



Mercedes-Benz

Service

**Service Manual
Chassis and Body
Model 107
Volume 1**

Mercedes-Benz of North America Inc.

www.crazyaboutmercedes.com



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Caution

Our service manuals contain descriptions of important assembly, adjustment and inspection jobs. Special tools required in performing certain service jobs are identified in the manual and recommended for use. Any part numbers given are only used for identification and easier differentiation between individual components, and are not intended for ordering purposes.

All procedures, illustrations and specifications contained in these manuals were based on the latest information available at the time of publication. If your Mercedes-Benz model differs from the specifications contained in the manual you select, consult your authorized Mercedes-Benz dealer.

Remember, the proper performance of services is essential for both the safety of the mechanic and the efficient operation of the vehicle. The procedures in these manuals are described in such a manner that the service may be performed safely and accurately.

However, it is always assumed that the reader is familiar with basic automotive repair procedures and Mercedes-Benz vehicles.

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Introduction

This Service Manual is the product of existing technical publications. Special care has been taken to provide accurate information on removal, disassembly, assembly, inspection, installation, and adjusting procedures, backed with the technical data necessary to do the job.

The material in this manual is divided according to the Mercedes-Benz Component Group System as outlined on the GROUP INDEX page. This page will quickly direct the reader to the Major Component Group. Each Major Component Group begins with a JOB INDEX listing all jobs within that group.

Mercedes-Benz of North America, Inc. recommends that repairs to, and maintenance of, Mercedes-Benz automobiles be performed only by Mercedes-Benz **trained personnel** at authorized Mercedes-Benz dealerships.

The information contained in this special publication is ordinarily issued by Mercedes-Benz of North America, Inc., in conjunction with supplementary service literature and special tools supplied only to its authorized dealers. The repair and maintenance procedures outlined herein are procedures to be used by **trained Mercedes-Benz service and dealership personnel**. Supplementary service literature will not be provided with this publication, but may be contained in reprints of this Service Manual.

Please note that this manual has been compiled from various sources, some of which cover models other than the subject of this book. Always refer to the engine and vehicle identification table for model and component information.

The information contained in this manual was accurate to the best of our knowledge at the time the manual was approved for publication. However, the right is reserved to make production, design and specification changes at any time, without notice and without obligation to give notice. Any such changes will not be contained in this manual.

Mercedes-Benz of North America, Inc. assumes no liability for any damage to person or property caused by the utilization of this publication to effect maintenance or repair work on Mercedes-Benz automobiles.

MERCEDES-BENZ OF NORTH AMERICA, INC.
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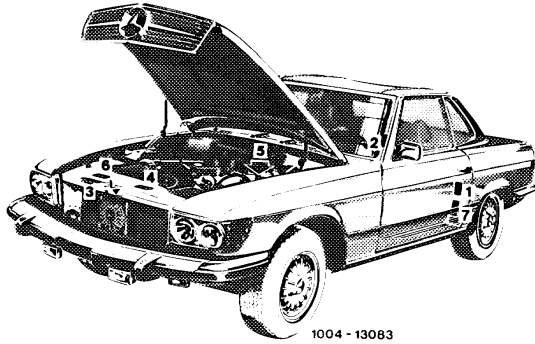
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00 Identification of Vehicle

When ordering spare parts, please quote chassis and engine numbers.

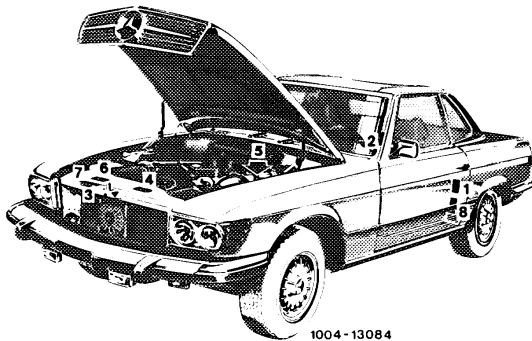
The illustration below depicts model 450 SL. On model 450 SLC identification plates are arranged accordingly.



- 1 Certification Tag (left door pillar)
- 2 Identification Tag (left window post)
- 3 Chassis No.
- 4 Body No. and Paintwork No.
- 5 Engine No. on engine block, rear
- 6 Emission Control Tag
Black tag: Federal and
Canada emission
control system
Yellow tag: California emission
control system
- 7 Emission Control Tag
Catalyst Information

When ordering spare parts, please quote chassis and engine numbers.

The illustration below depicts model 380 SL. On model 380 SLC identification plates are arranged accordingly.

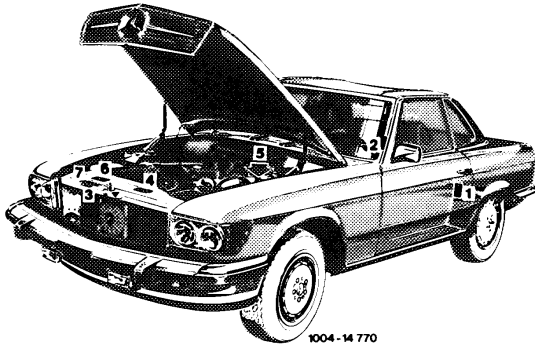


- 1 Certification Tag (left door pillar)
- 2 Identification Tag (left window post)
- 3 Chassis No.
- 4 Body No. and Paintwork No.
- 5 Engine No.
- 6 Information Tag
California version
Vacuum line routing for
emission control system
- 7 Emission Control Tag
- 8 Emission Control Tag
Catalyst Information

When ordering spare parts, please specify chassis and engine numbers.

The illustration below depicts model 560 SL.

- 1 Certification Tag (left door pillar)
- 2 Identification Tag (left window post)
- 3 Vehicle Identification No.
- 4 Body No. and Paintwork No.
- 5 Engine No.
- 6 Information Tag
California version
Vacuum line routing for
emission control system
- 7 Emission Control Tag



1004-14 770

This manual applies to the following passenger cars, starting 1972

Model	USA Model Year From	To	Chassis Type	Engine Type
350 SL	1972	1973	107.044	117.982
450 SL	1973	1975	107.044	117.982
450 SLC	1973	1975	107.024	117.982
450 SL	1976	1980	107.044	117.985
450 SLC	1976	1980	107.024	117.985
380 SL	1981	1982	107.045	116.960
380 SLC	1981	1982	107.025	116.960
380 SL	1982	1985	107.045	116.962
560 SL	1986	—	107.048	117.967

00 Technical Data

Model		350 SL, 450 SL (107.044) 380 SL (107.045) 560 SL (107.048)	450 SLC (107.024) 380 SLC (107.025)
Dimensions			
Length	mm (in.)	4370 (172.0) ³⁾	4740 (186.6) ³⁾
Width	mm (in.)	1790 (70.5)	
Height, driving condition	mm (in.)	1300 (51.2) roadster top 1290 (50.8) Coupe top	1330 (52.4)
Wheelbase	mm (in.)	2460 (96.9) [2455 (96.6)] ²⁾	2820 (111.0)
Track	front	mm (in.)	1452 (57.2) [1462 (57.6)] ²⁾
	rear	mm (in.)	1440 (56.7) [1465 (57.7)] ²⁾
Wheel lock	inside	40°	
	outside	34°	
Turning circle minimum	m (ft.)	10.34 (33.9) [10.48 (34.4)]*	11.55 (37.9) [11.68 (38.3)]*
Ground clearance, in design position ¹⁾	mm (in.)	136 (5.4) [131 (5.2)]*	
Weights			
Curb weight,	Model Year	kg (lbs.)	
	1972	1701 (3751)	2140 (4730)
	1973	1683 (3710)	1708 (3765)
	1974	1691 (3730)	1715 (3780)
	1975	1715 (3820)	1733 (3820)
	1976	1721 (3795)	1771 (3905)
	1977	1730 (3815)	1751 (3860)
	1978	1730 (3815)	1751 (3860)
	1979	1696 (3740)	1721 (3795)
	1980	1700 (3750)	1700 (3750)
	1981	1635 (3605)	1625 (3585)
	1982	1650 (3640)	—
	1983	1650 (3640)	—
	1984	1650 (3640)	—
	1985	1670 (3685)	—
	1986	1715 (3780)	—
	1987	1680 (3705)	—

Electrical System

Battery	Voltage	V	12
	Capacity	Ah	66,88 Ah as of Model Year 1975, (92) ²⁾

* Represent later model cars.

¹⁾ Design position: Vehicle loaded with 65 kg on each front seat and 65 kg on center of rear bench.

²⁾ Model 107.048 (560 SL) only.

³⁾ 1974 and later vehicles with energy absorbing bumpers are approximately 250 mm (10") longer.

Model

Sales designation	350 SL, 450 SL, 450 SLC	380 SL, 380 SLC	560 SL
Model designation	107.044, 107.024	107.045, 107.025	107.048

Filling Capacities

Fuel tank/reserve	fuel approx.	ltr.	90/13 (24/3.5 US gallons)	85/11.5 (22.45/3.0 US gallons)
Cooling system including heater	water approx.	ltr.	15 (32 US pts.)	12.5 (26.4 US pts.) 13.0 (appr. 28 US pts.)
Total filling quantity	max./min. engine oil	ltr.	8.5/6.5 (appr. 18/14 US pts.) with oil cooler 8.0/6.0 (appr. 17/13 US pts.) without oil cooler	8.5/6.5 (appr. 18/14 US pts.)
Crankcase (without oil filter and oil cooler)	max./min. engine oil	ltr.	7.5/5.5 (16/12 US pts.)	7.5/5.5 (16/12 US pts.)
Oil filter	engine oil	ltr.	0.75 (appr. 1.5 US pts.)	0.5 (appr. 1 US pt.)
Oil cooler	engine oil	ltr.	0.4 (approx. 0.8 US pts.) ²⁾	
Coolant pump			Maintenance-free	
Automatic transmission	W 3 A 040 ATF W 4 A 040	ltr.	8.9 ¹⁾ (appr. 19 US pts.) 7.3 ¹⁾ (appr. 15 US pts.)	8.6 ¹⁾ (appr. 18.5 US pts.)
Rear axle, hypoid gear oil SAE 90 ³⁾		ltr.	1.3 (appr. 2.7 US pts.)	
Power steering, MB Power Steering Gear Oil		ltr.	1.4 (appr. 3 US pts.)	
Front wheel hub, roller bearing grease (per hub)		grams	70	
Brake system Brake fluid	approx.	ltr.	0.5 (appr. 1 US pt.)	

¹⁾ For initial filling only, refill capacity approximately 7.9 liters (17 pts.) on transmission W 4 A 040, 6.2 liters (13 pts.) for transmission W 4 A 040, and 7.7 liters (16.5 pts.) on transmission W 4 A 040 in model 107.048.

²⁾ The oil cooler has been eliminated since early 1974 production.

³⁾ On model 107.048, use MB Limited Slip Differential Oil.



32—010 Permissible combinations springs — shock absorbers

A. Model 107 standard version

Model	Front spring Part no.	Shock absorber front Designation Part no.	Rear spring Part no.	Shock absorber or strut rear Designation Part no.
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Standard suspension (vehicles up to February 1980) — without level control on rear axle

107.022 107.042	107.023 107.043	115 321 30 04 114 321 06 04 ¹⁾	107 323 00 00 ²⁾ 107 323 01 00 ³⁾ 107 323 02 00 ²⁾ 107 323 03 00 ³⁾ 107 323 04 00 ¹²⁾	115 324 22 04 107 324 03 04 115 324 22 04 ⁵⁾	107 326 00 00 ²⁾ 116 326 02 00 ³⁾ 116 326 04 00 ²⁾ ¹⁰⁾ 116 326 08 00 ³⁾ ¹⁰⁾ 116 326 10 00 ⁴⁾ ¹⁰⁾ 126 326 06 00 ¹²⁾ 126 326 09 00 ¹²⁾
107.024 107.044		114 321 06 04 114 321 07 04 ⁶⁾			
107.026		114 321 05 04 ⁷⁾ 114 321 09 04 ¹⁾ ⁷⁾	115 323 10 00 ⁸⁾ 115 323 25 00 ¹²⁾ 107 323 01 00 ⁹⁾ 107 323 04 00 ¹²⁾	107 324 03 04	123 326 06 00 ¹²⁾ 116 326 02 00 ¹²⁾ 126 326 09 00 ¹²⁾

Standard suspension (vehicles with level control on rear axle)

107.022 107.023		115 321 30 04 114 321 06 04 ¹⁾	107 323 00 00 ²⁾ 107 323 01 00 ³⁾ 107 323 02 00 ²⁾ 107 323 03 00 ³⁾ 107 323 04 00	115 324 27 04	107 320 00 13 ²⁾ 116 320 30 13 ³⁾ 116 320 31 13 ⁴⁾ 116 320 45 13 ¹¹⁾
107.024		114 321 06 04 114 321 07 06 ⁶⁾			
107.026		114 321 05 04 ⁷⁾ 114 321 09 04 ¹⁾ ⁷⁾	115 323 10 00 ⁸⁾ 115 323 25 00 107 323 01 00 ⁹⁾ 107 323 04 00		123 320 04 13 ⁸⁾ 116 320 31 13 ⁹⁾ 116 320 45 13 ⁹⁾ ¹¹⁾

When installing springs, pay attention to tables of „Adjustment of springs“.

- 1) Valid for vehicles with additional special equipment (refer to „Adjustment of front springs“).
- 2) 1st version.
- 3) 2nd version.
- 4) 3rd version.
- 5) For vehicles with diagonal swing axle without starting torque compensation (USA) only.
- 6) Valid for (USA) 1974.
- 7) Standard version (for comfortable driving).
For sports-style driving, harder front springs can be subsequently installed:
for 114 321 05 04 — 115 321 30 04
for 114 321 09 04 — 114 321 06 04
- 8) Standard version (for comfortable driving).
- 9) Harder version (for sports-style driving).
Subsequent installation only.
- 10) Starting October 1978 only shock absorbers made by Bilstein are valid for rear axle. Starting January 1980, also part No. 126 326 09 00 made by F & S and part No. 126 326 06 00 made by Bilstein.
- 11) 4th version with 24 mm piston rod dia. (starting January 1980).
- 12) Shock absorber with separating piston.

Model	Front spring Part No.	Shock absorber front Designation Part No.	Rear spring Part No.	Shock absorber or spring strut rear Designation Part No.
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Standard suspension (vehicles starting March 1980) – **without** level control on rear axle

107.022 107.025	114 321 05 04 114 321 09 04 ¹⁾	115 323 10 00 ³⁾ 115 323 25 00 ³⁾ 107 323 01 00 ⁴⁾ 107 323 04 00 ⁴⁾	115 324 22 04	123 326 06 00 ³⁾ 123 326 16 00 ³⁾ 123 326 18 00 ³⁾ 126 326 06 00 ³⁾ 126 326 09 00 ³⁾ 126 326 12 00 ³⁾
107.026			107 324 03 04	
107.042	114 321 05 04		115 324 22 04	126 326 06 00 126 326 09 00 126 326 12 00
107.045 107.046	114 321 05 04 ¹⁾ 115 321 29 04	107 323 01 00 107 323 04 00	107 324 03 04	

107.022 107.025	114 321 05 04 114 321 09 04 ¹⁾	115 323 10 00 ³⁾ 115 323 25 00 ³⁾ 107 323 01 00 ⁴⁾ 107 323 04 00 ⁴⁾	123 324 29 04	123 300 10 13 ³⁾ 116 320 45 13 ⁴⁾
107.026			114 324 02 04	

During installation of springs, pay attention to tables "Adjustment of springs".

- 1) Valid for vehicles with additional special equipment (refer to "Adjustment of front springs").
- 2) Standard version (for comfortable driving)
For sports-style driving harder front springs can be subsequently installed: for 114 321 05 04 – 115 321 30 04
for 114 321 09 04 – 114 321 06 04
- 3) Standard version (for comfortable driving)
- 4) Harder version (for sports-style driving)
Subsequent installation only.



33–100 Removal and installation of front axle

Tightening Torques	Nm
Hex. bolts for rubber mountings of suspension on frame floor	45
Hex. nuts of lower shock absorber suspension	20
Hex. bolts of front engine mounting	35
Hex. nuts of track rod joints	35
Self-locking hex. head screw for fastening rpm sensor to steering knuckle	8

Special Tools	
Carrying stirrup for engine	107 589 02 61 00
Cradle for pit lift	115 589 06 63 00
Intermediate angle piece for pit lift	115 589 02 63 00
Remover for track rod	186 589 10 33 00

Notes

The jobs described below apply when the individual parts are subsequently controlled or the front axle is repaired. In such a case, the shock absorber, the torsion bar and the front springs are already removed on vehicle.

But if the vehicle will be placed on the frame straightening bench, for example, as the result of repairs following an accident in which the front axle has not been damaged, remove front axle **complete** with front springs, shock absorbers and torsion bar.

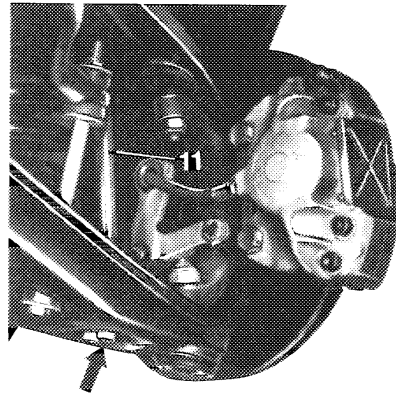
The front shock absorbers are serving simultaneously as a deflection stop for the front wheels. Therefore loosen shock absorber suspension only when the vehicle is on its wheels or when the lower control arm is supported.

There is a safety stop between the upper control arm and the front axle carrier.

Remove self-locking screws and nuts on principle!

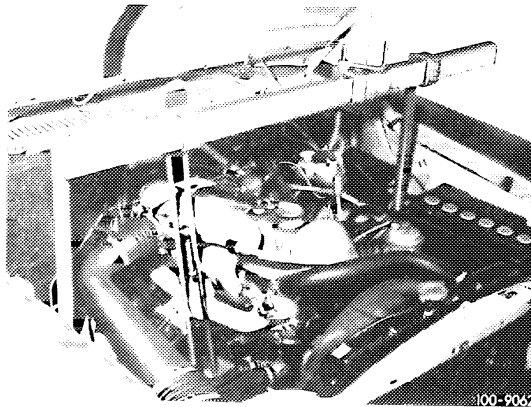
Removal

- 1 Loosen lower shock absorber suspension (arrow).
- 2 Jack-up vehicle at front and rear and place on supporting stands of similar height. Remove front wheels.
- 3 Remove front shock absorbers (11) (32-100).



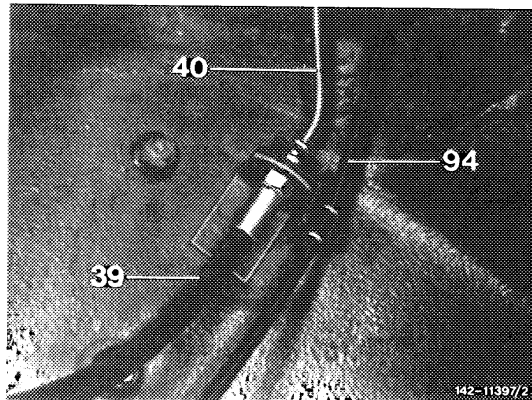
133-5609/2

- 4 Connect carrying stirrup to engine.
- 5 Additional work on type 107:
Unscrew the right and left metal shields from exhaust manifold.
- 6 Loosen hex. bolts of front engine mounting right and left.

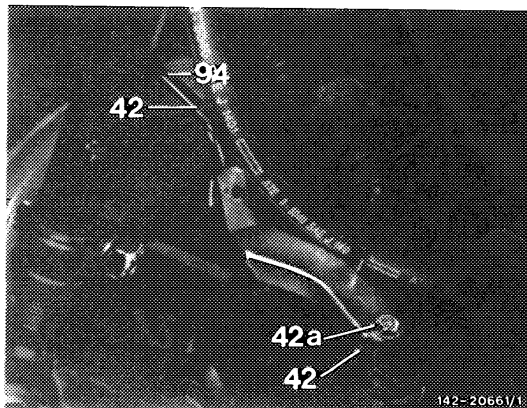


- 7 Separate brake lines and brake hoses from each other. Close connections with rubber plugs.

Note: On model 107 with brake lining wear indicator, pull cables of clip sensor out of plug connection on fixed caliper.



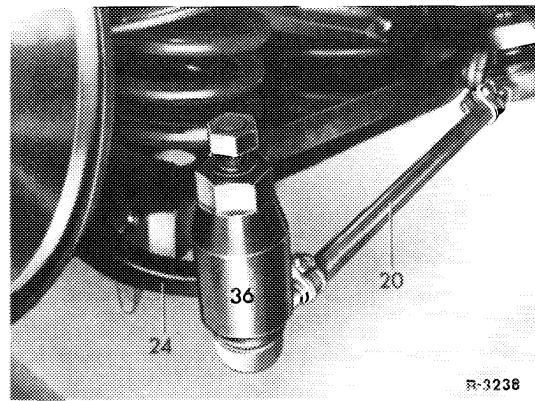
Note: On vehicles with ABS (model 107 only), remove rpm sensor (42) from steering knuckle by loosening hex. head screw (42a) (42-712).



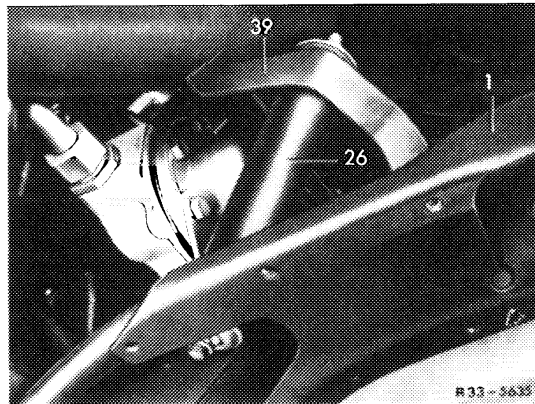
8 Remove track rods left and right from steering knuckle arm (46–530).

9 Remove front torsion bar (32–300).

- 20 Track rod
- 24 Steering knuckle arm
- 36 Remover

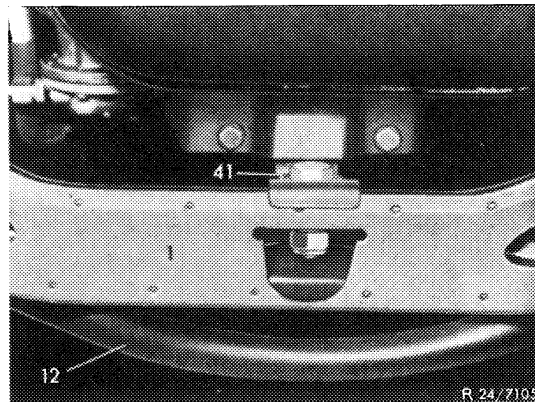


10 On vehicles with engines 110, 115, 117, 130, 180 and 615, 616, 617 detach engine shock absorber suspension from front axle carrier.



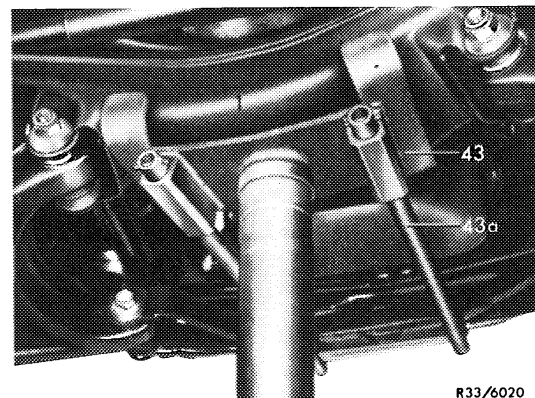
11 On vehicles with engines, 115, and 615, 616, detach engine movement limiter from front axle carrier.

- 1 Front axle carrier
- 12 Torsion bar
- 41 Engine movement limiter



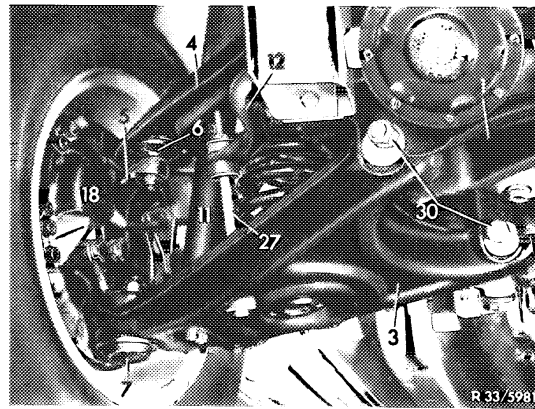
12 Remove front springs (32–200), attach lower control arms again temporarily to front axle carrier.

13 Support front axle carrier with pit lift and cradle (43) with supplementary member (43a).

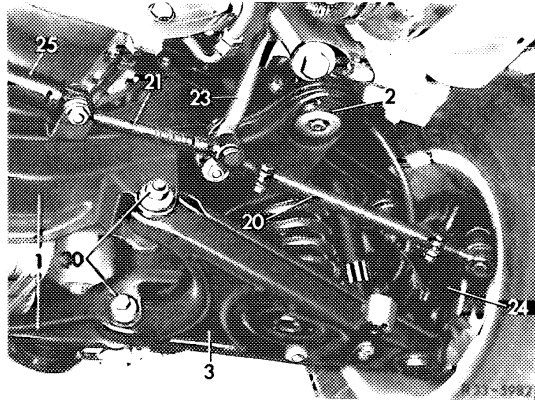


Front axle seen from the front

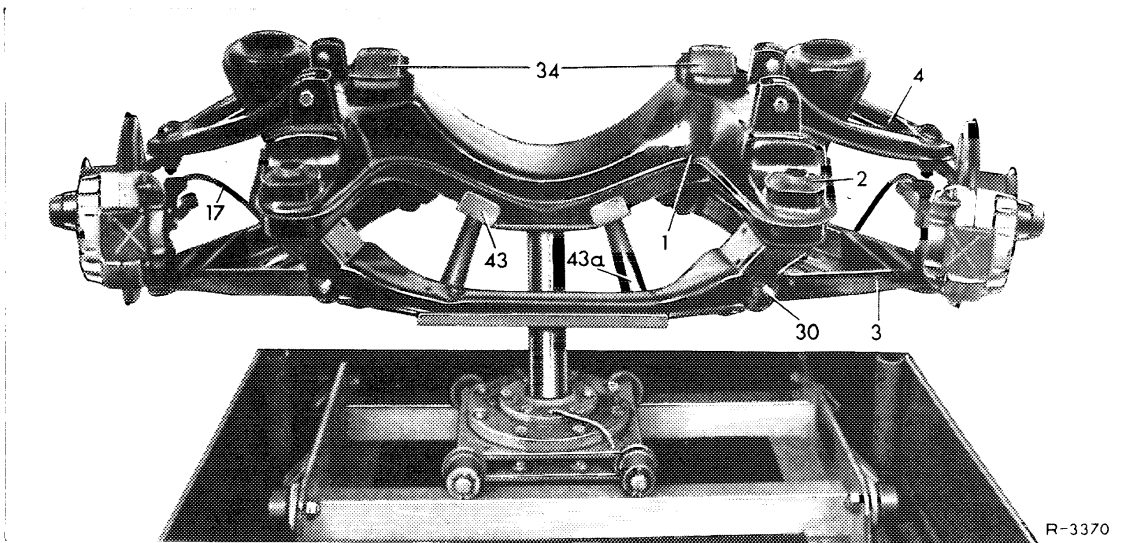
- | | |
|----------------------|-----------------------------------|
| 1 Front axle carrier | 11 Front shock absorber |
| 3 Lower control arm | 12 Torsion bar |
| 4 Upper control arm | 27 Torsion bar connecting linkage |
| 5 Steering knuckle | 30 Eccentric bolts |
| 6 Guide joint | |
| 7 Supporting joint | |



14 Loosen hex. bolts of four rubber mounts (2) for attaching front axle carrier to frame floor.



15 Lower pit lift and remove front axle.

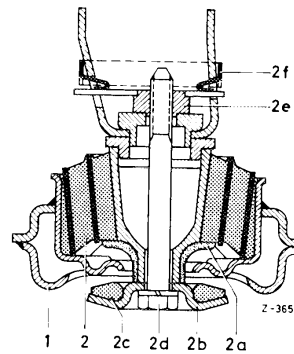


- | | | | |
|----------------------|---------------------|--|---|
| 1 Front axle carrier | 4 Upper control arm | 34 Rubber mount of front engine mounting | 43a Supplementary member for removal and installation of front axle |
| 2 Rubber mount | 17 Brake hose | 43 Cradle | |
| 3 Lower control arm | 30 Cam bolt | | |

Installation

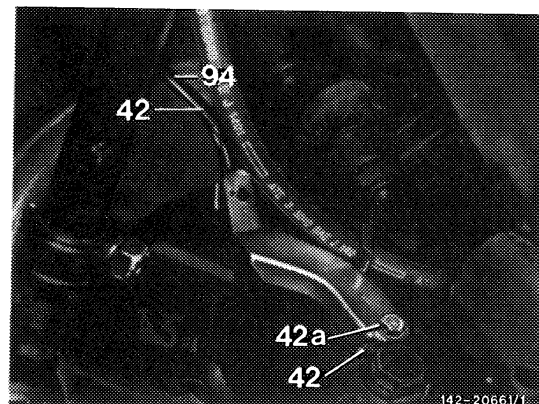
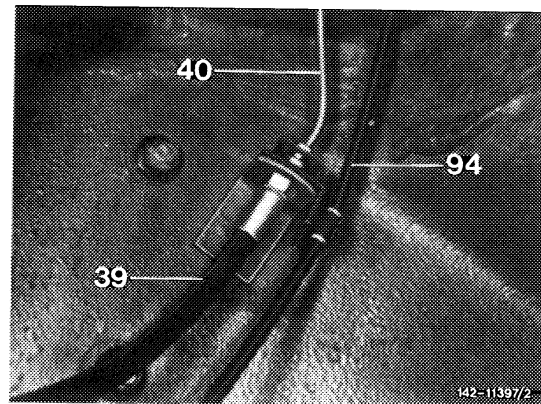
- 16 Check rubber mount of front engine mounting.
- 17 Check condition of rubber mount for suspending front axle and for tight seat in front axle carrier (33–110).
- 18 Introduce front axle and attach to frame floor.
- 19 Remove engine carrying stirrup. Install the hex. bolts for the engine suspension.
- 20 On type 107: Attach right and left metal shields to the exhaust manifold.

- 1 Front axle carrier
- 2 Rubber mount
- 2a Stop buffer for deflection
- 2b Stop plate
- 2c Stop buffer for deflection
- 2d Hex. bolt
- 2e Fastening nut
- 2f Holder for fastening nut



- 21 Connect brake hoses.

On model 107 mount brake lining wear indicator and rpm sensor for ABS.



22 Install front springs (32–200).

Attention!

Tighten hex. nuts of eccentric bolt for lower control arms **only, if the vehicle is resting on its wheels ready for driving.**

23 Install front shock absorber (32 - 100).

24 Mount track rod joints.

25 Install torsion bar (32–300).

26 On vehicles with engines 110, 115, 116, 117, 130, 180 and 615, 616, 617, attach engine shock absorber to front axle carrier.

27 On vehicles with engine 115 and 615, 616, mount engine movement limiter to front axle carrier and adjust.

28 Bleed brake system (42 -010).

29 Mount front wheels, lower vehicle.

30 Check vehicle level at front axle.

31 Check wheel adjustment at front axle and correct, if necessary (40 -320).

32 Check adjustment of headlights.

33–110 Removal, installation and inspection of rubber mounts for front axle suspension (front axle installed)

Tightening torques	Nm
Hex. bolts for rubber mounts of suspension on frame floor	45
Hex. nuts of lower shock absorber suspension	20
Hex. bolts of front engine mounting	35
Hex. nuts of track rod joints	35
Self-locking hex. head screw for fastening rpm sensor to steering knuckle	8

Special tools

Engine carrying stirrup	107 589 02 61 00
Cradle for pit lift	115 589 06 63 00
Remover for track rod	186 589 10 33 00

Note

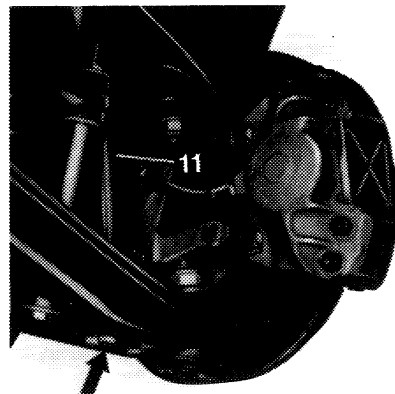
The front shock absorbers are simultaneously serving as a deflection stop for the front wheels. Therefore loosen shock absorber suspension only when the vehicle is on its wheels or when the lower control arm is supported.

There is a safety stop between the upper control arm and the front axle carrier.

Renew self-locking screws and nuts on principle!

Removal

- 1 Remove both front shock absorbers (11) (32–100).
- 2 Jack-up vehicle at the front and rear while making sure that all the four supporting stands are set to the same height. Remove front wheels.

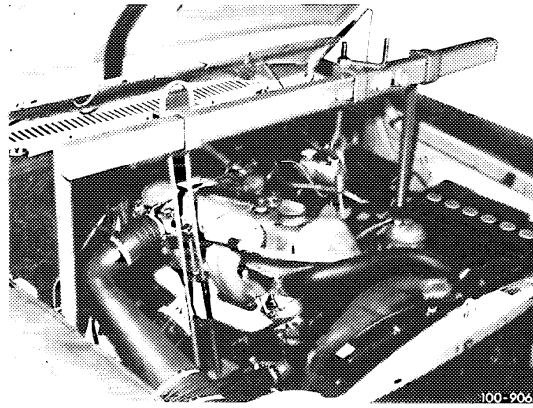


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3 Attach engine carrying stirrup.

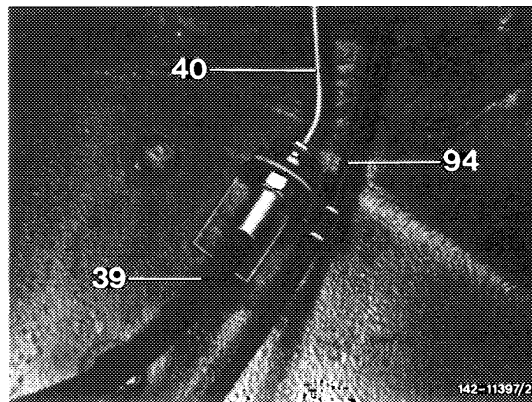
4 Additional work on model 107: Unscrew right and left metal shields from exhaust manifold.

5 Remove right and left hexagonal bolts from front engine suspension.

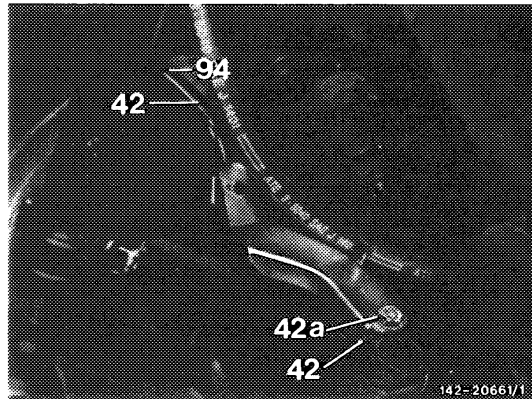


6 Separate brake tube and brake hose from each other. Block the connections with rubber plugs.

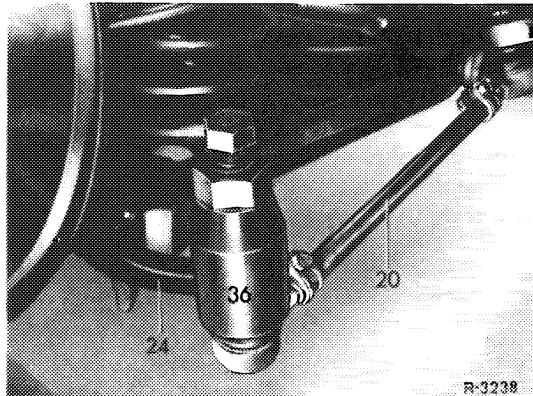
Note: On model 107 with brake lining wear indicator, pull cables of clip sensors out of plug connection on fixed caliper.



Note: On vehicles model 107 with ABS, remove rpm sensor (42) from steering knuckle by loosening hex. screw (42a) (42-712).



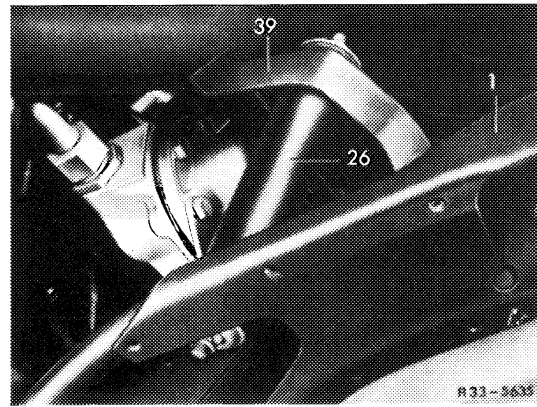
7 Remove tie rods from both steering knuckle arms.



20 Tie rod
24 Steering knuckle arm
36 Remover

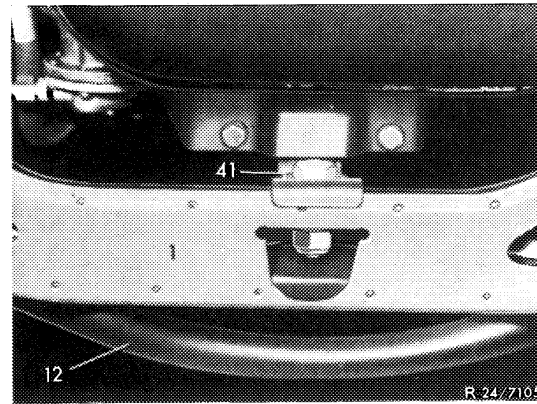
8 On vehicles with engines 110, 115, 116, 117, 130, 180 and 615, 616, 617, detach engine shock absorber from front axle carrier.

- 1 Front axle carrier
- 26 Engine shock absorber
- 39 Holder for engine shock absorber

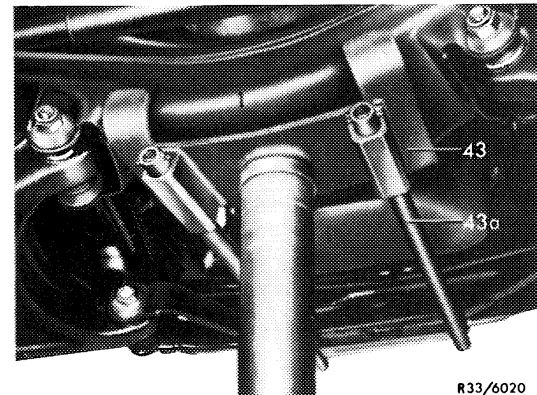


9 On vehicles with engines 115, 615 and 616, detach engine movement limiter from front axle carrier.

- 1 Front axle carrier
- 12 Torsion bar
- 41 Engine movement limiter

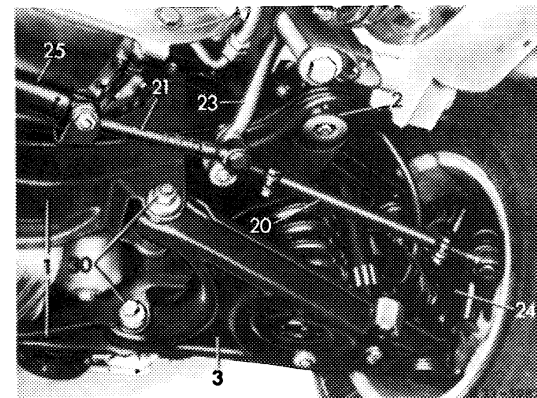


10 Support the front axle carrier with a pit lift and mounting (43) with supplementary part (43a).

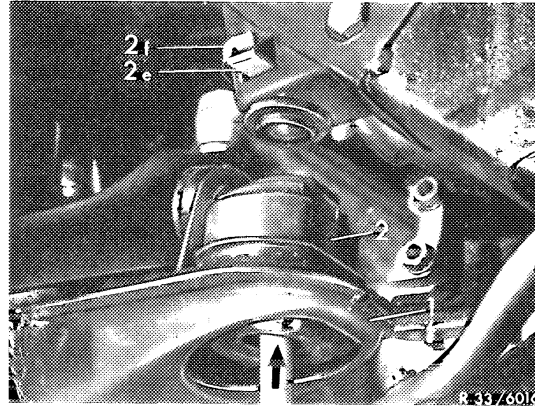


11 Loosen hex. head screws (2) of the four rubber mounts for front axle suspension on frame floor.

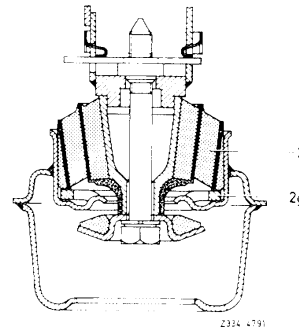
- 1 Front axle carrier
- 2 Rubber mount
- 3 Lower control arm
- 20 Tie rod
- 21 Drag link
- 23 Steering intermediate arm
- 24 Steering knuckle arm
- 25 Steering shock absorber
- 26 Eccentric bolts



12 Lower pit lift approx. 50 mm and knock the rubber mounts out of their seats in the front axle carrier from below (see arrow).



Note: On vehicles with longer wheelbase 3400 mm, models 114.008, 114.017, 115.103, 115.108, 115.112 and 115.119 there are washers (2g) between the front axle carrier and the rubber mount.



- 1 Front axle carrier
- 2 Rubber mount for front axle suspension
- 2g Washers
for front rubber mounts 2 mm thick
for rear rubber mounts 4 mm thick

Checking the rubber mounts

13 Check that inner sleeve fits tightly in rubber mantle.

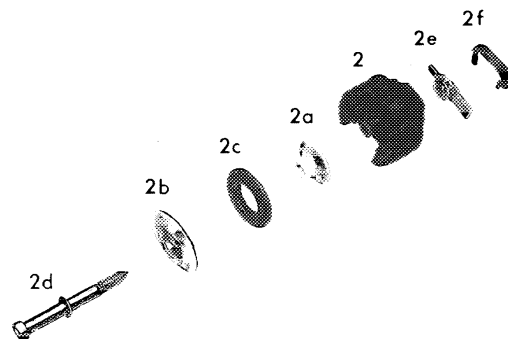
14 Check for cracks and damage on buffer stops for spring compression and rebound.

Installation

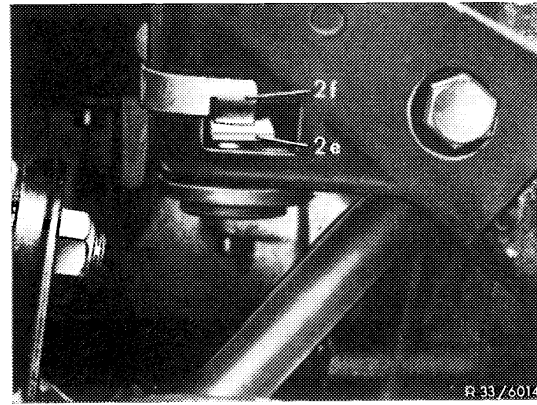
15 Push the buffer stop for spring compression (2a) onto the rubber mounts (2).

- 2 Rubber mount
- 2a Buffer stop for spring compression
- 2b Stop plate
- 2c Buffer stop for spring rebound

- 2d Hex. bolt with spring washer
- 2e Fastening nut
- 2f Holder for fastening nut



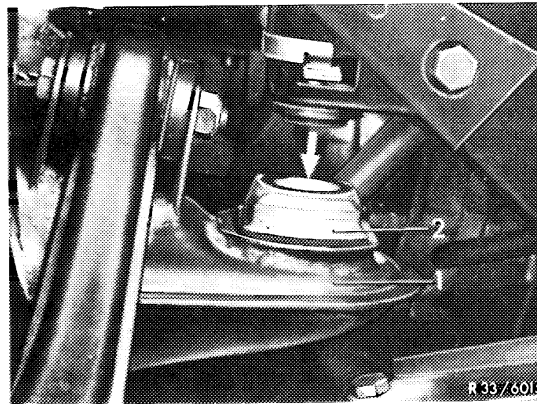
Note: For assembly of fastening nuts (2f) insert holder (2e) (if available).



- 2e Fastening nut
- 2f Holder for fastening nut

16 Apply lubricant "Naphtalen" (Part No. 000 989 04 60) to the rubber mount circumference.
On no account use oil or grease!

17 Press the rubber mounts into their seats in the front axle carrier.

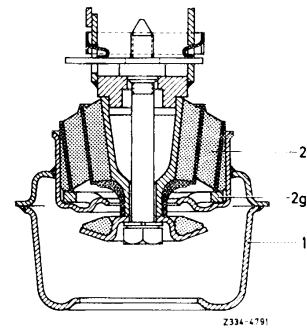


- 1 Front axle carrier
- 2 Rubber mount

Attention!

On vehicles with longer wheelbase 3400 mm, models 114.008, 114.017, 115.103, 115.108, 115.112 and 115.119, do not forget the washers (2g).

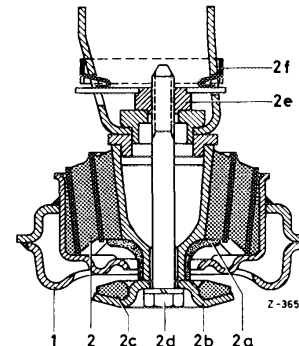
- 1 Front axle carrier
- 2 Rubber mount for front axle suspension
- 2g Washers
for front rubber mounts 2 mm thick
for rear rubber mounts 4 mm thick



18 Lift the front axle carrier with the pit lift, taking care that the rubber mount inner sleeve is correctly positioned on the frame.

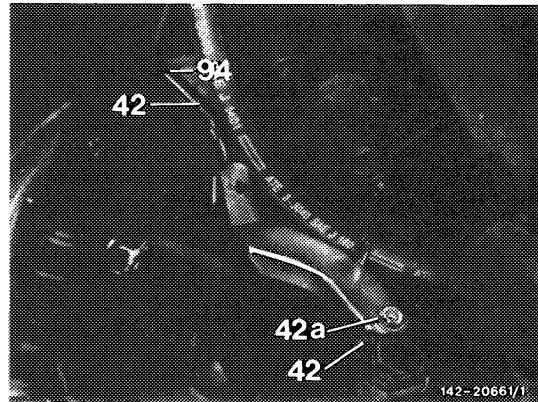
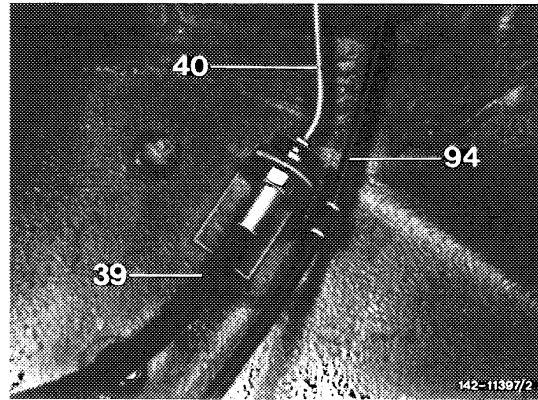
19 Mount the front axle carrier on the frame floor with the hex. bolts.

- 1 Front axle carrier
- 2 Rubber mount
- 2a Buffer stop for spring compression
- 2b Stop plate
- 2c Buffer stop for spring rebound
- 2d Hex. bolt with spring washer
- 2e Fastening nut
- 2f Holder for fastening nut

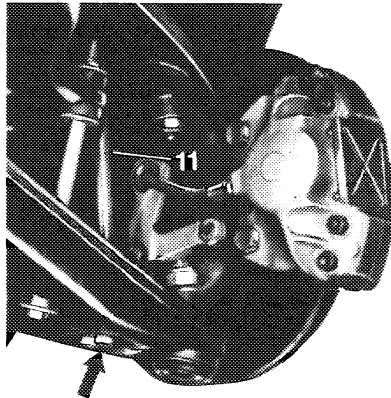


- 20 Remove engine carrying stirrup. Install hex. bolts for engine suspension.
- 21 On model 107.04 attach right and left metal shields to exhaust manifold.
- 22 On vehicles with engines 110, 115, 116, 117, 130, 180 and 615, 616, 617 mount engine shock absorber suspension on front axle carrier.
- 23 On vehicles with engines M 115 and 615, mount the engine movement limiter on the front axle carrier.
- 24 Install the tie rod ends.
- 25 Connect brake hoses.

On model 107, mount brake lining wear indicator and rpm sensor for ABS.



- 26 Screw lower shock absorber suspensions right and left to lower control arms (arrow).
- 27 Lower vehicle.
- 28 Bleed brake system (42-010).
- 29 Check headlight adjustment.





35—010 Removal and installation of complete rear axle

B. Models 107, 116

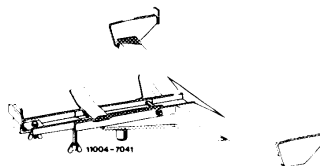
Oil types and capacities

Standard differential	Hypoid gear oil SAE 90 refer to specifications for service products page 235	
Differential with restricted slip (positive traction) (information plate on rear axle housing)	Special Hypoid gear oil refer to specifications for service products page 235.3	
Capacity	large center piece	1.3 litre
	small center piece	1.0 litre

Tightening torques	Nm
Hex socket or hex bolts for attaching rear rubber bearing to end cover	120
Hex bolts for attaching rear rubber bearing to frame floor	25
Hex bolts, self-locking for attaching rear rubber bearing to frame floor	30
Hex bolts for attaching front rubber bearings to frame floor	120
Hex bolts for attaching supporting plate to frame floor	40
Clamping nut of propeller shaft	30–40
Hex bolts for attaching universal shaft intermediate bearing to frame floor	25

Special tools

Vehicle jack top for removal and installation of complete rear axle



116 589 10 61 00

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



001 589 66 21 00

Torque wrench 40–200 Nm with plug-in ratchet 1/2" square

001 589 67 21 00

Open end wrench 46 mm for torque wrench
for clamping nut of propeller shaft



126 589 00 01 00

Spring tensioner for rear spring



115 589 00 31 00

Tubular socket 24 mm 1/2" square
for spring tensioner



116 589 01 09 00

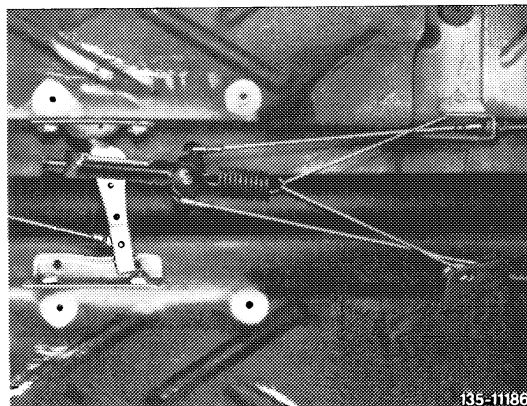
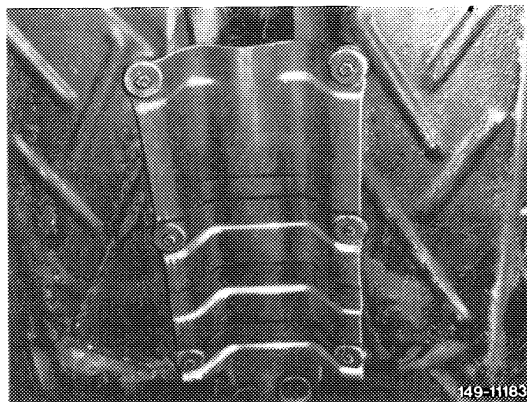
Note

On vehicles with hydropneumatic suspension observe "general jobs on vehicles with hydropneumatic suspension" (32-600).

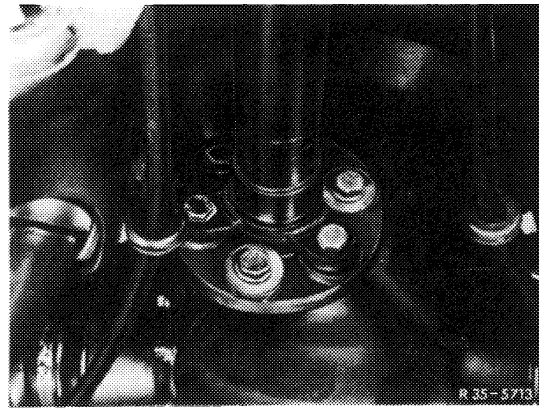
Remove rear axle only with wheels removed first to avoid damage to rear axle shaft during transportation of complete units.

Removal

- 1 Remove exhaust system (49-100).
- 2 Unscrew exhaust shield plate.
- 3 Remove shock absorbers or struts (32-110 or 32-610).
- 4 Remove intermediate lever of parking brake and disconnect cable controls (42-525).
- 5 Unscrew both brake hoses and close brake lines against penetration of dirt.
- 6 Loosen clamping nut and unscrew propeller shaft intermediate bearing from frame floor.

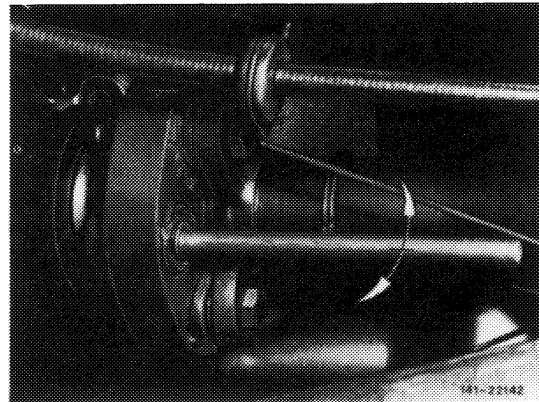


- 7 Unflange propeller shaft at the rear.
- 8 Slide propeller shaft out of centering in forward direction.



Attention!

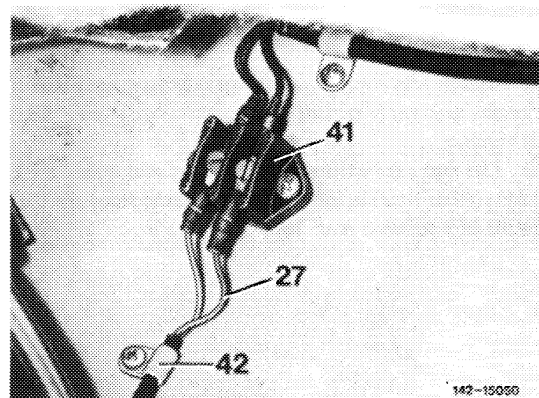
On model 107.042 with manual 5-speed transmission (starting October 1981), prior to sliding back propeller shaft, loosen fitted sleeves in universal flange by means of a cylindrical mandrel of 10 mm dia. and approx. 150 mm long. For this purpose, introduce mandrel each time into a fitted sleeve and move in radial direction (arrow). Only then slide propeller shaft out of centering in forward direction to prevent damage to companion plate.



- 9 Remove rear springs (32–230).
- 10 Loosen torsion bar connection to rear axle (32–310 or 32–320).

11 On vehicles with ABS

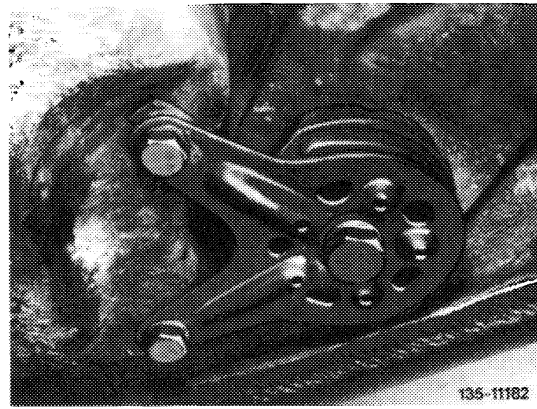
- a) Loosen cable connector (41) of rpm sensor behind rear seat backrest with ignition switched off and remove. Loosen clamps (42) and remove.
- b) Pull out cable (27) in downward direction through rubber grommet in frame floor and protect against damage.



- 27 Cable
- 41 Cable connector
- 42 Clamp

12 Slip vehicle jack top with vehicle jack or pit lift under rear axle and lift up to stop.

13 Unscrew supporting plates of front rubber bearing from frame floor.

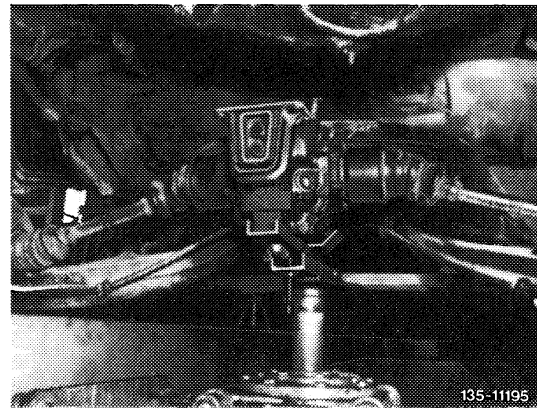


14 Unscrew rear rubber bearing from frame floor.

15 Carefully lower rear axle.

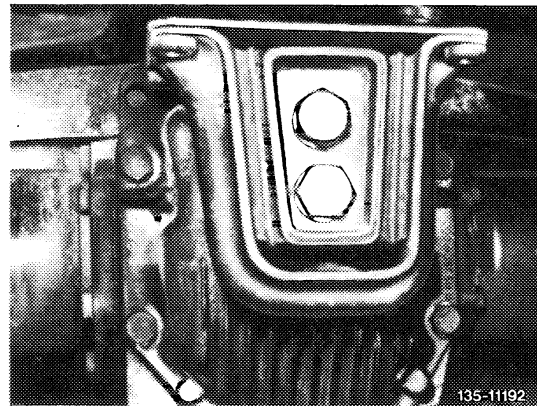
Attention!

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



16 Unscrew rear rubber bearing from rear axle end cover.

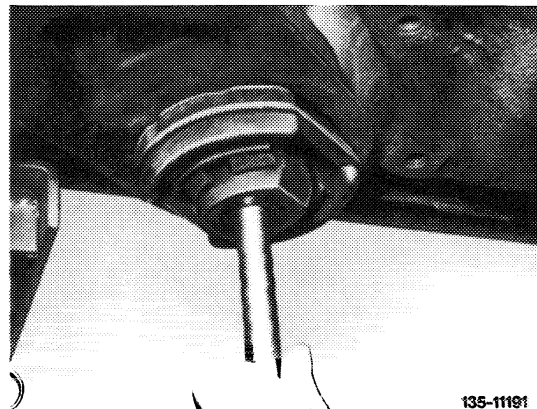
17 Check front and rear rubber bearing and renew, if required.



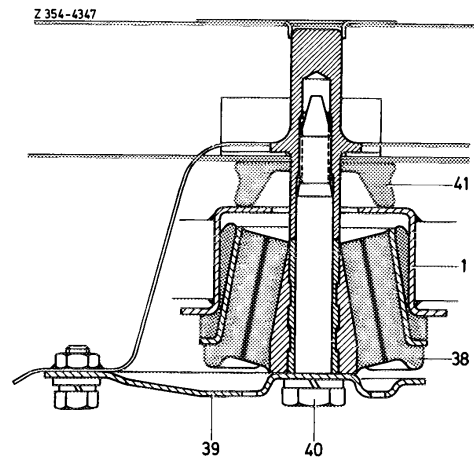
Installation

18 Attach rear rubber bearing to rear axle end cover. Tighten hex. bolts to 120 Nm.

19 Lift rear axle with vehicle jack top and insert front rubber bearing into guides on frame floor by means of a suitable mandrel.



20 Mount supporting plates of rubber bearings to frame floor. Tighten hex. bolts (40) of rubber bearings to 120 Nm and hex. bolts of supporting plates to 40 Nm.



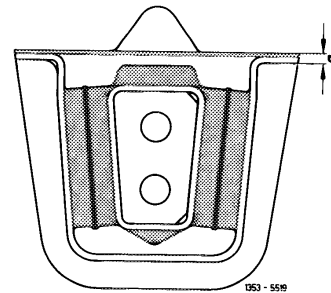
21 Mount rear rubber bearing on frame floor with hex. bolts, snap rings and washers or with new self-locking hex. bolts. Tightening torque of hex. bolts 25 Nm, of self-locking hex. bolts 30 Nm.

Attention!

Use self-locking hex. screws with plastic coating (micro-encapsulated) only once.

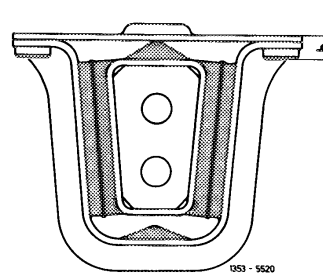
For rubber bearing **without** washers on fastening eyes, use hex. bolts with snap rings and washers (dimension a = 5 mm, on model 107 1st version only).

For rubber bearing **with** washers, use self-locking hex. bolts (dimension b = 12 mm).



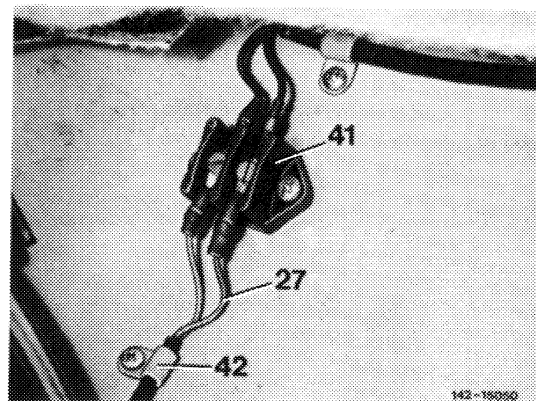
22 Remove vehicle jack top.

23 Flange propeller shaft to rear axle.



24 On vehicles with ABS

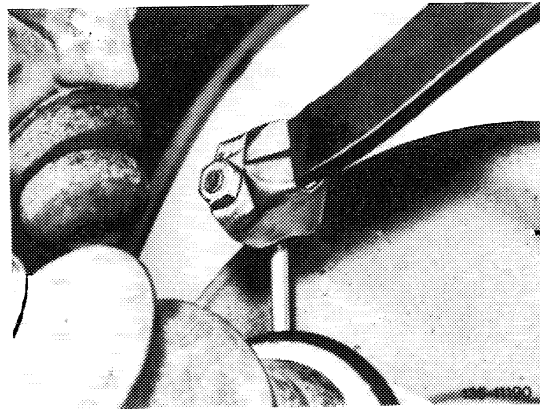
Pull cable (27) for rpm sensor in upward direction through rubber grommet in frame floor and connect to cable connector (41) Attach cable with clamps (42).



25 Screw on propeller shaft intermediate bearing, but do not yet tighten.

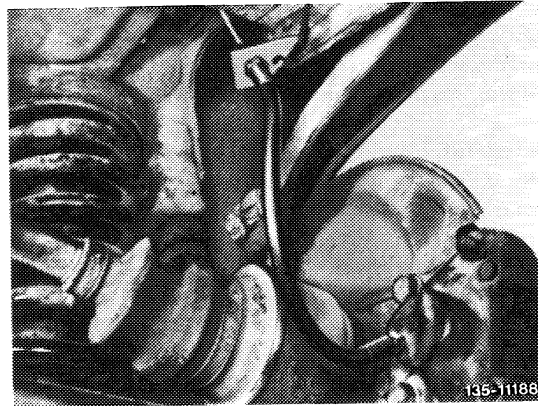
26 Mount torsion bar connection to rear axle (32-310 or 32-320).

27 Install rear springs (32-230).



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

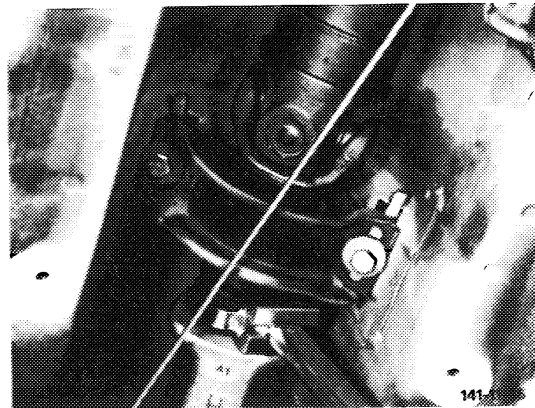
29 Connect both brake hoses and bleed brake system (42-010).



30 Attach cable controls of parking brake and mount bracket. Adjust parking brake (42-525).

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

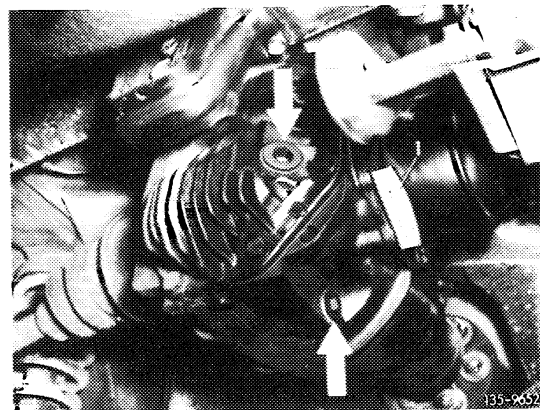
32 Tighten propeller shaft intermediate bearing to 25 Nm.



33 Mount shielding plate.

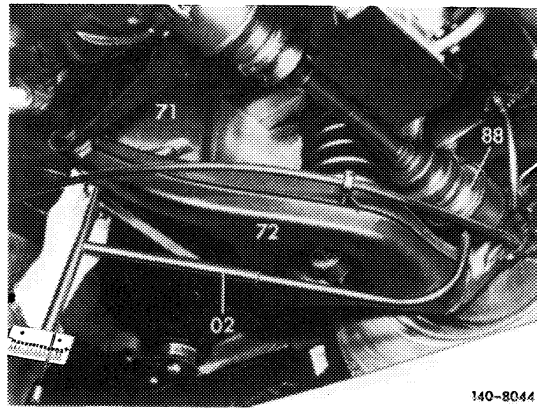
34 Install exhaust system (49-100).

35 Check oil level in rear axle and add oil up to level of filler hole, if required.



36 Check position of semi-trailing arm (40–300).

37 Check adjustment of headlights (82–250).



140-8044

35-040 Removal and installation of front rubber bearing of rear axle suspension

A. Model 107, 114, 115, 116, 123

Rear axle installed

Adjusting dimension of limit stop (on models 115.114 and 123 with engine 102, 115, 616 and 617 only)

Clearance between rubber buffer and supporting plate 2-3 mm

Slide fluid for pressing-in rubber bearings

Slide fluid (Naphtolen H or slide paste Fahr) 000 989 08 60

Tightening torques

Nm

Hex bolt for attaching front rubber bearing to frame floor 120

Hex screws for attaching supporting plate to frame floor 40

Hex bolt for attaching stop limitation (models 115.114 and 123 with engine 102, 115, 616 and 617 only) 40

Special tool

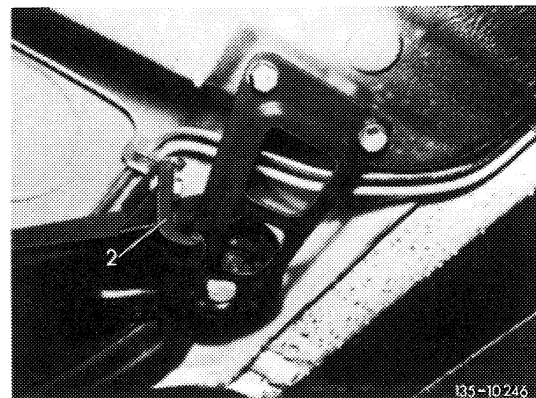
Installer for installing rubber bearing in rear axle carrier



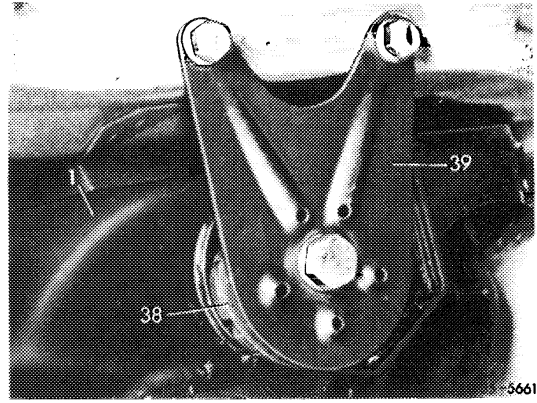
116 589 11 61 00

Removal

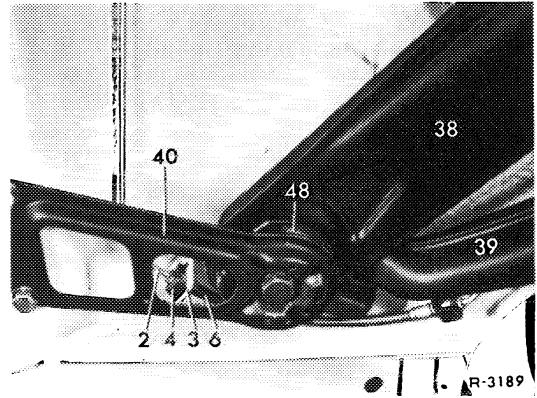
- 1 Support rear axle carrier at respective end.
- 2 Loosen stop limit (2) on rear axle carrier and remove (only on model 115.114 and on models 123 with engine 617, with engine 616 starting March 1978, with engine 115 starting September 1979 and with engine 102).



3 Unscrew supporting plate (39) from frame floor.

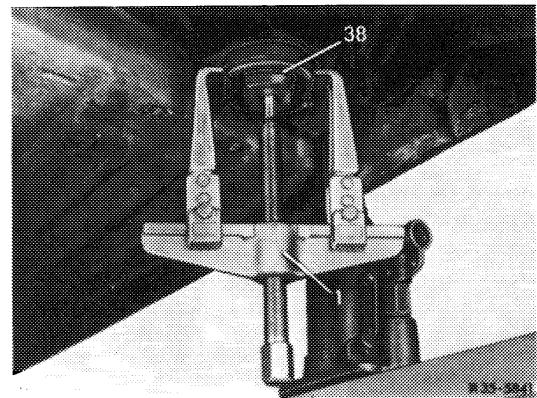


4 Loosen brake hose on holder (3) and close against penetration of dirt (models 114 and 115 of 1st version only).

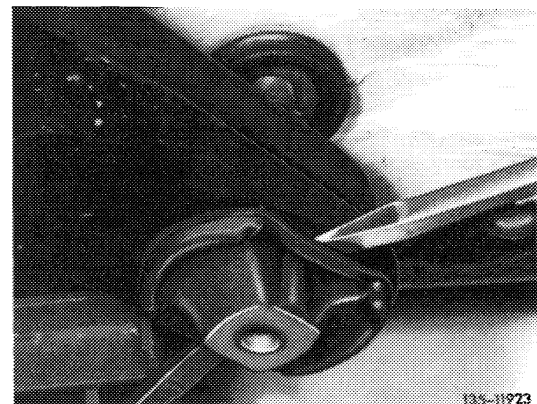


5 Insert a mandrel of 10 mm dia. and approx. 160 mm length into bore of rubber bearing and pull rubber bearing out of rear axle carrier by means of a puller.

On model 123, push rubber bearing out of rear axle carrier by means of a suitable tool until a two-arm puller can be applied.



Models 107, 114, 115, 116

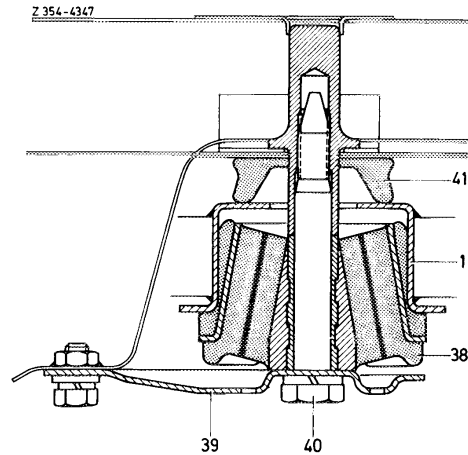


Model 123

6 Check rubber bearing (38) and stop rubber (41) on frame floor and renew, if required.

Attention!

Renew compressed rubber bearing on principle.

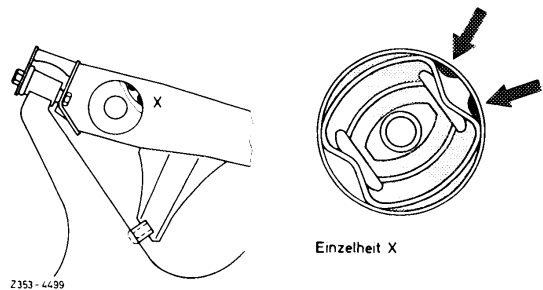


Installation

Attention!

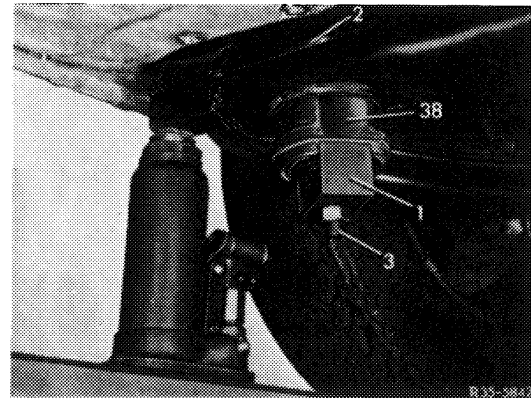
During installation pay special attention to position of rubber bearing.

On model 107.04 this position is marked by means of two lugs in cup. The two lugs should rest in a recess of rubber bearing.



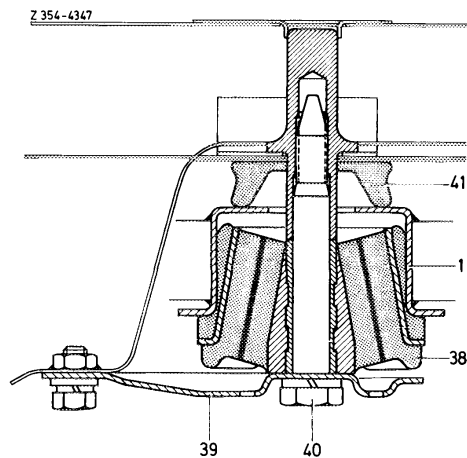
7 Rub rubber bearing with slide fluid and pull into rear axle carrier.

Note: When the vehicle is jacked up, the respective rear wheel must be additionally lifted, so that the rear axle carrier can move far enough downwards for positioning tool.



8 Attach rubber stop (41) (on models 115.114 and 123 with engine 617, with engine 616 starting March 1978, with engine 115 starting September 1979 and with engine 102, which are provided with an adjustable stop limit, no rubber stop is installed). Lift rear axle carrier and mount supporting plate. Tighten hex. screws on supporting plate to 40 Nm and on rubber bearing to 120 Nm.

9 Connect brake hose and bleed brake system (42–010, required only for 1st version of models 114 and 115).

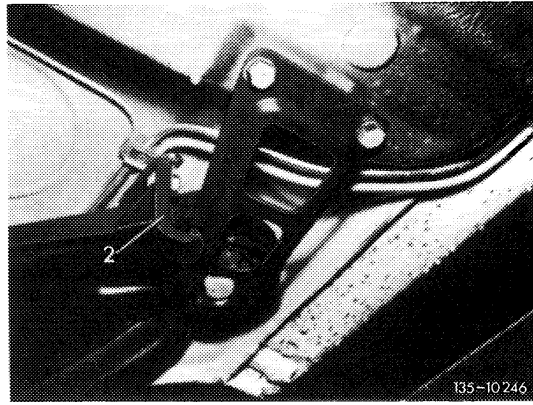


Adjustment of stop limit on models 115.114 and 123 with engine 617, with engine 616 starting March 1978, as well as with engine 115 starting September 1979 and with engine 102.

10 Loosely mount stop limitation (2) at front to rear axle carrier.

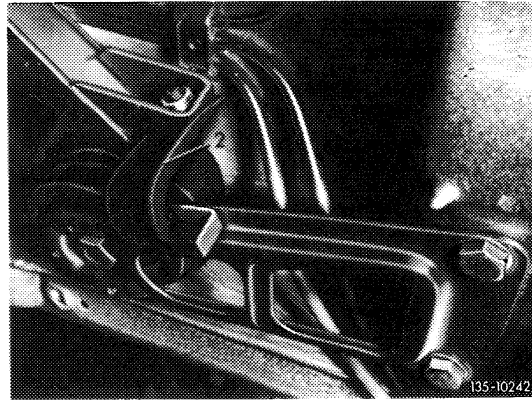
Attention!

Clearance between rubber buffer of stop limitation and supporting plate should be 2–3 mm with vehicle ready for driving.



11 Insert sheet metal angle piece between rubber buffer and supporting plate.

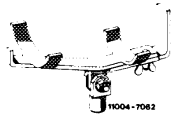
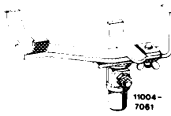
Note: Make sheet metal angle piece (2.5 mm thick) yourself according to the following dimensions: 60 mm long, 20 mm high, 10 mm wide.



12 Push stop limitation lightly upwards and tighten hex bolt to 40 Nm.

13 Remove sheet metal angle piece.

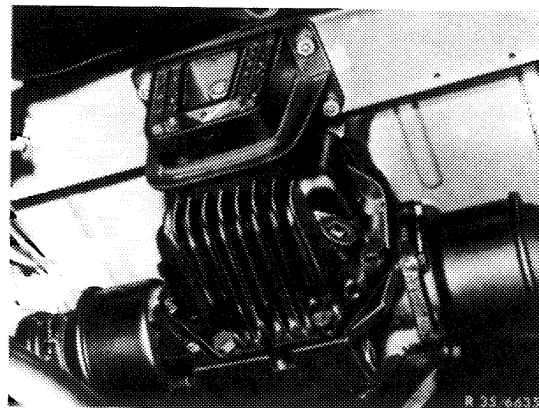
35—050 Removal and installation of rear rubber bearing of rear axle suspension

Tightening torques		Nm
Hex socket necked-down bolt for attaching rear rubber bearing to rear axle end cover (rubber bearing 1st version)		140
Hex. socket or hex. head screws for attaching rear rubber bearing to rear axle end cover (rubber bearing 2nd version)		120
Hex bolts for attaching rear rubber bearing to frame floor		25
Hex bolts, self-locking for attaching rear rubber bearing to frame floor		30
Special tools		
Vehicle jack top for removal and installation of rear axle center piece (large center piece) ¹⁾		116 589 02 63 00
Vehicle jack top for removal and installation of rear axle center piece (small center piece) ¹⁾		115 589 35 63 00

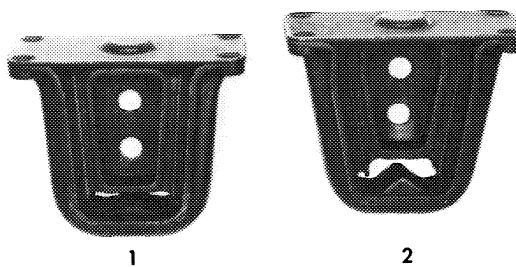
¹⁾ refer to installation survey rear axle center piece 35—500

Note:

During 1971 and 1972, the small and the large rear axle center piece for models 107, 114, 115 and 116 were occasionally provided with a rear axle end cover with large bulge.



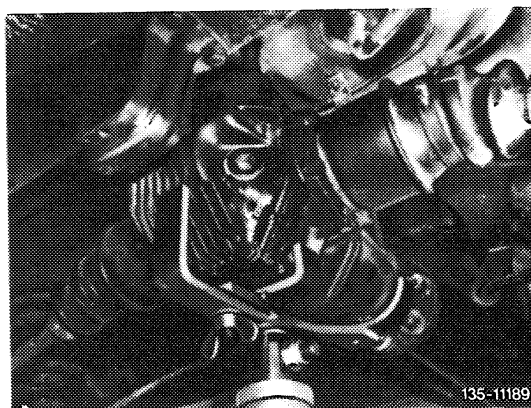
For this rear axle end cover, only the rubber bearing of the former version (1) applies. The rubber bearing (2) installed uniformly since the middle of 1978 cannot be used for reasons of available space.



135-10855

Removal

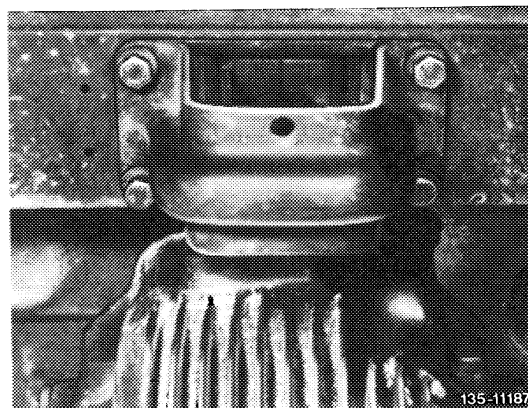
1 Support rear axle housing on vehicle jack top and raise slightly.



135-11189

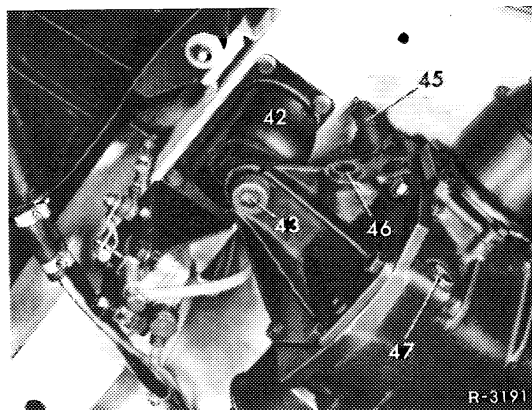
2 Unscrew hex bolts or locking bolts on frame floor and slightly lower rear axle.

On models 115.114 and 123 with engine 617, with engine 616 starting March 1978, with engine 115 starting September 1979 and with engine 102, additionally loosen front stop limit from rear axle carrier (35-040).



1st version on models 107 and 106
2nd version on models 114 and 115

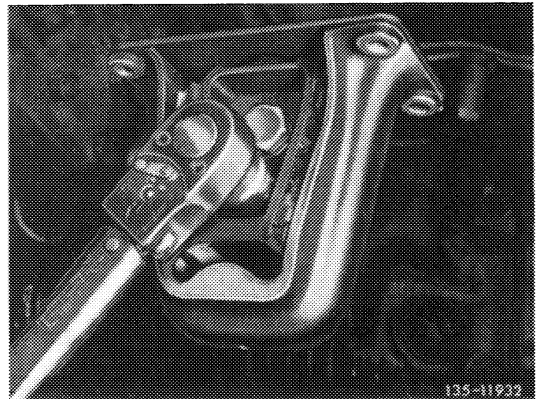
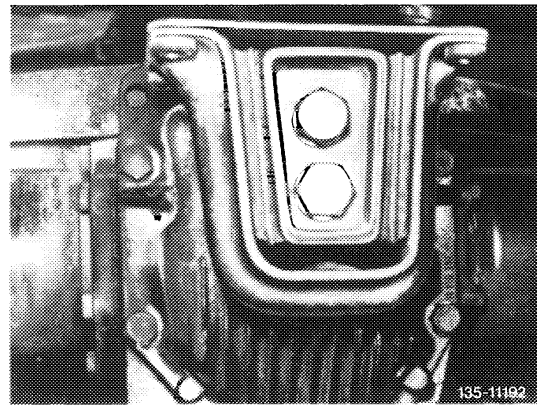
3 Unscrew hex. socket necked-down screw (43) and remove together with rubber bearing.



1st version on models 114 and 115

4 Unscrew rubber mounting from rear axle end cover and remove.

1st version on models 107 and 116
2nd version on models 114 and 115



1st version on models 123 and 126
2nd version on models 107 and 116
Repair version on models 114 and 115

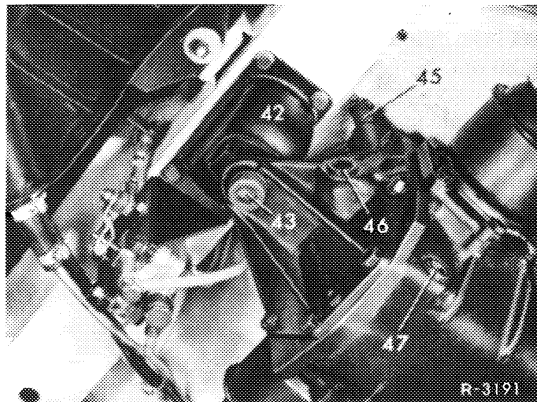
Installation

5 Attach rubber bearing (42) of 1st version to frame floor. Tightening torque of hex bolts 25 Nm (2.5 kpm).

Attention!

Rubber bearing is asymmetrically designed. To guarantee installation free of tensions, install rubber bearing with narrow end in driving direction.

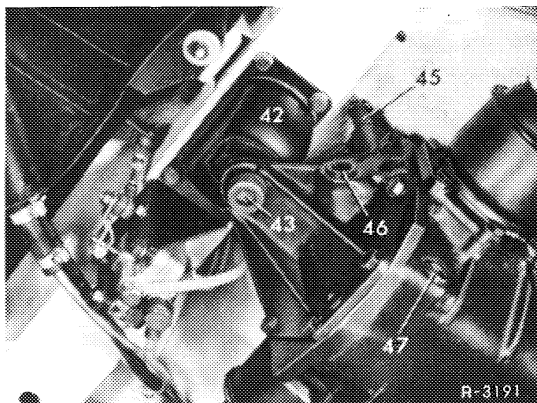
1st version on models 114 and 115



6 Lift rear axle and tighten hex socket necked-down screw (43) to 140 Nm.

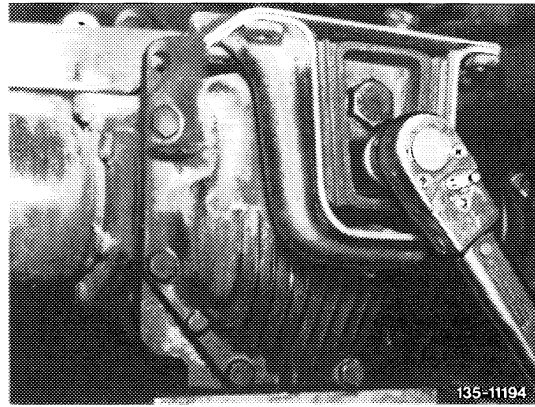
Note: Always replace hex. socket necked-down expanding screw (43) after using screw once.

1st version on models 114 and 115

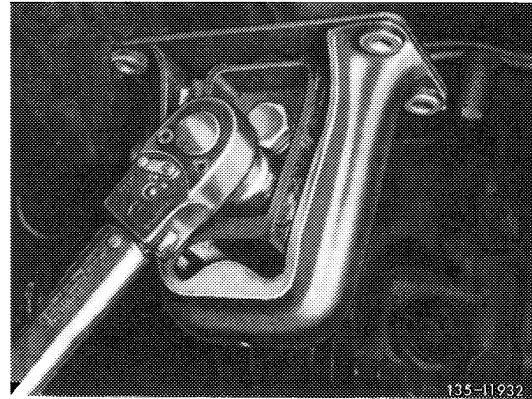


7 Attach rubber bearing to rear axle end cover.
Tighten hex. screws to 120 Nm.

1st version on models 107 and 116
2nd version on models 114 and 115



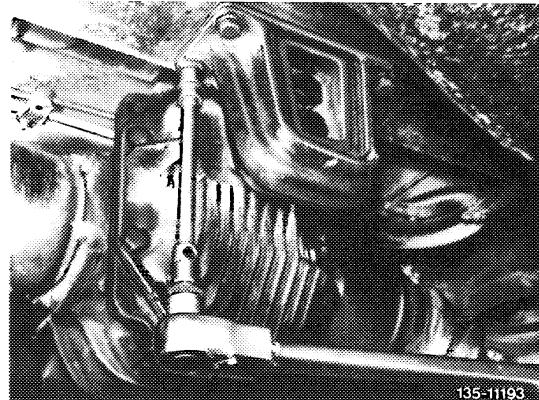
1st version on models 123 and 126
2nd version on models 107 and 116
Repair version on models 114 and 115



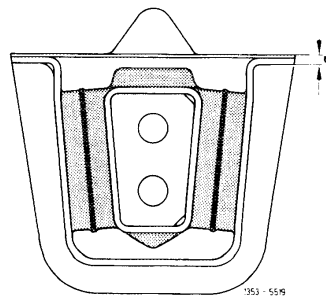
8 Lift rear axle and tighten hex bolts or self-locking hex bolts of rubber bearing to frame floor at 25 Nm or 30 Nm.

Attention!

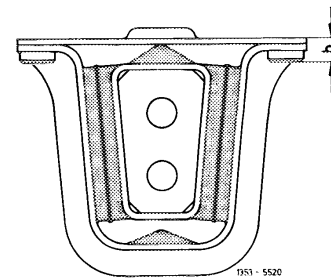
Self-locking hex. screws with plastic coating (micro-encapsulated) or holders with all-metal lock nut on model 126 may be used **only** once.



9 On rubber bearings **without** washers on fastening eyes, use hex bolts with washers and snap rings only (dimension a = 5 mm).

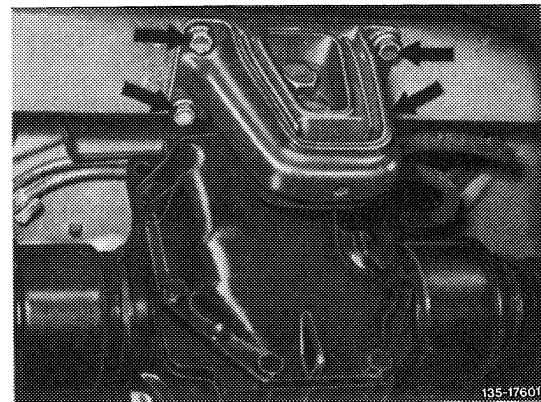


10 On rubber bearings with washers on fastening eyes use self-locking hex. bolts only (dimension b = 12 mm).

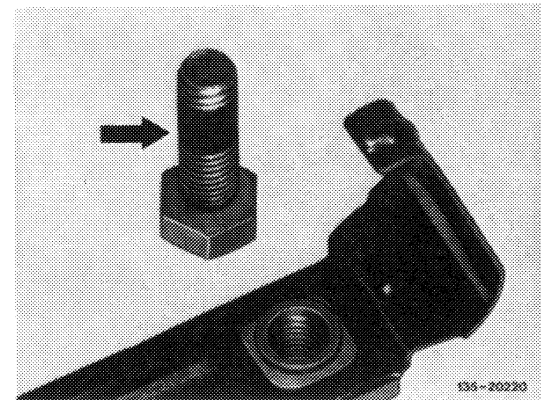


Model 126

11a Lift rear axle center piece up to frame floor and fasten rubber bearing to frame floor. Tightening torque of self-locking hex. bolts 1st version or hex. bolts 2nd version 30 Nm.



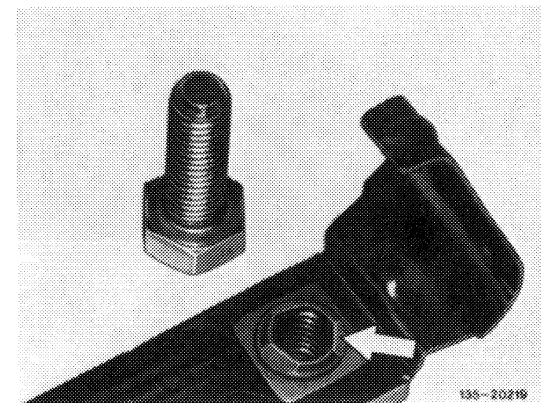
11b In the event of repairs, replace 1st version by 2nd version.



1st version
Self-locking hex. bolts
(arrow) and holder with nut
without lock

Attention!

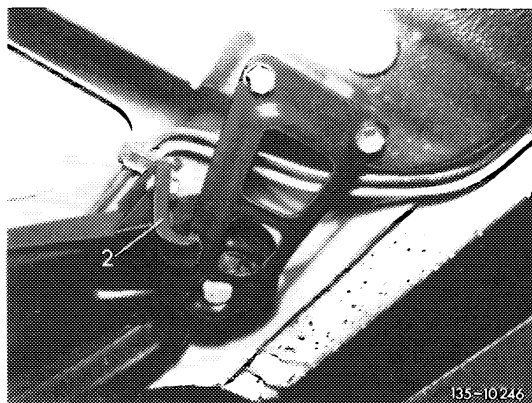
Be sure to replace holder of 2nd version after one-time use.



2nd version
Hex. bolts without lock
and holder with self-locking
nuts (arrow)

12 Lower pit lift or vehicle jack and remove top.

13 On models 115, 114 and 123 with engine 617, with engine 616 starting March 1978, with engine 115 starting September 1979 and with engine 102, mount stop limit (2) and adjust (35-040).

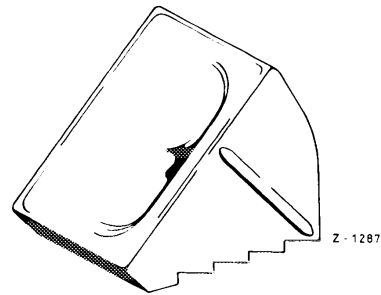




Note

Carefully lift vehicle to avoid accidents and damage to vehicle. Prior to lifting vehicle with a vehicle jack, be sure to protect vehicle by means of chocks (part No. 110 583 01 75) or the like against moving off.

For safety reasons (risk of tilting) T-sedans model 123 and special vehicles (special body) models 114, 115 and 123 should be lifted in empty condition only.



On level ground, protect one wheel of opposite vehicle end against moving off.

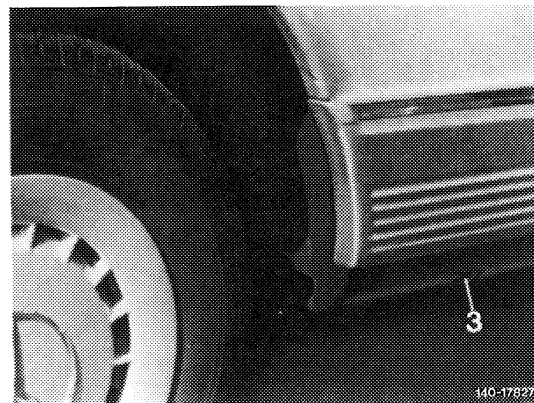
On a gradient, protect both wheels of opposite vehicle end against moving off.

On vehicles with manual transmission, engage first gear step. On vehicles with automatic transmission, place selector lever into position "P".

Step down energetically on parking brake pedal.

Push mounting pin of vehicle jack completely into respective plug-in tube (3) in outer longitudinal member of frame.

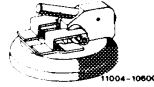
Position vehicle jack vertically — also on a gradient.



40-013 Positioning of jacking-up shoes and jacks

Special tools

Jacking-up shoe
required 4 each



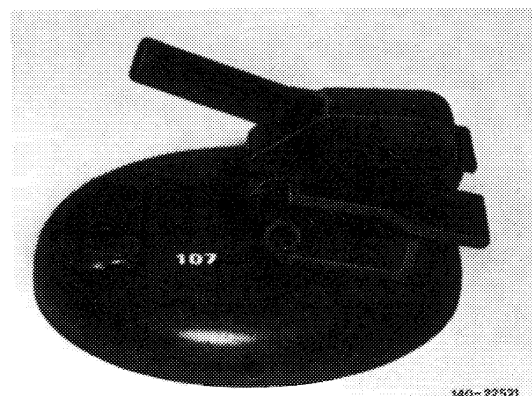
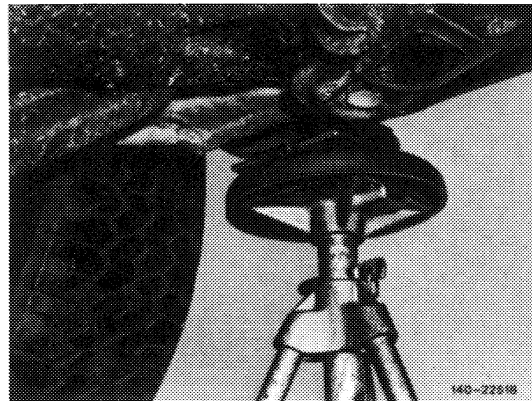
123 589 11 63 00

A. Models 107, 114, 115, 116 and 123

Between jack and frame floor, as well as when lifting vehicle with short stroke lifting platform, use jacking-up shoes for plugging-in at outer frame side members.

These jacking-up shoes will reliably prevent any denting of outer frame floor side members. The jacking-up shoes are providing the additional advantage that no bending torque is exerted against the plug-in tubes themselves, and there are no objections against loads against body for extended periods.

The flap positions required for positioning the jacking-up shoes for the individual models are shown on identification.



Model 107

40–100 Survey rims and tires

A. Model 107

Model	Rim	Summer tires Belted tires (radial) tubeless Tire size	Winter tires Belted tires (radial) tubeless Tire size
107.022 107.042	6 1/2J x 14 H2	185 R 14 90 H ¹⁾	185 R 14 90 Q M + S ¹⁾
		195/70 R 14 90 H ²⁾ ³⁾	195/70 R 14 90 Q M + S ²⁾ ³⁾ or 195/70 R 14 90 T M + S
107.024 ⁴⁾ ⁷⁾ 107.025 ⁵⁾ 107.044 ⁶⁾ ⁷⁾ 107.045 ⁶⁾		205/70 R 14 93 H	205/70 R 14 93 Q M + S or 205/70 R 14 93 T M + S
107.023 107.024 107.025 107.026 107.043 107.044 107.045 107.046		205/70 VR 14	

Possible conversions

Prior to conversion, pay attention to pertinent national laws and regulations!

Belted tires (radial) tubeless series 70

107.022 107.042	6 1/2J x 14 H2 (standard)	205/70 R 14 93 H	206/70 R 14 93 Q M + S or 205/70 R 14 93 T M + S
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Belted tires (radial) tubeless series 65

107.022 107.023 107.024 107.025 107.026 107.043 107.044 107.045 107.046	7 J x 15 H2	205/65 VR 15	—
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¹⁾ Up to February 1980.

²⁾ Starting march 1980.

³⁾ Tires of production up to 1979 carry the load capacity code number 89.

⁴⁾ (AUS) (J) (S) (USA)

⁵⁾ (J) (USA)

⁶⁾ (AUS) (J) (USA)

⁷⁾ HR-version tires are valid for vehicles in (USA) and Canada starting 1975. For vehicles in (J) (S) starting 1976, as well as for vehicles (AUS) starting 1977. VR-version tires were mounted prior to the respective periods.

Note

Each vehicle should be provided with rims of the same version on principle.

Mount only rims approved by us. When in doubt, the MB part no. adjacent to general designation will be decisive.

Designation and part no. are located on wheel disk (on steel plate and light alloy rims outside, on forged light alloy rims inside). As an additional identification a Mercedes star is impressed on steel plate rims starting July 1973, on light alloy rims from start of production.

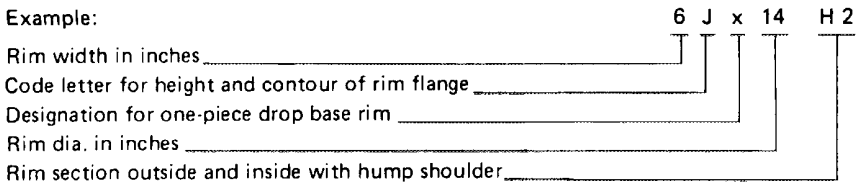
The additional identification A for symmetrical rim section, B for asymmetric rim section is no longer used on present passenger car rims, since only wheels with asymmetric rims are mounted. Mercedes-Benz wheels have an asymmetric rim and are provided outside and inside with a normal hump.

Rims with a hump at outside only are carrying the designation "H". At high air loss of tire, the hump prevents sliding of tire bead into well-base rim, that is, a sudden venting of tire. For tubeless tires at least one hump on rim outer side is specified.

If, in connection with a change of tire size, vehicles are converted to another rim size, approved by the company, attention must be paid to national laws and regulations prior to conversion.

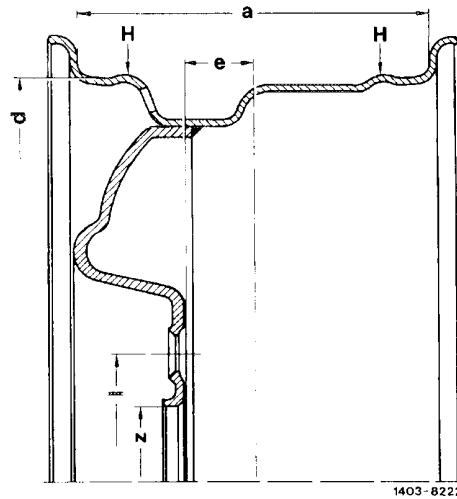
Rim designations

Example:

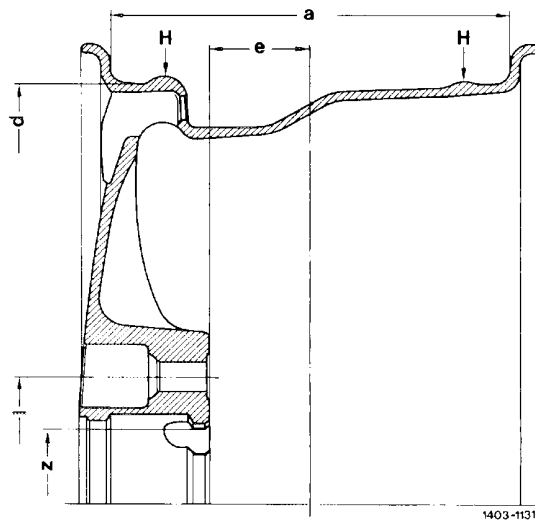


- a Rim width in inches
- d Rim dia. in inches (measuring points dia.)
- e Rim offset – ET
(distance from rim center to contact surface of wheel disk, measured in mm)
- l Hole circle dia. = 112 mm
- z Centering bore dia. = 66.5 ± 0.1 mm
- H Hump (rim with safety shoulder)

Steel plate and light alloy rim



Forged light alloy rim



Rim designation

- 1 Rim designation e.g. 6 J x 14 H 2
- 2 Part no. e.g. 108 400 14 02
- 3 Identification as original Mercedes-Benz part.
- 4 Production code number or production date
 - a) Identification of production plate including month/year up to February 1978, e.g. = January 1978
 - b) Identification of production date including week/year starting March 1978, e.g. 13 78 = 13th week 1978

5 Trademark of manufacturer

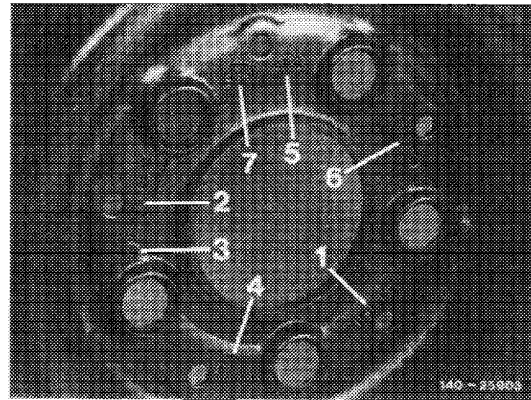
6 Part number of manufacturer

7 Rim offset — ET

Designation of rim offset:

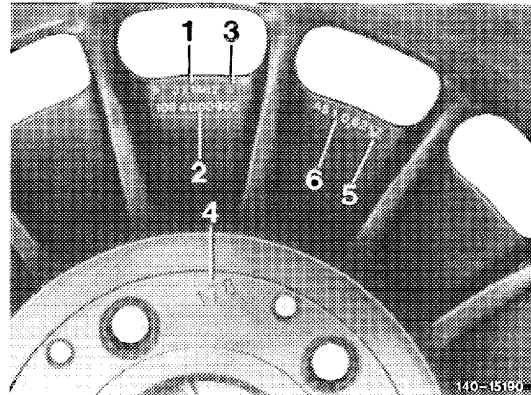
- a) On steel plate rims for the first time with ET 50 (rim 5 J x 14 H2 only) starting with production code number 41 81.
- b) On forged light alloy rims starting with production code number 32 81.

Identification on steel plate and light alloy rims outside

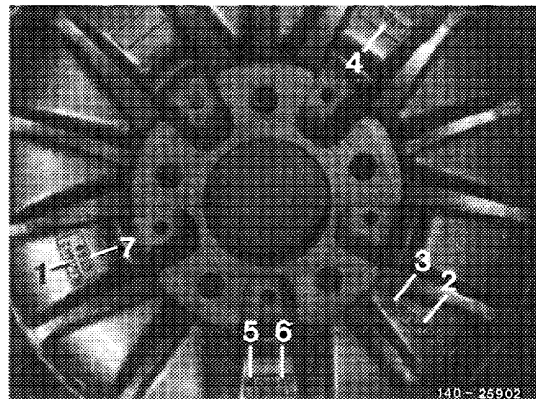


Identification on forged light-alloy rims inside

Version for models 107, 114, 115, 116, 123 and 126



Version for model 201



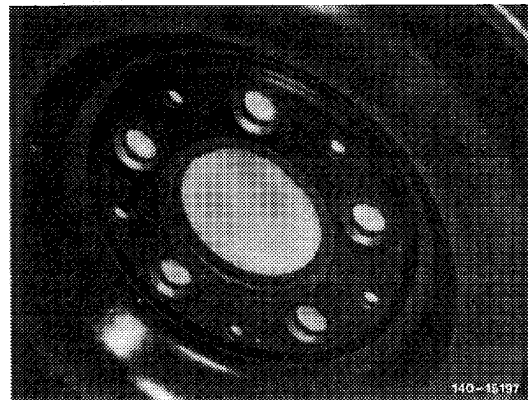
Steel plate rims

On steel plate rims the seat of the tire bead on radius toward rim flange and on rim flange itself, as well as the outer surfaces, particularly on inside of wheel, should not show any rust marks. Prior to fitting a new rubber valve, clean contact surfaces on rim. If required, derust surfaces and apply fresh paint.

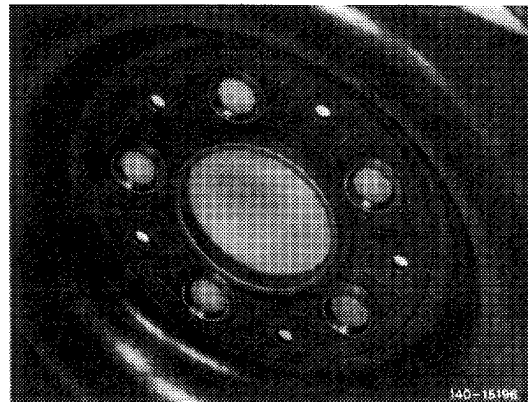
Particularly during the six winter months, check rims inside for contamination and clean, if required.

For steel plate rims the design of the fastening eyes is decisive for accurate fastening of wheels. Wheels with raised fastening eyes provide a very high degree of safety against excessive tightening of spherical collar bolts as compared with recessed fastening eyes used on former types of wheels.

1st version
Wheel with recessed
fastening eyes

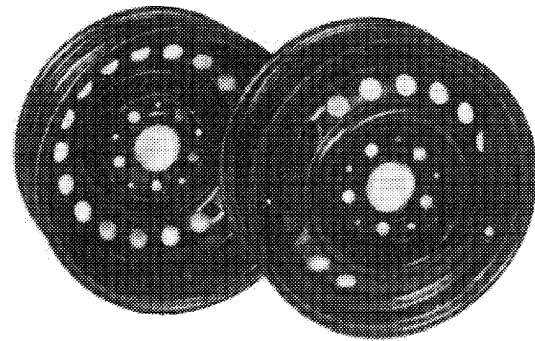
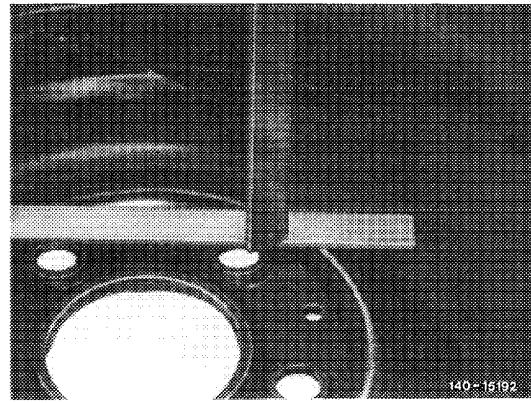


2nd version
Wheel with raised
fastening eyes

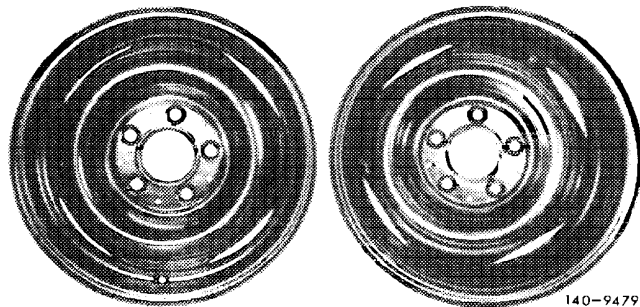


Wheels with reduced inside spacing in relation to contact surface caused by often, excessive tightening of spherical collar bolts should no longer be mounted.

