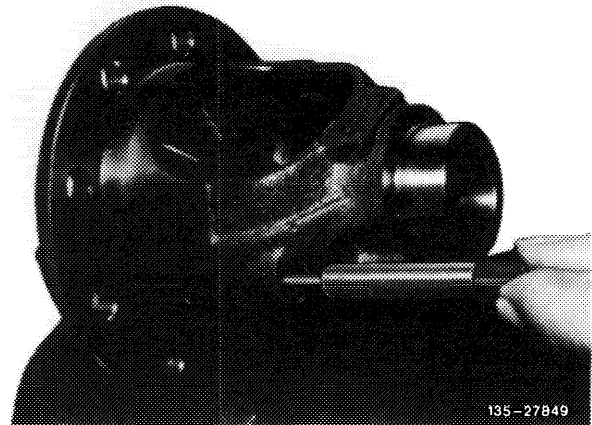
**Note:** Select thrust washers for differential side gears in such a manner that a given friction torque is available during assembly.



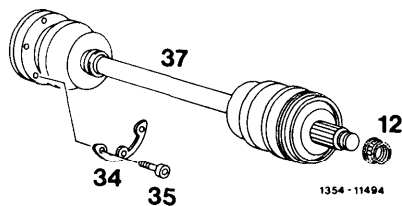
12 Knock in pinion shaft while paying attention to bore for clamping sleeve.



13 Knock in new clamping sleeve with a suitable mandrel.

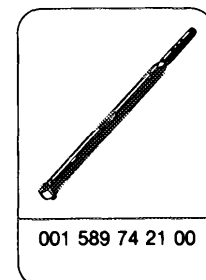
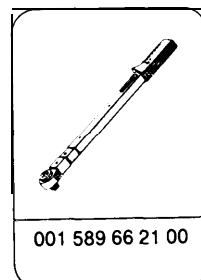
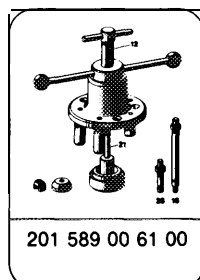
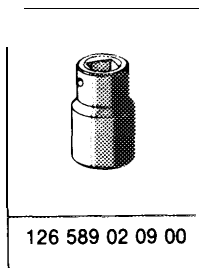


## 35-620 Removal and installation of rear axle shaft



12	Double hex. collar nut .....	Renew, tightning torque 280-320 Nm, secure by knocking in collar, special tool: socket 30 mm 126589020900
34	Washer .....	Renew
35	Locking screw .....	Renew, tightening torque 70 Nm, threads and screw head contact surface lubricated
37	Rear axle shaft, complete .....	Check rubber sleeves for damage, special tool: Remover and installer 201 589 00 61 00

### Special tools



### Conventional tools

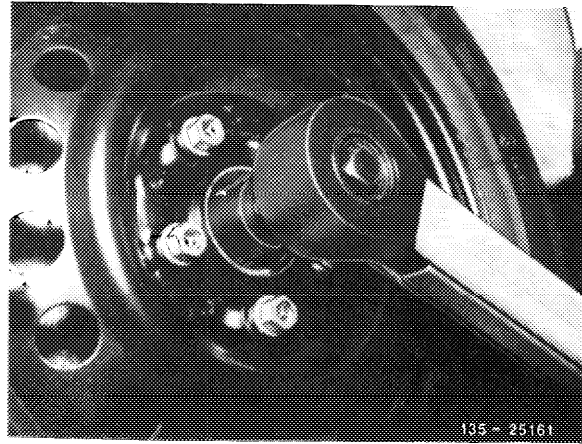
Screwdriver element for inside multi-tooth screws (XZN)1/2" square

e.g. Hatet  
D-5630 Remscheid  
Order No. 999 lg-10

## Removal

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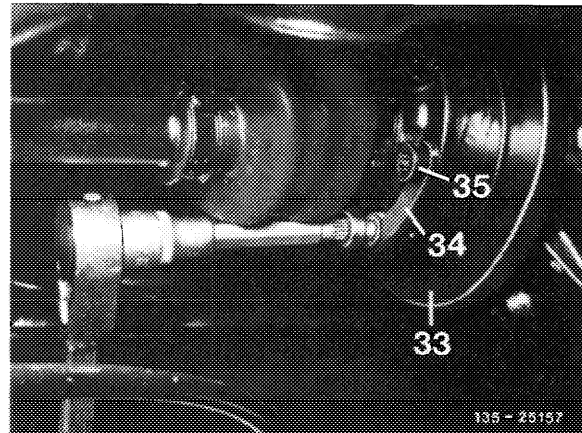
1 Loosen double hex. collar nut for fastening rear axle shaft prior to lifting vehicle and remove.



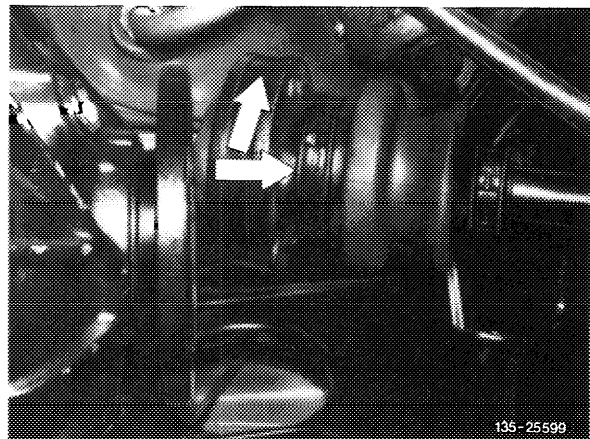
2 Remove rear axle shaft on connecting flange (33) and remove together with locking screws (35) and washers (34).