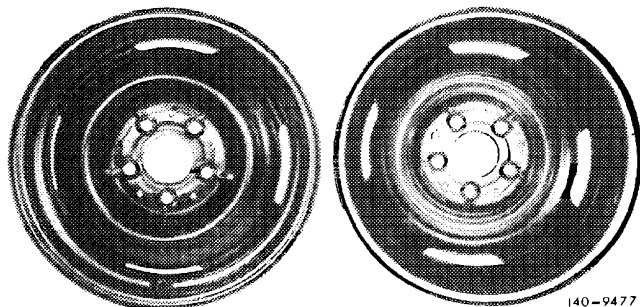
On a removed wheel, the distance between the contact surface and the range of the fastening eyes should amount to at least 0.7 mm. For measuring, use a straightedge and a sliding caliper with depth gage.



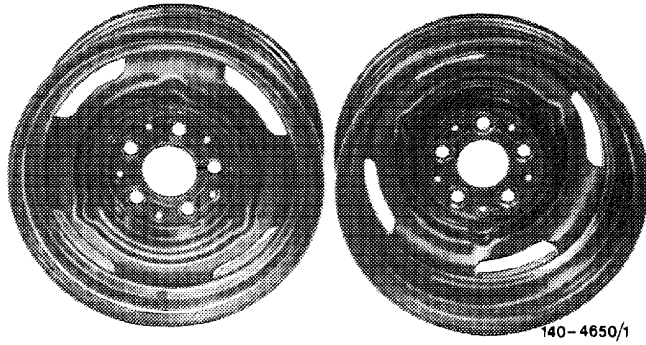
Steel plate rim
5 J x 14 H 2
without inner venting ring
wheel disk with 18 vent holes
of 20 mm dia.



Steel plate rim
5 1/2 J x 14 H 2
(version up to September 1977)

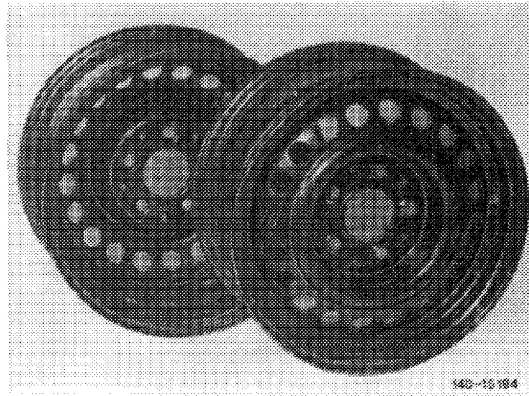


Steel plate rim
5 1/2 J x 14 H 2
(version starting October 1977)



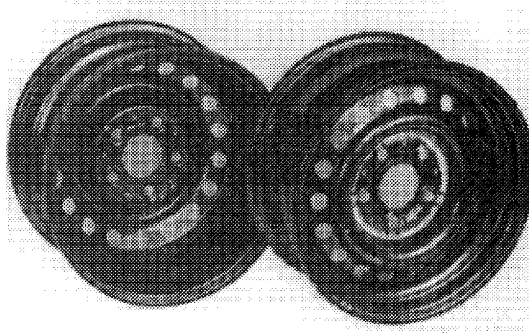
140-4650/1

Steel plate rim
6 J x 14 H 2
(version up to December 1969)



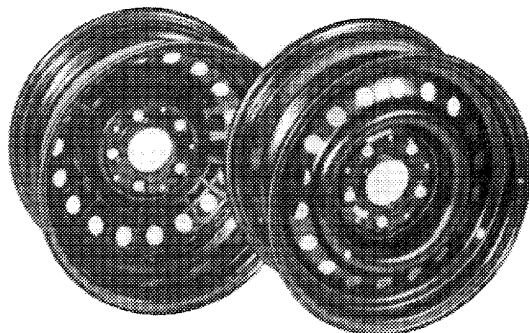
140-15184

Steel plate rim
6 J x 14 H 2
without inner venting ring
Wheel disk with 20 vent holes of 28 mm dia.
(version starting January 1970 up to October 1981)



140-21545

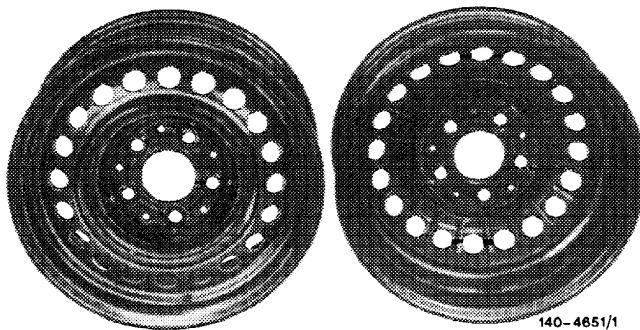
Steel plate rim
6 J x 14 H 2
without inner venting ring
Wheel disk with 18 vent holes of 25 mm dia.
(version starting November 1981)



140-20049

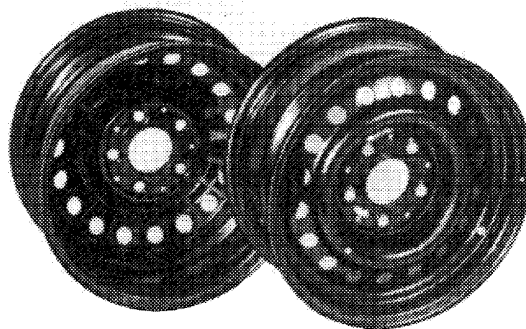
Steel plate rim
6 J x 14 H 2
with inner venting ring
Wheel disk with 18 vent holes of 25 mm dia.

40.5-102/6 F 2



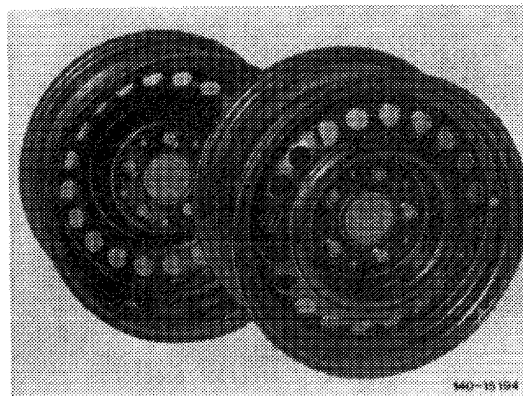
Steel plate rim
6 1/2 J x 14 H 2
with inner venting ring
Wheel disk with 20 vent
holes of 28 mm dia.
(version up to December 1979)

140-4651/1



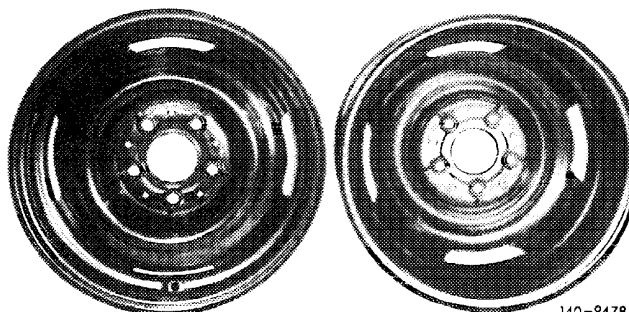
Steel plate rim
6 1/2 J x 14 H 2
with inner venting ring
Wheel disk with 18 vent holes of 25 mm dia.
(version starting January 1980)

140-20049



Steel plate rim
6 1/2 J x 14 H 2
without inner venting ring
Wheel disk with 18 vent
holes of 25 mm dia.

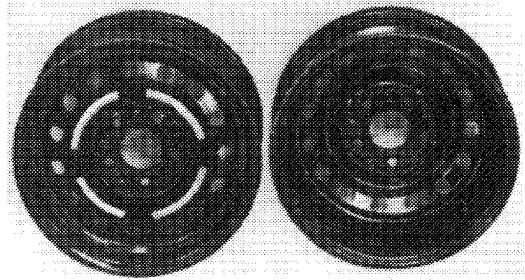
140-15194



Steel plate rim
5 1/2 J x 15 H 2

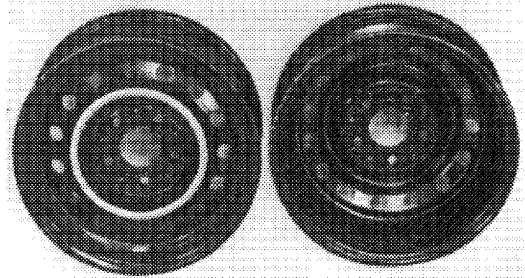
140-9478

USA light alloy rims



Light alloy rim
5 1/2 J x 14 H 2

140-17054/1



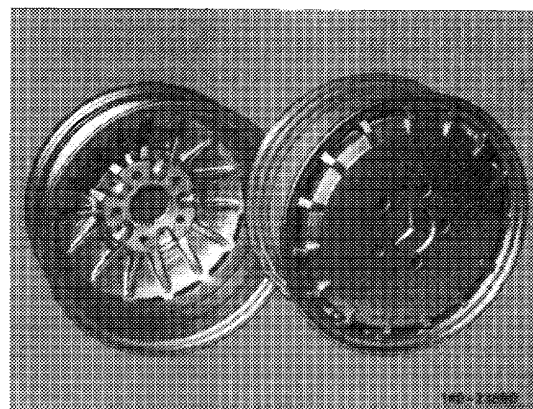
Light alloy rim
6 J x 14 H 2

140-17054

Forged light alloy rims

The rim flanges of light alloy rims may show increased wear under the following operating conditions: high load, trailer operation, not enough tire inflation pressure, use of unrecommended tire makes or tire versions, accumulation of dirt, sand and road salt (particularly during winter months). Prior to mounting a new tire, check rim flanges for wear. Remove burr, if any. Replace rim as soon as wear limit is attained (40-120).

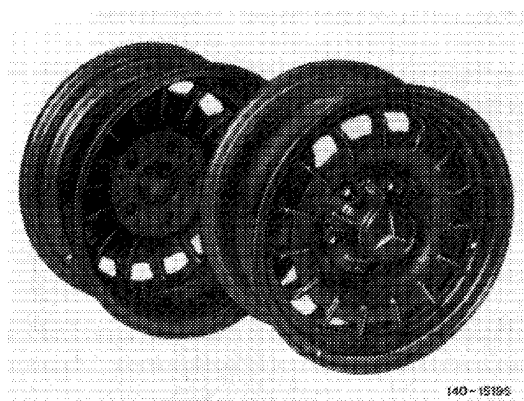
Particularly during the six winter months, check rims inside for contamination and clean, if required.



Forged light alloy rim
5 J x 14 H 2

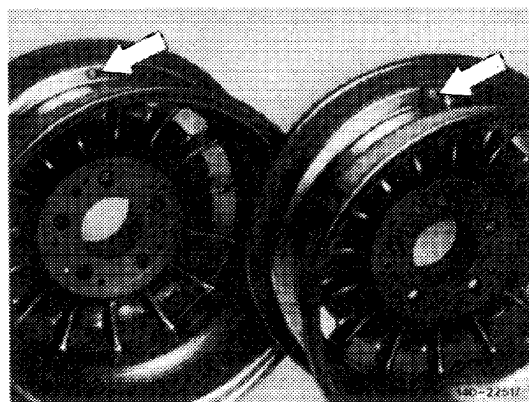
40.5-102/8 F 2

Forged light alloy rim
5 1/2 J x 14 H 2, 6 J x 14 H 2, 6 1/2 J x 14 H 2,
7 J x 15 H 2



Version up to September 1981
(without cavity on valve seat —
for special metal valve)

Version starting October 1981
(with cavity on valve seat —
for rubber valve)



Upkeep and cleaning of forged light alloy rims

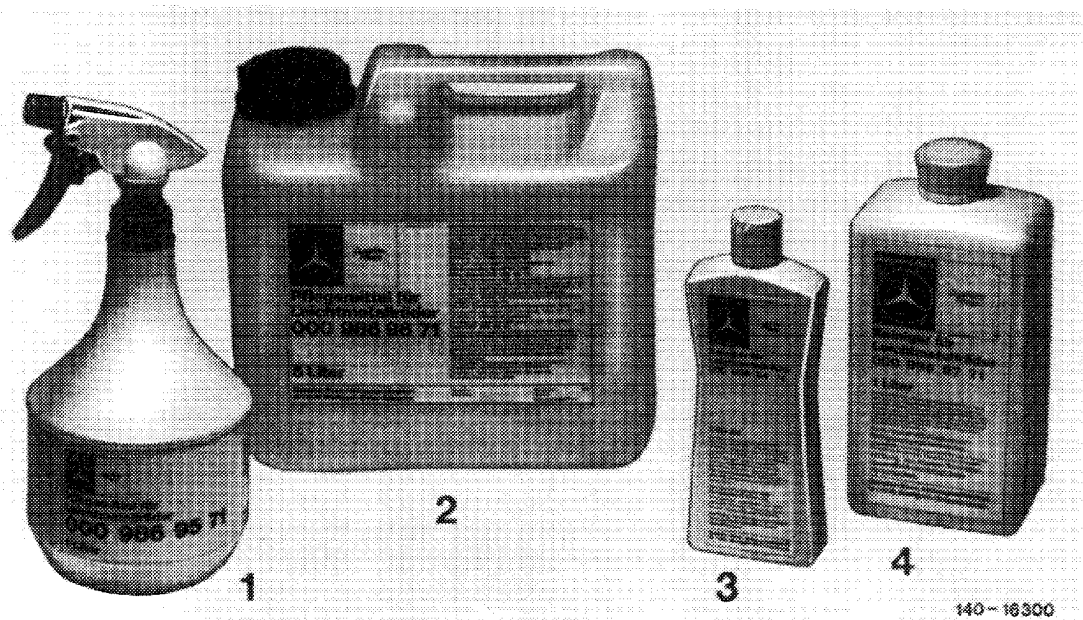
Light alloy rims are coated with a special metallic paint. For this reason, they must be serviced and cleaned with paint-protecting compounds only, just like the vehicle body. Any damage to clear paint surface may lead to peeling.

For this reason, the following instructions should be observed and maintained for upkeep and cleaning.

1. Never treat light alloy rims with abrasive compounds, compounds or sponges which are containing acids or are heavily alkaline. High-pressure hot-water cleaning units should also not be used.
2. Depending on accumulated dirt, clean wheels once a week, whenever possible. Normal dirt including abrasive dust from brake linings can be removed with lukewarm water, a mild solvent for removing dirt (of the type used for cleaning vehicle body) and a sponge. Also use lots of water.

If the wheel cleaning job in combination with a normal vehicle wash is not enough, special preserving and cleaning compounds for light alloy rims are now available (used after precleaning with water).

If repainting of light alloy rims is required, refer to paintwork repair instructions.



Service compounds and cleaners for light alloy rims

- | | |
|-------------------------------------|----------------------------------|
| 1 Spray bottle (1 liter) | 3 Bottle (1/4 liter) |
| 2 Canister — refill pack (5 liters) | 4 Bottle — refill pack (1 liter) |

Materials

Designation		Part No.
Service compound for light alloy rims	1-liter spray bottle	000 986 95 71
	5-liter canister	000 986 98 71
For regular treatment of rims, also if heavily contaminated, but not for tightly sticking residual dirt. Compound has a preservative effect.		
Cleaner for light alloy rims	1/4-liter bottle for approx. 5 treatments	000 986 94 71
	1-liter bottle	000 986 97 71

For removing tightly sticking dirt which cannot be removed with service compounds for light alloy rims.
After a cleaning job with this compound a subsequent preservation with gloss preservation 000 986 06 74
or service compound for light alloy rims 000 986 95 71 must be performed.

Rims

Designation	Rim offset	Part no.	Model	Remarks
Steel plate rims				
5 J x 14 H 2	50 mm	201 400 05 02	201	without inner vent ring-wheel disk with 18 vent holes of 20 mm dia.
5 1/2 J x 14 H 2	30 mm	115 400 13 02	114 115 123	version up to September 1977
		123 400 03 02		version starting October 1977 with modified wheel disk
6 J x 14 H 2	30 mm	108 400 00 02	114, 115 special sedans with higher permissible rear axle load 1160 kg	versions up to December 1969
		108 400 14 02	114 116 123	version starting January 1970 to October 1981 without inner vent ring -- wheel disk with 20 vent holes of 28 mm dia.
		123 400 16 02	114 115 116 123	version starting November 1981 without inner vent ring-wheel disk with 18 vent holes of 25 mm dia.
		126 400 06 02	126	with inner vent ring -- wheel disk with 18 vent holes of 25 mm dia.

Designation	Rim offset	Part no.	Model	Remarks
6 1/2 J x 14 H 2	30 mm	108 400 08 02	107 116	version up to December 1979 with inner vent ring – wheel disk with 20 vent holes of 28 mm dia.
		126 400 07 02	107 126.02 126.03	version starting January 1980 with inner vent ring – wheel disk with 18 vent holes of 25 mm dia.
		126 400 15 02	126.04	without inner vent – wheel disk with 18 vent holes of 25 mm dia.
		116 400 04 02	116.036	reinforced wheel disk with inner vent ring – wheel disk with 20 vent holes of 24 mm dia. additional designation: white edge on vehicle disk
5 1/2 J x 15 H 2	35 mm	115 400 14 02	114 115	version up to October 1978
		123 400 10 02	123	version starting November 1978 with modified wheel disk

Light alloy rims

5 1/2 J x 14 H 2	30 mm	123 400 13 02	123.123 (USA)	—
6 J x 14 H 2	30 mm	123 400 15 02	123.033 (USA) 123.130 (USA)	—

Forged light alloy rims

5 J x 14 H 2	50 mm	201 401 02 02 ¹⁾	201	spare parts – scope of delivery 201 400 06 02 ¹⁾ ⁵⁾
5 1/2 J x 14 H 2	30 mm	123 400 08 02 ²⁾	114 115 123	spare parts – scope of delivery 123 400 11 02 ²⁾ ⁴⁾ ⁶⁾
		123 400 17 02 ³⁾		spare parts – scope of delivery 123 400 18 02 ³⁾ ⁵⁾
6 J x 14 H 2	30 mm	108 400 09 02 ²⁾	114 115 116	spare parts – scope of delivery 108 400 21 02 ²⁾ ⁴⁾
		126 400 19 02 ³⁾	123 126	spare parts – scope of delivery 126 400 23 02 ³⁾ ⁵⁾
6 1/2 J x 14 H 2	30 mm	108 400 10 02 ²⁾	107 116 126	spare parts – scope of delivery 108 400 22 02 ²⁾ ⁴⁾
		126 400 21 02 ³⁾	107 116 126	spare parts – scope of delivery 126 400 24 02 ³⁾ ⁵⁾

Designation	Rim offset	Part no.	Model	Remarks
7 J x 15 H 2	25 mm	126 400 22 02 ¹⁾	107 116 126	spare parts — scope of delivery 126 400 27 02 ^{1) 5)}

¹⁾ With trough-shaped cavity in valve seat — for rubber valve.

²⁾ Version up to September 1981 (without trough-shaped cavity on valve seat — for special metal valve).

³⁾ Version starting October 1981 with trough-shaped cavity on valve seat — for rubber valve.

⁴⁾ Spare parts scope includes: Rim, cap, spherical collar screws, special metal valve and tag "Important information concerning light alloy rims".

⁵⁾ Spare parts scope includes: Ring gear, hub cap, spherical collar screws, rubber valve and tag "Important information concerning wheel assembly".

⁶⁾ With plastic hub cap (part no. 107 400 00 25) only.

Note

Use only tires recommended by us. Pay attention to our tire recommendations particularly with regard to light alloy rims.

As replacements or for a conversion, use tires of similar construction, similar make and similar version for all rims. We do not approve combination of belted tires (radial) with conventional tires (diagonal), steel belted tires with textile belted tires, as well as winter tires (M + S) with summer tires.

In the event of replacements, tires approved for higher speeds may of course be used instead of the tires specified for the respective model (example: belted tires 195/70 R 14 90 H instead of 195/70 R 14 90 S).

When replacing tires, include spare wheel as a road wheel, but only if depth of tire treads and tire version are similar. Avoid excessive ageing of tires!

New tires should be run in prior to demanding full efficiency. About 100 km driven at moderate speed are enough. Avoid sharp acceleration and braking.

Storage areas for keeping tires in stock should be dark, cool and dry. Avoid drafts as much as possible, since oxygen accelerates ageing of rubber compound.

Place tubes upright in shelf (min. 10 cm ground clearance) or in sets one upon the other on wooden gratings.

On removed tires, put tubes into tires lightly inflated and dusted with talcum, make sure that tires are not coming into contact with gasoline, oil or technical greases.

Apply safety rules as a protection against fire!

If vehicles are converted to a different tire size than the one ex factory, pay attention to national laws and regulations prior to conversion.

For tube type tires use only new tubes of the same make and specified designation.

For tubeless tires, insert valves of specified version into rims (refer to 40–120).

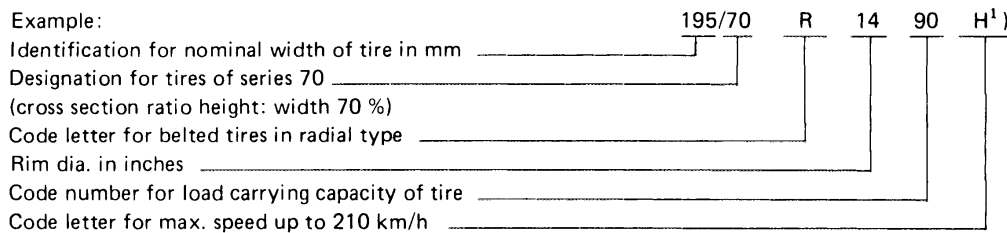
When renewing a tire, also exchange rubber valve as a safety measure. Prior to inserting the new rubber valve, clean contact surfaces on rim. If required, de-rust surfaces and re-paint.

Screw only metal or rigid plastic valve caps with rubber sealing rings, part no. 007757 008600, on valves.

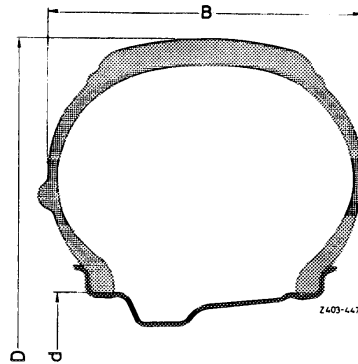
Tire designation

1 Tire designation

Example:



1) For designation of tires according to ECE-regulation no. 30 (starting 1978), with the exception of VR-version tires, the operational identification, that is, the code letter for the permissible max. speed and the code number for load carrying capacity is named following the tire designation. The former designation of tire was 195/70 HR 14 or as a temporary designation 195/70 HR 14 90 H.



B = Nominal width of tire in mm
D = Tire OD
d = Rim dia. in inches

2 Additional tire designations

Radial = designation for belted tires
tube-type = tube-type tires or assembly with tube
tubeless = tubeless version tires
M + S = mud and snow tires

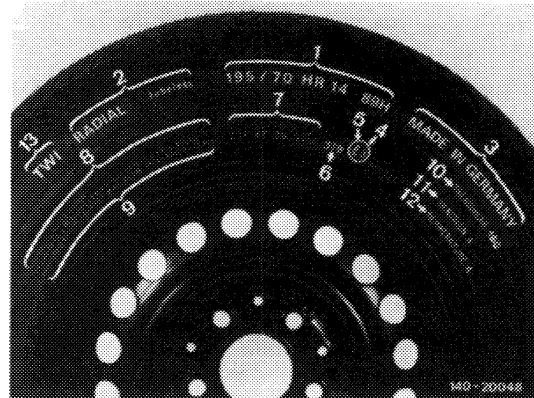
3 Indication of manufacturing country

4 Country code number for licence number

Example:

3 = Italy, 1 = Germany, 2 = France.

0132239 = registration number for type or model test



5 Europe licence number

E = Europe

6 Production date code number

The 3-digit code or production code number is at end of letter and number sequence beginning with DOT and located in bead range of outer tire flanc.

Number 1 and 2 = production week

Number 3 = last digit of production year

7 (USA) licence number

DOT = Certificate of Department of Transportation

XT = Manufacturer's code

J9 = Size code

XKNC = Type or version code

8 (USA) identification for tire understructure

Example:

SIDEWALL 2 PLIES RAYON = Sidewall of carcass comprises 2 layers rayon cord.

TREAD AREA 2 PLIES RAYON + 2 PLIES STEEL + 1 PLY NYLON = Tread zone has 2 layers rayon cord of carcass and 2 layers steel cord + 1 layer Nylon of belt.

9 (USA) identifications for max. wheel load and max. air pressure

Example:

MAX. LOAD RATING 1340 LBS =
max. permissible wheel load 1340 pounds

MAX. PERM. INFL. PRESS 36 PSI =
Max. permissible air pressure 36 pounds per square inch

10 (USA) identification for tread wear

TREAD WEAR 160 = Wear code number in % as compared with an average US comparison tire.

11 (USA) identification for anti-skid properties

TRACTION A = Identification for deceleration on wet asphalt and concrete.

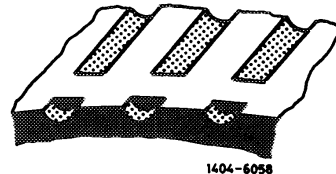
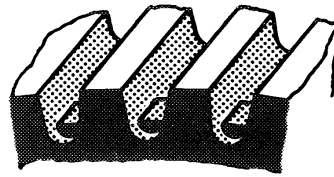
12 (USA) identification for temperature stress

TEMPERATURE A = Identification for temperature behavior during fast dynamometer run

13 Tire wear limit

The wear limit of 1.6 mm for tire tread specified for USA and lately for other countries has already been indicated for a number of years by the "TWI" tread wear indicator on tire.

These humps are 1.6 mm high and embedded in base of tread at 6 points of circumference and will show up as cross stripes on tread when the wear limit is attained.



Permissible max. speed for passenger car belted tires (radial)

Code letter Q up to 160 km/h
Code letter R up to 170 km/h
Code letter S up to 180 km/h
Code letter T up to 190 km/h
Code letter H up to 210 km/h
Code letter V above 210 km/h

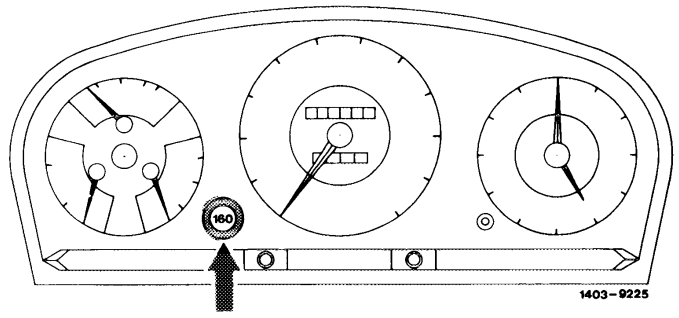
Sticker for M + S tires

Regulations in the Federal Republic of Germany are specifying that the legally permitted maximum speed for M + S tires "should be clearly displayed within view of driver", if the max. speed permitted for M + S tires is **below** the max. speed of the vehicle (refer to vehicle documents).

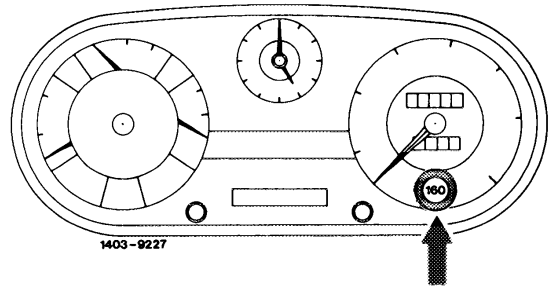
This sticker may be attached to the spot specified for this purpose only. On models 123 and 126 do not place this sticker on glass of instrument cluster, since this glass may be damaged when the residual glue is removed (plexiglass).

Sticker for M + S tire version
Q = up to 160 km/h

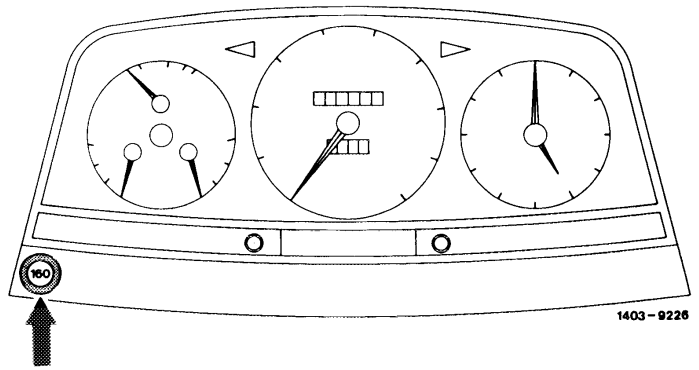
Sticker for M + S tire version
T = up to 190 km/h



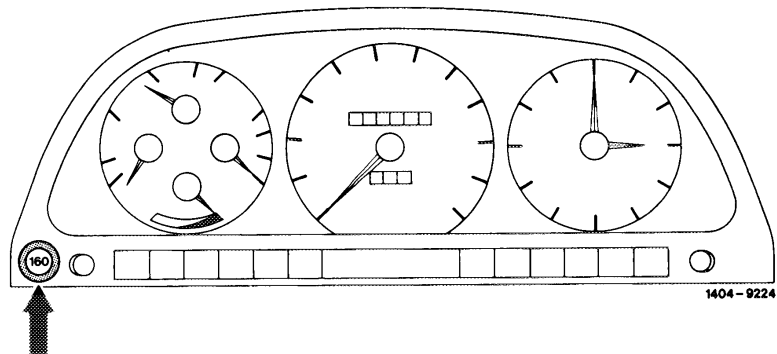
Models 107, 116



Models 114, 115

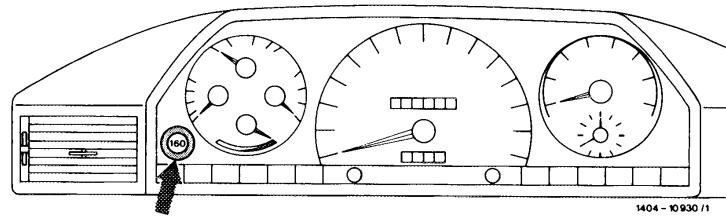


Model 123



Model 126

Model 201

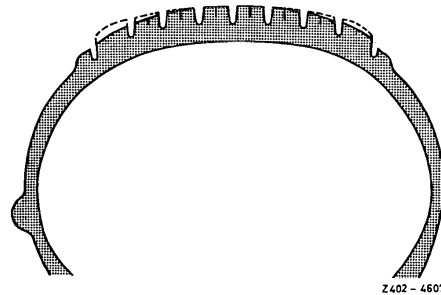


Tire wear

When evaluating tire wear patterns proceed as follows:

Front axle

On front wheels, a slightly higher wear of tire shoulders as compared with center of tread is normal, while the wear on tire shoulder facing the road center (e. g. with righthand traffic on outside of left-hand wheel, on inside of righthand wheel) may be more distinctive.



Causes of increased tire wear

1. Not enough inflation pressure, influencing both outer and inner shoulder to the same extent.
2. Predominantly city or highway driving, as well as sports style driving. The habit of driving around sharp bends while decelerating may lead to increased shoulder wear. Wear occurs mostly on outer shoulders, with righthand traffic particularly more clearly at lefthand front wheel.
3. Deviations of toe-in. Even minor deviations beyond normal tolerance range may lead to increased wear on tire shoulders, particularly on white tires (starting with series 70) each time on both wheels. At insufficient toe-in, increased wear will show up on inner shoulders or at increased toe-in on outer shoulders. In the event of toe-in deviations, which are clearly exceeding the tolerance limits, the wear may extend from tire shoulder almost to center of tread, in which case the tread may be slightly roughened.

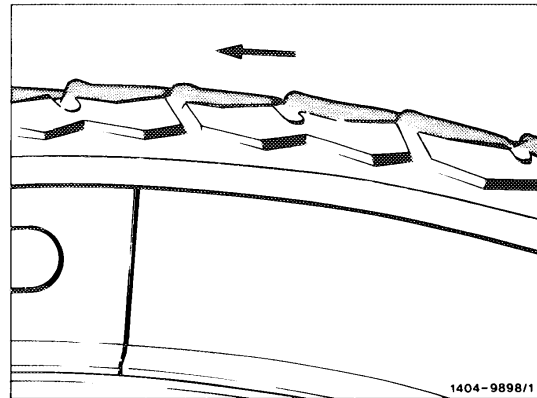
If deviations of pivot point position from nominal value are too high, increased shoulder wear may occur on both wheels as well as on one wheel only, since changes of toe-in during deflection will be too high. A pivot point which, for example, is substantially too low will lead to an increased change of track in minus direction during downstroke, while a pivot point which is substantially too high will lead too early to a change of track in minus direction during upstroke.

If the track difference angle deviates too much, an unfavorable wheel position may result in influences which lead to increased shoulder wear.

4. In dependence of tire version and tire tread, the wear on shoulders, predominantly outside, may have a saw-toothed shape. This wear pattern is particularly distinctive on tires with a shoulder zone open in outward direction, e. g. sports style summer tires and M + S tires.

Saw tooth-shaped wear occurs predominantly on front axle, but to a lesser degree also on rear axle.

Saw tooth-shaped wear on front wheel tires



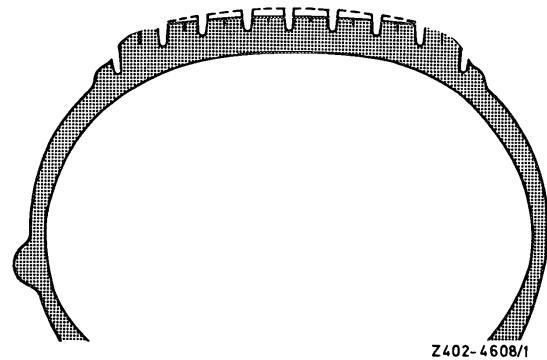
Rear axle

On rear wheels, wear is normally distributed across entire tire tread surface, but may be slightly higher in tread center than at the shoulders.

Causes of increased wear

1. Depending on load of vehicle rear end (on vehicles without level compensation increased minus camber at high load) wear on inner side of tread is higher than on outer side.

2. If toe-in is wrong, the same applies as explained in section "front axle".

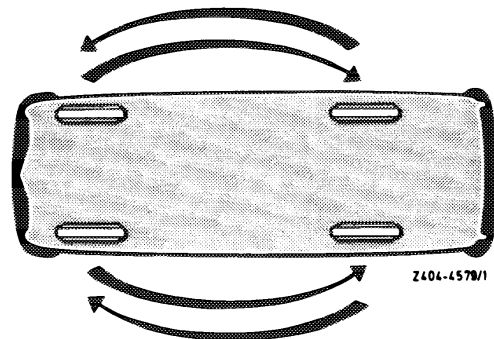


Rotation (switching) of wheels

Summer tires and winter tires (M + S):

For max. mileage while simultaneously maintaining good driving characteristics.

Rotate (switch) wheels depending on tire wear (that is, between 5000 and 10,000 km as shown by experience) while keeping driving direction of wheels the same.



However, the wheels should be rotated (switched) prior to attaining a distinctive, characteristic wear pattern, since otherwise driving characteristics will turn to the worse. Optimal driving characteristics, in turn, can be obtained only if the wheels are left in their position or are rotated (switched) at very short intervals (mileage).

Rebalancing of wheels may be required depending on driving style, wear pattern and condition of tires.

Upon rotation (switching) of wheels, make sure of correct tire inflation pressure.

Note

The tire inflation pressure specified by vehicle manufacturer is determined in accordance with the following criteria:

1. Consideration of axle loads on vehicle under influence of full load.
2. Consideration of attainable max. speed of respective vehicle.
3. Good driving characteristics, also for sports-style driving.
4. Satisfactory driving comfort.
5. Favorable tire wear pattern.

A wrong tire inflation pressure, particularly when the air pressure is too low, will influence the driving characteristics and the life of the tires depending on extent of deviation from specified value, and will also lead to an additional, higher fuel consumption.

If the tire inflation pressure is too low, flexing and thereby excessive heating will increase. The understructure of such a tire will lose its compactness. The results: tread and belt will come loose. Depending on size of reduced inflation pressure and driven speeds, the life of the tire will become shorter, while even short-term "inflation pressure sins" may lead to permanent damage.

On the other hand, a tire inflation pressure which is essentially too high (higher than the values named for fast driving or for max. loads) incorporates the disadvantages of a high loss in comfort, while the smaller tire road contact area results in a worsening of driving characteristics and on a wet road also in a higher trend toward aquaplaning.

Notes concerning tire inflation pressure checkup

1. Check inflation pressure of tubeless tires every two weeks.

On tube-type tires, checking inflation pressure once a week will be of advantage.

2. Measure inflation pressure as much as possible when tires are cold, while taking the respective outside temperature into account. Here, approx. 10 °C are equal to an air pressure change by 0.1 bar.

Example 1

The specified air pressure is valid if the temperature of the tires is in accordance with outside temperature.

Example 2

If the temperature of the tires is equal to room temperature (ambient temperature) e. g. + 20 °C, and the outside temperature amounts to approx. 0 °C, the tire inflation pressure must be set 0.2 bar higher than the specified air pressure.

3. If the inflation pressure is measured on warm tire, an increase up to 0.5 bar must be taken into consideration depending on extent of heating up caused for example by fast driving on a highway, by hot weather or by exposure to sunshine. Following normal driving, the increase in air pressure will amount to approx. 0.2 bar.

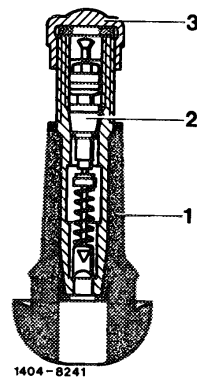
Never deflate warm tire.

4. If an inflation pressure checkup on a single wheel will always show a higher drop in inflation pressure than on the other tires, the respective wheel should be checked.




The following causes may be responsible:

- a) Penetration of foreign bodies.
 - b) Damaged tread or side wall.
 - c) Leaking valve bodies or valve elements (refer to item 4).
 - d) On tubeless tires leak between tire bead and rim.
 - e) On tube-type tires, leaking inner tube.
 - f) On tubeless tires leaking rim e. g. crack in welding seam or faulty welding on steel plate rims or porous spot on cast light alloy rims (products from other manufacturers).
5. If the valve cap is not screwed on again following a tire inflation pressure checkup, penetrating dirt may settle at edge of valve element during next inflation pressure checkup and will subsequently result in a creeping inflation pressure loss.
6. Use only metal valve caps or valve caps made of hard (rigid) plastic material with rubber sealing ring recommended by us. In contrast to caps made of soft plastic material, these caps guarantee additional sealing in the event of a leaking valve element.

- 1 Valve body
- 2 Valve element
- 3 Valve cap with rubber sealing ring



Models 107, 116, 126

Cold tires		Tire inflation pressure in bar				
		Summer tires up to 180 km/h 		above 180 km/h 		Winter tires up to 190 km/h 
107		2.2 ¹⁾	2.5 ¹⁾	2.4	2.7	
116.02	Partial load	2.1 ¹⁾	2.3 ¹⁾	2.4	2.6	2.3 ³⁾
116.032						
116.033	Max. load	2.3 ¹⁾	2.5 ¹⁾	2.6	2.8	
116.120						
116.036	Partial load	2.2 ²⁾	2.2 ²⁾	2.4	2.4	2.3
	Max. load	2.4 ²⁾	2.4 ²⁾	2.6	2.6	
126.02	Partial load	2.1 ¹⁾	2.3 ¹⁾	2.4	2.6	2.3
126.032						
126.033	Max. load	2.2 ¹⁾	2.5 ¹⁾	2.5	2.8	2.6
126.037 ⁴⁾						
126.043						
126.036	Partial load	2.1 ¹⁾	2.3 ¹⁾	2.5	2.7	2.3
	126.037 ⁵⁾					
126.044	Max. load	2.2 ¹⁾	2.7 ¹⁾	2.6	3.1	
126.120	Partial load	2.2 ¹⁾	2.3 ¹⁾	2.5	2.6	2.6
	Max. load	2.4 ¹⁾	2.5 ¹⁾	2.7	2.8	

Warm tires

Spare wheel

All models

Higher inflation pressure readout up to + 0.5 bar, therefore do not discharge air

Max. inflation pressure of rear wheel tires

- 1) To improve driving comfort for speeds up to 160 km/h, inflation pressure can be dropped by 0.2 bar for summer tires.
- 2) To improve driving comfort for speeds up to 180 km/h, inflation pressure can be dropped by 0.3 bar for summer tires.
- 3) Formerly 2.2/2.5 bar.
- 4) Vehicles with hydropneumatic suspension.
- 5) Vehicles with steel suspension.

Model	Part no.	Color base/letters
Models 107, 116, 126		
107	107 584 10 39 ⁹⁾	purple/silver
116.02 116.032 116.033 116.120	116 584 02 39 ¹⁰⁾	green/silver
116.024 (USA) 116.033 (USA) 116.120 (USA)	116 584 11 39	green/silver
116.036	116 584 10 39	silver/green
116.036 (USA)	116 584 15 39	green/silver
126.02 126.032 126.033 126.037 ¹¹⁾ 126.043	126 584 06 39 ¹³⁾	green/silver
126.036 126.037 ¹²⁾ 126.044	126 584 07 39 ¹⁴⁾	silver/green
126.120 (J)	126 584 05 39	brown/silver
126.032 (USA) 126.033 (USA) 126.037 (USA) 126.044 (USA) 126.120 (USA)	116 584 11 39	green/silver
Model 201		
201.022	201 584 00 39	silver/red
201.024	201 584 01 39	red/silver

- 1) Attached starting May 1972; up to April 1972, tire inflation pressure label 114 584 01 39 applied to models 114.01, 114.02 and 115.
2) Formerly 116 584 02 39.
3) The max. permissible axle loads for the individual models are shown in vehicle documents or on type rating plate.
4) Formerly 123 584 04 39.
5) Tire inflation label attached up to January 1980.
6) Tire inflation label attached starting February 1980.
7) Also applies to vehicles for the purpose of cleaning the rails.
8) Tire inflation label attached starting March 1978 (formerly 114 584 02 39).
9) Formerly 107 584 08 39 or 107 584 00 39.
10) With tires 205/70 R 14 93 T M + S up to 190 km/h, valid tire inflation label 116 584 21 39.
11) Vehicles with hydropneumatic suspension.
12) Vehicles with steel suspension.
13) Tire inflation label attached starting September 1981 (formerly 126 584 00 39).
14) Tire inflation label attached starting September 1981 (formerly 126 584 01 39).

40–108 Snow chains

Remove wheel caps.

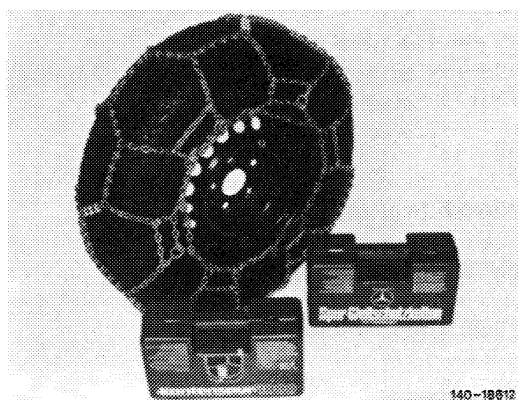
Retension snow chains after driving for a short distance!

When driving with snow chains, do not exceed max. speed of 50 km/h!

On roads free of snow, drive with restraint for safety reasons and to protect chains.

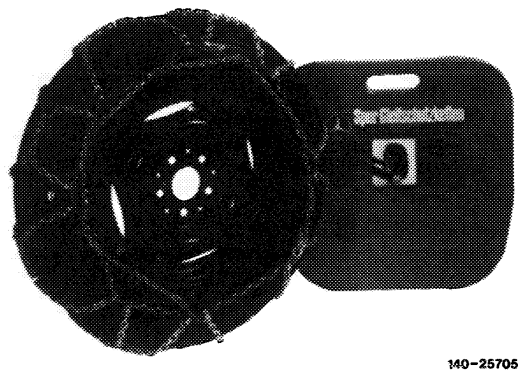
Mercedes-Benz non-skid chains with gripping studs (up to 1982)

Tire size	Part no.	Code no. ¹⁾
175 R 14	000 583 66 16	07 325
185 R 14	000 583 68 16	17 328
195/70 R 14	000 583 89 16	16 327
205/70 R 14	000 583 81 16	16 329
215/70 R 14	000 583 88 16	16 331
185 R 15		



Mercedes-Benz non-skid chains with gripping studs RUD-matic system (starting 1983)

Tire size	Part no.	Code no. ¹⁾
175/70 R 14	201 583 00 16	46 320
175 R 14	123 583 00 16	46 325
185 R 14	107 583 00 16	46 328
195/70 R 14		
205/70 R 14	126 583 00 16	46 329
215/70 R 14	116 583 00 16	46 331
185 R 15		
205/65 R 15	107 583 01 16	46 384



**Mercedes-Benz non-skid chains without gripping studs
RUD-matic system (starting 1983)**

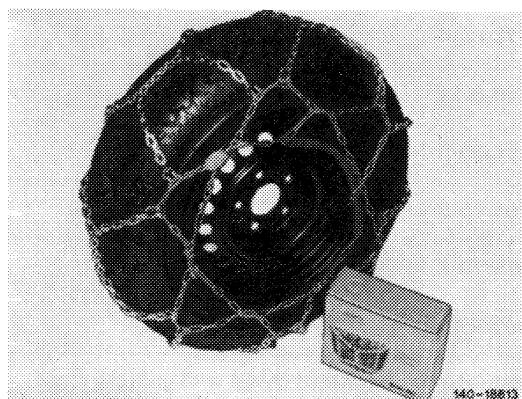
Tire size	HW-part no.	Code no. ¹⁾
175/70 R 14	758 0265	44 320
175 R 14	758 0266	44 325
185 R 14	758 0267	44 328
195/70 R 14		



140-25706

**Additionally recommended non-skid chains
Erlau-Quadrat-m (up to 1982)**

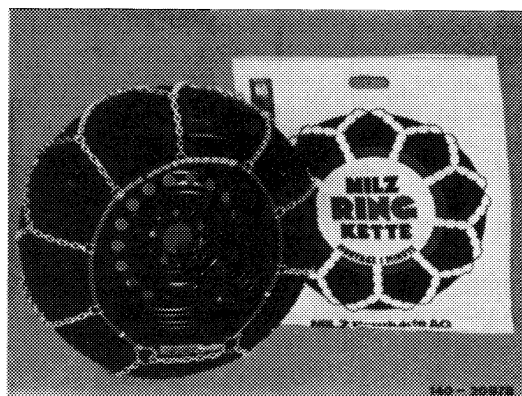
Tire size	Part no./code no. ¹⁾
175 R 14	417-048
185 R 14	417-056
195/70 R 14	417-059
205/70 R 14	417-057
215/70 R 14	417-054
185 R 15	417-061



140-18813

Milz ring chain

Tire size	Without gripping studs Y-grip pattern code no. ¹⁾	With gripping studs Y-super grip pattern code no. ¹⁾
175/70 R 14	60 or 20 060	—
175 R 14	70 or 20 070	23 070
185 R 14 195/70 R 14	80 or 20 080	23 080
205/70 R 14	90 or 20 090	23 090
215/70 R 14	100 or 20 100	23 100
165 R 15	90 or 20 090	23 090
205/65 R 15	90 or 20 090	23 090



140-23078

RUD-"non skid" (up to 1982)

Tire size	Part no. ¹⁾
175 R 14	07 125
185 R 14	17 128
195/70 R 14	16 127
205/70 R 14	16 129
215/70 R 14	16 131
185 R 15	



**RUD-matic
type "non-skid" (starting 1983)**

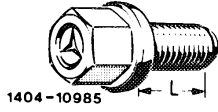
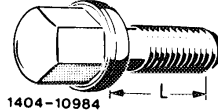
Tire size	Part no. ¹⁾
175/70 R 14	46 120
175 R 14	46 125
185 R 14 195/70 R 14	46 128
205/70 R 14	46 129
215/70 R 14	46 131
185 R 15	46 131
205/65 R 15	46 184



¹⁾ Code numbers or part numbers are each stamped-in at closing hook of tensioning chain or at outer (red) steel rope ring.

40-110 Removing and mounting of wheels

Wheel bolts for fastening wheel

Part no.	Threads	Length "L"	Type	
For steel plate and light alloy rims ¹⁾				
110 401 01 70	M 12 x 1.5	21	107 114 115 116 123 126 201	
For forged light alloy rim ²⁾				
108 401 00 70	M 12 x 1.5	29.5	107 114 115 116 123 126 201	

¹⁾ A Mercedes star is stamped into face of screw head for identification as an MB original part.

²⁾ A Mercedes star is stamped into face of threaded part for identification as an MB original part.

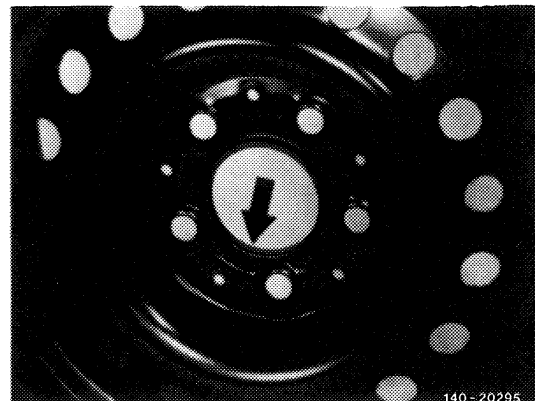
Centering of rims

Centering on rim dia.	Centering on front wheel hub or on rear axle shaft flange	Radial play between rim and front wheel hub or rear axle shaft flange ¹⁾
66.50	66.40	0.10
66.57	66.35	0.22

¹⁾ Checking wheel centering play.

Check centering bore of rim for burr, if any.

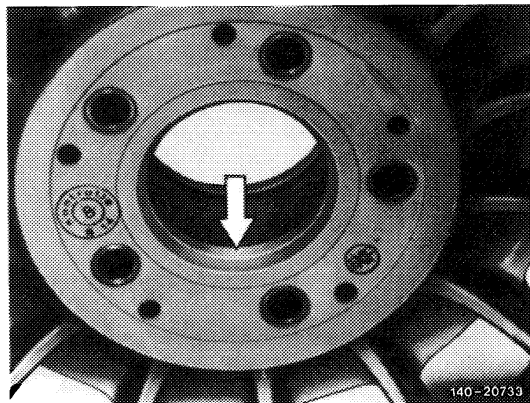
The wheel play between rim and front wheel hub or rear axle shaft flange should not exceed 0.2 mm. Reduce higher play by spraying quick-drying paint from a spray can against wheel center (refer to arrow), covering wheel contact surface for this purpose (refer to 40-130).



Steel plate rim

140-20295

Forged light alloy rim



Tightening torque

Nm

Wheel bolts for fastening wheel

110

Assembly bolt for forged light alloy rim¹⁾

Model	Part no.	Threads	Length "L"	
201	201 400 00 74 ¹⁾	M 12 x 1.5	80	

¹⁾ On light alloy rims, prior to mounting wheel, screw assembly bolt available with spare wheel into screw hole located at the top.
²⁾ Spare parts scope of delivery includes: Assembly bolt and rubber sleeve (rubber sleeve serves for fastening bolt in spare wheel).

Conventional tools

Electric or pneumatic impact wrench
with limited tightening torque of 100 Nm

e.g. Atlas-Copco
D-7250 Leonberg
order no. LMS 26 HR 01

Hex. socket for impact wrench,
OD max. 26.5 mm

e.g. Hazet
D-5630 Remscheid
order no. 900 S

Torque wrench, automatically releasing

e.g. Rahsol
D-5650 Solingen
order no. 7562-1

Wheel attachment

Never mix up spherical collar bolts for steel plate and light alloy rims with spherical collar bolts for forged light alloy rims.

Check spherical collar bolts. Clean dirty bolts. Replace screws with damaged threads, worn zinc layer on spherical collar and with corroded spherical collar. Check threads in front wheel hub and rear axle shaft flange for easy operation and refinish, if required.

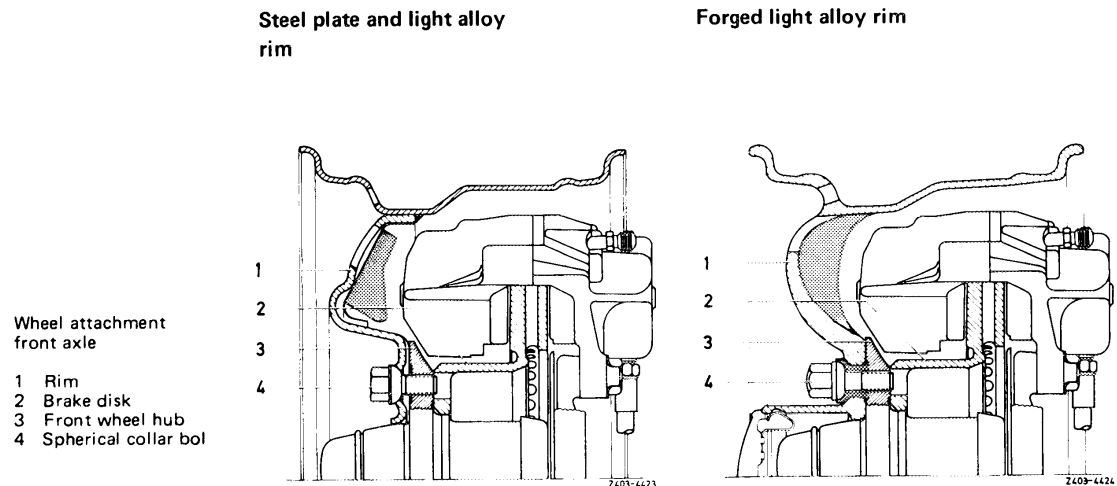
There should be no dirt or grease on spherical collar of bolts as well as on spherical segments of rims, since otherwise the threads of the spherical collar bolts and of front wheel hub or rear axle shaft flange will be excessively strained.

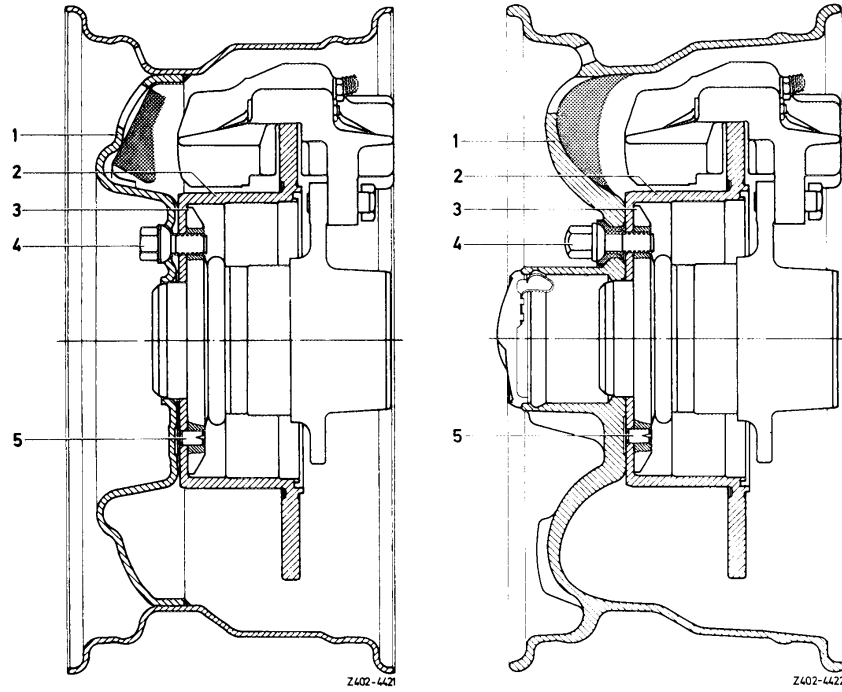
Contact surfaces on rim and front wheel hub or on brake disk bowl must be clean. Clean corroded surfaces with wire brush or emery cloth.

Always tighten spherical collar bolts with torque wrench on principle.

Check torque wrench regularly.

Re-tighten new rims after a mileage between 100 and 500 km. The reason for this requirement is the setting of the spherical sections for wheel fastening.





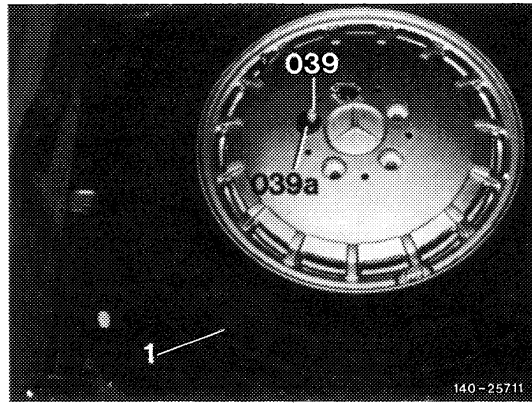
Wheel attachment rear axle

- 1 Rim
- 2 Brake disk
- 3 Rear axle shaft flange
- 4 Spherical collar bolt
- 5 Fitted pin for locating brake disk

Note

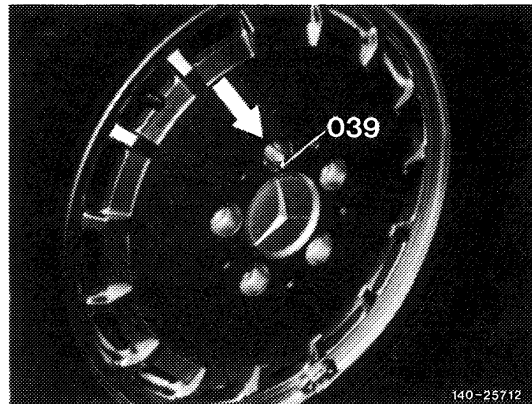
On model 201 with forged light alloy rims use assembly bolt available with spare wheel for mounting wheel.

- 1 Spare wheel
- 039 Assembly bolt
- 039a Rubber sleeve



Prior to mounting wheel, screw assembly bolt into tapped hole located at top (arrow).

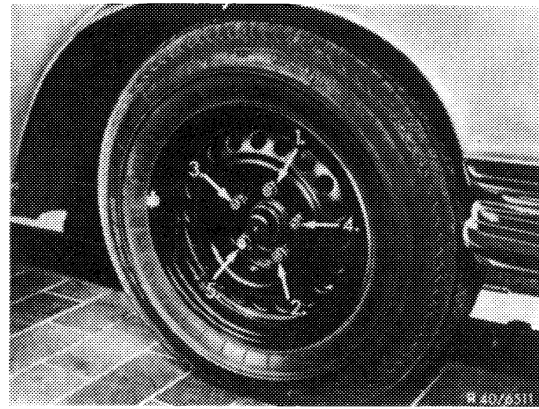
- 039 Assembly bolt



Make sure that the wheels are not distorted by one-sided tightening of spherical collar bolts.

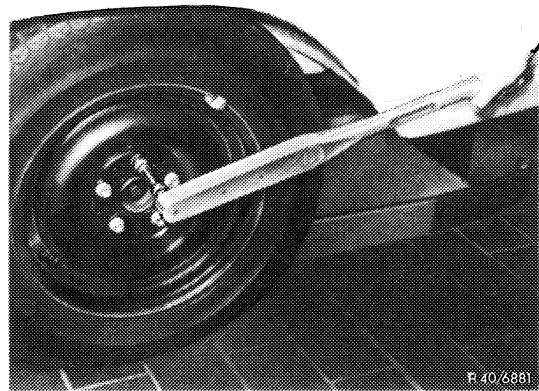
Tighten spherical collar bolts crosswise in several steps.

Make particularly sure that the first wheel bolt is not already tightened to its full tightening torque prior to at least screwing-on the others.



When using impact wrenches, tighten only up to appr. 3/4 of the required torque, then tighten with torque wrench while not exceeding specified value.

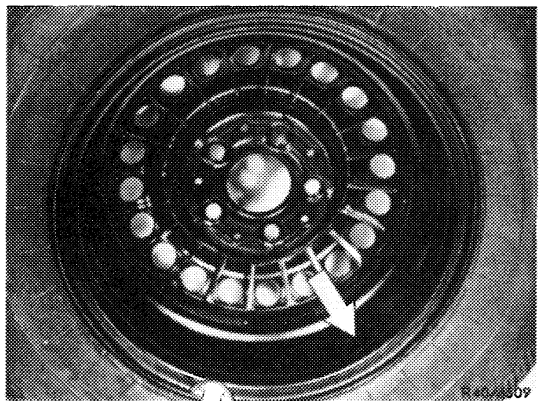
Experience has shown that impact wrenches will already obtain a tightening torque of 60 to 70 Nm under a single impact. When impacts continue, some impact wrenches may already have established an essentially excessive tightening torque, which may lead to a deformation of rim, damage to threads or fracture of spherical collar bolts.



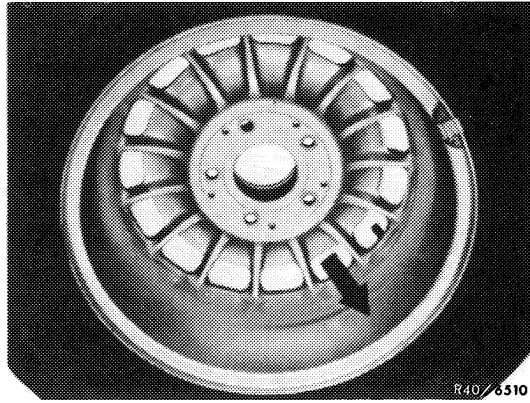
On forged light alloy rims, the OD of the wheel wrench or socket wrench element for impact wrench may amount to max. 26.5 mm, since otherwise hub of wheel may be damaged. When unscrewing last spherical collar bolt, make sure that the wheel is not tilting, since otherwise the paint on wheel hub may suffer damage.

For tightening spherical collar bolts, use a torque wrench with automatic release (click wrench).

Ventilated rims are subject to a high air flow. Prior to mounting rim, check wheel disk for contamination and clean, if required.



Steel plate rim

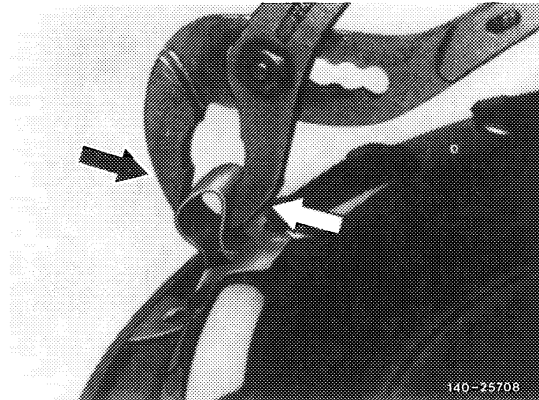


Forged
light alloy rim

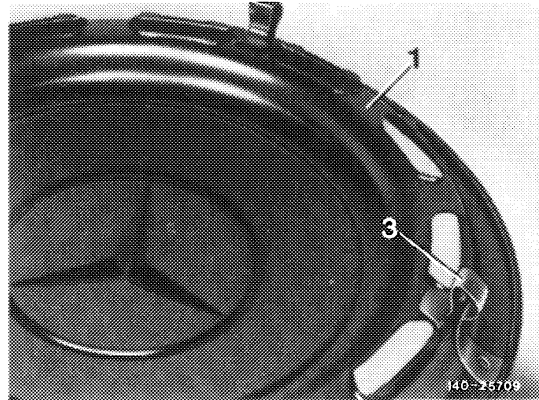
40-112 Removal and installation of holding spring or annular spring for wheel covers

A. Models 107, 114, 115, 116 and 123

For removal or installation of holding spring, compress ring by means of universal pliers (arrows).



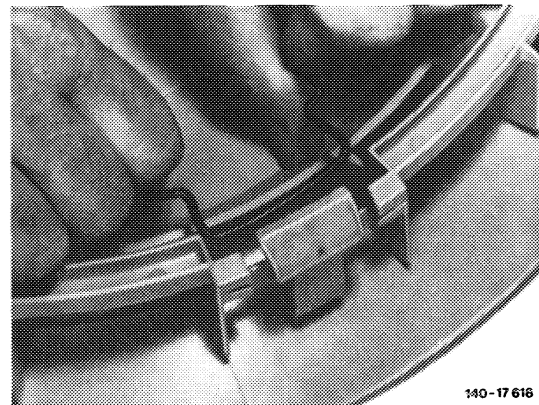
Attach four holding springs to cover spaced 90° apart.



- 1 Wheel cover
- 3 Holding spring

B. Model 126

For removal or installation of annular spring, compress spring and pull out or introduce each at slots of cover.

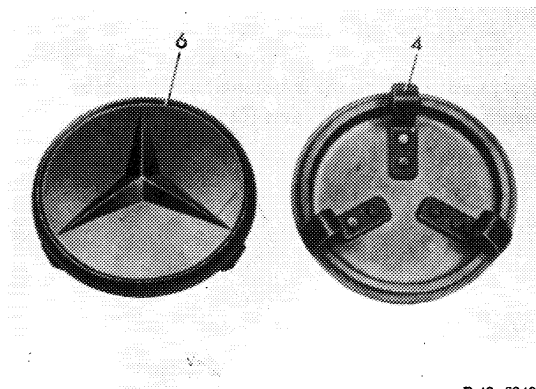


40-113 Removing and mounting hub cap for forged light alloy rims

The hub cap serves for covering rim hub.

A. Models 107, 114, 115, 116, 123 and 126

The light alloy hub cap (6) is fastened in rim hub by means of three holding springs (4).

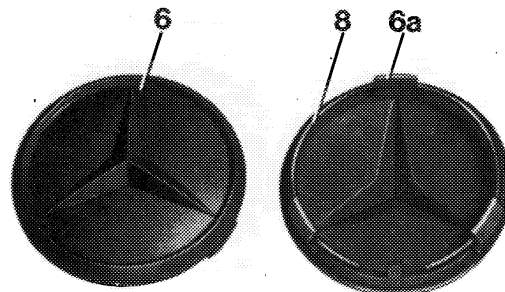


1st version up to December 1977

- 4 Holding spring
- 6 Light alloy hub cap

R 40-5042

The plastic hub cap (6) is fastened to hub of rim by means of three holding cams (6a) and annular spring (8).

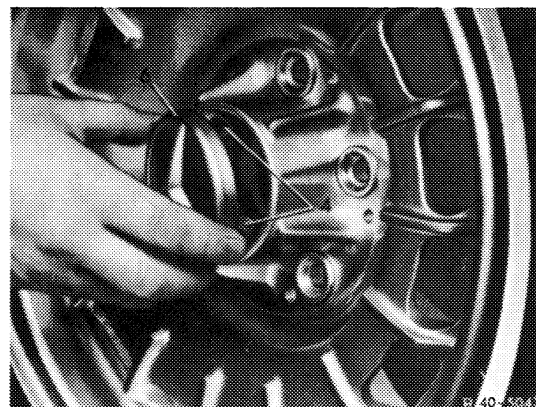


2nd version starting January 1978

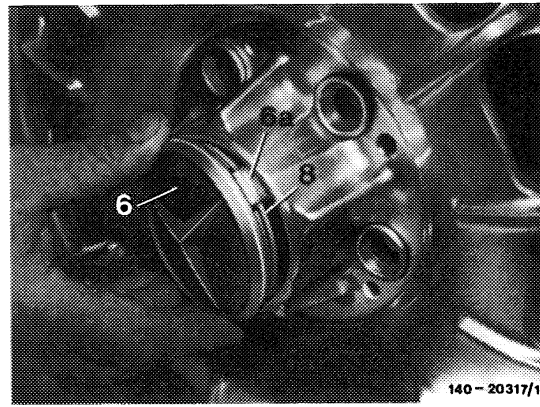
- 6 Plastic hub cap
- 6a Holding cam
- 8 Annular spring

140-20047

For removal, carefully push out hub cap from inside wheel, for insertion, push-on cap with ball of thumb.



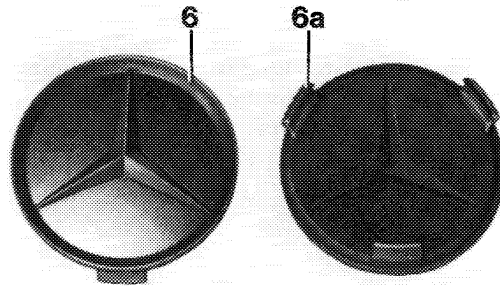
- 4 Holding spring
- 6 Light alloy hub cap



- 6 Plastic hub cap
- 6a Holding cam
- 8 Annular spring

B. Model 201

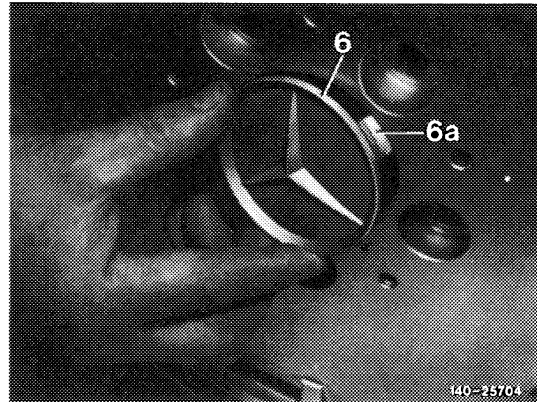
The plastic hub cap (6) is fastened in rim hub by means of three holding cams (6a).



- 6 Plastic hub cap
- 6a Holding cam

140-23738

For removal, carefully push out hub cap from inner side of wheel, for insertion, push-on hub cap with ball of thumb.



- 6 Plastic hub cap
- 6a Holding cam

140-25704



41-050 Removal and installation of propeller shaft

A. Models 107, 116

Lubricants

Centering sleeve, per sleeve approx. 6 grams

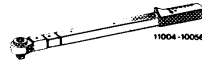
refer to specifications for service products page 266.2

Clamp connection

Tightening torques		Nm
Self-locking hex. nuts for fastening companion plates	M 10	45
	M 12	65
Hex screws to propeller shaft intermediate bearing		25
Clamping nut to propeller shaft		30-40
Hex screws for attaching tunnel closing plate to frame floor	M 8	25
	M 10	45
Hex bolts for attaching engine mount to tunnel closing plate		25

Special tools

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

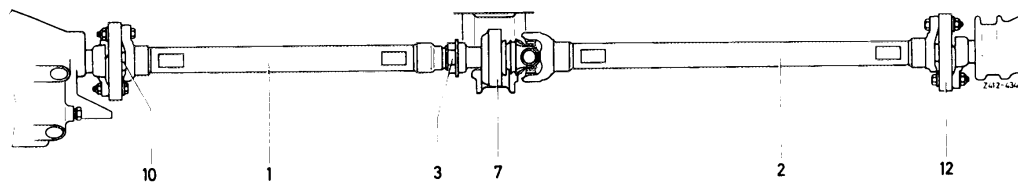


001 589 66 21 00

Open-end element 46 mm for plugging into torque wrench



126 589 00 01 00



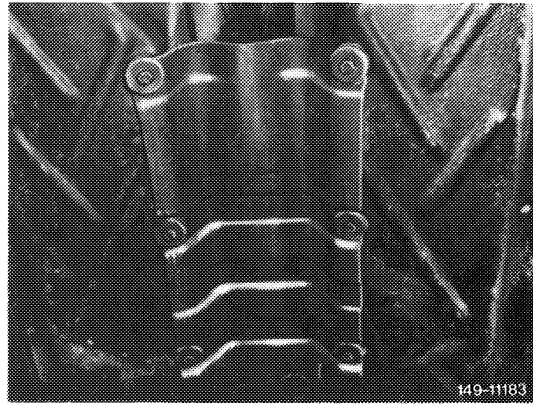
1 Front propeller shaft
2 Rear propeller shaft

3 Clamping nut
7 Propeller shaft intermediate bearing

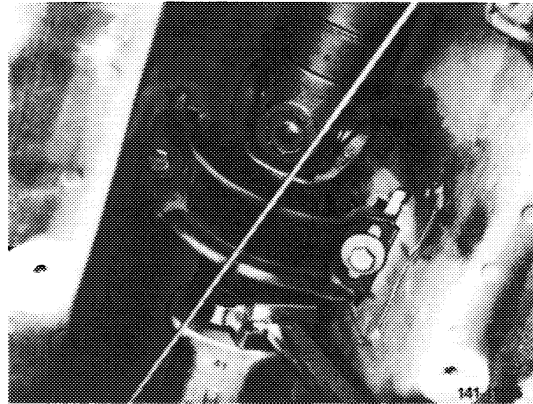
10 Centering sleeve
12 Companion plate

Removal

- 1 Remove exhaust system.
- 2 Unscrew shielding plate.

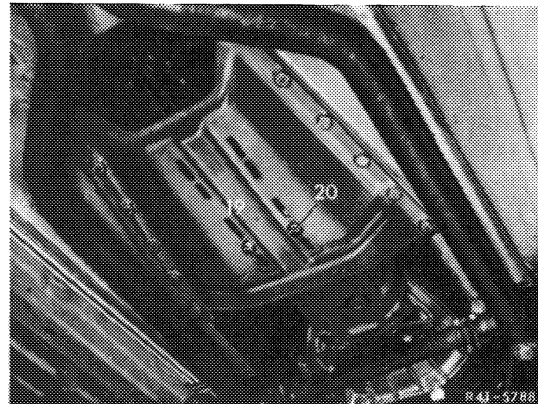


- 3 Lift transmission and jack up.
- 4 Loosen clamping nut of propeller shaft for about 2 turns without pushing back rubber sleeve (slides along).



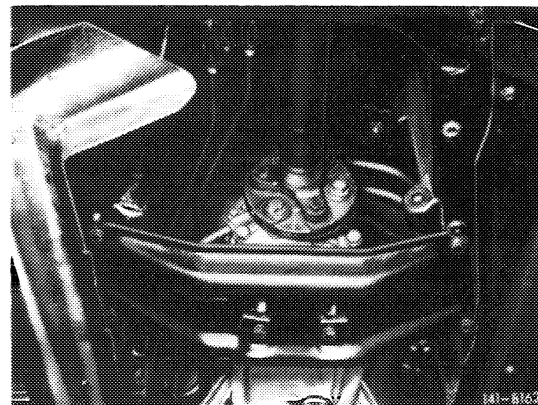
- 5 On model 107, unscrew hex bolts on tunnel closing plate (19) as well as the two screws (20) of the rear engine mount and remove tunnel closing plate (19).

Model 107

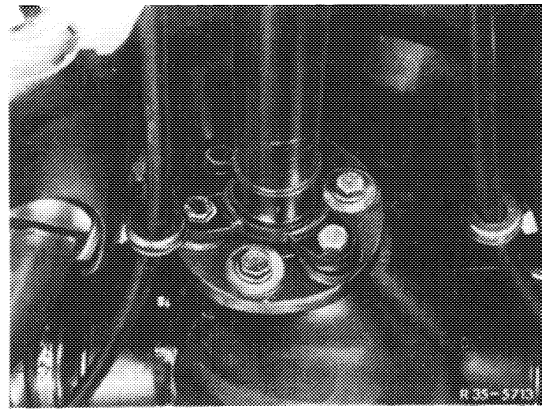


- 6 On model 116, unscrew hex bolts of rear engine carrier on frame floor as well as those for rear engine mount and remove.

Model 116

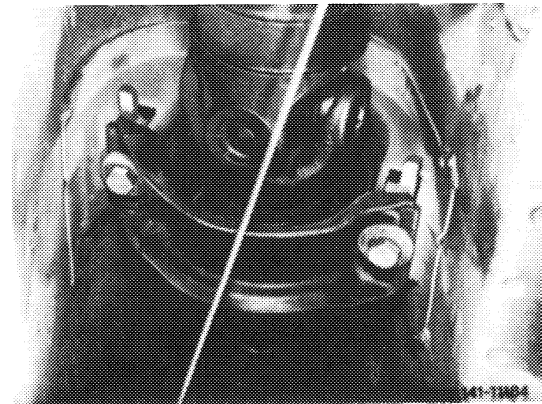


7 Unflange propeller shaft on transmission and on rear axle.



8 Unscrew hex bolts for attaching propeller shaft intermediate bearing to frame floor.

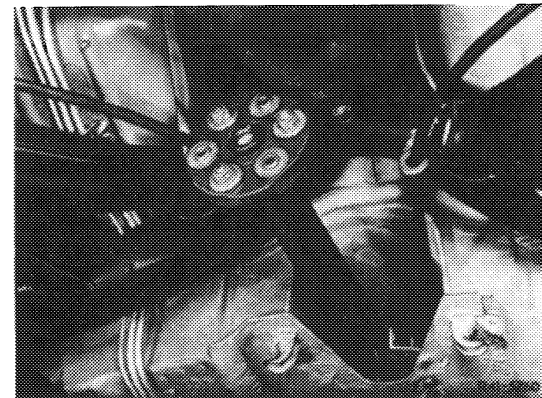
9 Disconnect compensating lever of parking brake.



10 Force propeller shaft from centering pin of rear axle drive pinion and pull out toward the rear. Make sure that the propeller shaft is not separated.

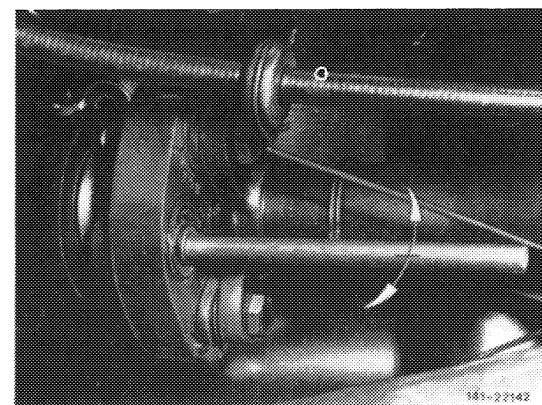
Attention!

If the propeller shaft must be separated, mark all parts in relation to each other since the propeller shaft is balanced as a unit. On model 107.042 starting August 1982 the front and rear propeller shaft are pertinently identified.



11 On models 107.022/042 starting September 1982 with radially or tangentially soft companion plates, the vulcanized centering bushings on companion plate must be loosened prior to sliding propeller shaft out of universal flange (arrows). For this purpose, use a cylindrical mandrel of 10 mm dia. and approx. 150 mm in length.

Note: Check companion plates, centering sleeves and propeller shaft intermediate bearing for damage, if any. Replace damaged parts.



Installation

12 Fill cavities of the two centering sleeves with the specified grease (approx. 6 grams per sleeve).

13 Slide propeller shaft with companion plates on centering pins on transmission and on rear axle.

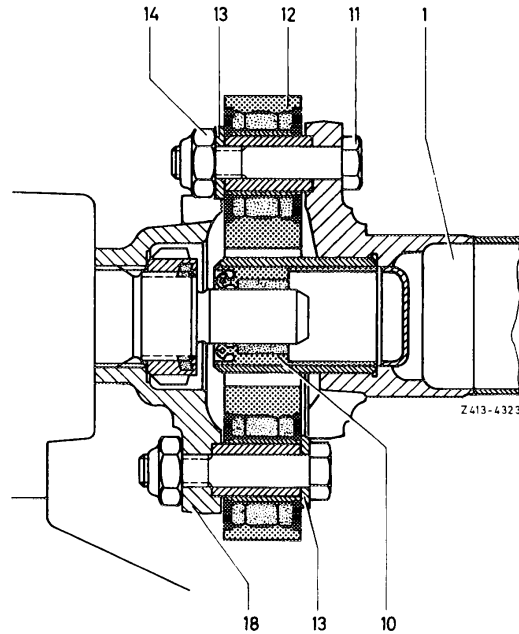
14 Attach propeller shaft intermediate bearing to frame floor, but do not yet tighten.

15 Attach propeller shaft to transmission into rear axle. Tightening torque of self-locking hex nuts (14) for M 10 = 45 Nm and for M 12 = 65 Nm.

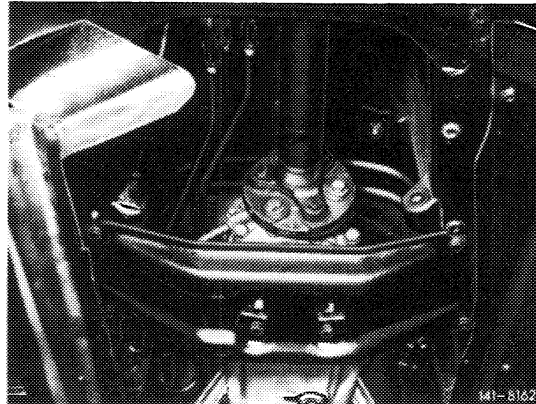
Attention!

Renew self-locking hex. nuts on principle.

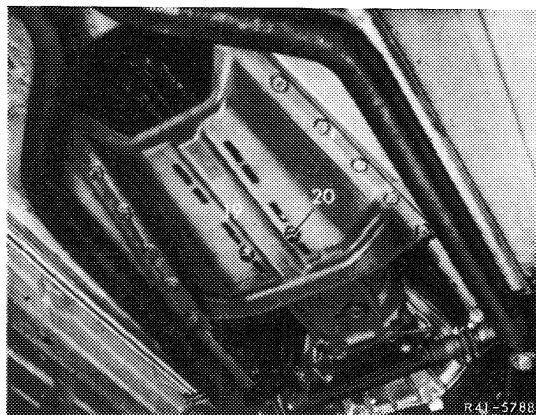
- 1 Front propeller shaft
- 10 Centering sleeve
- 11 Hex screw
- 12 Companion plate
- 13 Washer
- 14 Self-locking hex. nut
- 18 Transmission three-arm flange



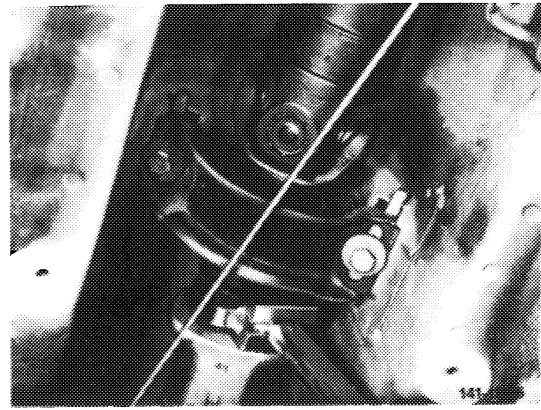
16 Mount tunnel closing plate or rear engine carrier to frame floor, tightening torque of hex screws for M 8 = 25 Nm and for M 10 = 45 Nm.



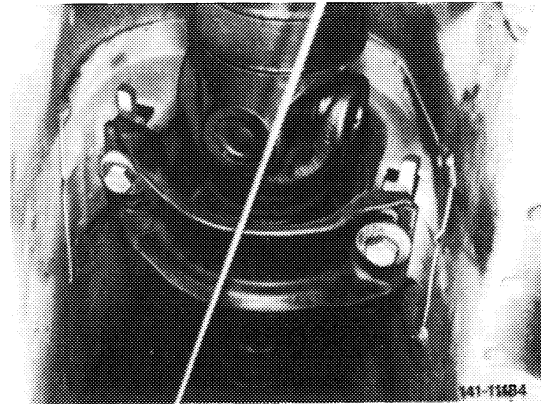
17 Lower transmission, position hex screws (20) for rear engine mount and tighten to 25 Nm.



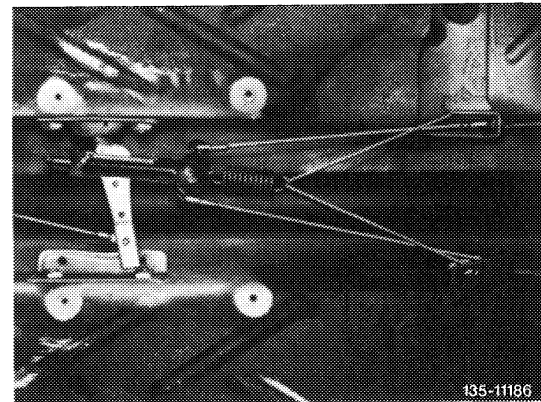
18 Tighten clamping nut on propeller shaft to 30–40 Nm, making sure of seating sleeve well.



19 Tighten hex bolts for attaching propeller shaft intermediate bearing to frame floor to 25 Nm.

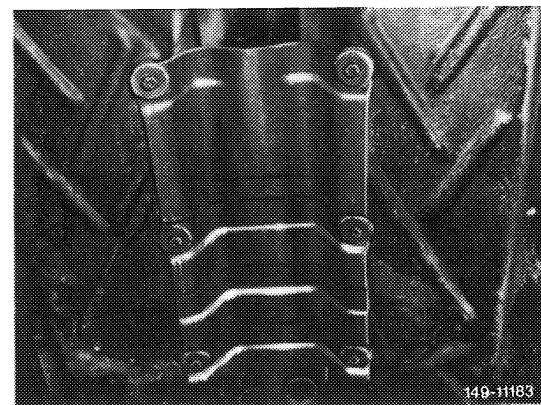


20 Attach compensating arm of parking brake.



21 Mount shielding plate.

22 Install exhaust system.



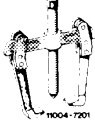

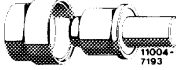

41-100 Removal and installation of propeller shaft intermediate bearing, replacement of radial ball bearing

A. Model 107, 114, 115, 116, 123, 126

Lubricants

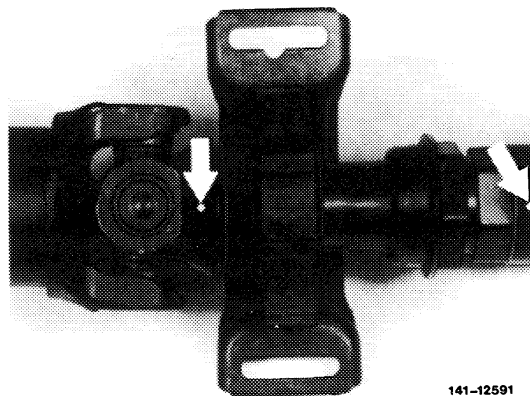
Clamp connection refer to specifications for service products page 266.2

Special tools

Two-arm puller		000 589 88 33 00
Puller arms (2 each)		116 589 03 33 00
Remover and installer for radial ball bearing		116 589 09 43 00
Mandrel for assembly of propeller shaft intermediate bearing and protective cap		126 589 03 15 00

Note

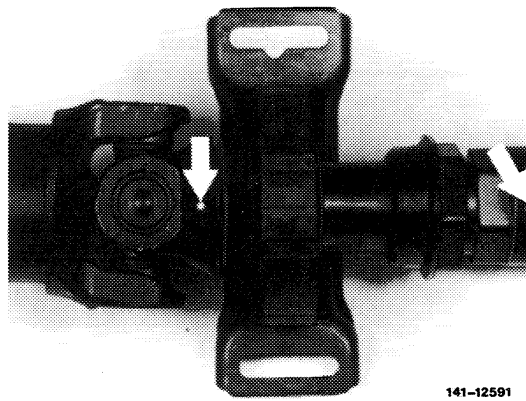
The components of propeller shafts are individually pre-balanced at the factory. To eliminate any residual unbalance which might still remain, re-balance the complete propeller shaft including the companion plates. For this reason, when disassembling the complete propeller shaft (e.g. when changing propeller shaft intermediate bearing) **mark individual components in relation to each other** (if no marks are in place) and reassemble to original shape.



141-12591

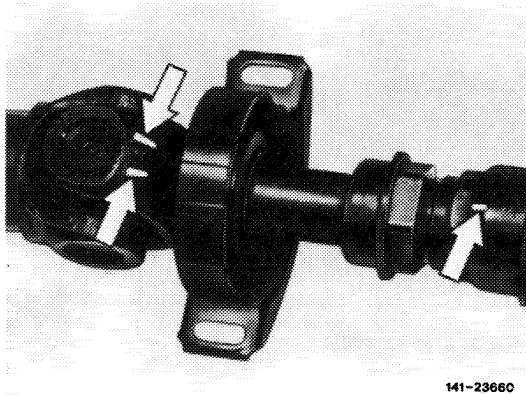
Removal of propeller shaft intermediate bearing

1 On vehicles up to July 1982, mark the individual propeller shaft components in relation to each other (arrows).



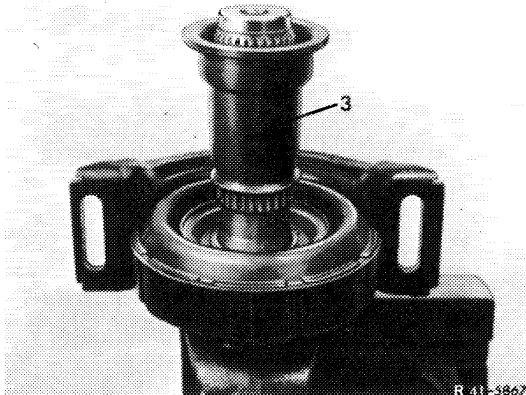
2 On vehicles starting August 1982 the front and the rear propeller shaft are marked in relation to each other (arrows).

Note: The identification has been partially already in place on propeller shafts prior to August 1982, but has not been taken into consideration during assembly. For this reason, propeller shafts on which the marking is not in agreement, must be identified prior to removal and the two parts must be plugged together again following this identification.



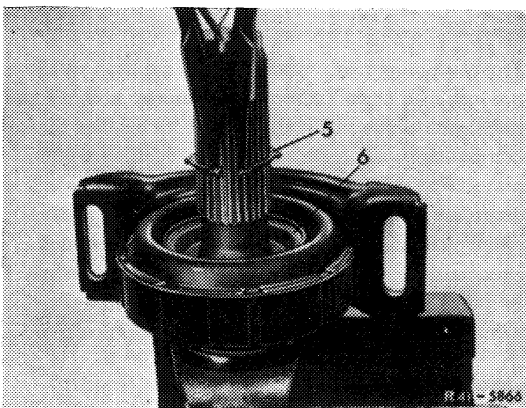
3 Separate front and rear propeller shaft on clamping connection.

4 Pull off rubber sleeve (3) over splining.



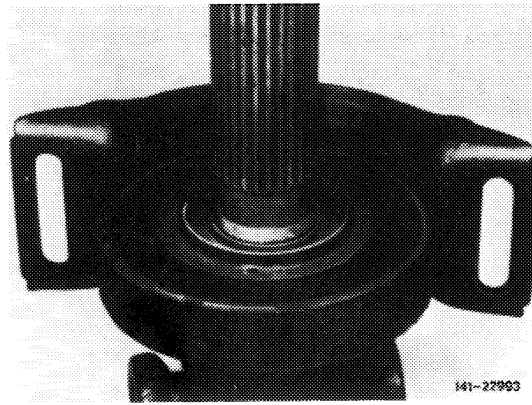
Rubber mount with outer V-fold

5 On vehicles up to July 1982, remove locking ring (5) from groove and take off together with front protective cap (6).

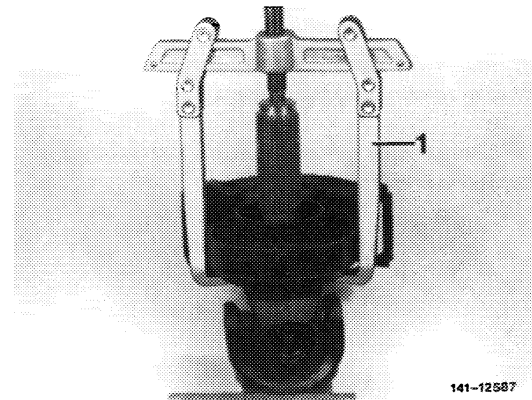


Rubber mount with inner V-fold

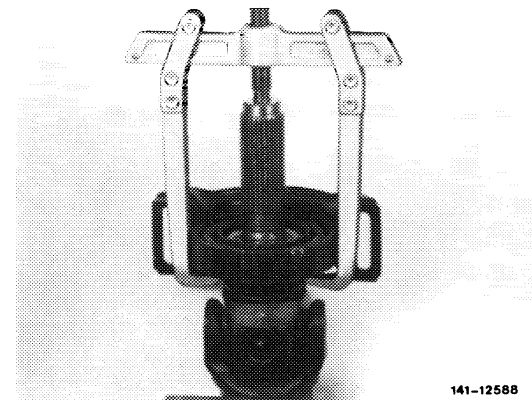
6 Vehicles starting August 1982 are not provided with a locking ring and for this reason the radial ball bearing is secured by the protective cap.



7 On vehicles up to July 1982, pull rubber mount and radial ball bearing together from yoke by means of two-arm puller (1).

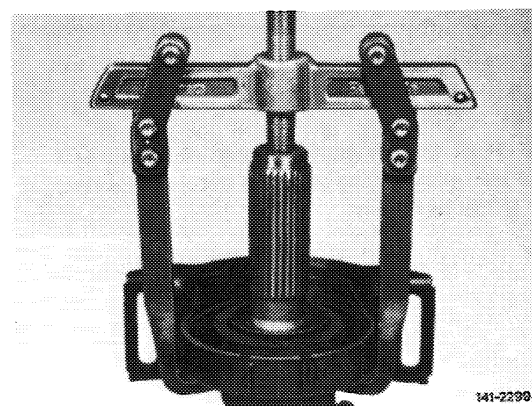


Rubber mount with outer V-fold

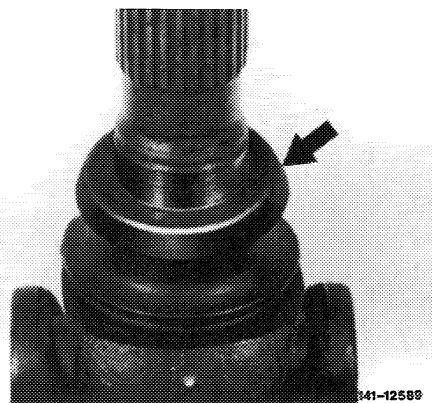


Rubber mount with inner V-fold

8 On vehicles starting August 1982, pull rubber mount, radial ball bearing and protective cap together from yoke by means of two-arm puller.

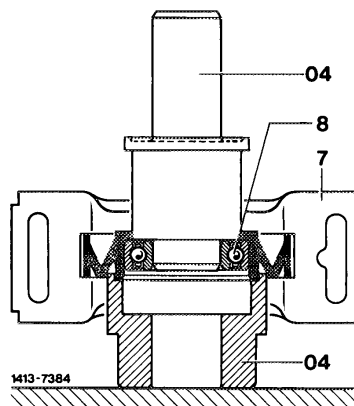


- 9 Remove rear protective cap on universal joint fork (arrow), on models 107, 116, 123 and 126 only).



Replacement of radial ball bearing

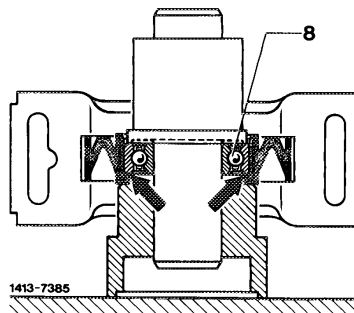
- 10 Press radial ball bearing (8) out of rubber mount (7) with remover and installer (04).
- 11 Check rubber mount and radial ball bearing for damage and replace, if required.



- 12 Slowly press radial ball bearing (8) in rubberized bearing seat up to contact surface (arrows).

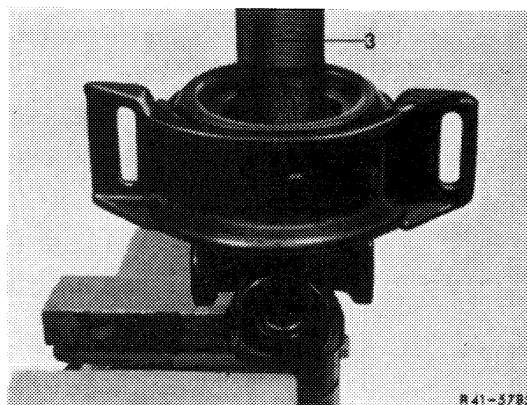
Attention!

Watch out for good seat of radial ball bearing.



Installation of propeller shaft intermediate bearing

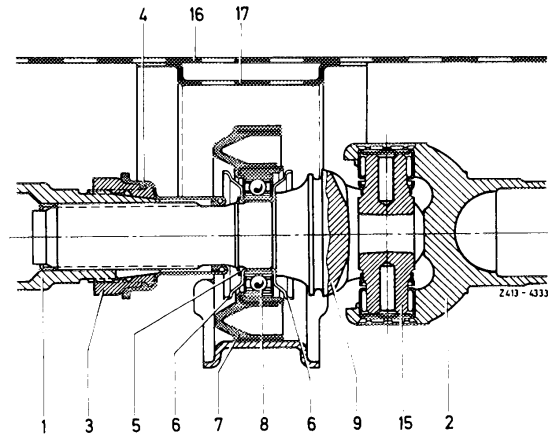
- 13 Insert rear protective cap (on models 107, 116, 123 and 126 only).
- 14 Press rubber mount with pressing-on sleeve (3) on yoke while paying attention to correct location of V-fold as follows:



On models 107 and 116 of 1st version the V-fold of rubber mount should point in driving direction.

Models 107, 116

- | | |
|--|--|
| 1 Front propeller shaft | 8 Radial ball bearing |
| 2 Rear propeller shaft | 9 Yoke |
| 3 Clamping nut | 15 Spider with needle bearing and bushings |
| 4 Rubber sleeve | 16 Frame floor |
| 5 Locking ring | 17 Propeller shaft tunnel |
| 6 Protective cap | |
| 7 Propeller shaft intermediate bearing | |

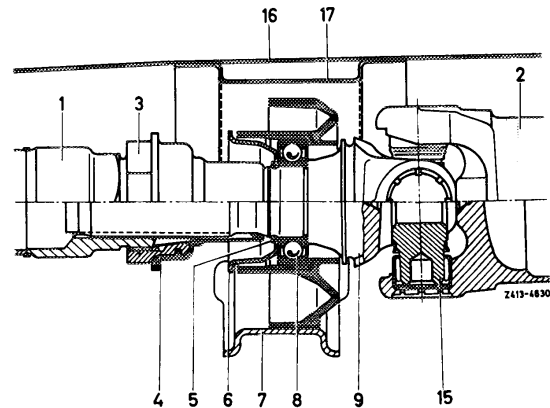


On models 114 and 115 with two-piece propeller shaft the V-fold should point toward the rear opposite to driving direction.

On three-piece propeller shaft the V-fold of front rubber mount should point in driving direction and that of the rear rubber mount opposite to the driving direction.

Models 114, 115

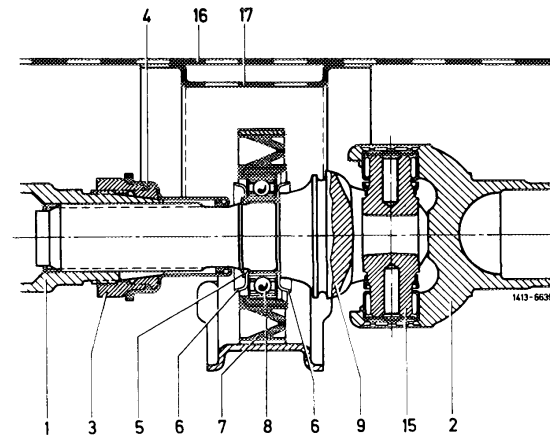
- | | |
|--|--|
| 1 Front propeller shaft | 8 Radial ball bearing |
| 2 Rear propeller shaft | 9 Yoke |
| 3 Clamping nut | 15 Spider with needle bearing and bushings |
| 4 Rubber sleeve | 16 Frame floor |
| 5 Locking ring | 17 Propeller shaft tunnel |
| 6 Protective cap | |
| 7 Propeller shaft intermediate bearing | |



Models 107, 116 of 2nd version, 123 and 126 have a rubber mount with inner V-fold. Install rubber mount in such a manner that inner V-fold points toward universal joint.

Models 107, 116 (2nd version), 123 and 126

- | | |
|--|---|
| 1 Front propeller shaft | 8 Radial ball bearing |
| 2 Rear propeller shaft | 9 Yoke |
| 3 Clamping nut | 15 Spider with needle bearing and bushing |
| 4 Rubber sleeve | 16 Frame floor |
| 5 Locking ring | 17 Propeller shaft tunnel |
| 6 Protective cap | |
| 7 Propeller shaft intermediate bearing | |

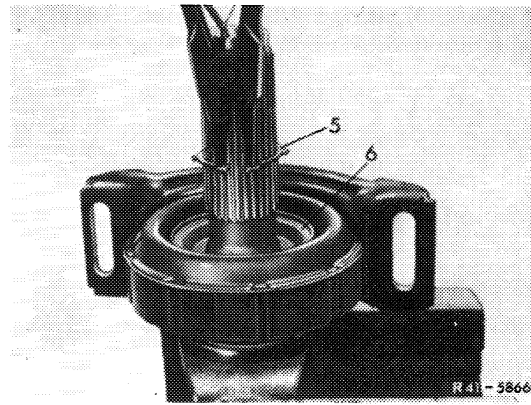


15 Plug front protective cap on vehicles up to July 1982.

16 Insert locking ring (5) into groove of yoke in such a manner that cap rests tightly against inner bearing race.

Attention!

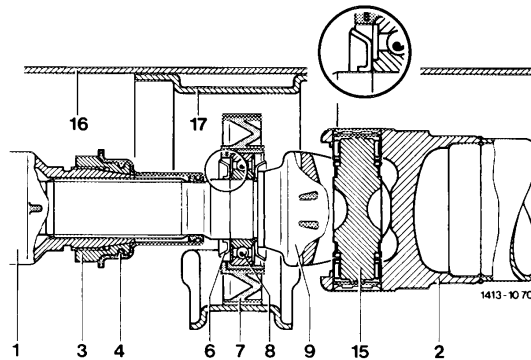
The inside crown of locking ring is pointing toward the cap.



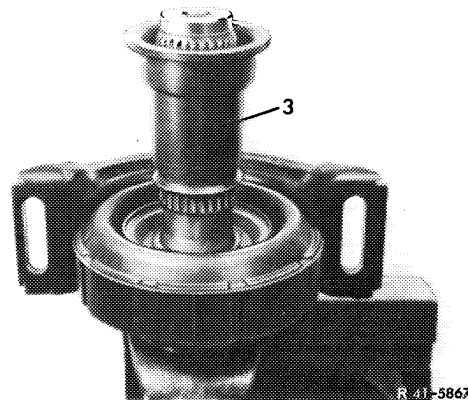
17 On vehicles starting August 1982, mount self-locking protective cap with pressing-on sleeve while making sure that the protective cap is resting well against radial ball bearing (cutout in Fig.).

Attention!

Use pressed-on protective cap only once.

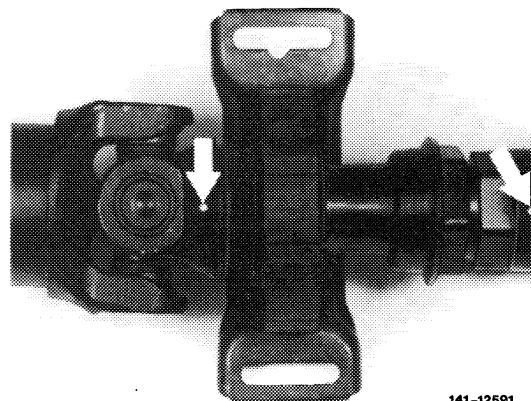


18 Pull rubber sleeve (3) over splining of yoke. Make sure that the sleeve is correctly seated at small diameter.

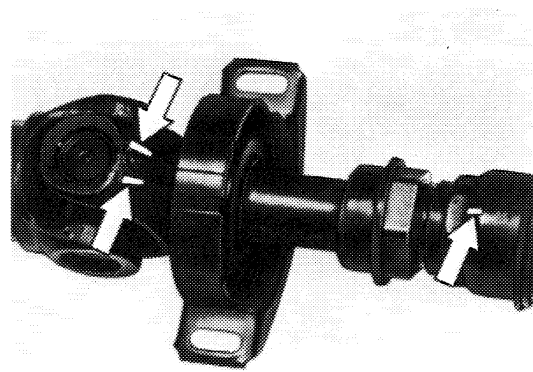


19 Coat splining with specified grease.

20 On vehicles up to July 1982, plug front and rear propeller shaft together as shown on drawing.



21 On vehicles starting August 1982 the identification is located on front and rear propeller shaft. The front shaft has one hump and the yoke of the rear shaft has two arrow-like humps (arrows). The hump of the front shaft should be located between the two arrows on yoke (arrows).



141-23660

41–200 Replacement of centering sleeve

A. Model 107, 114, 115, 116, 123, 126

Lubricant

Centering sleeve, per sleeve approx. 6 grams

refer to specifications for service products page 266.2

Tightening torques

Self-locking hex. nuts
for fastening companion plates

M 10
M 12

Nm

45
65

Note

In the event of wear or damage of sealing lip of centering sleeve (10) of front or rear propeller shaft the complete propeller shaft need not be replaced, since the centering sleeve can be individually exchanged.

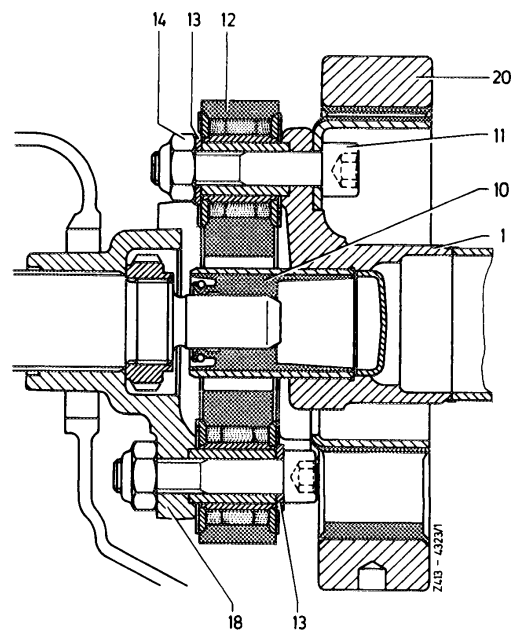
Removal

On propeller shafts with vibration eliminator 1st version

1 Unscrew hex. socket screws (11) with self-locking hex. nuts (14) and remove.

Attention!

Prior to removing vibration eliminator (20), mark vibration eliminator and three-arm flange in relation to each other.

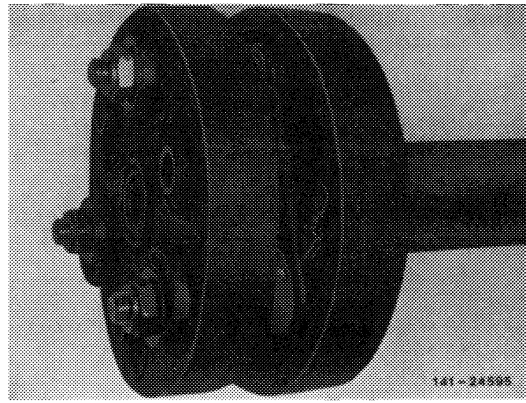


- 1 Front propeller shaft
- 10 Centering sleeve
- 11 Hex socket screw
- 12 Companion plate
- 13 Washer
- 14 Self-locking hex. nut
- 18 Transmission universal flange
- 20 Vibration eliminator

**On propeller shafts with vibration eliminator
2nd version**

2 Unscrew hex. socket screws with self-locking hex. nuts and remove. On this version, an identification is located on three-arm flange (one hump) and on vibration eliminator (one vulcanized arrow).

3 Push back vibration eliminator (20) on front propeller shaft.

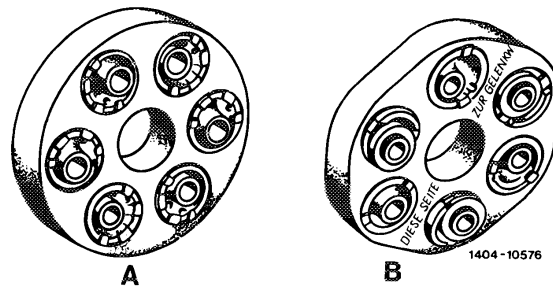


Propeller shafts without vibration eliminator:

4 Mark companion plate in relation to three-arm flange of propeller shaft and remove.

Attention!

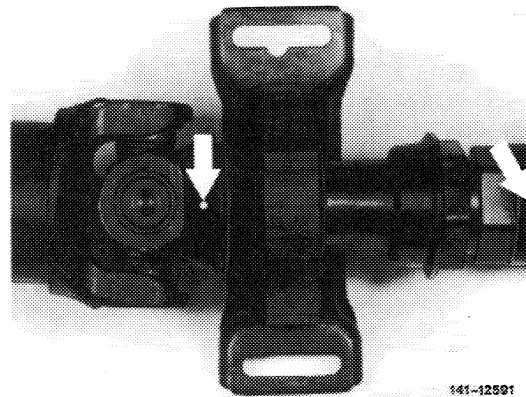
On radially or tangentially soft companion plates, loosen the vulcanized fitted sleeves in three-arm flange. For this purpose, use a cylindrical mandrel of 10 mm dia. and approx. 150 mm in length.



A Radially soft companion plate
B Tangentially soft companion plate

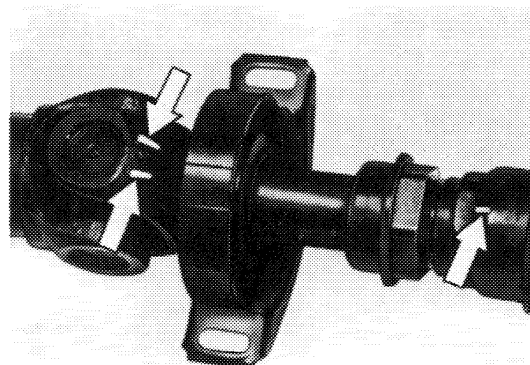
5 On vehicles up to July 1982

When separating front and rear propeller shaft, mark components in relation to each other (arrows).

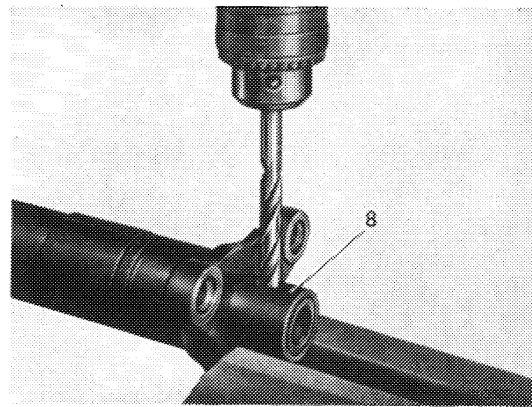


6 On vehicles starting August 1982

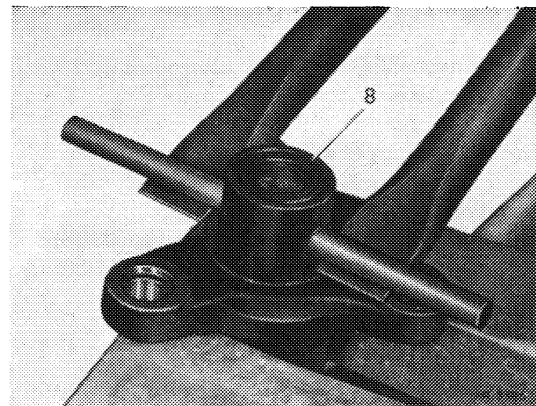
When separating front and rear propeller shaft, mark components in relation to each other (arrows).



7 Drill a hole of approx. 10 mm dia. at right angles through sleeve approx. 15 mm from face of centering sleeve.



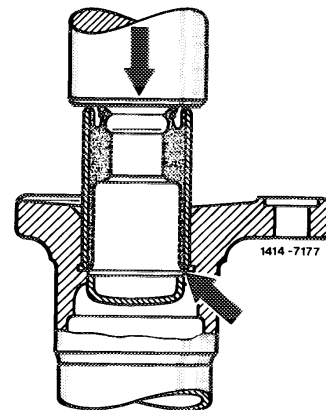
8 Insert mandrel into hole and pull centering sleeve out of propeller shaft by means of two mounting levers.



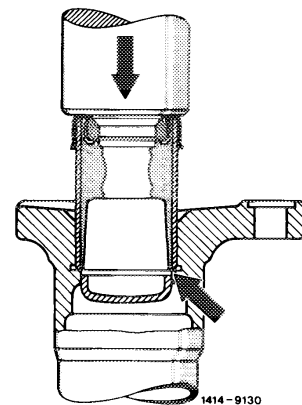
Installation

9 Install new centering sleeve up to stop by means of suitable mandrel (arrows).

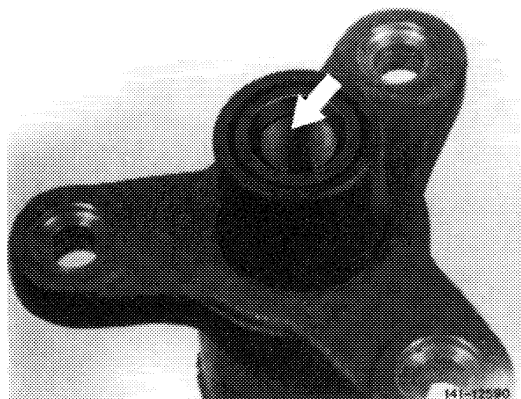
Model 107, 114, 115, 116 123 and 126.03
Centering sleeve for front propeller shaft
with standard companion plate and for rear
propeller shaft



Model 126.02 and vehicles with manual
5-speed transmission
Centering sleeve for front propeller shaft
with radially or tangentially softer compan-
ion plate



10 Fill cavity of centering sleeve with specified grease (approx. 6 grams per sleeve).



11 Propeller shafts with vibration eliminator.

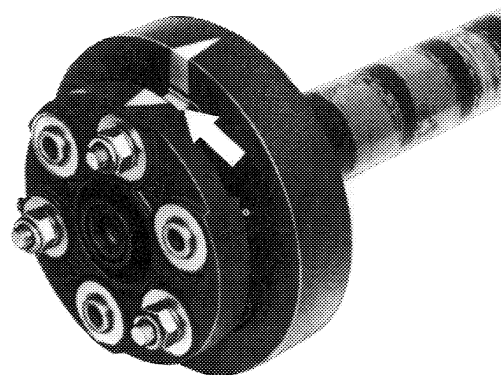
Mount vibration eliminator and companion plate with hex socket screws.

Tightening torque of self-locking hex. nuts 45 Nm.

Attention!

Pay attention to identification (arrow) applied prior to disassembly or already in place. Renew self-locking hex. nuts on principle.

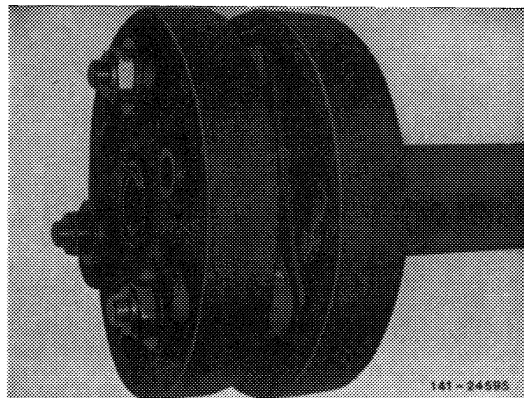
Identification applied



141 - 10859

The installation position is correct if the vulcanized arrow of eliminator points to hump of three-arm flange (identification already in place).

Identification in place



141 - 24580

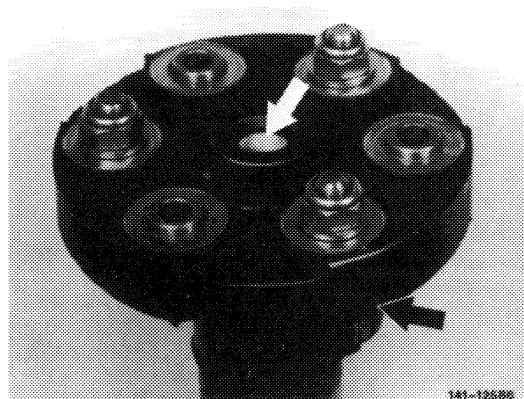
12 Propeller shaft without vibration eliminator:

Mount companion plate as shown on drawing.

Tightening torque of self-locking hex. nuts with M 10 threads 45 Nm and M 12 threads 65 Nm.

Attention!

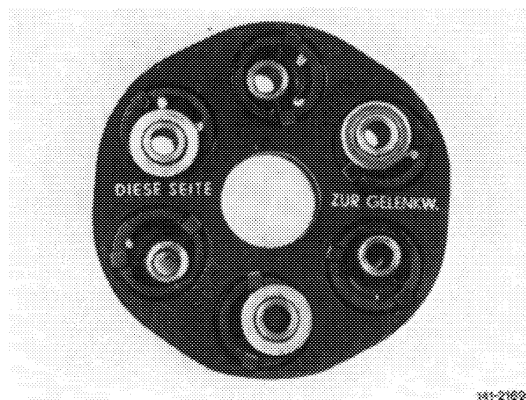
Replace self-locking hex. nuts on principle.



141 - 10586

13 Mount tangentially soft companion plates (on vehicles with 5-speed transmission) in accordance with lettering "DIESE SEITE ZUR GELENKWELLE" ("This side toward propeller shaft").

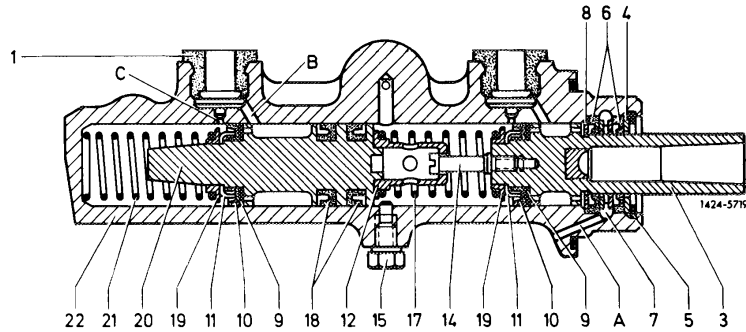
Lettering on companion plate:
DIESE SEITE ZUR GELENKWELLE
(This side toward propeller shaft)





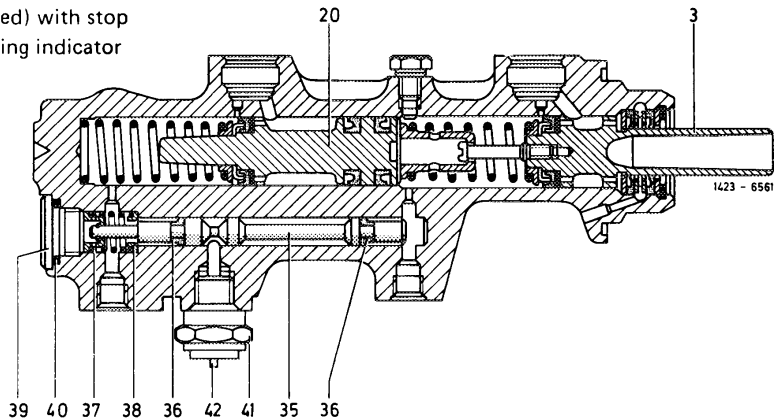
Teves tandem main cylinder (not stepped)
with stop screw

- 1 Container plug
- 3 Piston (pushrod circuit)
- 4 Stop washer
- 5 Locking ring
- 6 Secondary and vacuum sleeve
- 7 Intermediate ring
- 8 Stop washer
- 9 Filling disk
- 10 Primary sleeve
- 11 Supporting ring
- 12 Spring supporting plate
- 14 Connecting screw
- 15 Stop screw
- 17 Compression spring
- 18 Parting sleeve
- 19 Spring plate
- 20 Piston (floating circuit)
- 21 Compression spring
- 22 Housing
- A Leak bore
- B Filling hole
- C Compensating bore



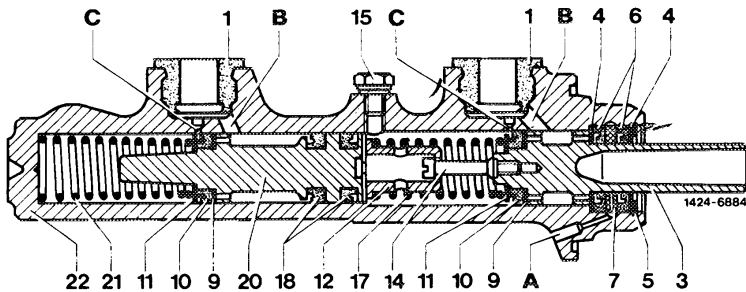
Teves tandem main cylinder (stepped) with stop screw and pressure difference warning indicator

- 3 Piston (pushrod circuit)
- 20 Piston (floating circuit)
- 35 Operating piston
- 36 Annular sleeve
- 37 Spring
- 38 Spring plate
- 39 Screw
- 40 Sealing ring
- 41 Switch
- 42 Release pin



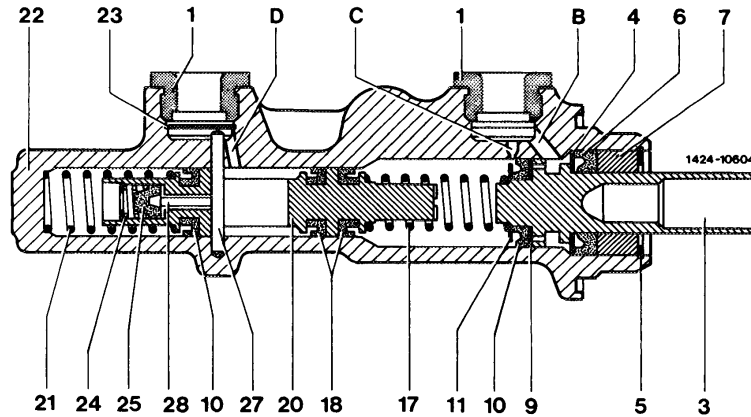
Teves tandem main cylinder (stepped)
with stop screw

- 1 Container plug
- 3 Piston (pushrod circuit)
- 4 Stop washer
- 5 Locking ring
- 6 Secondary and vacuum sleeve
- 7 Intermediate ring
- 9 Filling disk
- 10 Primary sleeve
- 11 Supporting ring
- 12 Spring supporting plate
- 14 Connecting screw
- 15 Stop screw
- 17 Compression spring
- 18 Parting sleeve
- 20 Piston (floating circuit)
- 21 Compression spring
- 22 Housing
- A Leak bore
- B Filling hole
- C Compensating bore



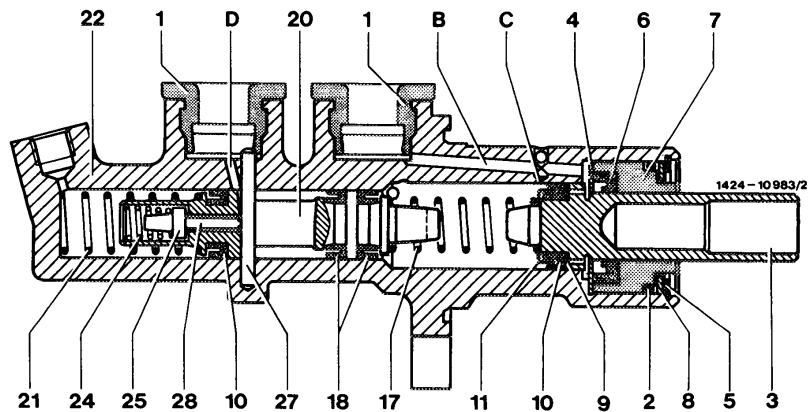
Teves tandem main cylinder with central valve without stop screw

- 1 Container plug
- 3 Piston (pushrod circuit)
- 4 Stop washer
- 5 Locking ring
- 6 Secondary sleeve
- 7 Plastic bushing
- 9 Filling disk
- 10 Primary sleeve
- 11 Supporting ring
- 17 Compression spring
- 18 Parting sleeve
- 20 Piston (floating piston)
- 21 Compression spring
- 22 Housing
- 23 Washer
- 24 Valve spring
- 25 Valve seal
- 27 Cylindrical pin
- 28 Valve pin
- B Filling hole
- C Compensating bore
- D Filling and compensating bore



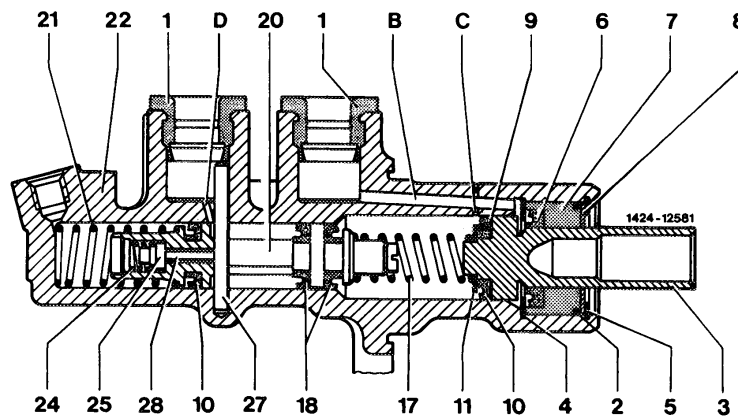
Girling tandem main cylinder of light alloy with central valve without stop screw

- 1 Container plug
- 2 O-ring
- 3 Piston (pushrod circuit)
- 4 Stop washer
- 5 Locking ring
- 6 Secondary sleeve
- 7 Bushing
- 8 Stop washer
- 9 Filling disk
- 10 Primary sleeve
- 11 Supporting ring
- 17 Compression spring
- 18 Parting sleeve
- 20 Piston (floating piston)
- 21 Compression spring
- 22 Housing
- 24 Valve spring
- 25 Valve seal
- 27 Cylindrical pin
- 28 Valve pin
- B Filling hole
- C Compensating bore
- D Filling and compensating bore



Teves tandem main cylinder of light alloy with central valve without stop screw

- 1 Container plug
- 2 O-ring
- 3 Piston (pushrod circuit)
- 4 Stop washer
- 5 Locking ring
- 6 Secondary sleeve
- 7 Bushing
- 8 Stop washer
- 9 Filling disk
- 10 Primary sleeve
- 11 Supporting ring
- 17 Compression spring
- 18 Parting sleeve
- 20 Piston (floating circuit)
- 21 Compression spring
- 22 Housing
- 24 Valve spring
- 25 Valve seal
- 27 Cylindrical pin
- 28 Valve pin
- B Filling hole
- C Compensating bore
- D Filling and compensating bore



42–010 Bleeding the brake system or renewing the brake fluid

Brake fluid

Use specified brake fluid only, refer to specifications for service products page 331.0

Important note

Handle brake fluid with care

- a) Fill brake fluid only into container from which the fluid cannot be consumed by mistake (**fatal dose 100 cc**).
- b) Even slight traces of mineral oil will lead to failure of brake system. When brake fluid is from colourless up to yellow, particular attention is required since in such a case the risk of making a mistake is the highest. If mineral oil is found in brake system or if the presence of mineral oil is suspected, thoroughly flush entire brake system with brake fluid. Also renew main cylinder.
- c) Do not permit brake fluid to come into contact with paint work of vehicle, since the fluid contains constituents, which act as solvents for the paint work.
- d) Brake fluid is highly hygroscopic, that is, fluid will take up moisture from the air, so that the boiling point will be reduced. For this reason, store brake fluid in well sealed storage containers only.

Note: During its service life the boiling point of the brake fluid will go down as a result of constant absorption of moisture from the atmosphere. When the brakes are sharply applied, there is a possibility of vapour lock in brake system. **For this reason, change the brake fluid once a year**, if possible in spring.

To facilitate inspections, attach a new sticker to brake unit following each change of brake fluid, indicating year and month of next change.

Attention!

The 4-piston fixed caliper, installed starting September 1985, has one vent screw each inside and outside. For venting brake system, or for replacing brake fluid, remove front wheels so that the outer pressure chamber can also be vented.

Bleeding

1 When using a bleeding unit, observe operating instructions of pertinent manufacturer.

To remove all air bubbles from tandem main cylinder, be sure to step down fully on brake pedal at least 3 times while bleeding, with bleed screws of brake pedal opened.

2 When bleeding by "pumping" the brake pedal, close the respective bleeder plug each time prior to releasing the brake pedal, so that no air will enter through the threads of the bleeder plug.

Note: Slowly retract brake pedal, so that enough brake fluid is drawn from expansion tank during piston return stroke.

3 Stop bleeding when clear brake fluid, free of bubbles, emerges from bleeding hose.

Attention!

Do not use the pumped-out brake fluid again, since it may contain foreign bodies, which will then again enter the brake system.

4 Fill expansion tank with brake fluid up to "maximum" mark.

Renewing (changing) the brake fluid

5 Pump empty or draw fluid out of expansion tank down to a fluid level of approx. 10 mm.

Attention!

Do not empty expansion tank completely, so that no air can enter the brake system.

a) Renewing (changing) the brake fluid **with** bleeding unit:

Permit approx. 80 cc of brake fluid to flow out at each brake caliper, so that the lines and the pressure cylinders of the brake calipers will also be filled with fresh brake fluid.

b) Renewing (changing) the brake fluid **without** bleeding unit:

Fill expansion tank with fresh brake fluid up to "maximum" mark. Pump used brake fluid out of each brake caliper with approx. 10 pump strokes each. Top up brake fluid.

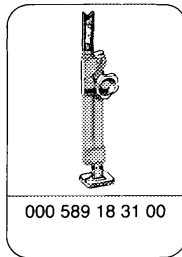
Note: For both kinds of renewal, brake fluid should flow out through vent hose clear and free of bubbles.

42-015 Checking the brake system for leaks

Data

	High-pressure test	Low-pressure test
Line test pressure in bar guage pressure	50-90	3
Duration of test in min	5	2
Pressure drop of preset value in %	5	0

Special tool



Conventional tool

Pressure tester

e.g. made by Teves, D-6000 Frankfurt
order no. 3.9305-1020.4

Note

The leak test required for both brake circuits includes a high-pressure test and a low-pressure test.

Attention!

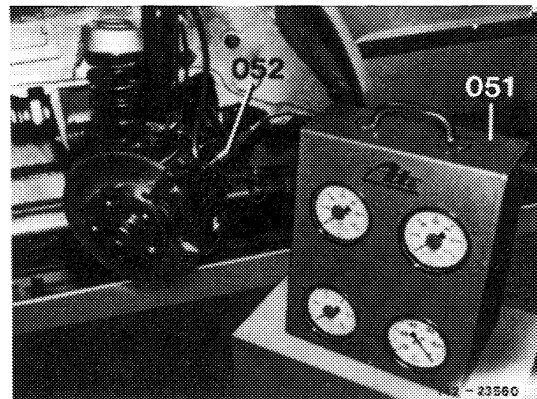
If the brake fluid loss cannot be observed externally, check whether brake fluid has entered into the brake unit through a leaking secondary seal in tandem main cylinder. In such a case proceed as follows:

1. Do **not** remove brake unit.
2. Draw off brake fluid.
3. If there are more than 100 cc brake fluid in brake unit, also replace brake unit.

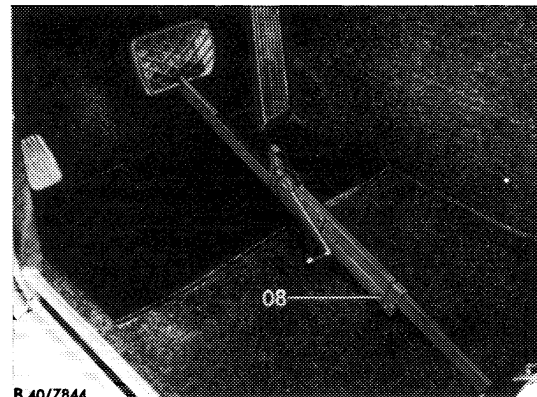
Note: The flexible diaphragm is resistant to brake fluid, but not the reaction disk and the plate valve in control valve. For this reason, brake fluid should not be drawn off with the brake fluid installed. Up to 100 cc, with the brake unit installed, no brake fluid can reach the reaction disk or the plate valve.

High-pressure test

- 1 Connect pressure tester (051) to brake caliper by screwing bleeder plug out and screwing connection (052) in. Then bleed pressure tester.
- 2 Run engine at medium speed and establish highest possible vacuum by suddenly releasing accelerator pedal.



- 3 Depress brake pedal with brake pedal winch (08) until the highest possible line pressure between 50 and 90 bar gauge pressure is obtained, then lock brake pedal in this position.
- 4 During the 5 minute test period, the pressure loss should not exceed 5% of the value set. If the pressure drop is higher, look for leak and seal.



Low-pressure test

- 5 Stop engine. Actuate brake pedal until the vacuum is exhausted.
- 6 Set brake pedal winch back until the pressure gauge shows a line pressure of just about 3 bar gauge pressure.
- 7 During a test duration of 2 minutes the preset pressure should not drop. If the pressure drops, look for leak and seal.

42-035 Checking warning device in expansion tank

Data

Length of contact insert (Teves expansion tank)	Remark
58 mm	Up to June 1972 valid for both chambers of expansion tank. From then on, for front chamber (front axle brake circuit) only.
42 mm	Starting June 1972 up to march 1974 valid for rear chamber (rear axle brake circuit)
58 mm	Starting March 1974 for 3-chamber expansion tank for front and rear axle brake circuit

Note

The warning lamp in instrument cluster is a combination lamp, that is, it will light up when:

- a) the parking brake is actuated,
- b) brake fluid level in one of the chambers in expansion tank is too low,
- c) on main cylinders with pressure difference warning indicator (DDW), if the pressure difference between both brake circuits amounts to more than 12.5 ± 2.5 bar gauge pressure.

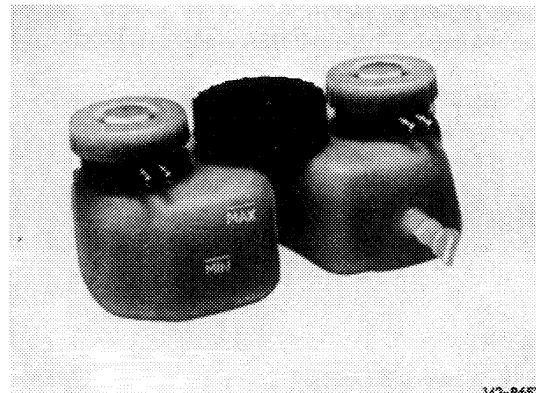
Checkup

Teves expansion tank with two contact inserts.

1 Open bleed screw on a caliper of front wheel brake and pump off brake fluid into a vessel by means of a bleed hose. While pumping (with ignition switched on and parking brake released) pay attention to the warning lamp in instrument cluster lighting up. The warning lamp should light up when the fluid level is approx. 6 mm below the minimum mark in expansion tank.

Do not pump chamber of expansion tank completely empty, since this would require bleeding the entire brake circuit.

2 Replenish brake fluid in the expansion tank; use fresh brake fluid only.



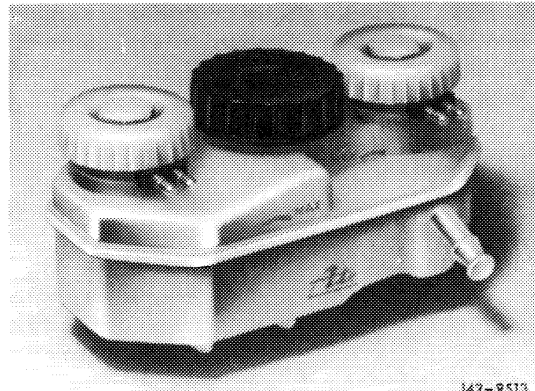
Teves expansion tank (2 chambers)

142-8683

3 Checking warning device of rear axle brake circuit (refer to item 1).

Note: From June 1972 to March 1974 the contact insert in the rear chamber of the expansion tank was 16 mm shorter than the contact in the front chamber. In the event of a leak in pushrod circuit, the warning device would respond much earlier.

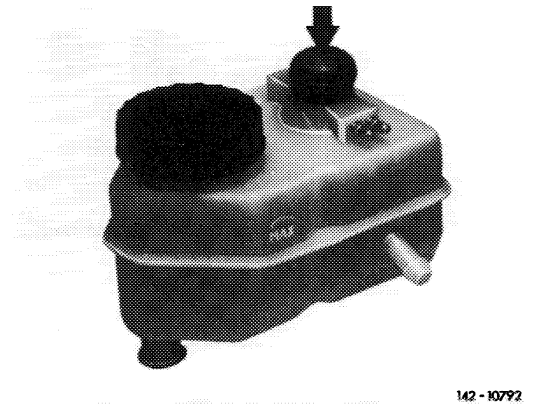
Teves expansion tank (3 chambers)



Teves expansion tank with one contact insert

Note: The expansion tank with one contact insert is installed only in vehicles with a stepped tandem main cylinder.

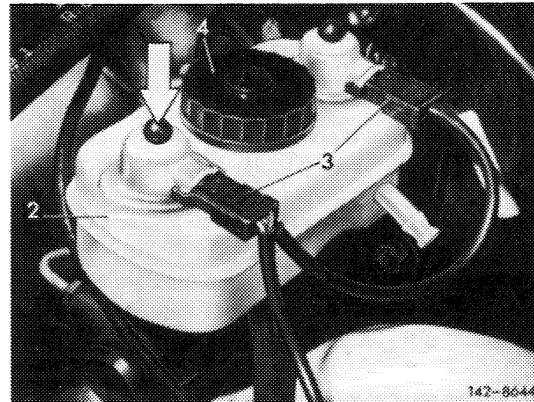
4 Push rubber cap down in direction of arrow. This will close the contact and the warning lamp will light up. The contact insert cannot be removed.



Bendix expansion tank

5 Push both rubber caps down one after the other in direction of arrow. This will close the contact and the warning lamp will light up.

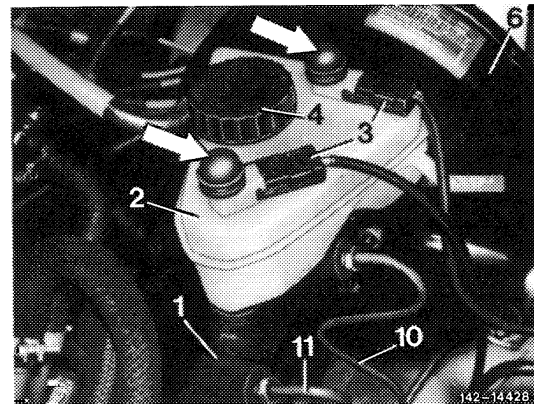
Note: The contact inserts in Bendix expansion tank cannot be removed.



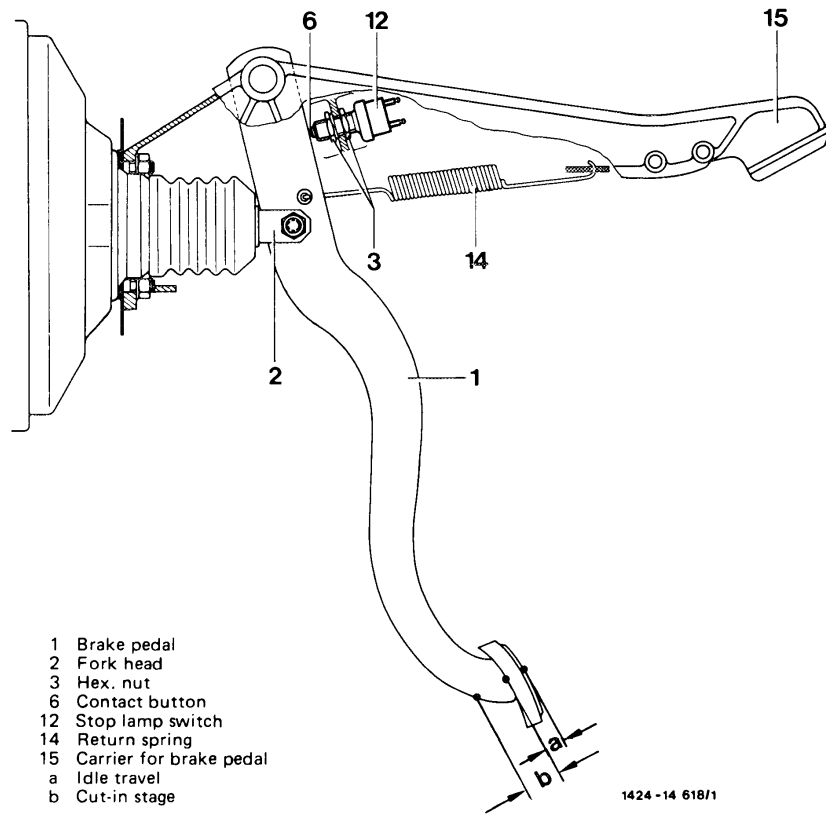
Larger expansion tank starting October 1978 and USA model year 1978

6 Push both contacts (refer to arrow) down one after the other. This will close respective contact and the warning lamp should light up.

Note: Contact inserts cannot be removed.



42-040 Inspection or adjustment of mechanical stop lamp switch



Inspection

1 The stop lamp should light up at a pedal travel between 7 – 20 mm, measured to center of pedal plate.

Adjustment

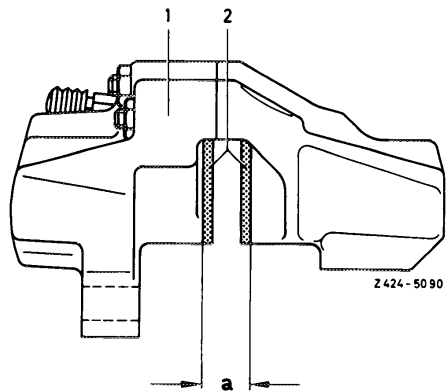
2 The stop lamp switch is adjusted by means of the two hex. nuts (3), which serve simultaneously to fasten switch (12).

42-100 Removal and installation of fixed caliper on front axle

Data

Fixed caliper make	Teves S 2-56	Teves	Bendix	Teves ¹⁾ M 4 - 40
Fixed caliper piston dia.	57	60		40
Shaft width for brake pads	77 + 0.15	90 + 0.15		
Disk contact width „a“	approx. 25			

¹⁾ 4-piston fixed caliper starting September 1985



a Disc contact width
1 Fixed caliper
2 Brake pad

Tightening torque

Nm

Fitted hex bolt for attaching fixed caliper to steering knuckle

115

Conventional tool

Open double box wrench 9 x 11 mm

e.g. made by Hazet, D-5630 Remscheid
order no. 612

Note

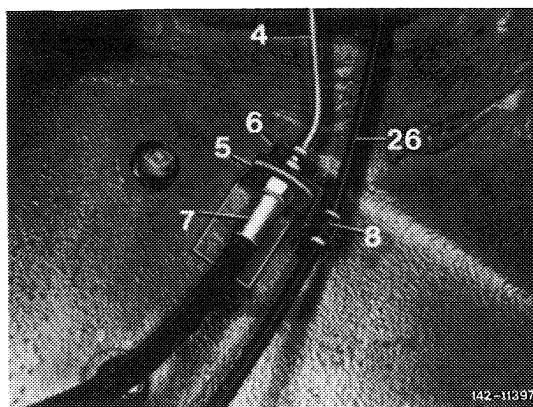
For loosening and tightening brake lines use conventional double box wrench only.

Removal

1 Pump brake fluid out of front brake circuit through an open bleeder plug.

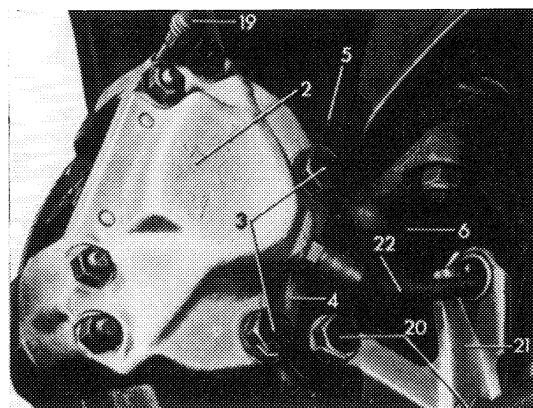
2 Loosen brake hose (7) on brake line (4), then close brake hose and brake line immediately with rubber plug.

3 On vehicles with brake lining wear indicator, pull cables of clip sensor out of plug connection on fixed caliper.



4 Loosen plug connection of brake lining wear indicator and brake hose (22) from fixed caliper (2). Close connection on brake hose and on fixed caliper with rubber plug.

5 Unbend locking plate (4), if installed, and unscrew hex. head fitted screw (3). Then remove fixed caliper from steering knuckle (6).



Installation

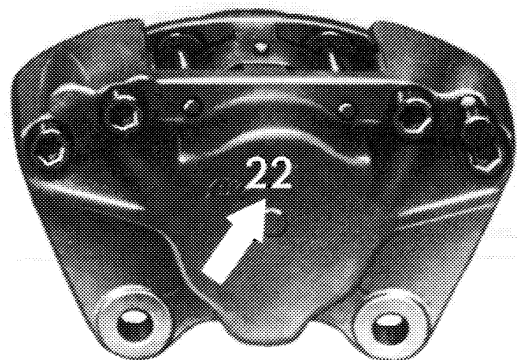
Attention! When installing a new fixed caliper proceed as follows:

The **piston dia.** of the fixed calipers of an axle **should be the same.** Up to August 1985 only the fixed calipers made by one and the same manufacturer may be installed on one axle.

Starting March 1980, modified fixed calipers with linings 17.5 mm thick and modified vented brake disks, which are identified by a groove at their circumference, are installed.

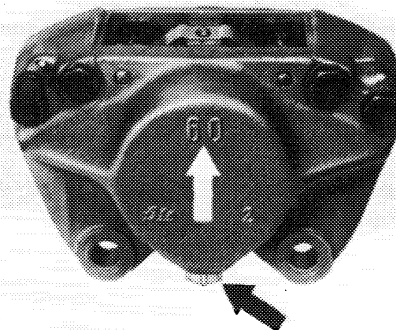
4-piston fixed calipers are installed since September 1985. The piston dia. is 40 mm.

Teves fixed caliper with 57 mm piston dia. and code No. 22

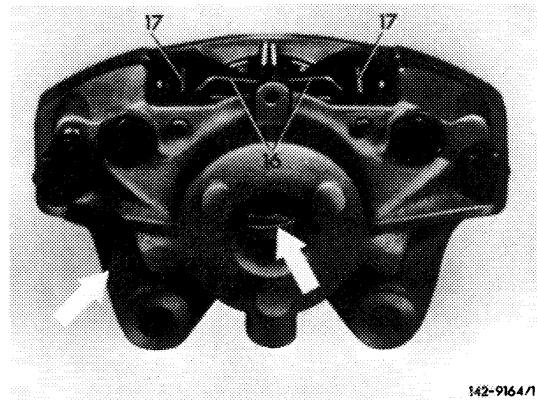


R42/6472/2

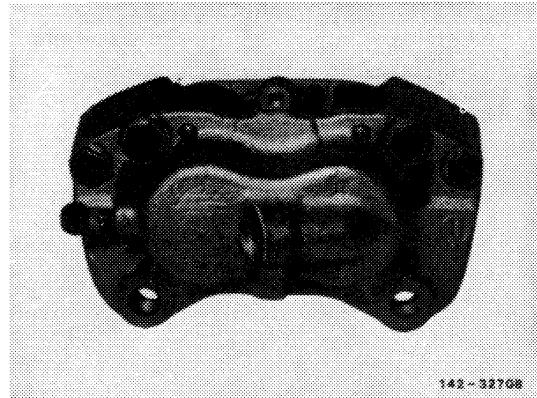
Teves fixed caliper with 60 mm piston dia. and code No. 60



R42/7318



Bendix fixed caliper with 60 mm piston dia.
and code No. 60



Teves 4-piston fixed caliper with 40 mm
piston dia.

6 Attach fixed caliper to steering knuckle (6) using a new locking plate (4) with fitted hex. screws (3) or self-locking fitted hex. screws (3) and tighten to 115 Nm. Secure with locking washer, if required.

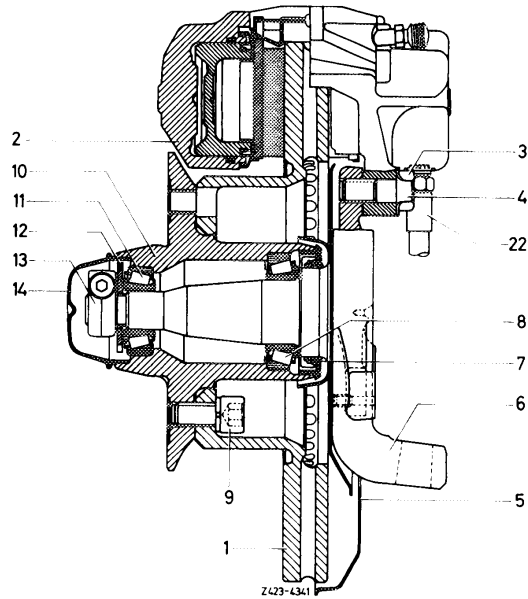
Note: Self-locking fitted hex. screws are installed since end of 1976. **Fitted hex. screws may be used only once.**

If the screw-in torque of the new self-locking hex. screws is very high, clean threads in steering knuckle from residual glue of micro-encapsulated screws by means of a tap M 12 x 1.5.

During reconditioning jobs (if the fixed caliper is not replaced), the original fastening method:

- a) screws with locking plate or
- b) self-locking screws should be maintained.

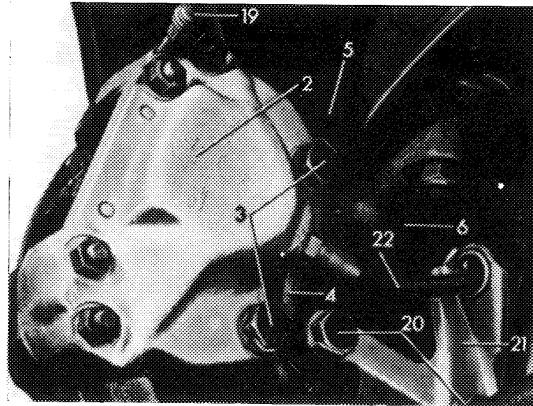
When renewing fixed calipers, use a locking plate also with self-locking screws for safety reasons.



- | | |
|--------------------------|------------------------------------|
| 1 Brake disc | 9 Hex. socket screw with snap ring |
| 2 Fixed caliper | 10 Front wheel hub |
| 3 Hex. head fitted screw | 11 Tapered roller bearing |
| 4 Locking plate | 12 Washer |
| 5 Cover plate | 13 Clamping nut |
| 6 Steering knuckle | 14 Hub cap |
| 7 Sealing ring | 22 Brake hose |
| 8 Tapered roller bearing | |

7 Introduce brake hose (22) through bracket (21), making sure that the guide grommet of the bracket is not damaged. Then attach brake hose to fixed caliper.

8 On vehicles with brake lining wear indicator, attach plug connection to fixed caliper. Insert cable of clip sensors into plug connection.

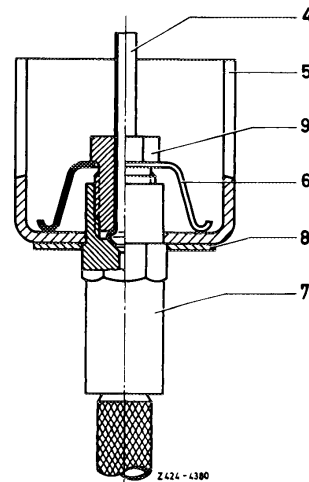


9 Connect brake line (4) to brake hose (7), making sure that the brake hose is not twisted.

Attention!

Holder (5) is provided with a double hexagon safety plate (8). Insert brake hose (7) into safety plate in such a manner that it will not wipe anywhere at left and right at full steering lock.

- | |
|--------------------------|
| 4 Brake line |
| 5 Bracket on frame floor |
| 6 Brake hose holder |
| 7 Brake hose |
| 8 Locking plate |
| 9 Cap screw |



10 Bleed front wheel brake circuit (42–010).

Attention!

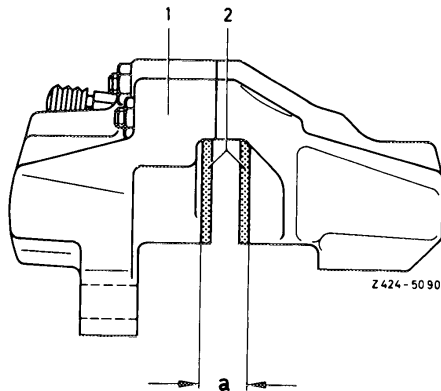
Checking brake system for leaks!

Upon bleeding, actuate brake pedal energetically several times to establish the correct play between brake disc and brake pad. Then, with the engine running, complete leak test by actuating brake pedal at approx. 200–300 N. The established pressure should hold up for some time, while brake pedal cannot be floored any further. Check all connections for leaks. If required, top up brake fluid in expansion tank of tandem main cylinder.

42-120 Removal and installation of fixed caliper on rear axle

Data

Fixed caliper make	Teves	Bendix, Girling
Fixed caliper piston dia.	38	
Shaft width for brake pads	62 + 0.15	
Disc contact width "a"	approx. 14	approx. 12.5

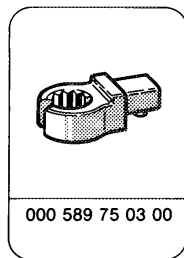
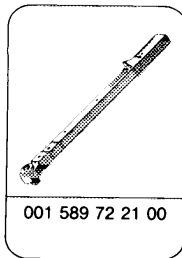


- a Disc contact width
- 1 Fixed caliper
- 2 Brake pad

Tightening torque

	Nm
Hex bolt for attaching fixed caliper to wheel carrier of rear axle	90
Brake hose on fixed caliper	15

Special tools



Conventional tool

Open double box wrench 9 x 11 mm

e.g. made by Hazet, D-5630 Remscheid
order no. 612

Note

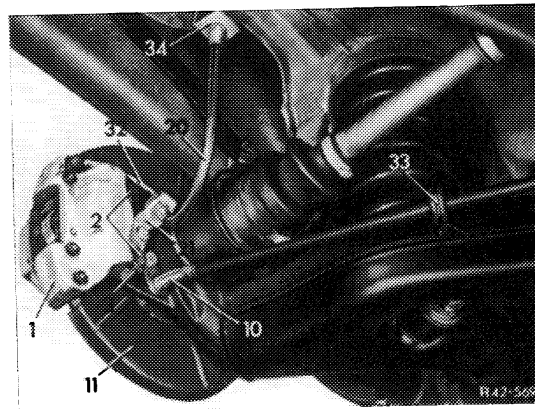
For loosening and tightening brake lines use conventional double box wrench only.

Removal

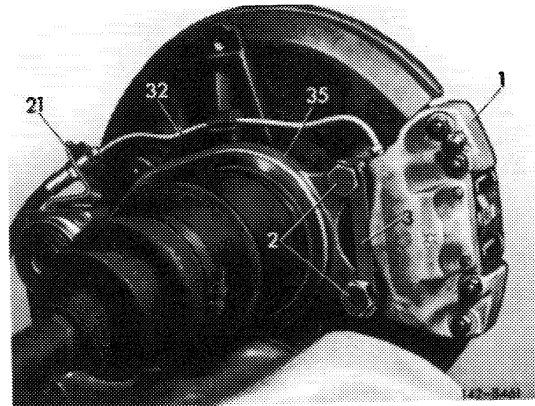
1 Pump brake fluid out of rear brake circuit through an open bleeder plug.

2 On vehicles with diagonal swing axle with brake line layout 1st version or with starting torque compensation, loosen brake line (32) on fixed caliper and then immediately close brake line and connection on fixed caliper with a rubber plug.

Brake line layout 1st version



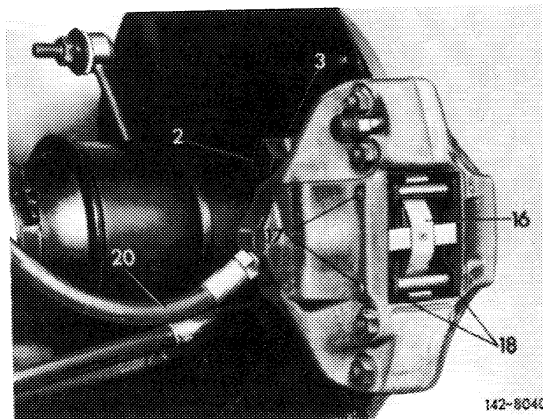
Brake line layout for diagonal swing axle with starting torque compensation



3 On 2nd version, loosen brake hose (20) on bracket of frame floor from brake line and unscrew from fixed caliper. Close all connections immediately with rubber plugs.

4 Unbend locking plate (3), if installed, and unscrew hex. bolts (2). Then remove fixed caliper.

Brake line layout 2nd version



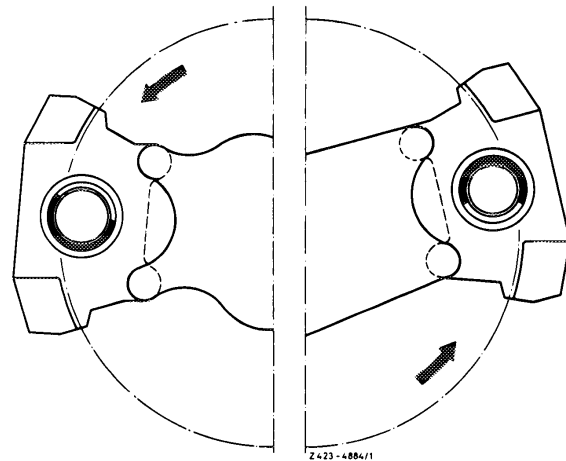
Attention!

When installing a new fixed caliper, proceed as follows:

Fixed calipers from different manufacturers may be installed on rear axle. However, the piston dia. of the fixed calipers must be the same.

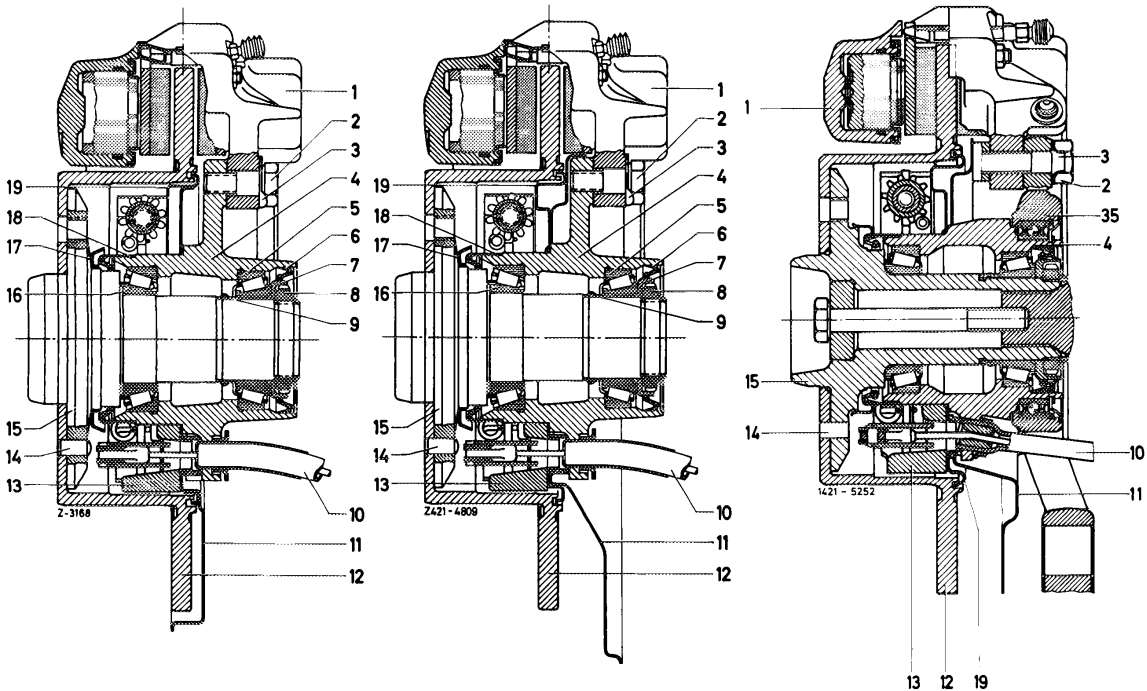
On the fixed calipers located behind the axle center on diagonal swing axle, the rise on fixed caliper piston (for reducing a tendency toward squealing) must be on top.

For fixed calipers on diagonal swing axle with starting torque compensation located in front of axle center, the elevation must be at bottom.



Version on diagonal swing axle with starting torque compensation

Version on diagonal swing axle



Layout cover plate diagonal swing axle 1st version

Layout cover plate diagonal swing axle 2nd version

Layout cover plate diagonal swing axle with starting torque compensation

- | | | |
|--------------------------------|------------------------|---------------------------------|
| 1 Fixed caliper | 8 Slotted nut | 15 Rear axle shaft flange |
| 2 Hex bolt | 9 Spacing sleeve | 16 Outer tapered roller bearing |
| 3 Locking plate | 10 Brake cable control | 17 Dust cap |
| 4 Wheel carrier | 11 Cover plate | 18 Radial sealing ring |
| 5 Inner tapered roller bearing | 12 Brake disc | 19 Cover ring |
| 6 Radial sealing ring | 13 Brake carrier | 35 Fixed caliper carrier |
| 7 Seal running ring | 14 Fitted pin | |

5 Position fixed caliper on wheel carrier (4). Then screw hex. screws (2) with new locking plate (3) or self-locking hex. screws (2) into holder and tighten to 90 Nm. Lock with locking plate, if required.

Note: Self-locking hex. screws are installed since December 1975. **Hex. screws may be used only once.**

If the screw-in torque of the new self-locking hex. screws is very high, clean threads in wheel carrier from residual glue of micro-encapsulated screws by means of a tap M 12 x 1.5.

During reconditioning jobs (if fixed caliper is not renewed), the original fastening method:

- a) screws with locking plate or
- b) self-locking screws should be maintained.

When renewing fixed calipers, use a locking plate also for self-locking screws for safety reasons.

Length of screws on vehicles:

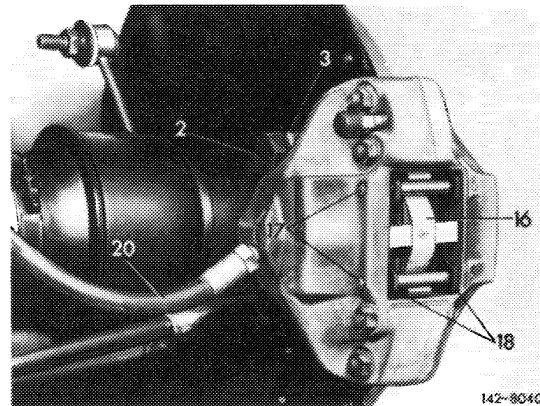
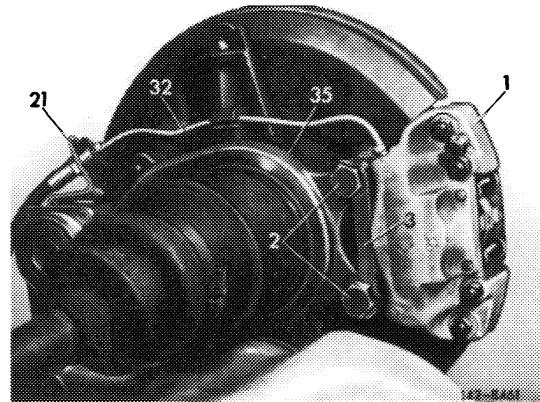
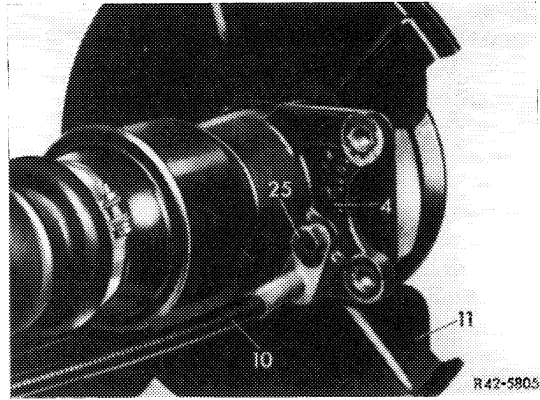
without starting torque compensation M 12 x 30

with starting torque compensation M 12 x 42

6 Screw brake hose (20) into fixed caliper with special tools torque wrench 001 589 72 21 00 and box wrench element 000 589 76 03 00 and tighten to 15 Nm, or screw brake line (32) into fixed caliper and tighten.

7 On vehicles with 2nd version of brake line layout, connect brake hose to brake line on bracket of frame floor.

Note: Make sure of perfect installation of hose, particularly on vehicles with diagonal swing axle and starting torque compensation.



8 Bleed rear axle brake circuit (42–010).

Attention!

Check brake system for leaks!

Upon bleeding, actuate brake pedal energetically several times to establish the correct play between brake disc and brake pad. Then, with the engine running, complete leak test by actuating brake pedal at approx. 200–300 N. The established pressure should hold up for some time, while brake pedal cannot be floored any further. Check all connections for leaks. If required, top up brake fluid in expansion tank of tandem main cylinder.

42–150 Replacement of piston seal on front axle fixed caliper

A. 2-piston fixed caliper

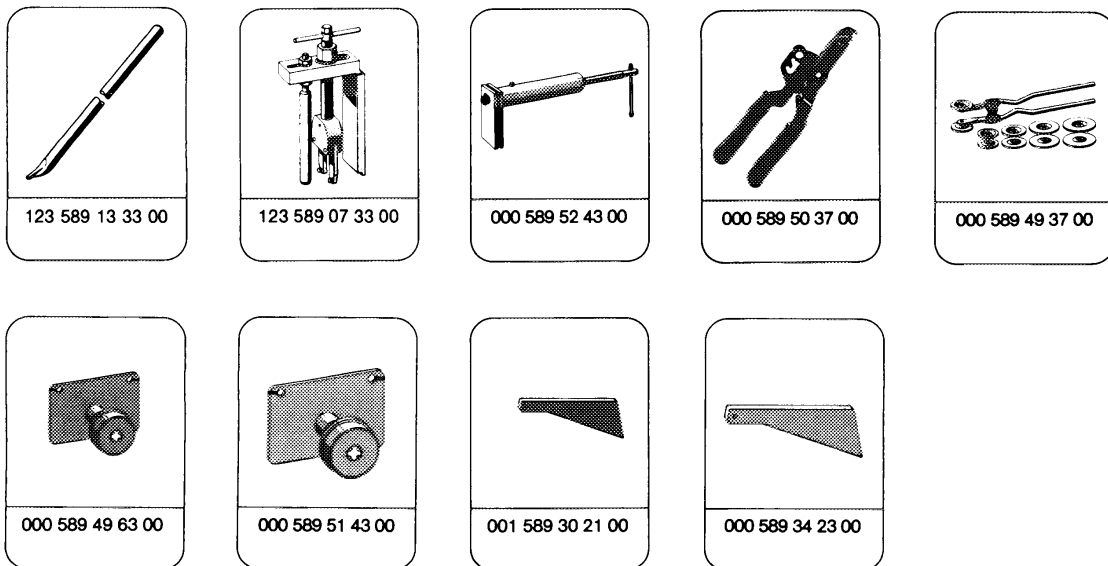
Data

Fixed caliper make	Teves	Bendix	Teves	Bendix
Housing dia.	56.99 57.04		59.99 60.04	
Shaft width for brake pads	77 + 0.15		90 + 0.15	

Lubricant

ATE brake cylinder paste

Special tools



Conventional tool

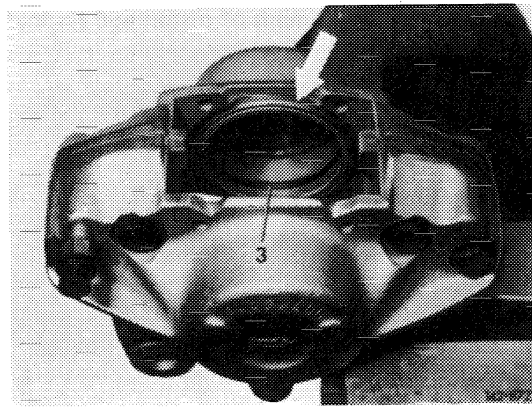
Open double box wrench 9 x 11 mm

e.g. made by Hazet, D-5630 Remscheid
order no. 612

Note

Do not separate the two halves of the fixed caliper since the fastening bolts are tightened to a definite torque by the manufacturer.

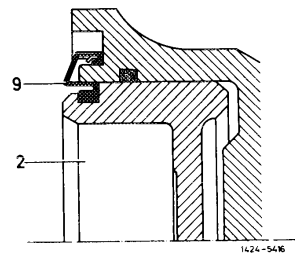
When renewing piston seal in Bendix fixed caliper, make sure that during removal of dust cap the pressed-on ring is not pushed off (refer to arrow). The ring is not available as a spare part. If the ring is corroded, experience has shown that the cylinder bore is also damaged. In such a case, replace complete fixed caliper.



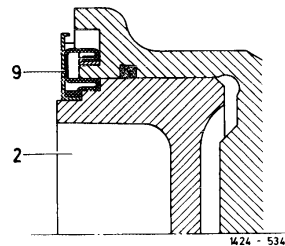
Removal

- 1 Remove brake pads (42-160).
- 2 Force dust cap (9) from housing by means of a screwdriver.

Teves version

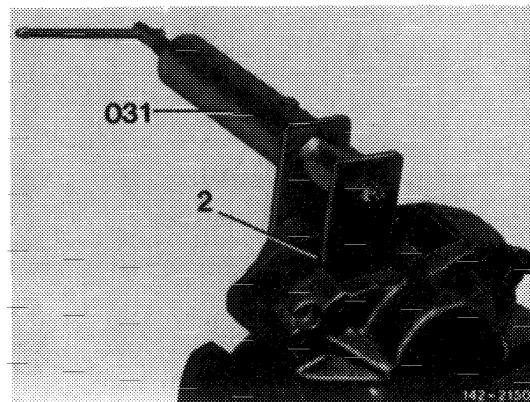


Bendix version



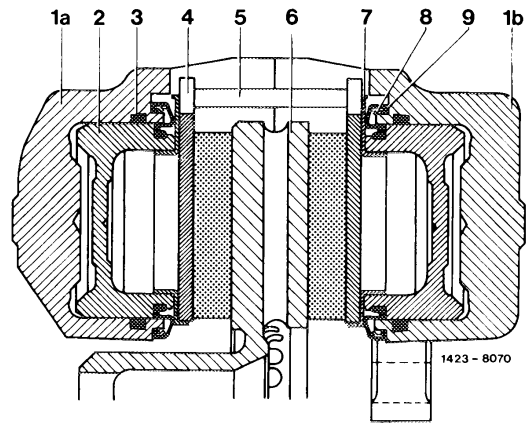
- 3 Hold piston (2) in place in fixed caliper by means of resetting device (031). Then carefully press out opposite piston with compressed air.

Note: If the pistons are rusted down, install a new fixed caliper.



4 Remove piston seal (3) from groove of cylinder bore.

- 1a Outer fixed caliper half
- 1b Inner fixed caliper half
- 2 Piston
- 3 Piston seal
- 4 Brake pad
- 5 Holding pin
- 6 Brake disc
- 7 Heat shield
- 8 Clamping ring
- 9 Dust cap



Inspection and repair

5 Push heat shield (7) away from piston.

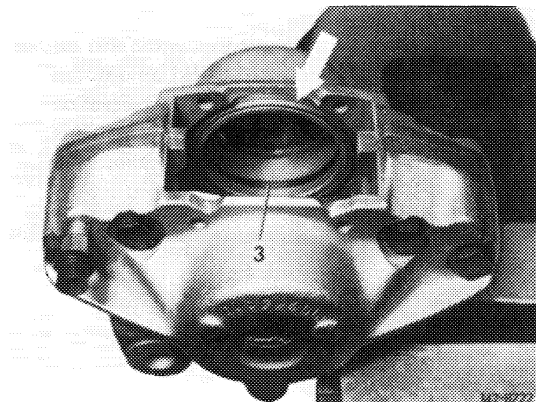
6 Remove deposits on piston with a soft brass wire brush or a rough cleaning cloth. Do **not** work on piston with polishing or emery cloth, since this might damage the chrome plated surface. Replace piston, if chrome surface is damaged.

7 Check cylinder bores of fixed caliper for wear. Replace complete fixed caliper if bores are scored or rusted. Remove small, minor rust spots in bore with polishing cloth, heavier rust spots in front of piston seal groove with fine emery paper (380 to 500 grain).

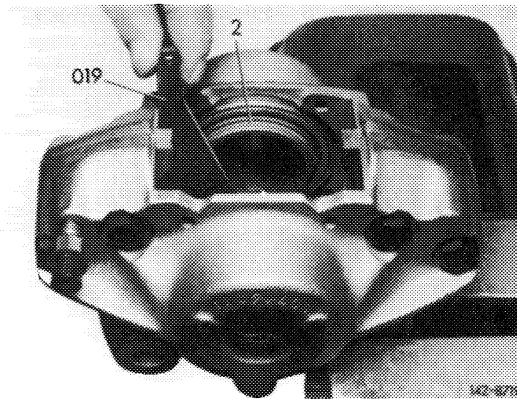
Installation

8 Coat new piston seal (3) slightly with ATE brake cylinder paste and insert into groove of cylinder bore.

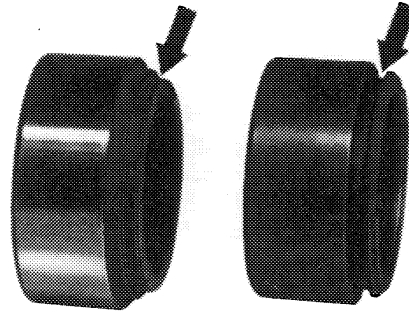
Note: When reconditioning Bendix (Bx) fixed caliper, make sure of a tight and correct seat of pressed-on ring (refer to arrow).



9 Insert piston (2) into bore of fixed caliper. Then check position of piston in fixed caliper with piston gauge (019).



Note: When installing pistons, note different piston versions.

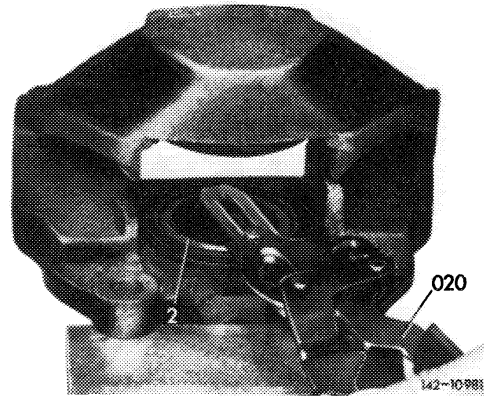


Left:
Bendix (Bx piston)

Right:
Teves piston

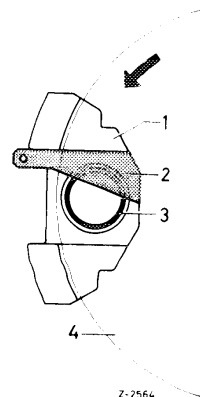
142-8643

10 Move piston (2) into correct position with piston pliers (020), if required.

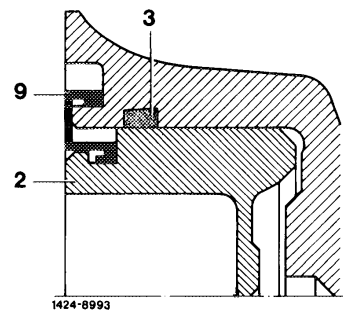


Attention!

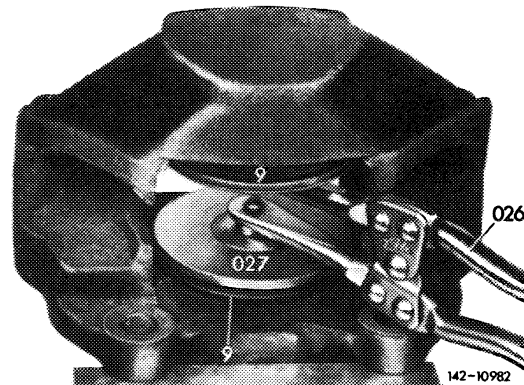
Install piston in such a manner that with fixed caliper installed the elevation (marked black) on piston is pointing downwards. While braking, this elevation will cause a one-sided contact of brake pads. This in turn will reduce a trend towards squealing.



11 On Teves fixed caliper, mount dust cap (9) on piston (2) and position against collar of fixed caliper.



12 Place dust cap (9) on collar of fixed caliper by means of pliers (026) and pertinent discs (027).

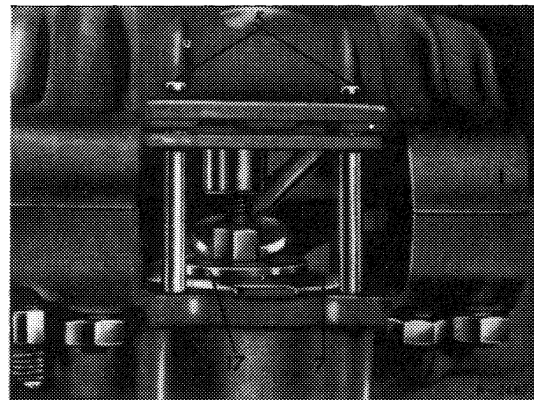


13 Insert heat shield (7) into piston with the recess in the shield fitting accurately into the elevation of the piston.

14 Place insertion device (17) into fixed caliper and press heat shield into piston.

Attention!

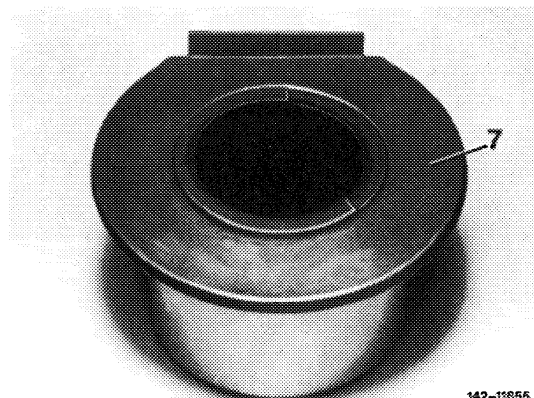
The elevation on the piston should project at least 0.1 mm beyond heat shield. The heat shields for the inner and the outer piston are different.



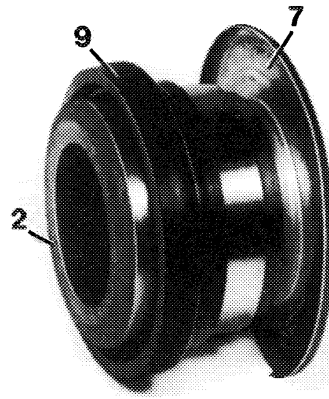
15 On Bendix fixed caliper, press heat shield (7) on piston according to piston position.

Attention!

The elevation on the piston should project at least 0.1 mm beyond heat shield.



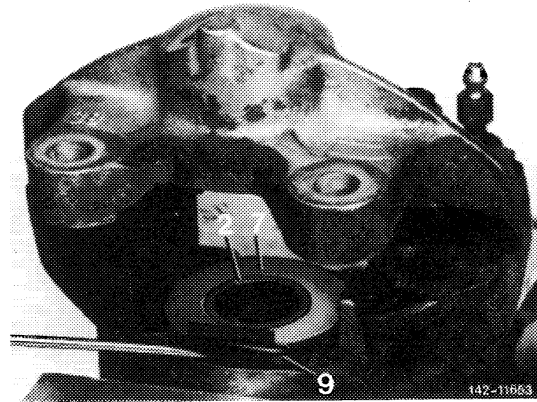
16 Place dust cap (9) on piston (2).



142-11654

17 Use blunt installation needle to mount dust cap (9) on collar of fixed caliper. Then push piston completely back until dust cap (9) is perfectly seated on piston collar.

18 Install brake pads into fixed caliper (42-160).



142-11663

B. 4-piston fixed caliper

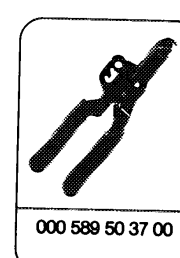
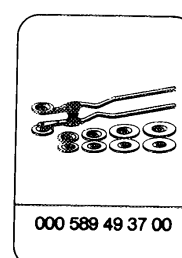
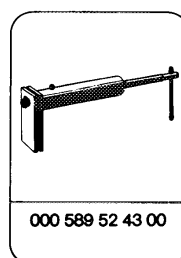
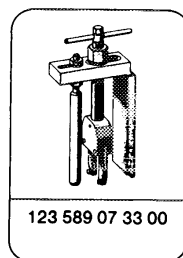
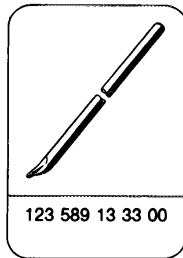
Data

Fixed caliper make	Teves
Housing dia.	39.98 40.03
Shaft width for brake pads	90 + 0.15

Lubricant

ATE brake cylinder paste

Special tools



Conventional tool

Open double box wrench 9 x 11

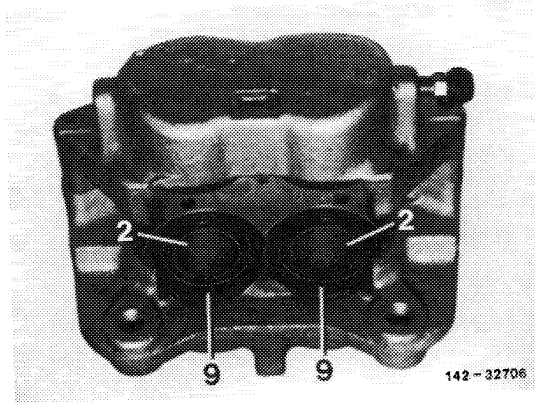
e.g. Hazet, D-5630 Remscheid
Order No. 612

Note

Do not separate the two halves of the fixed caliper from each other, since the fastening screws have been tightened to a given torque by the manufacturer.

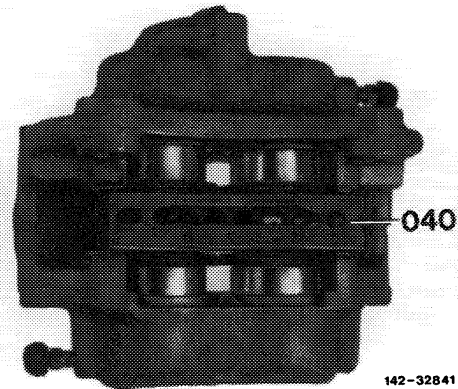
Removal

- 1 Remove brake pads (42-160).
- 2 Force dust cap (9) from housing by means of a screwdriver.



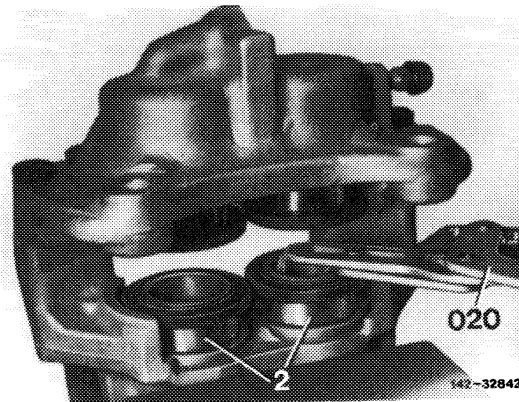
- 3 Insert metal segment (040), 22 mm thick, into fixed caliper, then press out pistons (2) carefully up to stop by means of compressed air.

Note: The metal segment may be a part taken from a brake disk.

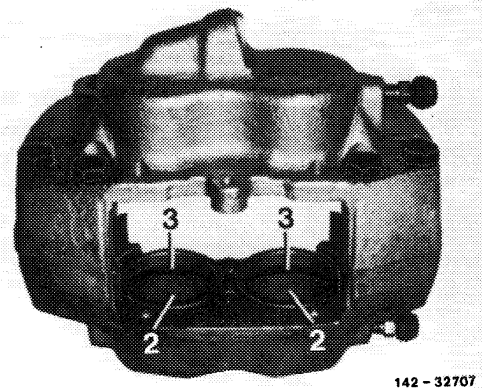


- 4 Remove metal segment. Remove piston (2) by means of rotary movements with piston-turning pliers (020).

Note: If the pistons are rusted down, install a new fixed caliper.



- 5 Remove piston seal (3) from groove of cylinder bore.



Checking and reconditioning

6 Remove deposits on piston with a soft brass wire brush or with a rough cleaning rag. Do not handle piston with polishing or emery cloth, since this will damage the chrome-plated surface. If chrome layer shows evidence of damage, replace piston.

7 Check cylinder bores of fixed caliper for wear. If bores are showing score marks or are rusted, replace complete fixed caliper. Remove slim, slightly rusty spots in bore with polishing cloth, larger rust spots in front of groove for piston seal with fine emery paper (grain 380 to 500).

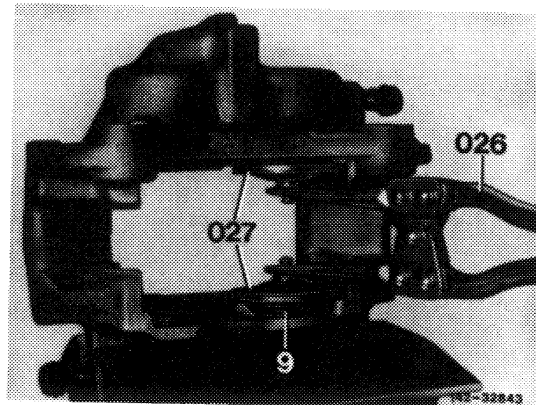
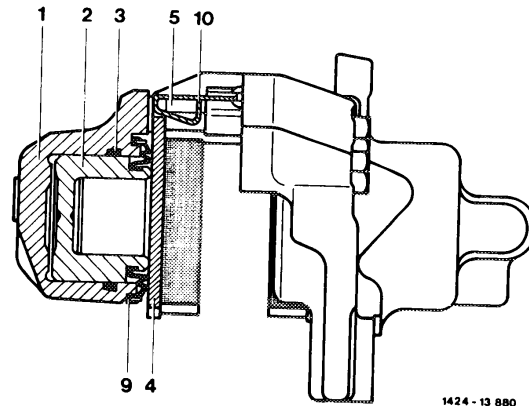
Installation

8 Rub new piston seal (3) lightly with ATE brake cylinder paste and insert into groove of cylinder bore.

9 Insert piston (2) into bore of fixed caliper. Mount dust cap (9) on piston (2) and position against flange of fixed caliper.

10 With pliers (026) and the respective plates (027) press dust cap (9) on flange of fixed caliper.

11 Install brake pads into fixed caliper (42-160).



42-155 Replacement of piston seal on rear axle fixed caliper

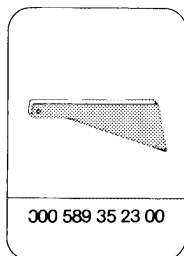
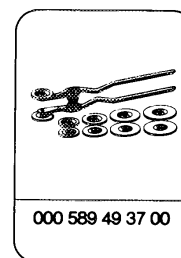
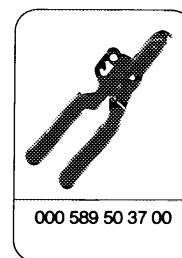
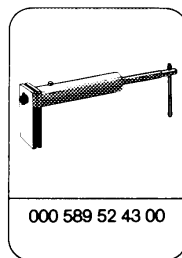
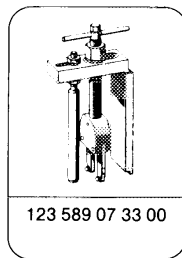
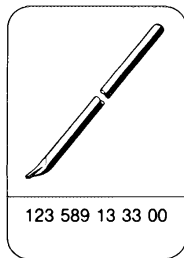
Data

Fixed caliper make	Teves	Bendix	Girling
Housing dia.	<u>37.99</u> 38.03		<u>38.17</u> 38.22
Shaft width for brake pads	62 + 0.15		

Lubricant

ATE brake cylinder paste

Special tools



Conventional tool

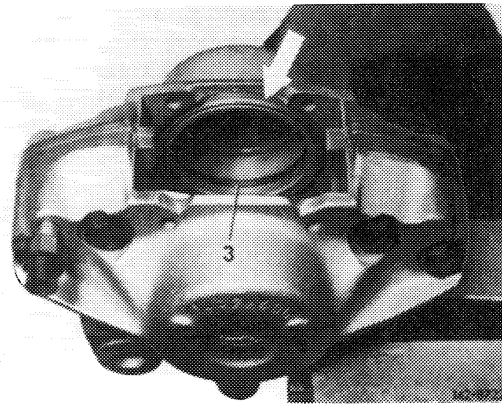
Open double box wrench 9 x 11 mm

e.g. made by Hazet, D-5630 Remscheid
order no. 612

Note

Do not separate the two halves of the fixed caliper since the fastening bolts are tightened to a definite torque by the manufacturer.

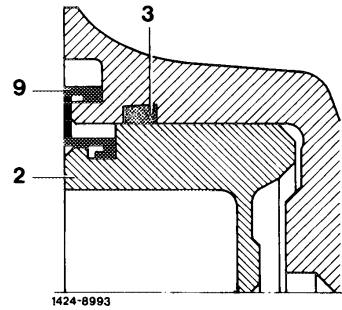
When renewing piston seal in Bendix fixed caliper, make sure that during removal of dust cap, the pressed-on ring is not pushed off (refer to arrow). The ring is not available as a spare part. If the ring is corroded, experience has shown that the cylinder bore is also damaged. In such a case, exchange complete fixed caliper.



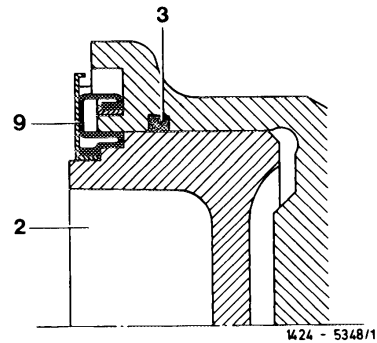
Removal

- 1 Remove brake pads (42–160).
- 2 Force dust cap (9) from housing by means of a screwdriver.

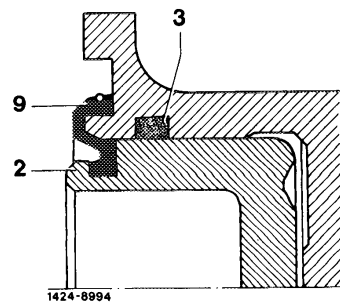
Teves version



Bendix version

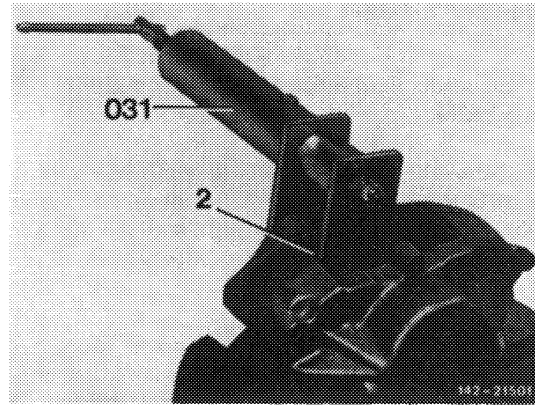


Girling version



3 Hold one piston (2) in fixed caliper in place by means of resetting device (031). Then carefully press out opposite piston by means of compressed air.

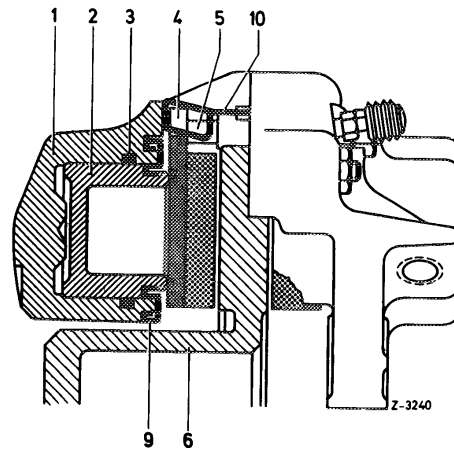
Note: If the pistons are rusted down, install new fixed caliper.



4 Remove piston seal (3) from groove of cylinder bore.

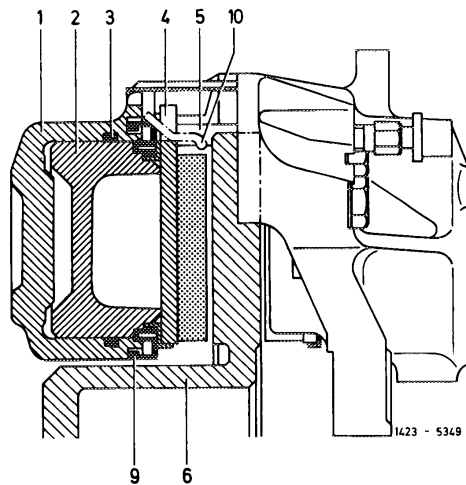
Teves version

- 1 Fixed caliper
- 2 Piston
- 3 Piston seal
- 4 Brake pad
- 5 Holding pin
- 6 Brake disc
- 9 Dust cap
- 10 Cross spring



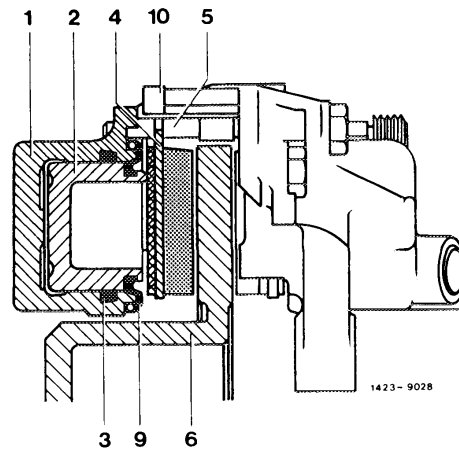
Bendix version

- 1 Fixed caliper
- 2 Piston
- 3 Piston seal
- 4 Brake pad
- 5 Holding pin
- 6 Brake disc
- 9 Dust cap
- 10 Holding spring for lining



Girling version

- 1 Fixed caliper
- 2 Piston
- 3 Piston seal
- 4 Brake pad
- 5 Holding pin
- 6 Brake disc
- 9 Dust cap
- 10 Holding spring for lining



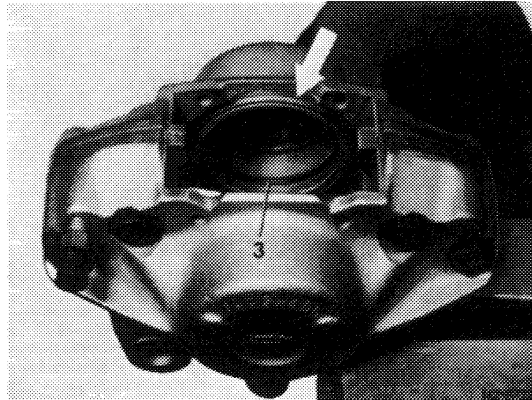
Inspection and repair

- 5 On Bendix fixed caliper, remove heat shield (7) from piston.
- 6 Remove deposits on piston with a soft brass wire brush or a rough cleaning cloth. Do **not** wipe on piston with polishing cloth or emery cloth, since this might damage the chrome-plated surface. Replace piston if chrome surface is damaged.
- 7 Check cylinder bores of fixed caliper for wear. Replace complete fixed caliper if bores are scored or rusted. Remove small, minor rust spots in bore with polishing cloth, heavier rust spots in front of piston seal groove with fine emery paper (380 to 500 grain).

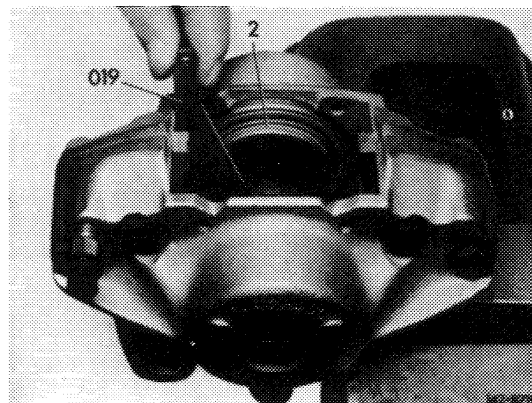
Installation

- 8 Coat new piston seal (3) slightly with ATE brake cylinder paste and insert into groove of cylinder bore.

Note: When reconditioning Bendix fixed caliper, make sure of a tight and perfect seat of pressed-on ring (refer to arrow).

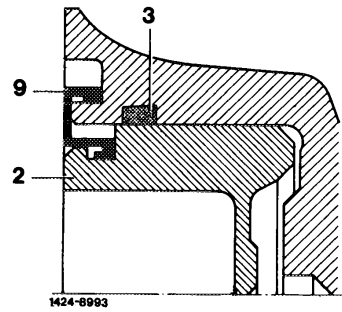


- 9 Insert piston (2) into bore of fixed caliper. Check position of piston in fixed caliper with piston gauge (019).

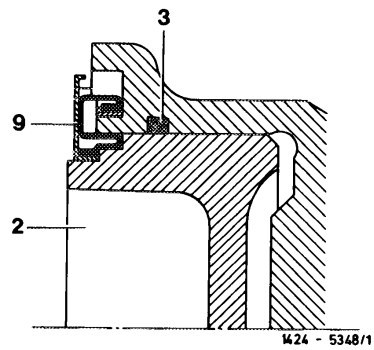


Note: When installing pistons, watch out for different piston versions.

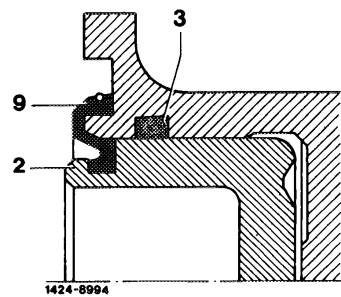
Teves version



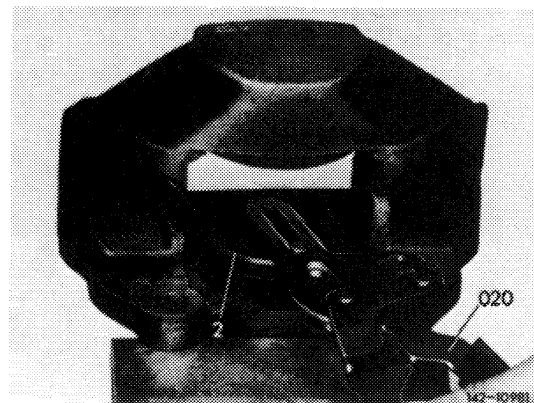
Bendix version



Girling version



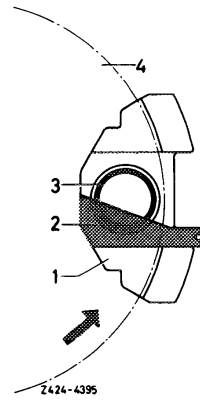
10 If required, move piston into correct position by means of piston rotating pliers (020).



Attention!

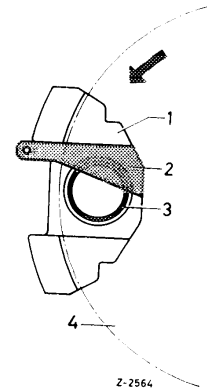
Install piston in such a manner that with fixed caliper installed the elevation (marked black) on piston is pointing upwards. While braking, this elevation will cause a one-sided contact of brake pads. This in turn will reduce a trend towards squealing.

Piston position diagonal swing axle

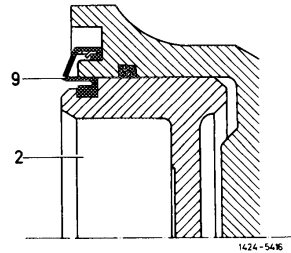


On fixed caliper for diagonal swing axle with starting torque compensation, the elevation on piston must be at bottom.

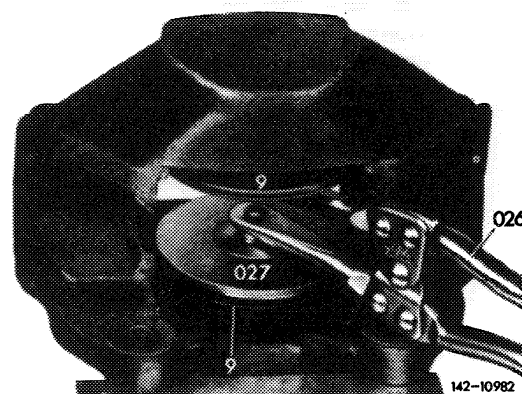
Piston position diagonal swing axle with starting torque compensation



11 On Teves fixed caliper, mount dust cap (9) on piston (2) and position against collar of fixed caliper.



12 Press dust cap (9) on collar of fixed caliper by means of pliers (026) and pertinent discs (027).

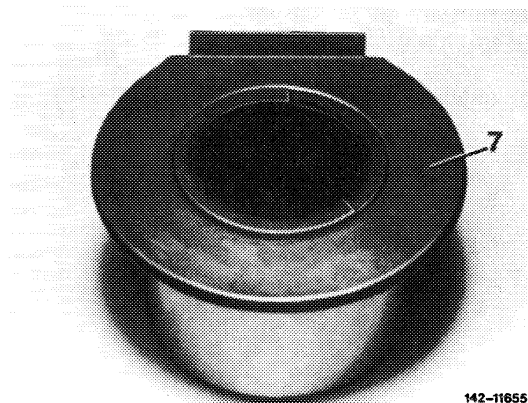


13 On Bendix fixed caliper, press heat shield (7) on piston in accordance with piston position.

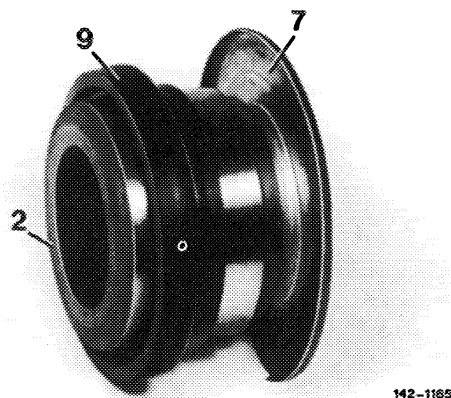
Attention!

The elevation on piston should project at least 0.1 mm beyond heat shield.

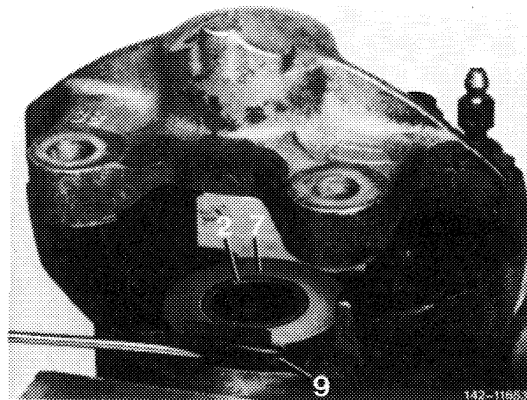
Note: The rear wheel fixed caliper made by Teves has no heat shield.



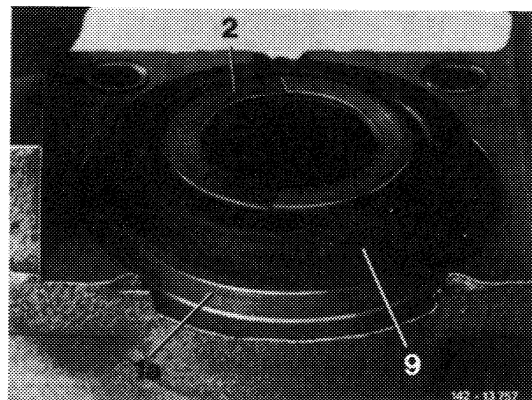
14 Place dust cap (9) on piston (2).



15 Mount dust cap (9) on collar of fixed caliper with a blunt assembly needle. Then push piston completely back until dust cap (9) is perfectly seated on piston collar.

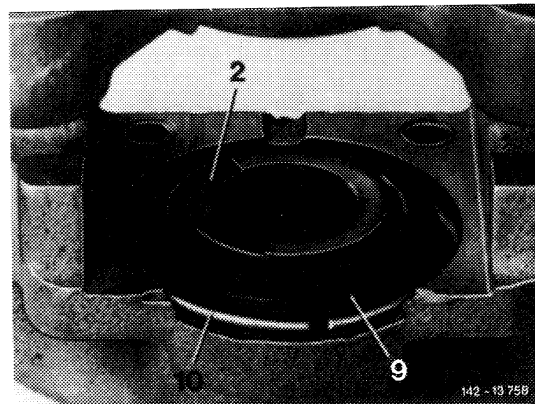


16 On Girling fixed caliper, mount dust cap (9) on piston (2).



17 Push dust cap (9) over web (1a) of fixed caliper and attach with clamping ring (10).

18 Install brake pads into fixed caliper (42-160).



42–160 Replacing brake pads

Data

Fixed caliper piston dia.	38	57	60/40 ¹⁾
Thickness of brake pad with lining backing plate	15/15.5 ²⁾	15	15/17.5 ²⁾
Thickness of lining backing plate	5		4.5
Permissible wear of brake lining up to a residual lining thickness of	2		
Width of brake pad max.	61.75	76.75	89.75
Effective brake surface per axle (cm ²)	100	152	206
Thickness of brake disk	front	22	
	rear	10	
Wear limit	front	–	20.6 / 20.0/19.4 ²⁾
	rear	8.3	
Limit during maintenance ³⁾	front	–	21.2 / 20.6/20.0 ²⁾
	rear	8.6	

¹⁾ Starting September 1985 4-piston fixed caliper

²⁾ Starting March 1980

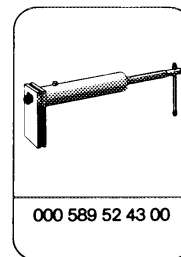
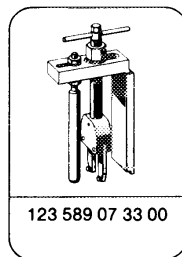
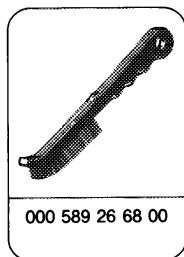
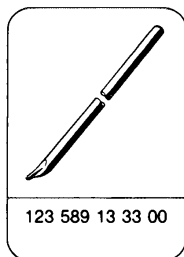
³⁾ Refer to maintenance manual volume 2 (item 4252).

Lubricant

DB brake pad paste

001 989 10 51

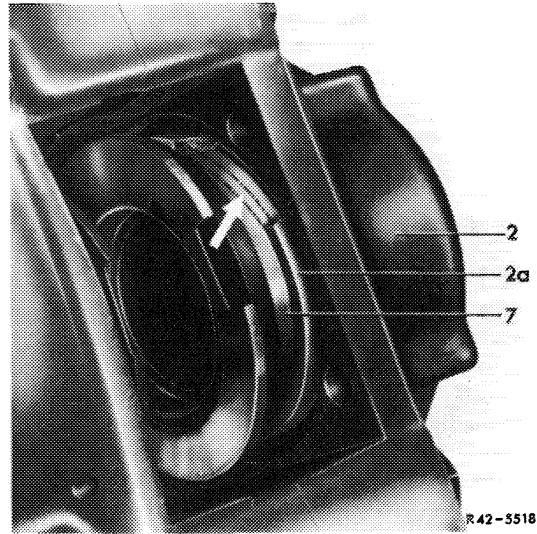
Special tools



Note

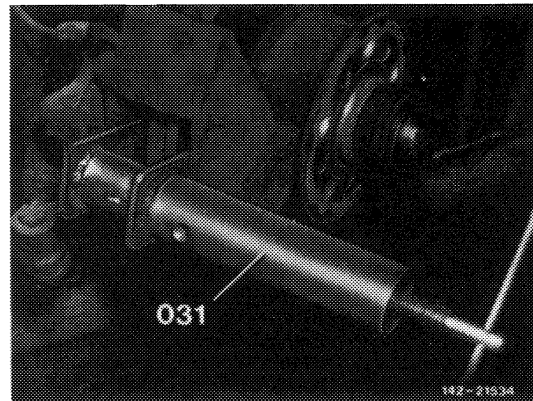
Replace brake pads when the lining is down to 2 mm or greasy. Use only approved lining grades.

When the brake pads are worn down to the lining backing plate beyond the permissible lining thickness, the fixed caliper may also suffer damage, since the web between the sealing ring groove and the dust cap will fracture and the fixed caliper will leak.



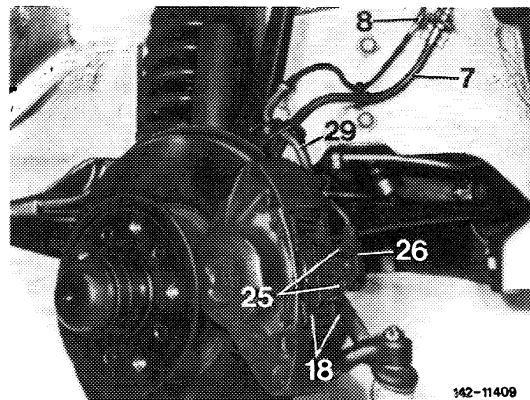
When brake pads are excessively worn, a high and low pressure test (90 or 3 bar gauge pressure) will be required.

To prevent canting of piston, push pistons back into their end position by means of resetting tool (031) only.



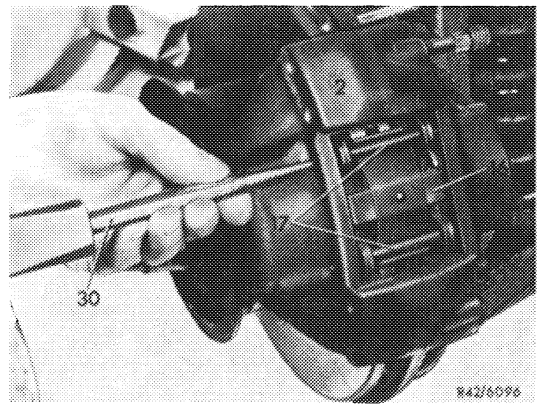
Removal

1 On fixed calipers with brake lining wear indicator, pull cables of clip sensor (25) out of plug connection (26) on fixed caliper.



2 On Teves fixed caliper, knock holding pins (17) out of caliper by means of punch.

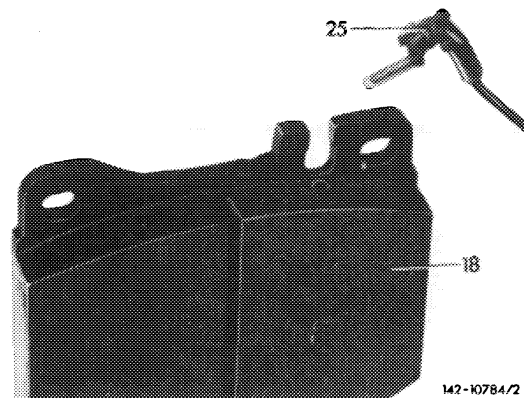
3 On Bendix and Girling fixed caliper, pull both locking eyes out of holding pins, remove holding pins.



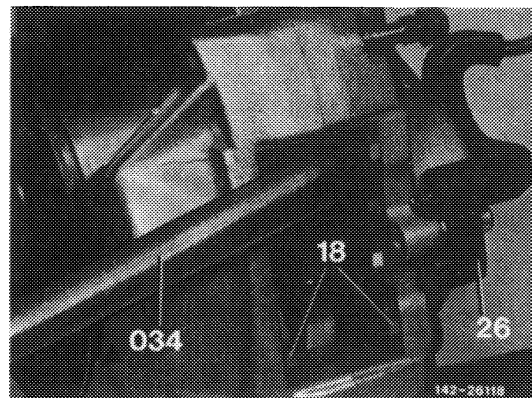
4 Pull sensor (25) out of backing plate or out of brake lining. Simultaneously remove cross spring or lining holding spring.

Attention!

Renew sensors on which the insulating layer of the contact pin has been chafed through or where a part of sensor including the line insulation, has been damaged.



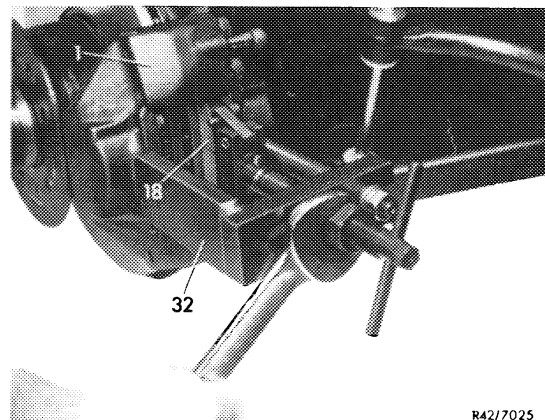
5 Force brake pads (18) out of fixed caliper by means of ejection lever (034).



Note: When brake pad is rusted down, use puller (32) for removing pad.

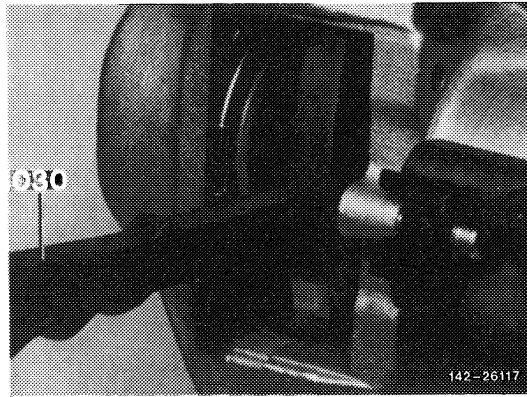
If brake pad wear is high, check piston for easy operation. If pistons are hard to move, recondition fixed caliper.

Brake discs which are badly contaminated at braking surface by deposits from lining (indicated by gray or blue discolouration of brake surfaces), must be cleaned prior to installing new brake pads (42-260).



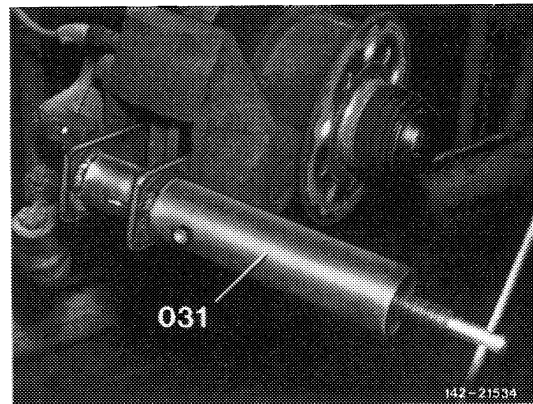
6 Clean guide for brake pad in fixed caliper (2) with brake caliper brush (030).

7 Check dust cap for cracks. If the dust cap is damaged, remove and disassemble fixed caliper, since penetrating dirt will quickly lead to leaks in caliper.



8 To prevent any overflowing of expansion tank when pushing back piston, draw some brake fluid out of expansion tank.

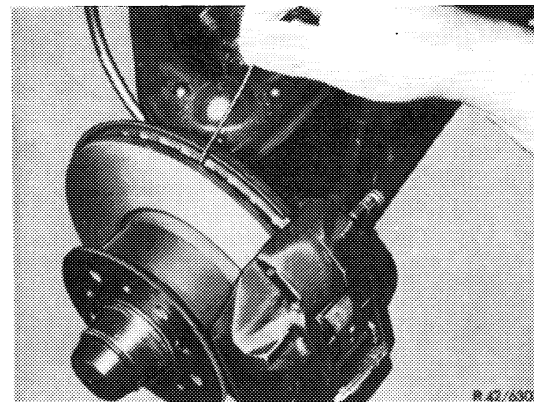
9 Push back both pistons by means of resetting tool (031).