### Attention!

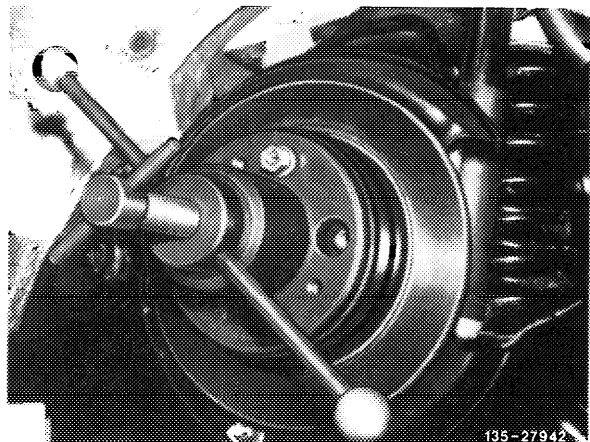
Make sure that while loosening locking screws the screw-driver element is **well-inserted in multi-tooth profile**. Clean, if required.



3 Separate rear axle shaft from connecting flange. Telescope rear axle shaft in axial direction (arrow) and swivel upwards (arrow).

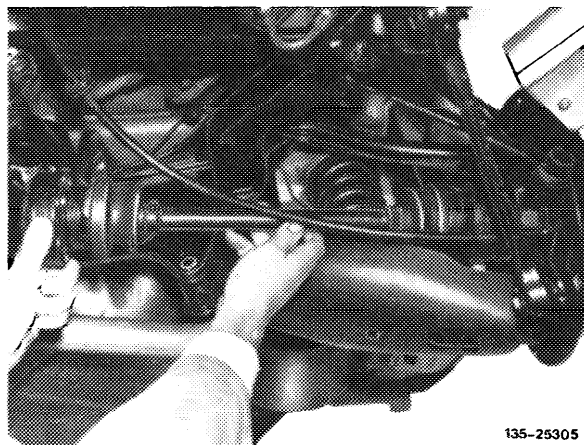


4 At fixed seat of rear axle shaft in rear axle shaft flange, push out rear axle shaft by means of remover.



5 Push rear axle shaft down at front end and remove.

**Note:** Make sure that end cover of universal joint ring is not loosening when removing rear axle shaft.

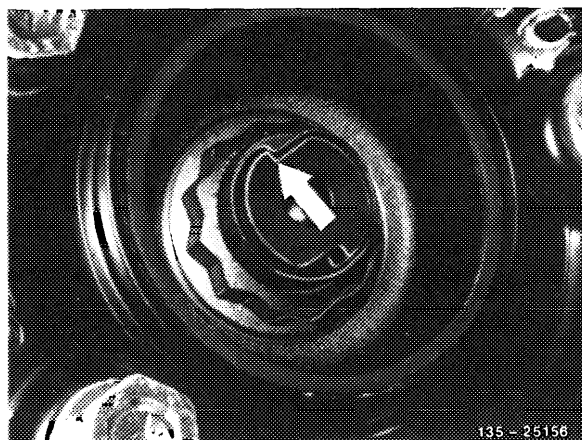
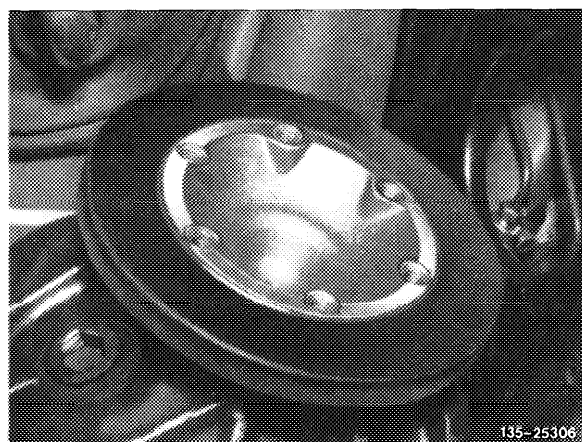


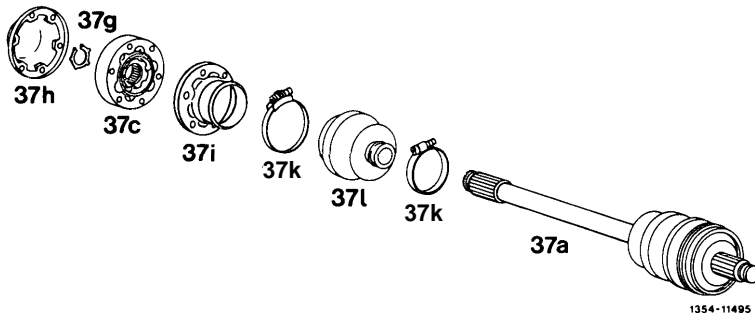
6 Check synchromesh joints as well as rubber sleeves and end cover for leaks and damage.

### Installation

7 Install in vice versa sequence, Pay attention to the following items:

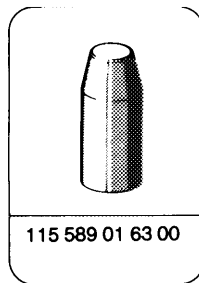
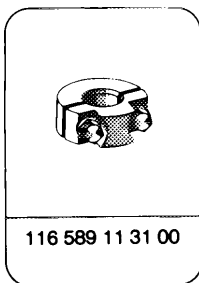
- a) Renew locking screws and double hex. collar nut on principle.
- b) Protect flange-on surface between connecting flange and end cover of rear axle shaft against contaminations.
- c) Prior to screwing-in locking screws, **moisten threads and screw head contact surface with oil.**
- d) Tightening torque of locking screws 70 Nm and of double hex. collar nut 280-320 Nm.
- e) Lock double hex. collar nut at crush flange (arrow).