10 When brake discs are vented, check air shafts for contamination. In such a case clean air shafts with a thin wire while making sure that the balancing clamps are not loosened. Blow dirt out of shafts with compressed air.

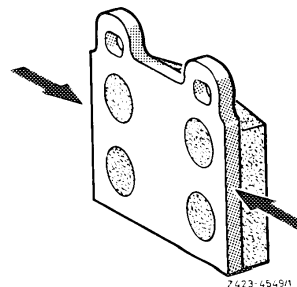
Note: Measure thickness of brake disk. Pay attention to limit dimension so that the wear limit is not less than specified (refer to data).

Replace brake disk if the test dimension is less than specified (42-220, 42-228).

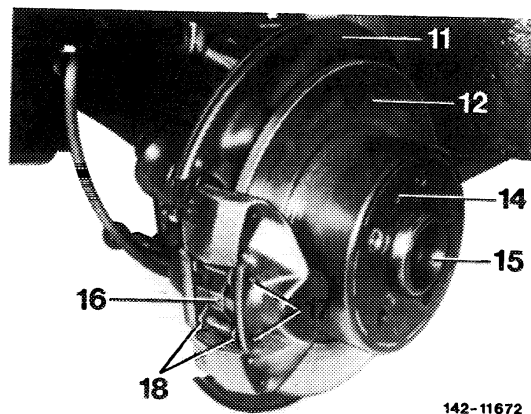


Installation

11 Slightly rub brake pads on spots indicated in illustration with arrows with specified lubricant (refer to table) and insert brake pads into fixed caliper.

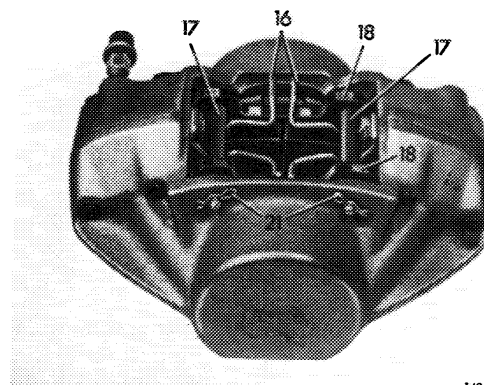


12 On Teves fixed caliper position cross spring (16) and knock holding pins (17) into fixed caliper.



142-11672

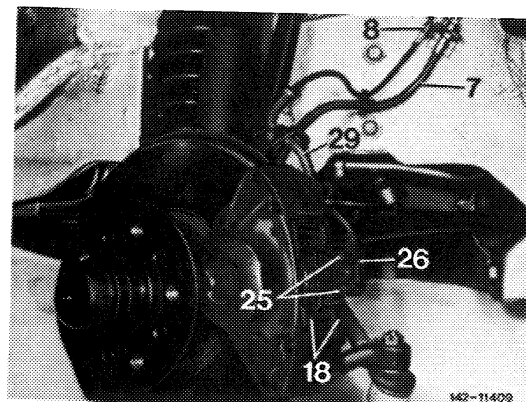
13 On Bendix and Girling fixed caliper, mount springs holding lining (16) and insert holding pins (17) into fixed caliper and locking eyes (21) into holding pins.



142-10097

14 On fixed calipers with brake lining-wear indicator, insert sensor (25) into brake pad and cable into plug connection (26).

15 Actuate brake pedal several times energetically until firm resistance is felt. Then check level of brake fluid in expansion tank and top up, if required.

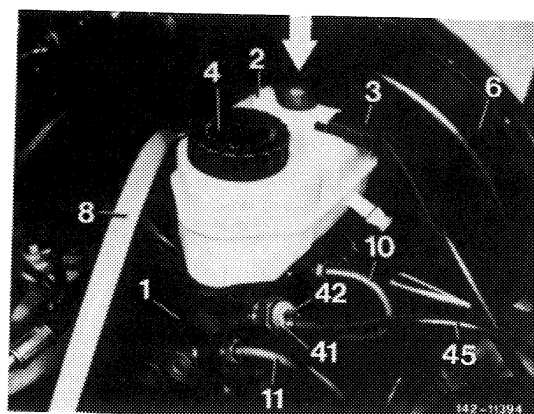


142-11409

Note: On vehicles with pressure difference warning indicator (DDW), the warning lamp of the warning indicator may light up when the lining is changed. For this reason, make sure that the releasing pin (42) on switch (41) is pushed following the change of lining.

New brake pads must be braked in carefully, that is, the vehicles should be braked several times from 80–40 km/h at slight pedal pressure.

Prior to each deceleration, permit brake to cool slightly. Braking to a stop under high deceleration should be attempted only with run-in linings.



142-11294

42–220 Removal and installation of brake disc on front axle

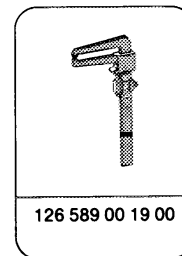
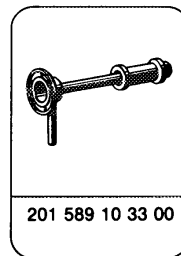
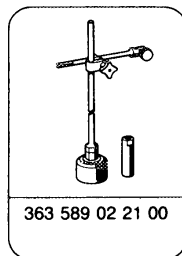
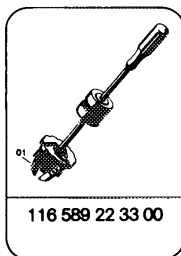
Data

Thickness of brake disk	22	
	on fixed caliper with 57 mm piston dia.	20.60
Wear limit	on fixed caliper with 60 mm piston dia.	20.0 19.4 ¹⁾
	on fixed caliper with 40 mm piston dia.	19.4
Brake disk dia.	1st version	273 ± 0.2
	2nd version	278 ± 0.2
	3rd version	284 ± 0.2
Fitted bore dia.		80.05
		80.00
Lateral runout	max. 0.12	

¹⁾ On fixed calipers with brake linings 17.5 mm thick. Starting March 1980.

Tightening torques	Nm
Self-locking hex. socket bolt for attaching brake disc to front wheel hub	115
Fitted hex. bolt for attaching fixed caliper to steering knuckle	115

Special tools



Conventional tools

Open double box wrench 9 x 11 mm

e.g. made by Hazet, D-5630 Remscheid
order no. 612

Dial gauge A 1 DIN 878

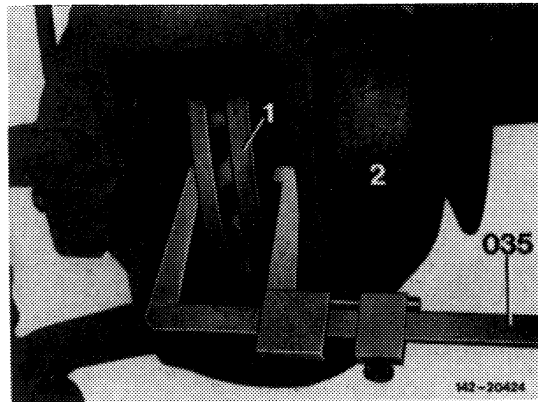
e.g. made by Mahr, D-7300 Esslingen
order no. 810

Note

When checking brake disc, proceed as follows:

- a) Measure thickness of brake disc between cover plate and fixed caliper, or with brake pads removed, in inspection hole by means of slide gauge.
- b) Check visually.

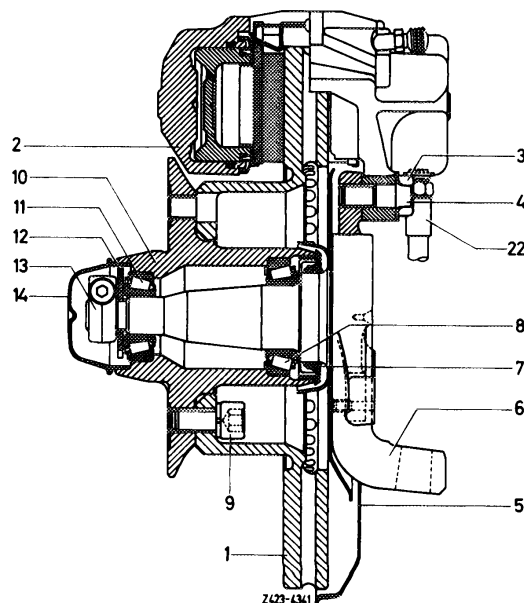
Vented brake disks with hair line cracks up to 25 mm in length, which may be caused by high stress, need not be replaced. Be sure to replace brake disks with gaping cracks, with cracks deeper than 0.5 mm, and after attaining the wear limit.



Removal

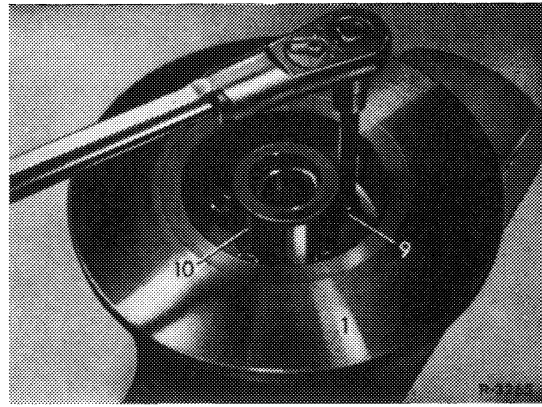
- 1 Remove fixed caliper (42–100).
- 2 Remove front wheel hub (33–310).

- 1 Brake disc
- 2 Fixed caliper
- 3 Hex. head fitted screw
- 4 Locking plate
- 5 Cover plate
- 6 Steering knuckle
- 7 Radial sealing ring
- 8 Tapered roller bearing
- 9 Self-locking hex. socket screw
- 10 Front wheel hub
- 11 Tapered roller bearing
- 12 Disc
- 13 Clamping nut
- 14 Hub cap



3 Screw three hex. bolts M 12 x 1.5 into front wheel hub. Then clamp front wheel hub into a vise, using aluminum jaws.

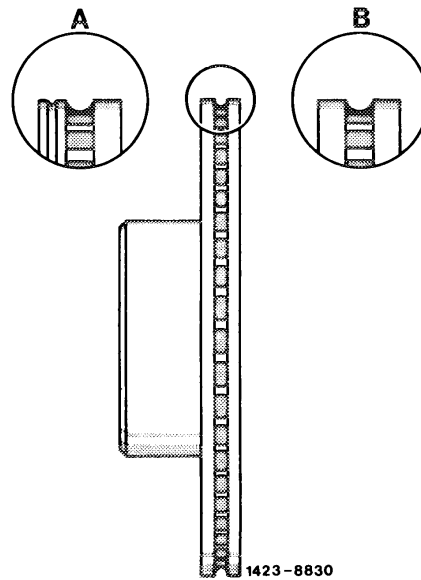
4 Unscrew self-locking hex. bolts (9), by means of which the brake disc (1) is attached to front wheel hub (10).



Installation

Attention!

Starting March 1980, modified fixed calipers will be installed with linings 17.5 mm thick and with modified vented brake discs, identified by a groove along their circumference.



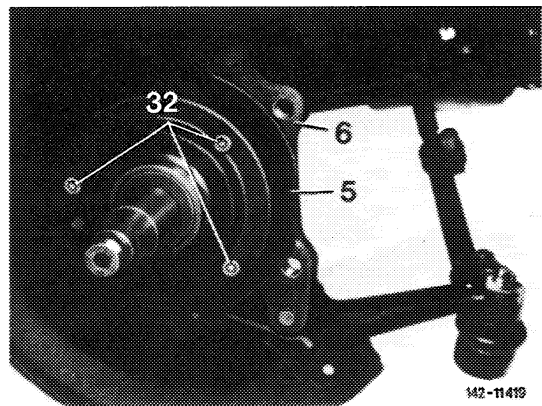
A = Brake disc with groove
B = Brake disc without groove

Note: Prior to installation of brake disc, remove rust (if any) on flange of brake disc and on front wheel hub. Make sure that there is no burr on fit of brake disc.

Check cover plate. Retighten hex. bolts (32), if required.

Spare part-brake discs are protected against corrosion by means of nitro-cellulose varnish. Prior to installation, these brake discs must be cleaned with thinner. Make sure that safety rules are observed.

Also make sure that the correct brake disc version is installed.

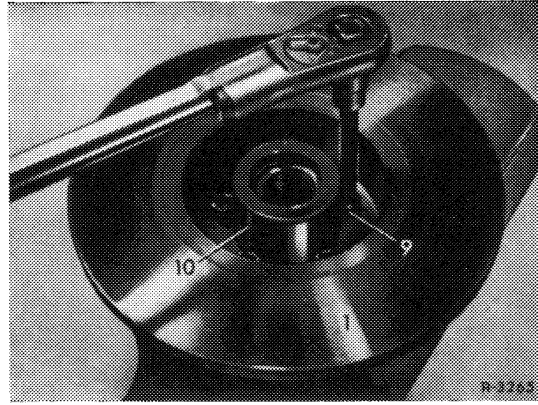


5 Attach brake disc (1) to front wheel hub (10) with new, self-locking hex. socket screws (9).

Tighten self-locking hex. socket screws to 115 Nm.

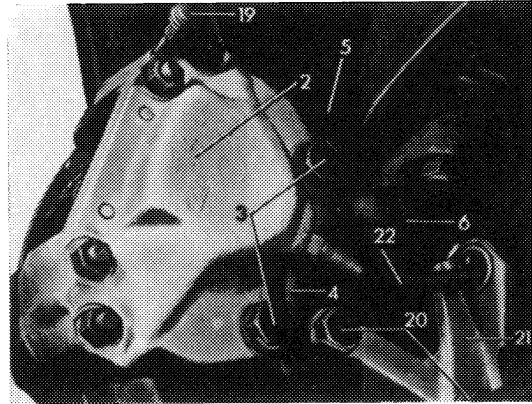
Instead of hex. socket screws with captive snap ring, part No. 000 990 3712, hex. socket screws with micro-encapsulated threads, part No. 000 990 7212 can also be used.

Note: Self-locking hex. socket screws may be used only once.



6 Install front wheel hub (33–310).

7 Fasten fixed caliper to steering knuckle (6) using a new locking plate (4) with fitted hex. screws (3) or self-locking fitted hex. screws (3) and tighten to 115 Nm. Lock with locking plate, if required (42–100).



Attention!

Self-locking fitted hex. screws are installed since end of 1976. Fitted hex. screws may be used only once.

During reconditioning jobs (if fixed caliper is not renewed) the original fastening method:

- a) screws with locking plate or
- b) self-locking screws should be maintained.

When renewing fixed calipers, use a locking plate also with self-locking screws for safety reasons.

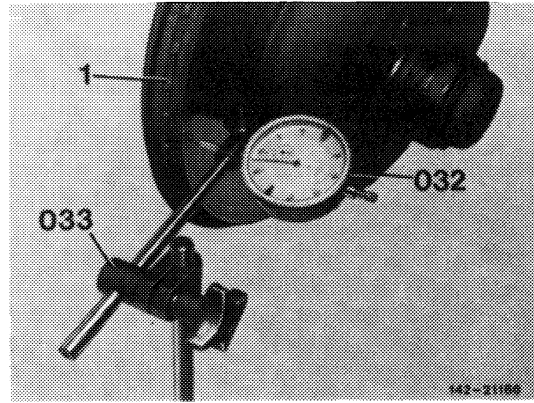
Pay attention to perfect installation of brake hose.

Attention!

Prior to starting, actuate brake pedal several times energetically to establish the correct play between the brake disc and the brake pad. Then top up brake fluid in expansion tank of tandem main cylinder.

Note: If the pedal travel varies during a test drive (mainly after driving around bends), measure lateral runout of brake disc at outside diameter. Simultaneously check end play of wheel bearing at front wheel hubs and adjust, if required (33–300).

If the lateral runout of the brake disc is too high, displace brake disc on front wheel hub. Renew brake disc, if required.



42–228 Removal and installation of brake disc on rear axle

Data

Thickness of brake disc	10
Wear limit	8.3
Brake disc dia.	279 ± 0.2
Fitted bore dia.	$\frac{67.00}{67.05}$
ID for parking brake	160 ± 0.2
Lateral runout (axial runout)	max. 0.15

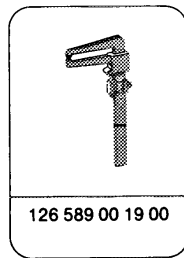
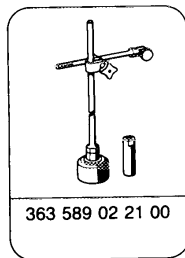
Lubricants

Molykote paste U	Molykote paste G rapid	Liqui-Moly paste 36
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Tightening torque Nm

Hex bolt for attaching fixed caliper to wheel carrier of rear axle 90

Special tools



Conventional tool

Dial gauge A 1 DIN 878

e.g. made by Mahr, D-7300 Esslingen
order no. 810

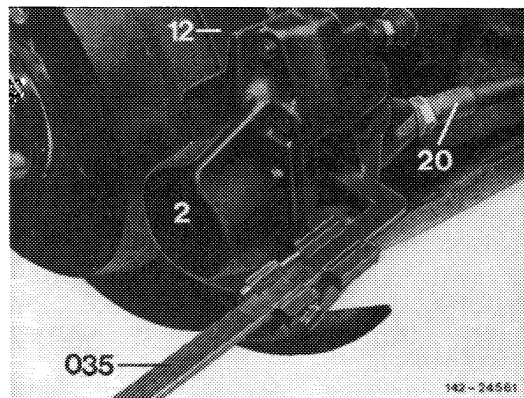
Note

When checking, proceed as follows:

a) Measure thickness of brake disc between cover plate and fixed caliper, or with brake pads removed, in inspection hole by means of slide gauge.

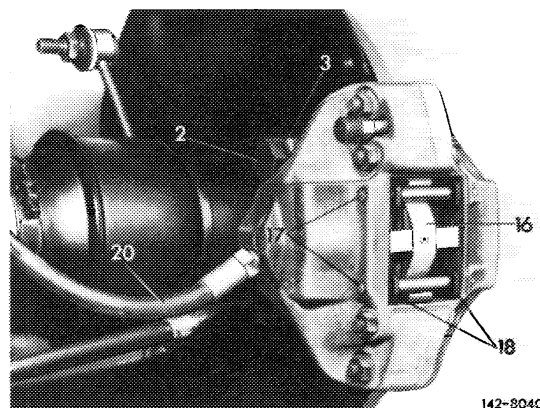
b) Check visually.

If cracks are rather large (not measurable), if score marks are deeper than 0.5 mm and when wear limit is attained, replace brake discs.

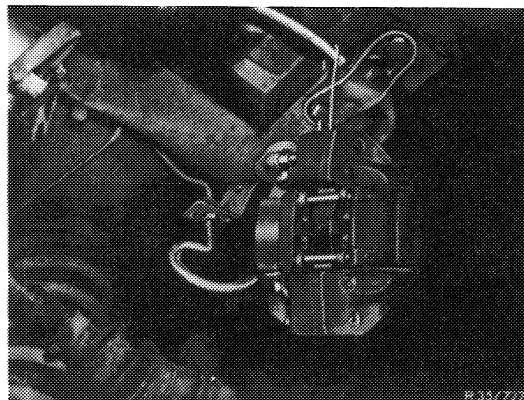


Removal

1 Unbend locking plate (3), if installed, and unscrew hex. bolts (2).

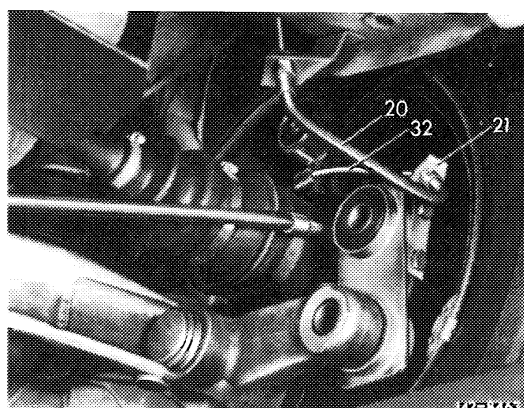


2 Remove fixed caliper and on vehicles with diagonal swing axle, hang up on torsion bar together with brake hose by means of a suitable hook.



3 On vehicles with diagonal swing axle with starting torque compensation, unscrew hex bolts for fastening brake hose holder (21) from caliper carrier. Then also hang up fixed caliper on torsion bar by means of a hook.

Note: The hook is self-made. Do not subject brake hose to tensile stress.



4 Remove brake disc (12) from rear axle shaft flange (15).

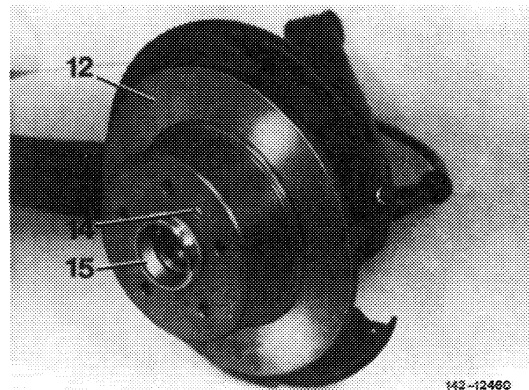
Loosen stuck brake discs from seat of rear axle shaft flange by light blows with a plastic hammer. Make sure that the parking brake is entirely released.

Installation

5 Coat fitted seat of rear axle shaft flange with a heat-resistant long-term lubricant (Molykote paste "U", Molykote paste G rapid, Liqui-Moly paste 36), so that the brake disc can be easily removed from rear axle shaft flange later on.

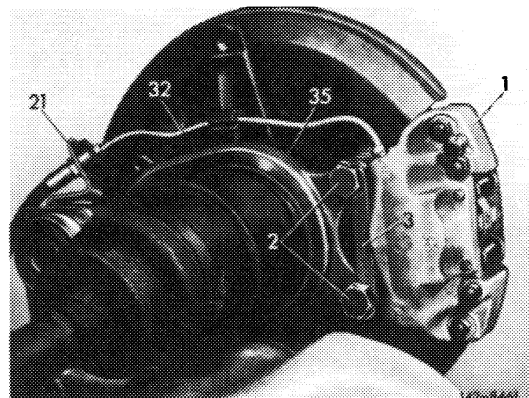
Note: Spare brake discs are protected against corrosion by means of nitrocellulose paint. For this reason, these brake discs must be cleaned with a solvent prior to installation. Make sure that safety rules are observed.

6 Place brake disc (12) on rear axle shaft flange. Make sure that the fitted pin (14) enters correctly into brake disc.



7 Place fixed caliper against wheel carrier. Then screw hex. bolts (2) with a new locking plate (3) or self-locking hex. bolts (2) into holder and tighten to 90 Nm. Secure with locking plate, if required (42-120).

Note: Self-locking hex. bolts will be installed starting December 1975. These hex. bolts may be used only once.



In the event of repairs (when fixed caliper is not replaced) continue using the original fastening system:

- a) Bolts with locking plate or
- b) self-locking bolts.

Length of bolts on vehicles:

without starting torque compensation M 12 x 30,
with starting torque compensation M 12 x 42.

When renewing fixed calipers, use locking plate also with self-locking bolts for safety reasons.

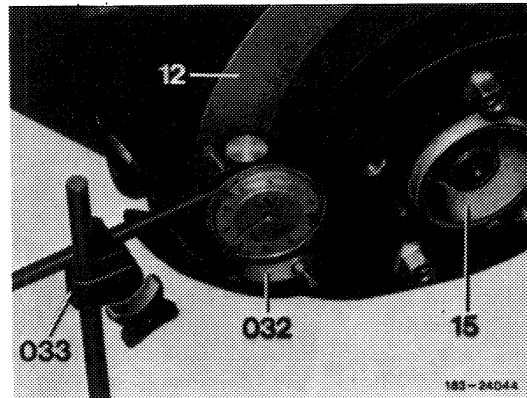
8 On vehicles with diagonal swing axle and starting torque compensation attach brake hose holder (21) to fixed caliper carrier.

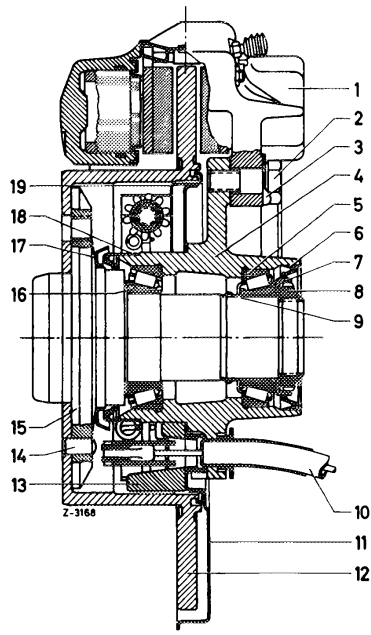
Attention!

Prior to moving off, actuate brake pedal several times energetically to obtain the correct clearance between brake disc and brake pad. Then top up brake fluid supply in expansion tank of tandem main cylinder.

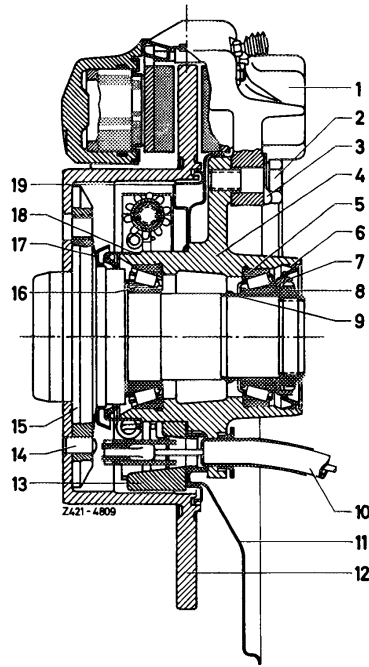
Note: If during a trial run (mainly after driving around a bend) a different pedal travel is observed, measure lateral runout of brake disc on OD. Simultaneously, check rear axle shaft flange or vertical and lateral runout and wheel bearing play in semitrailing arm and adjust, if required (35–130).

If the lateral runout of the brake disc is too high, renew brake disc.

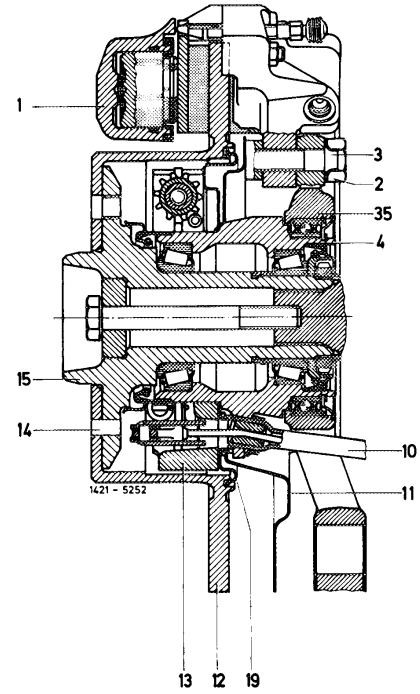




Layout cover plate
diagonal swing axle
1st version

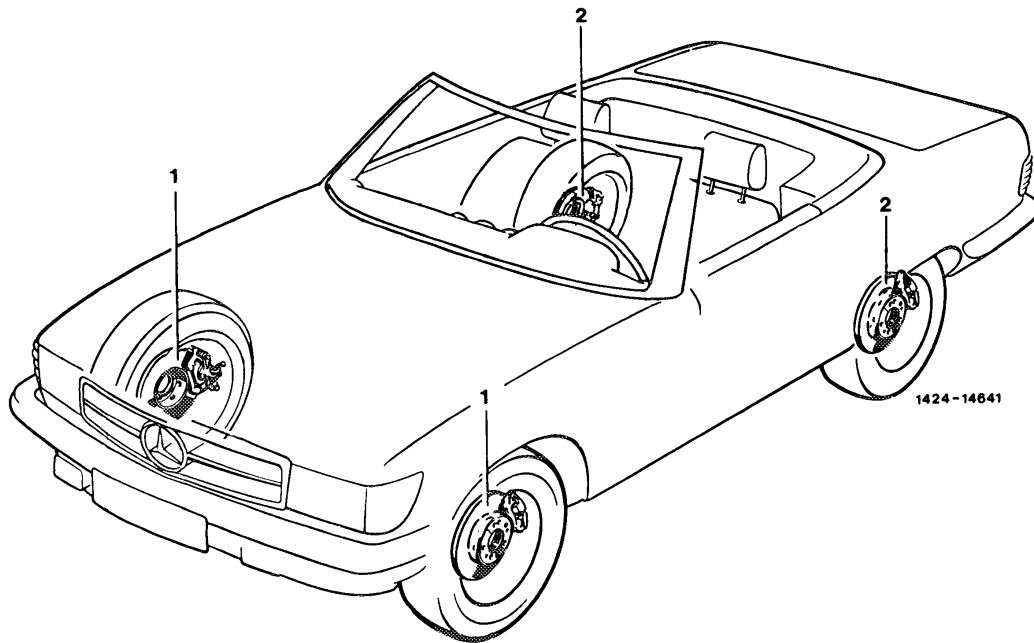


Layout cover plate
diagonal swing axle
2nd version



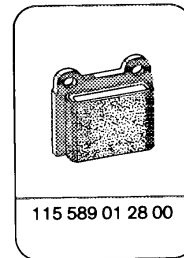
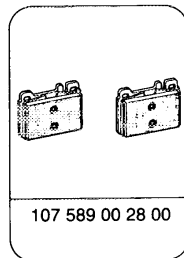
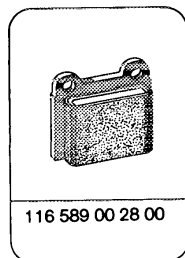
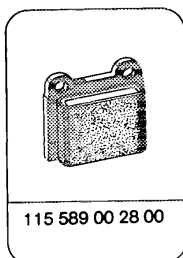
Layout cover plate
diagonal swing axle with
starting torque compensation

- | | | |
|--------------------------------|------------------------|---------------------------------|
| 1 Fixed caliper | 8 Slotted nut | 15 Rear axle shaft flange |
| 2 Hex bolt | 9 Spacing sleeve | 16 Outer tapered roller bearing |
| 3 Locking plate | 10 Brake cable control | 17 Dust cap |
| 4 Wheel carrier | 11 Cover plate | 18 Radial sealing ring |
| 5 Inner tapered roller bearing | 12 Brake disc | 19 Cover ring |
| 6 Radial sealing ring | 13 Brake carrier | 35 Fixed caliper carrier |
| 7 Seal running ring | 14 Fitted pin | |



- | | | | |
|---|-------------------------------------|---------------|--|
| 1 | Brake disks of front axle | Cleaning pads | 115 589 00 28 00 (4 each) 77 mm wide
116 589 00 28 00 (4 each) 90 mm wide
for 2-piston caliper
107 589 00 28 00 (2 each) 90 mm wide
for 4-piston caliper |
| 2 | Brake disks of rear axle | Cleaning pads | 115 589 01 28 00 (4 each) |

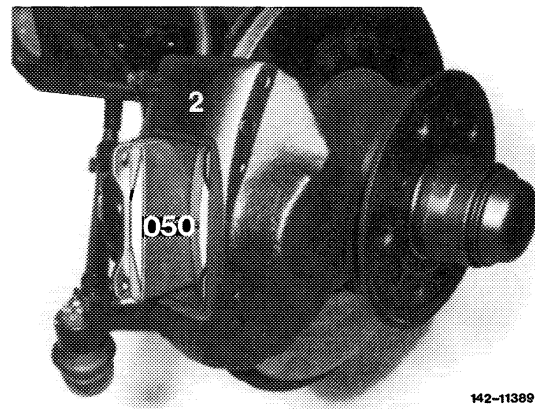
Special tools



Note

When cleaning brake disks while driving, always provide only one axle with cleaning pads. Do not operate brake in jerks, since the emery cloth might then be torn out of cleaning pads.

Owing to their low speed and the resulting insufficient cleaning effect, drum-type and brake dynamometers are not suitable for this purpose.



142-11389

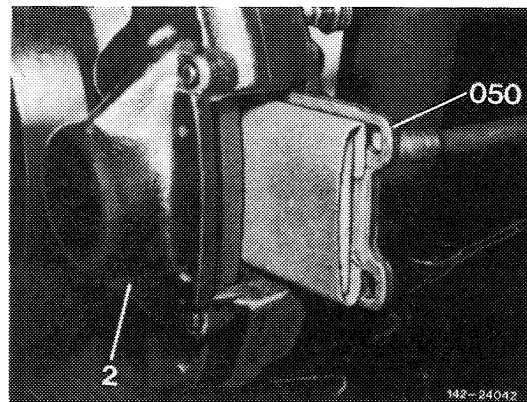
Front axle

- 1 Remove brake pads (42–160).
- 2 Install cleaning pads 115 589 00 28 00, 116 589 00 28 00 and 107 589 00 28 00 (050) according to brake caliper version, on front axle only.
- 3 Clean brake disks.
 - a) Drive the respective wheel by means of a suitable drive unit (e.g. Finish-Balancer made by Hofmann) and force the cleaning pads several times for a short moment against brake disk under slight foot pressure against brake pedal.
 - b) Drive vehicle at a speed of 30 km/h for a distance of 300 meters while forcing the cleaning pads for a short moment against brake disks at a slight foot pressure of approx. 50 N against brake pedal.
- 4 Remove cleaning pads.
- 5 Install brake pads (42–160).

Rear axle

- 1 Remove brake pads (42–160).
- 2 Install cleaning pads 115 589 01 28 00 (050) only on rear axle.

Drive vehicle at a speed of approx. 30 km/h for a distance of 300 meters while forcing the cleaning pads for a short moment against brake disks at a slight foot pressure of approx. 50 N against brake pedal.



142-24042

Attention!

With the vehicle jacked up, be sure that the rear wheels are not driven by the engine or by means of another drive unit.

3 Remove cleaning pads.

4 Install brake pads (42–160).

42-310 Removal and installation of tandem main cylinder

Data

	Tandem main cylinder up to fall 1975		Stepped tandem main cylinder starting fall 1975 – July 1983 ¹⁾		Stepped tandem main cylinder starting July 1983 ²⁾	
	Pushrod circuit	Floating circuit	Pushrod circuit	Floating circuit	Pushrod circuit	Floating circuit
Cylinder dia.	Inch	15/16	15/16	3/4	1	3/4
	mm	23.81	23.81	19.05	25.40	19.05

- 1) Starting September 1981 with central valve
2) Starting September 1985 made of light alloy

Tightening torques

Nm

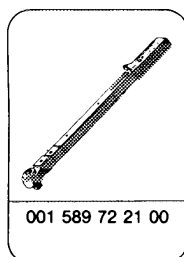
Hex. nuts for fastening main cylinder to brake unit

15

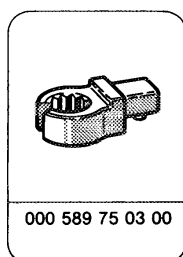
Cap screw of brake line on main cylinder

10

Special tools



001 589 72 21 00



000 589 75 03 00

Conventional tool

Open double box wrench 9 x 11 mm

e.g. Hazet, D-5630 Remscheid
Order No. 612

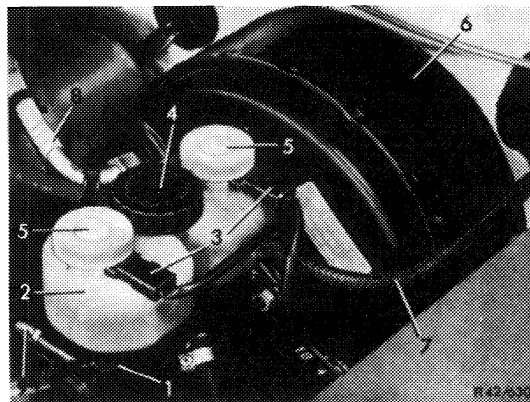
Note

For loosening and tightening brake line be sure to use conventional, open double box wrench or open box wrench element only.

Removal

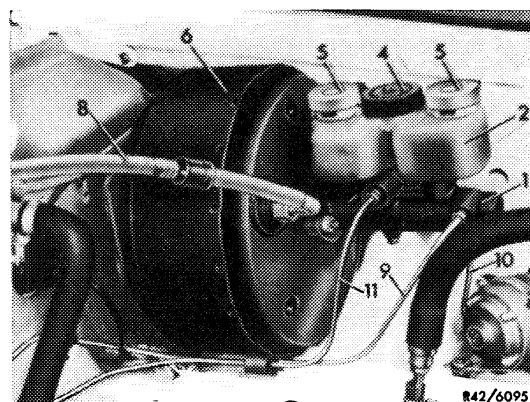
1 Pump out brake fluid via an open bleeder plug of the front axle and rear axle brake circuit. Make sure that both chambers of the expansion tank are drained.

2 Loosen plug connections (3) on contact inserts of warning device while lifting the holding lugs with a small screwdriver.

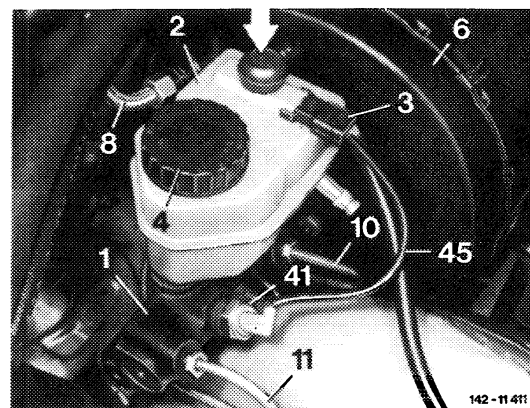


3 Disconnect both brake lines to front wheel brake and brake line to rear wheel brake on tandem main cylinder.

Immediately close all brake lines with rubber caps and close connections on tandem main cylinder with blind plugs.



4 On tandem main cylinder with pressure difference warning indicator (DDW) pull cable (45) from switch (41).

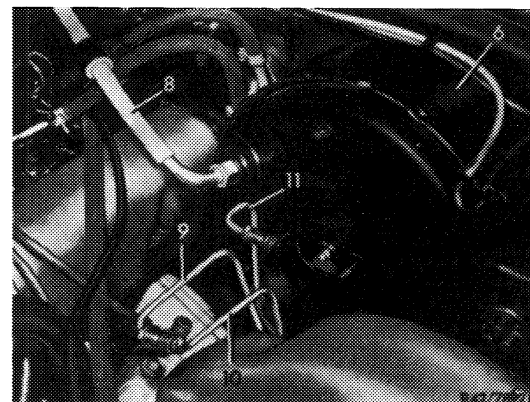


5 Loosen tandem main cylinder on brake unit and remove, while paying attention to O-ring located in groove of tandem main cylinder flange.

Attention!

In the event of externally unnoticeable brake fluid loss check whether brake fluid has entered the brake unit through a leaking secondary seal in tandem main cylinder. If so, proceed as follows:

1. Do **not** remove brake unit.
2. Draw off brake fluid.
3. If there are more than 100 cc brake fluid in brake unit, also replace brake unit.



Note: The flexible diaphragm is resistant to brake fluid, while the reaction disk and the plate valve in control section are not. Brake fluid should therefore be drawn off only with the brake unit installed. Up to 100 cc, with the brake unit installed, no brake fluid can flow to reaction disk or to plate valve.

Installation

Attention!

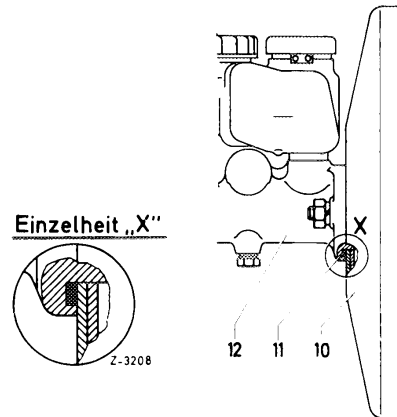
The sealing between the tandem main cylinder and the brake unit should always be renewed, since the connection must be **completely vacuum-tight**.

6 Insert sealing ring (11) into groove of tandem main cylinder (12) and fasten main cylinder to brake unit (10). Tighten hex. nuts to 15 Nm.

Note: On stepped tandem main cylinder (installed starting fall 1975) the brake circuits are interchanged. The front wheel brake is connected to pushrod circuit (piston dia. 23.81 mm) and the rear wheel brake to floating circuit (piston dia. 19.05 mm).

7 Connect brake lines to tandem main cylinder. For this purpose, use torque wrench 001 589 72 21 00 with open box wrench element 000 589 75 03 00.

Tightening torque 10 Nm.

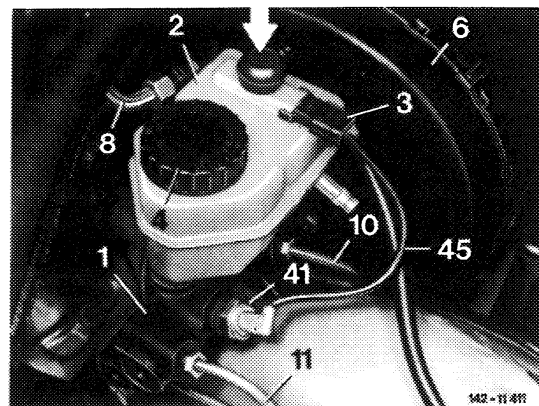


8 Fill expansion tank with brake fluid. Make sure that the individual chambers are filled.

9 Connect plug connection to contact inserts of warning device.

10 On tandem main cylinder with pressure difference warning indicator, plug cable (45) on switch (41).

11 Bleed brakes and check for leaks (42-010 and 42-015).



42-315 Disassembly, inspection and assembly of tandem main cylinder

A. Tandem main cylinder (not stepped)

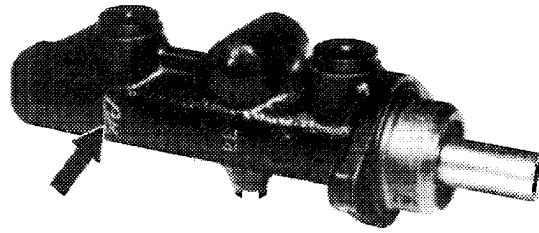
Data

Dia.	inches	15/16
	mm	23.81
Housing bore dia.		23.81
		23.86
Wear limit		23.92
Permissible out-of-round of bore		0.03
Piston dia.		23.77
		23.74
Wear limit		23.66
Piston clearance		0.02-0.15
Stroke	push rod circuit	13
	floating circuit	19
Lubricants		
Silicone grease		
Brake cylinder paste		
Tightening torque		
Stop screw		Nm
		5-8

Note

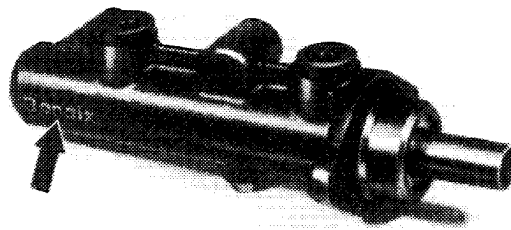
For reconditioning use the following repair kit:
Teves tandem main cylinder 001 586 93 43
Bendix tandem main cylinder 001 586 55 43

Note that the Bendix tandem main cylinder sprayed blue may not be repaired.



Teves tandem main cylinder

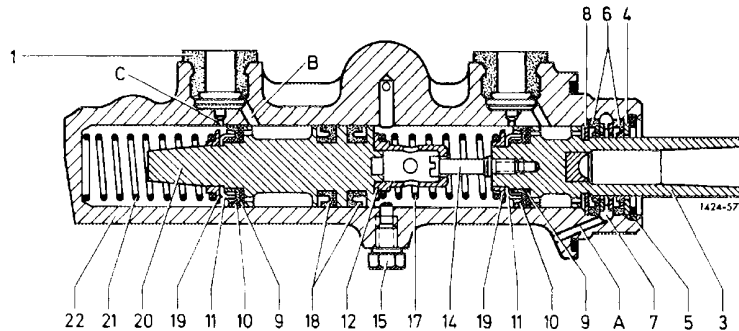
142-8633



Bendix tandem main cylinder

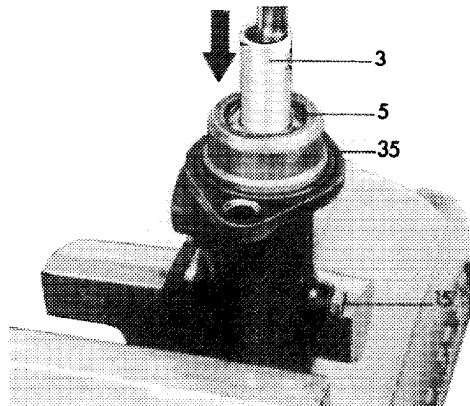
142-9512

- 1 Container plug
- 3 Piston (pushrod circuit)
- 4 Stop washer
- 5 Locking ring
- 6 Secondary and vacuum sleeve
- 7 Intermediate ring
- 8 Washer
- 9 Filling disc
- 10 Primary sleeve
- 11 Supporting ring
- 12 Spring retainer
- 14 Connecting screw
- 15 Stop screw
- 17 Compression spring
- 18 Parting sleeve
- 19 Spring retainer
- 20 Piston (floating circuit)
- 21 Compression spring
- 22 Housing
- A Leak hole
- B Filler hole
- C Compensating hole



Disassembly

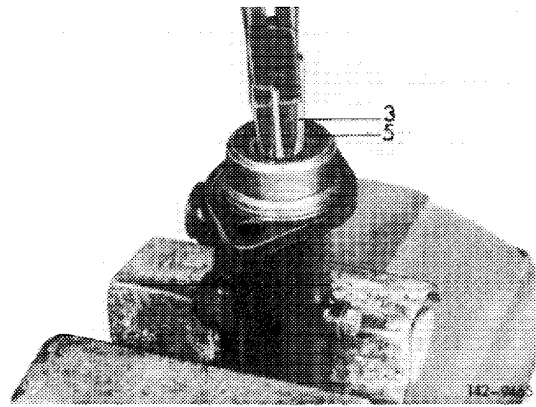
- 1 Pull expansion tank out of container plug of tandem main cylinder.
- 2 Push piston (3) slightly inwards by means of a mandrel, then unscrew stop screw (15) from housing and remove together with sealing ring.



142-9459

3 Remove locking ring (5) from housing. Then remove piston (3) from housing together with stop washers (4 and 8), secondary and vacuum sleeve (6) and intermediate ring (7).

4 Remove complete piston for floating circuit by knocking housing lightly against a wooden board.

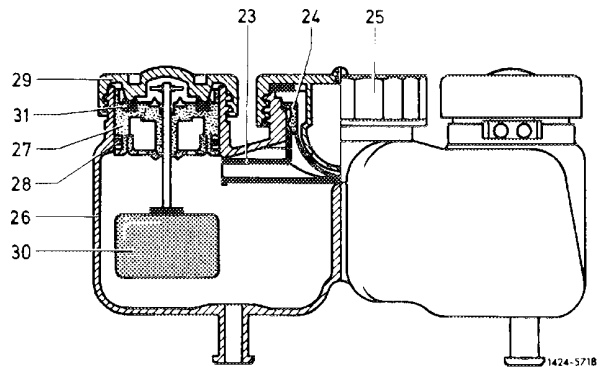


5 On Teves compensating tank, unscrew closing cover (25) and both end covers (29). Remove strainer (24), splash guard (23) and both contact inserts (27) including O-rings (31).

Note: The splash guard is installed only in compensating tank of 1st and 2nd version.

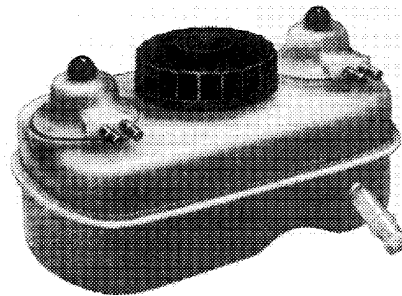
Teves compensating tank

23	Splash guard	28	O-ring
24	Strainer	29	End cover
25	Closing cover	30	Float
26	Compensating tank	31	O-ring
27	Contact insert		



6 On Bendix compensating tank, unscrew closing cover and remove strainer.

Note: The contact inserts of Bendix compensating tank cannot be removed.



Bendix compensating tank

142-8636

Checkup

7 Clean all parts well with spirit of alcohol, make sure that all residue is flushed out of housing and expansion tank.

8 Check bore in housing for score marks and rust. Slightly rusted spots may be cleaned with polishing cloth.

Housings showing score marks and badly rusted spots should not be machined. In such cases, replace tandem main cylinder completely.

Assembly

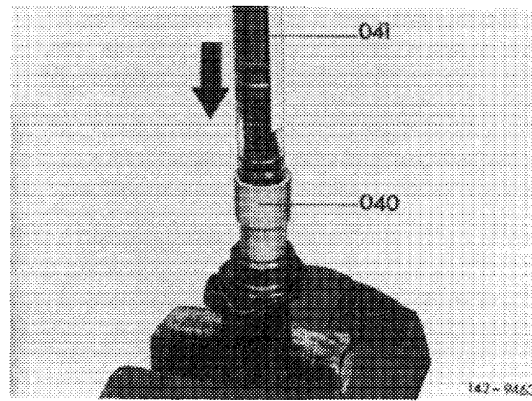
Bendix tandem main cylinder

9 Slightly coat bore of housing with brake cylinder paste.

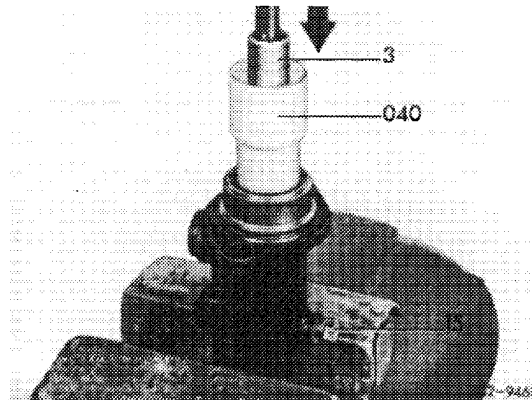
10 Remove secondary sleeve, vacuum sleeve, stop washers, intermediate ring, sealing ring and copper sealing ring from assembly sleeve.

11 Place assembly sleeve (040) on housing and slip complete piston package with a mandrel from sleeve (041) into housing.

12 Remove sleeve (041).

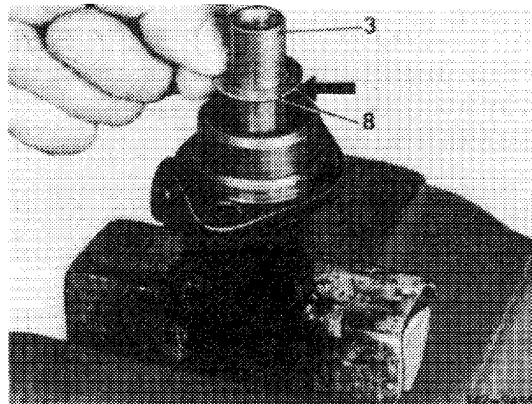


13 Push piston (3) completely into housing by means of a mandrel, screw-in stop screw (15) with new copper sealing ring and tighten to specified torque. Remove assembly sleeve.

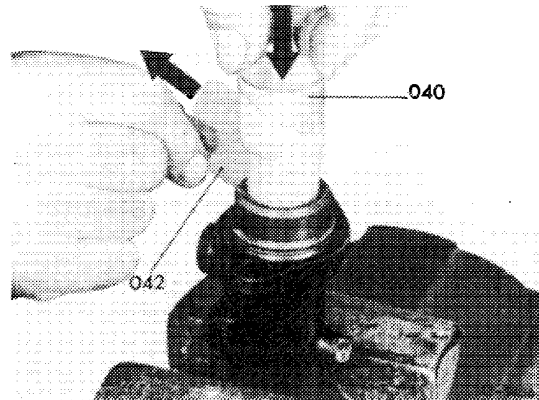
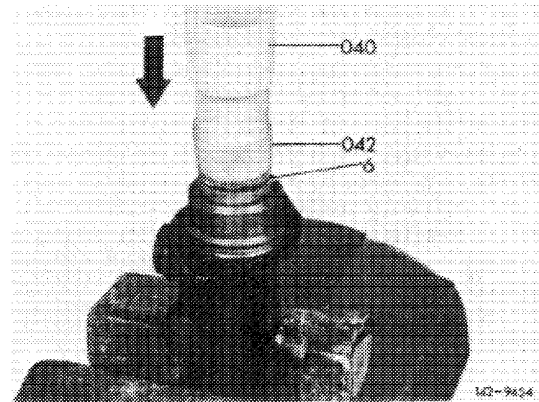
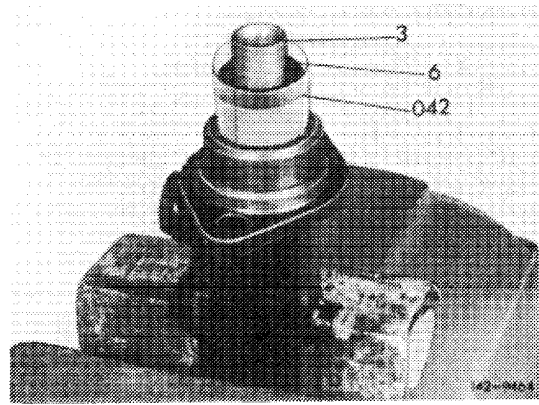


14 Place stop washer (8) on piston (3).

15 Slightly grease stem of piston (3) with silicone grease.

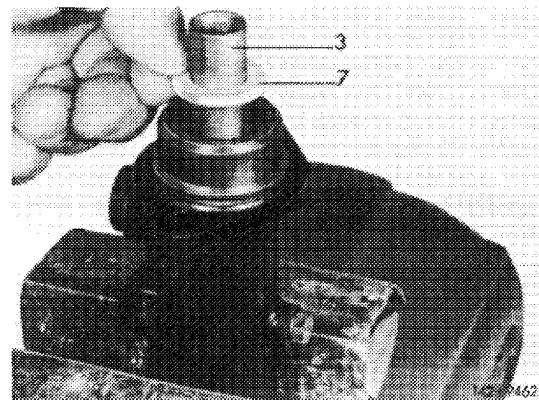


16 Coat secondary sleeve (6) with silicone grease and place on shaft of piston with sealing lip facing piston. Then insert plastic foil (042) to housing bore and push secondary sleeve with assembly sleeve (040) into housing. Pull plastic foil out of housing and remove assembly sleeve.

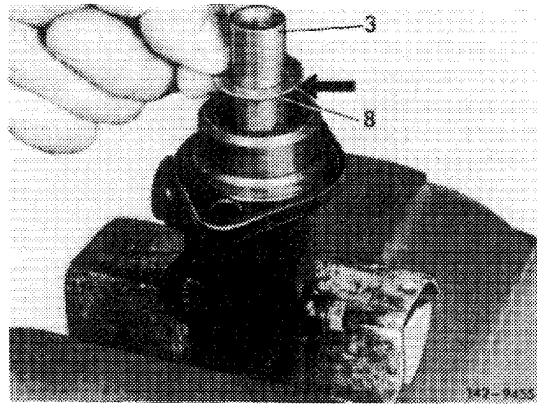


17 Insert intermediate ring (7) into housing, making sure that the bore in intermediate ring faces leak bore (A) in housing and push-in with assembly sleeve.

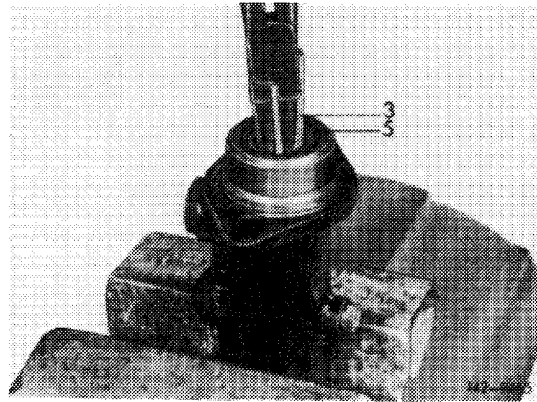
18 Install vacuum sleeve (6) as described in item 16.



19 Place stop washer (8) on piston (3).



20 Insert locking ring (5) making sure that the ring is correctly seated in groove of housing.



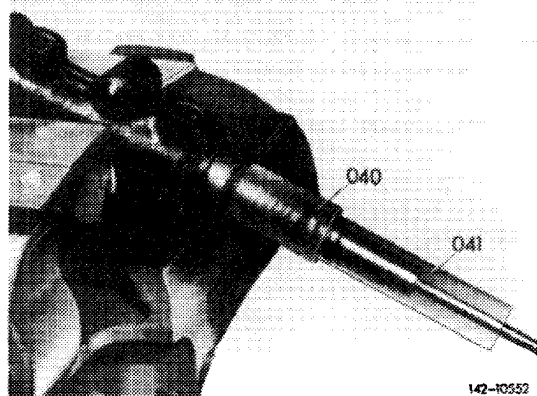
Teves tandem main cylinder

21 Slightly coat bore of housing with brake cylinder paste.

22 Remove secondary sleeve, vacuum sleeve, stop washers, intermediate ring, sealing ring, copper sealing ring, locking ring and silicone grease from assembly sleeve.

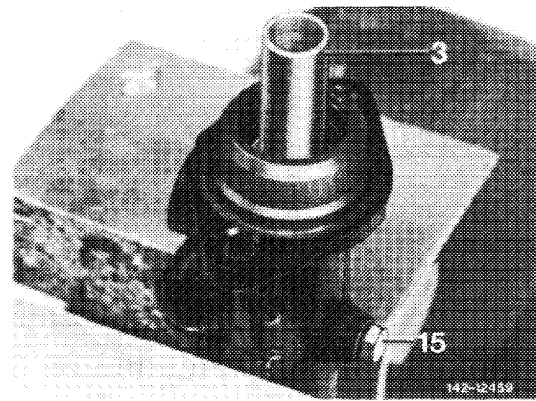
23 Clamp housing slightly tilted with bore in downward direction. Push assembly sleeve (040) forward against end of sleeve (041) and insert into housing. Push complete piston package with a mandrel from sleeve (041) up to stop into housing. Screw-in stop screw with new copper sealing ring.

24 Remove sleeve (041) and assembly sleeve (040).



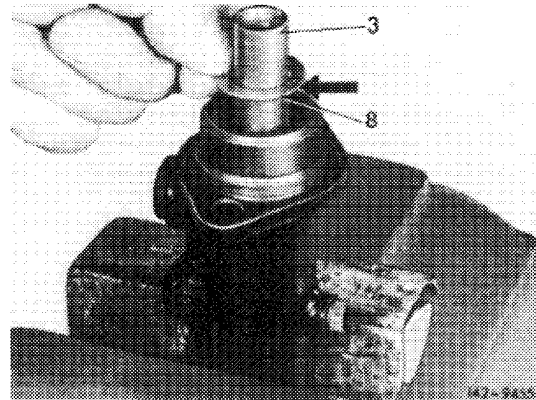
142-10352

25 Clamp tandem main cylinder in such a manner that the piston shaft is pointing upwards. Tighten stop screw (15) to specified torque.

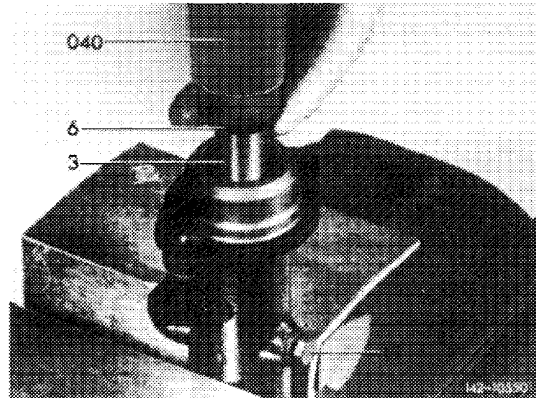


26 Place stop washer (8) on piston (3).

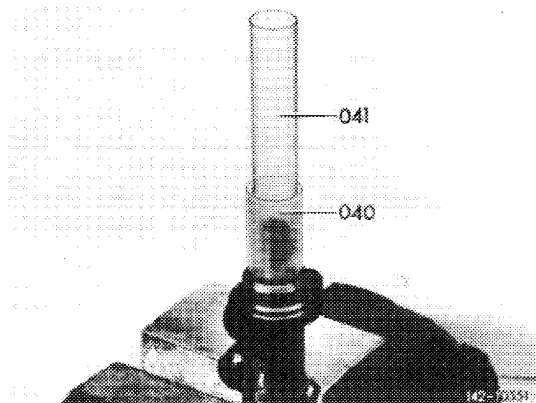
27 Slightly coat stem of piston (3) with silicone grease.



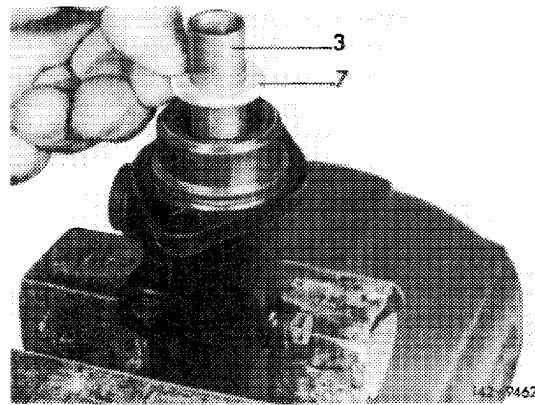
28 Adjust sleeve and assembly sleeve in such a manner that the end of sleeve (041) is in alignment with the inside edge of the smaller diameter of the assembly sleeve (040). Coat secondary sleeve (6) with silicone grease, then place on shaft of piston with sealing lip facing piston, hold in place and insert assembly sleeve (040) with inserted sleeve (041) over sleeve up to stop.



29 Slip both sleeves with secondary sleeve into bore of housing and push seal downwards with sleeve (041). First, pull up assembly sleeve (040) by height of sleeve and then remove both sleeves.

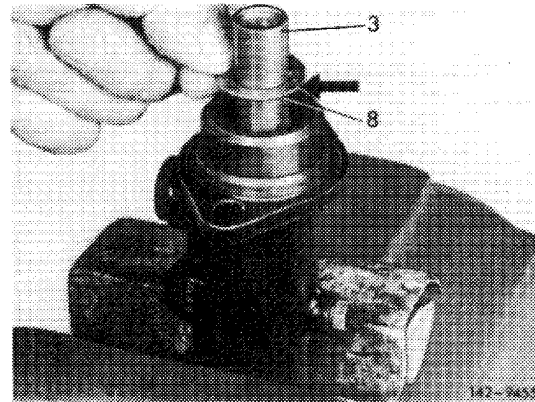


30 Insert intermediate ring (7) into housing, making sure that the bore in intermediate ring is pointing toward leak bore (A) in housing and push-in with sleeve (041).

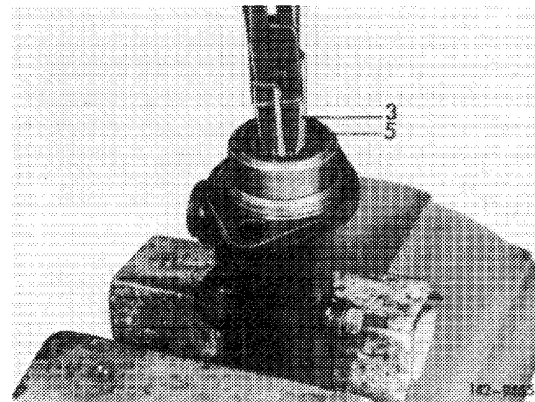


31 Install vacuum sleeve (6) as described in item 28 and 29.

32 Place stop washer (8) on piston (3).



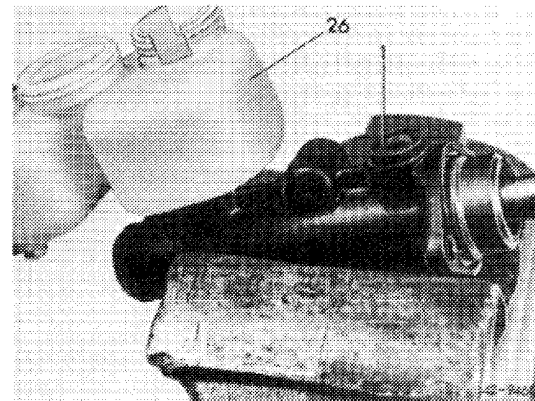
33 Insert locking ring (5), making sure that the ring is correctly seated in groove of housing.



Mounting expansion tank

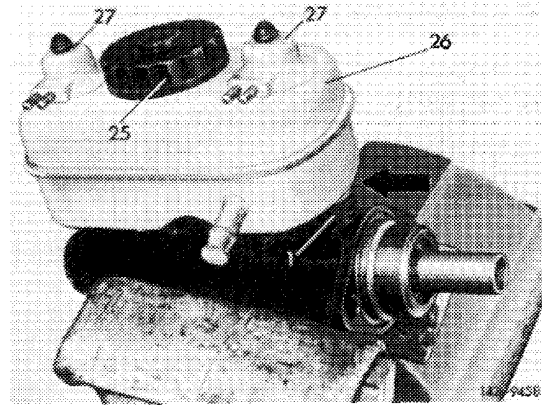
34 Coat container plug (1) lightly with brake cylinder paste and push into housing.

35 Insert expansion tank (26) first with a pipe connection into housing, turn by 180° and push second pipe connection into housing.



Watch out for correct seat (refer to arrow).

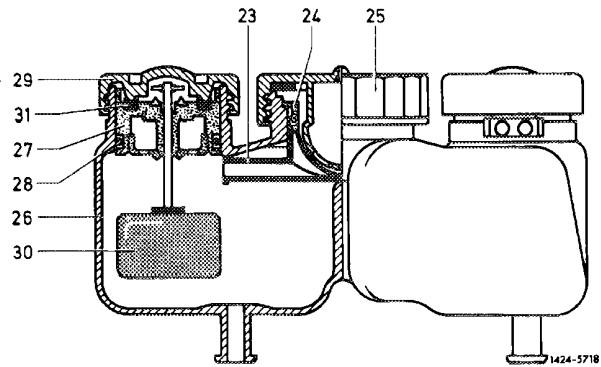
36 On Bendix expansion tank, insert strainer into container and screw-on closing cover.



37 On Teves expansion tank, insert both contact inserts (27) with new O-rings (28) into expansion tank. Mount O-rings (31) and screw-on end cover (29).

Teves expansion tank

- | | | | |
|----|----------------|----|-----------|
| 23 | Splash guard | 28 | O-ring |
| 24 | Strainer | 29 | End cover |
| 25 | Closing cover | 30 | Float |
| 26 | Expansion tank | 31 | O-ring |
| 27 | Contact insert | | |



Note: The Teves expansion tank is provided with the following contact inserts:

Expansion tank 1st and 2nd version

Production up to spring 1972:

Both chambers contact elements 58 mm high with metal float rod.

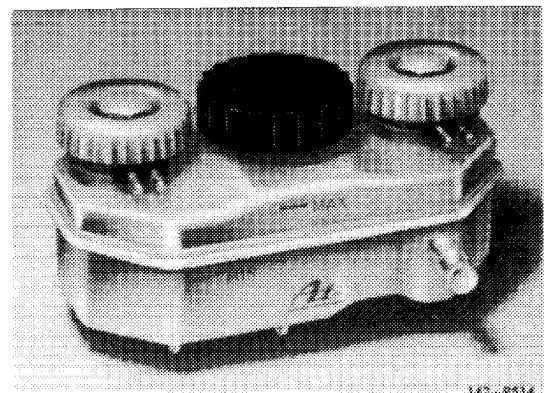
Production from spring 1972 to spring 1974:

Front axle brake circuit 58 mm and rear axle brake circuit 42 mm high contact element with metal float rod.

Teves expansion tank 1st version



Teves expansion tank 2nd version



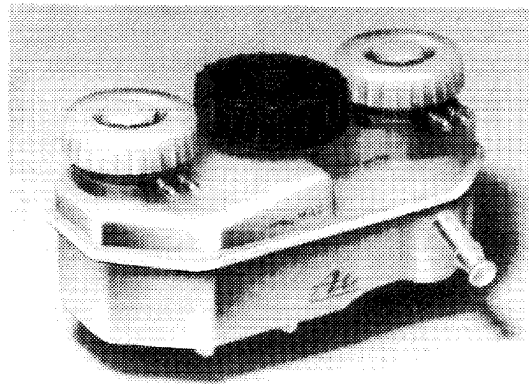
Expansion tank 3rd version

Production starting spring 1974: (three-chamber expansion tank):

Both chambers with contact inserts 58 mm high with metal or plastic float rod.

This expansion tank is not provided with a built-in splash guard.

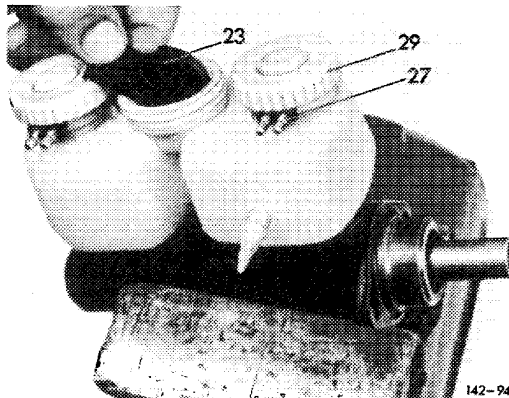
Teves expansion tank 3rd version



142-9513

38 Insert splash guard (23) and strainer into container and screw-on closing cover.

39 Insert sealing ring into flange of housing.



142-9457

B. Tandem main cylinder (stepped)

Data

		Push rod circuit	Floating circuit
Dia.	inches	15/16	3/4
	mm	23.81	19.05
Housing bore dia.		23.81	19.05
		23.86	19.10
Wear limit		23.92	19.16
Permissible out-of-round of bore		0.03	
Piston dia.		23.77	19.01
		23.74	18.97
Wear limit		23.66	18.90
Piston clearance		0.02–0.15	
Stroke		15	17

Lubricants

Silicone grease

Brake cylinder paste

Tightening torques

Nm

Stop screw

5–8

Closing plug

15–30

Switch

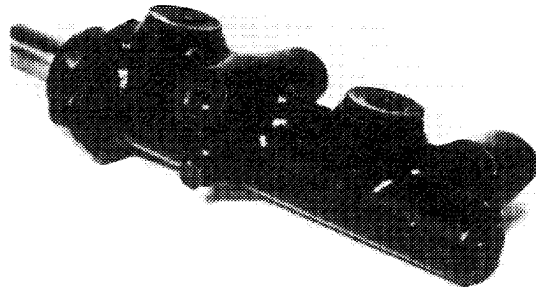
15–20

Self-made tool

Assembly pin (made of steel)

Note

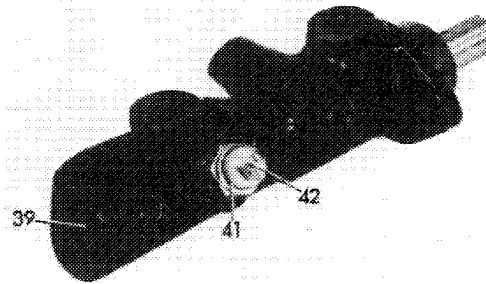
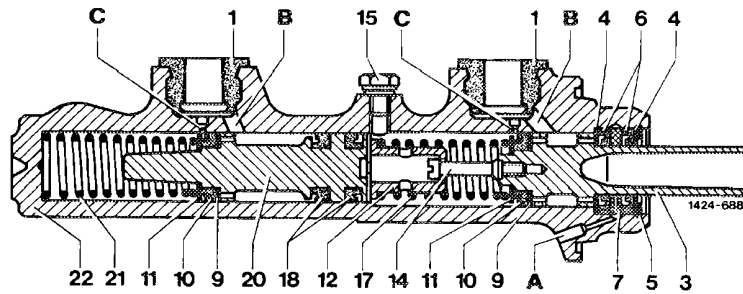
During reconditioning, make sure that the repair kit and the housing are from the same manufacturer.



142-11670

Stepped tandem main cylinder

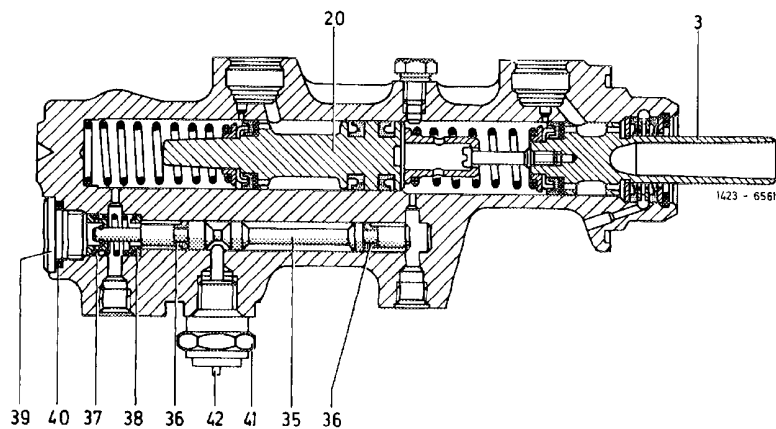
- 1 Container plug
- 3 Piston (push rod circuit)
- 4 Stop washer
- 5 Locking ring
- 6 Secondary and vacuum sleeve
- 7 Intermediate ring
- 9 Filling washer
- 10 Primary sleeve
- 11 Supporting ring
- 12 Spring retainer
- 14 Connecting screw
- 15 Stop screw
- 17 Compression spring
- 18 Parting sleeve
- 20 Piston (floating circuit)
- 21 Compression spring
- 22 Housing
- A Leak hole
- B Filler hole
- C Compensating hole



142-10793

Stepped tandem main cylinder with pressure difference warning indicator

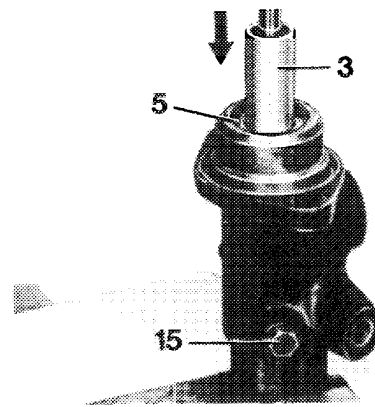
- 3 Piston (push rod circuit)
- 20 Piston (floating circuit)
- 35 Control piston
- 36 Ring sleeve
- 37 Spring
- 38 Spring retainer
- 39 Screw
- 40 Sealing ring
- 41 Switch
- 42 Release pin



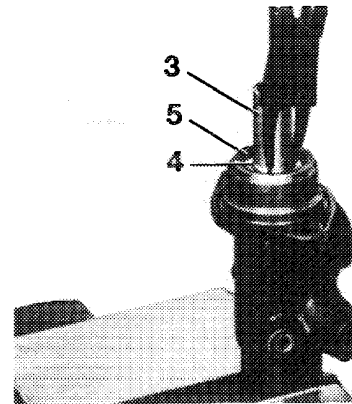
42.1-315/12 F3

Disassembly

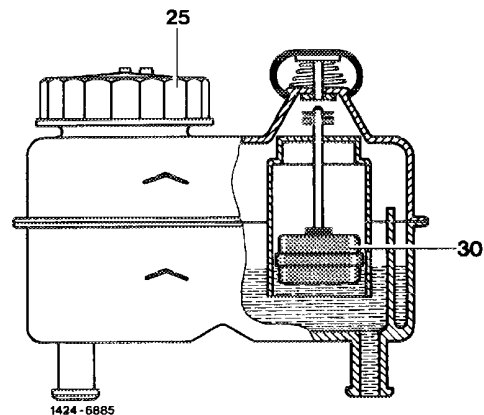
- 1 Pull expansion tank and container plug from tandem main cylinder.
- 2 Push piston (3) slightly inwards by means of a mandrel, then unscrew stop screw (15) from housing and remove together with sealing ring.



- 3 Remove locking ring (5) from housing. Then remove piston (3) from housing, together with stop washers (4), secondary and vacuum sleeve (6) and intermediate ring (7).
- 4 Remove complete piston for floating circuit by knocking housing lightly against a wooden board.
- 5 On tandem main cylinder with pressure difference warning indicator, unscrew closing plug (39) and knock-out control piston (35) as described under item 4.



- 6 Unscrew closing cover (25) and remove strainer.
- Note:** The contact insert (30) cannot be removed.



Checkup

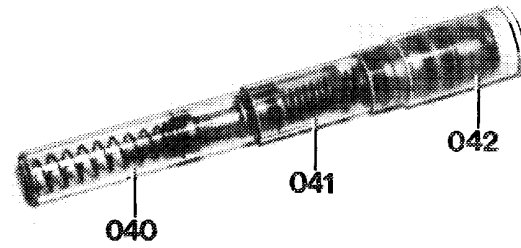
- 7 Clean all parts well with spirit of alcohol, make sure that all residue is flushed out of housing and expansion tank.
- 8 Check bore in housing for score marks and rust. Slightly rusted spots may be cleaned with polishing cloth.

Housings showing score marks and badly rusted spots should not be machined. In such cases, replace tandem main cylinder completely.

Assembly

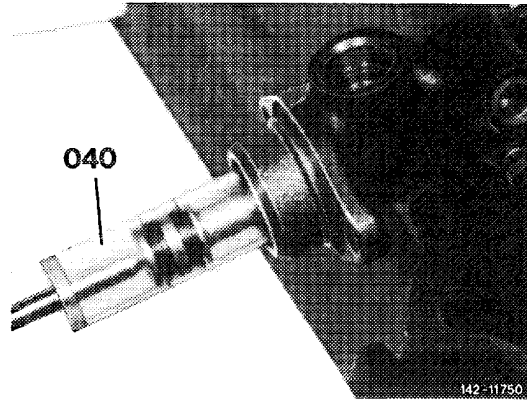
9 Slightly coat bore of housing with brake cylinder paste.

10 Remove vacuum seals, stop washers, intermediate ring, sealing ring and copper sealing ring from assembly sleeve.



142-12081

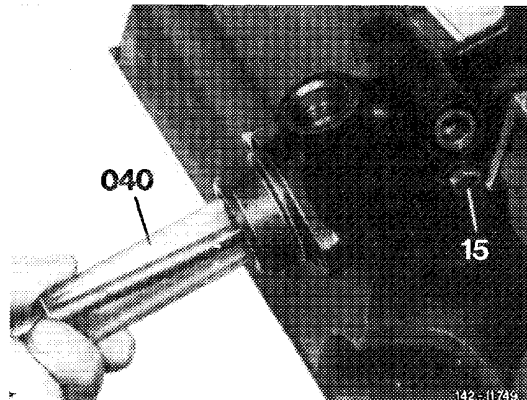
11 Clamp housing slightly tilted with bore in downward direction. Remove assembly sleeve (040) including floating piston (19.05 dia.) from assembly sleeve (041) for push rod piston (23.81 dia.). Place assembly sleeve (040) into housing and slide piston into housing up to stop by means of a mandrel.



12 Hold piston in place with mandrel, pull assembly sleeve (040) out until the stop screw (15) can be screwed in with a new copper sealing ring.

Tighten stop screw (15) to 5–8 Nm.

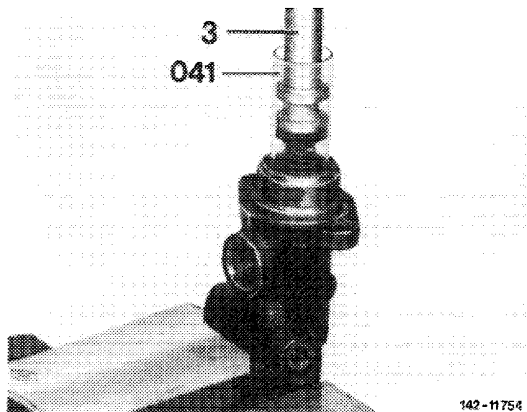
13 Remove assembly sleeve (040).



14 Clamp tandem main cylinder in such a manner that cylinder bore is pointing upwards.

15 Remove assembly sleeve (041) including push rod piston (23.81 dia.) from assembly sleeve (042) for secondary seal. Insert assembly sleeve (041) into housing and slip piston (3) into housing by means of a mandrel.

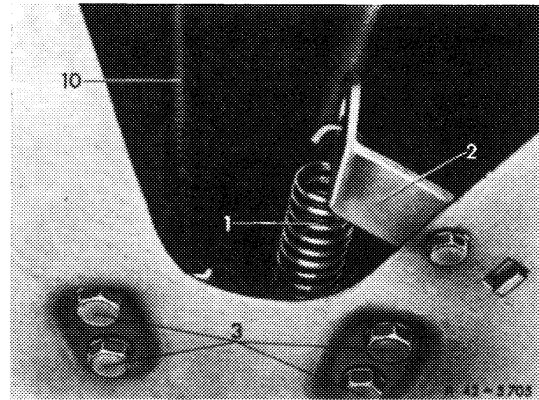
16 Remove assembly sleeve (041).



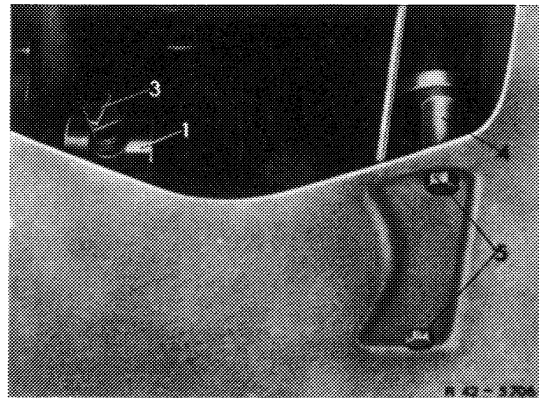
42-510 Removal and installation of parking brake pedal system

Removal

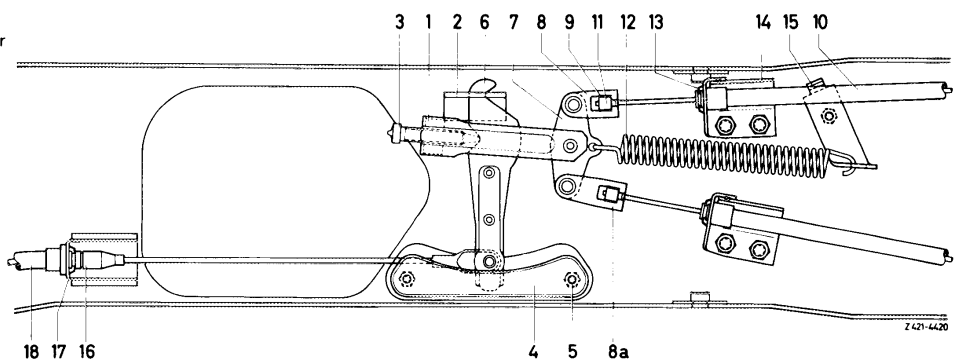
- 1 Remove exhaust system (49-100).
- 2 Disconnect return spring on bracket (2).



- 3 Unscrew adjusting screw (3) on adjusting bracket (1).



- 1 Adjusting bracket
- 2 Bearing to frame floor
- 3 Adjusting screw
- 4 Guide for intermediate lever
- 5 Hex. bolt
- 6 Intermediate lever
- 7 Compensating lever
- 8 Cable control link
- 8a Cable control link
- 9 Hose member
- 10 Rear brake cable control
- 11 Adapter
- 12 Draw spring
- 13 Spring clip
- 14 Holder for rear brake cable control
- 15 Holder for draw spring
- 16 Rubber grommet
- 17 Spring clamp
- 18 Front brake cable control



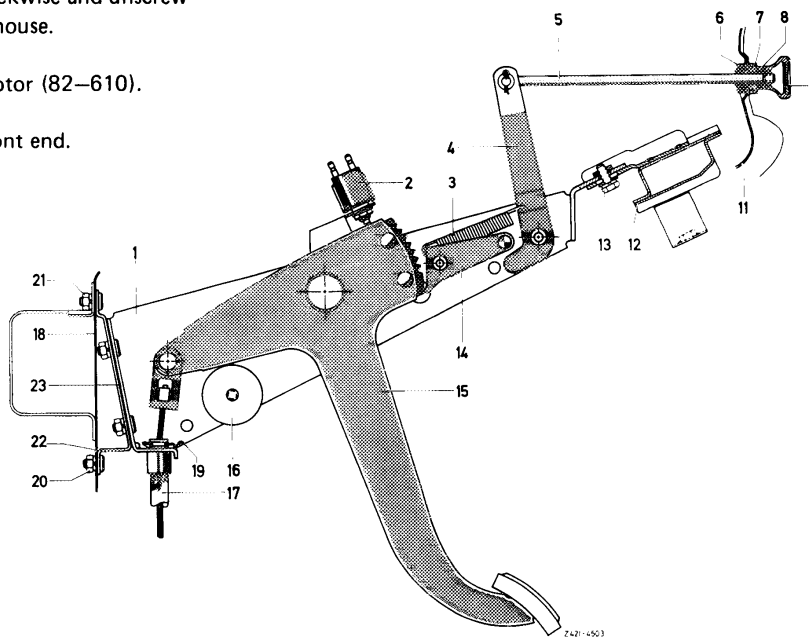
42.1-510/1 F3

4 Turn steering completely clockwise and unscrew hex. nut (20) in lefthand wheelhouse.

5 Remove windshield wiper motor (82-610).

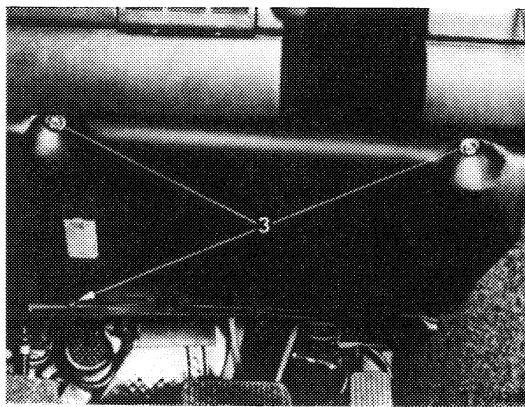
6 Unscrew hex. nut (21) on front end.

- 1 Mounting bracket
- 2 Switch for warning lamp
- 3 Return spring
- 4 Release lever
- 5 Pull rod
- 6 Nut on rosette
- 7 Rosette
- 8 Stop buffer
- 9 Actuating knob
- 11 Instrument panel
- 12 Cross member
- 13 Hex. socket screw with washer and snap ring
- 14 Locking pawl
- 15 Pedal
- 16 Stop buffer
- 17 Brake cable control
- 18 Front end
- 19 Spring clip
- 20 Hex. nut and snap ring
- 21 Hex. nut and snap ring
- 22 Connecting member
- 23 Gasket

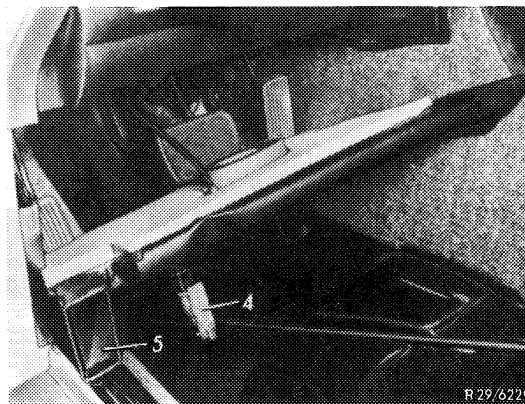


7 Unscrew actuating knob (9) for manual release, then remove stop buffer (8).

8 Unscrew cover under instrument panel in leg room (3) and pull downwards.



9 Push out leg room lamp (4), remove plug and pull cable out of cover.

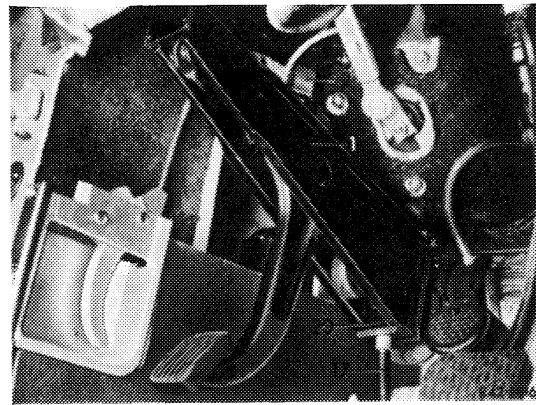


10 Disconnect brake cable control (17) from pedal link. Remove spring clip (19) and brake cable control.

11 Remove cables from cable band.

12 Loosen plug connection on switch (2) for warning light.

13 Unscrew hex. screw (13) from cross member (12) and remove complete pedal assembly with connection (22).



Installation

14 Attach pedal assembly in lefthand wheelhouse, at front end and on cross member under instrument panel, while inserting linkage for manual release into bore of instrument panel.

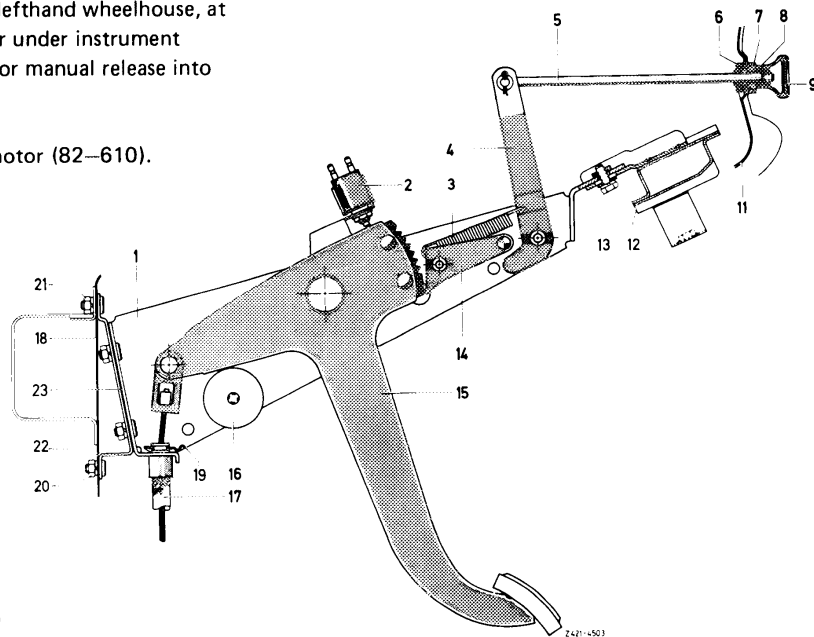
15 Install windshield wiper motor (82-610).

16 Attach brake cable control (17) into pedal link and insert spring clip (19) into cable guide.

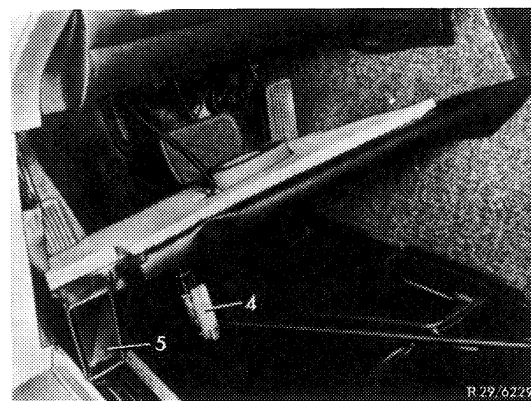
17 Attach plug connection to switch for warning light. Check warning light for function.

18 Attach cable harness with cable strap to pedal assembly.

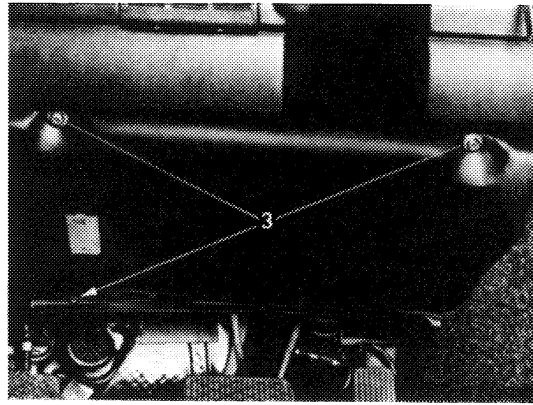
19 Insert stop buffer (8) into groove of pull rod (5) and screw actuating knob (9) for manual release on linkage.



20 Pull cable for leg room lamp through cover, attach plug and push leg room lamp (4) into cover.



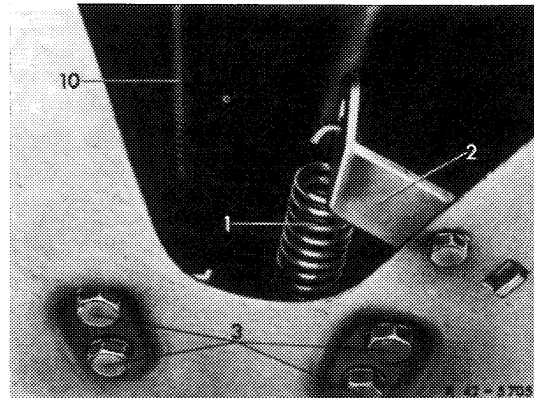
21 Introduce leg room cover and screw down.



22 Attach restoring spring (1) to bracket (2).

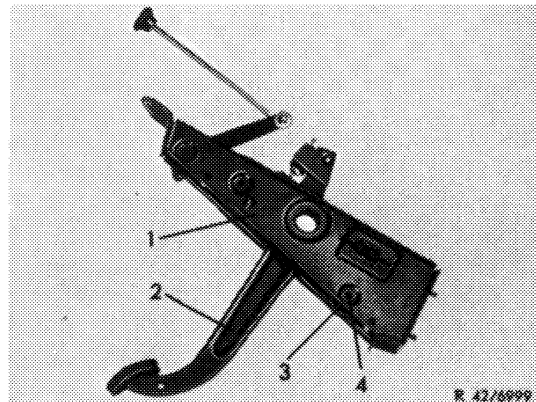
23 Adjust parking brake (42–540).

24 Install exhaust system (49–100).

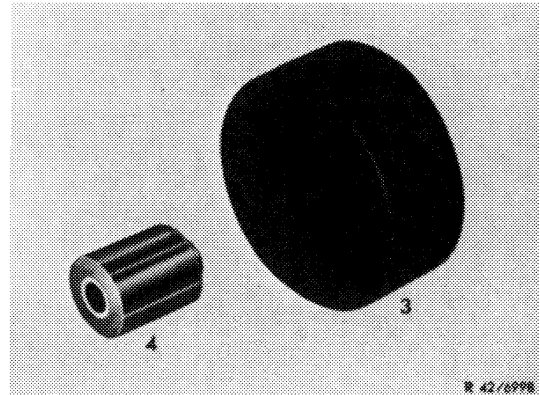


42-515 Replacement of rubber stop in pedal system of parking brake

- 1 Remove pedal assembly, but do **not** detach brake cable control at pull bar (42-510).
- 2 Drill out rivets on bearing tube (4) from both sides with a 8.2 mm dia. drill bit.
- 3 Remove bearing tube and open up existing hole to 8.2 mm diameter.

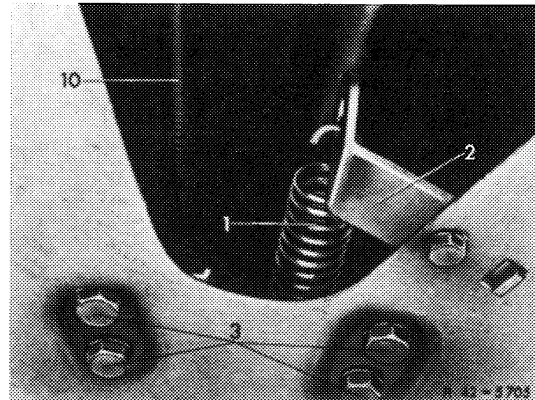


- 4 Install new rubber stop (3) on bearing tube (4). Install bearing tube with rubber stop in carrier and fasten with a 8 x 35 hexagon head bolt, lock washer and hexagon nut.

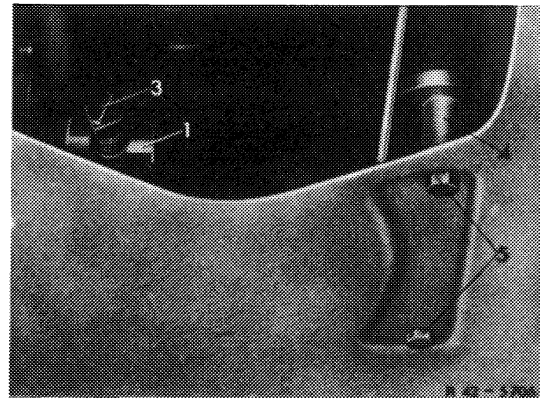


Removal

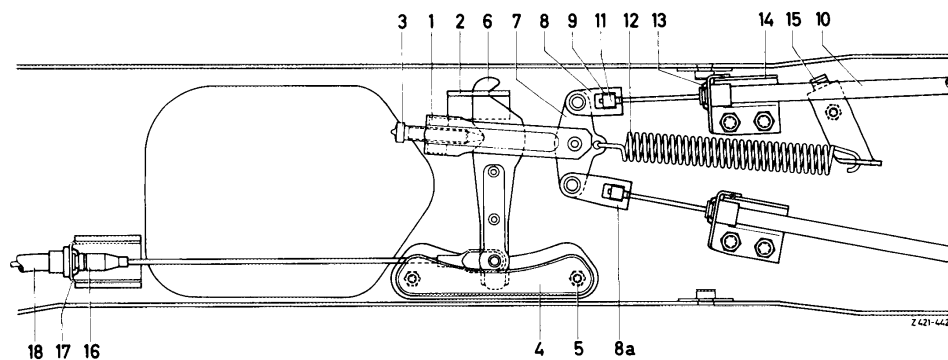
- 1 Remove exhaust system (49–100).
- 2 Remove draw spring (1) on bracket (2).



- 3 Unscrew hex. bolts (5) for attaching guide (4) for intermediate lever (6).
- 4 Completely unscrew adjusting screw (3) of adjusting bracket (1).



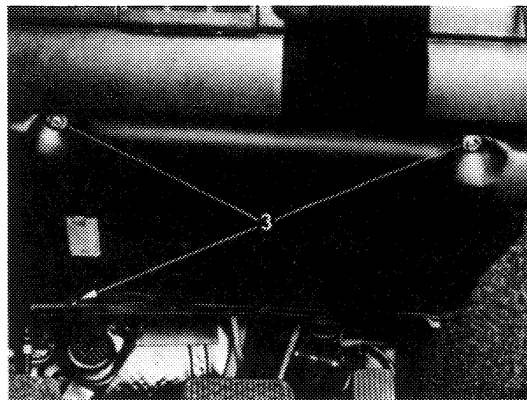
- 5 Disconnect intermediate lever (6) on bearing of frame floor (2) and remove from adjusting bracket (1).
- 6 Loosen brake cable control on intermediate lever (6) by pulling cotter pin out of flange bolt and remove flange bolt.



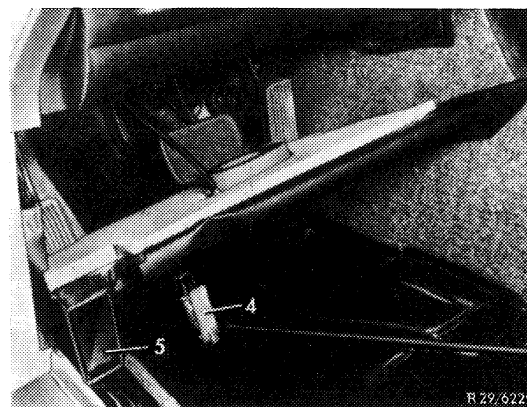
- | | | | |
|--------------------------------|-----------------------------|--|------------------------------|
| 1 Adjusting bracket | 7 Compensating lever | 12 Draw spring | 15 Holder for draw spring |
| 2 Bearing on frame floor | 8 Cable control link | 13 Spring clamp | 16 Rubber grommet |
| 3 Adjusting screw | 8a Cable control link | 14 Holder for rear brake cable control | 17 Spring clamp |
| 4 Guide for intermediate lever | 9 Hose member | | 18 Front brake cable control |
| 5 Hex. screw | 10 Rear brake cable control | | |
| 6 Intermediate lever | 11 Adapter | | |

7 Remove spring clamp (17) from cable control and pull brake cable control (18) out of holder.

8 Unscrew cover under instrument panel in leg room (3) and pull downwards.

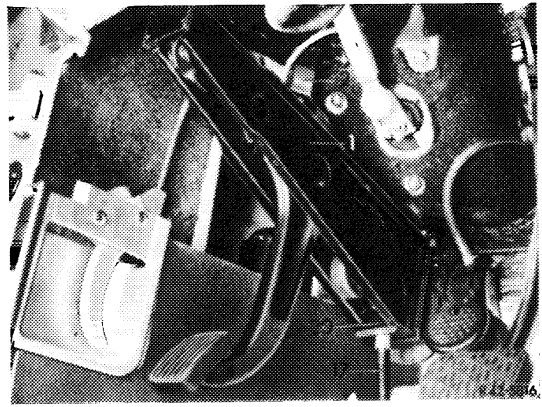


9 Push out leg room lamp (4), remove plug and pull cable out of cover.



10 Disconnect brake cable control (17) from pedal link, remove spring clamp (20) from cable guide and brake cable control from pedal assembly.

11 Pull brake cable control out of frame floor toward the rear.



Installation

12 Introduce brake cable control from below through frame floor and attach rubber grommet.

13 Attach brake cable control (17) to cable control link of pedal and insert spring clamp.

14 Pull cable for leg room lamp through cover, attach plug and push leg room lamp (4) into cover.

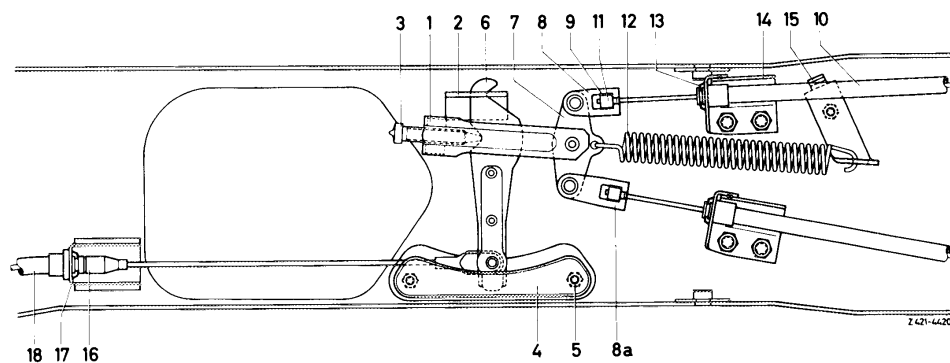
15 Introduce leg room cover and screw down.

16 Introduce cable guide into holder on frame floor and attach with spring clamp (17).

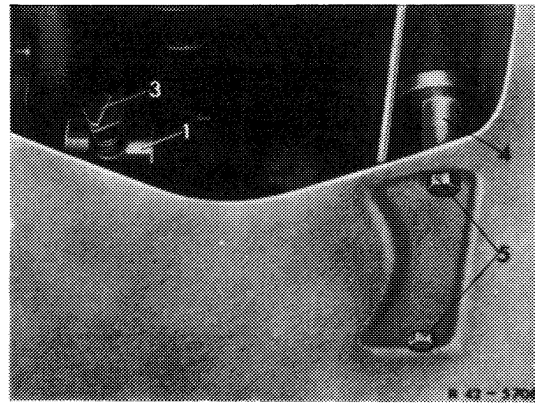
17 Place rubber grommet (16) on cable guide.

18 Attach brake cable control to intermediate lever with flange bolt and secure.

19 Introduce intermediate lever (6) into adjusting bracket (1). Then attach intermediate lever to bearing on frame floor (2).



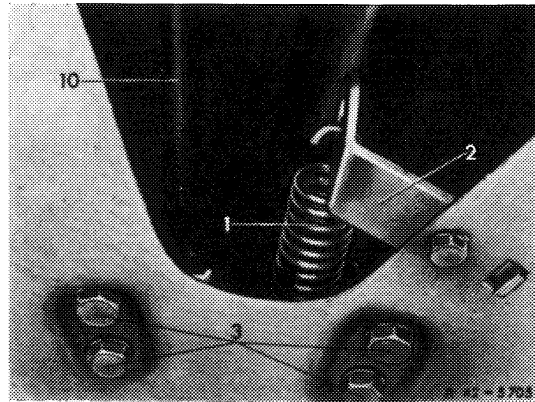
20 Screw-on guide for intermediate lever (4).



21 Attach draw spring (1) to bracket (2).

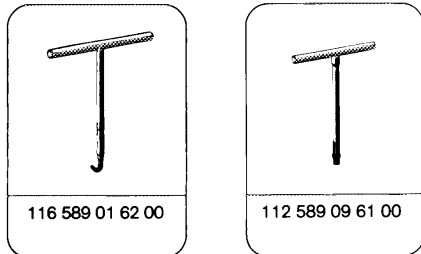
22 Adjust parking brake (42–540).

23 Install exhaust system (49–100).



42-525 Removal and installation of rear brake cable control

Special tools

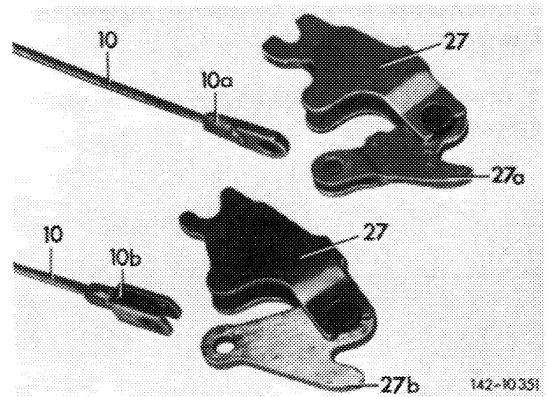


Note

Starting 1975 a modified expanding lock with solid draw plate is installed. This will change the rear brake cable control. The end piece is now designed as a fork head. The old and the new version of the expanding lock and the brake cable control cannot be interchanged.

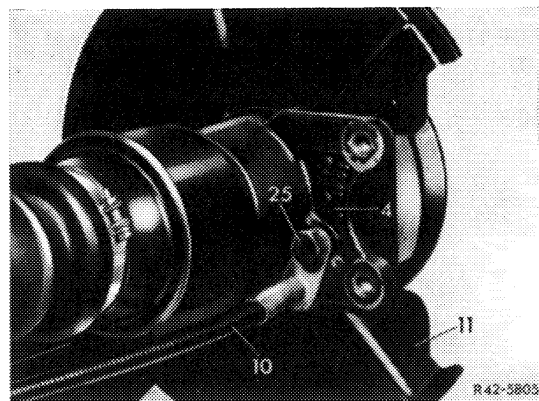
The 1st version spreader lock was not available since autumn of 1976.

- 10 Brake cable
- 10a Brake cable eye
- 10b Swivel-type end piece of brake cable
- 27 Spreader lock
- 27a Fork-shaped pull bar
- 27b Massive pull bar



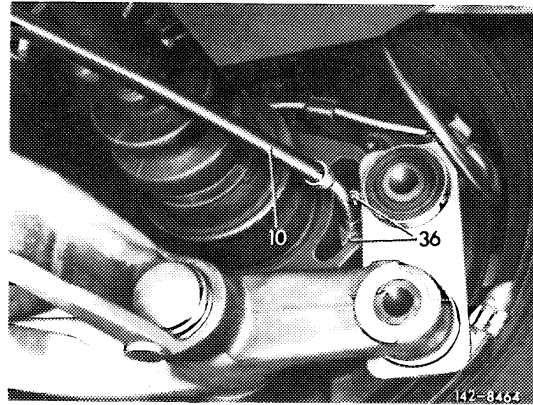
Removal

- 1 Remove brake shoes of parking brake (42-530).
- 2 Unscrew hexagon head bolt (25) from wheel carrier (4) of models with a diagonal swing axle and remove brake cable (10).

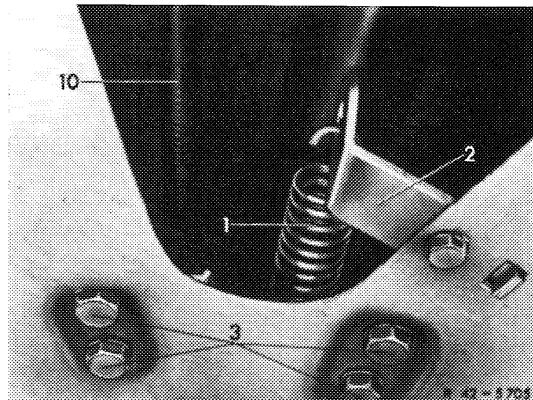


3 On vehicles with diagonal swing axle with starting torque compensation, screw both hex socket screws (36) out of wheel carrier.