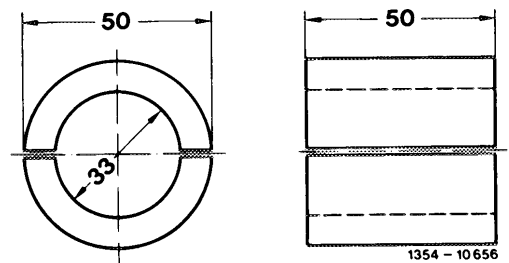
37a Rear axle shaft .....	Check for damage, special tool: Clamping jaws 116589 11 31 00
37c Ring joint inside complete. ....	Check for wear, use MB-longterm grease only, filling capacity model 201.02/01 100 grams per joint
37g Locking ring. ....	Renew
37h End cover .....	Check for damage, coat sealing surface with sealing compound
37i Sleeve cap .....	Check for damage, coat sealing surface with sealing compound
37k Hose clamp .....	Renew
37l Rubber sleeve .....	Renew, special tools: Assembly sleeve 11558901 6300

**Special tools**



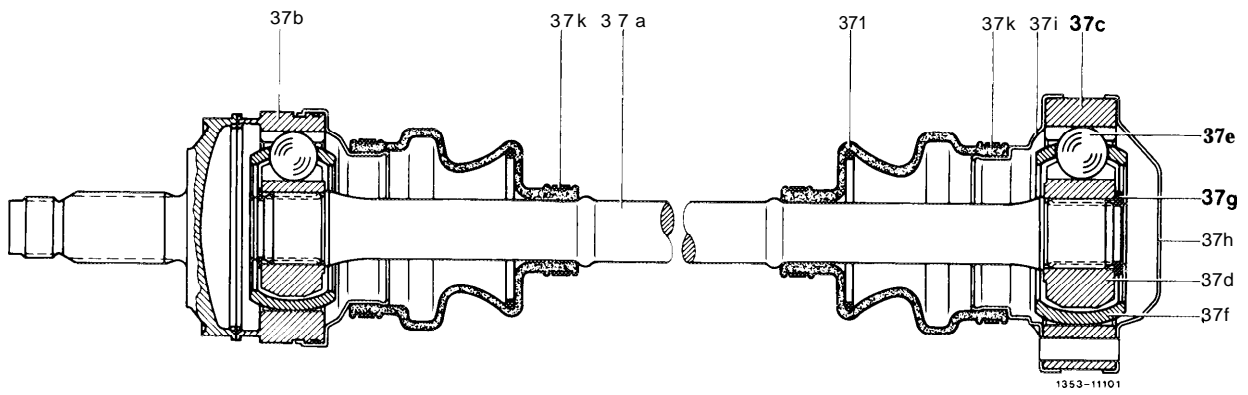
**Self-made tool**

Half shells for pressing off  
synchromesh joint



1354 - 10656





- |                                 |                  |                   |
|---------------------------------|------------------|-------------------|
| 37a Rear axle shaft             | 37e Ball         | 37i Sleeve cap    |
| 37b Universal joint ring, outer | 37f Ball cage    | 37k Hose clamp    |
| 37c Universal joint ring, inner | 37g Locking ring | 371 Rubber sleeve |
| 37d Universal joint hub         | 37h End cover    |                   |

#### Note

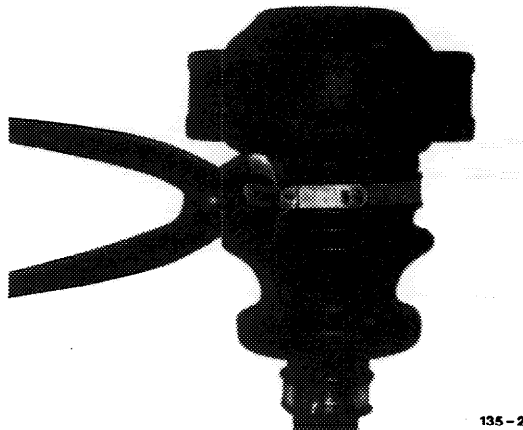
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Rubber sleeve of rear axle shaft on outer joint can be renewed only after disassembly of inner joint, since disassembly of outer joint is not possible.

#### Disassembly

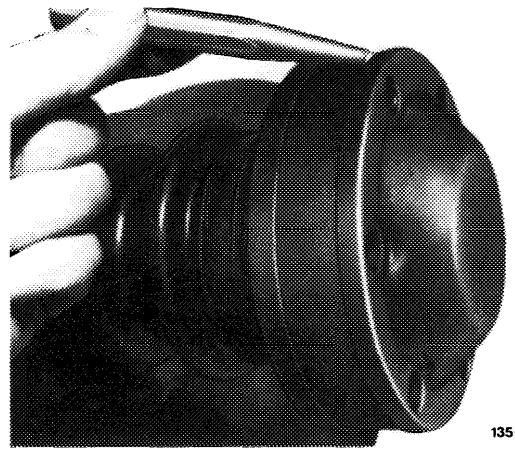
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- 1 Remove rear axle shaft (35-620).
- 2 Loosen hose clamps and remove. Open hose clamps without clamping screw by means of cutting pliers on clamping tube.



135-22694

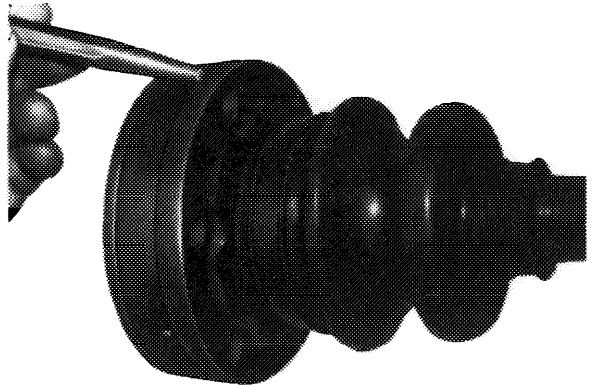
3 Force end cover from universal joint ring.



135-22695

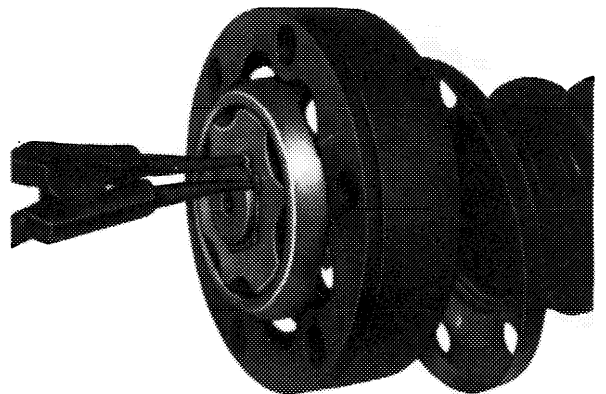
4 Force sleeve cap from universal joint ring.

5 Slip rubber sleeve with sleeve cap back on rear axle shaft. Clean joint from grease.



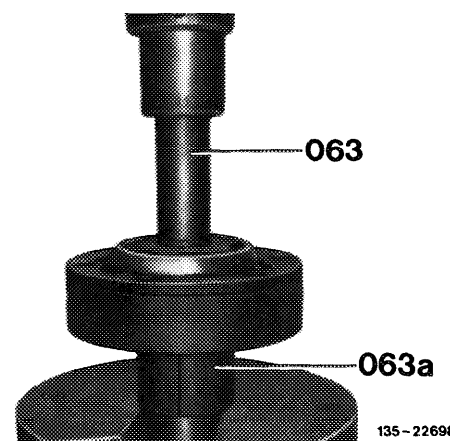
135-22696

6 Remove locking ring.

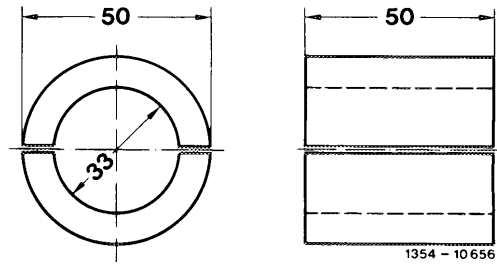


135-22697

7 Press synchromesh joint from rear axle shaft, while using the two self-made shells (063a) as well as a suitable mandrel (24 mm dia. and approx. 80 mm long 063).

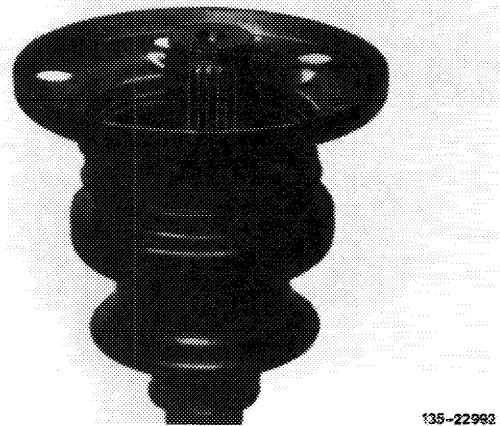


135-22698

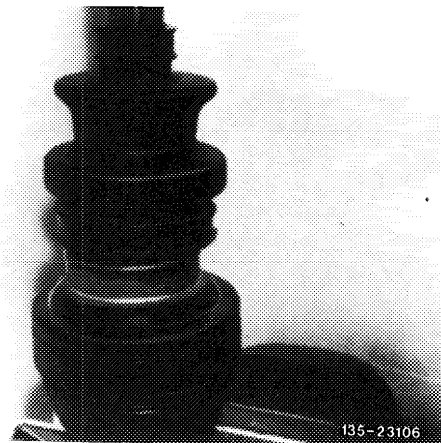


Self-made half shells

8 Pull sleeve cap and rubber sleeve from rear axle shaft.



Note: The second rubber sleeve can now be pulled off after loosening hose clamps via disassembled end of rear axle shaft, if required. Make sure that nothing of grease charge is getting lost and that no dirt can enter inside joint. Wipe off the grease still inside rubber sleeve and fill into synchromesh joint.

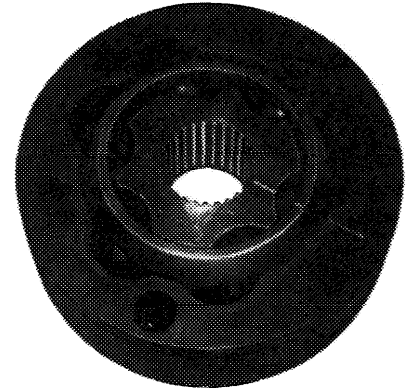


9 Clean synchromesh joint.

## Checking synchromesh joint for wear

**Note:** Disassemble joint for checking synchromesh joint for wear.

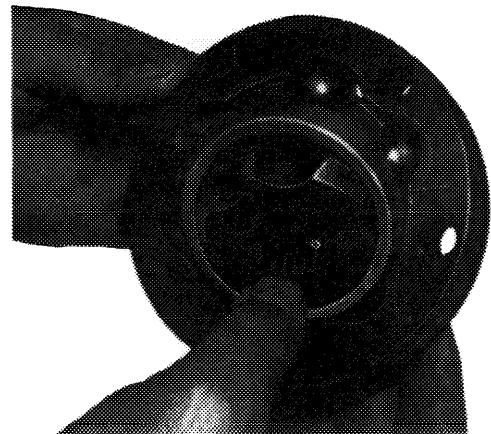
10 Mark location of universal joint ring, joint hub and ball cage prior to disassembly with electric pen or dressing stone.