4 Remove exhaust system (49–100).

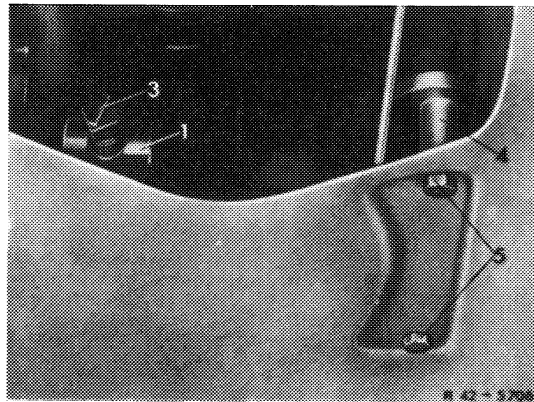


5 Disconnect draw spring (1) on holder (2).

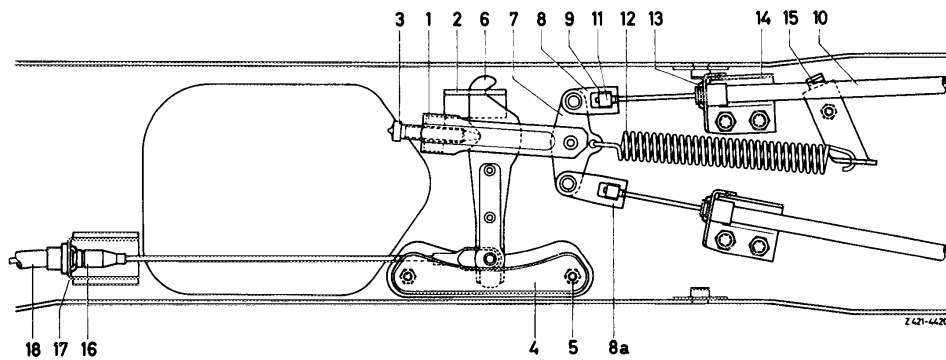


6 Unscrew hex. bolts (5) for attaching guide (4) for intermediate lever (6).

7 Completely unscrew adjusting screw (3) of adjusting bracket (1).



8 Disconnect intermediate lever (6) on bearing of frame floor (2) and remove from adjusting bracket (1).

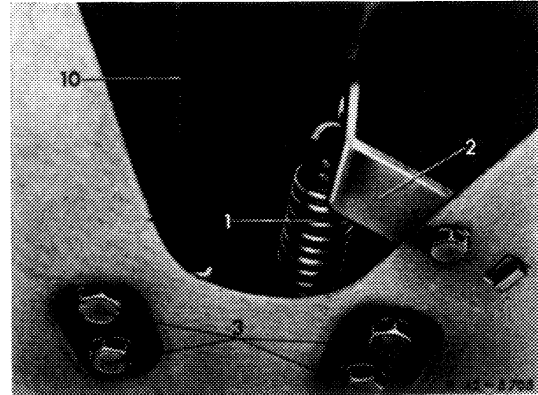


- | | | | |
|--------------------------------|-----------------------------|--|------------------------------|
| 1 Adjusting bracket | 7 Compensating lever | 12 Draw spring | 15 Holder for draw spring |
| 2 Bearing on frame floor | 8 Cable control link | 13 Spring clamp | 16 Rubber grommet |
| 3 Adjusting screw | 8a Cable control link | 14 Holder for rear brake cable control | 17 Spring clamp |
| 4 Guide for intermediate lever | 9 Hose member | | 18 Front brake cable control |
| 5 Hex. bolt | 10 Rear brake cable control | | |
| 6 Intermediate lever | 11 Adapter | | |

9 Unscrew hex. bolts (3) from holder.

10 Pull holder (14), compensating lever (7) with cable control links (8 and 8a) and intermediate lever (6) from tunnel by means of cable control (10).

11 Remove spring clamp (13) and disconnect cable control (10) from cable control link (8 or 8a) and holder (14).



Installation

12 During reinstallation make sure that hose member (9) on adapter (11) is not torn, to guarantee a safe hold of brake cable control (10) in cable control link (8 and 8a).

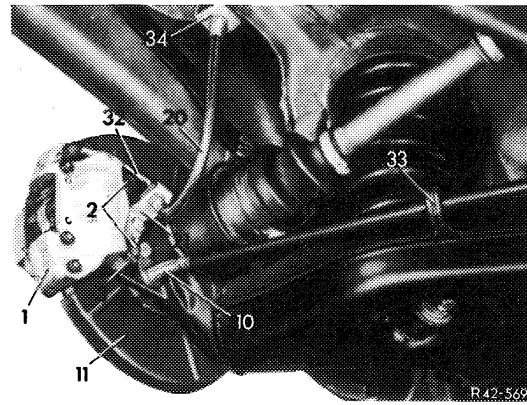
Note: Seen in driving direction, the longer cable control link (8a) is installed on compensating lever (7) at the left, and the shorter cable control (8) at the right. The recess for the adapter on the brake cable control should face upwards.

13 Make sure of perfect installation of brake cable control (10) in rubber grommet of holder (33).

14 Install brake shoes (42–530).

15 Adjust parking brake (42–540).

16 Install exhaust system (49–100).



42-530 Removal and installation of brake shoes of parking brake

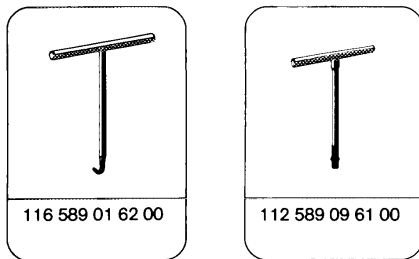
Data

Brake shoe dia.	160-0.2
Brake disk inside dia.	160 + 0.2
Brake shoe width	25

Lubricants

Molykote Paste U	Molykote Paste G Rapid	Liqui-Moly Paste 36
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Special tools



Conventional tool

Allen wrench double hex, 1/2" square,
120 mm long

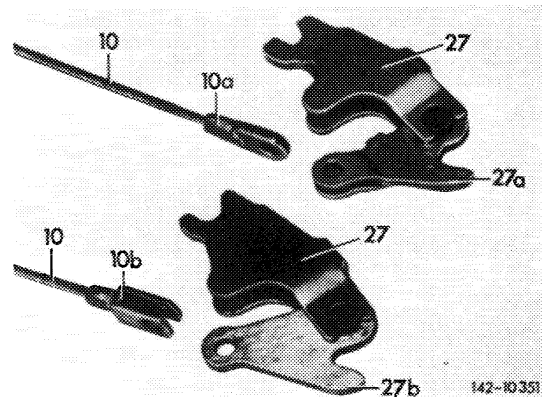
e.g. Stahlwille, D-5600 Wuppertal
Order No. 2054/8

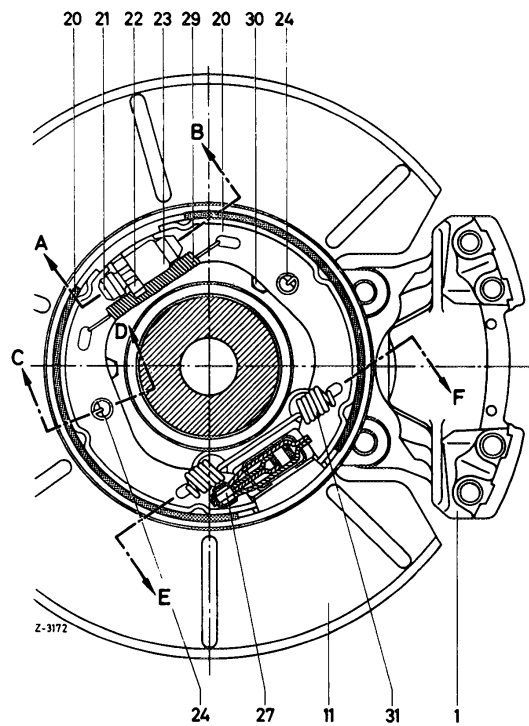
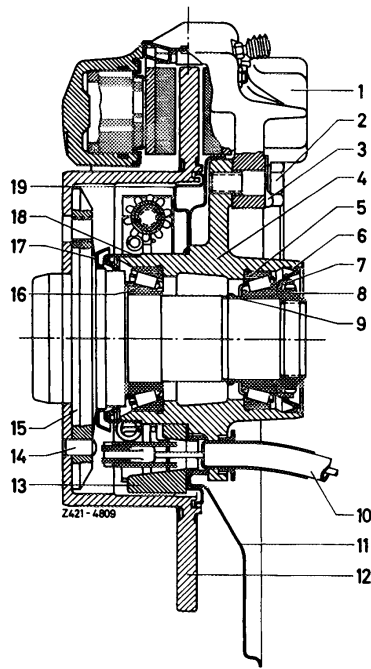
Note

Starting 1975 a modified expanding lock with solid draw plate is installed. This will change the rear brake cable control. The end piece is now designed as a fork head. The old and the new version of the expanding lock and the brake cable control cannot be interchanged.

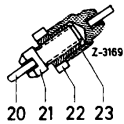
The 1st version spreader lock was not available since autumn of 1976.

- 10 Brake cable
- 10a Brake cable eye
- 10b Swivel-type end piece of brake cable
- 27 Spreader lock
- 27a Forked pull bar
- 27b Massive pull bar

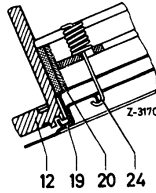




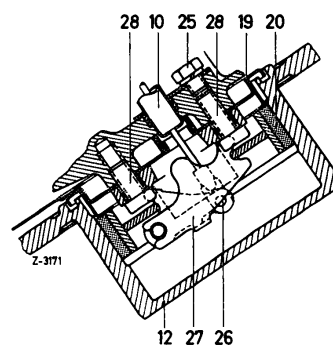
Schnitt A - B



Schnitt C - D

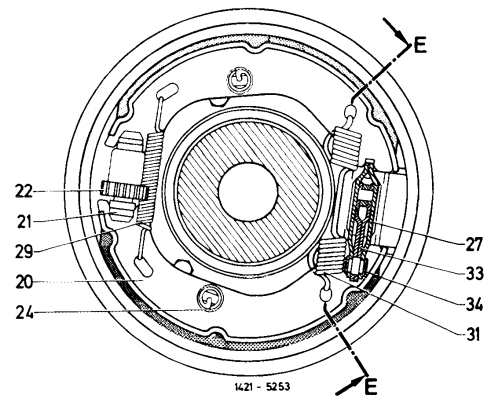
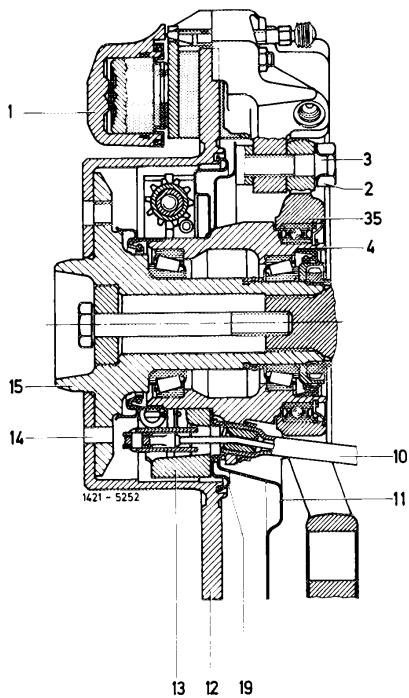


Schnitt E - F

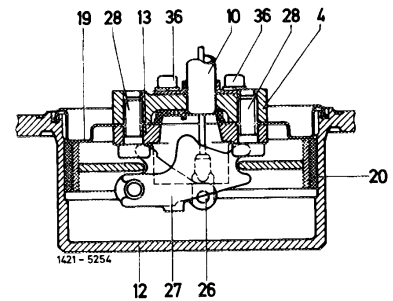


Diagonal swing axle layout

- | | | | |
|------------------------------|-------------------------------|---------------------------------------|---------------------------------------|
| 1 Fixed caliper | 10 Brake cable | 19 Cover ring | 26 Bolt |
| 2 Hexagon | 11 Guard | 20 Brake shoes | 27 Spreader lock |
| 3 Lock plate | 12 Brake disk | 21 Pressure piece | 28 Socket head bolt |
| 4 Wheel carrier | 13 Brake anchor plate | 22 Adjusting wheel | 29 Upper return spring |
| 5 Inner taper roller bearing | 14 Dowel pin | 23 Pressure sleeve | 30 Hexagon head bolt with lock washer |
| 6 Inner radial oil seal | 15 Rear axle shaft flange | 24 Contact pressure spring | 31 Lower return spring |
| 7 Sealing ring | 16 Outer taper roller bearing | 25 Hexagon head bolt with lock washer | |
| 8 Slotted nut | 17 Dust cap | | |
| 9 Spacer | 18 Outer radial oil seal | | |



Schnitt E - E

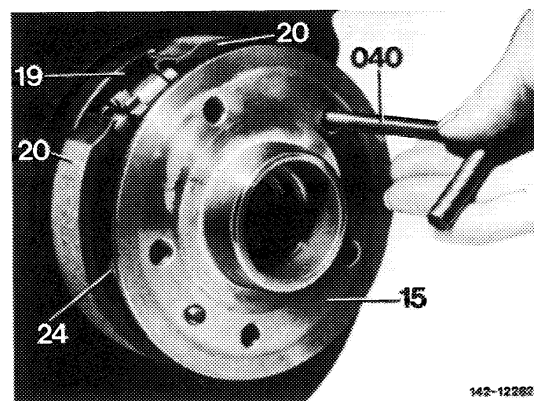


Diagonal swing axle with initial torque compensation layout

- | | | | |
|---------------------|---------------------------|----------------------------|--------------------------------------|
| 1 Fixed caliper | 13 Brake anchor plate | 23 Pressure sleeve | 31 Return spring |
| 2 Hexagon head bolt | 14 Dowel pin | 24 Contact pressure spring | 33 Operating lever |
| 3 Lock plate | 15 Rear axle shaft flange | 26 Bolt | 34 Pivot pin |
| 4 Wheel carrier | 19 Cover ring | 27 Pressure bar | 35 Caliper carrier |
| 10 Brake cable | 20 Brake shoes | 28 Socket head bolt | 36 Socket head bolt with lock washer |
| 11 Guard | 21 Pressure piece | 29 Return spring | |
| 12 Brake disc | 22 Adjusting wheel | | |

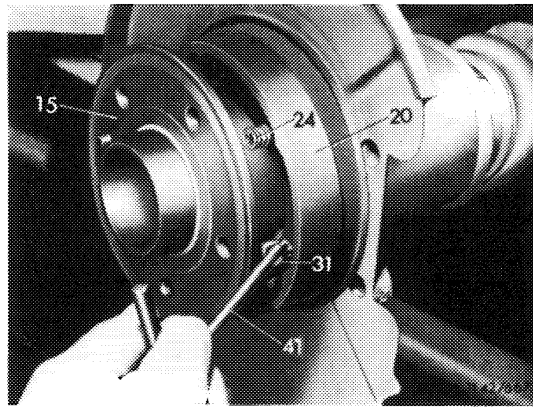
Removal

- 1 Remove brake disc (42-228).
- 2 Turn rear axle shaft flange (15) until one threaded hole faces spring (24). Now compress spring a little with installation tool (040), turn tool by approx. 90° finally detach spring at guard and remove.
- 3 Also remove springs on other brake shoes.

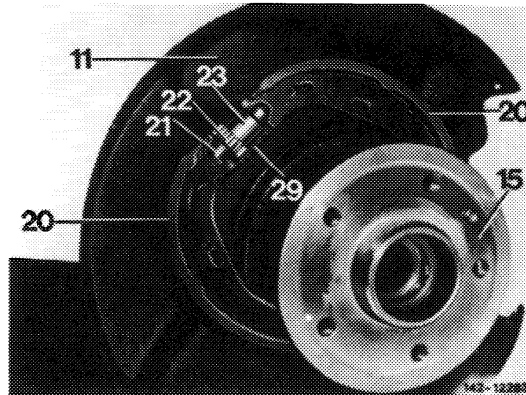


142-12282

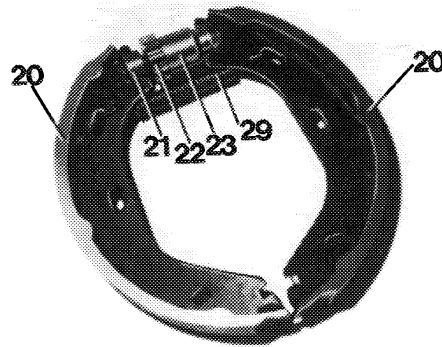
4 Detach return spring (31) from brake shoe (20) with removal and installation tool (41).



5 Pull both brake shoes (20) far enough apart, that they can be removed over rear axle shaft flange (15).



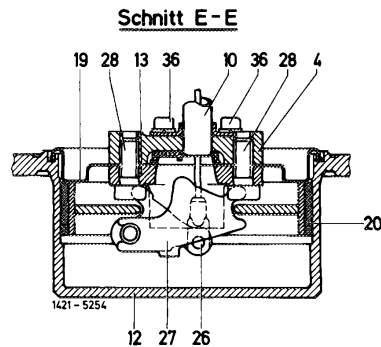
6 Detach return spring (29) from brake shoes (20) and remove adjusting device (21 through 23).



142-12284

7 Press bolt (26) off of spreader lock (27) and remove spreader lock from brake cable (10).

- 4 Wheel carrier
- 10 Brake cable
- 12 Brake disc
- 13 Brake anchor plate
- 19 Cover ring
- 20 Brake shoes
- 26 Bolt
- 27 Spreader lock
- 28 Socket head bolt
- 36 Socket head bolt with lock washer



Installation

8 Lubricate all bearing and sliding surfaces on spreader lock with specified lubricant (see table). Mount brake cable (10) on spreader lock (27) with bolt (26). Then press spreader lock to cover ring (19).

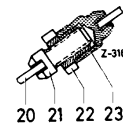
9 Check both hex socket screws for fastening brake carrier (13) for tightening torque 50 Nm.

Note: Self-locking hex socket screws will be installed starting October 1978. **Hex socket screws may be used only once.** Use a 7 mm hex or double hex socket wrench (Allen wrench) for tightening and release.

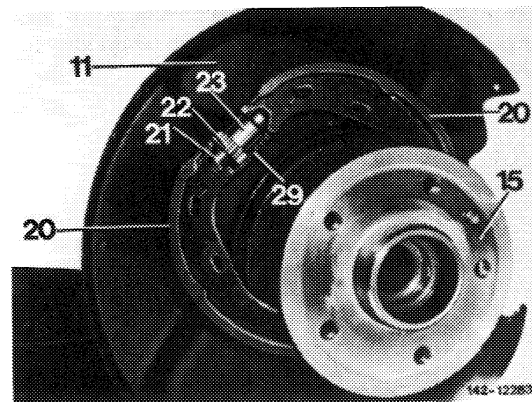
10 Lubricate threads of pressure piece (21) and cylindrical part of adjusting wheel (22) with specified lubricant (see table). Assemble adjusting device and turn it back all the way.

- 20 Brake shoe
- 21 Pressure piece
- 22 Adjusting wheel
- 23 Pressure sleeve

Schnitt A - B



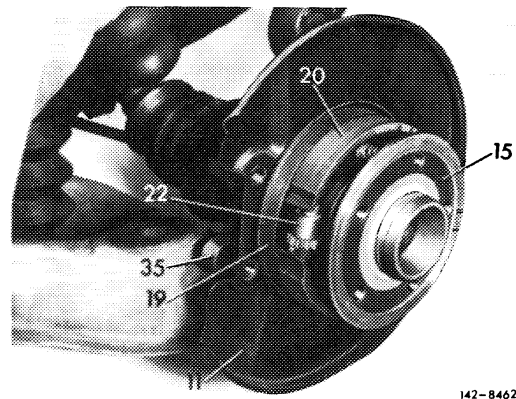
11 Install adjusting device (21 through 23) in both brake shoes, that adjusting wheel (22) of diagonal swing axle faces forward.



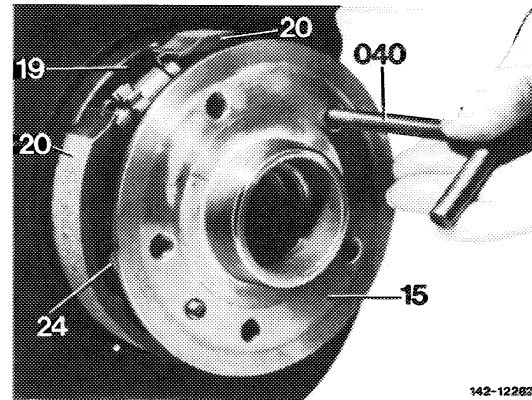
12 Adjusting wheel (22) of diagonal swing axle with starting torque compensation must face down.

13 Attach return spring (29) in both brake shoes.

14 Pull brake shoes (20) apart, guide them over rear axle shaft flange (15) and attach them in spreader lock.

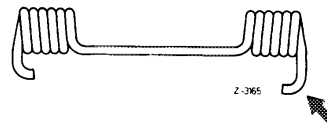


15 Install spring (24) in brake shoes (20) from side. Run in installation tool (040) through one threaded hole of rear axle shaft flange (15), then compress spring a little, turn by 90° and attach in cover ring (19). Make sure that spring is attached correctly.



16 Attach spring with small eye in brake shoes.

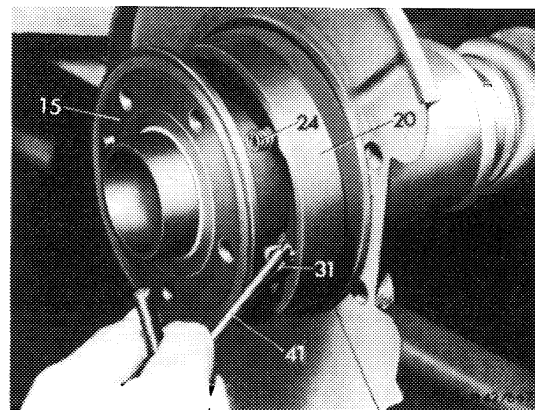
Note: The eyes of return springs are different. Large eye see arrow.



17 Attach removal and installation tool (41) in large eye of return spring (31), then attach return spring in other brake shoe (20).

18 Install brake disc (42-228).

19 Adjust parking brake (42-540).



42-540 Readjustment or adjustment of brake shoes of parking brake

Data

Total ratio of parking brake up to spreader lock outlet	1 : 22
Number of steps on ratchet	6
Number of detents required for locking parking brake by applying a mean force of approx. 400 N	2-3
Number of steps before there is any parking brake effect	1-2

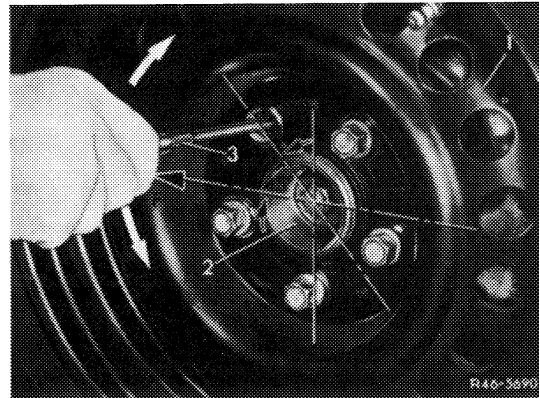
Note

The parking brake must be readjusted, if the brake pedal can be depressed by more than 2 steps (of a total of 6) without any braking effect.

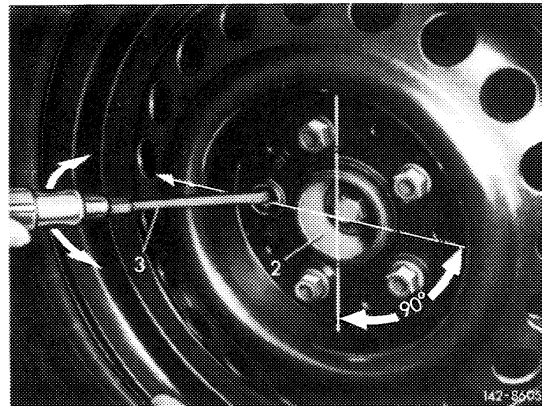
Adjustment up to July 1985

- 1 Unscrew one each spherical shouldered bolt from rear axle, left and right.
- 2 Jack up car and first turn one wheel until threaded hole, from which spherical shouldered bolt had been removed, faces forward and up by about 45° for models with a diagonal swing axle or exactly forward for models with a diagonal swing axle having initial torque compensation.

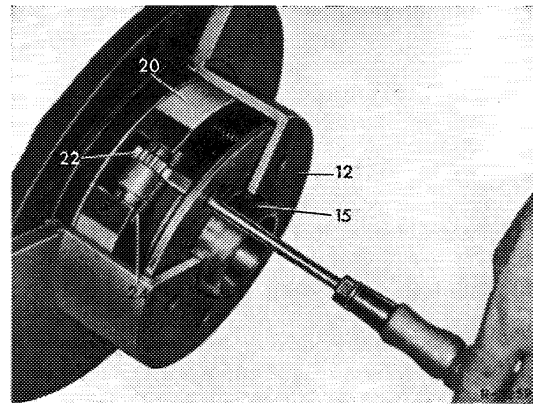
Position of wheel for models with diagonal swing axle



Position of wheel for models with diagonal swing axle and initial torque compensation



3 Insert a screw driver (size 4.5 mm) through hole of rim, of brake disk (12) and rear axle shaft flange (15) to engage in adjusting wheel of readjustment device (22) and turn adjusting wheel by corresponding movements until the wheel can no longer be turned. Then turn back adjusting wheel by about 2–3 teeth, i.e. far enough that the wheel can turn freely.



Attention!

Adjusting direction of screw-driver for application of brake shoes:

Models with diagonal swing axle

Left side: from bottom to top

Right side: from top to bottom

Models with diagonal swing axle and initial torque compensation

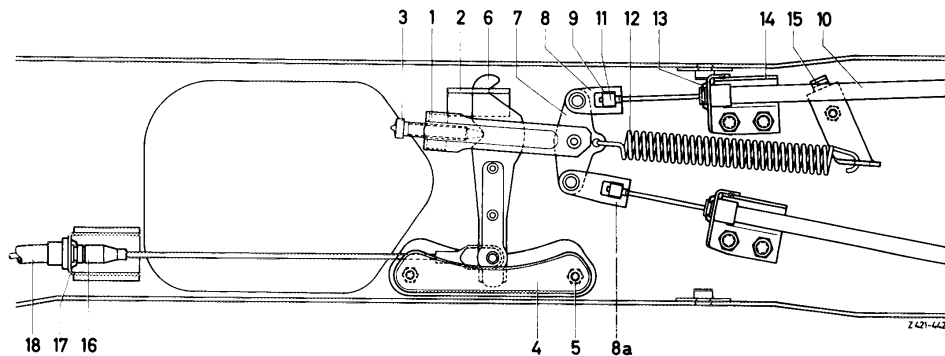
Left side: from back to front

Right side: from front to back

4 Upon completion of adjustments, check as follows: Depress pedal of parking brake to 1st detent. In this position, brake shoes of parking brake should be in lightly applied condition.

Attention!

Adjusting screw (3) on intermediate lever must not be altered when adjusting parking brake. It only balances the lengths of cables.

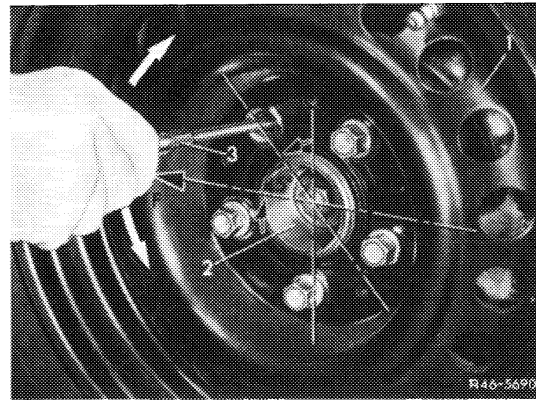
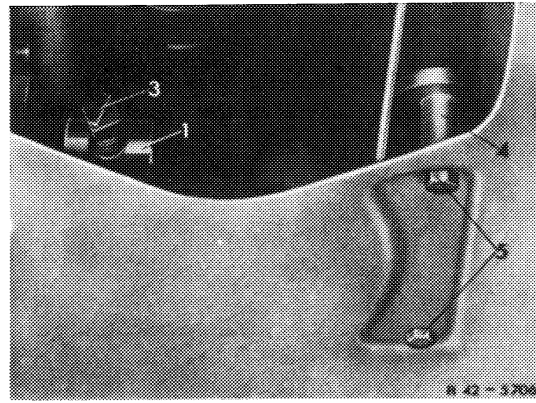


- | | | | |
|--------------------------------|-----------------------|--|------------------------------|
| 1 Adjusting bracket | 6 Intermediate lever | 10 Rear cable control | 15 Holder for draw spring |
| 2 Bearing on frame floor | 7 Compensating lever | 11 Adapter | 16 Rubber grommet |
| 3 Adjusting screw | 8 Cable control link | 12 Draw spring | 17 Spring clamp |
| 4 Guide for intermediate lever | 8a Cable control link | 13 Spring clamp | 18 Front brake cable control |
| 5 Hex. bolt | 9 Hose member | 14 Holder for rear brake cable control | |

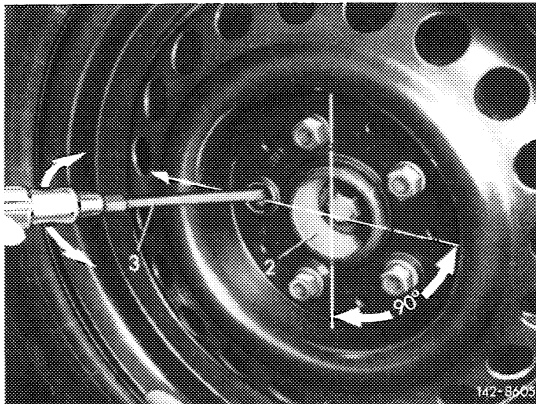
Adjustment starting August 1985

5 Completely loosen adjusting screw (3). The spreader locks should not be pretensioned.

6 Unscrew one wheel bolt each at rear axle left and right. Jack up vehicle.



Position of wheel on vehicles with diagonal swing axle

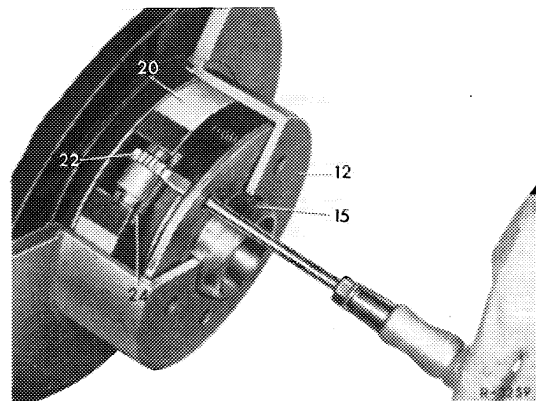


Position of wheel on vehicles with diagonal swing axle with starting torque compensation

7 Insert a screwdriver (size 4.5 mm) through hole of rim, brake disk (12) and rear axle shaft flange (15) into adjusting wheel of adjusting device (22) and rotate adjusting wheel by pertinent movements until the wheel can no longer be rotated. Then turn back adjusting wheel for approx. 2–3 teeth, i.e. enough until the wheel can be rotated again absolutely free.

Attention!

Adjusting direction of screwdriver for application of brake shoes:



Vehicles with diagonal swing axle

Lefthand side: from below in upward direction.

Righthand side: from above in downward direction.

Vehicles with diagonal swing axle with starting torque compensation

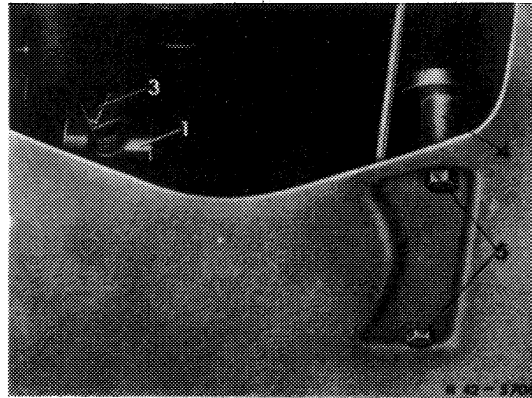
Lefthand side: from the rear to the front.

Righthand side: from the front to the rear.

8 Screw in adjusting screw (3) until the brake cables are no longer sagging.

9 Actuate parking brake several times energetically at approx. 400 N.

10 Screw adjusting screw (3) into adjusting bracket (1) until the pedal of the parking brake can be actuated by one tooth at medium force of approx. 150–180 N.



Basic adjustment

Basic adjustment is required if e.g. one of the brake cable controls or the rear axle were replaced (refer to Fig. item 8).

11 Loosen adjusting screw (3) on adjusting bracket all the way.

12 Adjust brake shoes of parking brake (refer to points 1 through 4).

13 Screw adjusting screw into adjusting bracket until pedal of parking brake permits depressing for a distance of 2–3 teeth at a medium force of approx. 400 N.

Attention!

The tab on adjusting screw (3) must always be vertical.

A. General information

The ABS anti-locking brake system (or electronic brake slip control) is one of the active safety elements of a vehicle for the purpose of decisively reducing the risk of becoming involved in an accident.

For this reason, the ABS is expected to meet the following demands:

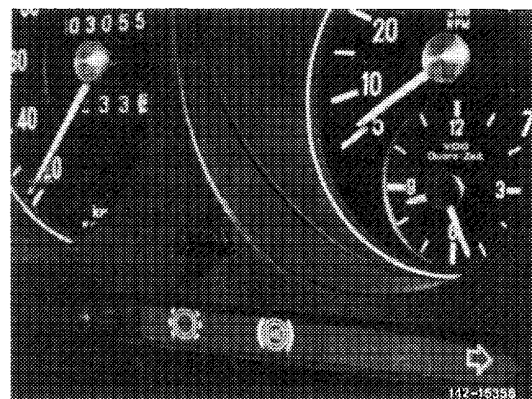
1. The driving stability of the vehicle should be assured while braking both when the braking force is slowly increased up to locking limit and when suddenly increasing the braking force in the event of a panic stop.
2. As long as the vehicle speed is adequately below the curve limit speed, braking in a curve should be possible without impairing driving stability while maintaining full steerability (the curve speed is the speed at which a vehicle can be driven around a bend without engine power and just fast enough that it will not leave the road under influence of centrifugal forces).
3. When the brake pedal is excessively operated to the extent that an uncontrolled braking system will result in locking of the wheels, the ABS will modify the braking pressure of the wheel brakes to the extent that the wheels are not locking and that instead the adhesion between the wheels and the road is optimally exploited.

Consequently, vehicles with ABS as compared with uncontrolled brake systems provide the following advantages when the brakes are fully applied:

- Higher driving stability.
- Better steerability.

B. Driving with ABS

When the ignition is switched on, the yellow indicator lamp with the symbols ABS in instrument cluster lights up and will go out when the engine is running. (Just like the charge indicator lamp). If the lamp does not go out, the electric on-board power supply may be subject to undervoltage or the power supply to the electronic control unit is interrupted. At approx. 5 km/h after starting, a self-testing routine will be started by ABS (bite). If a fault is found, the indicator lamp will again light up.



In the event of a permanent fault, e.g. a broken cable, the fault is stored in electronic control unit until the ignition is switched off. A timely restricted undervoltage in vehicle mains is not stored. That is, if the battery voltage is below 10.5 V when the ignition is switched on and the test speed is exceeded, the ABS will remain switched off until the charge from alternator increases the voltage to above 10.5 V. The warning lamp will go out then only.

Any braking in locking range initiated above 12 km/h can be controlled down to a speed of 5–7 km/h. This means that controlled braking begins only after the so-called control speed of 12 km/h has been exceeded. A modified electronic control unit is installed as of February 1984. The ABS is now operational as of 8 km/h and will control down to a speed of 3 km/h.

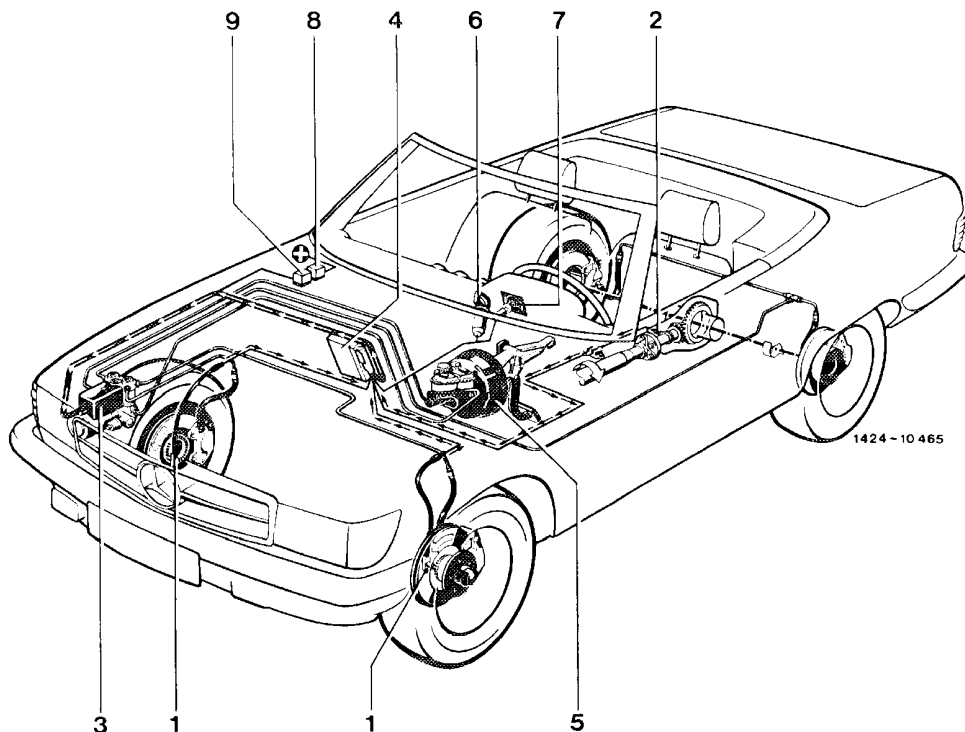
Attention!

When the warning lamp in instrument cluster lights up, the ABS is switched off and the vehicle can be braked without ABS control only. The conventional brake system remains operational. The vehicle should be checked and reconditioned in a Mercedes-Benz service station as soon as possible.

C. Layout

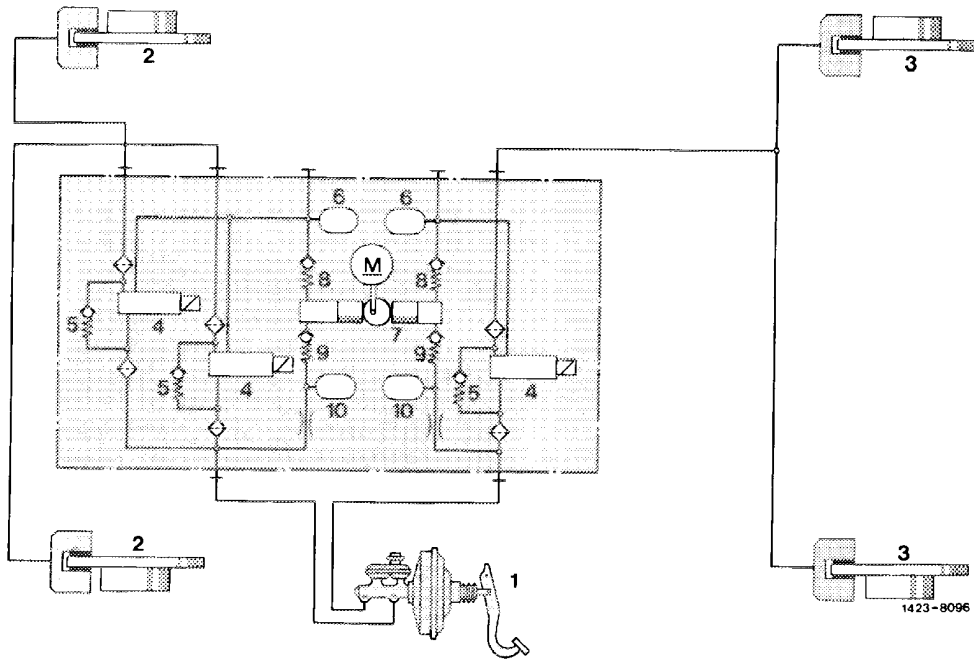
The ABS system comprises the conventional braking system known up to now and the following additional components:

- a) Hydraulic unit
- b) Speed sensor
- c) Electronic control unit
- d) Harness with relay and overvoltage protection



- | | |
|--|---|
| 1 Speed sensor front axle | 6 Steering lock |
| 2 Speed sensor rear axle | 7 Warning lamp in instrument cluster |
| 3 Hydraulic unit | 8 Overvoltage protection |
| 4 Electronic control unit | 9 Relay for voltage supply of electronic control unit |
| 5 Brake unit with tandem main cylinder | |

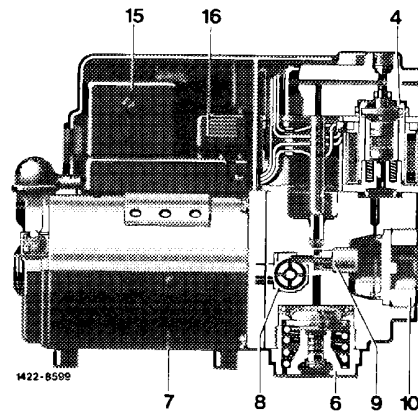
a) Hydraulic unit



- | | | |
|--|------------------|---------------------|
| 1 Brake unit with tandem main cylinder | 5 Check valve | 8 Pump input valve |
| 2 Front wheel brake | 6 Pump reservoir | 9 Pump output valve |
| 3 Rear wheel brake | 7 Return pump | 10 Silencer |
| 4 Solenoid valve | | |

Independent of the pressure in tandem main cylinder the hydraulic unit can change the fluid pressure to the brake calipers during control. However, the pressure increase with regard to the pressure introduced by the main cylinder is not possible.

- | |
|-----------------------------|
| 4 Solenoid valve |
| 6 Pump reservoir |
| 7 Return pump |
| 8 Pump input valve |
| 9 Pump output valve |
| 10 Silencer |
| 15 Relay for return pump |
| 16 Relay for solenoid valve |

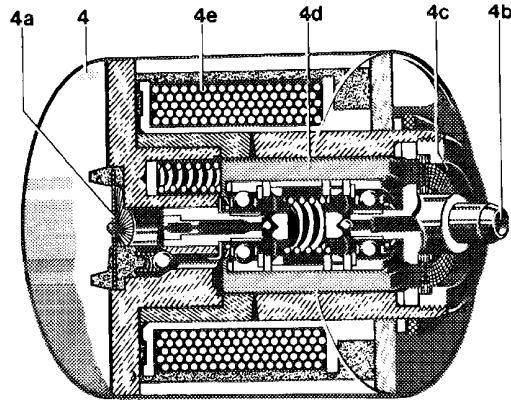


The hydraulic unit comprises three fast-switching solenoid valves. Of these valves, one each is associated with the lefthand or righthand front wheel brake and the third with the rear wheel brake.

By activating the valves with current of varying amperage, the brake fluid pressure in the individual calipers can be

- increased = pressure build-up stage (no current)
- held = pressure holding stage (half max. current)
- or reduced = pressure reduction stage (max. current).

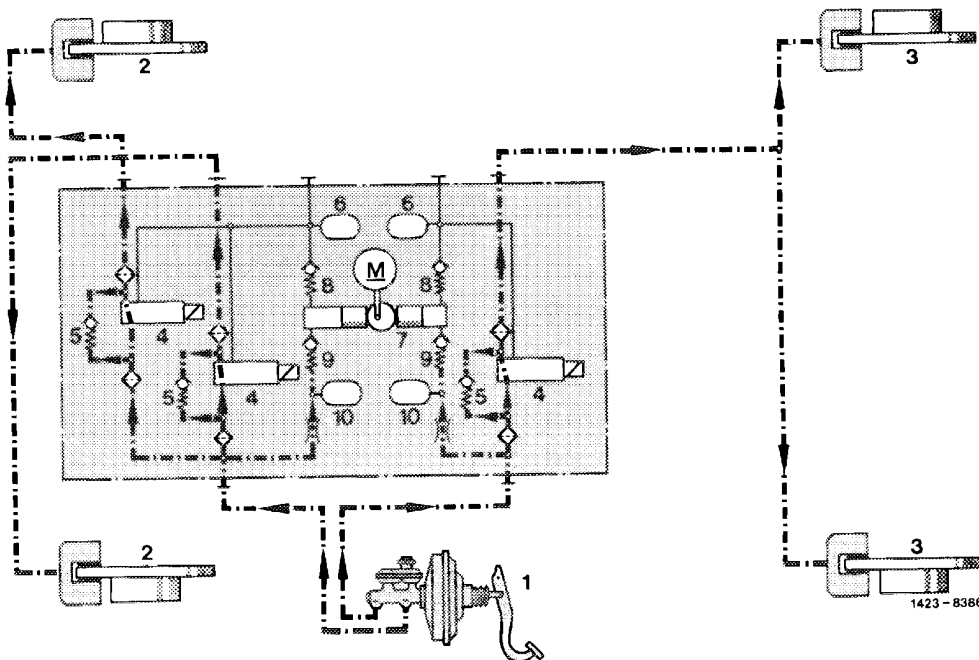
- 4 Solenoid valve
- 4a Connection brake line from main cylinder
- 4b Output return pump
- 4c Connection brake line to wheel brake
- 4d Armature
- 4e Coil



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Pressure build-up stage

During the pressure build-up stage the pressure can be increased via the opened intake valve in solenoid valve up to the pressure activated by the tandem main cylinder.

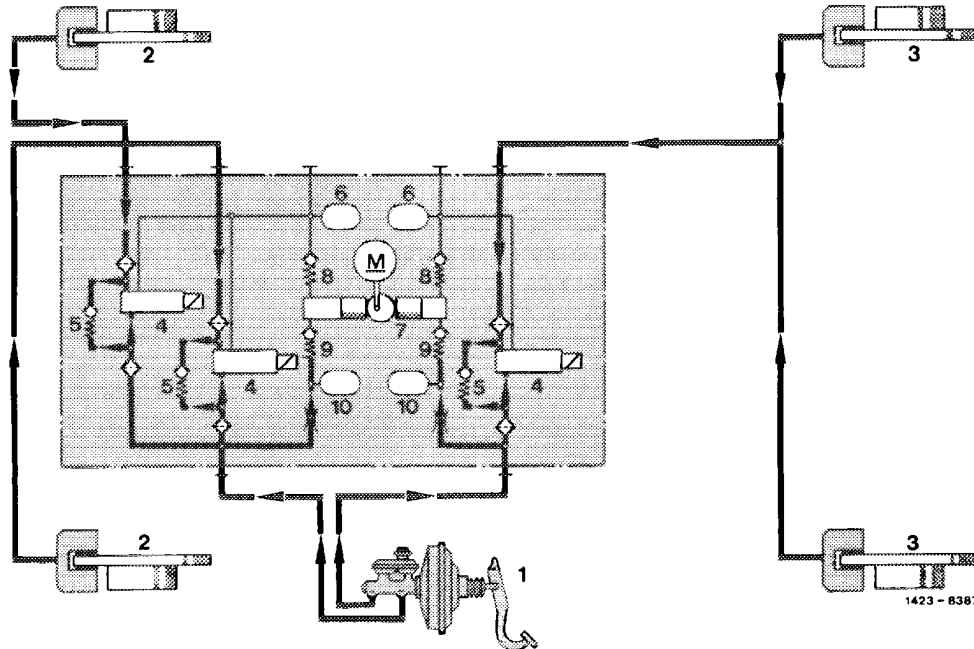


- 1 Brake unit with tandem main cylinder
- 2 Front wheel brake
- 3 Rear wheel brake
- 4 Solenoid valve
- 5 Check valve
- 6 Pump reservoir
- 7 Return pump
- 8 Pump input valve
- 9 Pump output valve
- 10 Silencer

42.1-700/4 F 4

Pressure-holding stage

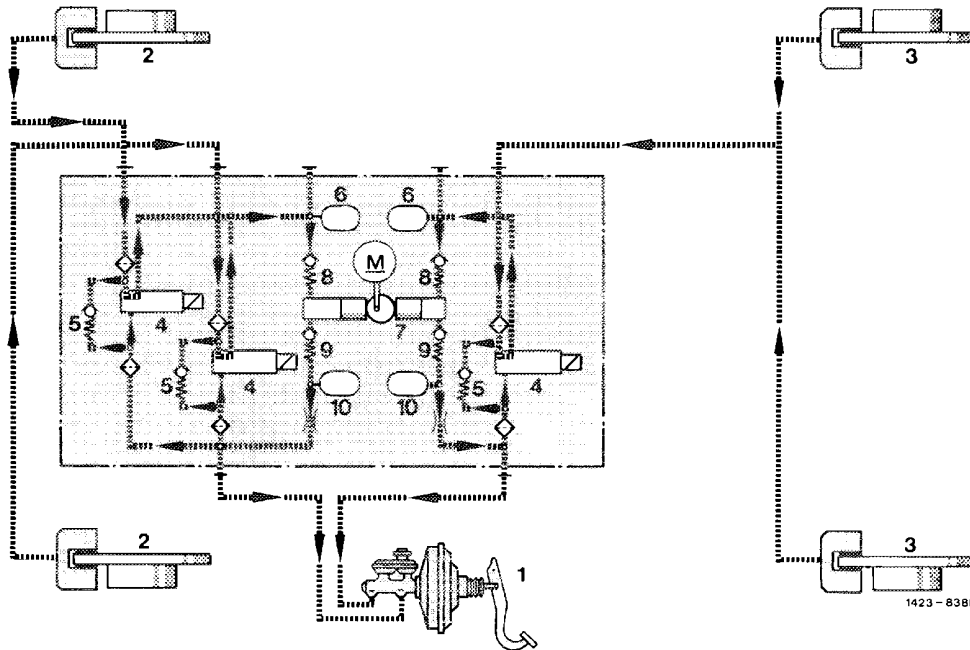
In the pressure-holding stage which precedes each pressure reduction stage the fluid pressure from hydraulic unit to wheel brakes is held constant because the output and input in solenoid valve is closed.



- | | | |
|--|------------------|---------------------|
| 1 Brake unit with tandem main cylinder | 5 Check valve | 8 Pump input valve |
| 2 Front wheel brake | 6 Pump reservoir | 9 Pump output valve |
| 3 Rear wheel brake | 7 Return pump | 10 Silencer |
| 4 Solenoid valve | | |

Pressure reduction stage

During the pressure reduction stage the brake fluid flows via a reservoir (6) into return pump (7). To maintain the fluid volume of main cylinder, the return pump returns the brake fluid into the main cylinder against the prevailing pressure. To dampen the delivery noise, each circuit is provided with a silencer (10).

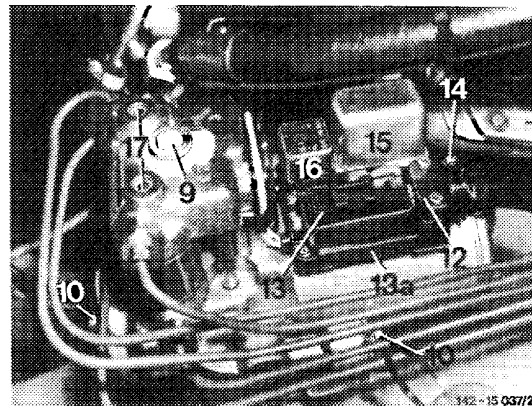


- | | | |
|--|------------------|---------------------|
| 1 Brake unit with tandem main cylinder | 5 Check valve | 8 Pump input valve |
| 2 Front wheel brake | 6 Pump reservoir | 9 Pump output valve |
| 3 Rear wheel brake | 7 Return pump | 10 Silencer |
| 4 Solenoid valve | | |

On plug socket (13a) of hydraulic unit is relay (16) for solenoid valves and relay (15) for return pump. A diode is additionally soldered into socket. The hydraulic unit is connected to the vehicle ground connection by means of grounding cable (14).

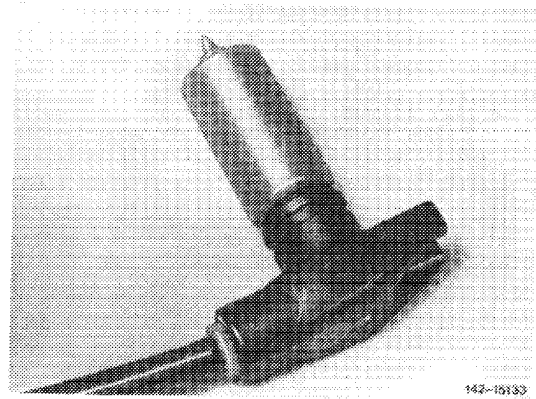
Note: Phased-in early 1986 a modified hydraulic unit will be installed. The valve relay (16) has 6 contact pins (previously 5) and contains the diode previously located in plug socket of hydraulic unit.

- | |
|-----------------------------|
| 9 Center bolt |
| 10 Hex. nut |
| 12 Harness stress relief |
| 13 Socket |
| 13a Plug socket |
| 14 Grounding cable |
| 15 Relay for return pump |
| 16 Relay for solenoid valve |
| 17 Hex. socket screws |

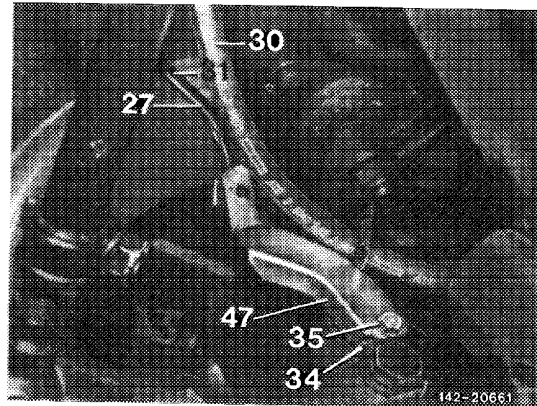


b) Speed sensor

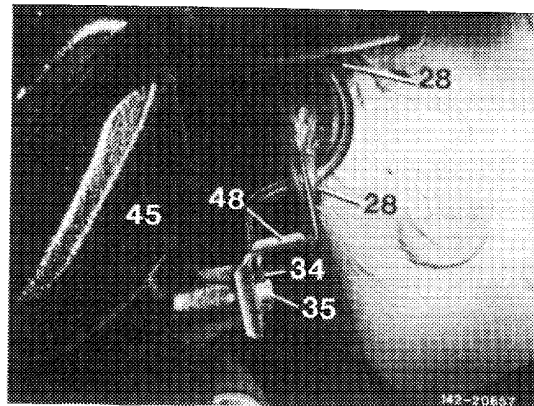
Rod-shaped speed sensors or impulse transmitters are used for measuring wheel speeds. The three-channel system with three-speed sensors installed in our vehicles serves for separately measuring the wheel speed of each wheel on front axle.



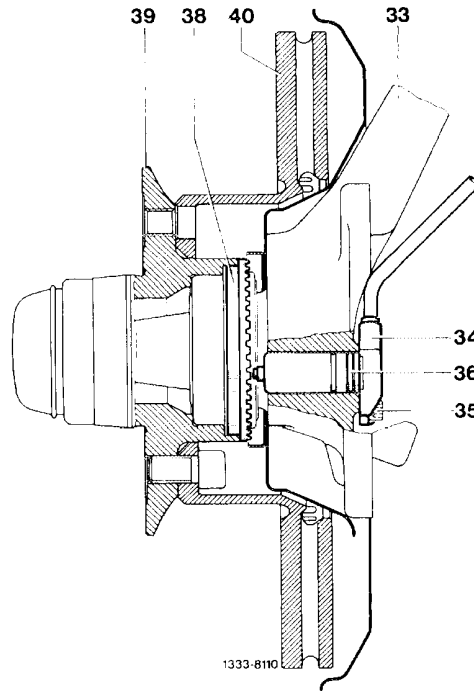
The speed sensors (34) for front axle are installed in steering knuckles.



The speed sensor (34) for rear axle is mounted on rear axle housing (45). The drive pinion serves to measure the mean speed of both rear wheels.

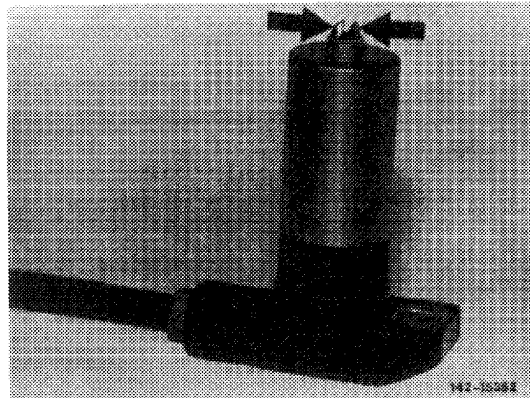


The speed sensors are probing the wheel speeds by way of the rotor teeth. On front axle, the rotor teeth (38) are machined into front wheel hub (39).

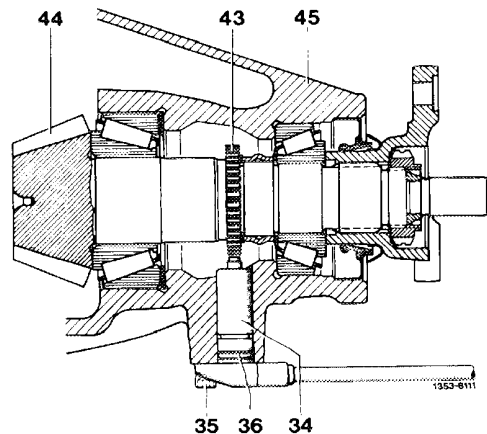


- 33 Steering knuckle
- 34 Speed sensor
- 35 Hex. socket screws
- 36 O-ring
- 38 Teeth (rotor)
- 39 Front wheel hub
- 40 Brake disk

The speed sensors for the front axle have two edges (arrows), starting September 1985 they have one edge and a diameter of 18 mm.

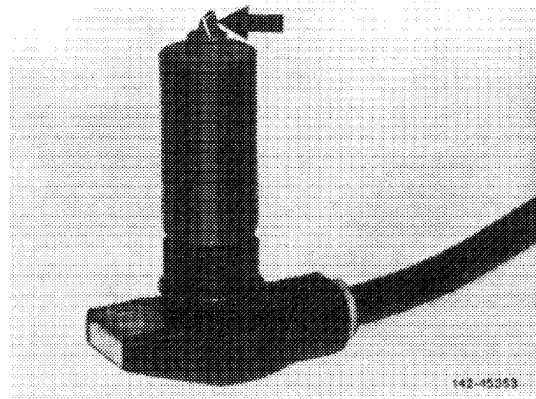


On rear axle, the rotor is a toothed wheel (43) and pressed on drive pinion (44). Each rear axle ratio is associated with a pertinent gear wheel having a different number of teeth.



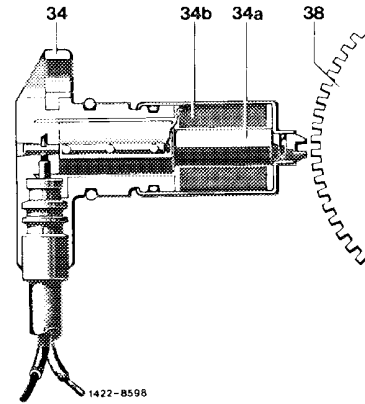
- 34 Speed sensor
- 35 Hex. socket screw
- 36 O-ring
- 43 Toothed wheel (rotor)
- 44 Drive pinion
- 45 Rear axle housing

The speed sensor for the rear axle is single-edged (arrow) and has a diameter of 15 mm.



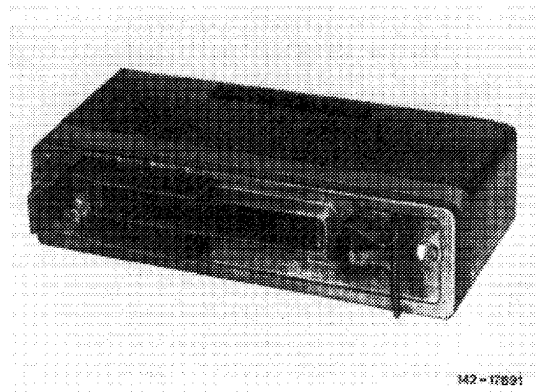
The speed sensors consist of a magnetic core and a coil. Rotation of toothed wheel or rotor, which is located at a given distance in relation to speed sensor, will change the magnetic field, so that an alternating voltage is induced in coil. This alternating voltage changes its frequency in accordance with the wheel speed and the number of teeth, i.e. the frequency is proportional to wheel speed.

- 34 Speed sensor
- 34a Magnetic core
- 34b Coil
- 38 Gear wheel (rotor)



c) Electronic control unit

The electronic control unit is laid out as a board version. The boards are provided with conductors on both sides and on one side with components such as resistors, diodes, transistors and so-called large-scale circuits. The boards are always one above the other inside the control unit and are enclosed by a light-alloy housing.



The control unit processes the signals of the speed sensors and contacts the valves in hydraulic unit.

The entire signal conditioning and signal processing is digital.

The electronic control unit is functionally subdivided into:

- the signal conditioning section
- the logic section and
- the safety circuit.

Signal-conditioning section

In the signal-conditioning section the signals supplied by the speed sensors are converted into a suitable shape for the logic section.

To prevent trouble while measuring the wheel speed, which may be caused by production tolerances and by movements in steering knuckle, the input signals are filtered prior to use. Deceleration and acceleration signals obtained from the wheel speed signals are processed in logic section.

Logic section

The logic section of the electronic control unit employs the following input signals for each controlled wheel or the controlled rear wheels:

Wheel slip

Wheel speed acceleration

Wheel deceleration

Output signals of logic section are controlling the solenoid valves of the hydraulic unit. The following hydraulic functions can be obtained in wheel brake calipers:

Pressure maintenance

Pressure reduction

Pressure build-up

Safety circuit

The safety circuit serves the purpose of recognizing faulty signals in electronic control unit and faults outside electronic control unit in the electric installation. In addition, the safety circuit intervenes in control sequence during extreme driving conditions such as aquaplaning. When a fault is recognized, the system should be switched off, a condition which is indicated to the driver by the warning lamp lighting up.

The safety circuit is also continuously monitoring the battery voltage. If the voltage is below specified requirements, the system is also switched off until the voltage is back again in specified range.

In addition to this monitored function the safety switch also includes an active section, the test cycle or Bite (built-in test equipment).

Test cycle (Bite)

Upon starting, the test cycle begins as soon as the wheel speed in all three speed channels is higher than 5–7 km/h. The cycle is activated by the speed sensor voltage, which is simultaneously also automatically monitored. The test cycle itself checks components of monitoring circuit as well as the logic section. For this purpose, the electronic control unit is fed with given test sample signals to check whether the correct output signals are available.

d) Harness with relay and overvoltage protection

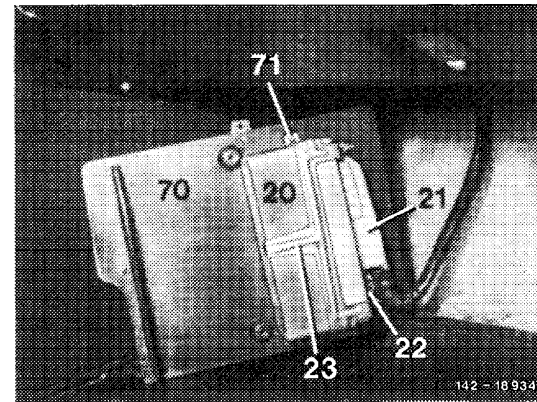
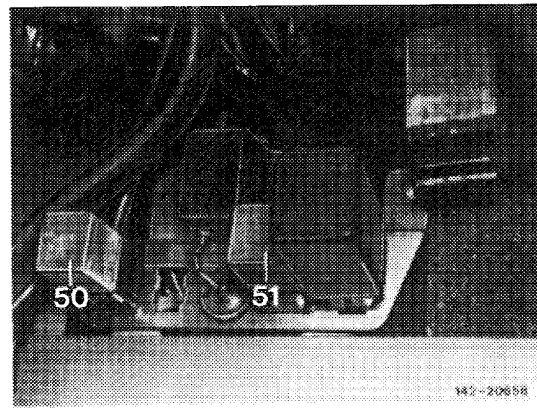
A supplementary harness for the ABS anti-locking brake system is installed.

To guarantee the function of the ABS system under all operating conditions, the electric power is supplied via the electronic relay (50) which is activated by terminal 15 (ignition lock).

The overvoltage protection (51) is located between battery and relay (50) and protects the electronic control unit against excess voltage.

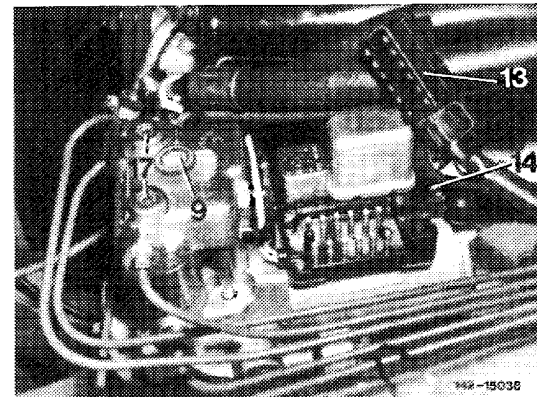
An overvoltage protection with integrated relay for voltage supply of electronic control unit and an exchangeable fuse are installed since September 1981.

The harness is connected to the electronic control unit (20) by means of a 35-pole plug connection (21).

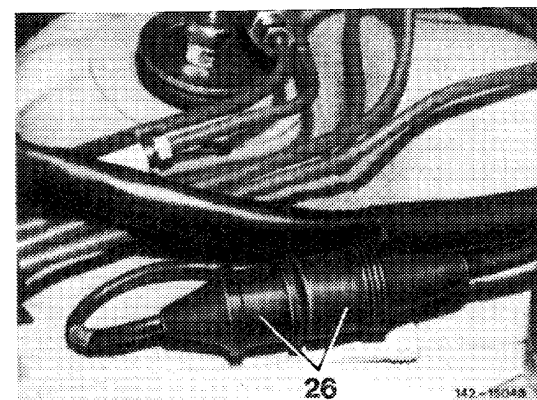


The harness with the 12-pole plug connection (13) leads to hydraulic unit.

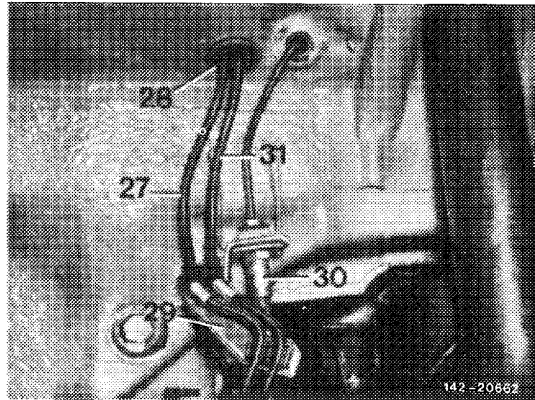
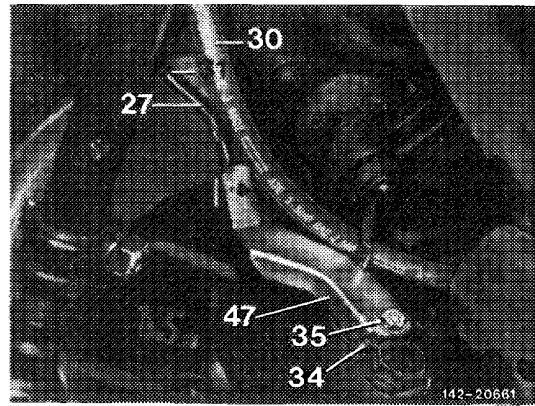
The grounding strap (14) for hydraulic unit is connected to side member (wheel house).



The speed sensors of the front axle are connected to harness by means of coaxial plug (26).



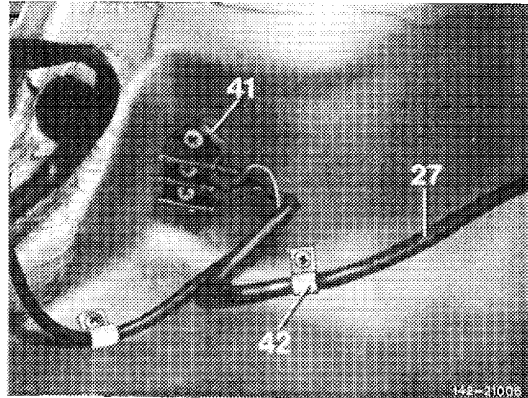
Cable (27) of speed sensor from steering knuckle to coaxial plug is guided through a holder (29) in wheel house.



Layout front axle

- 27 Speed sensor cable
- 28 Rubber grommet
- 29 Holder
- 30 Brake hose
- 31 Wear indicator cable

The speed sensor of the rear axle is connected to harness under rear seat bench by means of cable connector (41).



Layout of rear axle

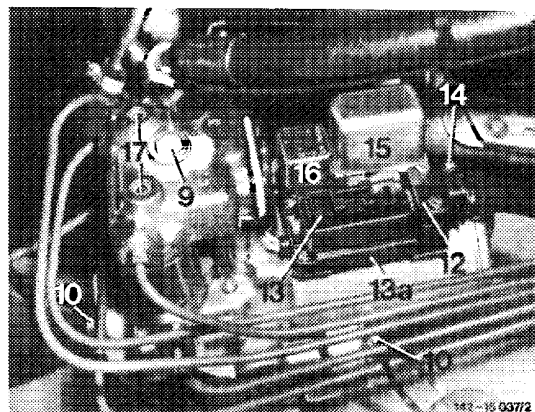
- 27 Speed sensor cable
- 41 Cable connector
- 42 Clamp

Two relays are located under cover of hydraulic unit. Relay (15) contacts return pump and the current flows to solenoid valves via relay (16).

A diode soldered into plug socket (13a) activates the warning lamp in instrument cluster when the multi-point plug on electronic control unit is pulled off.

Phased-in early 1986 the diode is no longer in plug socket, but in valve relay.

The new relay has 6 contact pins (previously 5).



D. Operation of ABS

The ABS is operational after the ignition has been switched on and as soon as a speed of 5–7 km/h is attained. All the braking steps in locking range are controlled as of the so-called control speed of 12 km/h. On the modified control unit, starting February 1984, the control speed is 8 km/h.

The following is a description of the control cycle on one wheel. The control sequence on the other wheels is the same. The wheel speed measured by the speed sensor provides the wheel deceleration and wheel acceleration signals for the electronic control unit. Linking of the individual wheel speeds provides the so-called reference speed, which is the approximate vehicle speed. A comparison of the wheel speed with the reference speed supplies the slip signals.

If a wheel shows a tendency toward locking as a result of too much brake fluid pressure in caliper, a condition which is recognized by means of the wheel speed sequence (wheel slip), the fluid pressure will be held constant, i.e. an additional pressure increase is not possible.

If there is still a tendency toward locking, because the constant pressure is still too high, the fluid pressure will be lowered by opening the outlet valve in solenoid valve. Simultaneously the brake fluid still in accumulator is pumped back to the tandem main cylinder by the return pump. If the pressure is at such a low level that the wheel wants to accelerate again, there will be no additional pressure reduction, and the fluid pressure will again be held constant.

When the re-acceleration of the wheel passes a threshold value, the pressure is again increased in-between by opening the input valve in solenoid valve.

By means of pertinent signals of the electronic control unit, the hydraulic unit can actuate the three following control stages of

pressure build-up

pressure maintenance and

pressure reduction.

The control sequence is continuously repeated during controlled braking until the brake pedal is released or shortly before vehicle stops.

General information

When working on vehicles provided with an ABS anti-locking brake system, proceed as follows:

Welding jobs

When welding with an electric welding unit, pull plug from electronic control unit.

Paintwork

During painting jobs, the electronic control unit may be loaded for short periods up to max. 95 °C/203 °F and for long periods (approx. 2 hours) up to max. 85 °C/185 °F.

Installation of battery

If the battery has been removed, tighten cable terminals on both connections again well upon reinstallation.

Rear axle center piece

When exchanging or replacing a rear axle center piece or during a reconditioning job make sure that the correct toothed wheel with the correct ratio for speed sensor is installed.

If a wheel with the wrong number of teeth is installed, this fault will not be found when checking the system with an ABS tester. The stopping distance, however, will be extended during controlled braking.

Function test

Following all jobs on brake system during which no direct components of ABS were involved, a simple operational checkup will be sufficient. This means that with the engine running and the ABS intact the yellow warning lamp in instrument cluster should go out and no longer light up after exceeding a speed of 5–7 km/h.

Such jobs include for example exchange or replacement of calipers, brake linings, brake hoses, brake disks, brake booster, tandem main cylinder, brake cable controls and components of parking brake, as well as the two brake lines on rear axle.

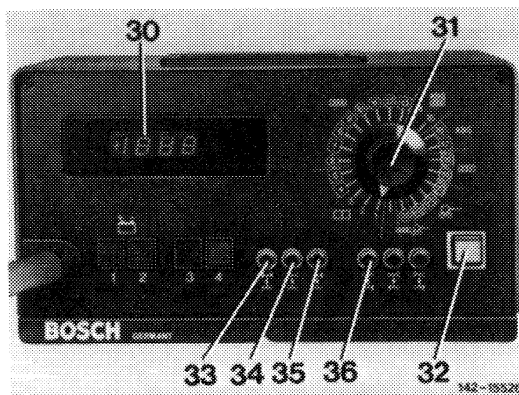
If the work includes the hydraulic unit, the electronic control unit, the speed sensors, the harness, or if units are exchanged, e.g. during repairs following an accident, the entire ABS must be checked with the available Bosch tester in combination with a brake test bench, or with an adapter together with a multimeter.

Handling of ABS components of vehicles following an accident

Parts with no visible damage need not be replaced. An exchange of the hydraulic unit, for example, is only required whenever the cover of the solenoid valves or electric lines are damaged.

Bosch tester

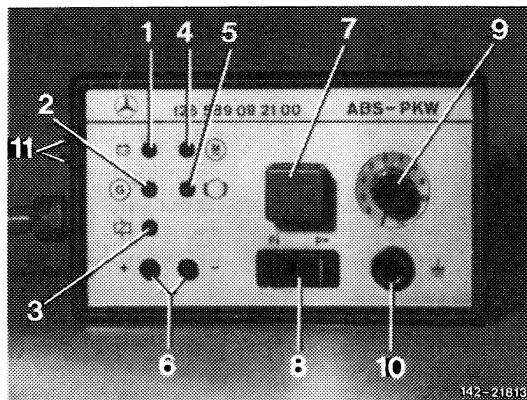
- 1 Green light (battery voltage)
- 2 Red light (battery voltage)
- 3 Green light
- 4 Red light
- 30 Digital readout
- 31 Program switch
- 32 Yellow light button
- 33 Pushbutton front wheel brake
- 34 Pushbutton front wheel brake left
- 35 Pushbutton front wheel brake right
- 36 Pushbutton rear wheel brake



Adapter

- 1 LED battery voltage
- 2 LED alternator
- 3 LED solenoid valve
- 4 LED return pump
- 5 Stop lamp
- 6 Connecting jacks for measuring instrument
- 7 Overvoltage protection
- 8 Rocker switch for reducing or holding pressure
- 9 Program switch
- 10 Ground connection button
- 11 Automatic cutout

LED = Light-Emitting-Diodes

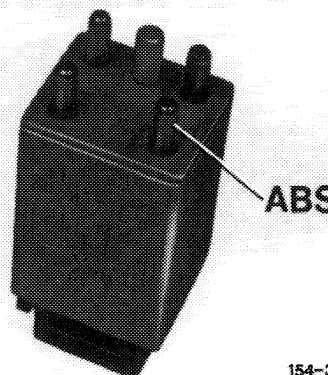


Note

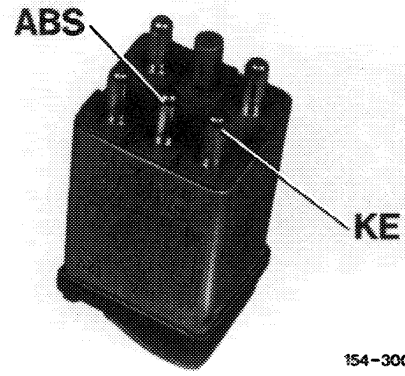
A modified overvoltage protection for electronic control unit is installed since September 1985. The modified overvoltage protection is provided with an additional pin 87 for CIS-E injection system.

The overvoltage protection has 7 pins since September 1986.

Version without CIS-E injection system up to August 1985 (4 pins)



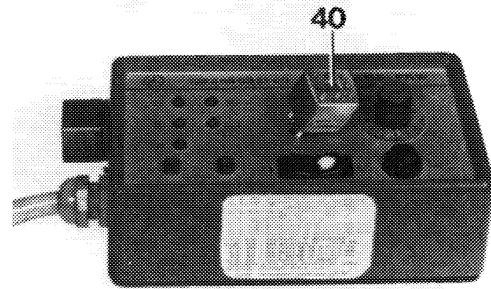
154-30024



Version with CIS-E injection system
starting September 1985 (5 pins)

154-30025

The overvoltage protection with 5 pins can be tested with the ABS tester together with the protective adapter (40) part No. 126 589 15 63 00. In addition, make sure that the version of the overvoltage protection installed in vehicle is also plugged into tester. The different versions cannot be interchanged with each other.

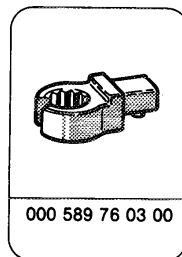
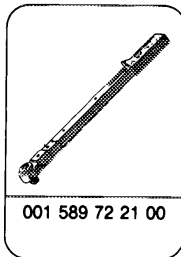


Example:
Protective adapter (40)
installed in DB adapter

142-30323

42-705 Removal and installation of hydraulic unit

Special tools



Conventional tool

Open double-box wrench 9 x 11 mm

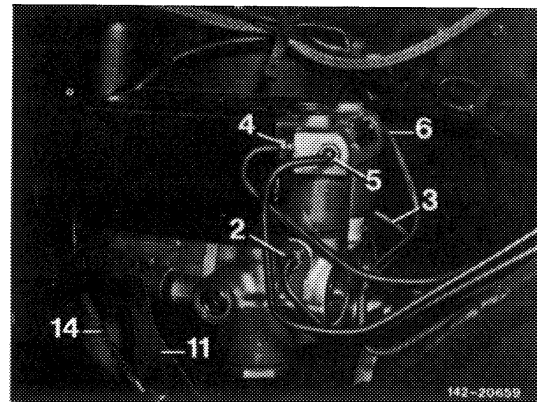
e.g. made by Hazet, D-5630 Remscheid
Order No. 612

Note

For loosening brake lines use conventional double-box wrench only.

Removal

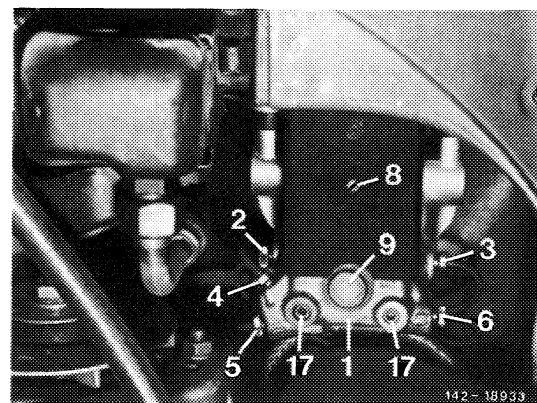
- 1 With ignition switched off, loosen grounding cable on battery.
- 2 Loosen brake lines (2 to 6) from hydraulic unit (1).
- 3 Close brake lines and connections immediately with blind plugs.



Attention!

Do not loosen sealed center bolt (9) and the two hex. socket screws (17).

- 4 Loosen fastening screw (8) and remove cover.

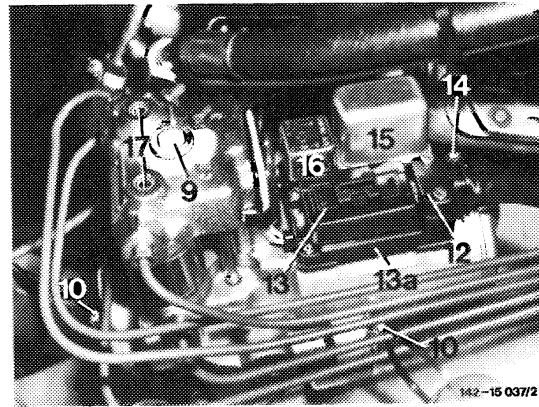


5 Disconnect grounding strap (14) from pump motor.

6 Loosen stress relief (12) and remove plug (13).

Note: The two relays (15 and 16) for pump motor or for solenoid valves can be replaced (42-710).

7 Loosen hex. nuts (10) and remove hydraulic unit.



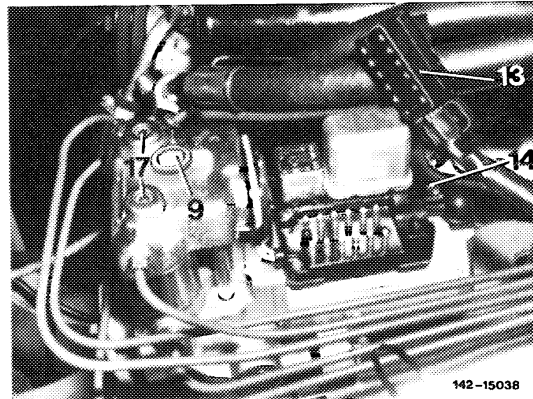
Installation

8 Mount hydraulic unit in mounting bracket and attach by means of hex. nuts (10).

9 Connect grounding strap (14) to pump motor. Mount 12-pole plug (13) and attach stress relief (12).

10 Attach cover (7) to hydraulic unit by means of screw (8).

11 Connect brake lines to hydraulic unit in accordance with identification. For this purpose, use torque wrench together with open box wrench socket.



Tightening torque 14 Nm

Torque wrench 000 589 72 21 00

Open box wrench socket 11 mm

000 589 75 03 00

Attention!

Do not mix up brake lines. Identification on hydraulic unit:

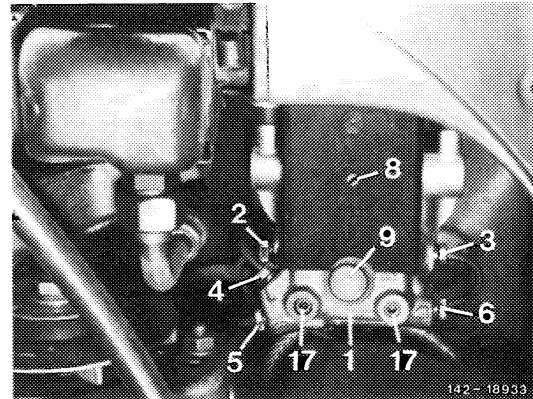
V = of stepped tandem main cylinder, front axle brake circuit

H = of stepped tandem main cylinder, rear axle brake circuit

l = from hydraulic unit to front wheel brake left

r = from hydraulic unit to front wheel brake right

h = from hydraulic unit to rear wheel brake



12 Connect grounding cable to battery.

13 Bleed brake system and check for leaks (42-010 and 42-015).

14 Complete test program (42-720).

42-708 Removal and installation of electronic control unit

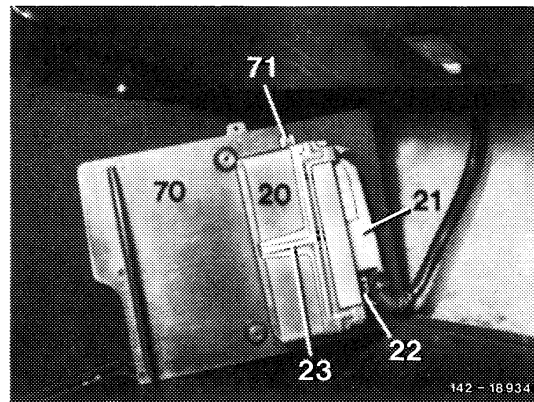
Attention!

Remove and install electronic control unit only with ignition switched off.

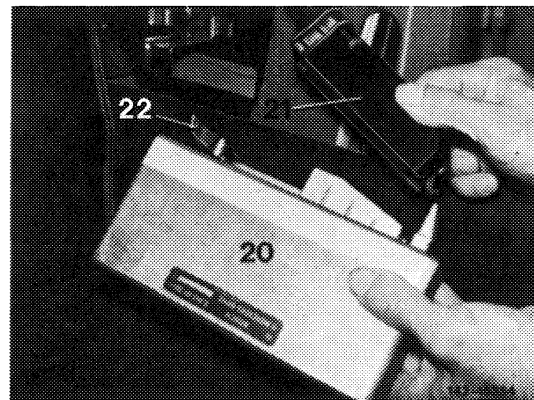
Removal

Note: The electronic control unit is located below leg support on side of front passenger.

- 1 Remove floor mat.
- 2 Loosen fastening screw on leg support and remove leg support (70).
- 3 Unscrew fastening screw (71), loosen clamp (23).



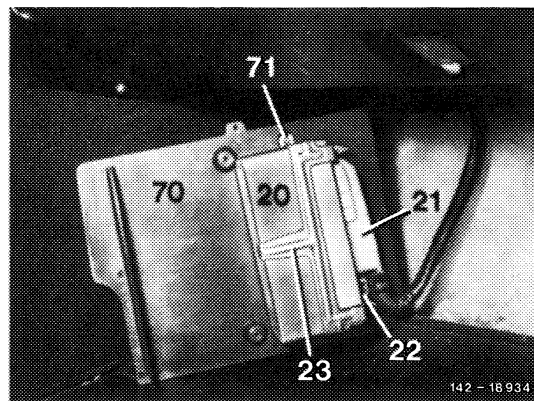
- 4 Remove electronic control unit (20) from leg support (70).
- 5 Actuate lock (22) and pull plug (21) from electronic control unit.



Installation

- 6 Mount plug (21) on electronic control unit (20). Make sure that plug engages audibly in lock (22).

- 7 Fasten electronic control unit with clamp (23) to leg support (70).
- 8 Install leg support. Put in floor mat.
- 9 Complete test program (42-720).



42-710 Removal and installation of relay and overvoltage protection

Conventional tool

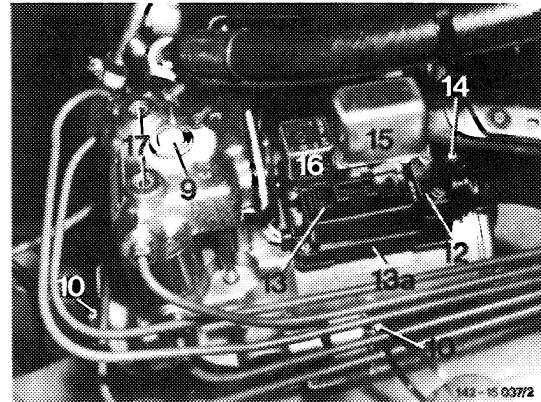
Screwdriver (Torx)

e.g. Hazet, D-5630 Remscheid
837/T 15

Note

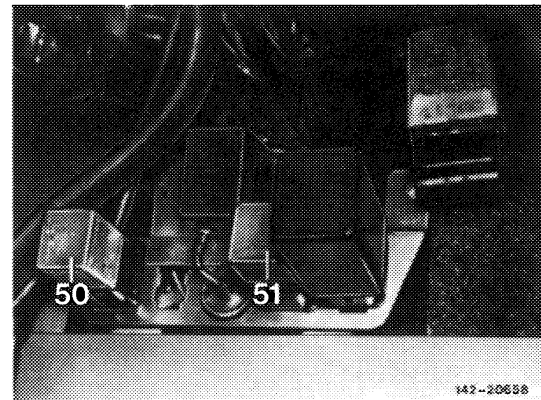
The following relays and the overvoltage protection of ABS can be exchanged with ignition switched off:

- a) Motor relay (15)
- b) Valve relay (16)



Hydraulic unit

- c) Relay for voltage supply of electronic control unit (50).
- d) Overvoltage protection (51).



Note: The relay and the overvoltage protection are located on side of front passenger in legroom at the right behind lining.

An overvoltage protection with integrated relay for voltage supply of electronic control unit and an exchangeable fuse are installed since September 1981.

A modified overvoltage protection with an additional pin 87 for the CIS-E injection system is installed since September 1985.

The overvoltage protection has 7 pins since September 1986.

42-712 Removal and installation of rpm sensor on front axle

Lubricant

Molykote Longterm 2

Tightening torque

Self-locking hex. screw for attaching
rpm sensor to steering knuckle

Nm

8

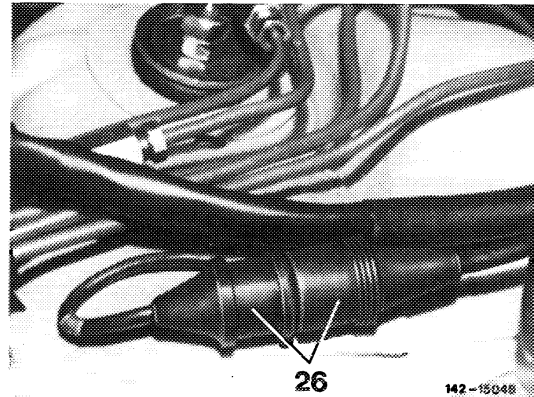
Self-locking hex. socket screws for fastening
rpm sensor to steering knuckle¹⁾

22

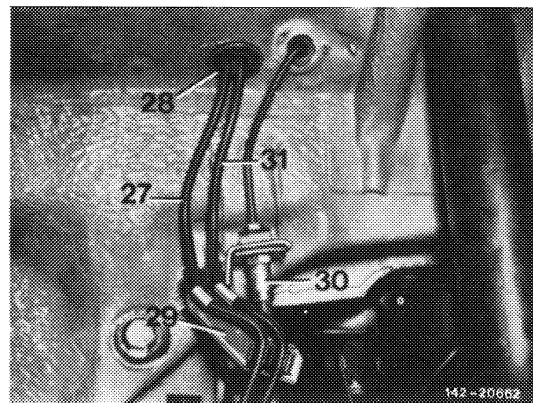
¹⁾ Starting September 1985

Removal

- 1 Remove front wheel.
- 2 With ignition switched off, separate coaxial plug (26) in engine compartment.



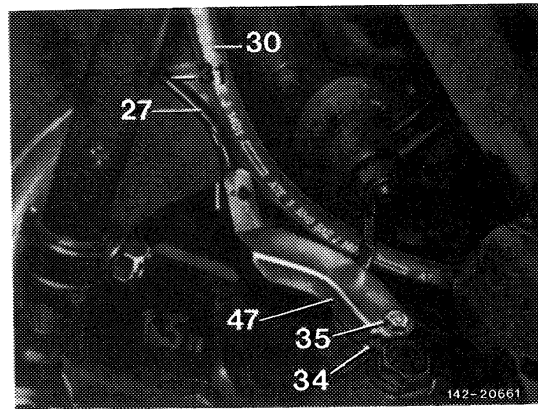
- 3 Remove cable (27) from holder (29) and pull out of wheel house through rubber grommet (28) in downward direction.



4 Loosen cable (27 and 31) from cover plate.

5 Loosen hex. screw (35), remove cover plate (47) and pull rpm sensor (34) out of steering knuckle.

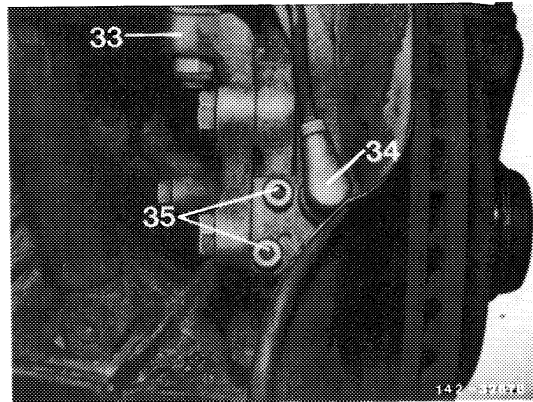
Version up to September 1985



6 Loosen hex. socket screws (35) and pull rpm sensor (34) out of steering knuckle (33).

7 Remove rpm sensor complete with cable.

Version starting September 1985



Installation

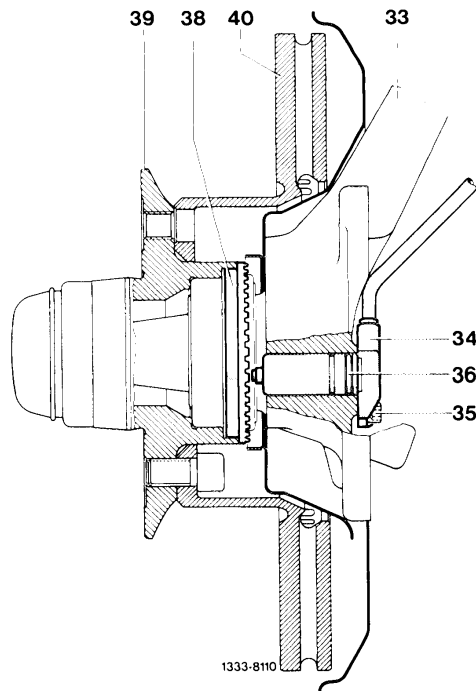
Version up to September 1985

Attention!

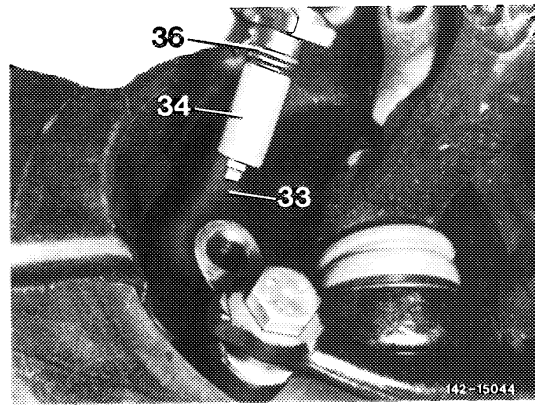
The rpm sensors are provided with different protective plates at left and right. They are identified by an L or an R punched into protective plate.

Prior to installation make sure that no metallic foreign bodies are held on magnetic edges of rpm sensor. Then coat rpm sensor and bore in steering knuckle with Molykote Longterm 2 lubricant.

- 33 Steering knuckle
- 34 Rpm sensor
- 35 Hex. socket screw
- 36 O-ring
- 38 Teeth (rotor)
- 39 Front wheel hub
- 49 Brake disk



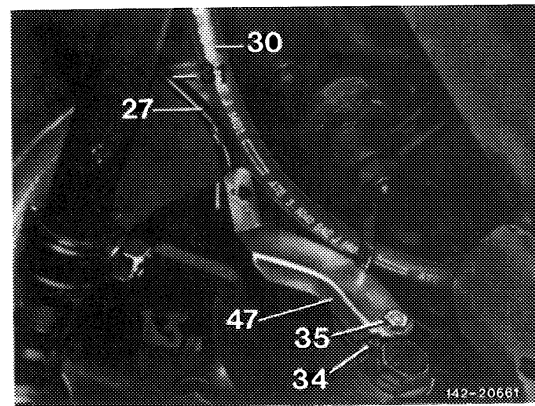
8 Replace O-ring (36) on rpm sensor, mount rpm sensor (34) on steering knuckle, making sure that the O-ring (36) is not damaged and that rpm sensor rests with its flange against steering knuckle. Do not use force.



9 Fasten rpm sensor and protective plate (47) with hex. screw (35) to steering knuckle. Tightening torque 8 Nm.

Note: The self-locking hex. socket screw may be used only once.

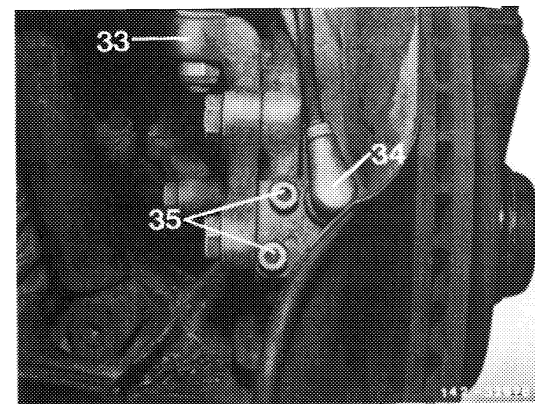
10 Clip cable (27 and 31) to cover plate (47).



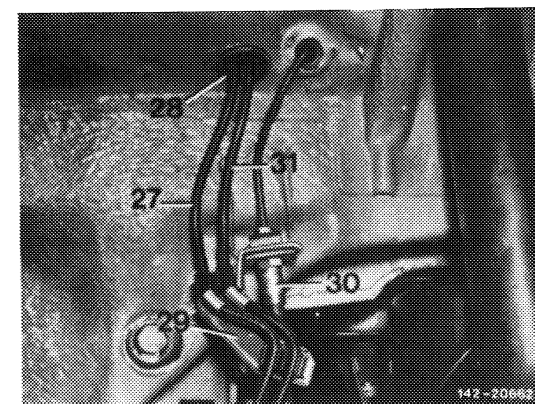
Version starting September 1985

11 Fasten rpm sensor (34) with new self-locking hex. socket screws (35) to steering knuckle (33). Use screws only once. Tightening torque 22 Nm.

Make sure that the rubber grommet between rpm sensor and steering knuckle is installed and that the rpm sensor rests with its flange against steering knuckle. Do not use force!



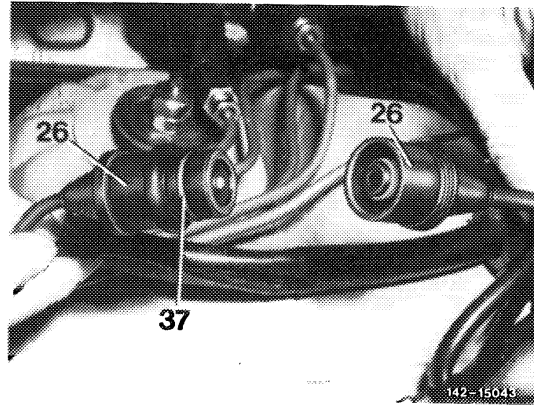
12 Clip cable (27) to holder (29) and pull through rubber grommet (28) into engine compartment.



13 Renew O-ring (37). Connect coaxial plug (26).

14 Mount front wheel.

15 Complete test program (42–720).



42-714 Removal and installation of rpm sensor on rear axle

Tightening torque

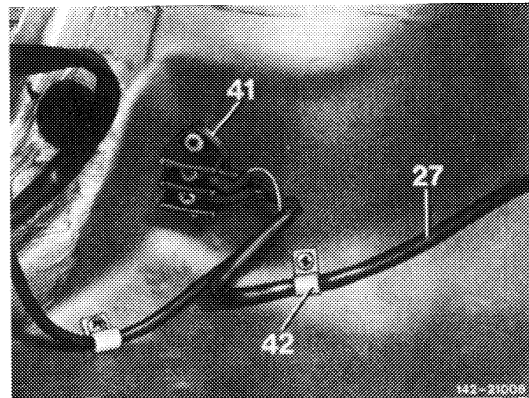
Nm

Self-locking hex. socket screw for
attaching rpm sensor to rear axle housing

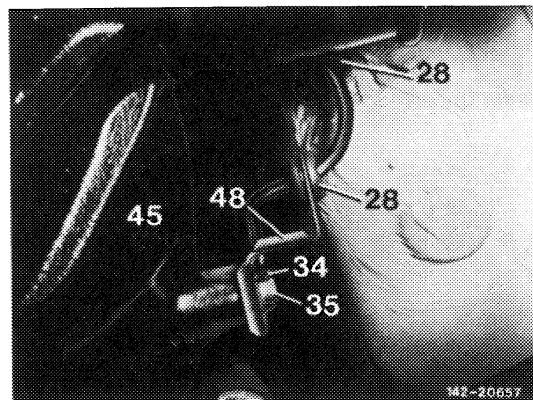
8

Removal

- 1 Remove rear seat or rear storage compartment.
- 2 With ignition switched off, loosen cable (27) on cable connector (41) and also loosen clamps by means of which the rpm sensor cable is attached.



- 3 Pull cable (27) in downward direction through rubber grommets (28) in frame floor and axle carrier.
- 4 Loosen hex. socket screw (35) and remove rpm sensor (34) from rear axle housing (45).

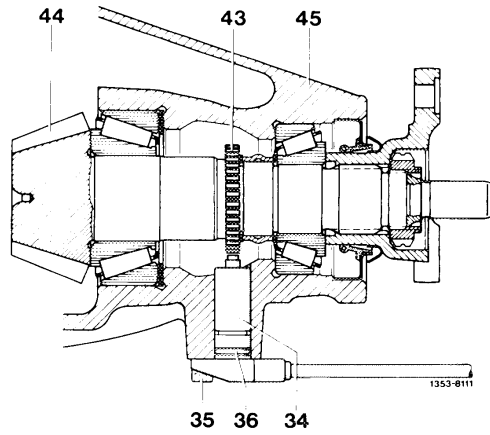


Installation

Attention!

Starting September 1985 an rpm sensor with steel flange is installed. The distance dimensions of bore in rear axle center piece for mounting the sensor and of bore for fastening screw have also changed. For this reason, the two rpm sensor versions cannot be interchanged.

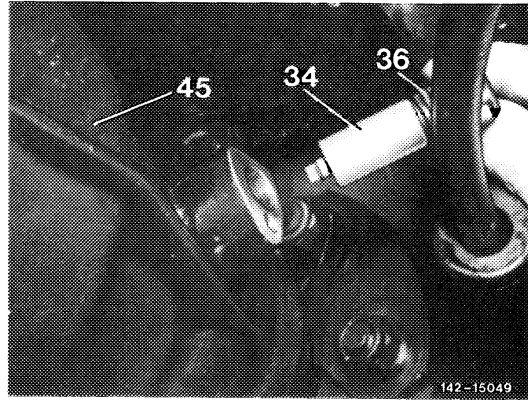
Note: Prior to installation, make sure that no metallic foreign bodies are located on magnetic edge of rpm sensor.



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

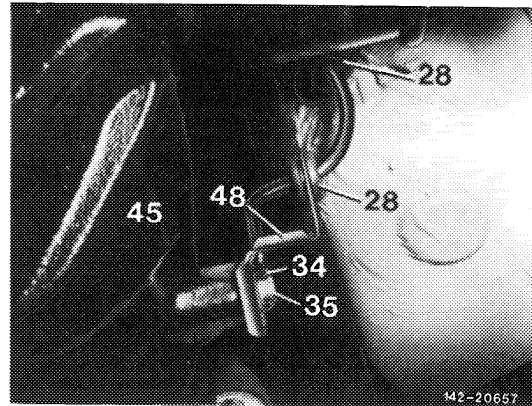
5 Replace O-ring (36) on rpm sensor (34).

6 Insert rpm sensor (34) into rear axle housing (45), making sure that the O-ring (36) is not damaged and that the rpm sensor rests with its flange against rear axle housing.



7 Attach rpm sensor with hex. socket screw (35) to rear axle housing. Tightening torque 8 Nm.

Note: Use self-locking hex. socket screw only once.

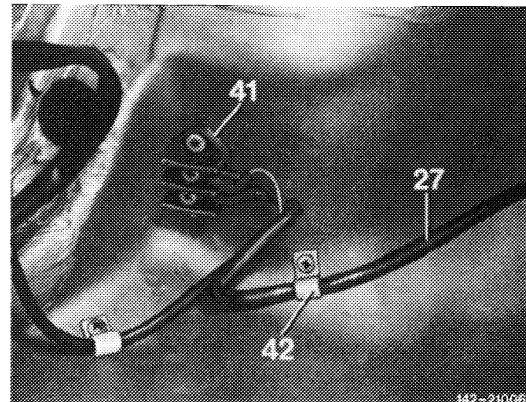


8 Pull cable (27) in upward direction through rubber grommets (28) in axle carrier and frame floor and connect to cable connector (41).

9 Attach cable (27) with clamps.

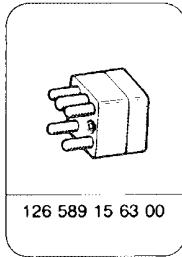
10 Install rear seat or rear storage compartment.

11 Complete test program (42-720).



A. Testing with Bosch tester

Special tool



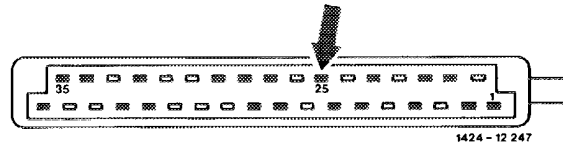
Conventional tool

Tester	e.g. Bosch Type ETT 016.00 Order No. 0684 101 600
--------	---

Note

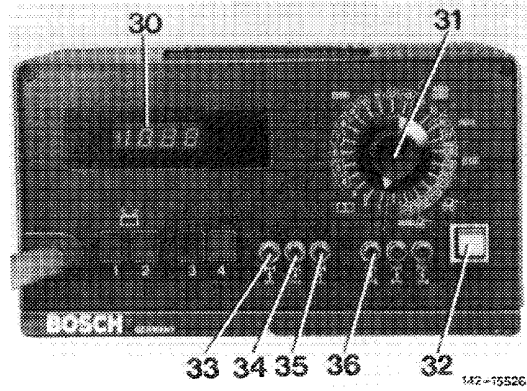
Perform all test steps, starting with test step 1, on principle. Except on electronic control unit with green Bosch type rating plate and Bosch number 0 265 101 011 or blue type rating plate and Bosch No. 0 265 101 016 of the series phased-in starting February 1984. This electronic control unit can no longer be tested with the Bosch tester. Test steps 13, 16, 17, 18 and 19 have been eliminated.

Owing to the modified electronic control unit the ABS cable harness is also modified, since the stop lamp switch has been additionally included in the ABS logics. The stop lamp switch is connected to the 35-pole plug on pin 25 and should be checked as follows:



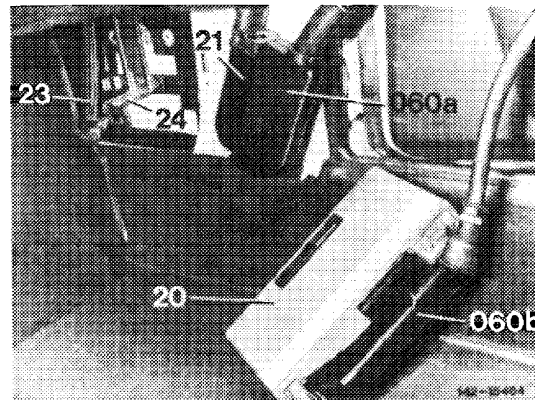
Actuate brake and measure voltage between PIN 25 and ground by means of a voltmeter, e.g. SUN-DMM5 or Avometer 2003. To prevent damaging the contact on cable plug, it is recommended to use the pertinent connecting cable from „electric connection set“.

- 1 Green light (battery voltage)
- 2 Red light (battery voltage)
- 3 Green light
- 4 Red light
- 30 Digital readout
- 31 Program switch
- 32 Yellow light button
- 33 Pushbutton front wheel brake
- 34 Pushbutton front wheel brake left
- 35 Pushbutton front wheel brake right
- 36 Pushbutton rear wheel brake

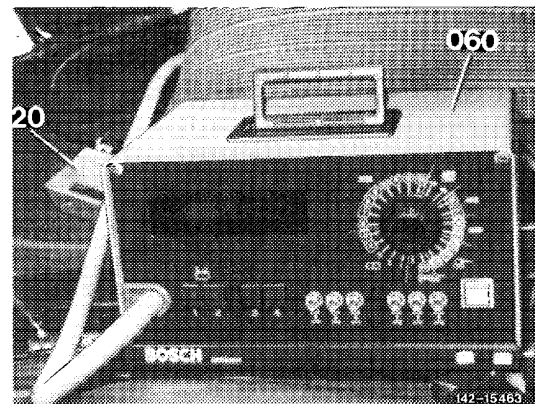


Connecting tester

- 1 Remove electronic control unit (20) with ignition switched off.
- 2 Connect multi-pole plug (35-pole) (21) of cable set for electronic control unit to plug (060a).
- 3 Attach plug (060b) of tester to electronic control unit, holding spring should engage audibly on plug.
- 4 Switch on ignition, make sure that all the other consumers are switched off.