135-22693

11 Swivel joint hub with ball cage and remove balls individually one after the other.

12 Remove joint hub with ball cage from universal joint ring.



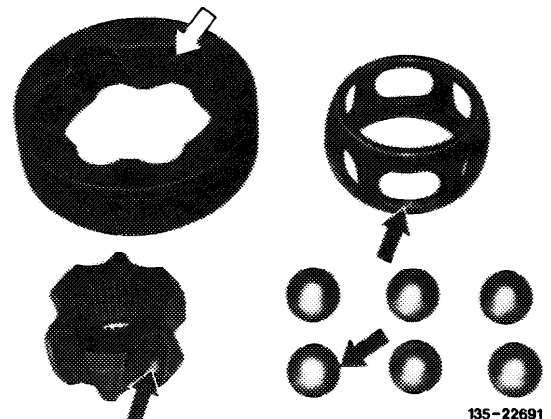
135-22692

13 Swivel joint hub by 90° in relation to ball cage and remove.



135-22699

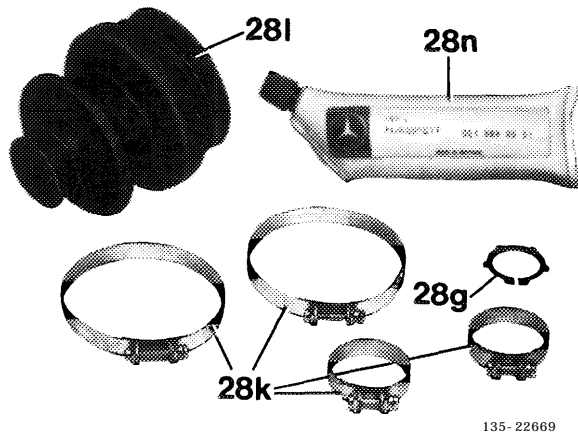
14 Check ball races of joint ring, joint hub, ball cage and balls for pitting marks and evidence of wear (arrows). If these parts are showing considerable wear, renew complete synchromesh joint. Smooth spots and running traces caused by the balls are no reason for exchanging synchromesh joint.



135-22691

Note: A repair kit with all required parts is available for changing sleeve. If a second sleeve is required for the same rear axle shaft, use an additional rubber sleeve for this purpose.

- 28l Rubber sleeve
- 28k Hose clamps
- 28s Locking ring
- 28n MB longterm grease



135-22699

**Assembly**

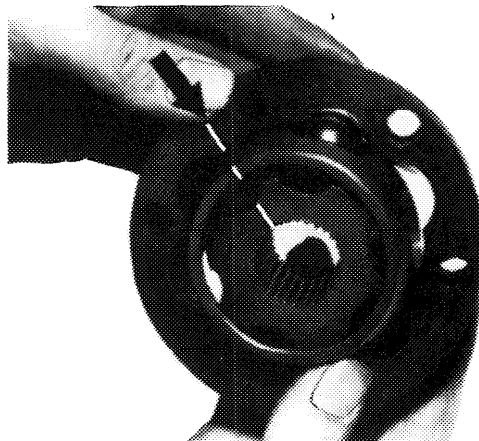
15 Set joint hub vertically in relation to ball cage an insert.



135-22699

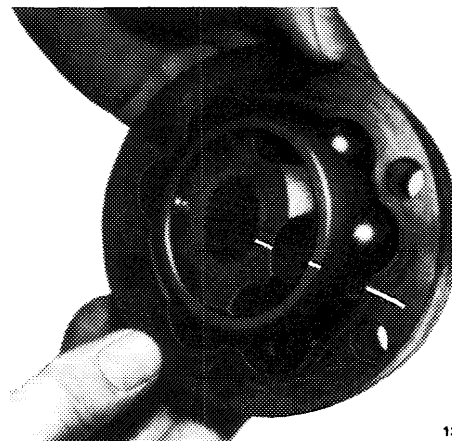
16 Introduce one ball while paying attention to applied mark of joint hub and ball cage.

17 Insert joint hub with ball cage and ball into joint ring. Also pay attention to applied marks (arrow).



135-22707

18 Swivel joint hub with ball cage to the extent that one ball after the other can be inserted.



Sixth ball inserted

135-22705

19 Slip assembly sleeve (029) on splining of rear axle shaft.



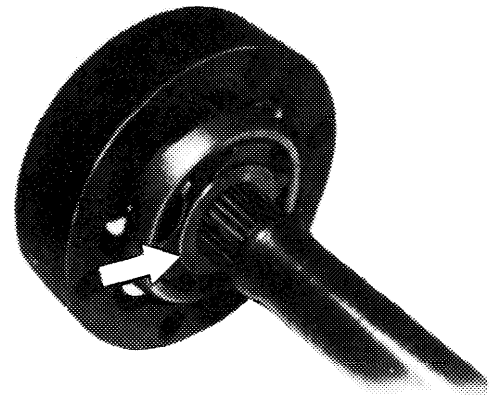
135 - 22704

20 Slip rubber sleeve and sleeve cap on rear axle shaft.



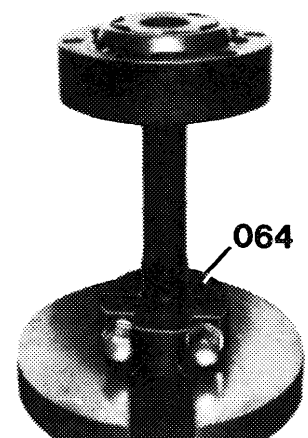
135 - 22703

21 Slip synchromesh joint on rear axle shaft (arrow).



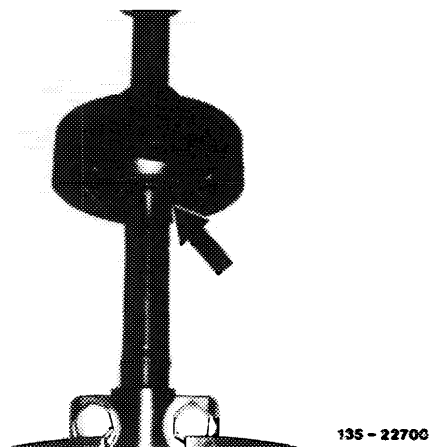
135 - 22702

22 Position clamping device (064) against sleeve flange of rear axle shaft.



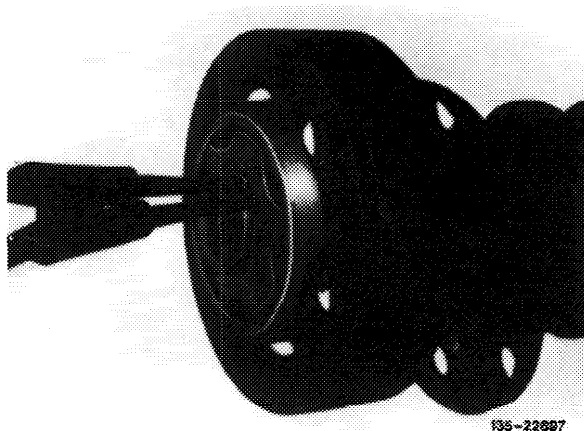
135 - 22701

23 Press on synchromesh joint by means of a suitable mandrel up to contact surface of rear axle shaft (arrow).

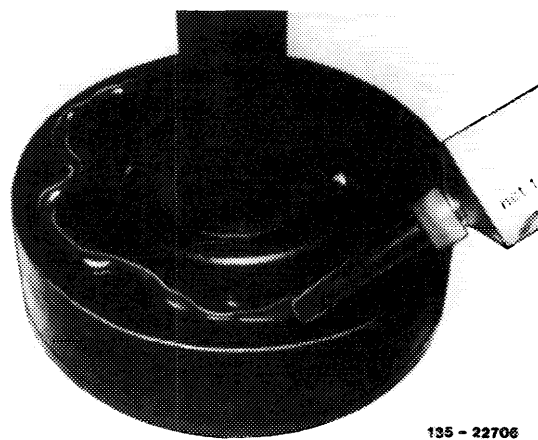


24 Remove clamping device and pressing-on mandrel.

25 Mount locking ring.



26 Coat sealing surface on synchromesh joint of end cover and sleeve cap with sealing compound (e.g. Curil, Loctite 574 or Hylomar) and mount. But mount end cover only after the grease has been filled in.



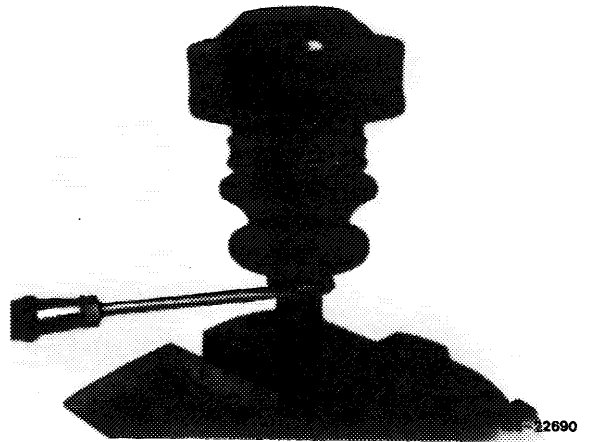
27 Fill synchromesh joint and rubber sleeve with grease.

**Attention!**

Use specified type of grease and quantity only.

28 Fasten rubber sleeve on sleeve cap and on rear axle shaft with new hose clamp, while pushing sleeve up to bead on rear axle shaft.

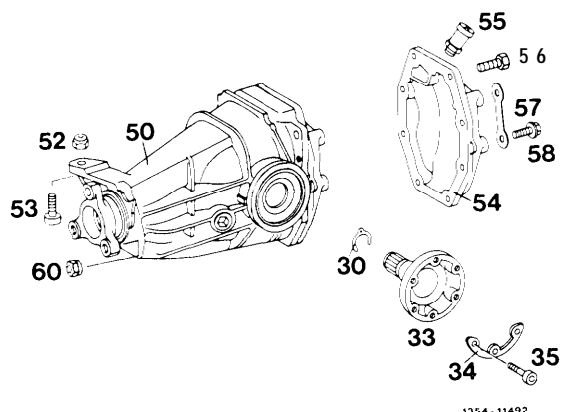
Note: The screws of the two hose clamps on one sleeve should point in one and the same direction. On second sleeve, mount clamps in such a manner that the screws are rotated by 180° in relation to first sleeve.