Note: Do not drive vehicle with tester connected.



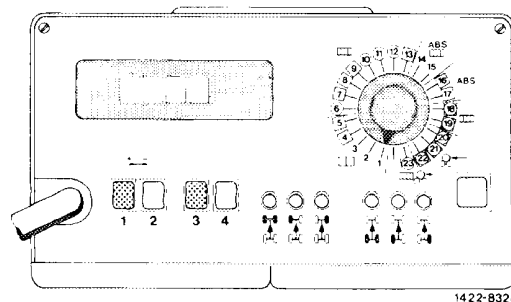
Testing battery voltage (at all program switch positions).

Note

The battery voltage is constantly monitored during entire test sequence. Lamps (1) and (2) are check lights.

If no lamp lights up, the power supply to the electronic control unit and to tester is interrupted.

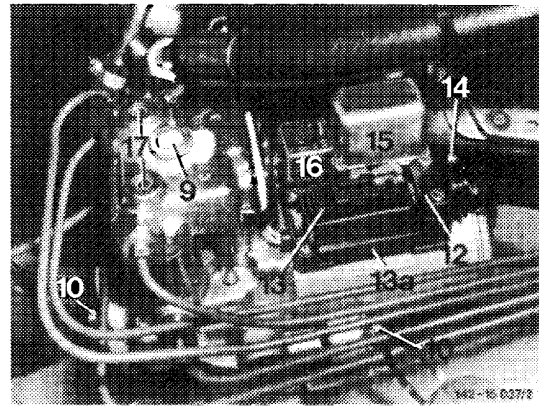
Since September 1981 the overvoltage protection (51) and the relay (50) for the power supply of the electronic control unit are one unit.



1. Poor contact of plug connection at valve relay (16).
2. Lines to valve relay interrupted (refer to electric wiring diagram).
3. Valve relay (16) defective.

Remedy

1. Check plug connection.
2. Check lines from harness and in plug socket of hydraulic unit.
3. Replace valve relay (16).



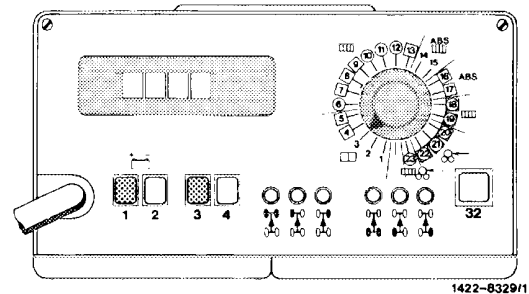
Test step 3

Testing relay for motor of return pump in rest position.

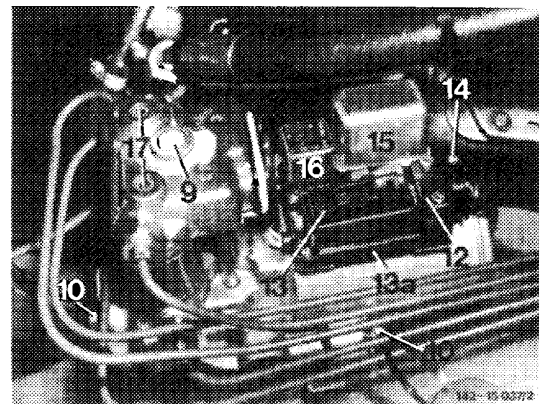
Actuation: none

Readout

Good	Fault
Lamp 1 (green) Lamp 3 (green)	Lamp 4 (red)



1. Poor contact at plug connection on motor relay (15).
2. Lines to motor relay interrupted (refer to electric wiring diagram).
3. Grounding strap (14) or positive connection loose (visual checkup).
4. Motor relay (15) defective.



Remedy

1. Check plug connections.
2. Check lines to motor relay and in plug socket of hydraulic unit.
3. Attach grounding strap or positive connection.
4. Replace motor relay.

Test step 4

Testing contacted relay for motor of return pump.

Actuation

Push yellow light button (32).

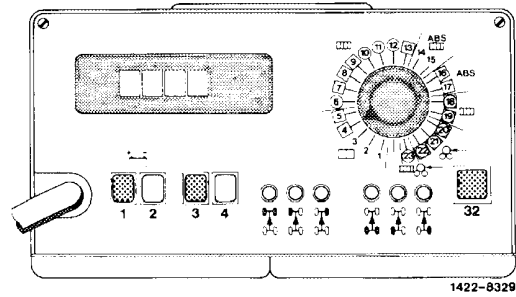
Readout

Good

Lamp 1 (green)
Lamp 3 (green),
lights up upon
actuation of yellow
light button (32),
(pump motor runs
following actuation
of yellow light button).

Fault

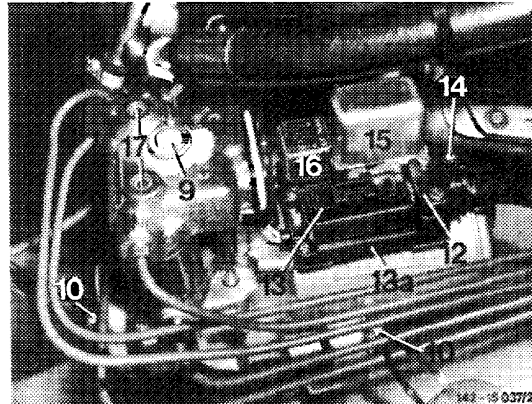
Lamp 4 (red),
lights up following
actuation of yellow
light button (32).



1. Poor contact at plug connection on motor relay (15).
2. Lines to motor relay interrupted (refer to electric wiring diagram).
3. Grounding strap (14) loose (visual checkup).
4. Motor relay (15) defective.

Remedy

1. Check plug connections.
2. Check lines to motor relay and in plug socket of hydraulic unit.
3. Fasten grounding strap.
4. Replace motor relay.



Possible faults:

- a) Multi-pole plug (35-pole) (21) not connected.
- b) Line from battery to overvoltage protection interrupted (refer to electric wiring diagram).
- c) Overvoltage protection (51) defective (refer to test step 5).
- d) Grounding line from electronic control unit to overvoltage protection (terminal 2) interrupted.
- e) Check lines to relay (50) (refer to electric wiring diagram).
- f) Relay (50) defective.
- g) Grounding line (52) to overvoltage protection (51) interrupted.

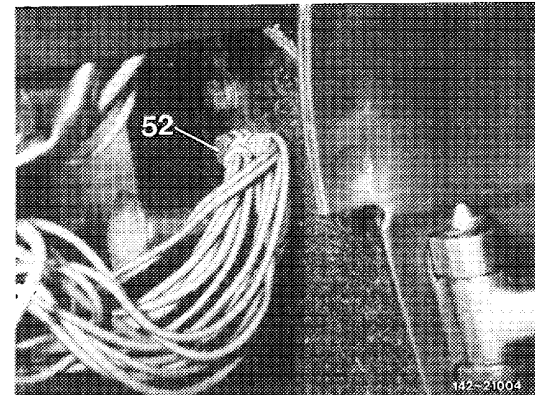
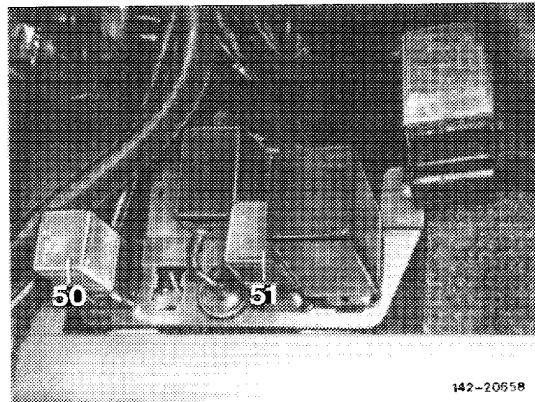
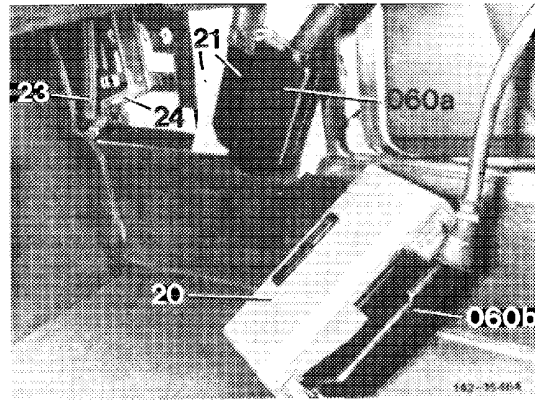
If lamp (2) lights up during one of the following test steps, the supply voltage of the battery under load of test jobs is too low.

Readout	
good	fault
Lamp 1 (green)	Lamp 2 (red)

1. Battery voltage < (smaller) 10.8 V
2. Battery voltage > (higher) 15 V

Remedy

1. Check battery and recharge, if required.
2. Check regulating voltage of alternator.

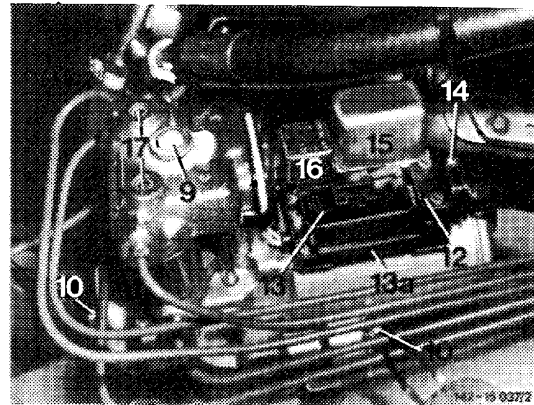
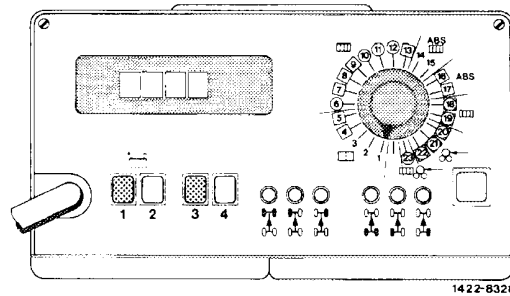


Test step 1 Testing valve relay in rest position.	
Actuation: none	
Readout	
Good	Fault
Lamp 1 (green) Lamp 3 (green)	Lamp 4 (red)

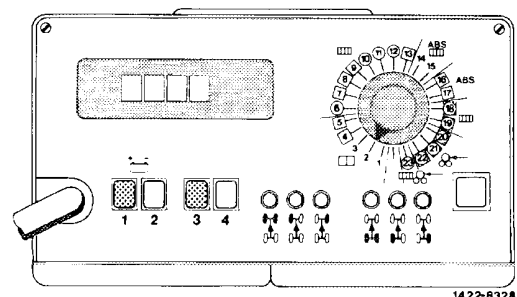
- Poor contact of plug connection on valve relay (16).
- Lines to valve relay interrupted (refer to electric wiring diagram).
- Valve relay (16) defective.

Remedy

- Check plug connection.
- Check lines from harness and in plug socket of hydraulic unit.
- Renew valve relay (16).



Test step 2 Testing contacted valve relay.	
Actuation: none	
Readout	
Good	Fault
Lamp 1 (green) Lamp 3 (green)	Lamp 4 (red)



Test step 5

Testing overvoltage protection.

Attention!

An overvoltage protection with integrated relay for voltage supply of electronic control unit and an exchangeable fuse are installed since September 1981. During the test, plug the overvoltage protection version installed in vehicle into test unit. Starting September 1985 the overvoltage protection has also been additionally modified. It can now be tested only together with the protective adapter, part No. 126 589 15 63 00. As of September 1986 overvoltage protection with 7 pins.

Note: Overvoltage protection up to September 1981. A fuse wire (arrow) can be seen through bore in rear part of overvoltage protection. The overvoltage protection may be damaged even though the fuse wire is intact.

Actuation

Switch off ignition, pull multiple plug from electric control unit. Remove overvoltage protection (51) from test socket of tester or from socket of vehicle.

Insert overvoltage protection (51) of tester (060) into plug socket of vehicle and overvoltage protection of vehicle into test socket of tester. Switch on ignition. After approx. 0.5 s, push yellow light button (32). Switch off ignition. Attach multi-pole plug to electronic control unit. Then switch on ignition again.

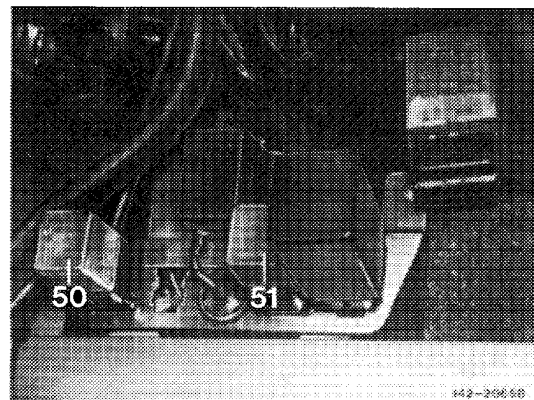
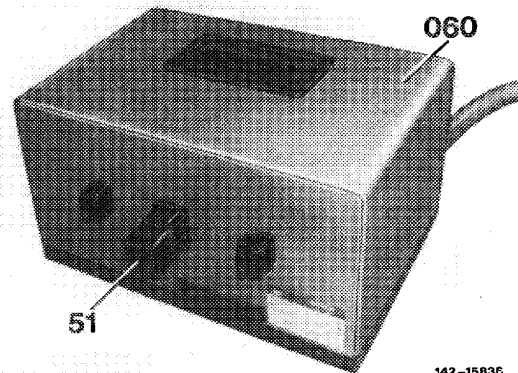
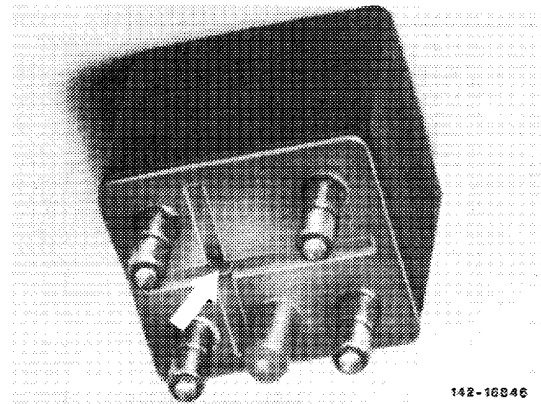
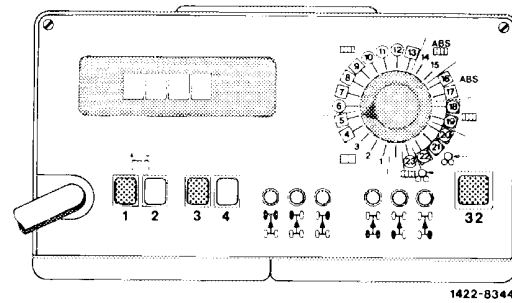
Readout

Good	Fault
Lamp 1 (green) Lamp 3 (green) lights up following actuation of yellow light button.	Lamp 4 (red) lights up following actuation of yellow light button. (Repeat test step).

Overvoltage protection defective.

Remedy

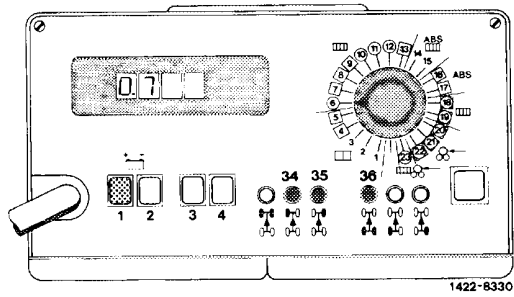
Replace overvoltage protection (51).



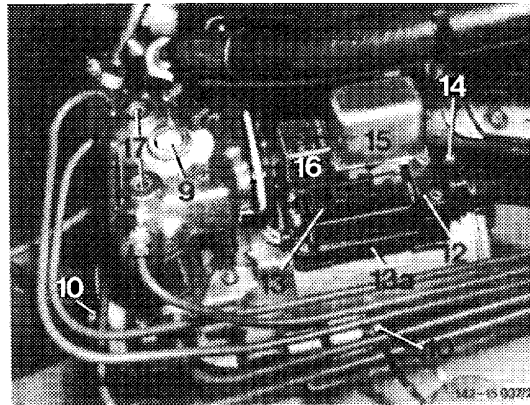
Test step 6
Testing internal resistance of solenoid valves.

Actuation
Depress pushbutton VL (34), VR (35) and HA (36) one after the other. Read value on tester after pushing each button.

Readout	
Good	Fault
Lamp 1 (green) Digital readout: between 0.7 Ω – 1.7 Ω	Readout: > (higher) 1.7 Ω – 999 Ω < (lower) 0.7 Ω



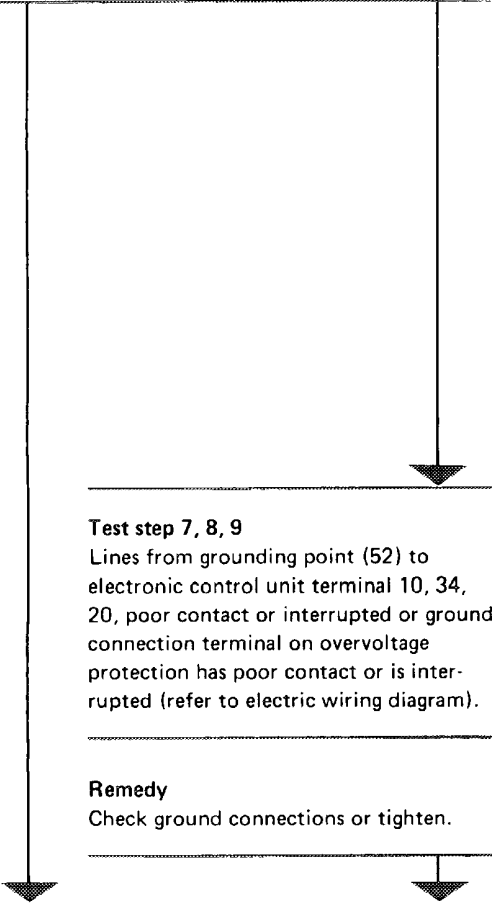
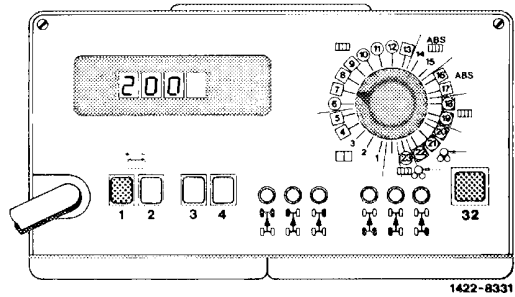
- Poor contact at plug connection on hydraulic unit.
- Lines to respective valve interrupted (refer to electric wiring diagram). Lines in plug socket of hydraulic unit interrupted.
- Respective valve has short circuit or interturn ground connection.



Remedy

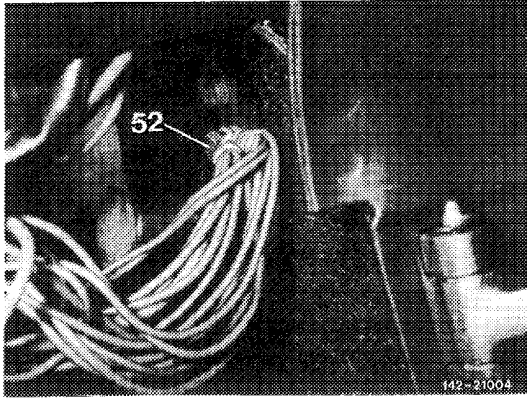
- Check plug connections and spray with contact spray, if required.
- Check lines, also in plug socket of hydraulic unit.
- Replace hydraulic unit.

<p>Test step 7 Testing ground connection from overvoltage protection to electronic control unit terminal 10.</p> <p>Test step 8 Ground connection from grounding point (52) to electronic control unit terminal 34.</p> <p>Test step 9 Ground connection from grounding point (52) to electronic control unit terminal 20.</p> <p>Actuation Push yellow light button (32).</p>									
<p>Readout</p> <table border="1"> <thead> <tr> <th>Good</th> <th>Fault</th> </tr> </thead> <tbody> <tr> <td>Lamp 1 (green) Digital readout:</td> <td>Readout:</td> </tr> <tr> <td>Test step 7 between 110 mV – 300 mV</td> <td>> (higher) 300 mV < (lower) 110 mV</td> </tr> <tr> <td>Test step 8 and 9 between 40 mV – 250 mV</td> <td>> (higher) 250 mV < (lower) 40 mV</td> </tr> </tbody> </table>		Good	Fault	Lamp 1 (green) Digital readout:	Readout:	Test step 7 between 110 mV – 300 mV	> (higher) 300 mV < (lower) 110 mV	Test step 8 and 9 between 40 mV – 250 mV	> (higher) 250 mV < (lower) 40 mV
Good	Fault								
Lamp 1 (green) Digital readout:	Readout:								
Test step 7 between 110 mV – 300 mV	> (higher) 300 mV < (lower) 110 mV								
Test step 8 and 9 between 40 mV – 250 mV	> (higher) 250 mV < (lower) 40 mV								



Test step 7, 8, 9
Lines from grounding point (52) to electronic control unit terminal 10, 34, 20, poor contact or interrupted or ground connection terminal on overvoltage protection has poor contact or is interrupted (refer to electric wiring diagram).

Remedy
Check ground connections or tighten.



Test step 10

Testing internal resistance of speed sensor.

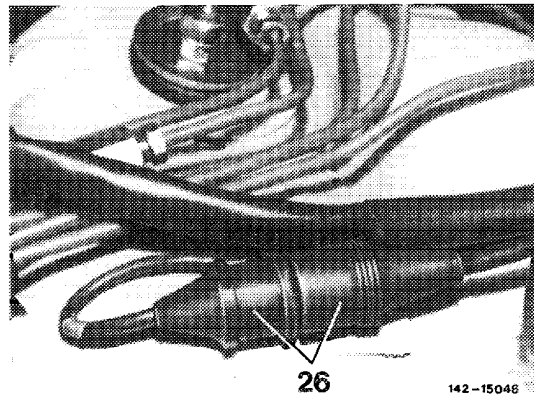
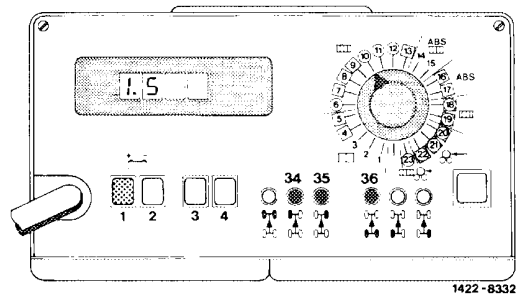
Actuation

Depress pushbutton VL (34), VR (35) and HA (36) one after the other.

After pushing each button, read value on tester.

Readout

Good	Fault
Lamp 1 (green)	Readout:
Digital readout for:	Front axle
Front axle	< (lower) 0.85 Ω
0.85 k Ω – 2.3 k Ω	> (higher) 2.3 k Ω
Rear axle	Rear axle
0.6 k Ω – 1.6 k Ω	< (lower) 0.6 k Ω
	> (higher) 1.6 k Ω



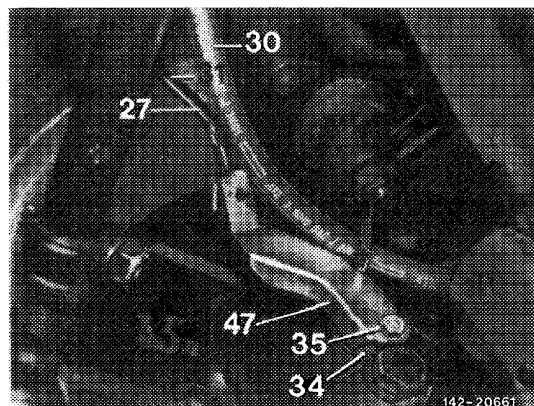
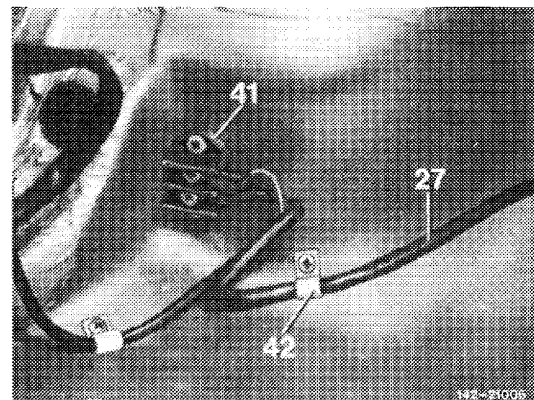
1. Poor contact at coaxial plugs (26) or cable connector (41).
2. Line to respective speed sensor interrupted.
3. Speed sensor defective.

Remedy

1. Test coaxial plug or plug connector.
2. Pull off both coaxial plugs (26) and test lines to electronic control unit.

Disconnect lines on cable connector (41) and test.

3. Replace respective speed sensor.

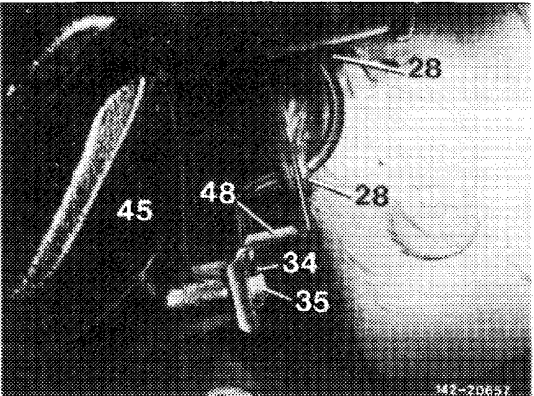
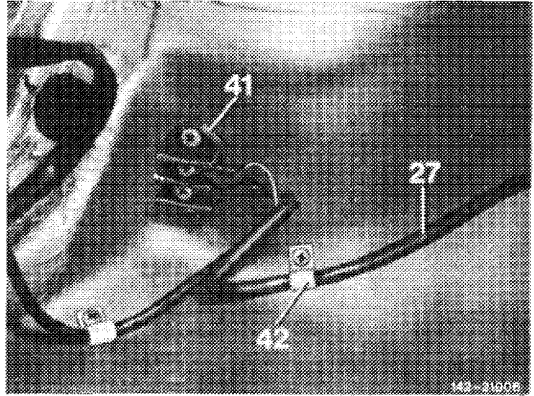
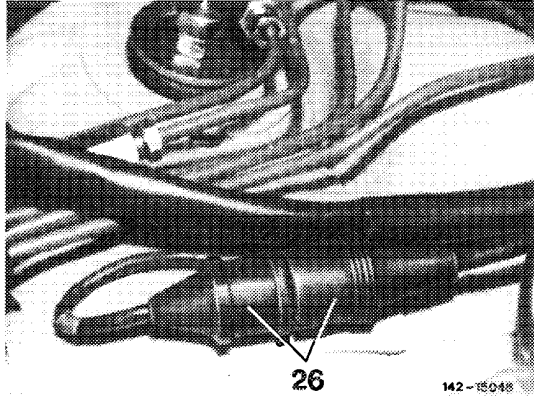
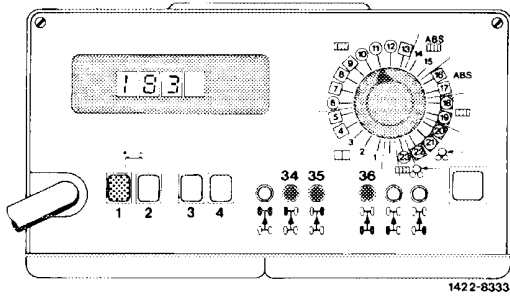


Test step 11
Testing insulation resistance of speed sensor against ground.

Actuation
Depress pushbutton VL (34), VR (35) and HA (36) one after the other.

After pushing each button, read value on tester.

Readout	
Good	Fault
Lamp 1 (green) Digital readout: > (higher) 20 kΩ (max. 999)	Readout: < (lower) 20 kΩ



1. Line to respective speed sensor has ground connection.
2. Coaxial plug or cable connector has ground connection.
3. Rpm sensor has ground connection.

Remedy

1. Test line to rpm sensor.
2. Test coaxial plug or cable connector.
3. Replace respective rpm sensor.

Test step 12

Testing insulation resistance of speed sensor against supply voltage.

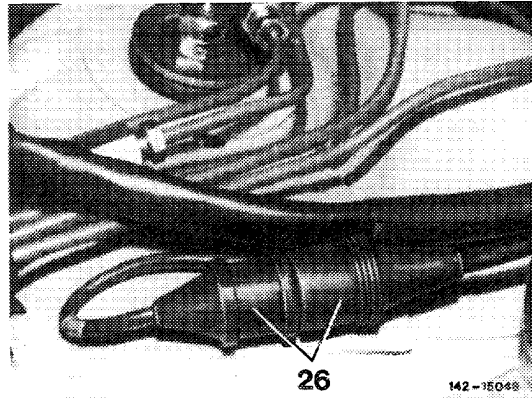
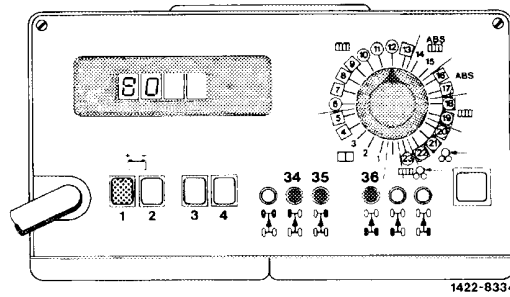
Actuation

Depress pushbutton VL (34), VR (35) and HA (36) one after the other.

After pushing each button read value on tester.

Readout

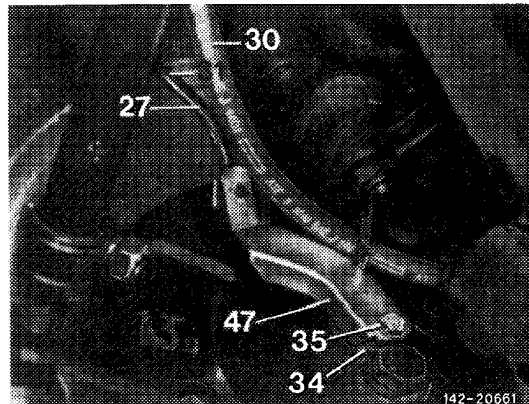
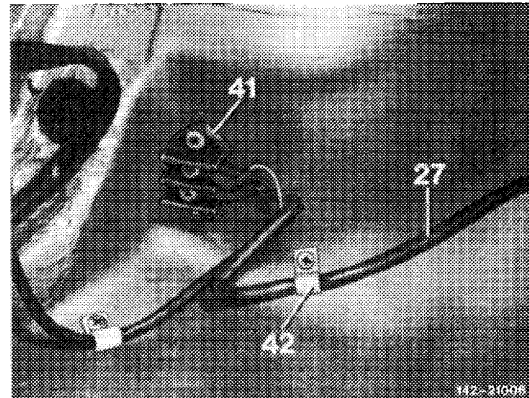
Good	Fault
Lamp 1 (green) Digital readout: between 0 – 100 mV	Readout: > (higher) 100 mV (max. 999)



Line from rpm sensor to electronic control unit shorted against plus (12 V).

Remedy

Repair line from rpm sensor to electronic control unit or renew.

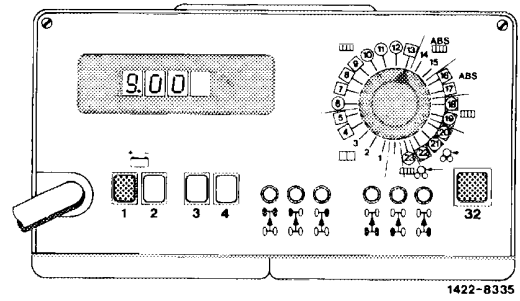


Test step 13
Testing electronic control unit (internal electronic voltage).

Note
Not possible on electronic control unit
3rd version with green or blue type rating plate. Installed starting February 1984.

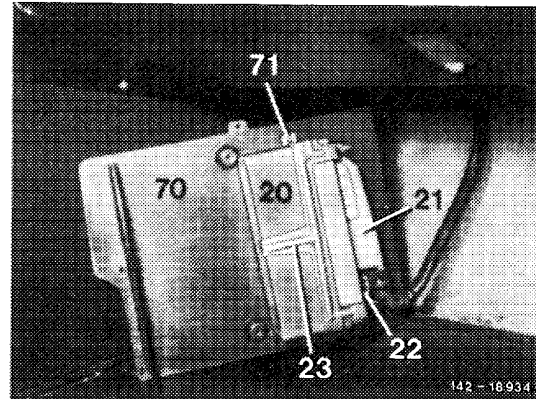
Actuation
Depress yellow pushbutton (32) up to digital tester.

Readout	Fault
Good	
Lamp 1 (green) Digital readout: between 8.82 – 9.18 V	Readout: < (lower) 8.82 V > (higher) 9.18 V



Electronic control unit defective.

Remedy
Replace electronic control unit (20).



Test step 14

Testing function of ABS indicator lamp.
(Diode in flow direction).

Actuation: none

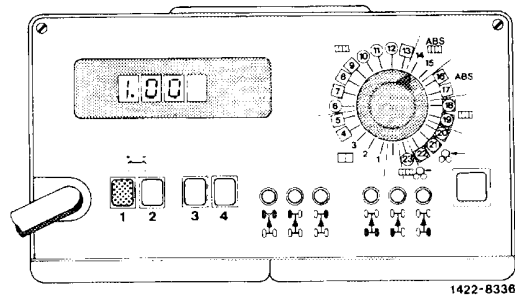
Readout

Good

Fault

Lamp 1 (green)
ABS indicator lamp
lights up.
Digital readout:
between 0.4–1.5 V

ABS indicator lamp
not lighting up.
Readout:
< (lower) 0.4 V
> (higher) 1.5 V



1422-8336

1. Indicator lamp defective.
2. Line from plug socket (13a) of hydraulic unit (terminal 7) to 35-pole multi-plug (terminal 29) of electronic control unit interrupted (refer to electric wiring diagram).
3. Diode in plug socket (13a) of hydraulic unit or in valve relay (16) interrupted or short-circuit.

Note

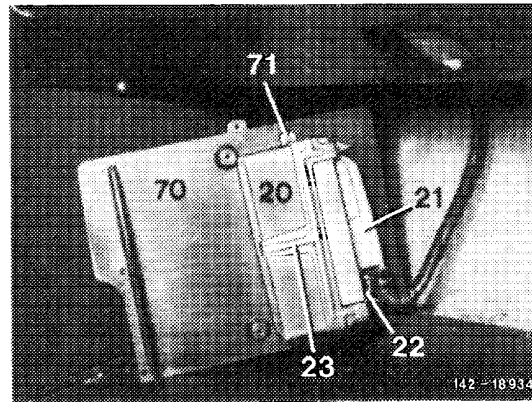
Modified hydraulic unit without diode in plug socket since early 1986.

Remedy

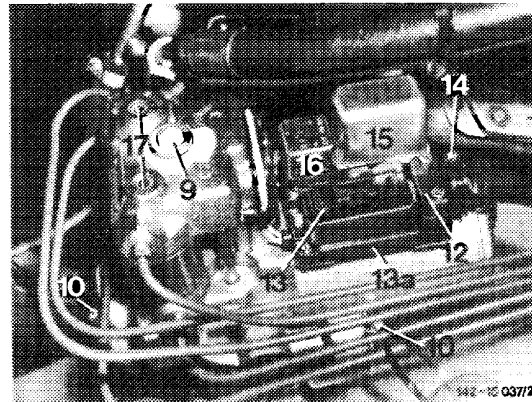
1. Replace indicator lamp.
2. Check lines.
3. Replace hydraulic unit or valve relay (16).

Attention!

If the ABS indicator lamp goes out upon replacement of hydraulic unit with ignition switched on but without the engine running, also replace the electronic control unit since it is a consecutive damage of the defective diode.

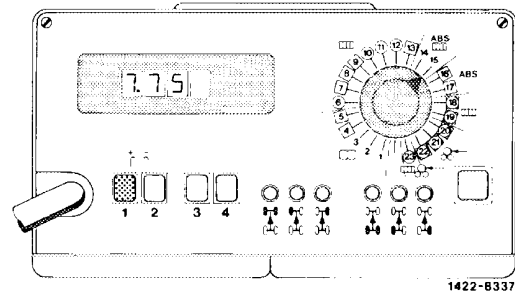


142-18934



142-12 037/2

<p>Test step 15 Testing function of ABS indicator lamp (diode in locking direction).</p> <p>Actuation: none</p>					
<p>Readout</p> <table border="1"> <thead> <tr> <th>Good</th> <th>Fault</th> </tr> </thead> <tbody> <tr> <td>Lamp 1 (green) ABS indicator lamp lights up darker. Digital readout: between 5.5–8.5 V</td> <td>Readout: ABS indicator lamp not lighting up. < (lower) 5.5 V > (higher) 8.5 V</td> </tr> </tbody> </table>		Good	Fault	Lamp 1 (green) ABS indicator lamp lights up darker. Digital readout: between 5.5–8.5 V	Readout: ABS indicator lamp not lighting up. < (lower) 5.5 V > (higher) 8.5 V
Good	Fault				
Lamp 1 (green) ABS indicator lamp lights up darker. Digital readout: between 5.5–8.5 V	Readout: ABS indicator lamp not lighting up. < (lower) 5.5 V > (higher) 8.5 V				



1. Indicator lamp defective.
2. Lines to indicator lamp interrupted (refer to electric wiring diagram).
3. Diode in plug socket (13a) of hydraulic unit or in valve relay (16) interrupted or short-circuit.

Note

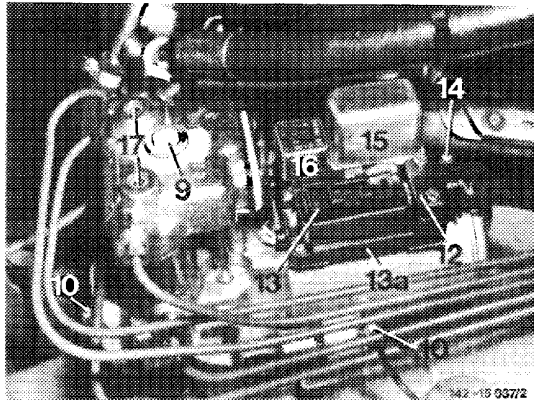
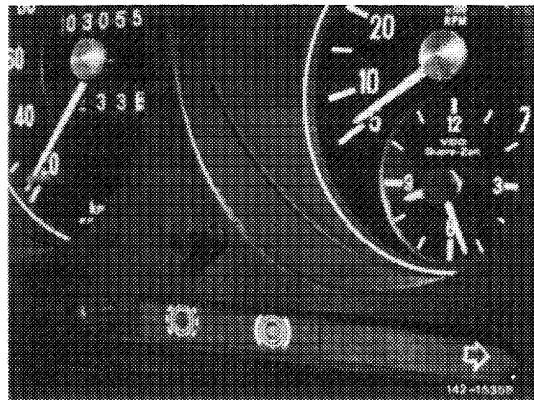
Modified hydraulic unit without diode in plug socket since early 1986.

Remedy

1. Test indicator lamp.
2. Test line to indicator lamp.
3. Replace hydraulic unit or valve relay (16).

Attention!

If the ABS indicator lamp goes out upon replacement of hydraulic unit with ignition switched on but without the engine running, also replace the electronic control unit since it is a consecutive damage of the defective diode.



Perform test steps 16–22 with engine running.

Test step 16

Testing electronic control unit, completing test cycle.

Note

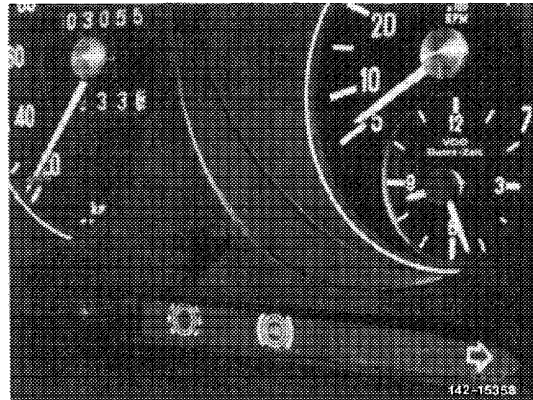
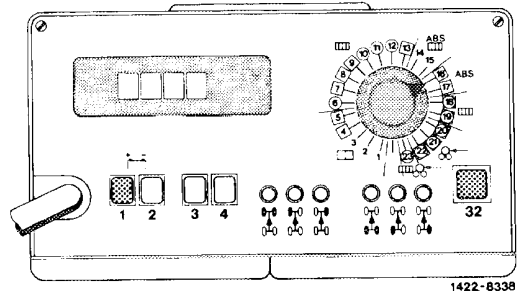
Not possible on electronic control unit 3rd version with green or blue type rating plate. Installed starting February 1984.

Actuation

Push yellow light button (32).

Readout

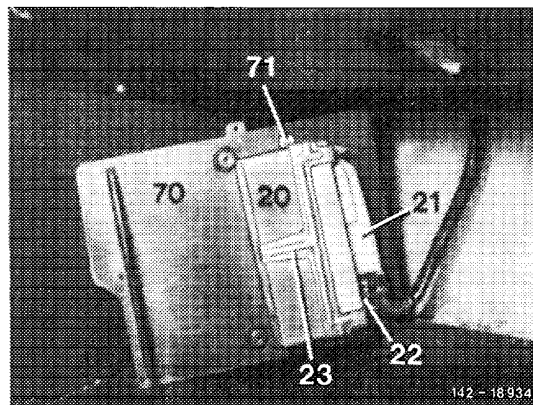
Good	Fault
Lamp 1 (green) ABS indicator lamp in instrument cluster goes out after approx. 0.5 s.	ABS indicator lamp not going out. (If in doubt, repeat test step).



Electronic control unit defective.

Remedy

Replace electronic control unit (20).

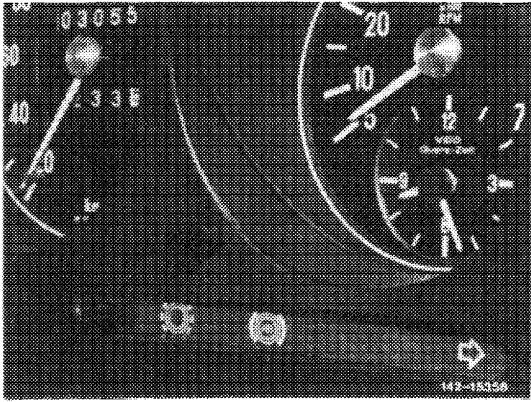
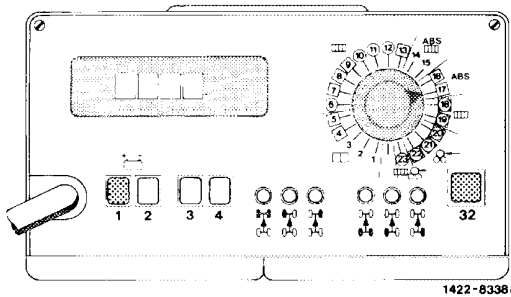


Test step 17
 Testing electronic control unit (test cycle with input of a simulated fault).

Note
 Not possible on electronic control unit 3rd version with green or blue type rating plate. Installed starting February 1984.

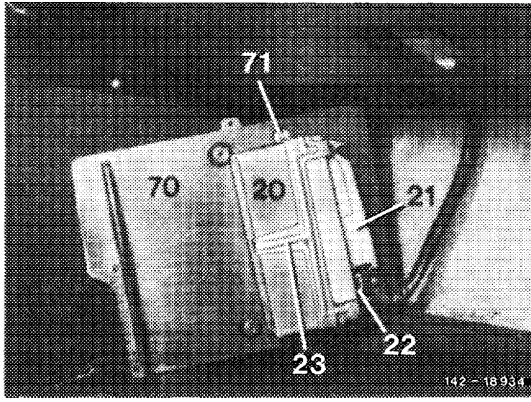
Actuation
 Depress yellow pushbutton (32) approx. 2 s.

Readout	
Good	Fault
Lamp 1 (green) ABS indicator lamp in instrument cluster goes out for a short moment and lights up again.	ABS indicator lamp goes out and is not lighting up again.



Electronic control unit defective.

Remedy
 Replace electronic control unit (20).



Test step 18

Testing electronic control unit (current to solenoid valve "pressure-holding stage").

Note

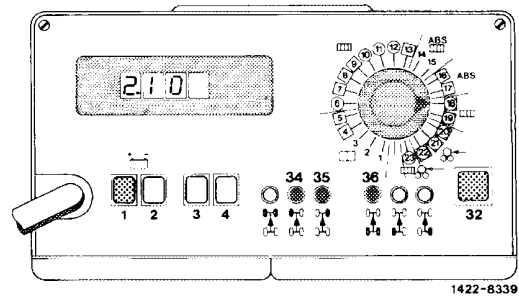
Not possible on electronic control unit 3rd version with green or blue type rating plate. Installed starting February 1984.

Actuation

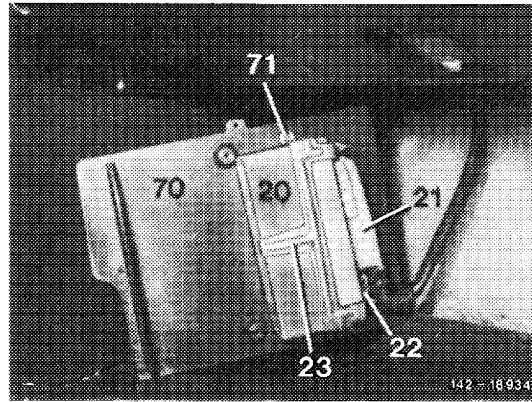
Attention! Do not actuate brake pedal. Wait for approx. 5 s after test step 17, then depress push-buttons VL (34), VR (35) and HA (36) one after the other. Additionally push yellow light button (32) at each pushbutton position. After releasing yellow light button, wait for zero readout and only then push yellow light button again. Following each actuation of pushbutton and light button, read value on tester.

Readout

Good	Fault
Lamp 1 (green) Digital readout between 1.9–2.3 A	Readout: < (lower) 1.9 A > (higher) 2.3 A



1422-8339



142-18934

Electronic control unit defective.

Remedy

Replace electronic control unit (20).

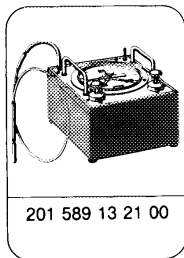


43-023 Inspection of check valve

Data

Test vacuum in bar	0.75-0.8
Duration of test	30 s
Pressure drop in bar vacuum	0.2

Special tool



Self-made tool

Measuring connection

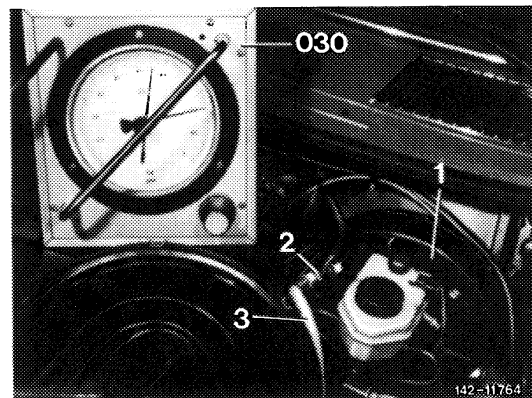
refer to Illustration item 2, note

Note

Inspect check valve in vacuum line for leaks each time the brake unit is renewed.

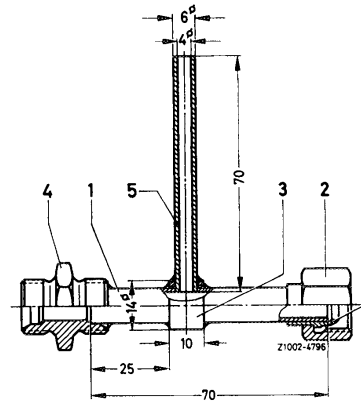
Checkup

- 1 Loosen vacuum line (3) on brake unit (1) and attach measuring connection (2) between brake unit and line.
- 2 Connect tester for vacuum (030) to measuring connection (2).



Note: The measuring connection is self-made according to specified dimensions (parts 1, 3, 4, 5 and 6 are brazed to each other). For connection to brake unit, the pipe member including the coupling nut of an old vacuum line may be used. Connection to vacuum line is made by means of a screw connection.

3 Run engine warm and establish a vacuum of 0.75–0.8 bar by accelerating and sudden release of accelerator pedal.



4 Inspect check valve for leaks. The available vacuum should drop by no more than 0.2 bar within 30 seconds. If the dropping vacuum is higher, replace check valve including vacuum line.

Note: Repeat leak test upon installation of a new vacuum line. If the pressure drop is still too high, the leak may be the result of damaged screw connections or a leaking brake unit.

43-325 Checking the brake unit

Data

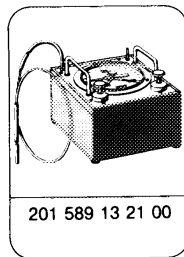
Pressure against brake pedal N	bar vacuum	Line pressure bar gauge pressure		
		Teves T 51/1802 9" double ¹⁾	Teves T 52/225 T 9" double ²⁾	Girling LSC 115 T Teves T52/4A 225-210 8"/9" double ³⁾
50	0.75-0.8	7- 15	2- 12	
100		30- 40	28- 40	
150		52- 65	54- 68	
200		75- 90	80- 97	
250		98-116	105-125	
300		121-140	132-140	
Overlap between pushrod piston of main cylinder and pushrod of brake unit			0.2-1.2	

¹⁾ Installed up to May 1977

²⁾ Installed starting June 1977 up to August 1985

³⁾ Installed starting September 1985

Special tool



Conventional tools

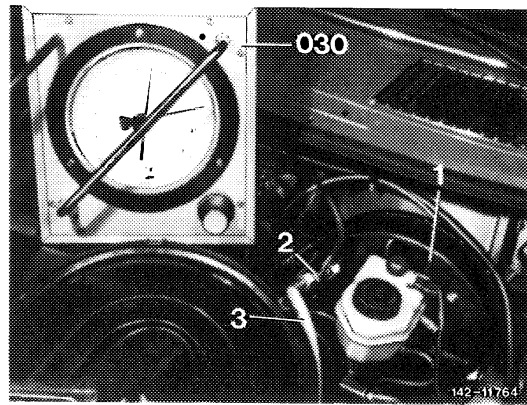
Pressure tester	e.g. Teves, D-6000 Frankfurt/M Order No. 3 9305-1020.4
Pedal pressure meter	e.g. Hofmann-Prüftechnik, D-3210 Elze 1 Order No. PKM 60

Self-made tool

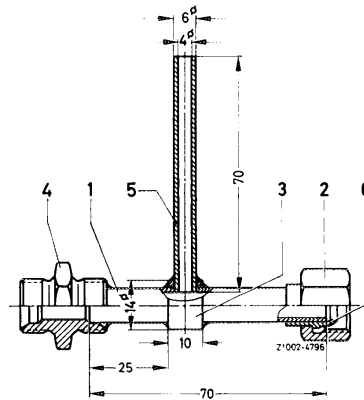
Measuring connection	refer to Fig. item 2, Note
----------------------	----------------------------

Checkup

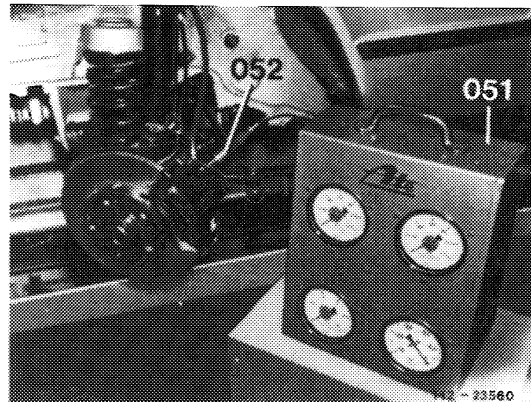
- 1 Loosen vacuum line (3) on brake unit (1) and attach measuring connection (2) between line and brake unit.
- 2 Connect vacuum tester (030) to measuring connection (2).



Note: The measuring connection is self-made according to specified dimensions (part 1, 3, 4, 5 and 6 are brazed to each other). For connection to brake unit, the pipe member including the coupling nut of an old vacuum line may be used. Connection to vacuum line is made by means of a screw connection.



- 3 Connect pressure tester (051) to a caliper. For this purpose, unscrew bleed screw and screw-in connection (052). Then bleed pressure tester.
- 4 Attach pedal force meter to brake pedal.
- 5 Run engine and establish a vacuum of 0.75–0.8 bar by acceleration and sudden release of accelerator pedal.



If only a slightly reduced vacuum is attained or if the vacuum drops off immediately, the reason may be as follows:

- a) Leaking vacuum line or leaking connections.
- b) Test check valve (43-023).
- c) Damaged sealing ring between brake unit and tandem main cylinder.

- d) Damaged vacuum seal in tandem main cylinder; as a result, air can enter from atmosphere through leak hole of main cylinder into brake unit.
 - e) Damaged sealing ring on control housing of brake unit. The sealing ring cannot be renewed with workshop equipment, therefore the brake unit must be replaced.
- 6 Run engine until a vacuum of 0.75–0.8 bar has been attained, then measure the respective line pressure with specified pressure at brake pedal.
- Note:** If the measured line pressures deviate by more than ± 10 bar gauge pressure, renew brake unit.
- 7 Remove pedal pressure meter and test instruments.
- 8 Bleed brake system at caliper only to which the pressure tester was connected (42–010).

43–350 Removal and installation of brake unit

Data

Brake unit		Teves T 51/1802 Teves T 52/225 T	Girling LSC 115 T Teves T 52/4 A 225-210
Diameter	Inch	9	8/9
	mm	228.6	203/228.6
Boosting factor		approx. 4.5	approx. 5.6
Tightening torques			Nm
Hex. nuts for mounting brake unit to front end			15
Coupling nut of vacuum line on brake unit			30

Attention!

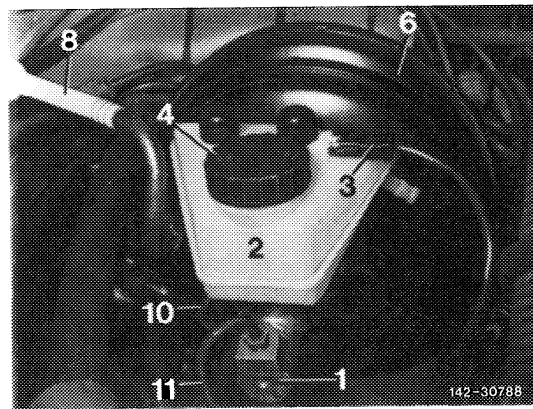
If externally no brake fluid loss can be observed, check whether brake fluid has entered the brake unit through a leaking secondary seal in tandem main cylinder. If so, proceed as follows:

1. Do **not** remove brake unit.
2. Draw off brake fluid.
3. If more than 100 cc brake fluid are in brake unit, the brake unit has also to be exchanged.

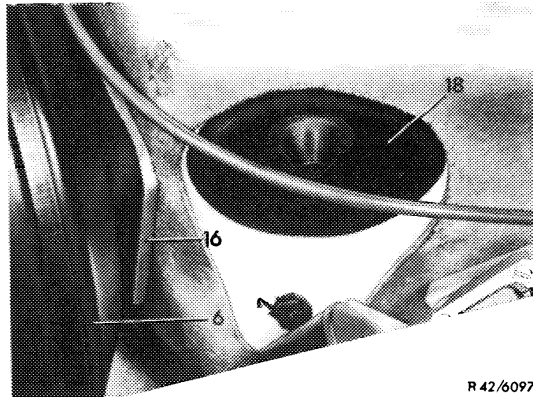
Note: The flexible diaphragm is resistant to brake fluid, but not the reaction disk and the plate valve in control member. The brake fluid may therefore only be drawn off with the brake unit installed. Up to 100 cc no brake fluid can come to the reaction disk or the plate valve with installed brake unit.

Removal

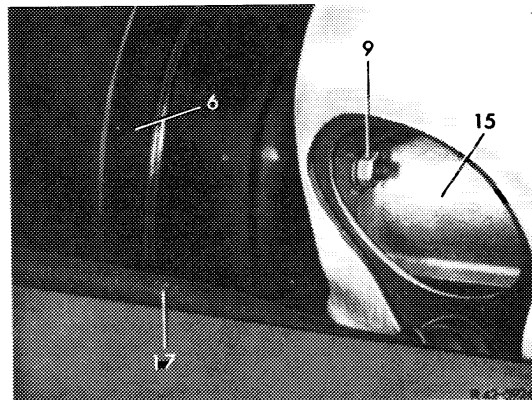
- 1 Take connecting hose (7) off of master cylinder for models with a manual transmission.
- 2 Remove tandem master cylinder (42-310).
- 3 Detach vacuum line (8) at brake unit (6).



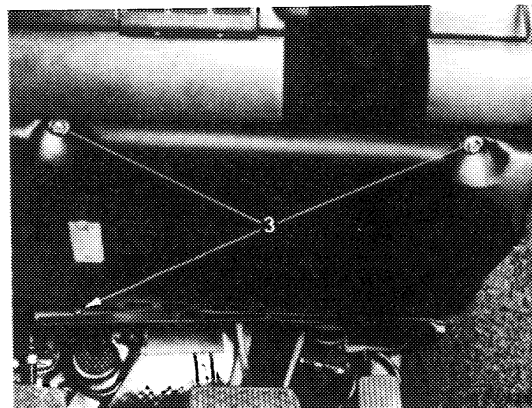
- 4 Remove rubber cover (18) at front end.



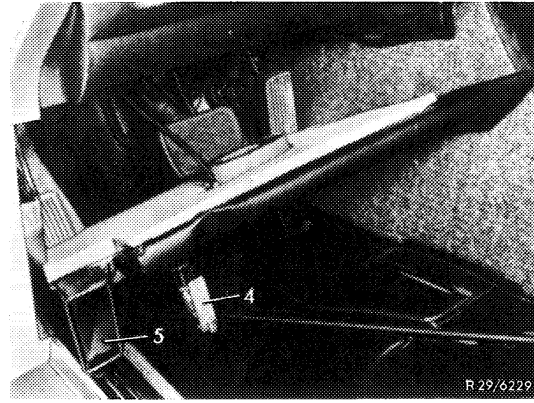
- 5 Unscrew hex. nut (9).



- 6 Unscrew cover below instrument panel in leg room (3) and pull downwards.



7 Push out leg room lamp (4), remove plug and pull cable out of cover.



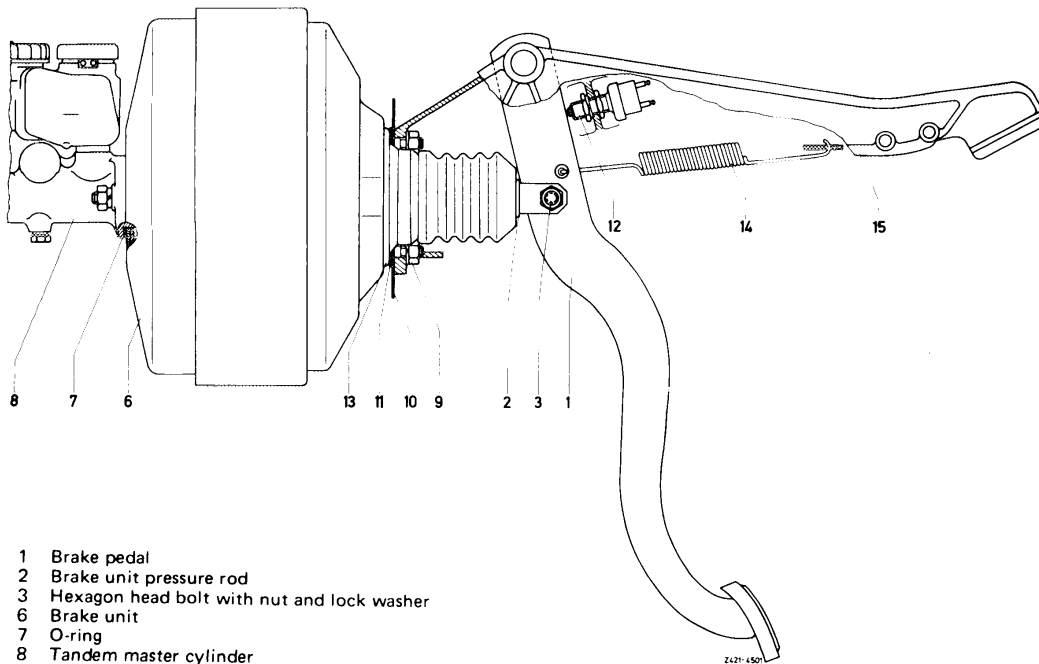
8 On 1st version, unscrew hex. screw (3) and remove bushing out of brake pedal (1), on 2nd version, remove lock (8) and pull out flange pin (7), so that push rod of brake unit on brake pedal is released.

9 Unscrew hex. nut for fastening brake unit to front end.

10 Remove brake unit.

Attention!

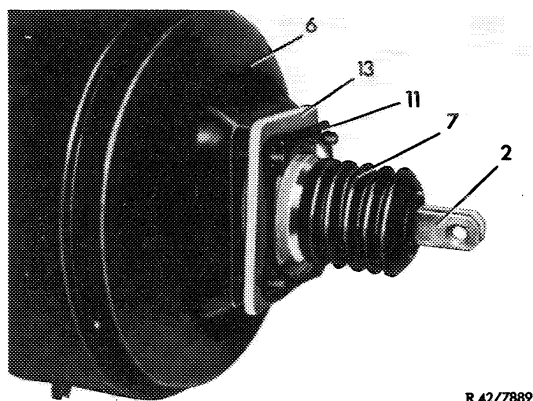
The control housing of brake unit is made of plastic and would break if not handled with care.



- 1 Brake pedal
- 2 Brake unit pressure rod
- 3 Hexagon head bolt with nut and lock washer
- 6 Brake unit
- 7 O-ring
- 8 Tandem master cylinder
- 9 Hexagon nut
- 10 Front end
- 11 Gasket
- 12 Stop light switch
- 13 Intermediate flange
- 14 Return spring
- 15 Carrier

Note: When installing brake unit make sure that rubber cup (7) is fastened correctly on pressure rod (2) and intermediate flange (13), and do not forget gasket (11).

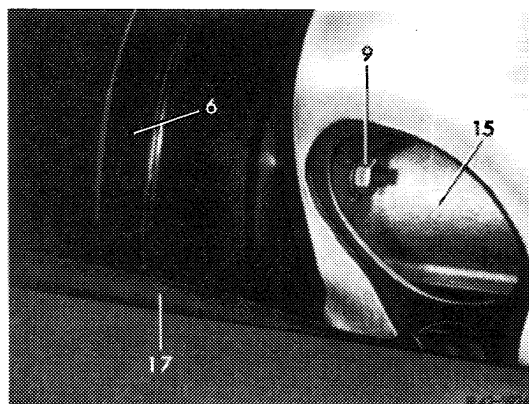
Also check whether separate check valve is good. If in doubt, replace valve along with plastic lines (42-023).



R 42/7889

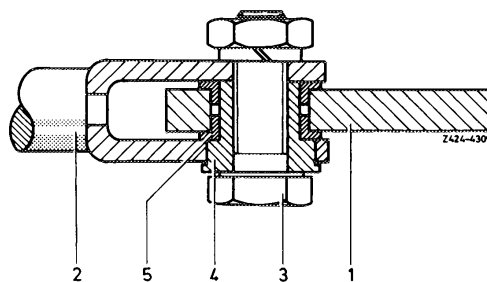
Installation

11 Attach brake unit to front end. The lefthand upper hex. nut (9) is screwed in through an opening in front end from direction of engine compartment. Tighten hex. nuts to 15 Nm (1.5 kpm). Insert rubber cover after tightening hex. nut (9).



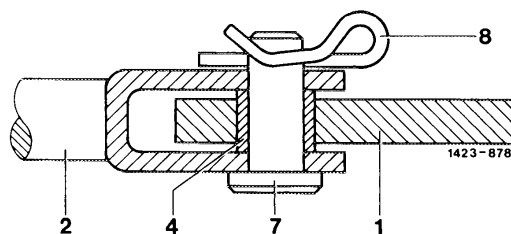
Note: Starting September 1979 the fork head of pushrod on brake unit and the brake pedal are modified. Instead of the hex bolt and the flange bushing used up to now, a flange bolt of 8 mm dia. together with a lock is now installed.

12 On first version, fasten pushrod (2) of brake unit to brake pedal (1) by means of bushing (4) and hex bolt (3).



1st version

13 On second version starting September 1979 fasten pushrod (2) of brake unit to brake pedal (1) by means of flange bolt (7) and lock (8).

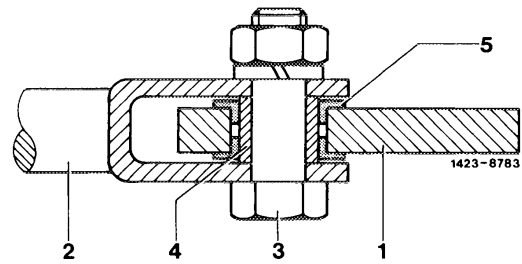


2nd version

Attention!

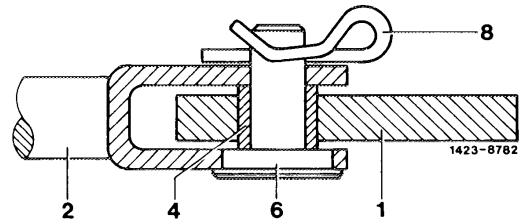
When installing a brake unit with a new fork head and an old brake pedal install bushing (4), part no. 123 292 01 50, additionally into lever (1). Hex bolt (3) with snap ring and nut may be used again.

Fork head new, brake pedal old

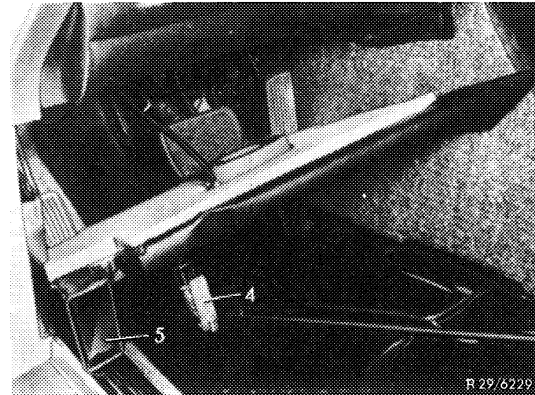


When installing a new brake pedal and a brake unit with an old fork head, install flange bolt (6), part no. 126 292 01 74, together with lock (8).

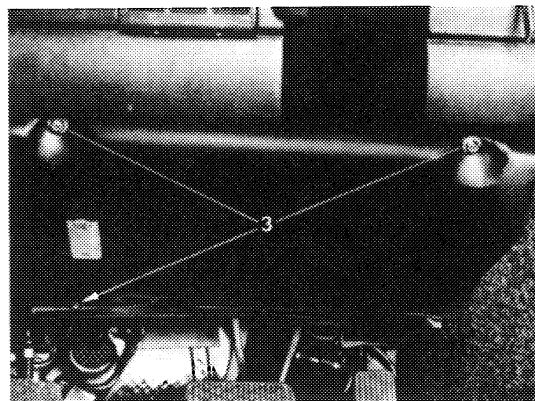
Brake pedal new, fork head old



14 Pull cable for leg room lamp through cover. Attach plug and push leg room lamp (4) into cover.



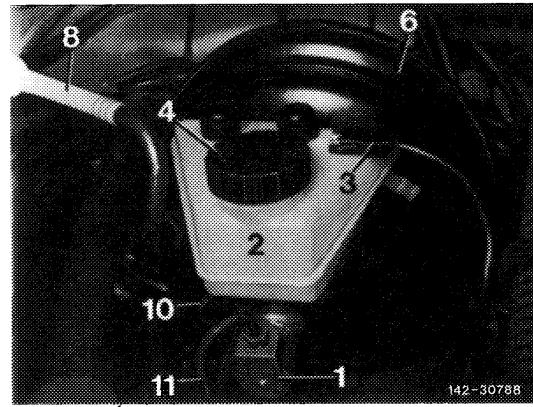
15 Introduce leg room cover and screw down.

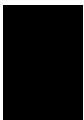


16 Connect vacuum line to brake unit, tighten coupling nut to 30 Nm.

17 Install tandem main cylinder (42-310).

18 On vehicles with manual transmission, attach connecting hose (7) to master cylinder on expansion tank.





46-010 Differentiating characteristics of steering gears

A. Power steering 765 (LS 90, LS 68)

Part No.	Installed in model	Steering gear	Reaction piston dia.	Code number	Pitch Ball circulation	Remarks
107 460 13 01 LL ¹) 107 460 14 01 RL ²)	107. 1st version	765.700	11	—	10.5	—
114 460 17 01 LL ¹) 114 460 18 01 RL ²)	107 2nd version 114, 115 1st version	765.700	10	—	10.5	—
114 460 08 01 LL ¹) 114 460 09 01 RL ²)	107 3rd version 114, 115 2nd version 116.02, 116.032/033 1st version	765.701	10	—	10.5	—
114 460 21 01 LL ¹) 114 460 22 02 RL ²)	107 4th version 114, 115 3rd version	765.701	11	1	10.5	—
107 460 17 01 LL ¹) 107 460 18 01 RL ²)	107 5th version 114, 115 4th version 123 1st version	765.701	11.5	1	10.5	—
107 460 19 00 LL ¹)	107 6th version	765.701	11.5	1	10.5	Identification "S" on steering case = additional stop
116 460 10 01 LL ¹) 116 460 11 01 RL ²)	116.02 116.032/033 2nd version	765.702	9	9	10.5	—
116 460 12 01 LL ¹) 116 460 13 01 RL ²)	116.036	765.703	8	8	10.5	—
123 460 47 01 LL ¹) 123 460 48 01 RL ²)	123 2nd version	765.704	11.5	1	10.5	Steering locks in steering case, identification "A"
123 460 58 01 LL ¹) 123 460 59 01 RL ²)	123 3rd version	765.704	11.5	1	9	Steering locks in steering case, identification "A"

Part No.	Installed in model	Steering gear	Reaction piston dia.	Code number	Pitch Ball circulation	Remarks
126 460 04 01 LL ¹⁾ 126 460 05 01 RL ²⁾	126.02 126.03 1st version	765.706	13	—	10.5	Identification "D" (degressive reaction)
126 460 14 01 LL ¹⁾ 126 460 15 01 RL ²⁾	126.04 1st version 126.02 126.03 2nd version	765.706	13	—	10	Identification "D" and automatic compensation for play
201 460 57 01 LL ¹⁾ 201 460 58 01 RL ²⁾	201.02 1st version	765.900	11.5	—	10	Automatic compensation for play. Grey iron housing, with dowel sleeve
201 460 43 01 LL ¹⁾ 201 460 49 01 RL ²⁾	201.02 2nd version 201.1 1st version	765.900	11.5	—	10	Automatic compensation for play. Light alloy housing, with dowel sleeve
201 460 66 01 LL ¹⁾ 201 460 67 01 RL ²⁾	201.02 3rd version 201.1 2nd version	765.900	11.5	—	10	Automatic compensation for play. Light alloy housing, without dowel sleeve
201 460 60 01 LL ¹⁾	201.03	765.902	11.5	—	11	Automatic compensation for play. Light alloy housing, without dowel sleeve

¹⁾ LL = lefthand steering

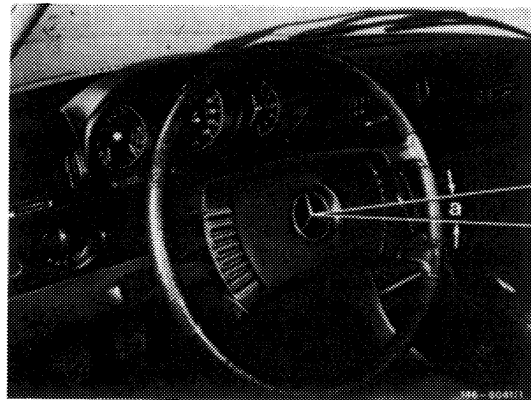
²⁾ RL = righthand steering

General checkup

1 Check free play on steering wheel while arresting front wheels. The free play on steering wheel circumference should not exceed max.

a = 25 mm in center position of steering.

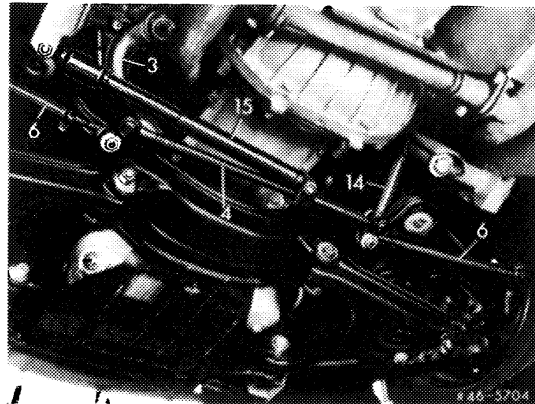
2 If the steering wheel play is higher, check steering linkage, steering intermediate lever, steering, steering coupling and bearing play of front axle.



Steering linkage

3 Check play of track rods and drag link by energetically shaking linkage manually.

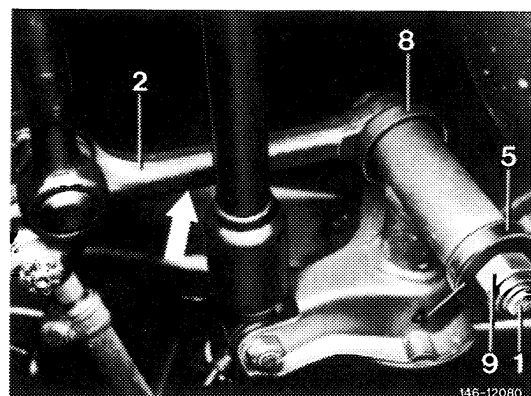
If required, replace drag link or ball joints of track rod.



Intermediate steering lever

4 Check play of intermediate steering lever by energetically pushing up and down.

If required, replace rubber slide bearing in journal bearing.



Steering

If no abnormal play shows up in steering linkage and on front axle, and provided that the steering is neither renewed nor reconditioned, check and adjust installed steering while accurately observing adjusting instructions (46–480).

46–120 Checking start of manual restriction

Data

Start of manual restriction with a force
at steering wheel circumference of

approx. 7 N (0.7 kp)

Start of manual restriction
measured

at steering shaft 5–7 Nm (50–70 kpcm)

at steering wheel circumference 23–33 N (2.3–3.3 kp)

Special tool

Mounting for torque wrench
1/2" square



126 589 13 63 00

Checkup

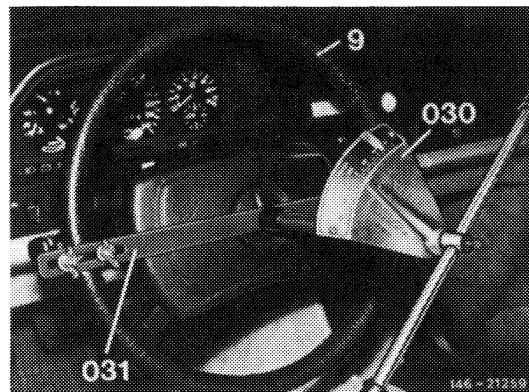
1 Fasten mounting for torque wrench to steering wheel.

2 Run engine at idle.



3 Place torque wrench into mounting and measure
force required for turning steering spindle, which
should not exceed 5–7 Nm.

4 Remove mounting from steering wheel.



46–130 Inspection of oil pressure of power steering pump

Data

Max. speed of power steering pump	7000/min.
Circulation pressure	max. 5 bar gauge pressure (atü)
Pressure relief valve opens at	65 ± 5 bar gauge pressure (atü)

Oil grades/filling capacity and oil level checkup

ATF	refer to Specifications for service products, page 236.2
or gear oil	refer to Specifications for service products, page 237

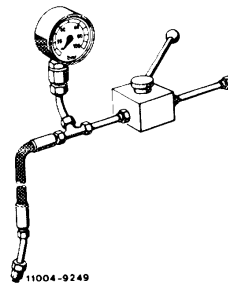
Filling capacity	approx. 1.5 liter
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Oil level checkup: With the oil at operating temperature (approx. 80 °C) the oil level in supply tank should reach up to punched-in or cast-in mark (approx. 20 mm below edge of tank). With cold oil and at ambient temperature the oil level should be 6–8 mm below mark. For filling up, use only perfectly clean oil, since even minimum particles of dirt may cause trouble in hydraulic system.

Tightening torque	Nm	(kpm)
Coupling screw on high-pressure expanding hose	45–50	(4.5–5)

Special tool

Tester



115 589 13 21 00

Box wrench element, open
17 mm 1/2" square

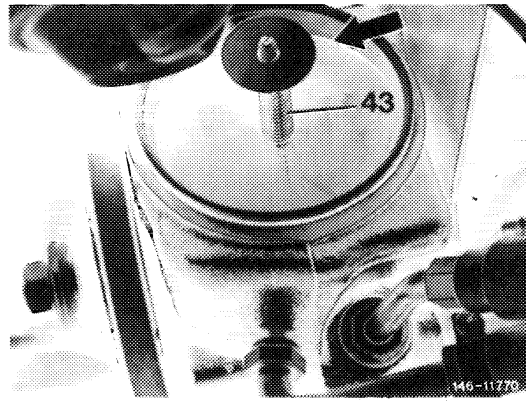


000 589 68 03 00

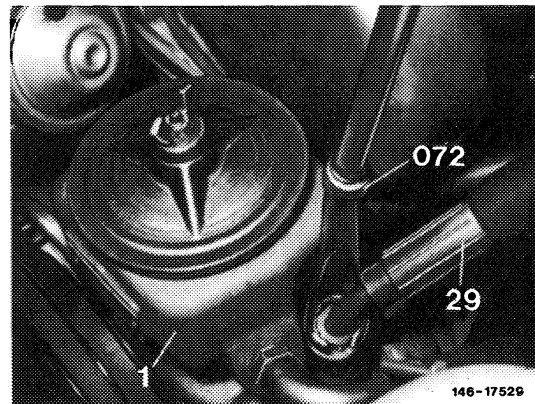
Checkup

1 Remove closing cover and draw off oil with a syringe, since otherwise the oil will run out when unscrewing high-pressure expanding hose.

Note: On Vickers power-steering pump VT 49 1st version, pay attention to disc (arrow).



2 Unscrew high-pressure expanding hose (29) on power steering pump with open box wrench element (072).



3 Connect high-pressure expanding hose (070a) of tester, as well as high pressure expanding hose (29) to tester (070). Fill reservoir with specified oil.

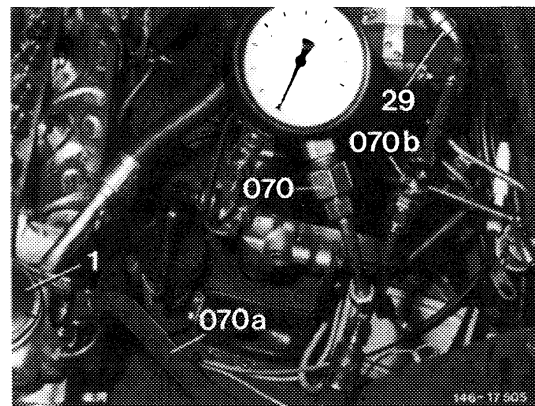
4 Run engine at idle speed and perform the following measurements:

a) with throttle valve opened, measure circulating pressure which should not exceed 5 bar gauge pressure (5 atü). Do not move steering wheel when measuring, since this would activate the control valve and the pressure would increase.

b) Close throttle valve on tester and measure max. pressure of power steering pump, while accelerating engine to maintain a speed of approx. 1000/min.

The max. pressure can also be measured by turning the steering to left-hand and right-hand lock.
Caution, do not spend too much time for measuring, since this would cause the oil temperature to rise to non-permissible limits, which would in turn result in damage to power steering pump.

c) If the pump does not attain the specified pressure, check volume control valve and pressure relief valve and replace, if required.



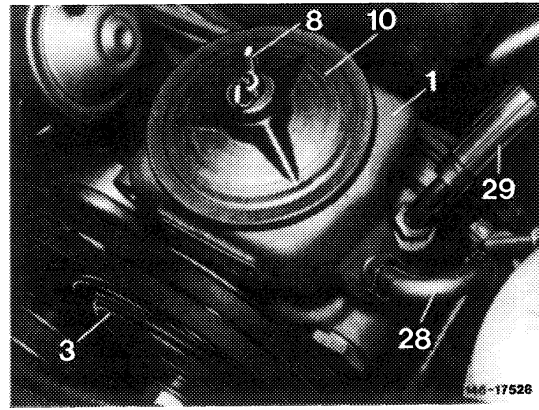
5 Disconnect high-pressure expanding hose on tester, remove tester, connect high-pressure expanding hose to power steering pump. Tighten coupling screw to 45–50 Nm (4.5–5 kpm).

6 Fill supply tank with oil. Fill up with engine running.

Note: Oil level with oil at operating temperature (approx. 80 °C) up to punched-in or cast-in mark (approx. 20 mm below edge of tank).

Oil level with engine cold (ambient temperature) = 6–8 mm below mark.

7 Check servo system for leaks.



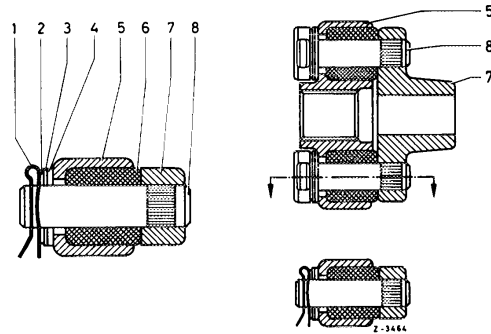
Note

Steering couplings starting June 1973 are riveted and cannot be reconditioned.

Disassembly

1 Remove clip lock (1) from both bolts (8), remove washers (2 and 3) and plastic washers (4). Then pull lower flange (5) from upper flange (7) and remove both bushings (6).

- 1 Clip lock
- 2 Steel washer
- 3 Spring washer
- 4 Plastic washer
- 5 Lower flange
- 6 Bushing
- 7 Upper flange
- 8 Bolt



Assembly

2 Push new bushings (6) into lower flange. Slightly grease bolt (8) of upper flange, then slightly press upper flange into lower flange in a vise.

Mount plastic washers (4), spring washer (3) and steel washer (2) and insert clip lock (1).

Attention! Make sure that the clip locks are perfectly seated in bolt.

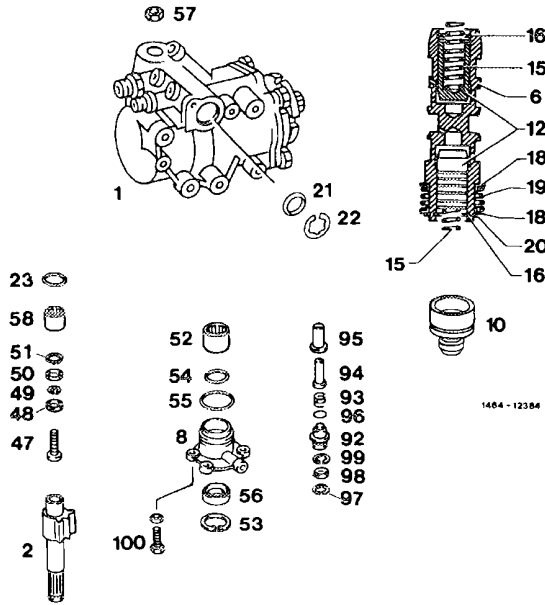
Top and bottom of both steering coupling versions are supported in plastic bushings. **Brake fluid and antifreeze will decompose these plastic bushings.**

When handling such fluids in engine compartment, proceed carefully and/or cover steering coupling.

To keep lubricant in place, do not spray directly on steering coupling with a steam jet sprayer.

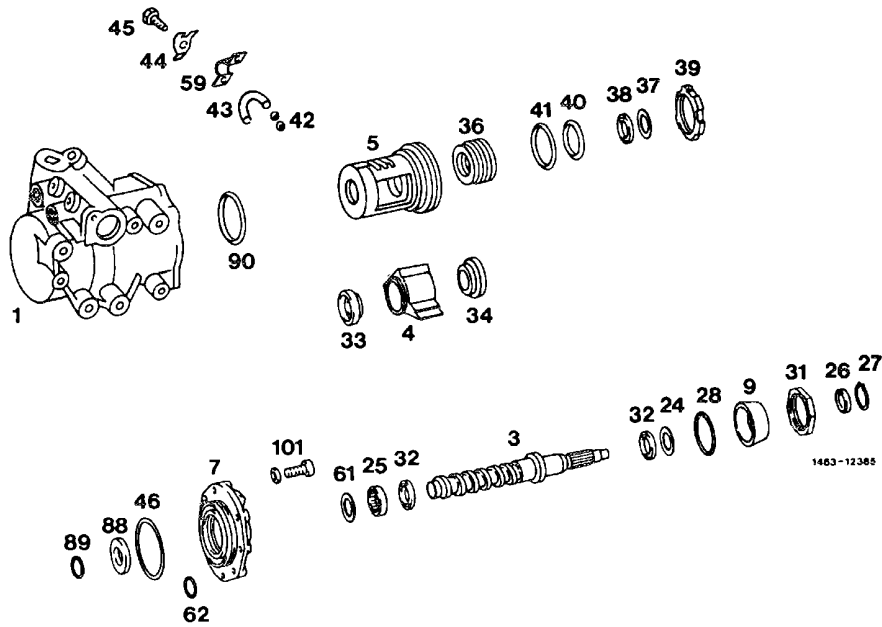
Note: In the event of noise in steering coupling, apply thin oil, e.g. gear oil, in range of plastic bushings, while turning the steering several times to the left and to the right. Do not use "Caramba".

A. Steering gear 765.7 (LS 90)



1 Steering case	Clamp with special tool 123 589 03 59 00
2 Pitman shaft	Check for wear on bearing points and on tooth segment, as well as for distortion. Attention! Pay attention to toothing.
6 Control valve	Pay attention to different versions, do not disassemble!
8 Steering case cover with needle sleeve	Check needle sleeve for damage and quiet running. If needle sleeve is damaged, renew case cover.
10 Closing cap	
12 Reaction bolt	Different diameters, according to steering gear model designation
15 Compression spring	
16 Locking ring	
18 Thrust washer	
19 Compression spring	
20 Locking ring	
21 O-ring (closing cap)	Renew
22 Locking ring	Renew
23 O-ring	Renew
47 Adjusting screw	Mount free of play
48 Thrust washer	
49 Locking ring	Renew
50 Thrust ring	
51 Locking ring	Renew
52 Needle sleeve	Check, renew case cover if required
53 Locking ring	Renew
54 O-ring	Renew
55 O-ring	Renew
56 Radial sealing ring	Renew, special tool 116 589 07 43 00

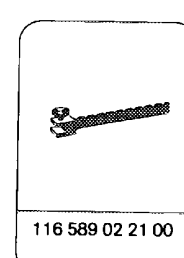
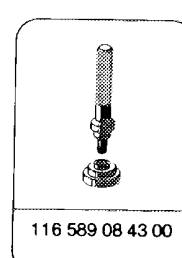
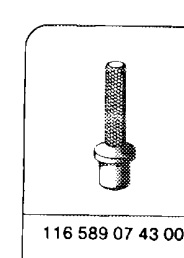
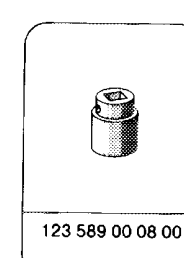
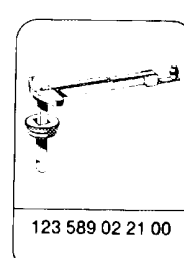
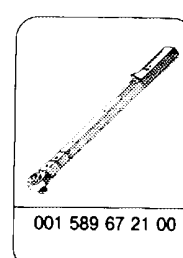
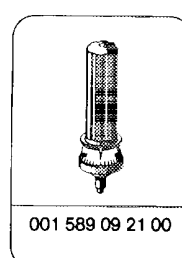
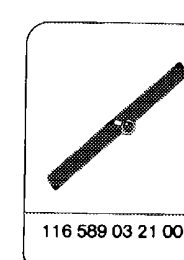
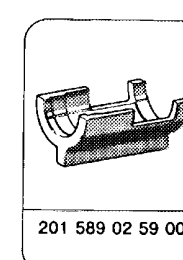
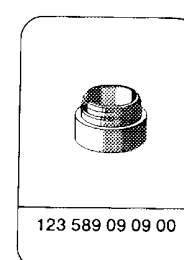
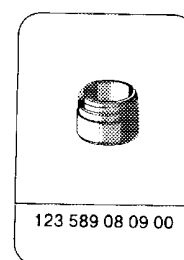
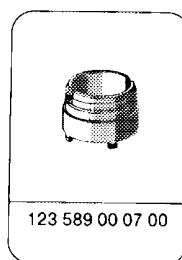
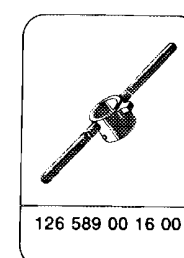
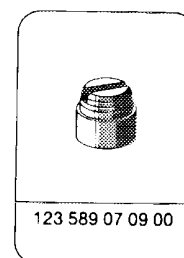
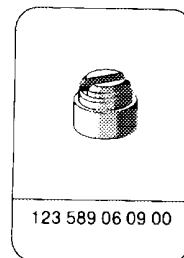
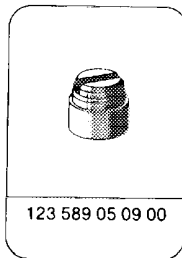
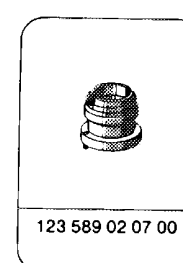
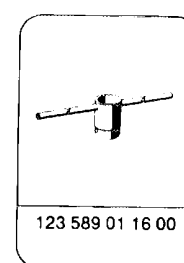
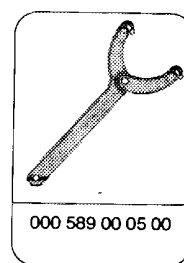
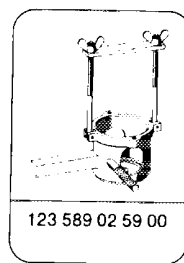
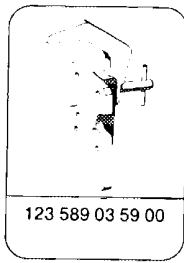
57	Self-locking hex. nut	60–65 Nm
58	Needle bearing	Control valve 2nd version
92	Cover	Check for damage and quiet running
93	Compression spring	
94	Spring bolt	
95	Bushing	
96	O-ring	Renew
97	Locking ring	Renew
98	Thrust ring	
99	Locking ring	
100	Hex. head screws	Renew, 30–35 Nm



1 Steering case	Check needle sleeve at top in steering case for damage and quiet running. If required, remove needle sleeve with a conventional puller and renew. Special tool for mounting 123 589 03 59 00
3 Steering worm	Check ball circuit for score marks. Pay attention to different version, according to steering model designation.
4 Steering nut	Special tool for friction torque 116 589 03 21 00 or 123 589 02 21 00, 116 589 02 21 00 123 589 00 08 00 001 589 09 21 00
5 Working piston	Pay attention to toothing and version (with and without compensation for play) Special tool 201 589 02 59 00 123 589 02 59 00
7 Bearing cap	Pay attention to different version, according to steering model designation.
9 Bearing insert with needle sleeve	Check needle sleeve for damage and quiet running. Renew bearing insert completely, if required. Special tool 000 589 00 05 00, 116 589 08 43 00, 123 589 01 16 00, 123 589 02 07 00
24 Axial washer	
25 Needle sleeve	Renew
26 Radial sealing ring	Renew
27 Locking ring	Renew
28 O-ring	Renew
31 Slot nut or hex. nut	140-160 Nm Special tool 126 589 00 16 00, 123 589 01 07 00 or 123 589 09 09 00
32 Axial cyl. roller cage	Check for quiet running and damage
33 Axial angular ball bearing	Check for quiet running and damage
34 Axial cyl. roller cage	Check for quiet running and damage
36 Screw cover (hex.)	Special tool depending on version
36a Screw cover (square)	123 589 01 16 00, 123 589 05 09 00 123 589 07 09 00, 123 589 06 09 00

37	O-ring	Renew
38	Sealing ring (teflon)	Renew
39	Slot nut	200–240 Nm
39a	Hex. nut	Special tool 126 589 00 16 00 and 123 589 00 07 00 or 123 589 09 09 00
40	O-ring	Renew
41	Sealing ring (teflon)	Renew
42	Steel balls	24 each
43	Ball guide half	Check for damage
44	Fastening clamp	
45	Hex. head screw	12–16 Nm
46	O-ring	Renew
59	Locking plate	Renew
61	Axial washer	
62	O-ring	Renew
88	Sealing ring (teflon) in bearing cap	Renew
89	O-ring in bearing cap	Renew
90	Stop ring	Different thickness according to steering model designation
101	Hex. head screws	60–65 Nm

Special tools



Conventional tool

Box wrench, plug-type 19 mm for
torque wrench 001 589 67 21 00

e.g. made by Wille, D-5600 Wuppertal
Order No. 732/40 - 19 mm

Data

Number of balls in ball circuit

24

Adjusting values

Ncm

Friction torque of steering worm in bearing cap
prior to preloading bearing insert

≤ 12

Additional friction torque of steering worm after
preloading bearing insert

4-7

Friction torque of steering nut in working piston

6-10

Friction torque of ball circuit steering worm - steering nut

30-50

Total friction torque

110-160

Note

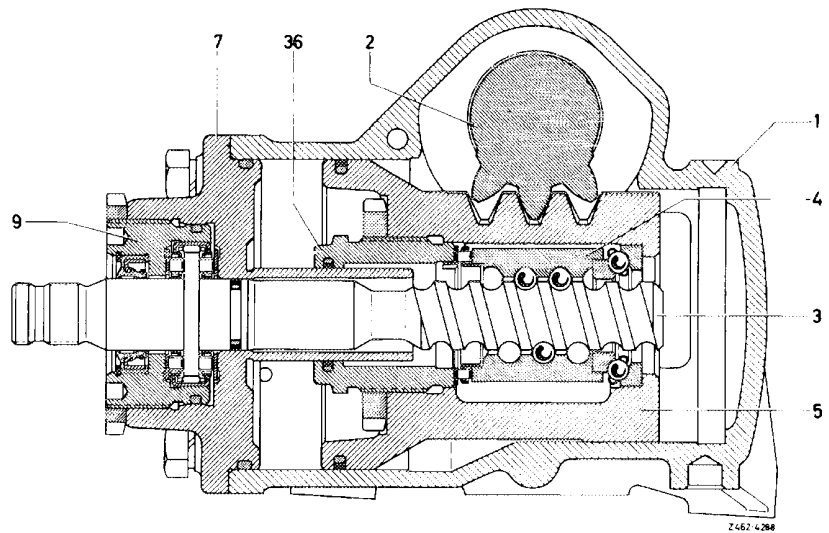
The following description covers assembly and adjustment of the following steering gears:

Steering without and with inside stop

Steering with automatic compensation for play

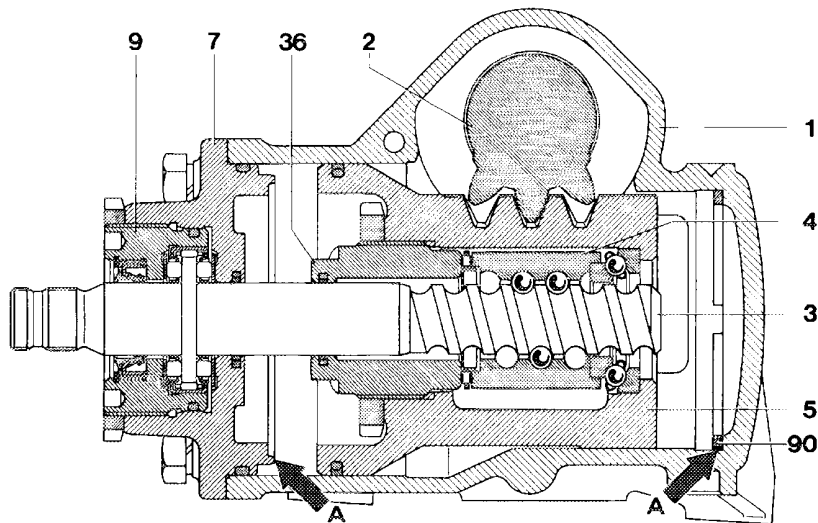
The data valid for the individual models and steering gears with regard to pitch of ball circuit and diameters of reaction piston are shown in list "Differentiating characteristics of steering gears" 46-010.

1st version
 Power steering without inside
 stop
 (steering 765.700, 765.701,
 765.702, 765.703)

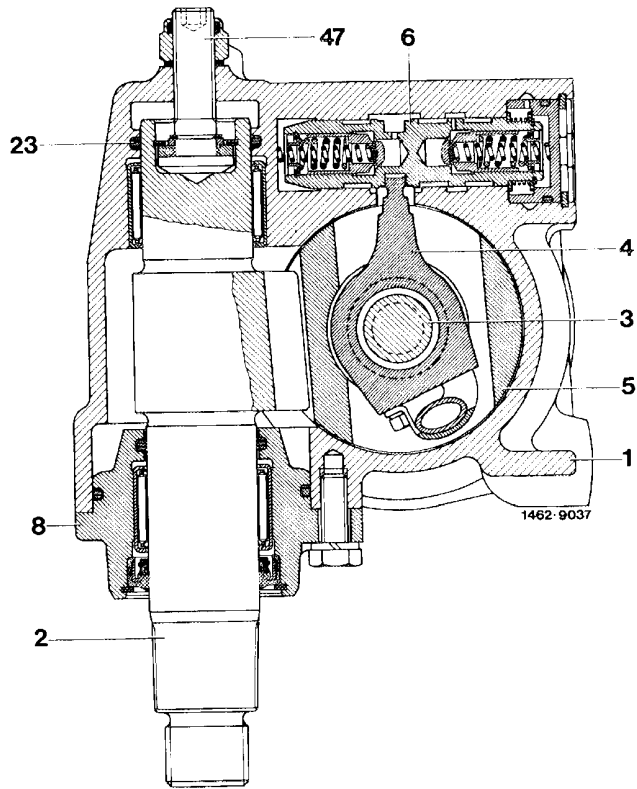


Z467 4288

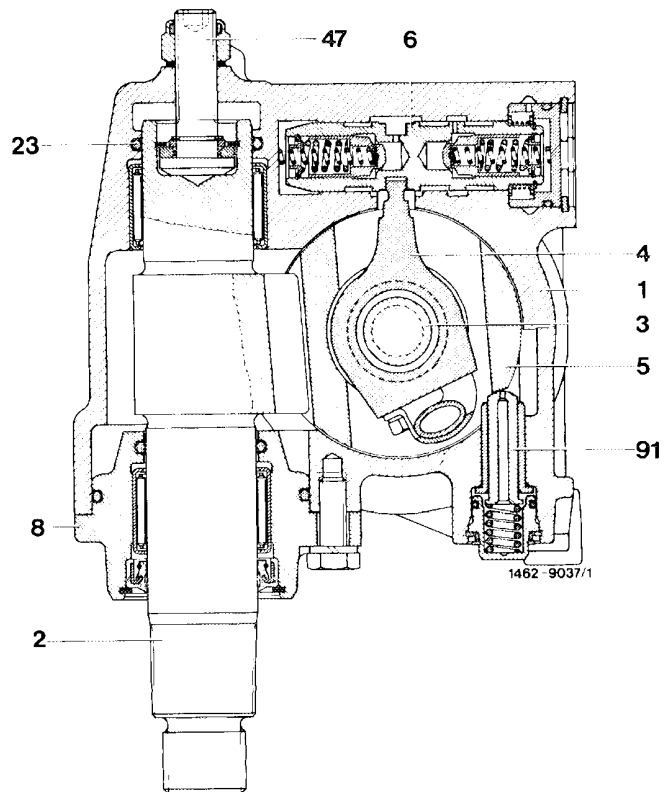
2nd version
 Power steering with inside
 stop
 (steering 765.704, 765.706)



1462-7211/1



Power steering **without** compensation for play
 (steering 765.700, 765.701, 765.702, 765.703, 765.704)
 1 Steering case
 2 Pitman shaft
 3 Steering worm
 4 Steering nut
 5 Working piston
 6 Control valve
 8 Case cover
 23 O-ring
 47 Adjusting screw

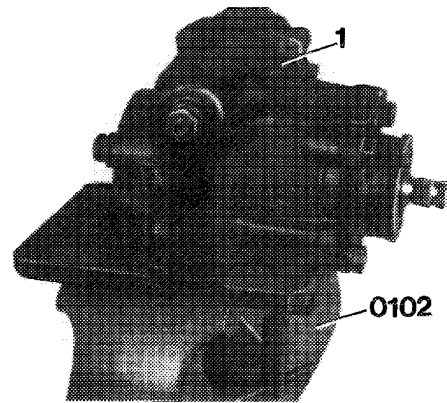


3rd version
 Power steering **with** automatic compensation for play
 (steering 765.706)
 1 Steering case
 2 Pitman shaft
 3 Steering worm
 4 Steering nut
 5 Working piston
 6 Control valve
 8 Casing cap
 23 O-ring
 47 Adjusting screw
 91 Automatic compensation for play

Disassembly

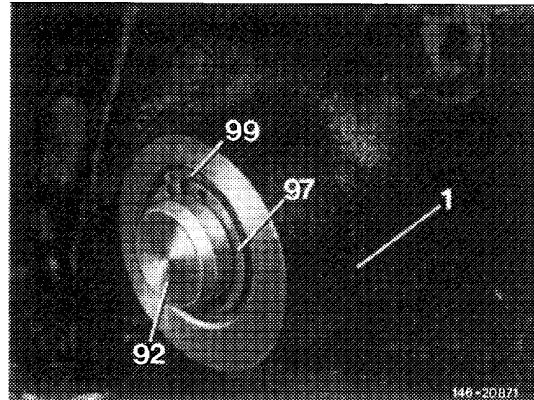
1 Fasten steering (1) to assembly device (0102).

Special tool 123 589 03 59 00



146-15834

2 On steering 3rd version (with automatic compensation for play) turn steering worm until working piston is slightly in lefthand or righthand lock.

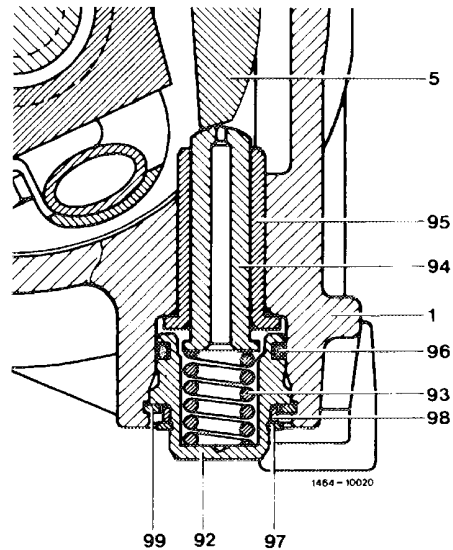


146-20071

3 Remove locking ring (97) from cover (92), then remove thrust ring (98) from steering case.

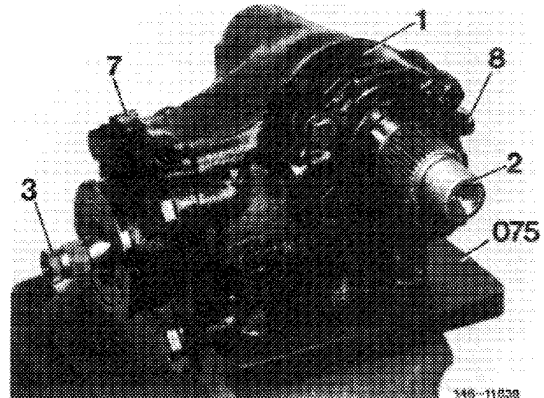
Remove locking ring (99) from steering case (1).

Remove compression spring (93), spring bolt (94) and bushing (95).



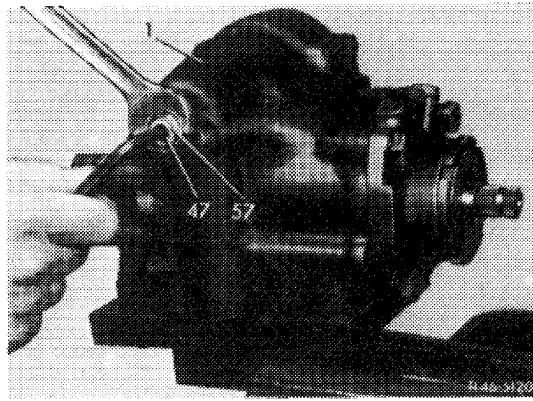
1464-10020

4 Unscrew hex. screws for fastening casing cover (8) to steering case (1).



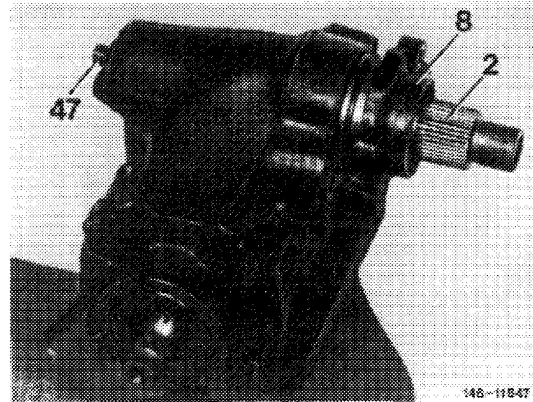
146-11838

5 Unscrew self-locking hex. nut (57) from adjusting screw (47), while applying counterhold to adjusting screw.

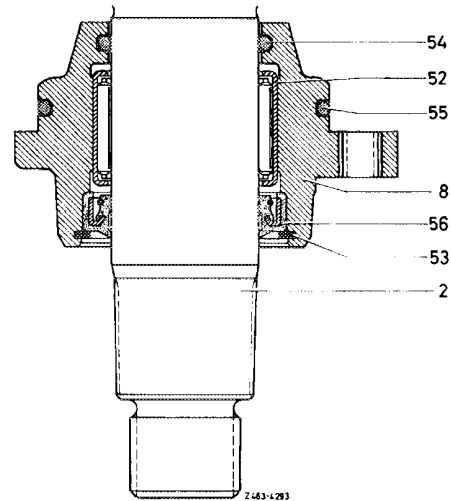


6 In center position of steering, turn adjusting screw to the right, which will force pitman shaft including casing cover out of steering case.

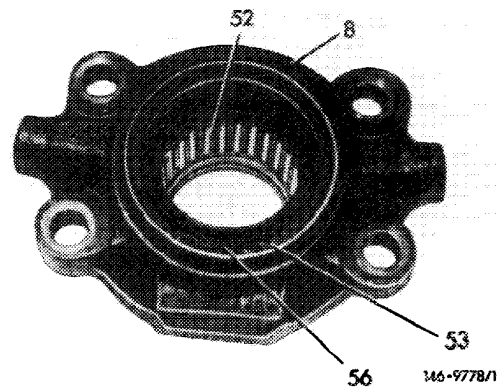
7 Remove casing cover (8) from pitman shaft (2).



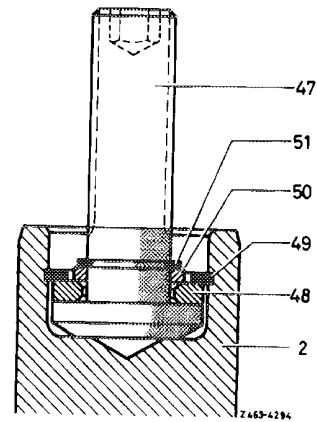
8 Remove O-rings (54 and 55) from casing cover.