## 35-670 Removal and installation of connecting flange of rear axle shaft

Rear axle center piece removed



30 Locking ring

33 Connecting flange without ring-shaped weight

34 Washer

35 Locking screw

50 Rear axle center piece

52 Self-locking hex. nut, front

53 Hex. socket screw, front

54 Rear axle end cover

55 Vent

56 Hex, head screw

57 Locking plate

58 Locking screw, rear

60 Self-locking hex. nut for propeller shaft

Renew, thickness from 1.20 to 1.80 mm for adjusting end play, steps: 0.05 to 0.05 mm

Renew, if heavy score marks of radial sealing ring are showing up

Renew

Renew, tightening torque 70 Nm, threads and screw head contact surface lubricated

Clean sealing surface, oil type hypoid gear oil SAE 90, filling capacity 0.7 liter (Specs. for Service Products, sheet 235), special tool: Clamping device 201 589 03 31 00

Renew

Tightening torque 45 Nm

Clean sealing surfaces and coat with sealing compound

Renew dirty vent

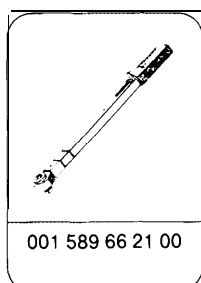
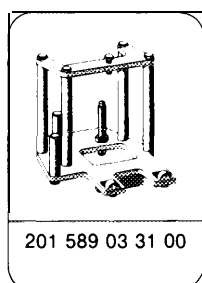
Tightening torque 45 Nm

Renew

Renew, tightening torque 50 Nm

Renew, tightening torque 40-50 Nm

### Special tools



## Conventional tool

Screw driver element for multitooth socket screws M 10 (XZN) 1/2" square

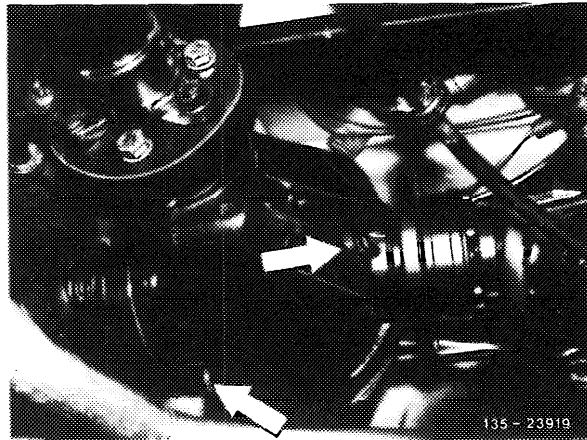
e.g. Hazet  
5630 Remscheid  
Order-No. 990 Ig-10

## Note

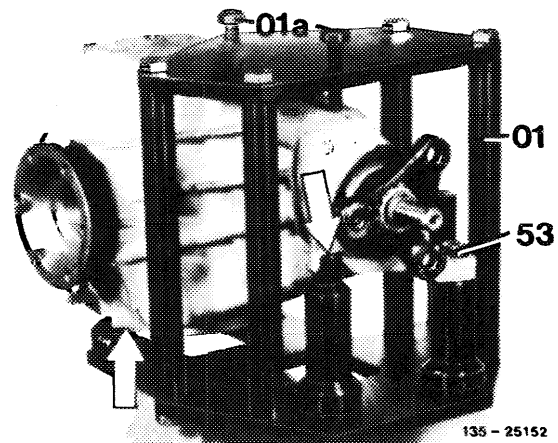
A connecting flange can be replaced only with rear axle center piece removed. Thoroughly clean rear axle housing in range of bearing cap so that no dirt can enter rear axle housing.

## Removal

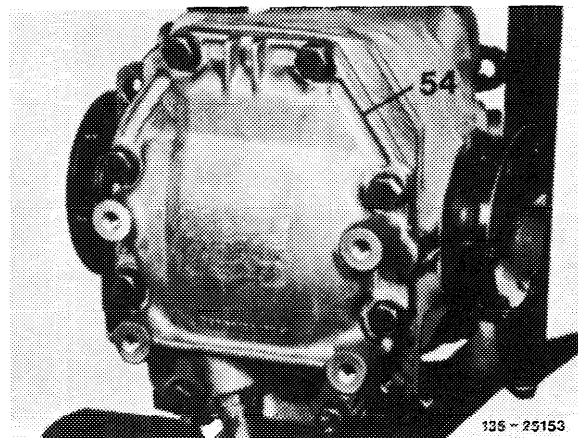
- 1 Drain rear axle oil.
- 2 Remove rear axle center piece (35-520).



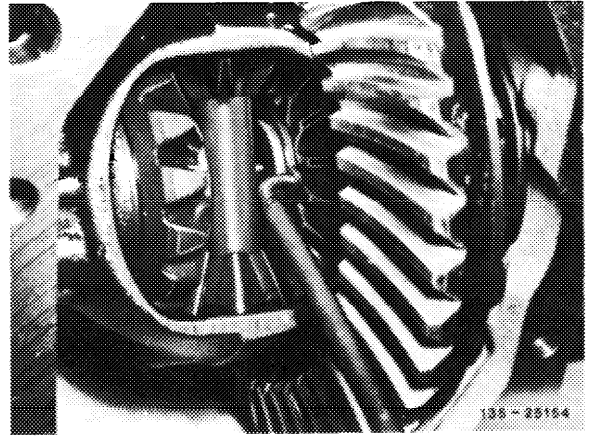
- 3 Place rear axle center piece into clamping fixture (01) and tighten with hex. socket screw (53) and hex. head screws (01 a). Pay attention to good seat of center piece in clamping fixture (arrows).



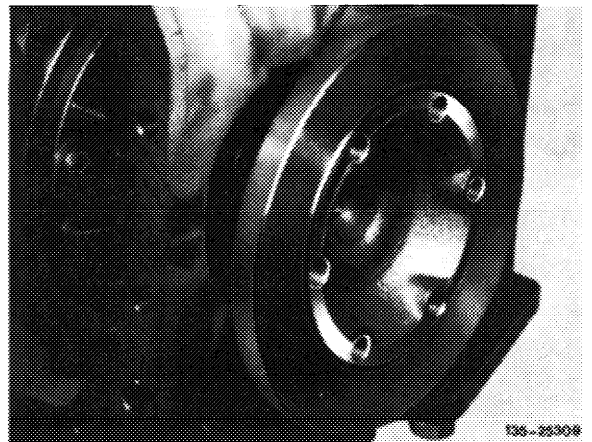
- 4 Unscrew rear axle end cover (54) and remove.



5 Pull locking ring from connecting flange with pliers or suitable hook and remove from housing.



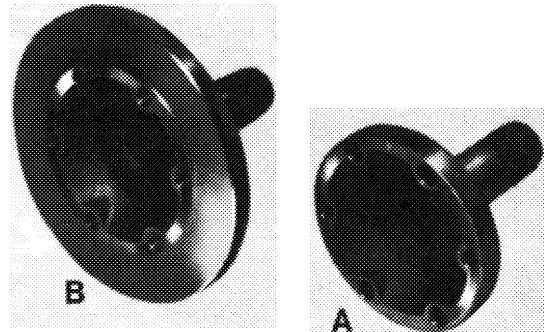
6 Pull connecting flange out of rear axle side gear and remove.



**Connecting flange with ring-shaped**

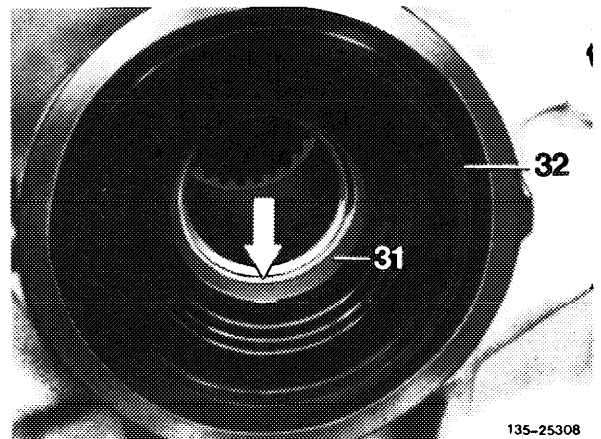
7 Check running surface for radial sealing ring on connecting flange and renew connecting flange if required, if running surface is badly worn out.

Note: As from start of series, models 201.02 are provided with one ring-shaped weight each on connecting flanges. Different installation is not permitted, but exchange like for like. Model 201.1 has no ring-shaped weight,



**A Connecting flange without weight  
B Connecting flange with weight**

8 Prior to inserting connecting flange, check whether compensating washer (31) is still firmly seated in differential cage (arrow).

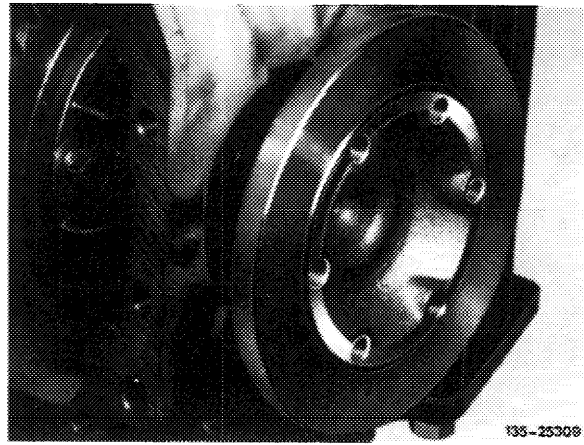


**31 Compensating washer  
32 Radial sealing ring**

## Installation

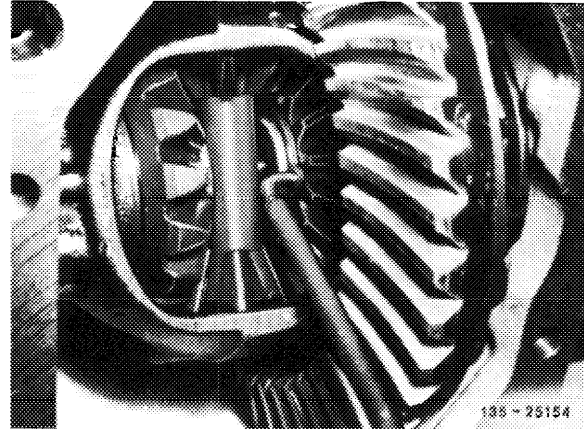
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9 Install connecting flange. For this purpose, use a new locking ring of the same thickness between connecting flange and rear axle side gear.

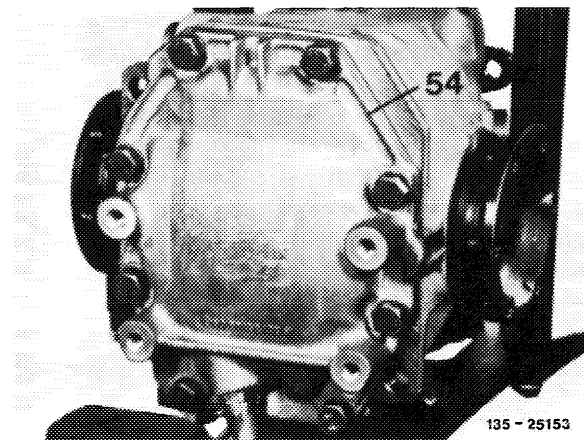


10 Check end play between connecting flange and rear axle side gear.

There should be no noticeable end play; rotation of locking ring in groove should still be possible. If required, mount a thicker or a thinner locking ring.



11 Clean sealing surface on end cover and on rear axle housing and coat with sealing compound. Mount rear axle end cover (54) and tighten hex. head screws to 45 Nm.



12 Remove rear axle center piece from clamping fixture.

13 Install rear axle center piece (35-520).

14 Fill-in hypoid gear oil up to bottom edge of oil filler hole.