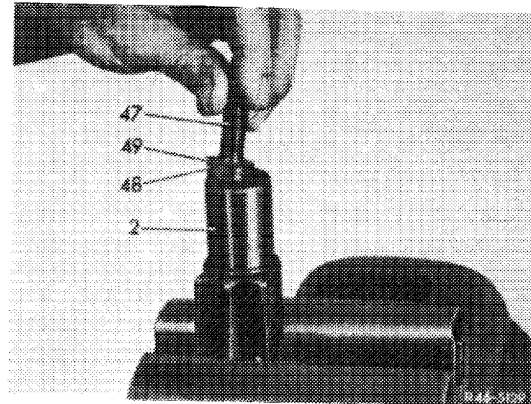
9 Remove locking ring (53) and radial sealing ring (56) from casing cover (8).



10 Take locking ring (51) out of adjusting screw (47), then remove thrust ring (50).



11 Remove locking ring (49) from pitman shaft (2). Remove adjusting screw (47) including thrust washer (48).

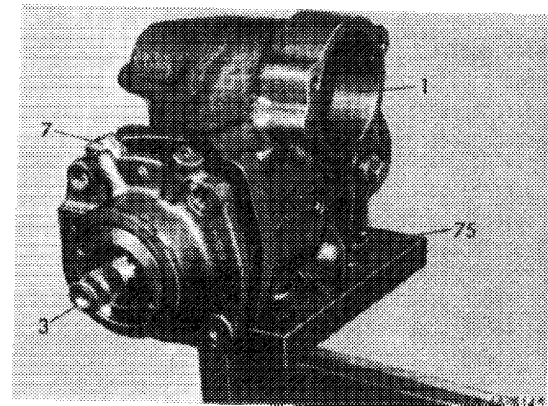


12 Unscrew hex. screws for fastening bearing cap (7) to steering case (1).

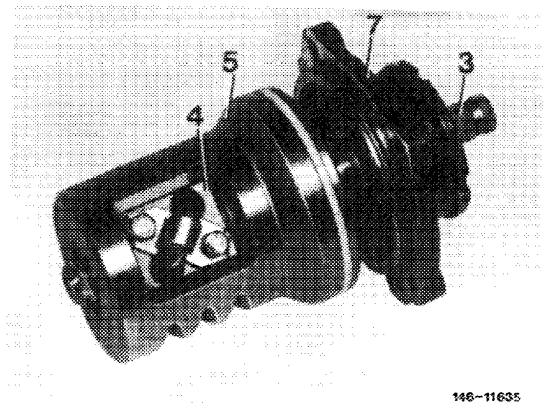
13 Slip steering coupling on steering worm, turn steering worm to the left until bearing cap is pushed slightly out of steering case.

Attention!

Do not turn too far, since otherwise the balls may fall out of ball circuit.



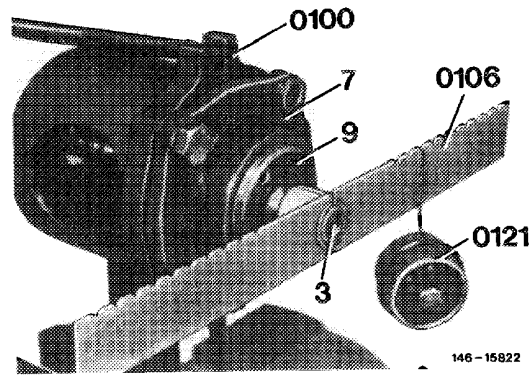
14 Remove bearing cap together with steering worm and working piston out of steering case.



15 Place measuring device on splining of steering worm and measure friction torque of ball circuit. The friction torque steering nut – steering worm should amount to 5–50 Ncm (i.e. 50 g in notch "10" as lowest or 500 g in notch "6" to "12" as highest friction torque).

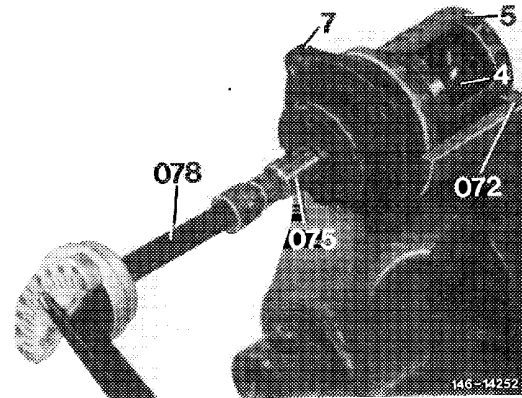
Special tool 116 589 03 21 00

If the friction torque is lower, the ball circuit has play; if it is higher, ball circuit is damaged. In both cases, replace the steering case.

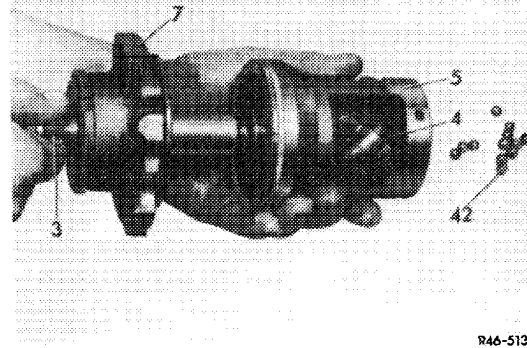


16 The friction torque can also be measured with torque wrench in combination with respective socket.

Special tool 123 589 02 21 00 and
123 589 00 08 00

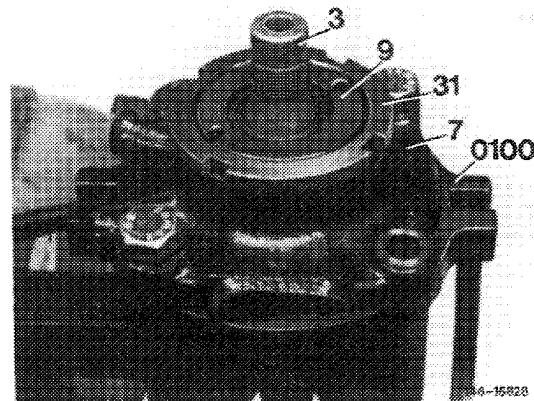


17 Screw steering worm (3) out of steering nut (4), making sure that no balls (42) are lost.



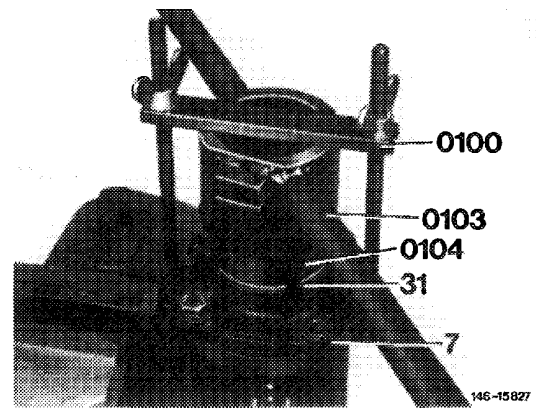
18 Remove O-ring from bearing cap (7) and fasten bearing cap in device (0100).

Special tool 123 589 02 59 00

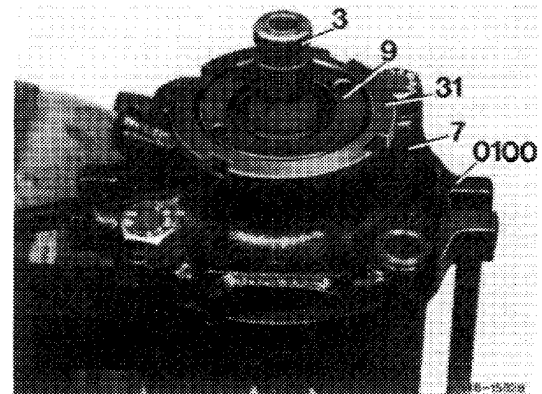


19 Unscrew slot nut or hex. nut with tommy handle (0103) and unscrew pertinent insert (0104) from bearing insert.

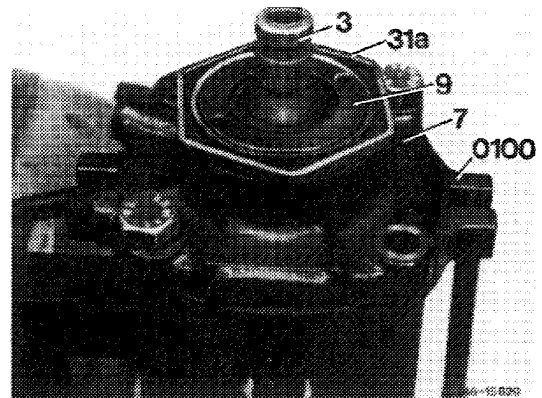
Special tool 126 589 00 16 00 and
123 589 01 07 00 or
123 589 09 09 00



Layout bearing insert with slot nut



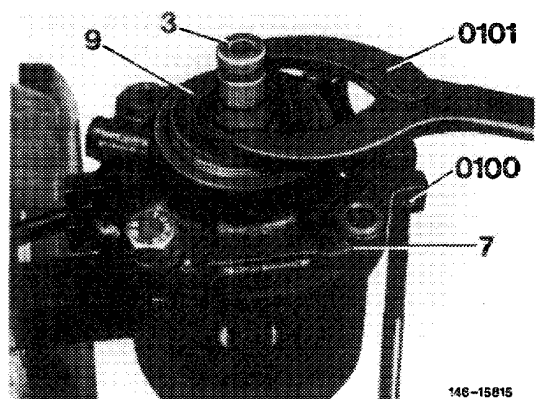
Layout bearing insert with hex. nut



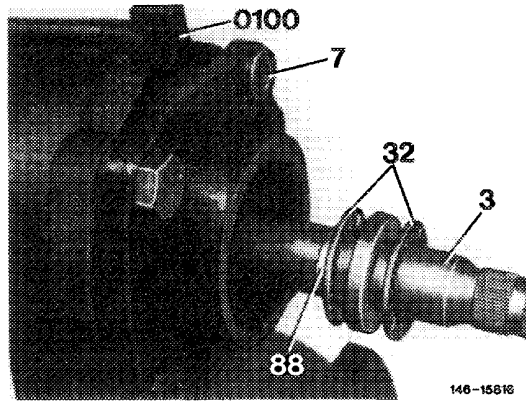
20 Unscrew bearing insert (9) with pin wrench from bearing cap (7).

Special tool 000 589 00 05 00

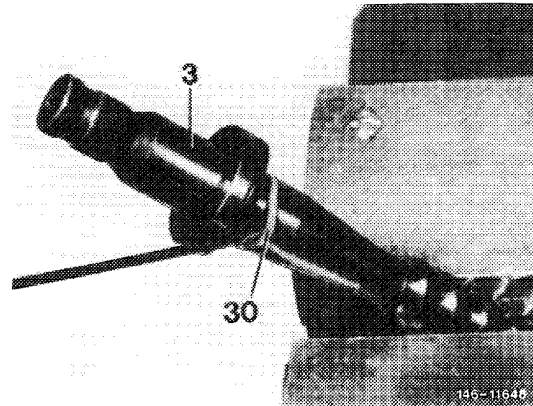
Note: Bearing insert can also be unscrewed by means of the adjustable pin wrench.



21 Remove steering worm (3) from bearing cap (7),
remove axial cyl. roller cage (32) from steering worm.



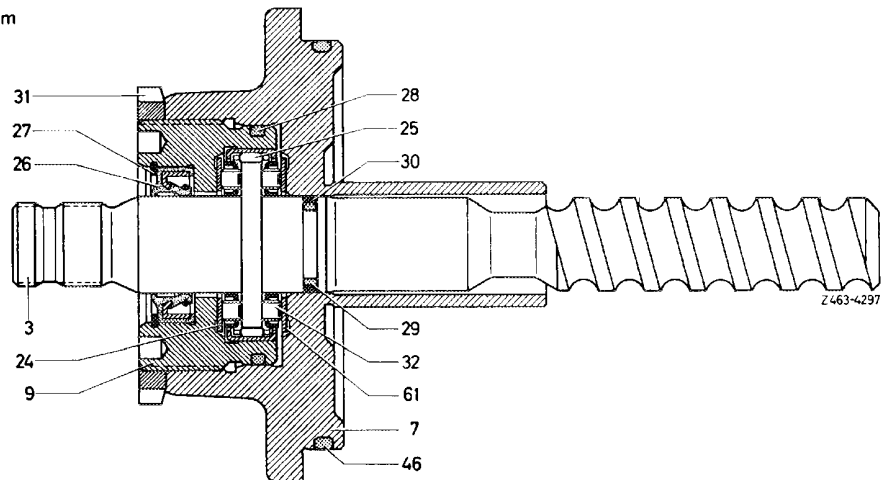
22 On 1st version, remove bearing cap/steering worm
sealing ring (30) and O-ring (29) from steering worm
(3).



Bearing cap and steering worm
1st version.

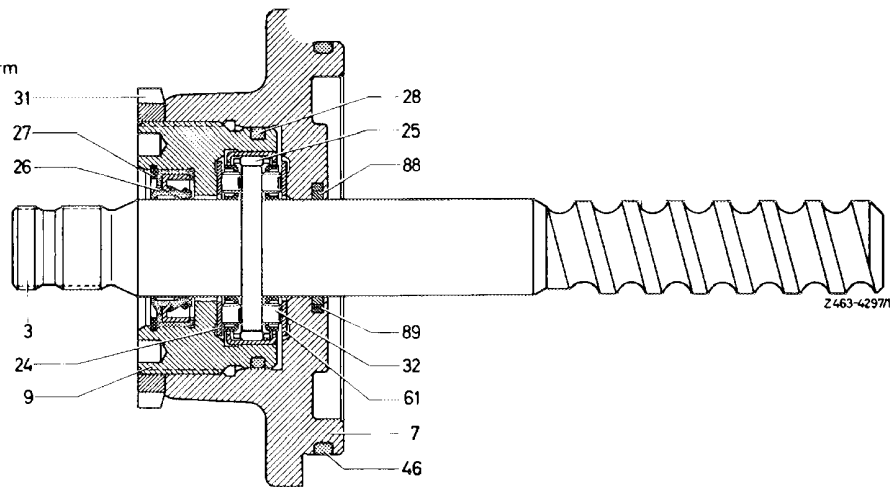
Bearing cap with neck,
sealing ring (teflon) and
O-ring on steering worm

- 3 Steering worm
- 7 Bearing cap
- 9 Bearing insert
- 24 Axial washer
- 25 Needle sleeve
- 26 Radial sealing ring
- 27 Locking ring
- 28 O-ring
- 29 O-ring
- 30 Sealing ring (teflon)
- 31 Slot or hex. nut
- 32 Axial cyl. roller cage
- 46 O-ring
- 61 Axial washer

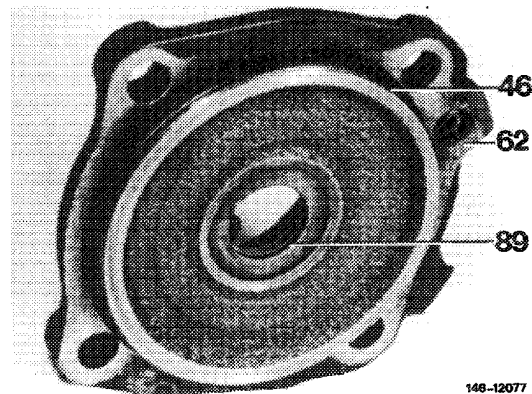


Bearing cap and steering worm
2nd version.
Bearing cap without neck,
sealing ring (teflon) and
O-ring in bearing cap

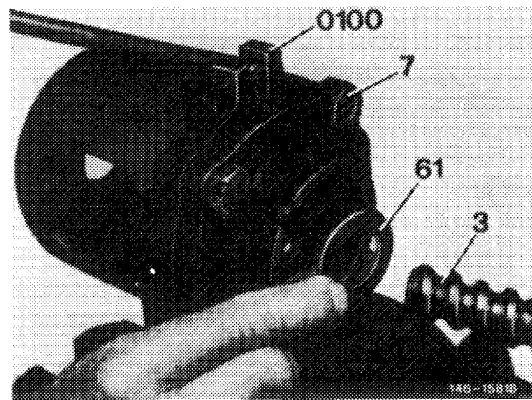
- 3 Steering worm
- 7 Bearing cap
- 9 Bearing insert
- 24 Axial washer
- 25 Needle sleeve
- 26 Radial sealing ring
- 27 Locking ring
- 28 O-ring
- 31 Slot or hex. nut
- 32 Axial cyl. roller cage
- 46 O-ring
- 61 Axial washer
- 88 Sealing ring (teflon)
- 89 O-ring



23 On 2nd version bearing cap/steering worm re-
move sealing ring (89) and O-ring from bearing cap.

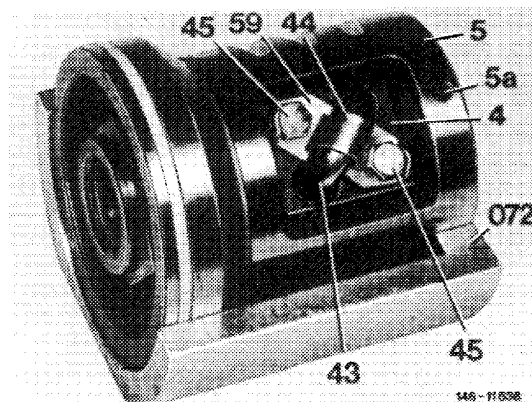


24 Remove axial washer (61) from bearing cap (7).



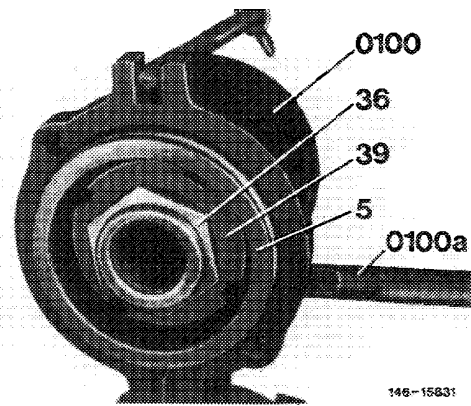
25 Unbend locking plate (59), unscrew hex. screws
(45), remove locking plate, fastening clip (44) and
both ball guide halves (43).

Special tool 201 589 02 59 00



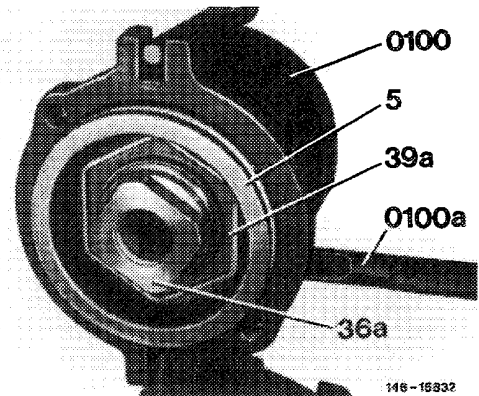
26 Clamp working piston (5) into device (0100) and secure with plug (0100 a).

Special tool 123 589 02 59 00



Layout screw cover (36) with hexagon SW 36 or 46 and slot nut (39)

146-15831



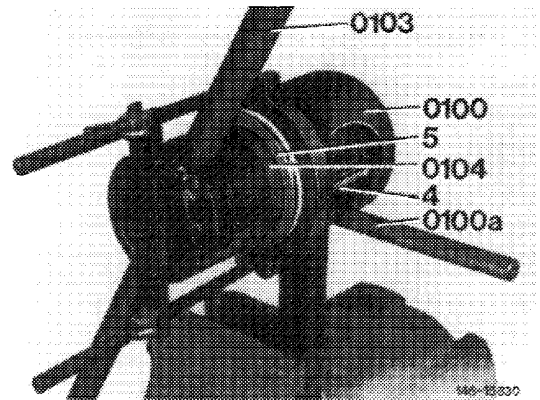
Layout screw cover (36 a) with square head and hex. nut (39 a)

146-15832

27 Unscrew slot nur or hex. nut with pertinent insert (0104) including tommy handle (0103), then unscrew screw cover with pertinent insert.

Special tool for slot or hex. nut
126 589 00 16 00, 123 589 00 07 00,
123 589 09 09 00

Special tool for screw cover
123 589 01 16 00, 123 589 05 09 00,
123 589 06 09 00, 123 589 07 09 00

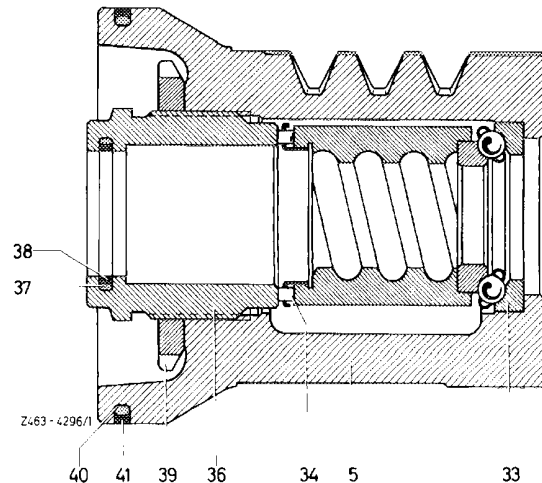


146-15833

28 Take sealing ring (teflon) (38) and O-ring (37) from screw cover (36).

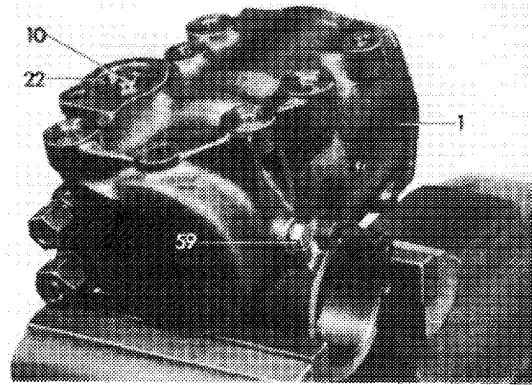
29 Remove axial cyl. roller cage (34) from steering nut (4) and steering nut from working piston (5).

30 Remove axial angular ball bearing (33) from working piston.

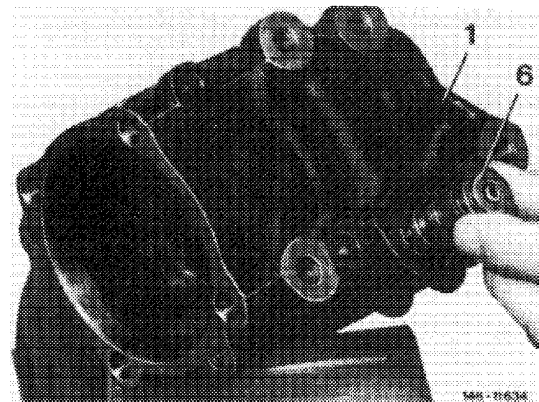


Z463-4296/1

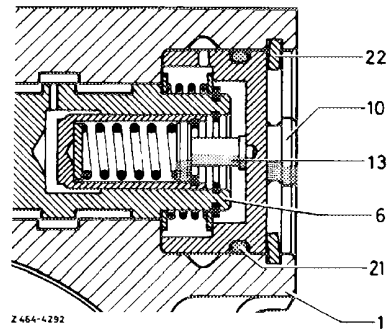
31 Remove locking ring (22) and closing cover (10) from steering case.



32 Remove control valve (6) from steering case (1), making sure that the springs on control valve 2nd, 3rd and 4th version are not falling out of reaction piston.



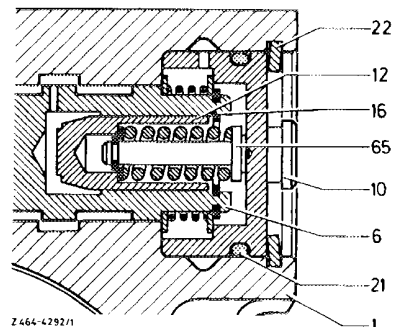
33 Remove O-ring (21) from closing cover.



a) Control valve 1st version

- 1 Steering case
- 6 Control valve
- 10 Closing cover
- 13 Supporting bolt
- 21 O-ring
- 22 Locking ring

Z 464-4292



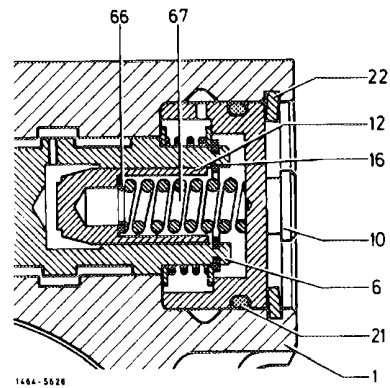
b) Control valve 2nd version

- 1 Steering case
- 6 Control valve
- 10 Closing cover
- 12 Reaction piston
- 21 O-ring
- 22 Locking ring
- 65 Spring bolt

Z 464-4292/1

c) Control valve 3rd and 4th version

- 1 Steering case
- 6 Control valve
- 10 Closing cover
- 12 Reaction piston
- 16 Locking ring
- 21 O-ring
- 22 Locking ring
- 66 Compensating washer
- 67 Spring



Checkup

Apply strict standards when checking steering components. When in doubt, replace respective part on principle.

Note

The ball circuit, that is, the steering worm and the steering nut, are assembled free of play at factory.

To maintain the specified clearance of 0.006 to 0.01 mm between straightedge of steering nut and control valve, both parts are assembled by selection.

The same applies to steering case and the control valve mounted inside case. For this reason, except for gasket and bearing set, only the pitman shaft, the working piston and the case cover are available as spare parts.

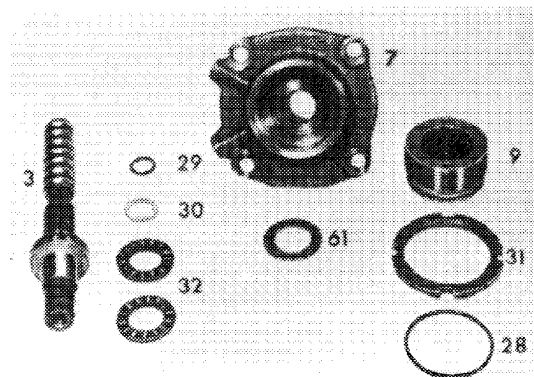
Steering worm

34 Check ball circuit on steering worm (3). If impact dents are showing up, replace steering.

Bearing insert

35 Check needle sleeve for wear. If needle sleeve is damaged, renew complete bearing insert (9).

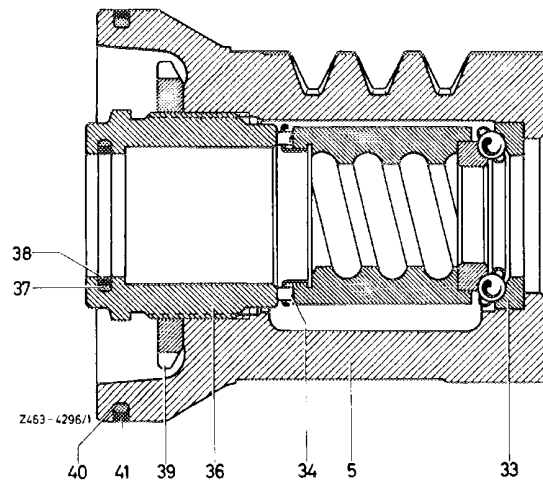
- 3 Steering worm
- 7 Bearing cap
- 9 Bearing insert
- 28 O-ring
- 29 O-ring
- 30 Sealing ring (teflon)
- 31 Slot nut
- 32 Axial cyl. roller cage
- 61 Axial washer



Working piston and steering nut

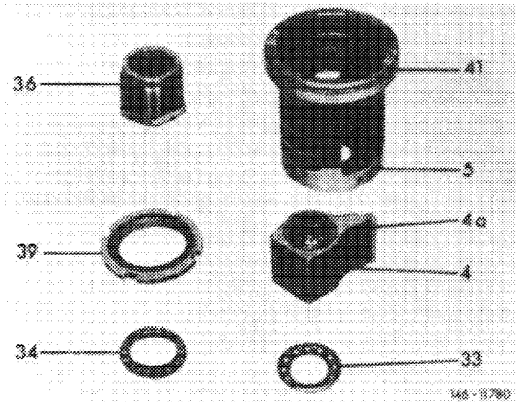
36 Remove sealing ring (41) and O-ring (40) from working piston (5). Press outer race of axial angular ball bearing (33) out of working piston.

37 Remove sealing ring (38) and O-ring (37) from screw cover (36).



38 Check ball circuit in steering nut (4). If impact dents are showing up, replace steering.

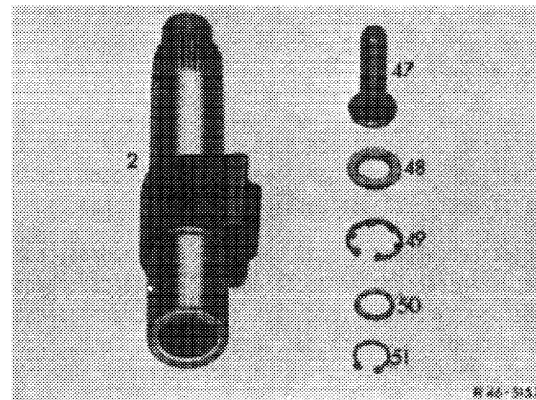
- 4 Steering nut
- 4a Straightedge on steering nut
- 5 Working piston
- 33 Axial angular ball bearing
- 34 Axial cyl. roller cage
- 36 Screw cover
- 39 Slot or hex. nut
- 41 Sealing ring (teflon)



Pitman shaft

39 Check pitman shaft (2) for wear at bearing points and on tooth segment, as well as for distortion or other damage. Renew pitman shaft, if required.

- 2 Pitman shaft
- 47 Adjusting screw
- 48 Thrust washer
- 49 Locking ring
- 50 Thrust ring
- 51 Locking ring

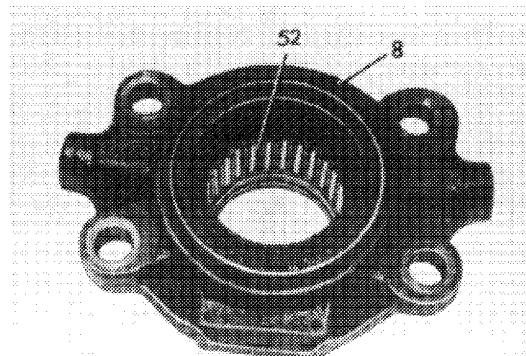


Case cover

40 Check needle sleeve (52) for wear. If needle sleeve is damaged, renew complete case cover.

Steering case

41 Check needle sleeve in steering case for wear. If required, pull out needle sleeve with a conventional puller.



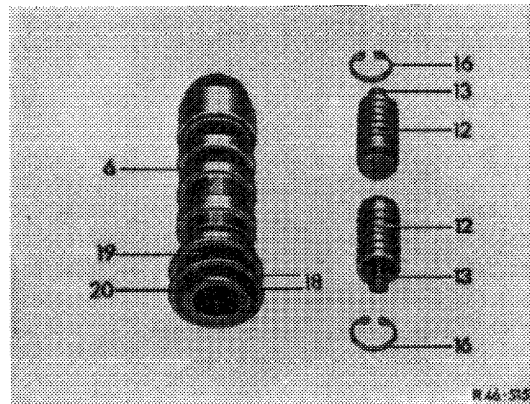
Control valve

Note: On 1st version of control valve the reaction pistons have a diameter of 11 mm and the supporting pistons (13) are secured in reaction pistons by means of locking rings (14). On 2nd version (production starting middle of 1972) the diameter of the reaction pistons is 10 mm. Two spring bolts (65) are inserted in reaction pistons. On control valve 3rd version (production starting end of 1973) the reaction pistons have a diameter of 11 mm. Inside reaction pistons are compensating washer (66) and spring (67). Starting at the beginning of 1976 the control valve 4th version is installed, with a reaction piston diameter of 11.5 mm.

1st version

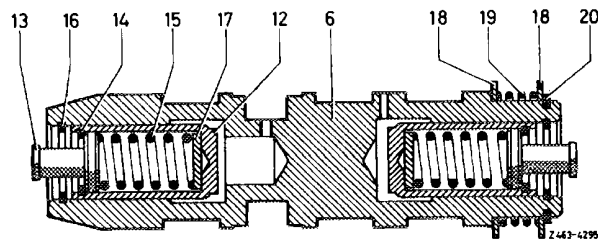
42 Check reaction piston (12) and supporting piston (13) in control valve (6) for easy operation. If required, remove and clean reaction piston after removing locking ring (16).

- 6 Control valve
- 12 Reaction piston (11 mm dia.)
- 13 Supporting bolt
- 16 Locking ring
- 18 Thrust washer
- 19 Compression spring
- 20 Locking ring



Note: Do not remove supporting bolts (13) from reaction pistons (12), since the spring load of compression spring (15) is adjusted by means of compensating washers (17).

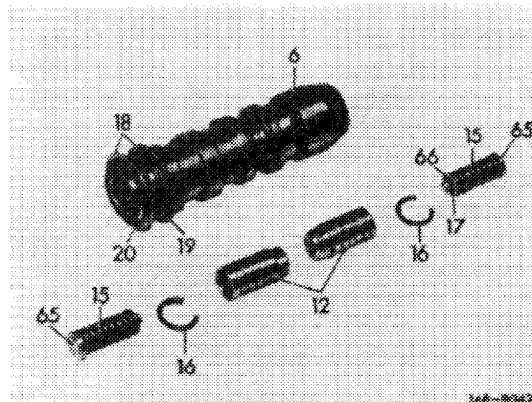
- 6 Control valve
- 12 Reaction piston
- 13 Supporting piston
- 14 Locking ring
- 15 Compression spring
- 16 Locking ring
- 17 Compensating washer
- 18 Thrust washer
- 19 Compression spring
- 20 Locking ring



2nd version

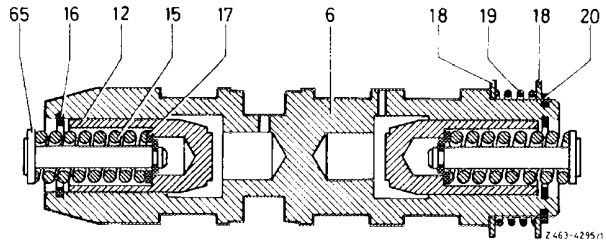
43 Check reaction piston (12) in control valve (6) for easy operation.

- 6 Control valve
- 12 Reaction piston (10 mm dia.)
- 15 Compression spring
- 16 Locking ring
- 17 Compensating washer
- 18 Thrust washer
- 19 Compression spring
- 20 Locking ring
- 65 Spring bolt



Note: Do not disassemble spring bolts (65), since the spring preload is adjusted with compensating washers (17).

- 6 Control valve
- 12 Reaction piston (10 mm dia.)
- 15 Compression spring
- 16 Locking ring
- 17 Compensating washer
- 18 Thrust washer
- 19 Compression spring
- 20 Locking ring
- 65 Spring bolt

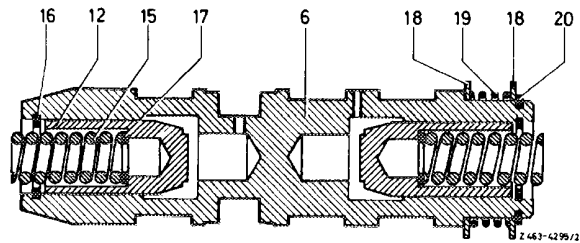


3rd and 4th version

44 Check reaction piston (12) in control valve (6) for easy operation.

Note: Do not mix up springs (15) and compensating washers (17) of both reaction pistons.

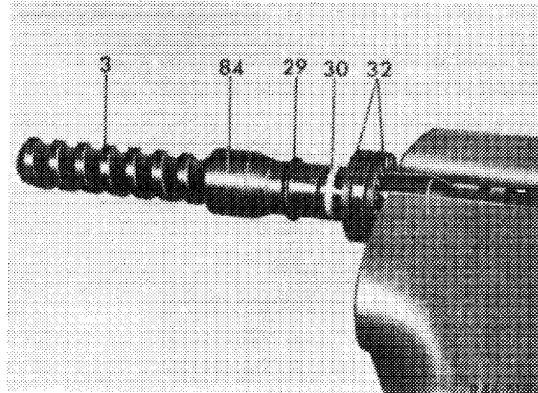
- 6 Control valve
- 12 Reaction piston (11 or 11.5 mm dia.)
- 15 Compression spring
- 16 Locking ring
- 17 Compensating washer
- 18 Thrust washer
- 19 Compression spring
- 20 Locking ring



Steering worm for steering without inside stop

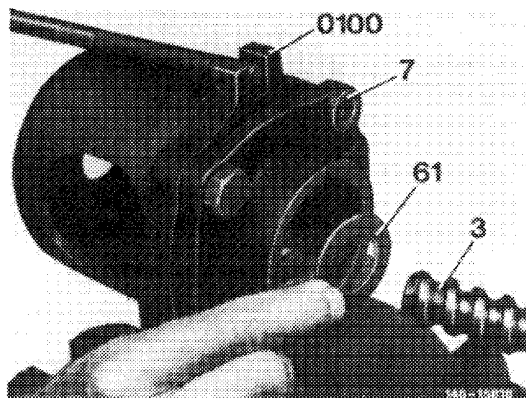
45 Place lower axial cyl. roller cage (32) on steering worm (3).

46 Slip assembly sleeve (84) on steering worm (3) and mount O-ring (29) first, then sealing ring (30).



Bearing cap for steering without inside stop

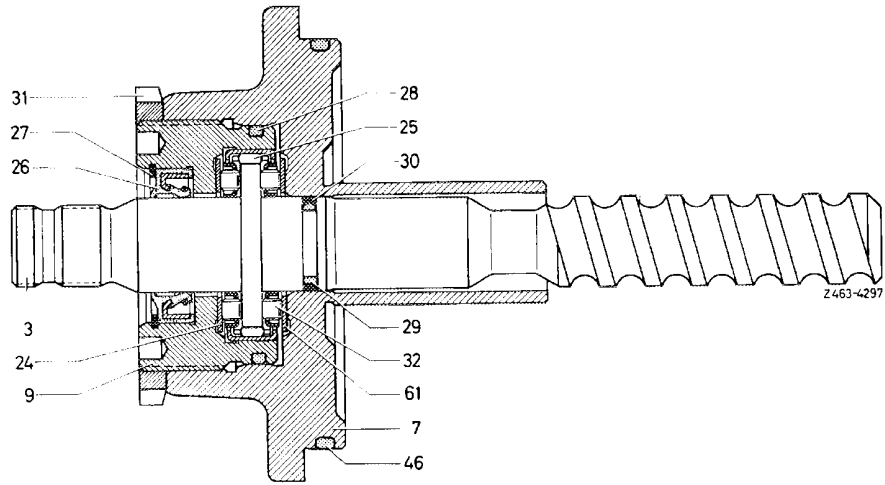
47 Fasten bearing cap (7) in device (0100), insert axial washer (61) into bearing cap, then steering worm (3).



Bearing cap and steering worm for steering without inside stop:

Bearing cap with neck, sealing ring (teflon) and O-ring on steering worm

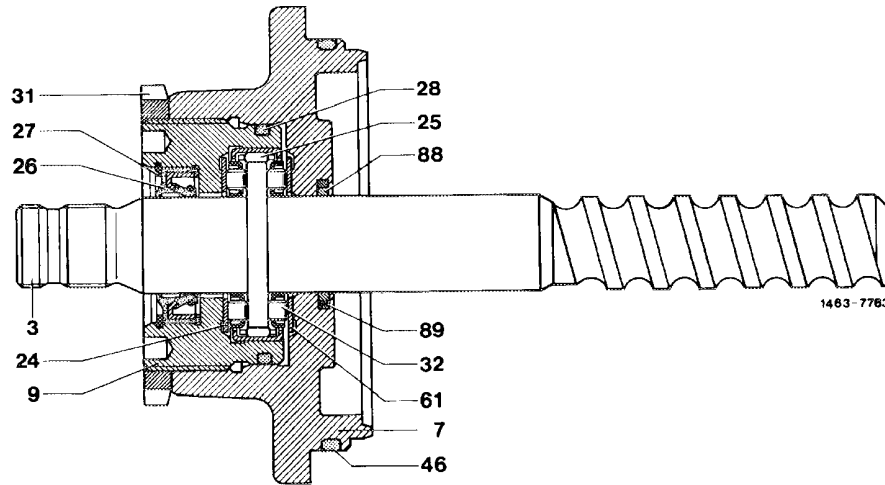
- 3 Steering worm
- 7 Bearing cap
- 9 Bearing insert
- 24 Axial washer
- 25 Needle sleeve
- 26 Radial sealing ring
- 27 Locking ring
- 28 O-ring
- 29 O-ring
- 30 Sealing ring (teflon)
- 31 Slot or hex. nut
- 32 Axial cyl. roller cage
- 46 O-ring
- 61 Axial washer



Bearing cap and steering worm for steering with inside stop:

Bearing cap without neck, sealing ring (teflon) and O-ring in bearing cap

- 3 Steering worm
- 7 Bearing cap
- 9 Bearing insert
- 24 Axial washer
- 25 Needle sleeve
- 26 Radial sealing ring
- 27 Locking ring
- 28 O-ring
- 31 Slot or hex. nut
- 32 Axial cyl. roller cage
- 46 O-ring
- 61 Axial washer
- 88 Sealing ring (teflon)
- 89 O-ring



46-412 Removal and installation of power steering

Data

Steering	Part No.	Steering version	Type	Reaction piston dia. 1)	Pitch ball circ.	Ratio in center position i =	Total ratio in center pos. i =	Remarks
	107 460 13 01	LL	107.022					
	107 460 14 01	RL	107.023					
			107.024	11				
			107.042					
			107.043					
			107.044					
			1st version					
	114 460 17 01	LL	107.022					
	114 460 18 01	RL	107.023					
			107.024					
			107.042					
			107.043					
			107.044					
			2nd version	10				
	116 460 08 011	LL	107.022					
	116 460 09 01	RL	107.023					
			107.024					
			107.042					
			107.043					
			107.044					
			3rd version					
765.701					10,5	13,92	15,69	
	114 460 21 01	LL	107.022					
	114 460 22 01	RL	107.023					
			107.024	11				
			107.042					
			107.043					
			107.044					
			4th version					
	107 460 17 01	LL	107.022					
	107 460 18 01	RL	107.023					
			107.024					
			107.042					
			107.043					
			107.044					
			5th version	11,5				
	107 460 19 01	LL	107.022					
			107.023					
			107.024					
			107.042					
			107.043					
			107.044					
			6th version					
			107.025					
			107.026					
			107.045					
			107.046					

1) This steering is identified on steering case with code number "1" adjacent to closing cover for control valve (Reaction piston 11 mm dia. or 11.5 mm dia.).

Oil grade/filling capacity and oil level checkup

ATF refer to Specifications for service products page 236.2
 or gear oil refer to Specifications for service products page 237

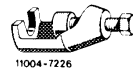
Filling capacity approx. 1.5 liter

Oil level checkup: With oil at operating temperature (approx. 80°C) the oil level in supply tank should reach up to punched-in or cast-in mark (approx. 20 mm below edge of tank). With cold oil and at ambient temperature, oil level 6–8 mm below mark. Use only perfectly clean oil for re-filling, since even minimum particles of dirt may lead to trouble in hydraulic system.

Tightening torques	Nm	(kpm)
Locking screws for attaching steering to side member of frame floor	70–80	(7–8)
Self-locking hex. nut to pitman shaft	160–200	(16–20)
Hex. socket screws to steering coupling	25	(2.5)
Castle nut to track rod and drag link	35	(3.5)
High-pressure expanding hose to steering	25–30	(2.5–3)
Return line to steering	35–40	(3.5–4)

Special tools

Puller for ball joints of track rod on pitman arm, intermediate steering arm and steering knuckle arm



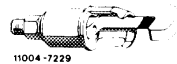
186 589 10 33 00

Puller for ball joints of drag link on pitman arm and steering intermediate arm



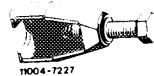
111 589 08 33 00

Puller for ball joints of drag link on pitman arm and steering intermediate arm



123 589 09 33 00

Puller for pitman arm



100 589 04 33 00

Check screw for center position of steering



116 589 06 21 00

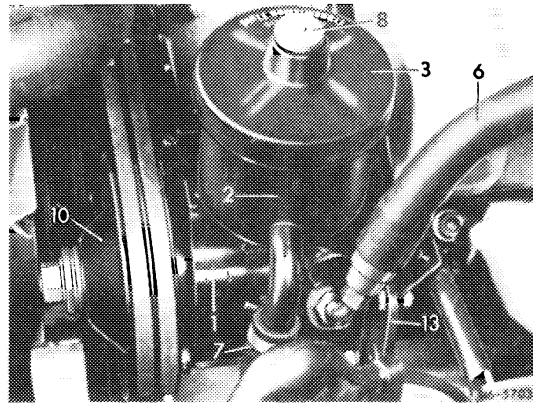
Self-made tool

Assembly pin

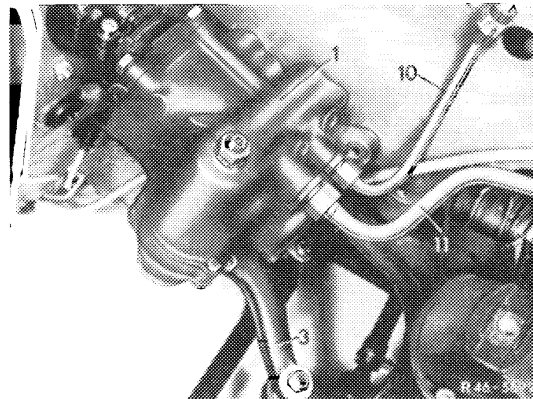
refer to illustration item 23

Removal

1 Draw oil out of supply tank (2) of power steering pump by means of a syringe.

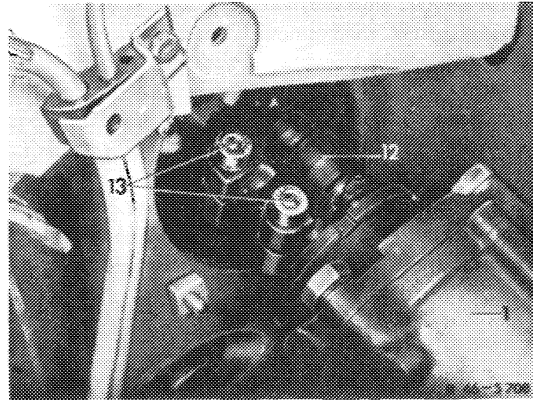


2 Loosen high-pressure expanding hose (10) and connecting pipe for return flow hose (11) on steering, while applying counterhold to connections on steering.



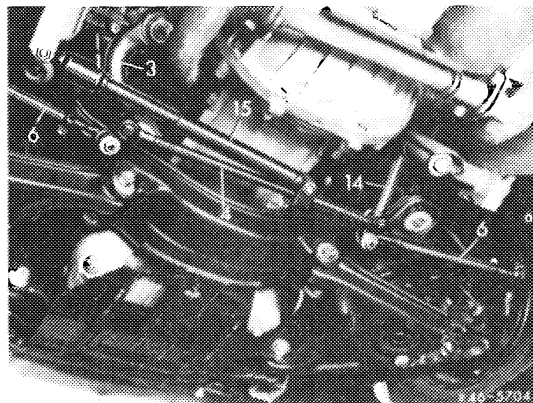
3 Close oil hoses and connecting points on steering with blind plugs.

4 Unscrew lower hex. socket screw (13) from steering coupling (12).

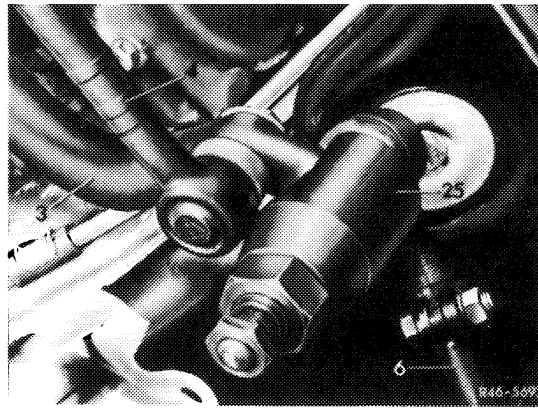


5 Uncotter castle nut of drag link and track rod and unscrew castle nut.

Note: If the steering has been exchanged and the pitman arm is not replaced, the drag link and the track rod on steering arm need not be released.



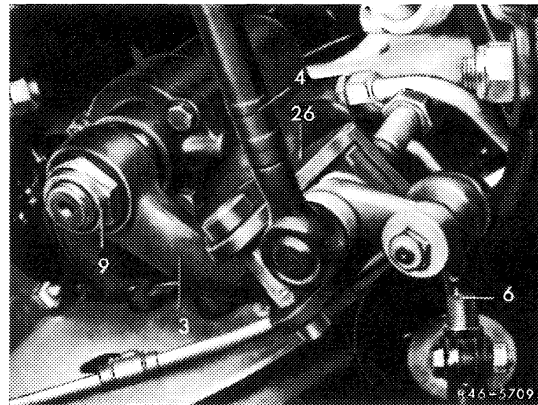
6 Push ball joint of track rod from pitman arm by means of puller.



7 Push ball joint of drag link from pitman arm by means of puller.

Note: The drag link can also be pushed off with puller 123 589 09 33 00. To avoid damaging rubber sleeve on drag link of 2nd version, use puller 123 489 00 33 00 only if the bell head of puller has been refinished.

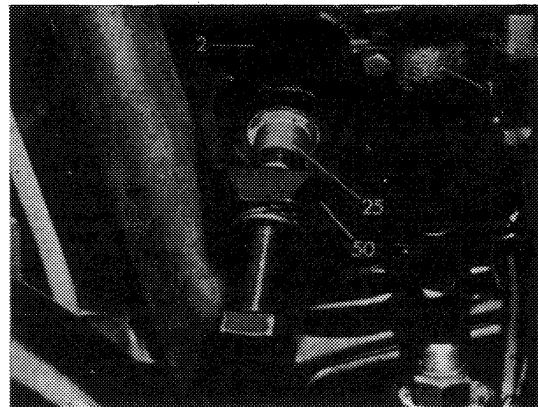
8 Unscrew self-locking hex. nut (9) from pitman shaft.



9 On vehicles with 8-cylinder engine remove rear exhaust system, then remove lefthand exhaust pipe on manifold.

10 Remove pitman arm(2) from pitman shaft (25) with puller (50).

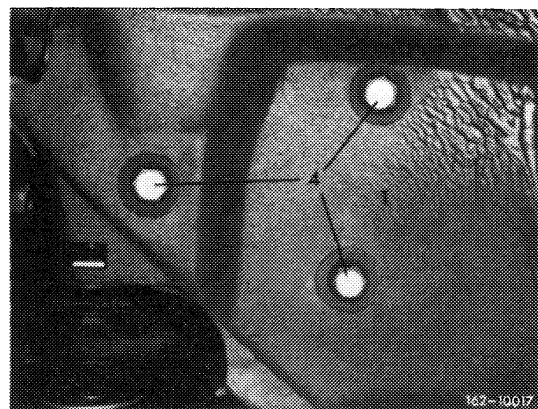
11 Remove steering shaft (46-630, item 2-5). However, pull steering shaft upwards only to the extent that the steering coupling is no longer entering steering worm.



12 Unscrew locking screw (4) for attaching steering to side member of frame floor. Then remove steering in downward direction.

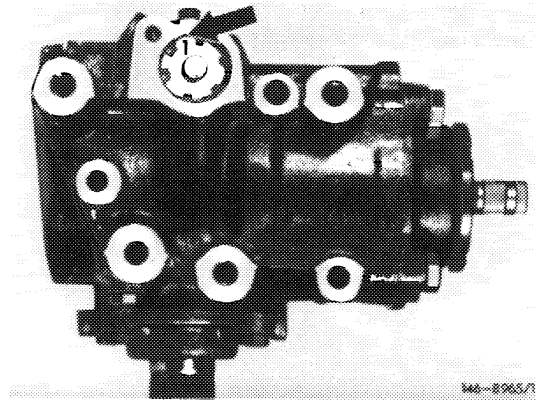
13 Upon removal of steering, drain oil from steering housing by turning steering worm completely to the left and to the right.

14 Remove steering coupling from steering shaft.



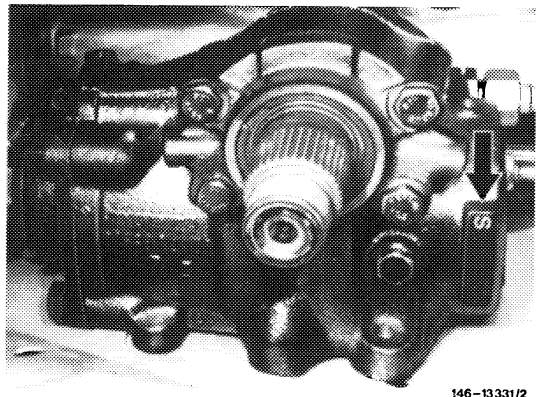
Installation

Note: When the steering is renewed, make sure that only the type of steering may be installed which is marked with the code number "1" on closing cover for control valve.



Install only steering identified with an "S" into model 107.026. This steering is provided with an additional stop to prevent pitman arm from resting against exhaust pipe when in steering lock position.

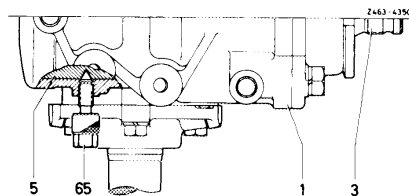
This steering is installed in all lefthand steering models starting spring 1979.



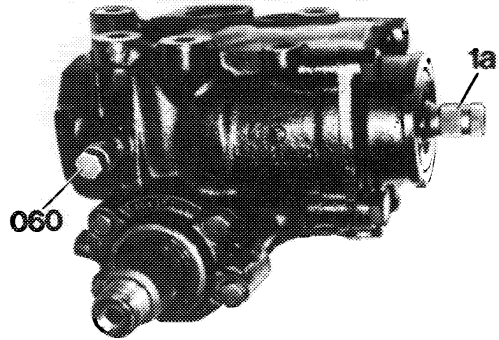
Upon repairs following an accident, when one of the side members or the front end have been straightened or replaced, or when the jacket tube has been removed, check alignment between steering shaft and steering worm. For this purpose, install steering and complete jacket tube **without steering coupling**. A vertical and lateral offset between steering shaft and steering worm of 2 mm is permitted. Alignment can be corrected by displacing jacket tube on cross member or cover plate on front end. Pay attention to perfect location of steering lock cap in cutout of instrument panel.

15 Prior to installation, check steering coupling for wear and recondition or renew, then attach steering coupling to steering shaft.

16 Turn steering to center position. For this purpose, unscrew closing plug from steering housing. Turn steering worm (3) until the center point in power piston (5) is accurately under threaded bore.



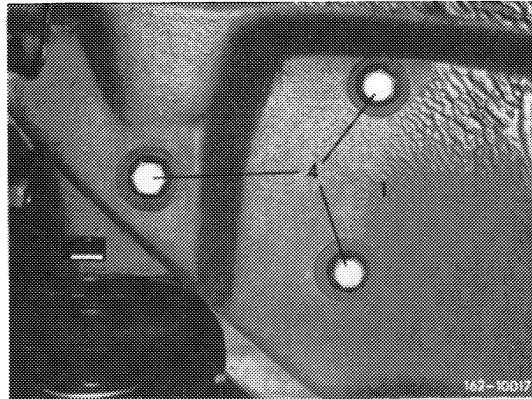
17 Screw center-position check screw (060) into steering housing and locate power piston.



146-11347

18 Attach steering with **three new** locking screws (4) to side member of frame floor. Tightening torque 70–80 Nm (7–8 kpm).

Attention!
Always renew locking screws on principle.



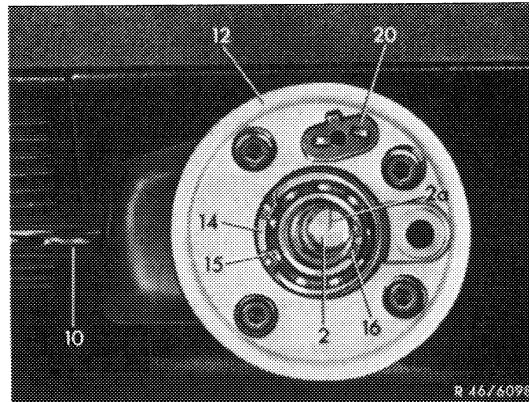
142-10017

19 Turn steering shaft until resetting cam for combination switch is in center of cutout in jacket tube and marking (2a) is pointing upwards. Then introduce steering coupling into splining of steering worm.

Note: The steering shaft should not move axially when steering coupling is inserted into steering worm.

20 Attach bearing body (12) to jacket tube. Install combination switch (10).

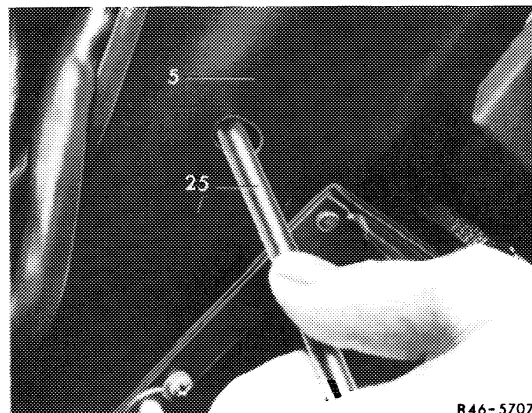
21 Install steering wheel (46–610).



R 46/4098

Note: On vehicles with jacket tube 1st version the longitudinal adjustment of the steering shaft can be checked through bore in jacket tube. For this purpose, insert assembly pin (25) into check bore of steering shaft.

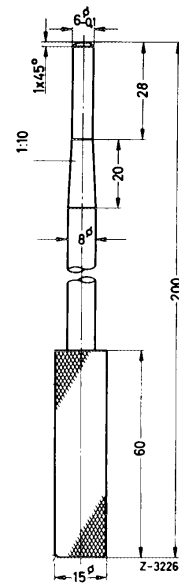
In jacket tube 2nd version installed starting end of 1977 the control bore in steering shaft is no longer in place.



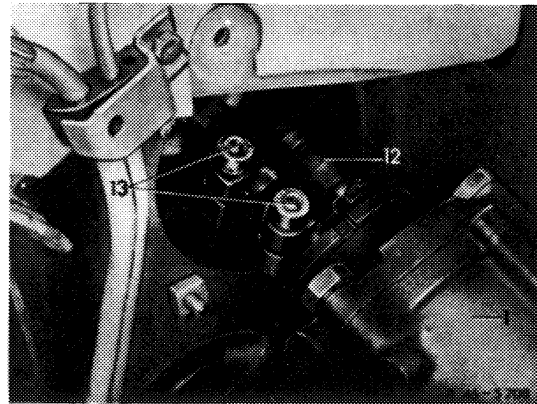
R 46-5707

Note: The assembly pin is self-made according to specified dimensions.

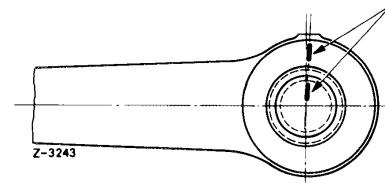
22 Unscrew center-position check screw, screw closing plug into steering housing together with a new copper sealing ring. Remove assembly pin from steering shaft.



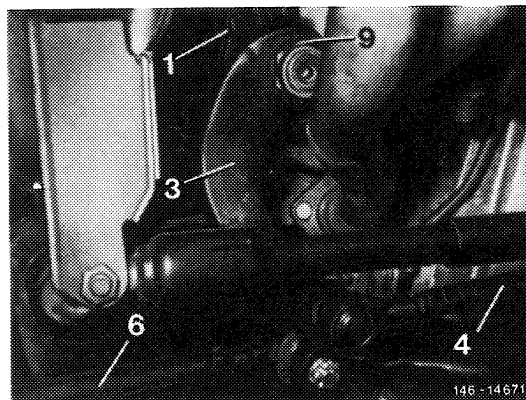
23 Screw hex. socket screw (13) into lower flange of steering coupling (12) and tighten. Tightening torque 25 Nm (2.5 kpm) – reference value.



24 Slip pitman arm on splining of pitman shaft, while paying attention to code number and markings (arrow) on lever and on pitman shaft.

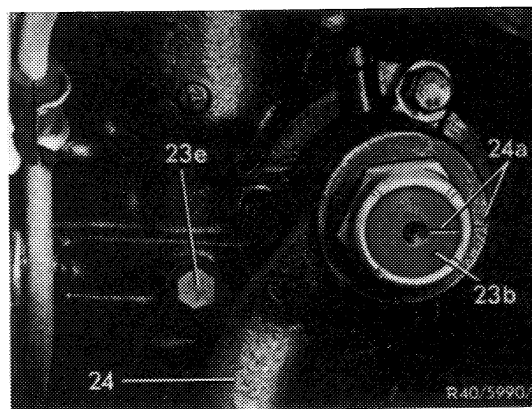


Note: On model 107.026 install only the sickle-shaped pitman arm(3) part no. 107 463 16 01 (code number 0716). This arm replaces simultaneously the pitman arms, part. no. 107 463 10 01 (code number 0710) and 107 463 12 01 (code number 0712) valid for the other lefthand steering models. The pitman arm 107 463 13 01 (code number 0713) is valid for all righthand steering models.

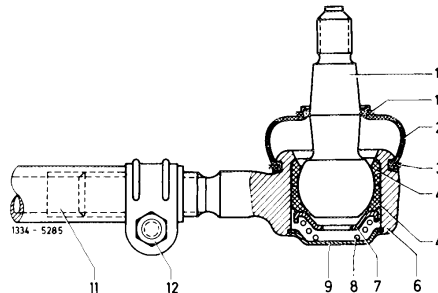


25 Attach pitman arm (24) with a new self-locking hex. nut. Tighten hex. nut to 160–200 Nm (16–20 kpm).

Attention!
Be sure to renew self-locking hex. nut on principle.

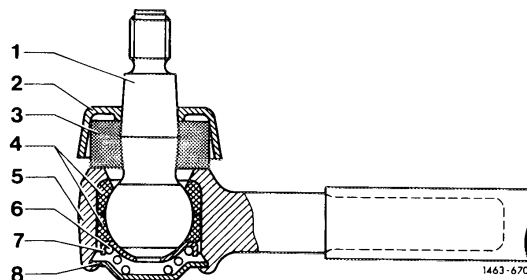


26 Check rubber sleeve (2) on joint of track rod (11). If the sleeve is damaged, check joint for wear and replace, if required (46–540).



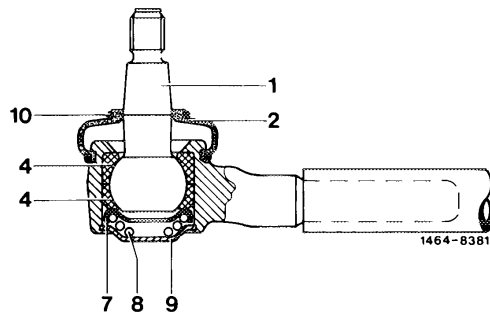
27 On darg link 1st version, check joint of drag link for wear and replace drag link, if required.

Place sealing ring (3) and plastic cover (1) on ball joint.



28 On drag link 2nd version, check rubber sleeve (2) on joint. If sleeve is damaged, check joint for wear and replace drag link, if required (46–550).

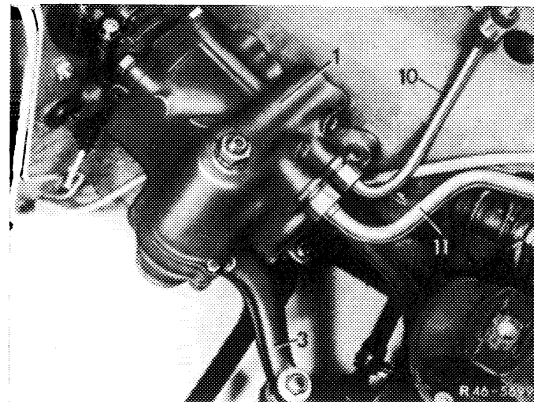
29 Attach track rod and drag link to pitman arm, insert cotter pins into castle nuts. Tightening torque 35 Nm (3.5 kpm) — reference value.



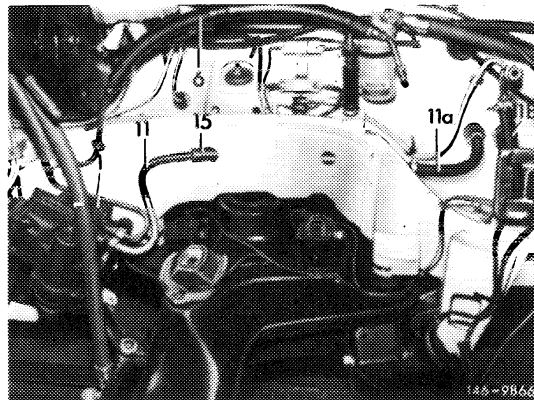
30 Remove blind plug. Connect high-pressure expanding hose and connecting pipe for return flow hose.

Attention!

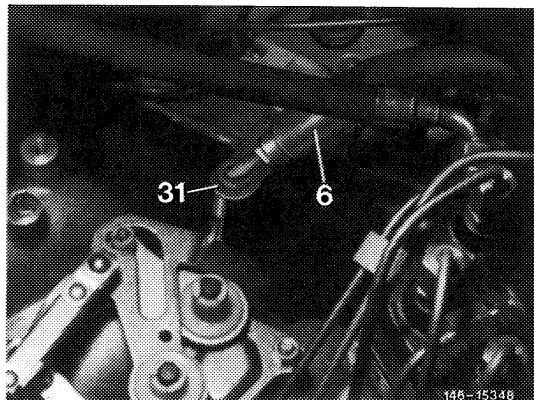
Pay attention to perfect installation of hose. Even minor chafing marks may result in early oil losses and consequently in a loss of hydraulic support.



Note: On vehicles with 8-cylinder engine the return line (11) has been moved to frame side member for reasons of available space.



On vehicle engines 110 with increased output (production starting April 1978) the high-pressure expanding hose including rubber grommet is attached in holder (31).

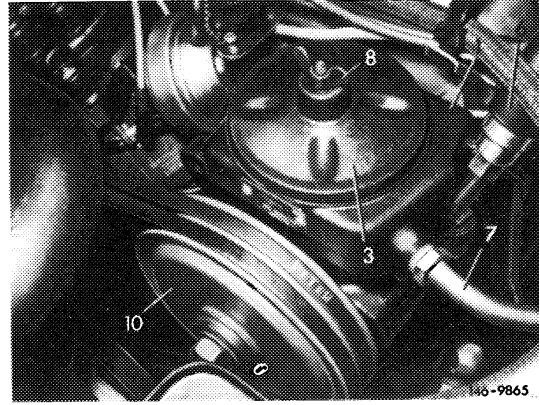


31 Install exhaust system on vehicles with 8-cylinder engine.

32 Fill supply tank of power steering pump with specified oil grade (refer to specifications for service products).

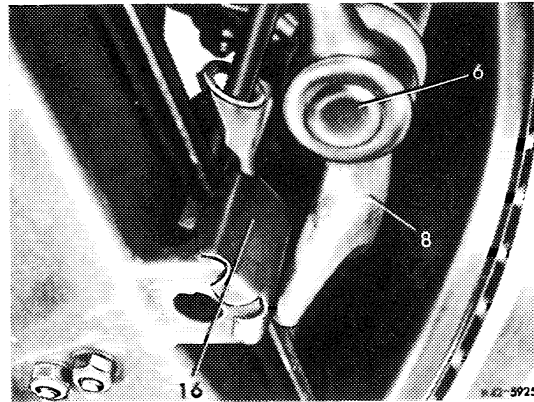
33 Run engine and turn steering several times to the left and to the right while adding oil.

Note: Steering is self-venting.

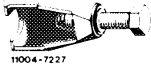
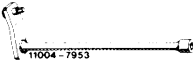

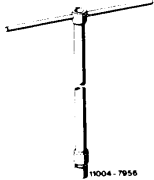
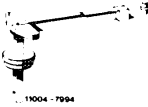



34 Turn steering completely to the left and to the right while checking whether steering knuckle arm (8) rests each time against stop (16) of lower control arm.

35 Check wheel adjusting values on front axle (40–320).



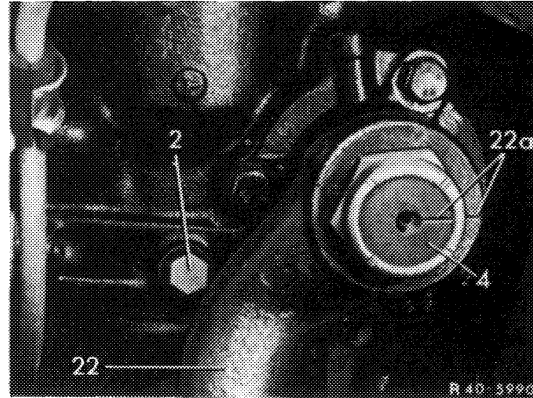
46–480 Adjusting power steering in vehicle

Adjusting value		Ncm	(kpcm)
Total friction torque of steering measured at steering worm		110–160	(11–16)
Tightening torques			
Hex. head collar nut to adjusting screw		60–65	(6–6.5)
Self-locking hex nut on pitman shaft		160–200	(16–20)
Special tools			
Puller for pitman arm			100 589 04 33 00
Allen wrench insert 6 mm 3/8" square			123 589 01 10 00
Box wrench insert 19 mm 1/2" square			123 589 01 03 00
Socket wrench 19 mm			123 589 01 09 00
Torque wrench 1/2" square 0–400 Ncm (0–40 kpcm)			123 589 02 21 00
Mounting for torque wrench 1/2" square			126 589 13 63 00

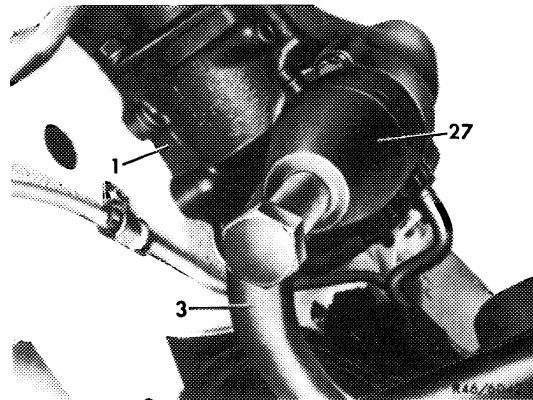
Conventional tools

Allen wrench insert 3/8" with joint for hex. socket screw 6 mm	e.g. made by Hazet order No. 2740	5630 Remscheid
Slide handle 3/8" 200 mm long	e.g. made by Hazet order No. 8815	5630 Remscheid
Extension 3/8" 255 mm long	e.g. made by Hazet order No. 8821-10	5630 Remscheid

- 1 Unscrew self-locking hex nut from pitman shaft.



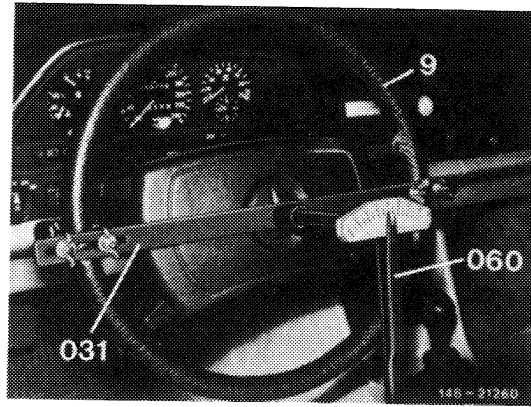
- 2 Pull pitman arm (3) from pitman shaft by means of puller (27).



- 3 Fasten mounting for torque wrench to steering wheel.



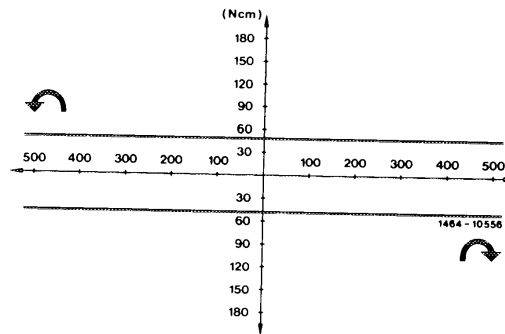
4 Place torque wrench (060) into mounting (031) and turn steering several times from lock to lock. Measure friction torque while turning steering wheel.



5 Readjust steering if, while turning steering from lock to lock, there is no more increase of friction value in center range.

Example: Friction torque of used steering. Friction torque is the same over entire turning range.

Attention:
If friction torque increases above 110 Ncm in center range of steering, do not readjust steering.



Adjusting friction torque

6 Loosen hex. collar nut (57) and turn adjusting screw (47) approx. 1/4 turn to the left. Tighten hex. collar nut to 60 Nnm.

7 Check friction torque. In center range, torque should be 30–60 Ncm above basic friction torque measured before.

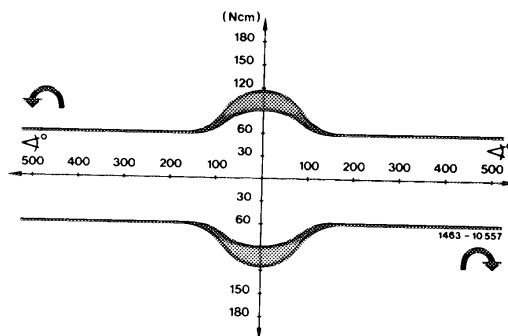
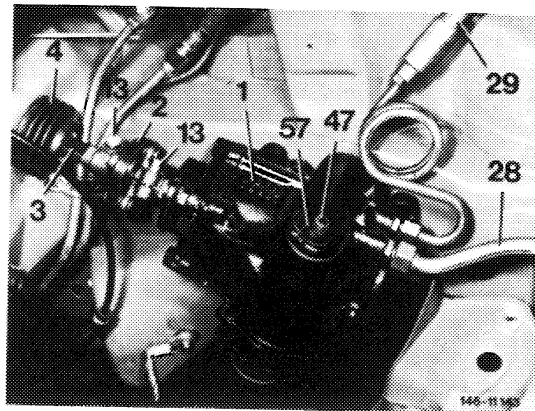
Example: Friction torque of steering following adjustment

Basic friction torque = 60 Ncm

Increase in center range = 30–60 Ncm

Total friction torque = 90–120 Ncm

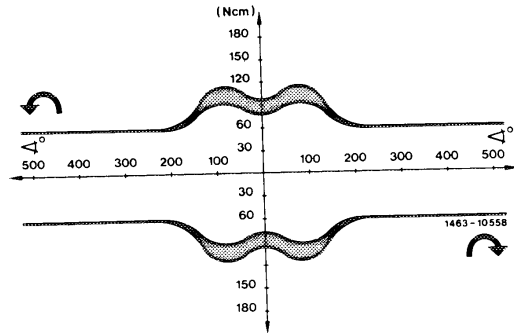
If this increase is not attained, screw adjusting screw again outward by 1/8 to 1/4 turn.



When turned beyond center position the total friction should not exceed 120 Ncm.

Turn steering from lock to lock. Steering should not bind across entire turning range.

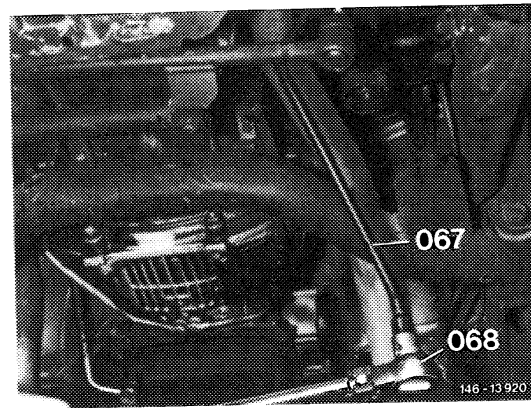
Note: On a steering gear which has been operated for an extended period and has not been readjusted, the friction torque may drop slightly in center range but will increase at left and right of center. Such a slight drop is unobjectionable and is noticed on steering wheel by a minimum play which cannot be removed.



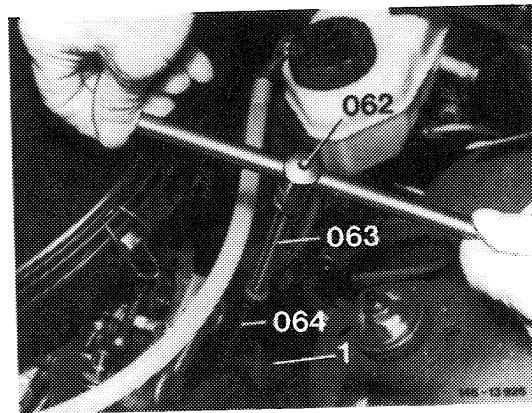
8 Application of special tools and conventional tools:

Models 107.022 and 107.042

For loosening or tightening hex. collar nut, use box end wrench 123 589 01 03 00.

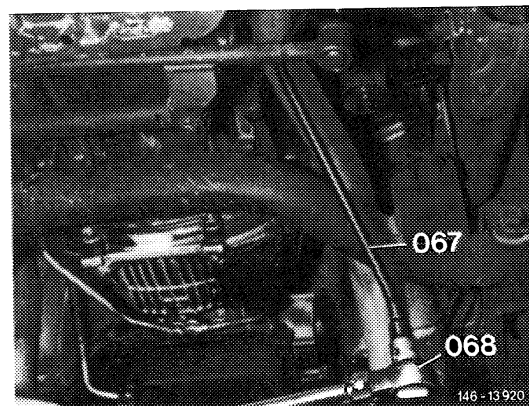


Required for setting adjusting screw: Allen wrench with joint (064), extension (063) and sliding handle (062).



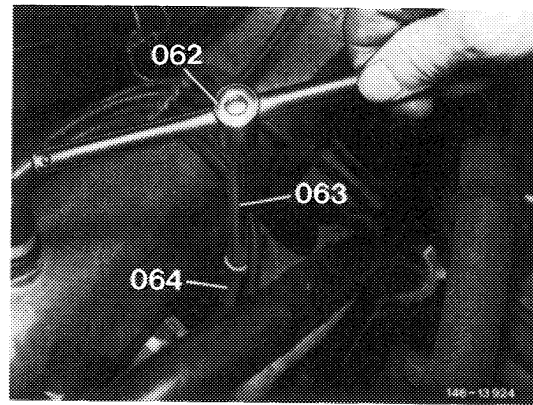
Models 107.023, 107.024, 107.025, 107.026, 107.043, 107.044, 107.045 and 107.046

For loosening or tightening hex. head collar nuts from below, box wrench 123 589 01 03 00 (067) will be required.



Setting of adjusting screw requires the following:
Allen wrench with joint (064), extension (063) and
slide handle (062).

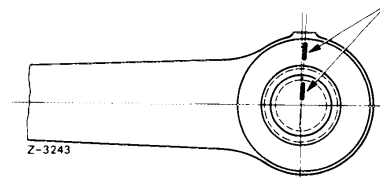
Note: On engine with electronic injection the shield-
ing plate on lefthand exhaust manifold and, in
addition, the air filter on engine with CIS injection
must be removed.



All models

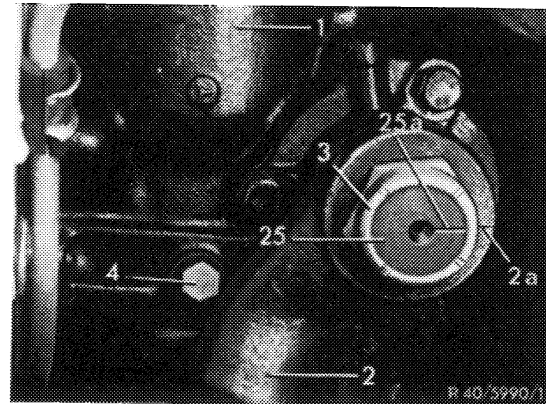
9 Clean serrations (notches) on pitman shaft and
on pitman arm.

10 Slip pitman arm on pitman shaft, making sure
that the marking on arm is in alignment with marking
on pitman shaft.

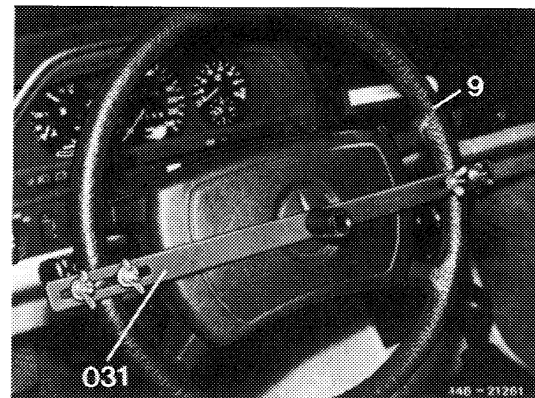


11 Screw new self-locking hex nut on pitman shaft
and tighten to 160–200 Nm (16–20 kpm).

Attention!
Always replace self-locking hex nuts.



12 Remove mounting from steering wheel.



46-510 Removal and installation of pitman arm

Data

	Part. No.	Version	Code No.	Remarks	
107.022	107.043	107 463 10 01	Lefthand steering	0710	1st version
107.023	107.044	107 463 11 01	Righthand steering	0711	
107.024	107.045	107 463 12 01	Lefthand steering	0712	2nd version
107.025	107.046	107 463 13 01	Righthand steering	0713	
107		107 463 16 01	Lefthand steering	0716	3rd version for left-hand steering vehicles. Replacement for 107 463 10 01 and 107 463 12 01.

Tightening torques

	Nm	(kpm)
Self-locking hex. nuts to pitman shaft	160-200	(16-20)
Castle nut to drag link and track rod	35	(3.5)

Special tools

Puller for ball joint of track rod  186 589 10 33 00

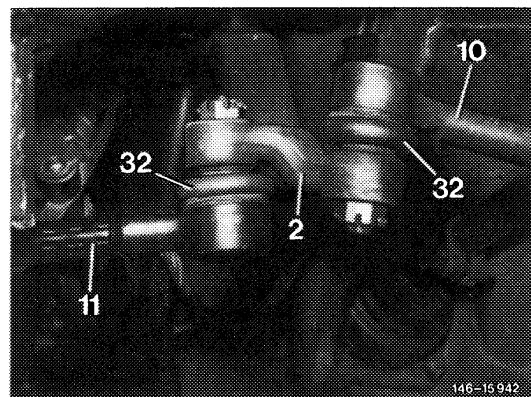
Puller for ball joint of drag link  123 589 00 33 00

Puller for ball joints of track rod and drag link on pitman arm  111 589 08 33 00

Puller for pitman arm  100 589 04 33 00

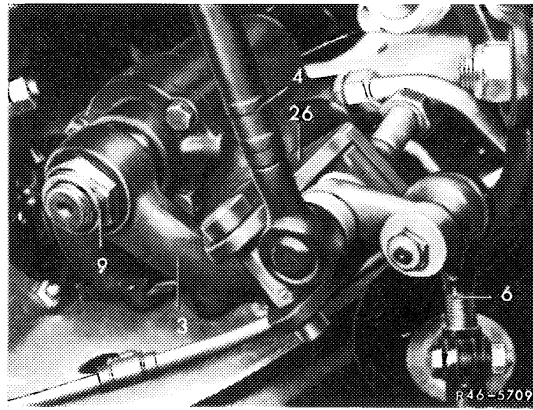
Removal

- 1 Uncotter castle nut of drag link and track rod on pitman arm and unscrew castle nut.

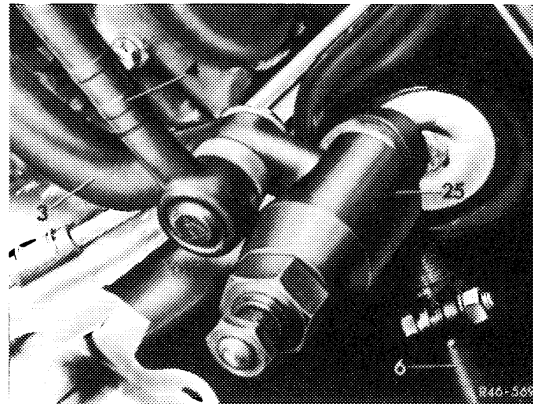


2 Force ball joint of drag link (4) from pitman arm by means of puller (26). On 1st version of drag link, pay attention to plastic cover ring and sealing disc.

Note: The drag link can also be forced off with puller 123 589 09 33 00. To prevent damaging of rubber sleeve on drag link 2nd version, use puller 123 589 00 33 only if the bell-type puller has been refinished.



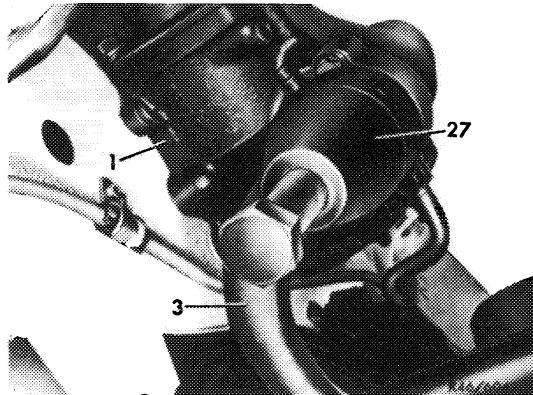
3 Force ball point of track rod (6) from pitman arm (25) with puller.



4 Unscrew self-locking hex. nut from pitman shaft.

5 On vehicles with 8-cylinder engine remove rear exhaust system, then take off lefthand exhaust pipe on manifold.

6 Pull pitman arm (3) from pitman shaft with puller (27).

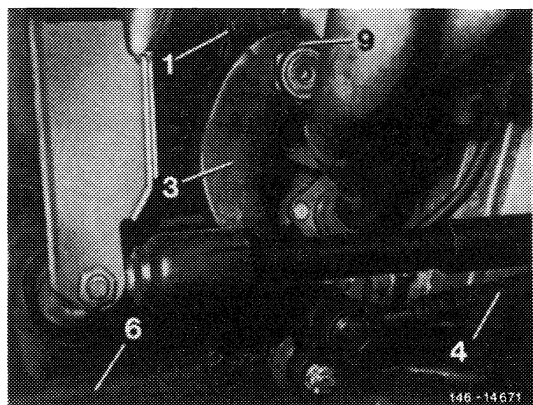


Installation

7 The pitman arm cannot be checked with conventional workshop equipment. **When in doubt**, particularly following an accident, renew **pitman arm**.

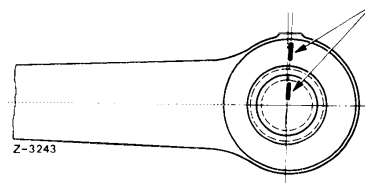
Pay attention to correct code number of pitman arm.

Note: On model 107.026 install sickle-shape pitman arm 107 463 16 01 (code number 07 16) only.



8 Clean splining on pitman shaft and pitman arm.

9 Slip pitman arm on pitman shaft, marking on arm should be in alignment with marking on pitman shaft.

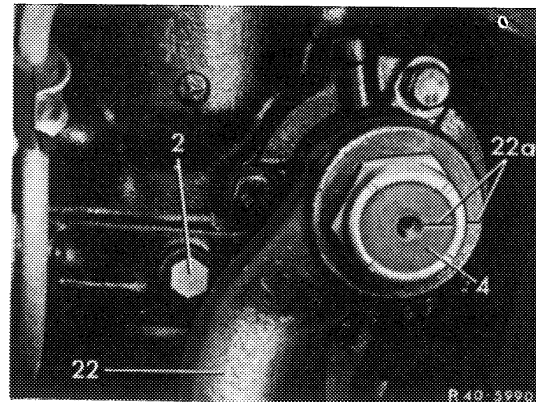


10 Screw new self-locking hex. nut on pitman shaft and tighten to 160–200 Nm (16–20 kpm).

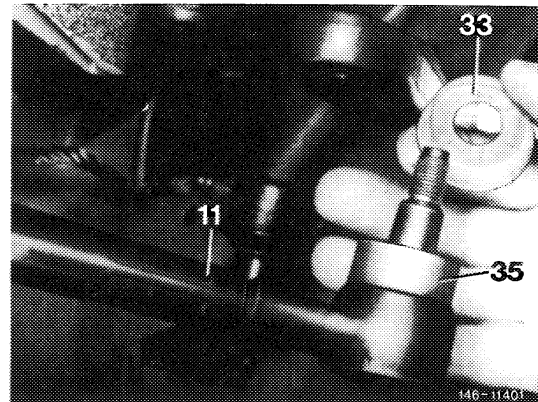
Attention!

Always replace self-locking hex. nuts on principle.

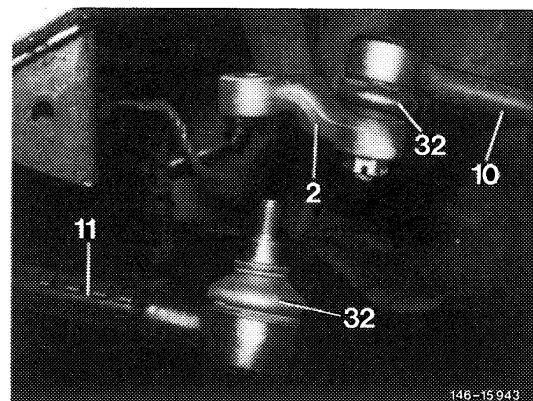
11 On vehicles with 8-cylinder engine, install exhaust system.



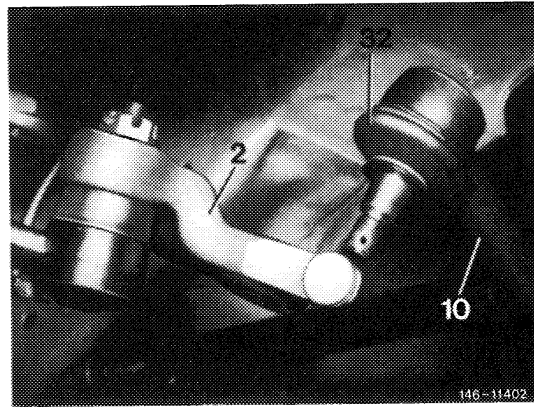
12 On drag link 1st version, check joint of drag link for wear and replace drag link, if required. Place sealing ring (35) and plastic cover (33) on ball joint (46–550).



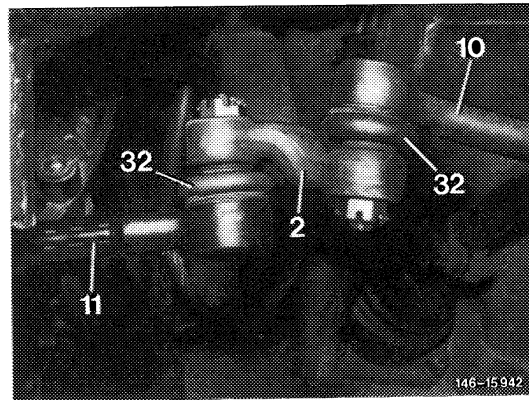
13 On drag link 2nd version, check rubber sleeve (32) on ball pin. If the rubber sleeve is damaged, check ball joint for wear and replace drag link, if required (46–550).



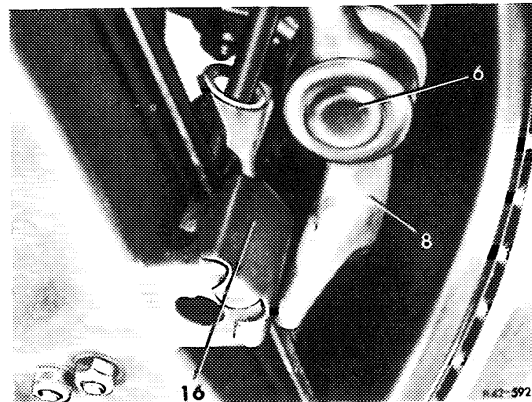
14 Check rubber sleeve (2) on ball pin of track rod.
If rubber sleeve is damaged, replace ball joint
(46–540).



15 Fasten track rod and drag link to pitman arm,
insert cotter pins into castle nuts, tightening torque
35 Nm (3.5 kpm) reference value.



16 Turn steering completely to the left and right
while checking whether steering knuckle arm (8)
each time rests against stop (16) of lower control
arm.



17 Check wheel adjusting values on front axle
(40–320).

46–520 Removal and installation of intermediate steering arm, checking and reconditioning of intermediate steering arm bearing

Data

Part No.	Version	Code No.	Remarks
107 463 04 10	Lefthand steering	0704	1st version
107 463 05 10	Righthand steering	0705	
107 463 08 10	Lefthand steering	0708	2nd version and replacement for 1st version
107 463 09 10	Righthand steering	0709	
107 463 10 10	Lefthand steering	0710	3rd version for left-hand steering and replacement for 1st and 2nd version.





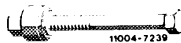
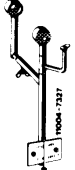
Adjusting value

Permissible difference in height of ball point location between pitman arm and steering intermediate lever	4 mm
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Tightening torques

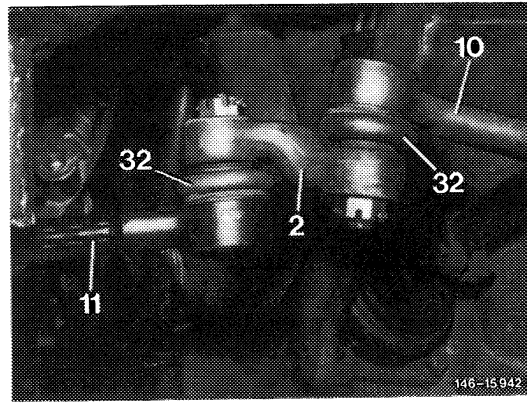
	Nm	(kpm)
Self-locking hex. nut for attaching steering intermediate arm	120	(12)
Castle nut to drag link and track rod	35	(3.5)

Special tools

Puller for ball joint of track rod		186 589 10 33 00
Puller for ball joint of drag link		123 589 09 33 00
Puller for ball joint of drag link and track rod on steering intermediate lever		111 589 08 33 00
Remover for rubber slide bearing		116 589 01 33 00
Installer for rubber slide bearing		115 589 08 61 00
Measuring instrument for ball point position		115 589 03 21 00

Removal

1 Remove cotter pins from castle nuts of drag link and track rod and unscrew castle nuts.

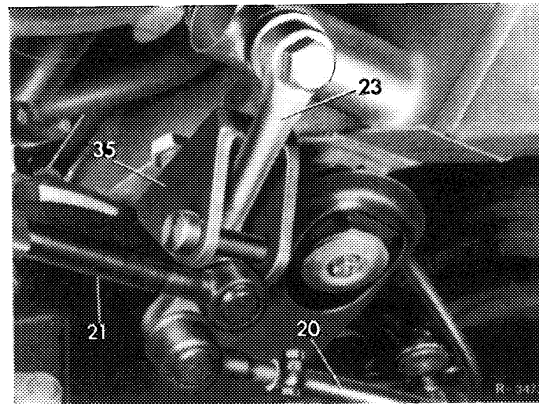


2 Remove shielding plate from bearing of steering intermediate arm.

3 Force ball joint of drag link from steering intermediate arm by means of puller (35). Pay attention to plastic cover and sealing ring on drag link 1st version.

Note: The ball joint of the drag link can also be removed from steering intermediate arm by means of puller 123 589 00 33 00.

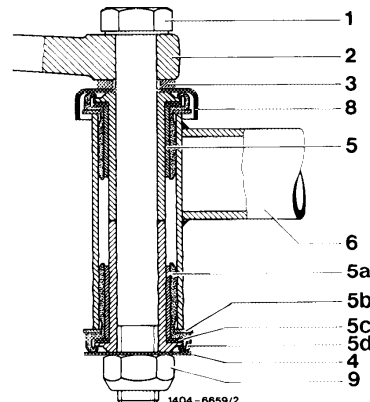
To prevent damaging rubber sleeve on drag link 2nd version, use puller 123 589 00 33 00 only if the bell-type puller has been refinished.



4 Force ball joint of track rod from steering intermediate arm.

5 Unscrew self-locking hex. nut (9) from hex. bolt (1). Remove sealing washer (4).

6 Remove hex. bolt (1) together with steering intermediate lever (2) and dust cap (8). Pay attention to washer (3) between steering intermediate arm and dust cup, if installed.



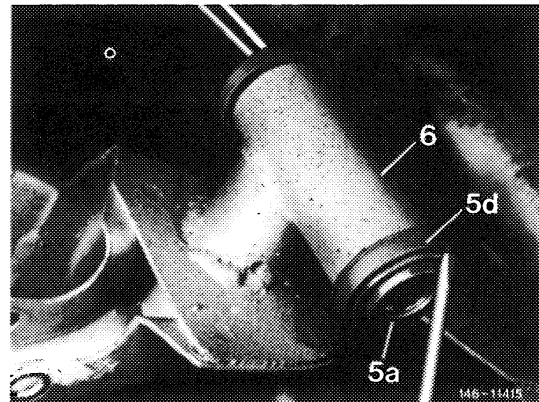
Checking and reconditioning of intermediate steering arm bearing

The steering intermediate arm cannot be checked with conventional workshop equipment. **When in doubt, particularly following an accident, renew steering intermediate arm.**

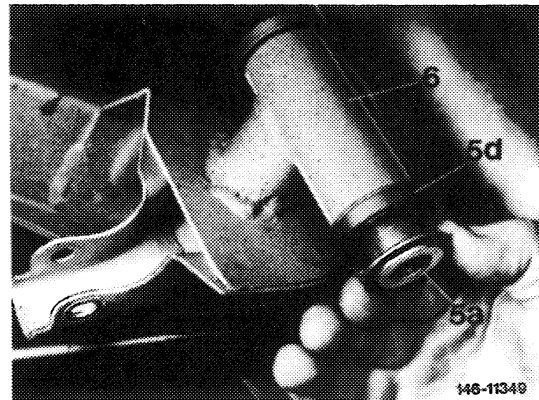
Pay attention to correct code number of steering intermediate arm.

7 Check rubber slide bearing in journal bearing (6) for wear and renew, if required.

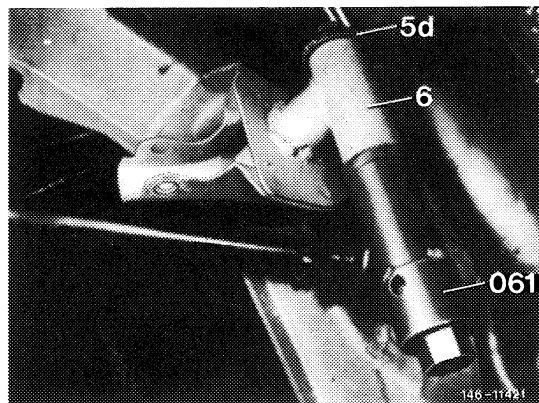
For this purpose, lift rubber bushing (5d) with a screw driver.



8 Remove slide bushing (5a) from rubber bearing.

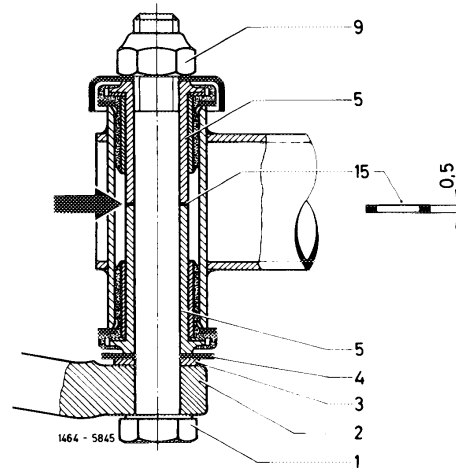


9 Remove both rubber bushings (5d) from journal bearing by means of puller (061).

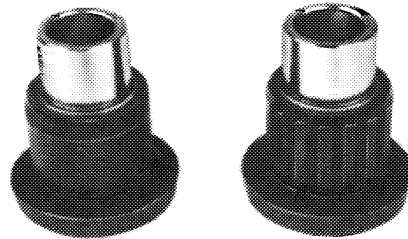


Note: If new rubber slide bearings are installed because of complaints about noise, proceed as follows:

a) When installing rubber slide bearing 1st version, insert steel disc part no. 115 463 01 52 (15) between both slide bushings. Note that the end play of both slide bushings in rubber bushings should not exceed max. 0.5 mm. The end play is checked by pushing steering intermediate arm on and off.



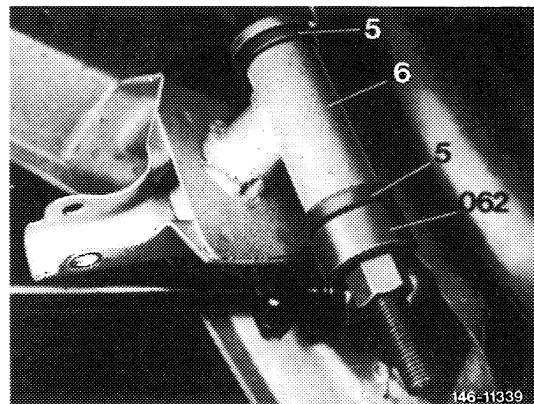
b) Install rubber slide bearing 2nd version with longitudinal grooves.



left: smooth rubber slide bearing
right: rubber slide bearing with longitudinal grooves

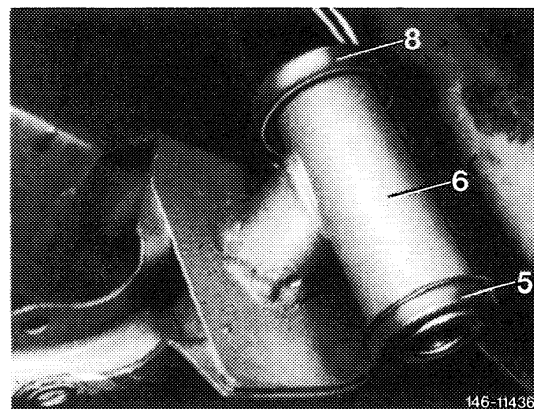
146-10143

10 Rub rubber slide bearing (5) outside with slide fluid, e.g. white oil, and press into journal bearing (6) by means of pressing-in tool (062).



146-11339

11 Place dust cap (8) on upper rubber slide bearing.

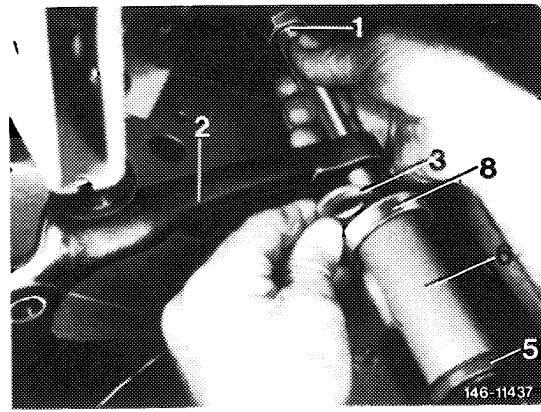


146-11436

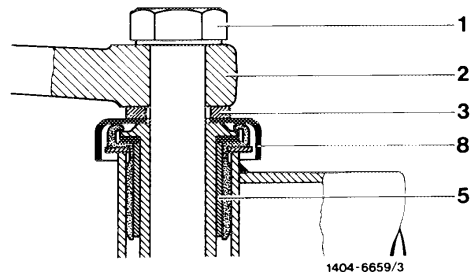
Installation

12 Insert hex. bolt (1) with steering intermediate arm (2) and dust cap (8) into rubber slide bearing.

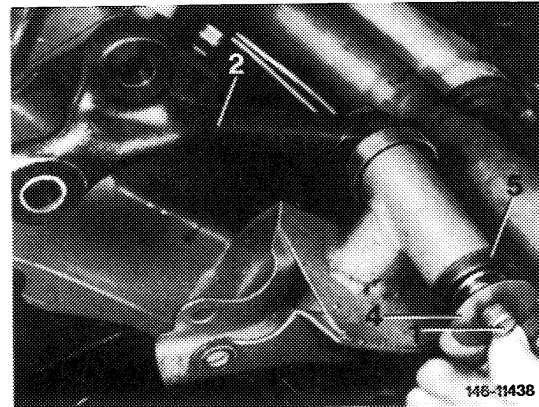
Note: Mount hex. bolt with bolt head facing steering intermediate arm, install bolts of grade 10.9 only.



13 Reinstall spacing washer (3) between dust cap (8) and steering intermediate arm (2), if previously installed.

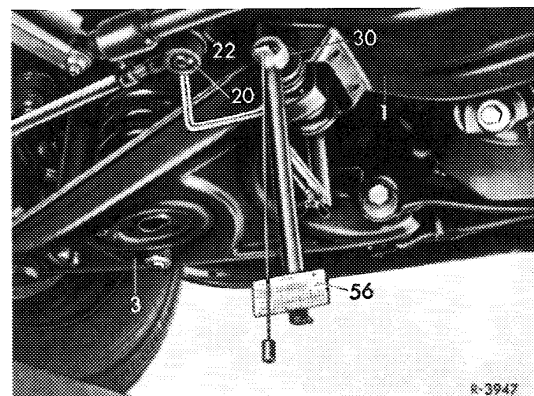


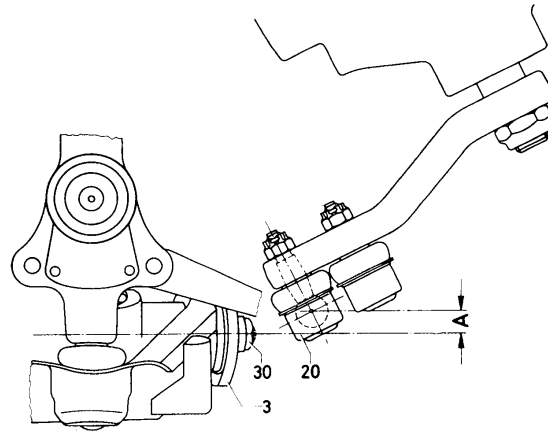
14 Mount sealing plate (4), screw-on normal hex. nut M 16 x 1.5 and tighten to approx. 70 Nm (7 kpm).



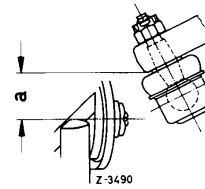
15 Measure permissible deviation in height of ball point location between pitman arm and intermediate steering arm by means of measuring instrument (56). Max. permissible difference 4 mm.

If a larger difference is measured, perform remedies described in 40–320.





- 3 Lower control arm
- 20 Track rod
- 30 Eccentric bolt
- A Ball point position (theoretical)
- a Ball point position (measuring point)



16 Unscrew hex. nut, then screw-on new self-locking hex. nut (9) and tighten to 120 Nm (12 kpm).

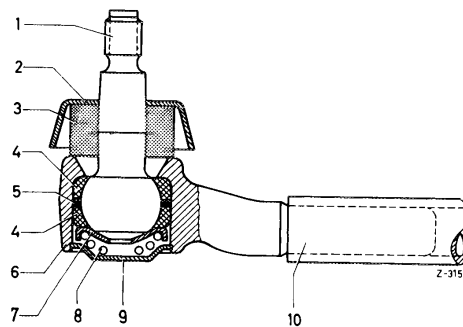
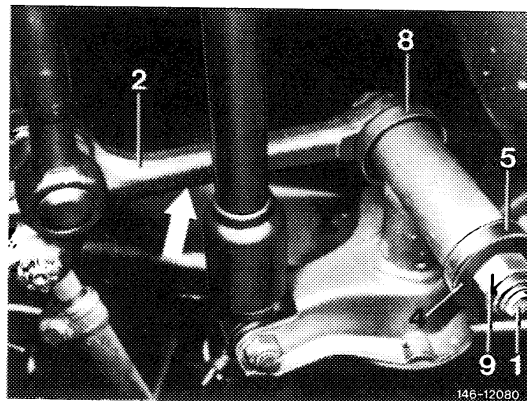
Note: After tightening self-locking hex. nut, at least one thread of hex. bolt should project above hex. nut.

Attention!
Always replace self-locking hex. nut on principle.

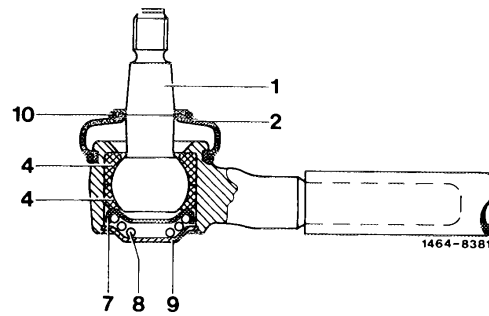
17 Check whether steering intermediate arm can be turned to the left and right without binding.

18 Attach shielding plate to journal bearing.

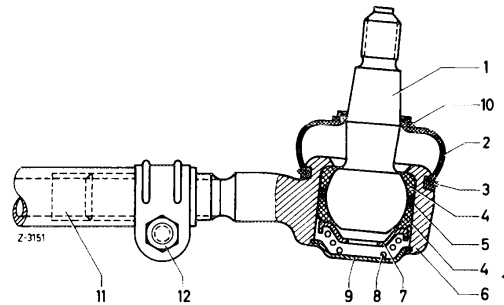
19 On drag link 1st version, check joint of drag link for wear and replace drag link, if required. Place sealing ring (3) and plastic cover (2) on ball joint (46–550).



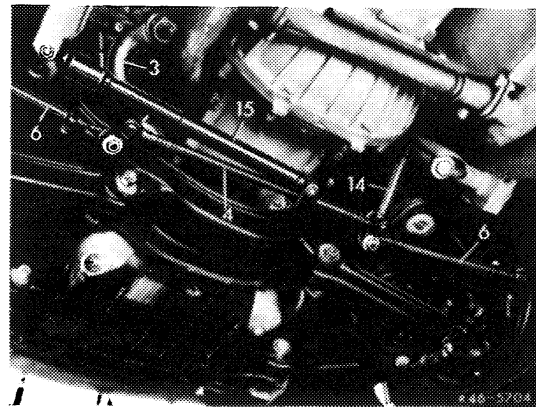
20 On drag link 2nd version, check rubber sleeve (2) on ball pin. If rubber sleeve is damaged, check ball joint for wear and replace drag link, if required (46–550).



21 Check rubber sleeve (2) on ball pin of track rod. If rubber sleeve has been damaged, replace complete ball joint (46–540).

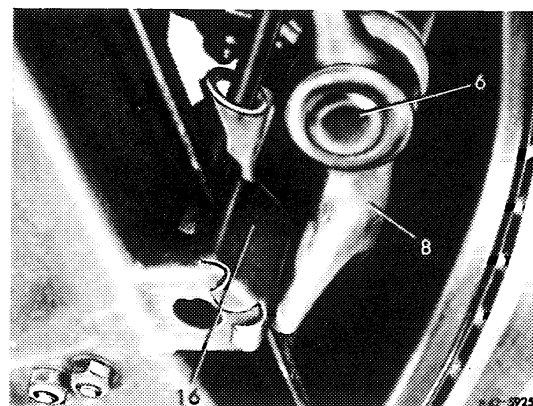


22 Fasten track rod and drag link to intermediate steering arm, insert cotter pins into castle nuts. Tightening torque 35 Nm (3.5 kpm) — reference value.



23 Turn steering completely to the left and right while checking whether steering knuckle arm (8) rests each time against stop (16) of lower control arm.

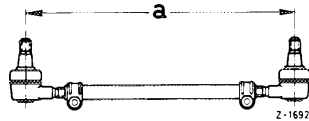
24 Check wheel adjusting values on front axle (40–320).



46-540 Removal and installation of track rod

Data

Part No.	Length "a"	Remarks
115 330 07 03	342 ± 2	Lefthand thread mounted at the left in driving direction



Approved grease types for ball joint

Multi-purpose grease refer to Specifications for service products, page 267

Tightening torques	Nm	(kpm)
Castle nut for attaching track rod to steering arms	35	(3.5)
Hex. bolt to clamp of track rod	20	(2)

Special tool

Puller for ball joint of track rod on steering arms



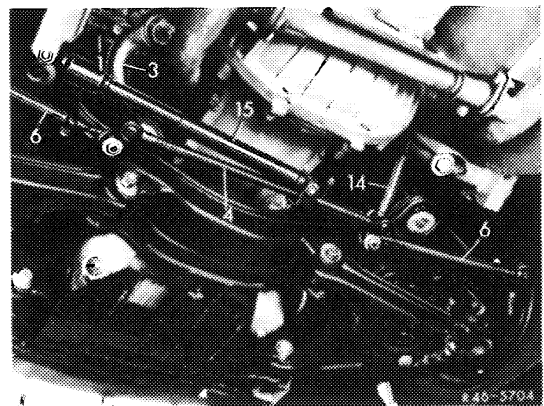
186 589 10 33 00

Self-made tools

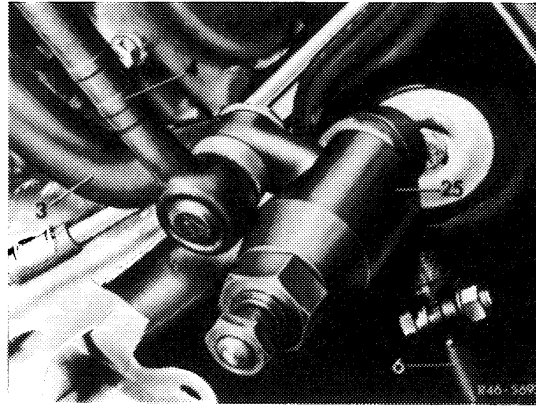
Assembly bushing for flat wire clamping ring	refer to illustration item 8
Assembly bushing for plastic ring	refer to illustration item 8

Removal

1 Uncotter castle nuts on joints of track rod (6) and unscrew.



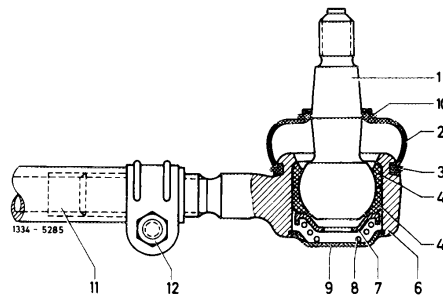
2 Remove track rod (6) on steering arms with puller (25).



Checkup

3 Check joints of track rod. If joints are moving too easily or in the event of play, replace respective track rod head.

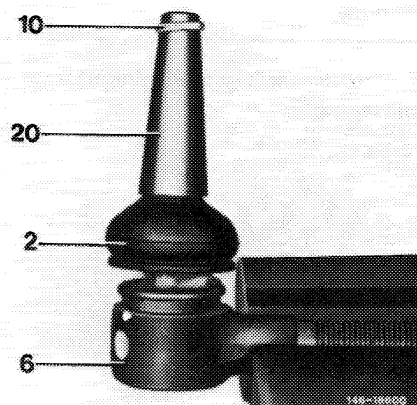
4 Check rubber boots (2) for joints. **If the rubber boot of a used joint is damaged, completely replace respective joint.**



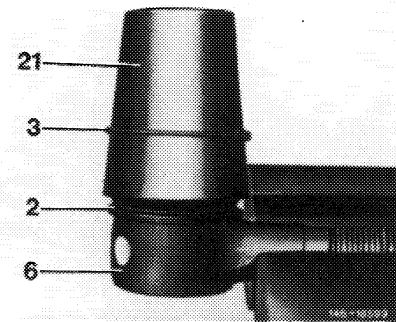
5 If the rubber boot (2) has been damaged during removal of track rod, only the rubber boot need be replaced. For this purpose, remove flat wire clamping ring (3) and pull off boot including plastic fastening ring (10).

6 Prior to mounting new rubber boot, fill space between boot and joint with specified grease.

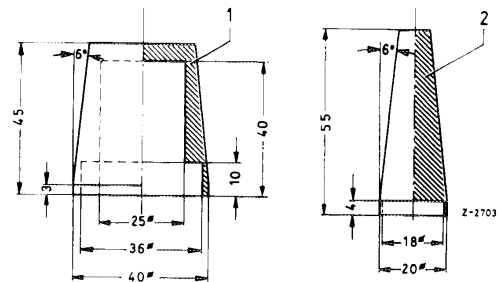
7 Place rubber sleeve (2) and then assembly sleeve (20) on ball pin. Insert plastic fastening ring (10) over assembly bushing into rubber boot.



8 Place assembly bushing (21) on ball joint and over rubber bushing (2) and insert flat wire clamping ring (3).



Note: Assembly bushings are self-made according to specified dimensions.



- 1 Assembly sleeve for flat wire clamping ring
- 2 Assembly sleeve for plastic ring

Note: The service-free joints are filled with grease for life. On these joints, **sealing** against penetration of dirt is of decisive importance for life of joint. For this reason, a **damaged rubber boot must be replaced immediately**, since otherwise the entering dirt will result in worn joints. For the same reason, it is also necessary to **check the joints regularly and carefully**.

Installation

Mount track rods in such a manner that the track rod head **with lefthand threads** is **always at the left** (seen in driving direction).

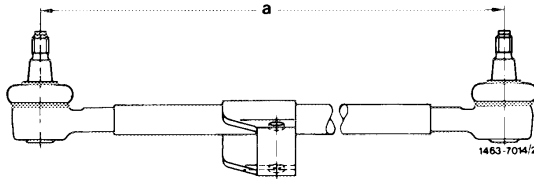
9 Clean ball pins as well as conical seats in steering arms perfectly from grease. Then push ball pin tightly into cone of steering arm, **screw-on castle nut** and tighten. Tightening torque 35 Nm (3.5 kpm) – reference value cotter castle nut.

10 Check wheel adjusting values on front axle (40–320).

46–550 Removal and installation of drag link

Data

	Part no.		Length "a"
	1st version	2nd version	
	107 460 02 05	107 460 05 05	470 ± 0.5



Approved grease types for ball joints

Multi-purpose grease refer to Specifications for service products, page 267

Tightening torques	Nm	(kpm)
Castle nut for attaching drag link to steering arms	35	(3.5)
Hex. bolt for attaching steering damper to drag link	45	(4.5)

Special tools

Puller  111 589 08 33 00

Puller for drag link  123 589 09 33 00

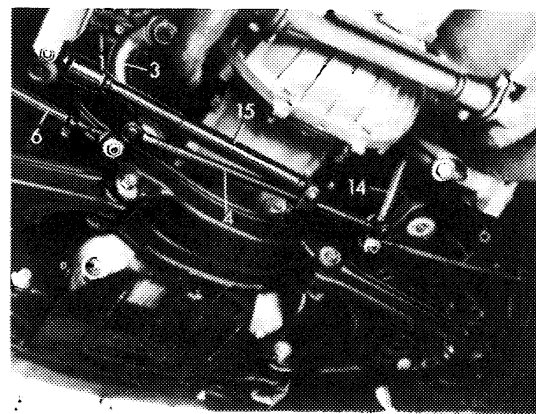
Self-made tools

Assembly sleeve for flat wire clamping ring refer to fig. item 10

Assembly sleeve for plastic ring refer to fig. item 10

Removal

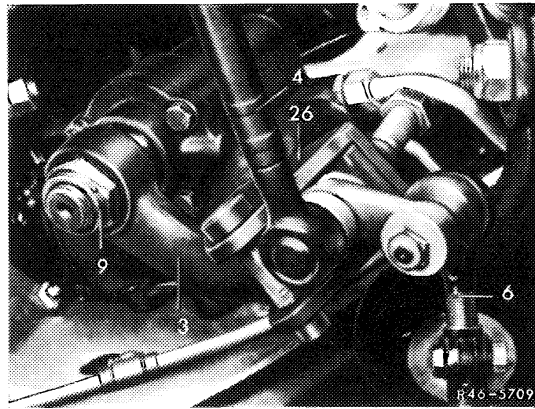
- 1 Uncotter castle nuts on joints of drag link (4) and unscrew.
- 2 Unscrew hex. bolt for attaching steering damper and push steering damper out of holder.



3 Force ball joint of drag link (4) from steering arms by means of puller (26).

Note: The drag link can also be pushed off from steering arms by means of puller 123 589 09 33 00.

To prevent damaging rubber sleeve on track rod 2nd version, use puller 123 589 00 33 00 only if the bell-type puller has been refinished.

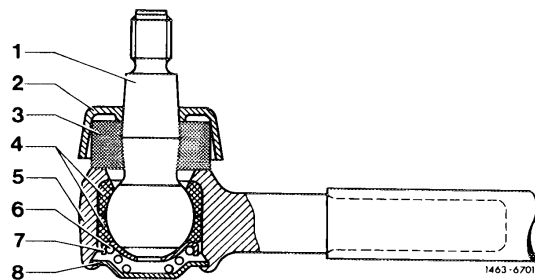


Checkup

1st version

4 Check joints (1) of drag link. If joints are moving too easily or in the event of play, replace drag link.

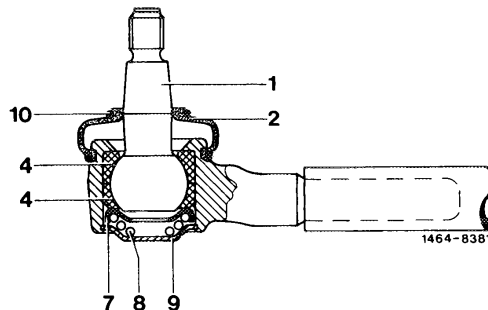
- 1 Ball pin
- 2 Plastic cover
- 3 Sealing ring
- 4 Plastic bearing shell
- 5 Joint head
- 6 Pressure spring
- 7 Pressure plate
- 8 Closing cap



2nd version

5 Check joints of drag link. If drag link operates too easily or in the event of play, replace drag link.

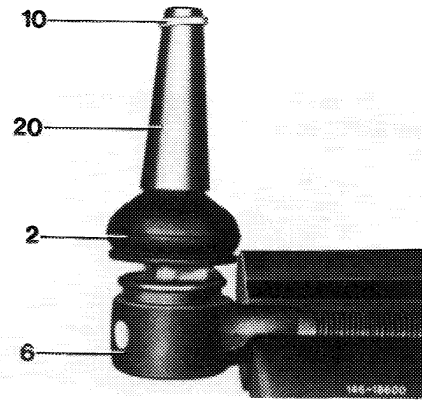
6 Check rubber sleeves (2) for joints. **If a rubber sleeve on a used joint is damaged, replace drag link.**



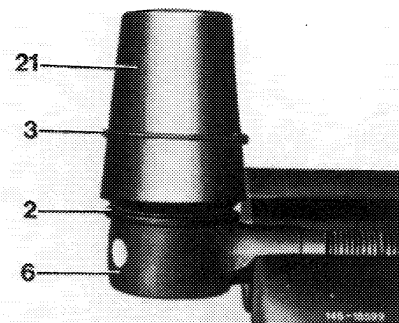
7 If the rubber sleeve (2) has been damaged during removal of drag link, simply replace rubber sleeve. For this purpose, remove flat wire clamping ring (3) and pull off sleeve together with plastic fastening ring (10).

8 Prior to positioning new rubber sleeve, fill space between sleeve and joint with specified grease.

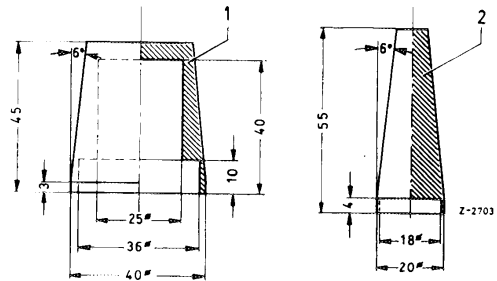
9 Place rubber sleeve (2) and then assembly sleeve (20) on ball pin. Insert plastic fastening ring (10) over assembly sleeve into rubber sleeve.



10 Place assembly sleeve (21) on ball joint and over rubber sleeve (2) and insert flat wire clamping ring (3).



Note: The assembly sleeves are self-made according to specified dimensions.

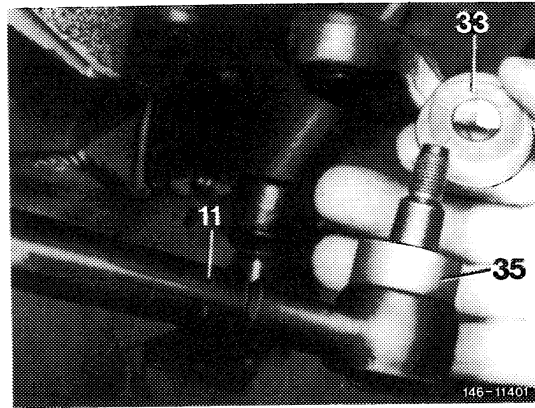


- 1 Assembly sleeve for flat wire clamping ring
- 2 Assembly sleeve for plastic ring

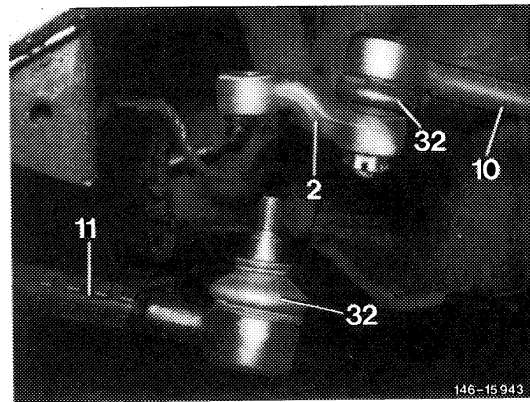
Note: Maintenance-free joints are provided with grease for life. On these joints, the seal against penetration of dirt is of **decisive importance for life of joint**. A **damaged rubber sleeve should therefore be replaced immediately**, since otherwise the penetrating dirt will wear out the joints. For this reason, it is also required to **check the joints carefully at regular intervals**.

Installation

11 On 1st version of drag link, replace sealing ring (35) and plastic cover (33).



Drag link 1st version



Drag link 2nd version with rubber sleeve

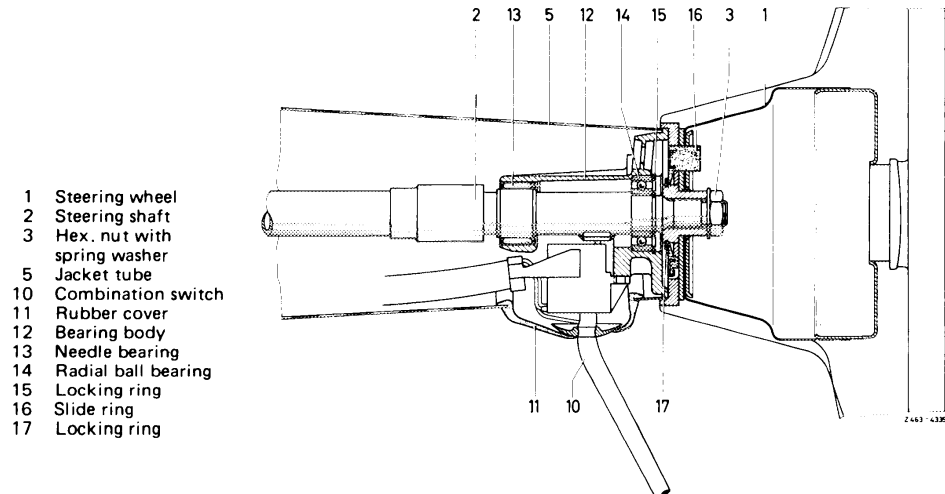
12 Clean ball pins as well as conical seats in steering arms perfectly from grease. Push ball pins tightly into cone of steering arms. Screw-on castle nuts and insert cotter pins. Tightening torque 35 Nm (3.5 kpm) reference value.

13 Attach steering damper to drag link.

14 Check wheel adjustment on front axle (40–320).

46-610 Removal and installation of steering wheel

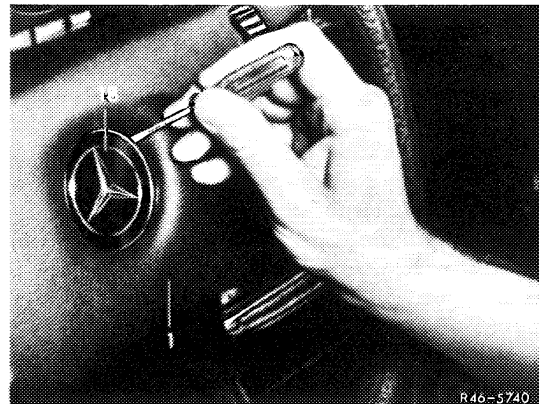
Tightening torques	Nm	(kpm)
Hex. nut for attaching steering wheel to steering shaft	50	(5)
Hex. nut M 18 x 1.5 or countersunk screw for attaching steering wheel to steering shaft	80	(8)



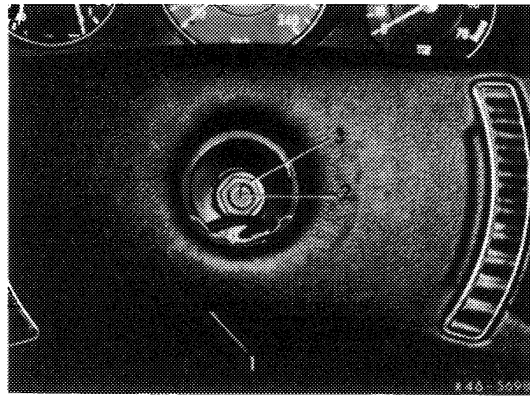
A. 1st version, plastic-foamed steering wheel (polyurethane). Production up to end of 1972

Removal

1 Carefully lift company symbol (18) out of padded plate by means of a small screw driver.



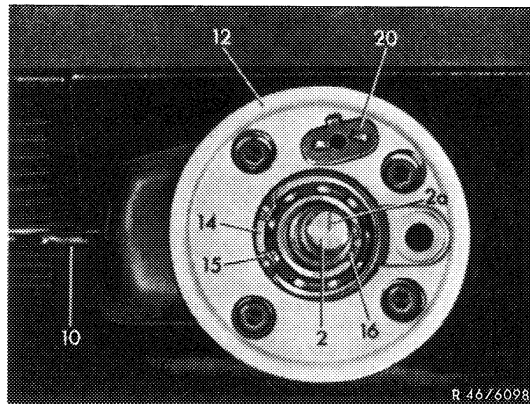
2 Unscrew hex. nut (3) and remove spring washer as well as steering wheel from steering shaft (2).



Installation

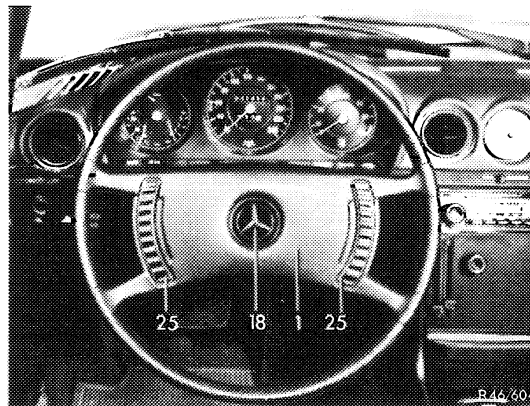
3 Turn steering shaft (2) in such a manner that the marking line (2a) is pointing accurately upwards.

4 Mount steering wheel on splining of steering shaft, paying attention to horizontal position of spokes on steering wheel, the slightly curved spoke should be below.



5 Place hex. nut in a socket wrench, mount spring washer and glue to socket wrench with adhesive tape.

Screw hex. nut on steering shaft, making sure that the spring washer is not dropping from socket wrench. Remove adhesive tape from socket wrench, then tighten hex. nut to 50 Nm (5 kpm). Push company symbol into steering wheel.



6 During test drive, check position of steering wheel with road wheels in straight-ahead position. If the position of the steering wheel while driving straight ahead is not in alignment with front wheels, check toe-in and correct, if required. If the steering wheel position requires still further correction, the steering wheel can be displaced to the left or right in splining (max. 2 teeth).

7 Check signal horns for function and also check automatic return of combination switch.

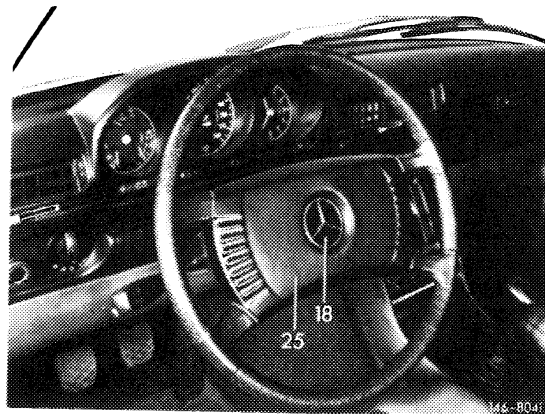
Note: Dirty or sticky steering wheels can be cleaned with a neutral household cleaning compound by washing steering wheel with a luke-warm solution of the compound.

Do not use abrasive compounds since they will attack the plastic foaming.

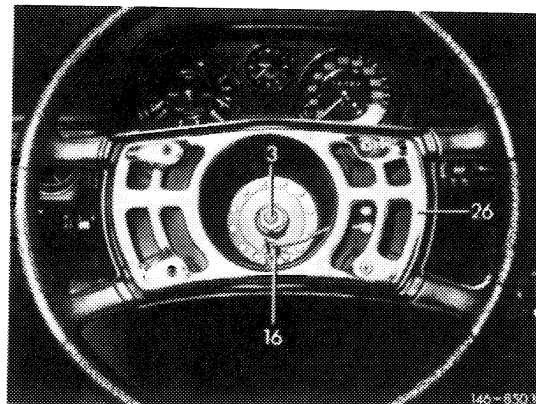
B. 2nd version, steering wheel plastic-foamed (polyurethane). Production starting 1973

Removal

1 Pull-off padded plate (25) from signal carrier in upward direction. Pulling-off is done best at a corner of the padded plate in range of one of the two steering wheel spokes.



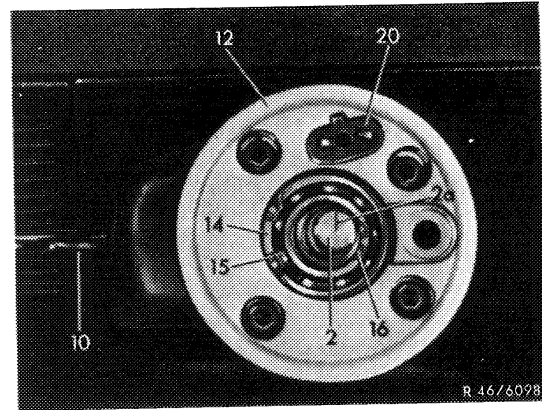
2 Unscrew hex. nut (3). Remove spring plate first, then steering wheel from steering shaft.



Installation

3 Turn steering shaft (2) in such a manner that the marking line (2a) is pointing accurately upwards.

4 Position steering wheel on splining of steering shaft, making sure of horizontal position of spokes on steering wheel; the slightly curved spoke should be below.



5 Place spring plate on steering shaft, screw-on hex. nut and tighten to specified torque.

Note: The steering wheel with large hub dia. has no spring washer.

Tightening torque of hex. nut:
M 14 x 1.5 = 50 Nm (5 kpm)
M 18 x 1.5 = 80 Nm (8 kpm)

6 Attach padded plate to signal carrier. Suitably, fastening of padded plate is started at a corner in range of steering wheel spokes. Do not use force, so that the signal carrier is not damaged.

7 During test drive, check position of steering wheel in straight-ahead position of road wheels. If the steering wheel position while driving straight ahead is not in alignment with front wheels, check toe-in and make corrections, if required. If the steering wheel position then also requires a correction, the steering wheel can be displaced in splining to the left or to the right (max. 2 teeth).

8 Check signal horns for function, also check automatic return of combination switch.

Note: Dirty or sticky steering wheels can be cleaned with a neutral household cleaning compound by washing steering wheel with a luke-warm solution of the compound.

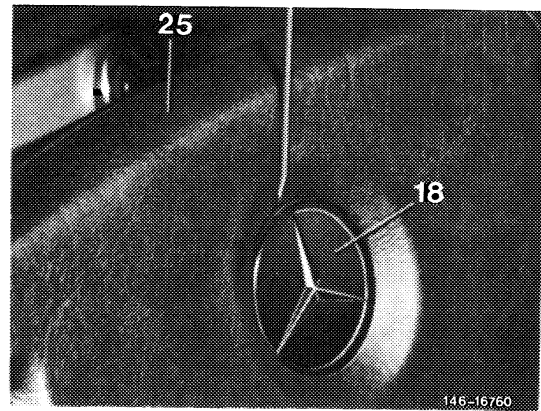
Do not use abrasive compounds since they will attack the plastic foaming.

- C. 3rd version, steering wheel plastic-foamed (polyurethane). Production starting end of 1979

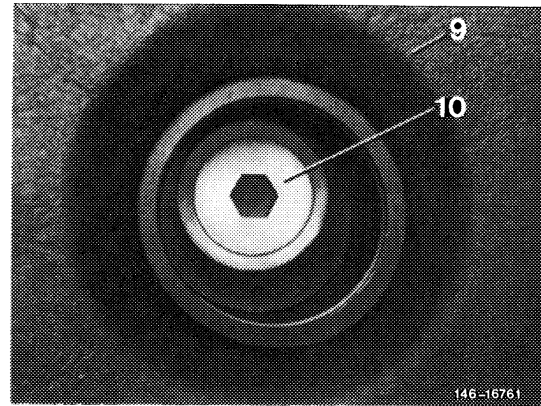
Removal

- 1 Carefully lift company symbol (18) from padded plate with a small screwdriver.

Note: To prevent damage, do not pull padded plate from signal carrier.



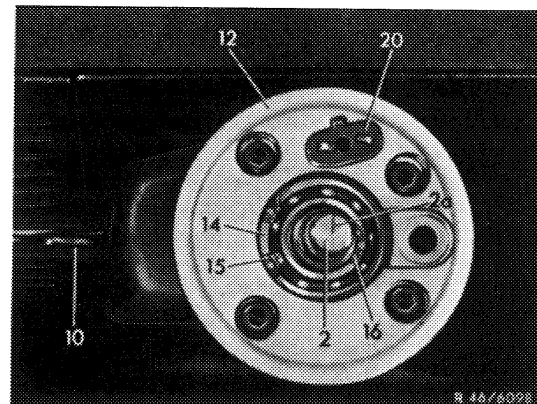
- 2 Unscrew countersunk screw (10) from steering shaft with steering lock engaged and remove steering wheel.



Installation

- 3 Turn steering shaft (2) in such a manner that the marking line (2a) is pointing accurately upwards.

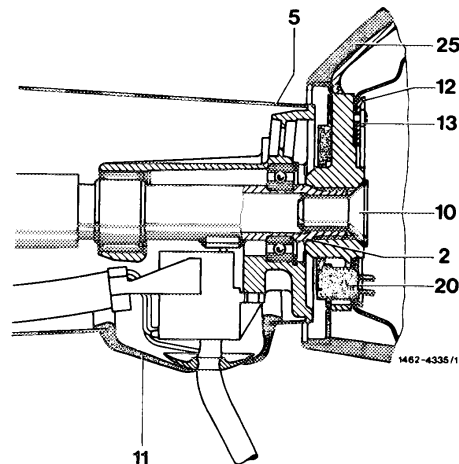
- 4 Place steering wheel on splining of steering shaft while paying attention to horizontal position of steering wheel spokes; the slightly curved spoke should be below.



- 5 Screw countersunk screw (10) into steering shaft with steering lock engaged and tighten to 80 Nm (8 kpm).

Note: Always replace countersunk screw with micro-encapsulated threads.

- 6 Insert company symbol into padded plate.



7 During test drive, check position of steering wheel in straight ahead position of wheels. If the steering wheel position while driving straight ahead is not in alignment with front wheels, check toe-in and correct, if required. If the steering wheel position still requires correction, displace steering wheel in splining to the left or right (max. 2 teeth).

8 Check signal horns for function and automatic return of combination switch.

Note: Dirty or sticky steering wheels can be cleaned with a neutral household cleaning compound by washing the steering wheel with a luke-warm solution of the cleaning compound.

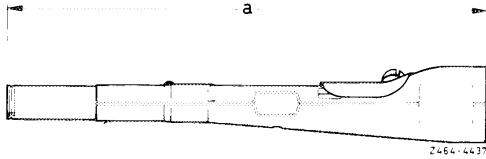
Do not use abrasive compounds since they will attack the plastic foaming.

46–620 Removal and installation of jacket tube

Data

Length of jacket tube "a"

604–1



Tightening torques

		Nm	(kpm)
Hex. nut or countersunk screw for fastening steering wheel	M 14 x 1.5	50	(5)
	M 16 x 1.5, M 18 x 1.5	80	(8)
Hex. socket screw to steering coupling		25	(2.5)
Hex. screws to cross member		25	(2.5)

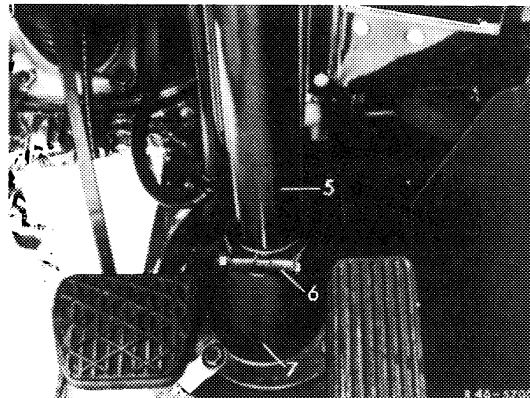
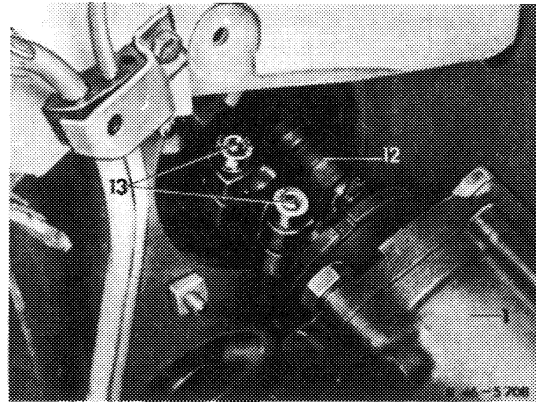
Self-made tool

Assembly pin for steering shaft

refer to illustration item 11, note

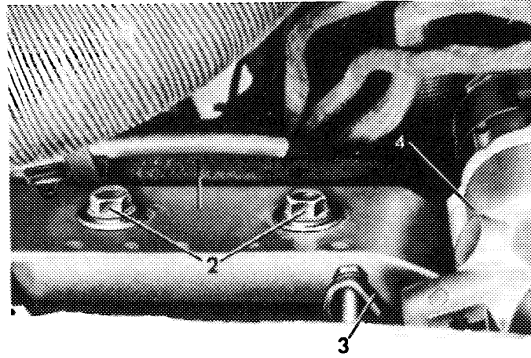
Removal

- 1 Disconnect cable on battery.
- 2 Remove steering wheel (46–610).
- 3 Unscrew hex. socket screw (13) from steering coupling (12) and remove instrument cluster (54–310).
- 4 Remove steering lock (46–640).
- 5 Remove cover from under instrument panel and air duct.
- 6 Loosen plug connection for cable harness of combination switch.
- 7 Unscrew hex. screws for fastening cover plate to front end.



8 Unscrew both hex. bolts (2) for attaching jacket tube to cross member (1).

9 Remove jacket tube.

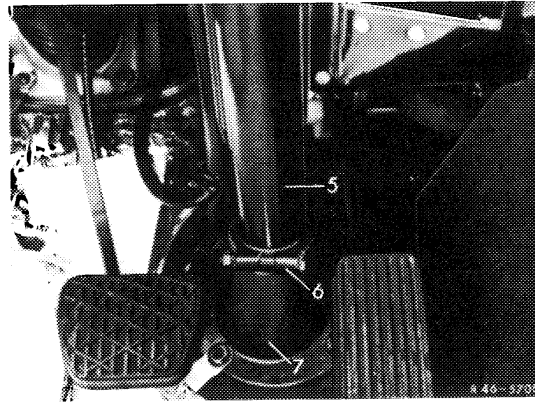


R46-5642

Installation

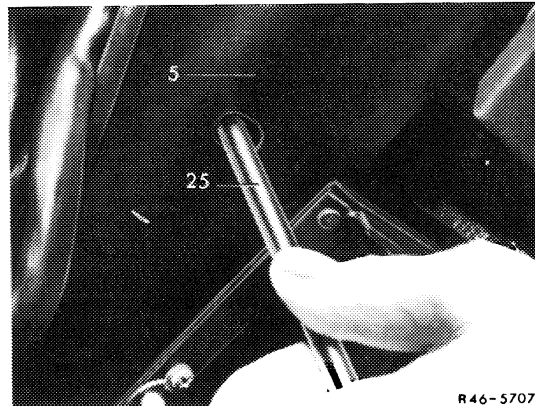
If the jacket tube **has been crushed by an accident, replace tube**, since it can no longer be returned to its specified position.

10 Loosen clamping screw on fastening clamp (6).



R 46-5705

11 Locate steering spindle with assembly pin (25) through bore in jacket tube (5).

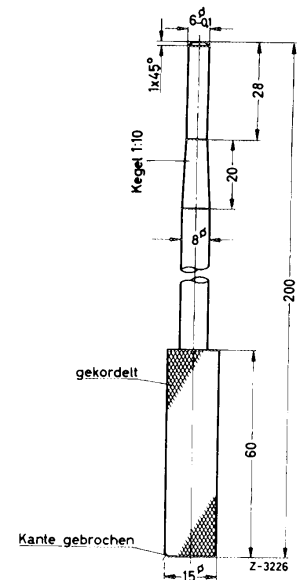


R46-5707

Note: Be sure to locate steering spindle to prevent displacement of spindle during installation of jacket tube.

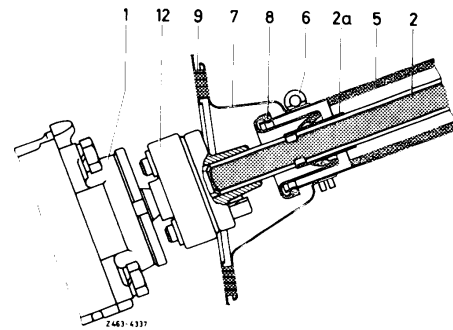
The assembly pin is self-made according to specified dimensions.

The steering shaft 2nd version (for steering wheel with larger hub dia.) has no check bore.



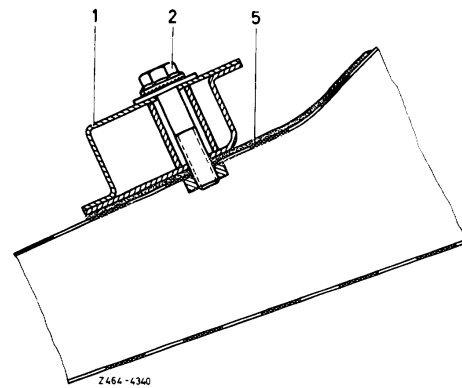
12 Check whether rubber sleeve (8) for sealing steering shaft (2) is correctly located in jacket tube (5).

13 Insert jacket tube (5) into front end and cross member, making sure that the gasket (9) is correctly seated on cover plate (7) and is inserted into steering coupling (12) together with steering shaft (2).



- | | |
|-------------------|----------------------|
| 1 Steering | 7 Cover plate |
| 2 Steering shaft | 8 Rubber sleeve |
| 2a Sealing ring | 9 Gasket |
| 5 Jacket tube | 12 Steering coupling |
| 6 Fastening clamp | |

14 Screw jacket tube (5) to cross member (1) with the two hex. screws (2), but do not yet tighten screws.



15 Attach cover plate to front end, then tighten hex. screws on cross member and clamping screw on fastening clamp.

16 Connect plug connection of cable harness to each other.

17 Install steering lock (46–640) and check for function.

18 Install instrument cluster (54–310).

19 Screw upper hex. socket screw into steering coupling and tighten. Tightening torque 25 Nm (2.5 kpm) – reference value.

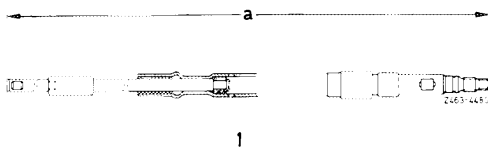
20 Install steering wheel (46–610).

21 During test drive, check position of steering wheel in straight-ahead position of wheels. If steering wheel position while driving straight-ahead is not in alignment with front wheels, check toe-in and correct, if required. If steering wheel position then still requires a correction, the steering wheel can be displaced in splining to the left or right (max. 2 teeth).

46-630 Removal and installation of steering shaft

Data

Length "a" of steering shaft (reference dimension)	with male treads	687
	with female threads	668.5



Tightening torques		Nm	(kpm)
Hex. nut or countersunk screw for attaching steering wheel to steering shaft	M 14 x 1.5	50	(5)
	M 16 x 1.5, M 18 x 1.5	80	(8)
Hex. socket screw to steering coupling		25	(2.5)

Self-made tool

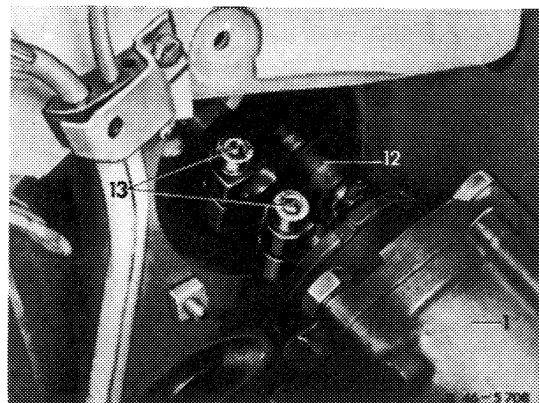
Assembly pin for steering shaft	refer to fig. item 12, note
---------------------------------	-----------------------------

Note

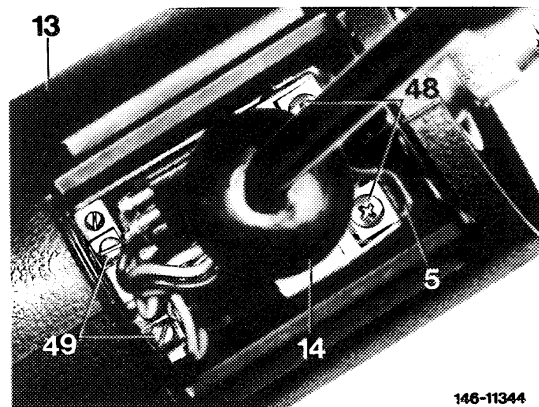
Since the OD of the closing ring of the steering shaft is larger than the ID of the needle bearing in bearing body, the steering shaft must be removed together with bearing body.

Removal

- 1 Unscrew upper hex. socket screw (13) from steering coupling (12) with a double joint wrench.
- 2 Remove steering wheel (46-610).
- 3 Remove rubber cover for combination switch (10) from jacket tube. Unscrew switch on bearing body (12) and pull out slightly.

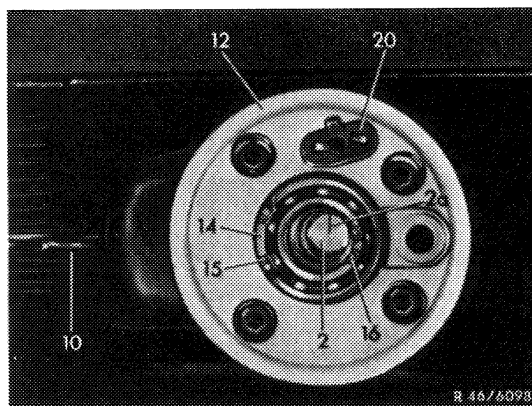


4 Unscrew both slotted screws (49) for cable of carbon contact on combination switch.



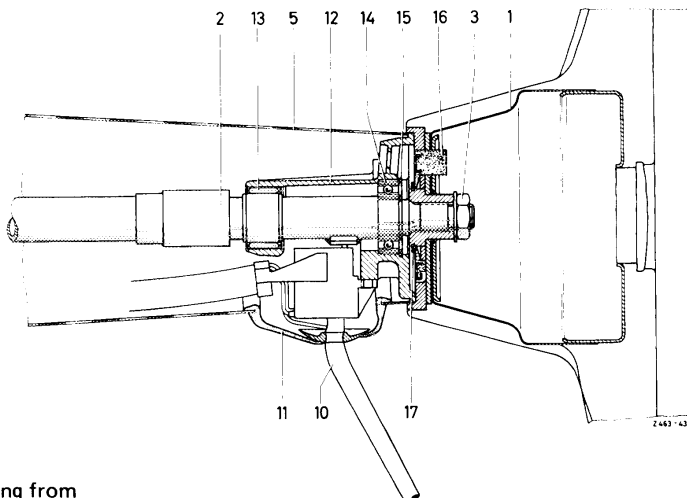
146-11344

5 Unscrew hex. socket screws from jacket tube and pull steering shaft including bearing body out of jacket tube in upward direction.



46/6098

- 1 Steering wheel
- 2 Steering shaft
- 3 Hex. nut with spring washer
- 5 Jacket tube
- 10 Combination switch
- 11 Rubber cover
- 12 Bearing body
- 13 Needle bearing
- 14 Radial ball bearing
- 15 Locking ring
- 16 Slip ring
- 17 Locking ring



6 Remove locking ring for radial ball bearing from steering shaft and knock steering shaft out of bearing body in downward direction by means of a plastic hammer.

Checkup

7 Check radial ball bearing for wear and replace, if required.

8 Check telescopic connection of steering shaft. Steering shaft should telescope in axial direction only at approx. 800 N (80 kp).

Check length of steering shaft and adjust. For this purpose, attach an old steering coupling to steering shaft and adjust steering shaft to required dimension by means of light blows with a plastic hammer.

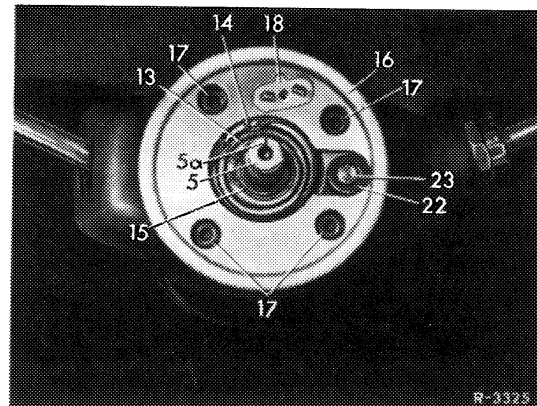
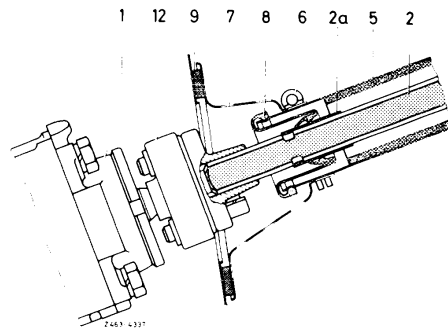
9 Check needle bearing (13) in bearing body (12) and replace needle bearing, if required.

Installation

Note: Beginning 1978, a modified steering shaft (2nd version) together with the steering wheel valid for model 123 and a modified jacket tube will be installed. Note that the steering shaft 1st version should not be installed into a jacket tube 2nd version. The reversed installation — steering shaft 2nd version into a jacket tube 1st version — is permitted, but the steering wheel should then also be replaced due to the changed hub dia. **During insertion into steering coupling, the steering shaft should not be axially displaced.** In addition, make sure that the sleeve (8) is not damaged or pushed away from jacket tube.

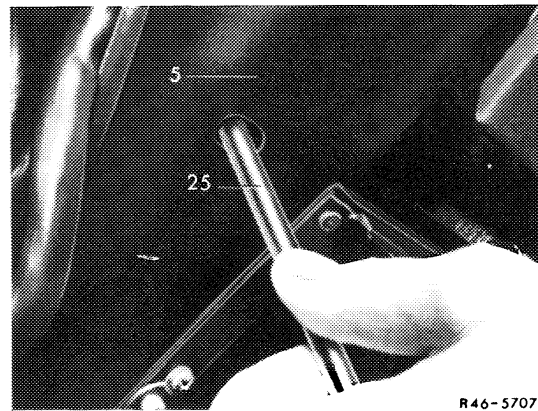
10 Introduce steering shaft (5) including bearing body (16) into jacket tube and steering coupling. Make sure that the wheels are in straight-ahead position and that the restoring cam for the combination switch is in center of cutout on jacket tube. In addition, the notch (5a) on steering shaft should point upwards.

11 Attach bearing body (16) to jacket tube by means of hex. socket screws (17).



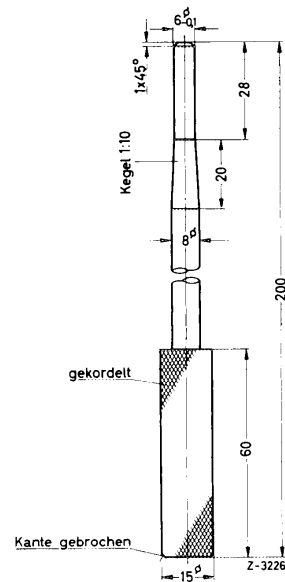
12 Check longitudinal adjustment of steering shaft 1st version through bore in jacket tube (5). For this purpose, insert assembly pin (25) in check bore of steering shaft.

The assembly pin should easily enter check bore.
(Steering shaft 2nd version has no check bore).



R 46-5707

Note: The assembly pin is self-made according to specified dimensions.

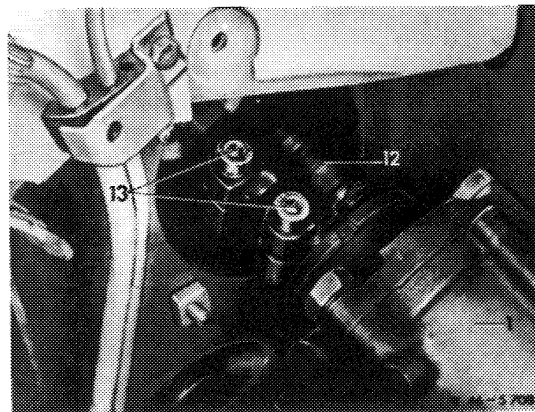


13 Screw upper hex. socket screw (13) into steering coupling (12) and tighten. Tightening torque 25 Nm (2.5 kpm) — reference value.

14 Install steering wheel (46–610).

15 Check steering lock for function.

16 Connect cable of carbon brush to combination switch, install combination switch and check for function. Insert rubber cover into jacket tube.



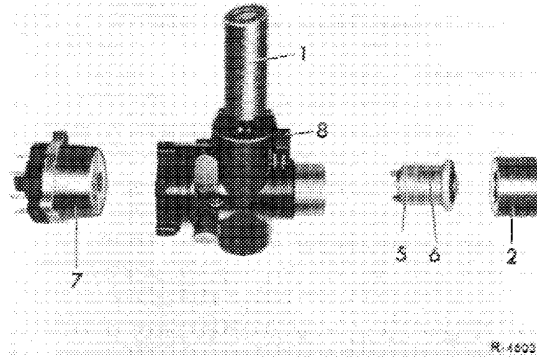
The steering lock comprises the three main components:

- A. Steering lock starter switch (electrical section)
- B. Locking cylinder
- C. Steering lock (mechanical section)

The steering lock starter switch and the locking cylinder can be removed without removing steering lock.

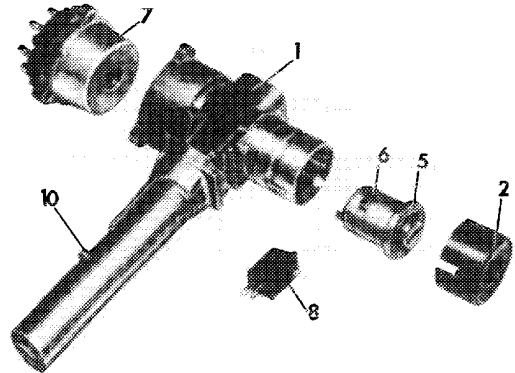
Steering lock 1st version
(plug-type cap)

- 1 Steering lock
- 2 Cap (chrome-plated)
- 5 Locking cylinder
- 6 Detent
- 7 Steering lock starter switch
- 8 Contact switch (USA version only)



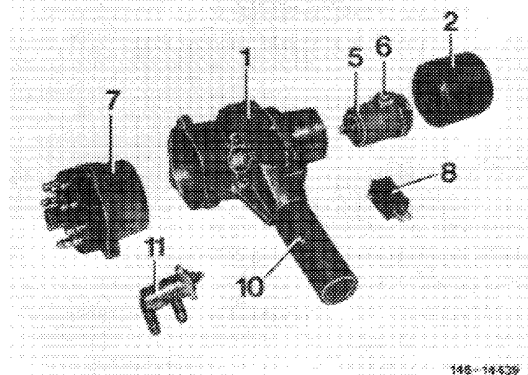
Steering lock 2nd version
(plug-type cap)

- 1 Steering lock
- 2 Cap (plastic)
- 5 Locking cylinder
- 6 Detent
- 7 Steering lock starter switch
- 8 Contact switch (USA version only)
- 10 Locking pin



Steering lock 3rd version
(screw-type cap)

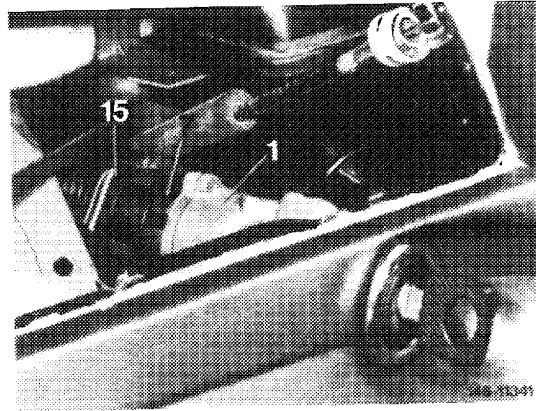
- 1 Steering lock
- 2 Cap
- 5 Locking cylinder
- 6 Detent
- 7 Steering lock starter switch
- 8 Contact switch
- 10 Locking pin



A. Removal and installation of steering lock starter

Removal

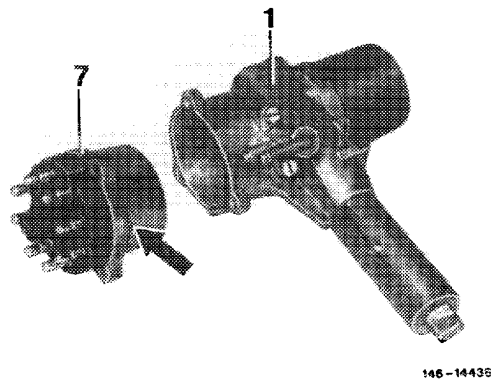
- 1 Remove steering wheel (46-610).
- 2 Remove instrument cluster. For this purpose, pull out instrument cluster as far as possible, loosen tachometer shaft, both electric plug connections and oil pressure line.
- 3 Remove plug connection (15) from steering lock starter switch.
- 4 Unscrew fastening screws for steering lock starter switch from steering lock with a short screw driver and remove steering lock starter switch.



Installation

Note: Starting in the middle of 1978 a starter switch with modified start repeat lock is installed. With this starter switch, the period available prior to any restarting, if required, is extended since the ignition key must be pulled back into position "0" prior to restarting (formerly only into position "1").

- 5 Attach starter switch to steering lock and attach plug connections, making sure that the switch with its locating lug (arrow) is inserted into recess of steering lock.
- 6 Install instrument cluster.
- 7 Install steering wheel.
- 8 Check steering lock starter switch for function.

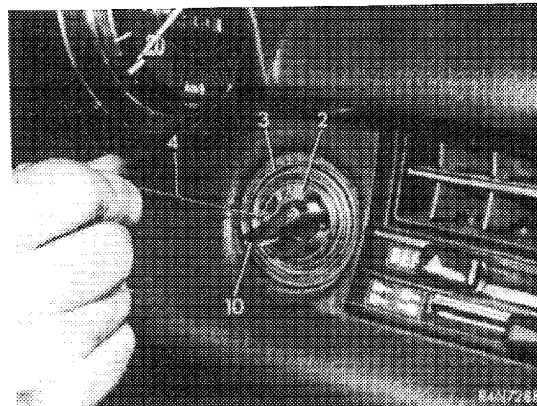


B. Removal and installation of locking cylinder

Removal

Steering lock 1st version (plug-type cap chrome-plated).

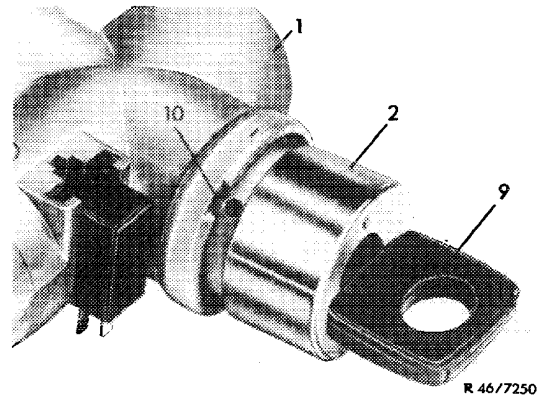
- 1 Turn key to position "1", the so-called assembly or radio position.
- 2 Lift cap (2) up to bottom edge of key. If required, pull cap up to bottom edge of key out of steering lock by means of a pulling hook made of 1 mm steel wire (4). Insert pulling hook between rosette (3) and cap.



3 Turn key to position "0" and remove together with cap.

4 Put key back into locking cylinder and turn to position "1" (90° to the right). Push down detent and remove locking cylinder.

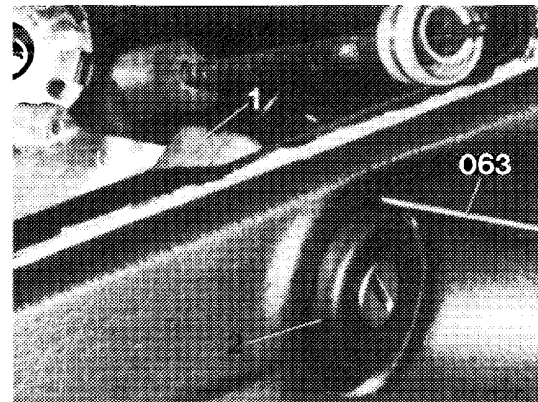
Note: The detent is at the right and can be pushed down only in position "1".



R 46/7250

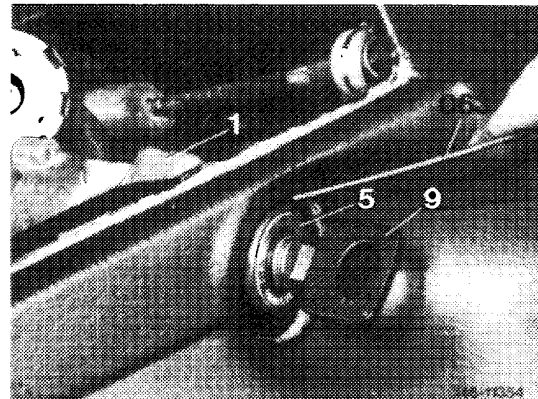
Steering lock 2nd version, with plastic cap

5 Pull off key and pull cap from steering lock by means of a 1 mm steel wire angled off at its end by approx. 1.5 mm.



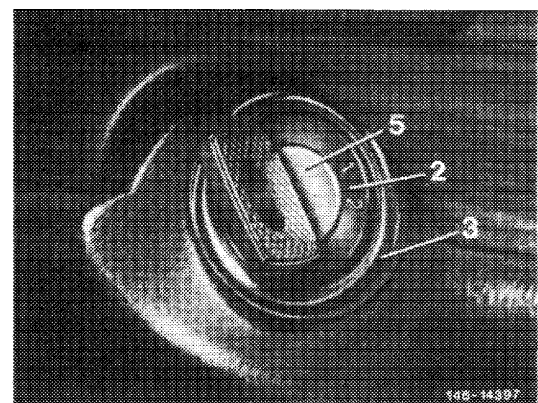
6 Put key back into locking cylinder and turn to position "1" (90° to the right), push detent and remove locking cylinder.

Note: The detent is at the right and can be pushed only in position "1".

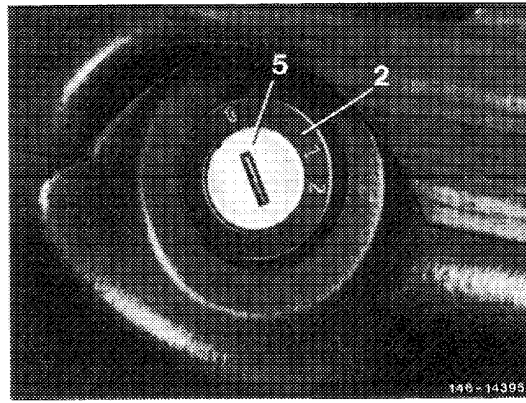


Steering lock 3rd version (screw-type cap)

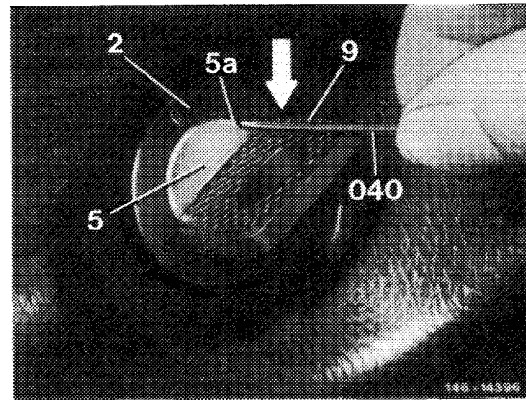
7 Remove rosette (3) from instrument panel.



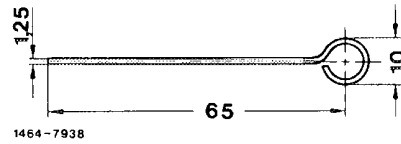
8 Turn locking cylinder into position "1" by means of key.



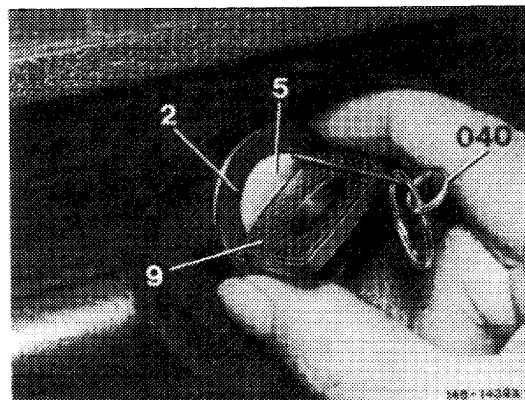
9 Introduce releasing wire (040) through bore in locking cylinder. Then insert releasing wire and unlock detent of locking cylinder by overcoming the resilient resistance.



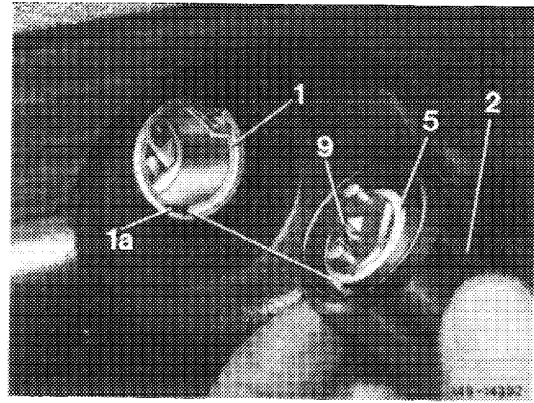
Note: The releasing wire is self-made from 1.25 mm steel wire according to adjacent drawing.



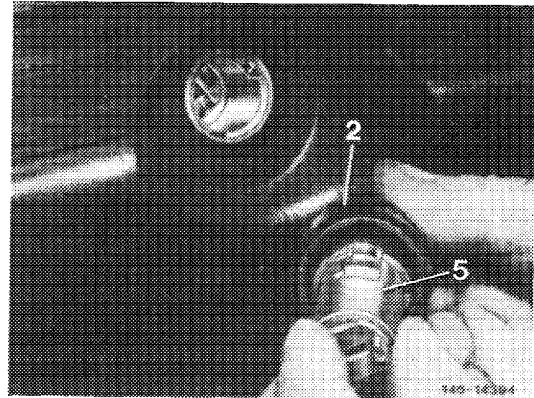
10 Unscrew cap from steering lock with detent released.



11 Remove cap including locking cylinder from steering lock. Pull releasing wire out of locking cylinder. Turn key to position "0" and pull out.



12 Remove locking cylinder from cap.



Installation

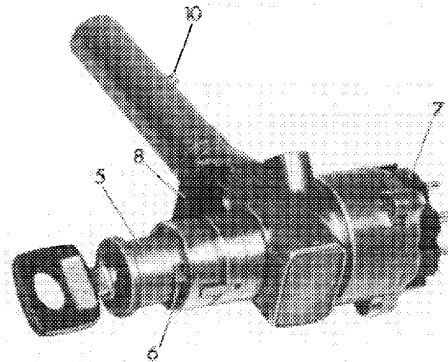
Steering lock 1st version (plug-type cap, chrome-plated)

13 Turn locking cylinder to position "1" and insert into steering lock, making sure that detent (6) engages.

14 Turn key to position "0" and pull out.

15 Mount cap on steering lock, insert key and turn to position "1". Push cap completely down.

16 Check locking cylinder for function.



166-8643

Steering lock 2nd version (plug-type plastic cap)

17 Turn locking cylinder to position "1" and insert in steering lock, making sure that detent engages.

18 Turn key to "0" and pull out.

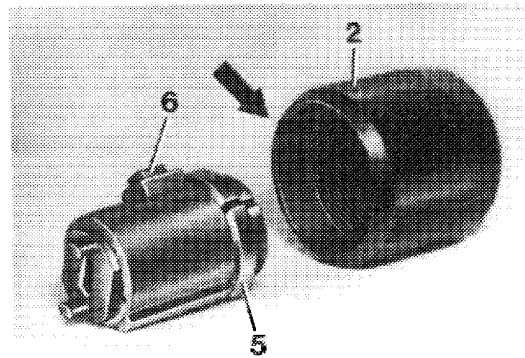
19 Mount cap in correct position on steering lock, pay attention to recesses on cap.

Check locking cylinder for function.

Steering lock 3rd version (screw-type cap)

20 Slightly coat threads in cap or threads of steering lock with Anticorit PRC II or with antifriction bearing grease.

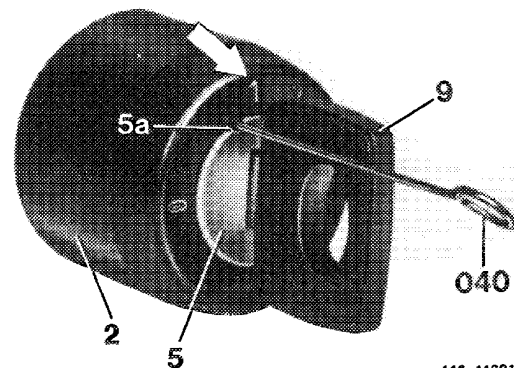
21 Insert locking cylinder into cap in such a manner that the detent enters into groove of cap (arrow).



146-14390

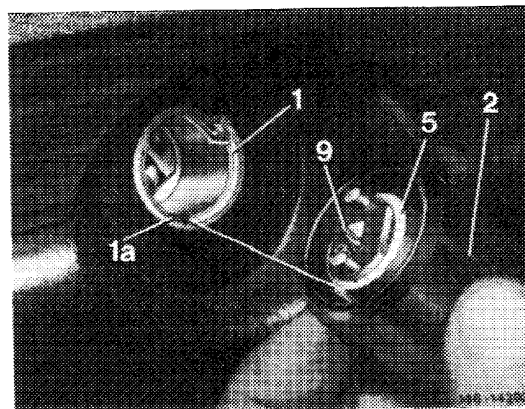
22 Insert key into locking cylinder and turn to position "1".

23 Unlock detent with releasing wire (040) through bore in locking cylinder.

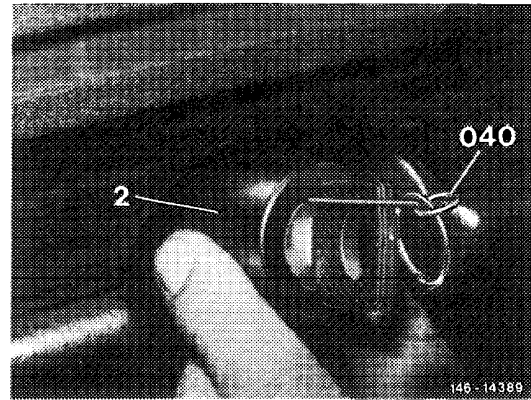


146-14391

24 Position cap including locking cylinder on steering lock in such a manner that the elevation on locking cylinder enters groove of steering lock.

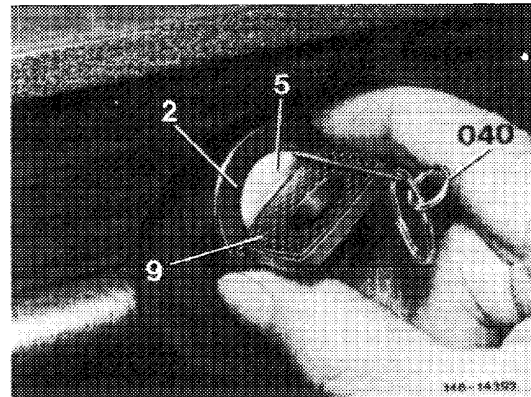


25 Screw cap completely on steering lock.



26 Pull releasing wire out of locking cylinder. Turn cap to the left (max. 1 turn) until detent of locking cylinder enters groove of cap.

27 Check locking cylinder for function.



C. Completely remove and install steering lock

Note: If a defective locking cylinder cannot be turned to position "1", the locking pin cannot be pushed in. For removal of steering lock, punch-mark locking pin and remove by drilling with an angle drilling machine. Make sure that the jacket tube is not damaged. To remove steering lock from jacket tube and instrument panel, loosen jacket tube on cross member and on cover plate.

Removal

- 1 Remove steering wheel (46–610).
- 2 Remove instrument cluster by pulling out instrument cluster as far as possible, then loosen tachometer shaft, both electric plug connections and oil pressure line.
- 3 Take rosette (3) out of instrument panel by unbending holding plate slightly.
- 4 Remove cap of steering lock.

Note: The cap must be removed so that the steering lock can be turned during subsequent removing procedure.

Steering lock 1st version (plug-type cap chrome-plated).

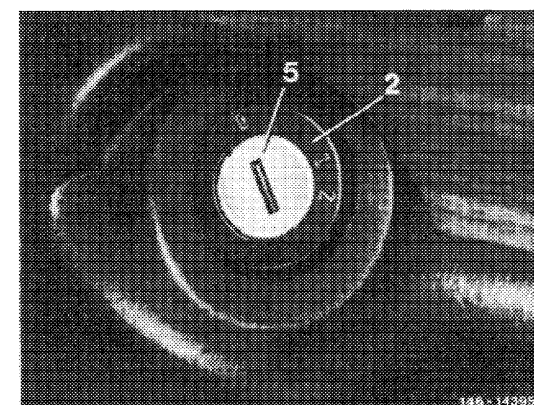
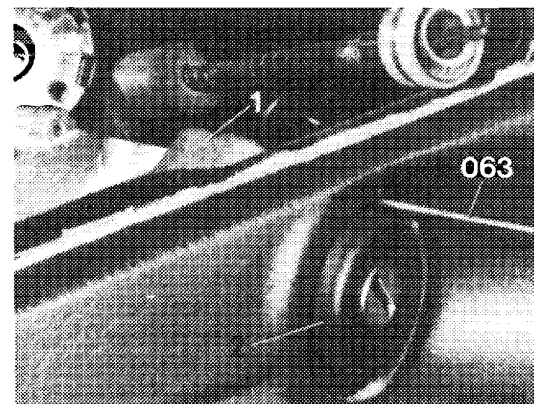
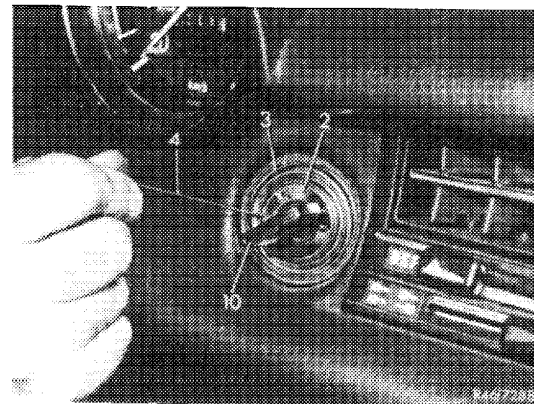
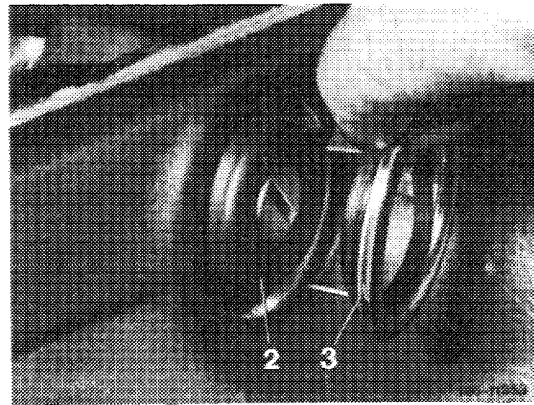
- 5 Turn key into position "1", the so-called assembly or radio position.
- 6 Lift cap (2) up to bottom edge of key. If required, pull cap out of steering lock up to bottom edge of key by means of a pulling hook made of steel wire (4) 1 mm thick. Insert pulling hook between rosette (3) and cap.
- 7 Turn key to position "0" and remove together with cap.

Steering lock 2nd version, cap made of plastics

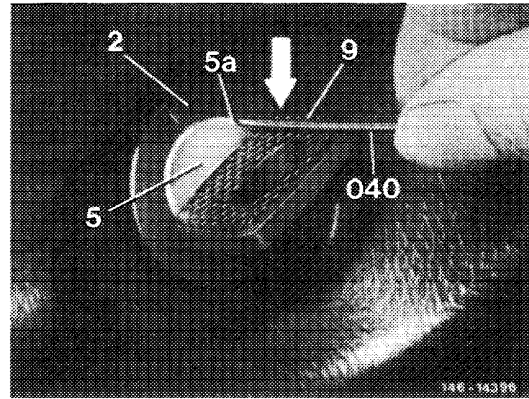
- 8 Pull off key and pull cap from steering lock by means of a steel wire 1 mm thick, offset by approx. 1.5 mm at end.

Steering lock 3rd version (screw-type cap)

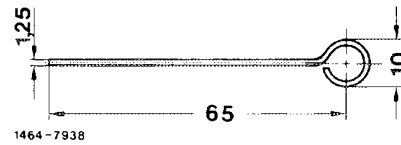
- 9 Turn locking cylinder into position "1" with key.



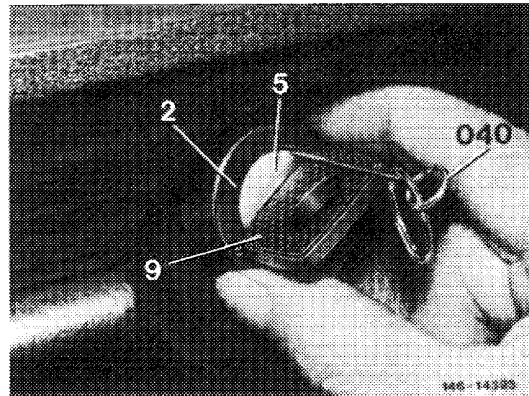
10 Insert releasing wire (040) via bore in locking cylinder. Then push releasing wire inwards and unlock detent of locking cylinder by overcoming resilient resistance.



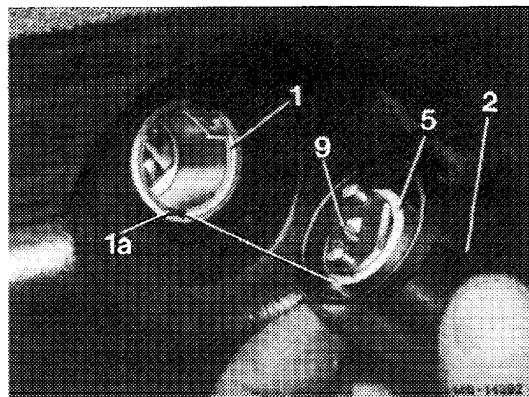
Note: The releasing wire is self-made of steel wire 1.25 mm thick according to adjacent drawing.



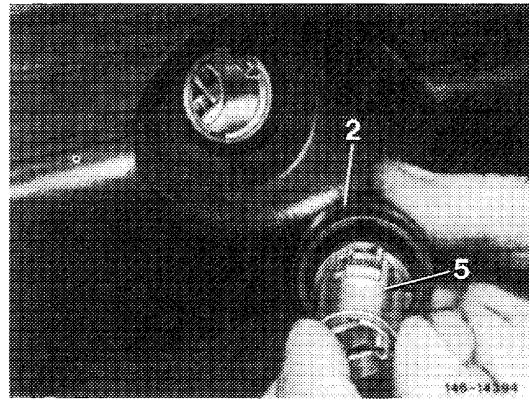
11 Unscrew cap from steering lock with detent unlocked.



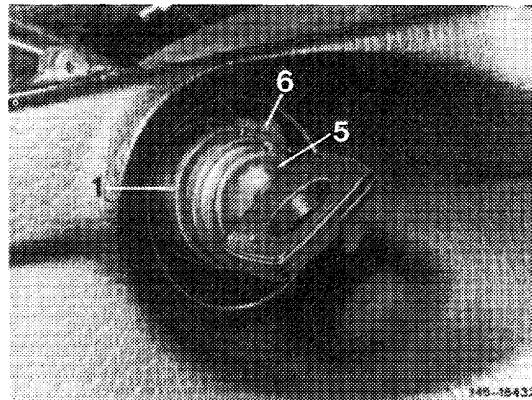
12 Remove cap including locking cylinder from steering lock. Pull release wire out of locking cylinder. Turn key to position "0" and pull off.



13 Remove locking cylinder from cap.



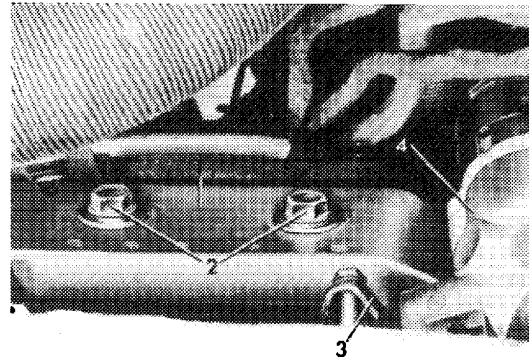
14 Turn locking cylinder into position "1", push-in detent (6) and insert locking cylinder into steering lock without cap.



15 Loosen clamping screw on fastening clip (3).

16 Remove plug connection from steering lock starter switch.

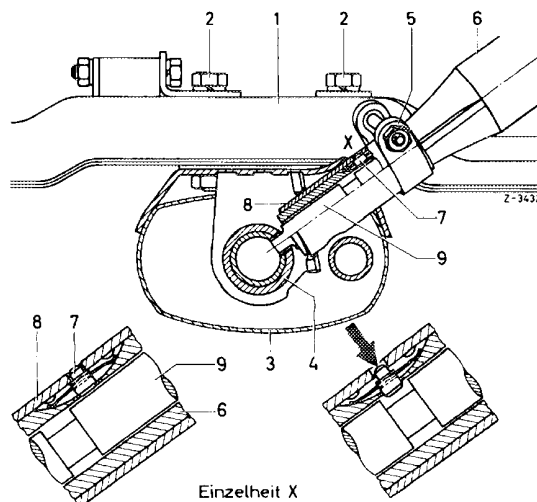
17 Pull plug connection from contact switch for warning buzzer.



18 Turn locking cylinder into position "1". Push-in locking pin (7) for steering lock (6) by means of a punch approx. 3 mm thick (refer to arrow). Slightly turn steering lock, turn ignition key into position "0" and pull off. Remove steering lock from holder (8) of jacket tube and instrument panel.

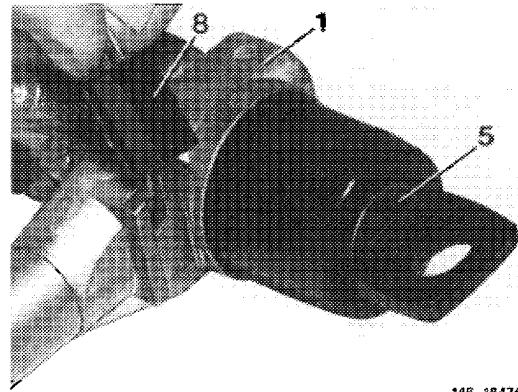
Attention!

The locking pin can be pushed-in only in position "1" of steering lock and provides additional protection against burglars.



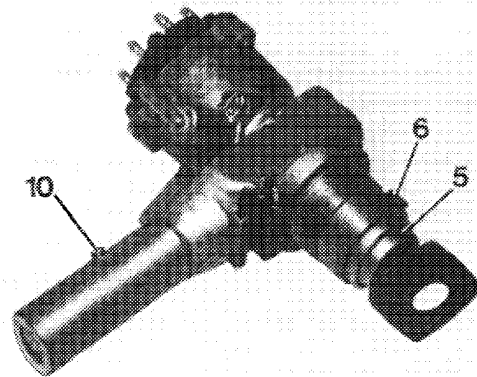
19 Turn locking cylinder into position "1" and remove contact switch (8) for warning buzzer from steering lock.

Note: The contact switch for warning buzzer may be removed and installed only in position "1" of so-called assembly or radio position with steering lock removed.



146-18474

20 On steering lock 3rd version, push detent (6) into position "1" and remove locking cylinder (5) from steering lock.



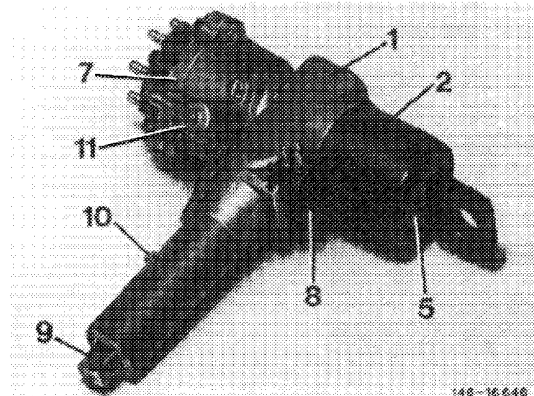
146-18475

Installation

Note: When steering locks of 1st and 2nd version are used up, only the steering lock 3rd version is available as a spare part (with screw-type cap).

If instead of a steering lock of the 1st or the 2nd version a steering lock of the 3rd version is installed, the cutout in the instrument panel for cap must be enlarged, by cutting some material from panelling. In addition, install rosette of larger diameter.

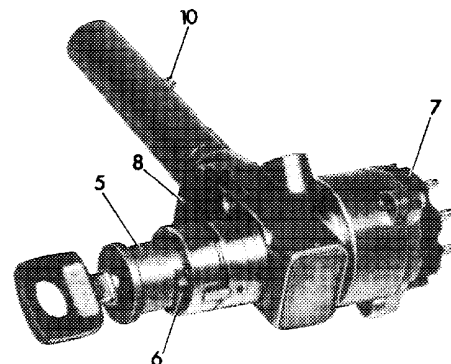
21 Insert contact switch for warning buzzer into steering lock.



146-16648

Steering lock 1st and 2nd version (plug-type cap, chrome-plated or made of plastics)

22 In position "1", push locking pin inwards. Pull off ignition key. Insert steering lock into holder of jacket tube while pushing locking pin. Turn steering lock until locking pin enters bore of holder.

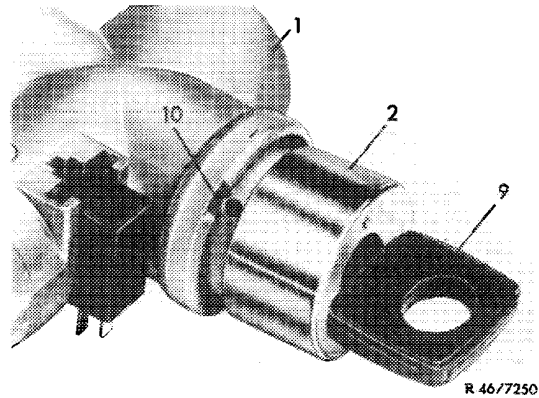


146-8645

23 On 1st version, plug cap on steering lock, insert key, turn to position "1". Push cap completely down.

24 On 2nd version, plug cap in correct position on steering lock, pay attention to cutouts on cap.

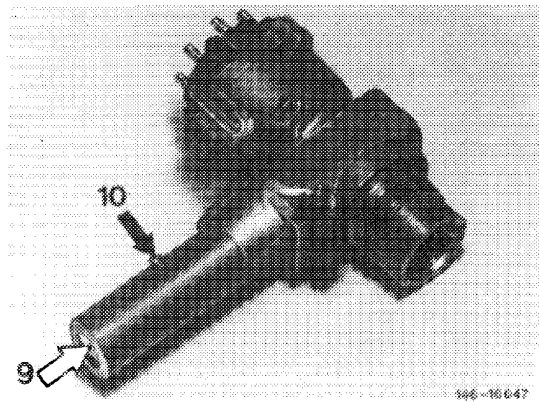
25 On both versions, check locking cylinder for function.



Steering lock 3rd version (screw-type cap)

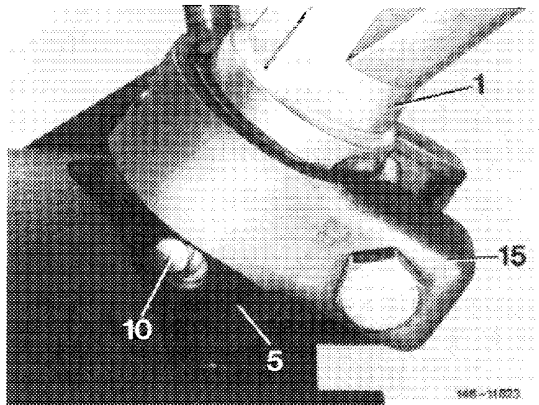
26 Push striker pin (9) into steering lock until locking pin (10) is no longer locked.

27 Push locking pin into steering lock and insert steering lock into holder of jacket tube.

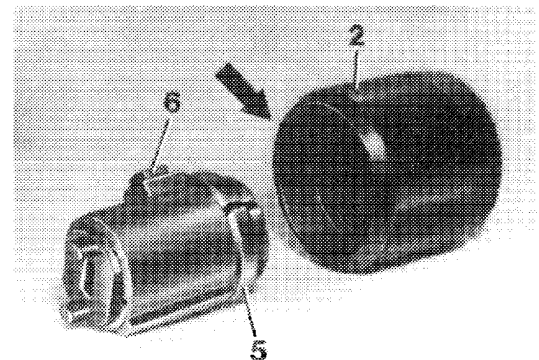


28 Turn steering lock until locking pin (10) engages in bore of holder.

29 Slightly coat threads in cap or threads of steering lock with Anticorit PRC II or anti-friction bearing grease.

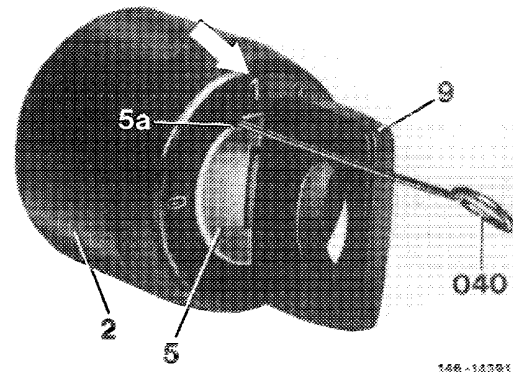


30 Insert locking cylinder into cap in such a manner that the detent enters groove of cap (arrow).

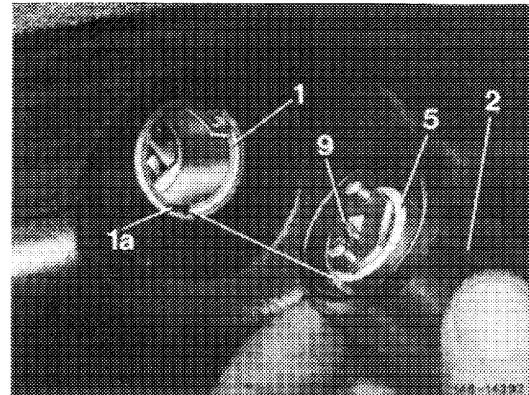


31 Insert key into locking cylinder and turn to position "1".

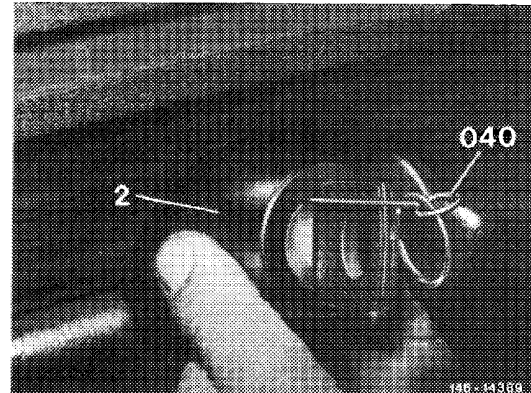
32 Unlock detent with releasing wire (040) via bore in locking cylinder.



33 Position cap including locking cylinder against steering lock in such a manner that the rise on locking cylinder enters groove of steering lock.

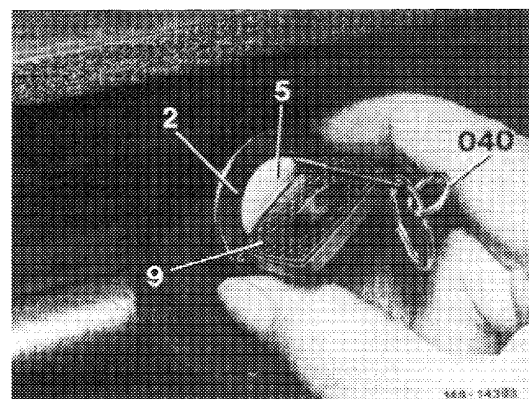


34 Screw cap completely on steering lock.

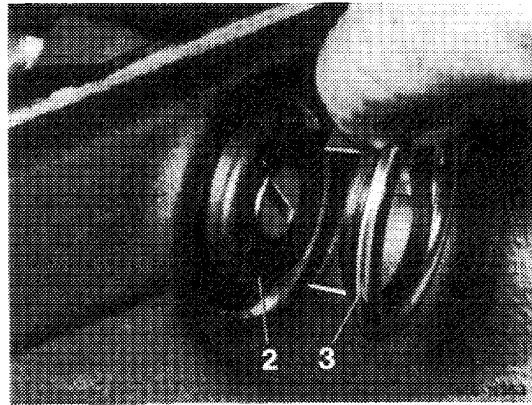


35 Pull releasing wire out of locking cylinder. Turn cap to the left to the extent (max. 1 turn) until detent of locking cylinder enters groove of cap.

36 Check locking cylinder for function.



37 Insert rosette into instrument panel.



38 Connect plug connection on contact switch for warning buzzer.

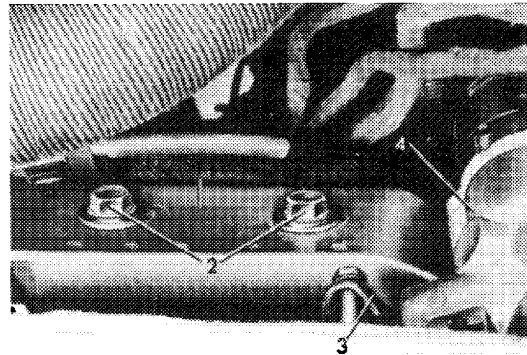
39 Tighten clamping screw of fastening clip.

40 Mount plug connection on steering lock starter switch.

41 Install instrument cluster.

42 Install steering wheel.

43 Check steering lock for function.



R46-5642

46-700 Differentiating characteristics of power steering pump

Part No.	Version	Opening pressure Pressure relief valve (bar gage pressure)	Color code Type rating plate	Installed in model	Remarks
127 460 12 80	without tank	65 ± 5	black	107 1st version ¹) ²)	Grey iron (Vickers VT 27)
116 460 17 80 116 460 20 80	with cast-on tank	65 ± 5	black	123, 1st version 107, 2nd version ¹) ²)	Grey iron (Vickers VT 49, ZF)
116 460 24 80 116 460 26 80	with cast-on tank	65 ± 5	black	123, 2nd version 107, 3rd version ¹)	Light alloy (Vickers VT 49, ZF)
126 460 00 80 126 460 02 80	with cast-on tank	65 ± 5	black	107, 4th version ²)	Light alloy (Vickers VT 49, ZF)
116 460 25 80 116 460 27 80	with cast-on tank	82 ± 5	blue	126 ¹)	Light alloy (Vickers VT 49, ZF)
126 460 01 80 126 460 03 80	with cast-on tank	82 ± 5	blue	126 ²)	Light alloy (Vickers VT 49, ZF)
201 460 05 80 201 460 06 80 201 460 09 80	with cast-on tank	65 ± 5	black	201.1, 02 ³)	Light alloy (ZF Vickers VT 60)
201 460 16 80	with cast-on tank	85 ± 5	blue (with green dash adjacent to type rating plate)	201.03 ³)	Light alloy (Vickers VT 60)

¹) With engine 110

²) With engine 116 and 117

³) When a pump is replaced, make sure that only a pump with the same opening pressure will be installed.

46-705 Renewing radial sealing ring of power steering pump

Note: These repair instructions apply only to models 107, 123 and 126.





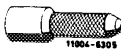
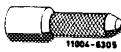
Oil types/filling capacities and oil level checkup

ATF (automatic transmission fluid) or manual transmission oil	refer to specifications for service products	Page 236.2
	refer to specifications for service products	Page 237
Filling capacity approx. liters	107, 123	1.4
	126	1.2

Oil level checkup: With oil at operating temperature (approx. 80 °C) the oil level in supply tank should reach up to punched-in or cast-in mark (approx. 20 mm below edge of tank). With cold oil and at ambient temperature oil level should be 6-8 mm below mark. Use only perfectly clean oil for refilling, since already minimum particles of dirt may lead to trouble in hydraulic system.

Tightening torques	Nm
High-pressure expanding hose to power steering pump	45-50
Connecting pipe for return flow hose	45-50

Special tools

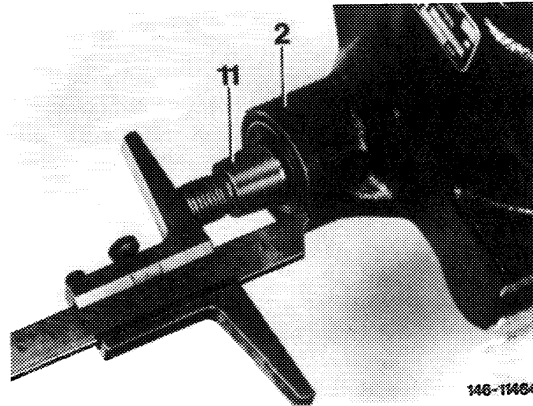
Puller for pulley		108 589 02 33 00
Puller for radial sealing ring (baisc unit)		116 589 24 33 00
Claw 33 mm dia. for Vickers VT 27, ZF and Vickers VT 49 2nd version		116 589 06 34 00
Claw 30 mm dia. for Vickers VT 49 1st version		116 589 05 34 00
Installation mandrel 33 mm dia. for Vickers VT 27, ZF and Vickers VT 49 2nd version		116 589 14 15 00
Installation mandrel 30 mm dia. for Vickers VT 49 1st version		116 589 13 15 00

Removal

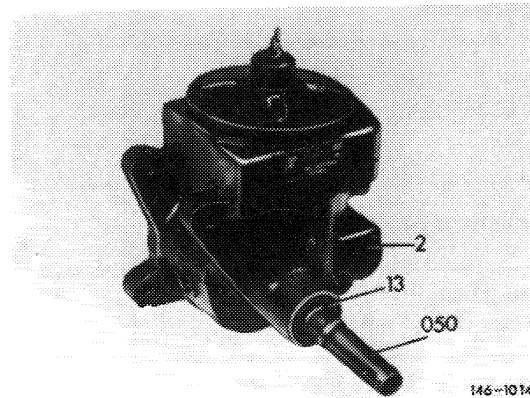
- 1 Remove power steering pump.
- 2 Remove Woodruff key on drive shaft.

3 On Vickers power steering pump VT 49 measure outlet end dimension of drive shaft in relation to pump flange.

Note: The dimension of drive shaft must be obtained because the drive shaft must not be forced into pump housing when pulling off the radial sealing ring. To check, measure again after removing sealing ring. Note that both measured values must be the same. If the dimension is larger during 2nd measurement, disassemble power steering pump and recondition.



- 4 Screw guide sleeve (050) on drive shaft.



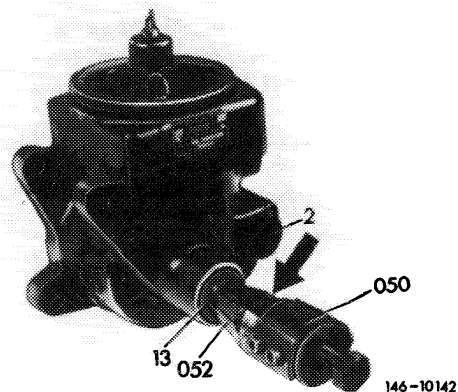
- 5 Screw back hex. screw of puller (050) and slip device on drive shaft, while punching with claws (051) through sealing lips of radial sealing ring (13).

Note: For power steering pumps, the puller requires the following claws:

Vickers VT 27, ZF, Vickers VT 49 2nd version
= 33 mm dia.

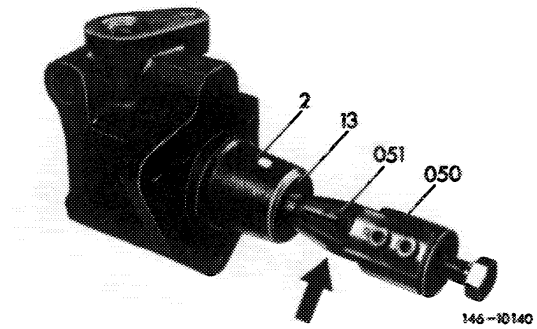
Vickers VT 49 1st version = 30 mm dia.

The respective claws must be attached to puller. The claw diameter is punched in.



6 Turn clamping cone (arrow) of puller (050) up to stop in clockwise direction and pull sealing ring out of case.

7 On Vickers power steering pump VT 49, measure axial play of drive shaft (refer to note following item 3).



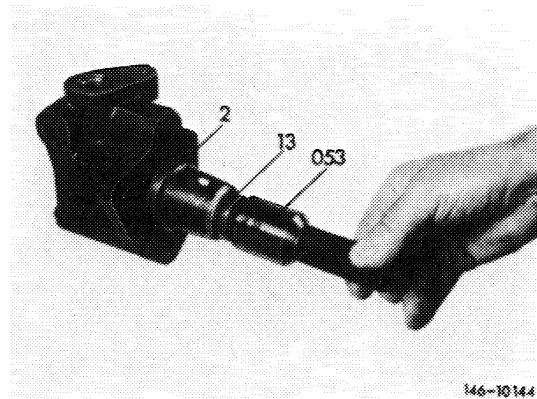
Installation

8 Slip radial sealing ring (13) over guide sleeve (050) on drive shaft and knock into case by means of respective installation mandrel (053).

Note: For Vickers power steering pump VT 27, ZF and Vickers VT 49 2nd version the installation mandrel with 33 mm dia. will be required, and for VT 49 pump 1st version the installation mandrel with 30 mm dia.

9 Insert Woodruff key into drive shaft.

10 Install power steering pump.



46–710 Removal and installation of power steering pump

Data



Model	Version	Part no.	Opening pressure of pressure relief valve bar gauge pressure (atü)	Color code of nameplate	Remarks
107.022, 107.023 107.024, 107.042 107.043, 107.044	1. 2.	127 460 12 80 116 460 17 80 116 460 20 80			Vickers VT 27 with separate tank Vickers VT 49 and ZF with cast-on tank
107.026	1.	116 460 24 80	65 ± 5	black	
107.022, 107.042	3.	116 460 26 80			Light alloy (Vickers and ZF)
107.025, 107.045 107.046	1.	126 460 00 80			
107.026	2.	126 460 02 80			

Oil grades/filling capacities and oil level checkup

ATF or gear oil	refer to specifications for service products	page 236.2
	refer to specifications for service products	page 237
Capacity		approx. 1.5 liter
Oil level checkup:	With the oil at operating temperature (approx. 80 °C) the oil level in supply tank should reach up to cast-in mark (approx. 20 mm below edge of tank). With cold oil and at ambient temperature the oil level should be 6–8 mm below mark. For filling up, use only perfectly clean oil, since even minimum particles of dirt may cause trouble in hydraulic system.	

Tightening torques	Nm	(kpm)
Hex. nut to drive shaft	50	(5)
Pipe nut of high-pressure expanding hose	45–50	(4.5–5)
Connecting pipe for return hose	45–50	(4.5–5)
Attachment of power steering pump to carrier	Hex. bolt M 10	50 (5)
	Hex. bolt 3/8"	35–40 (3.5–4)
	Hex. bolt M 8	25 (2.5)

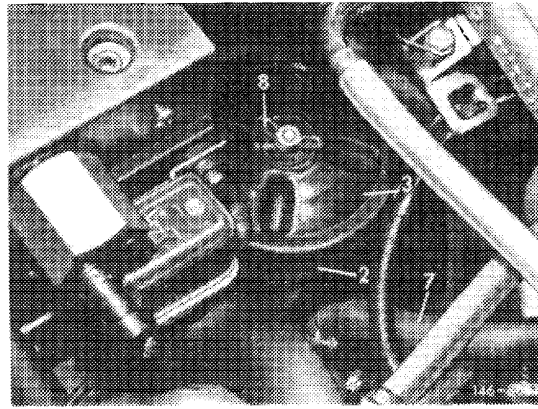
Special tool

Puller for pulley on drive shaft		108 589 02 33 00
Box wrench element open 17 mm 1/2" square		000 589 68 03 00

Removal

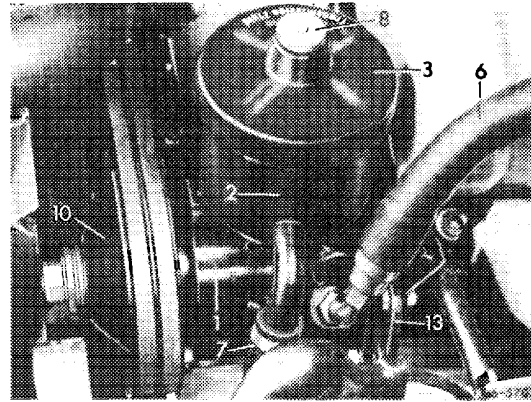
All models

1 Unscrew knurled nut or wing nut (8) from supply tank (2). Remove closing cover (3), pressure spring and steadying plate. Draw oil from supply tank with a syringe.



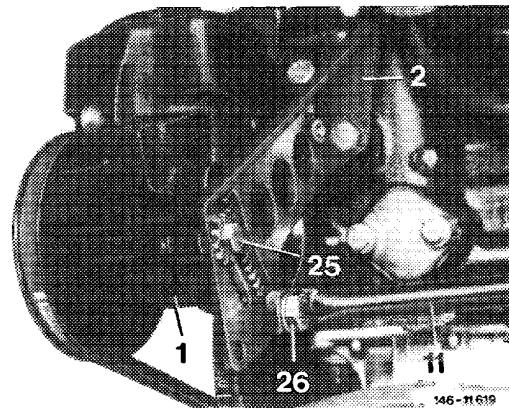
Layout of Vickers power steering pump VT 27 in models 107.022 and 107.042.

2 Loosen high-pressure expanding hose (6) and return hose (7) on power steering pump, close connections on pump and hoses with blind plugs.

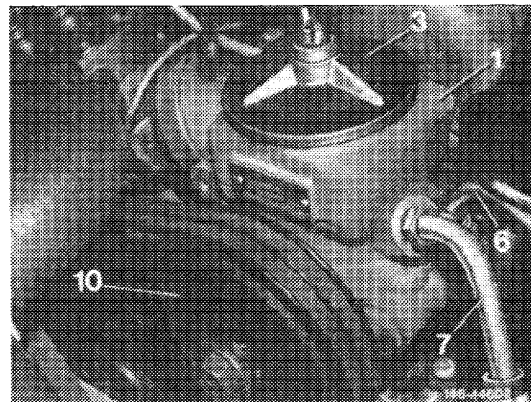


Layout of Vickers power steering pump VT 27 in models 107.023, 107.024, 107.043, 107.044.

Layout of Vickers VT 49 and ZF power steering pump in models 107.022 and 107.042.

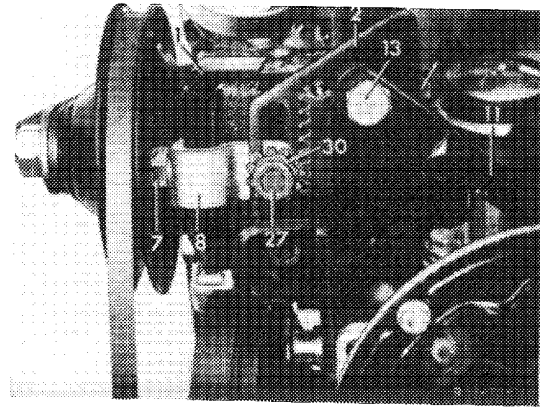


Layout of Vickers VT 49 and ZF power steering pump in models 107.023, 107.024, 107.025, 107.026, 107.043, 107.044, 107.045, 107.046.

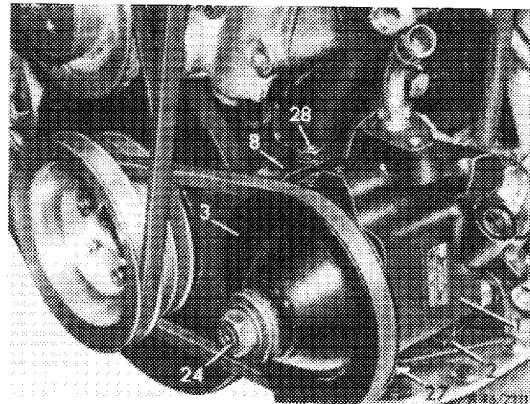


Models 107.022 and 107.042 with Vickers VT 27 power steering pump

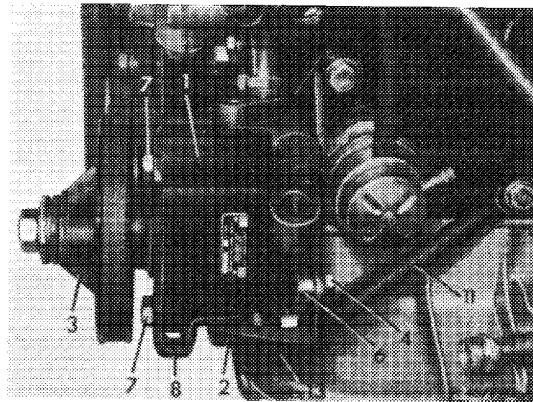
- 3 Loosen radiator shell.
- 4 Loosen hex. socket screw (27) as well as hex. screws (4).



- 5 Loosen hex. socket screw (28).
- 6 Unscrew hex. nut (24) from drive shaft and force off pulley with puller. Push power steering pump toward crankcase by turning gear wheel and remove vee-belt.

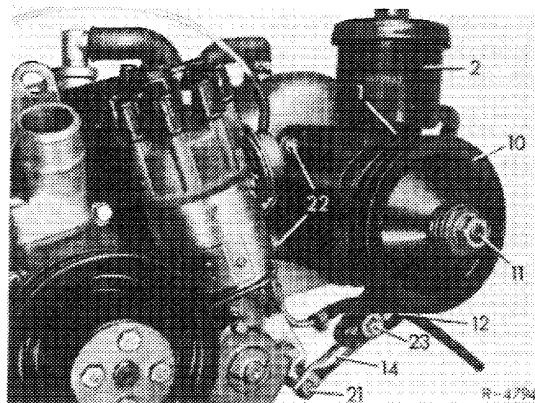


- 7 Unscrew hex. screws (4) and (7) and remove power steering pump.



Models 107.023, 107.024, 107.043 and 107.044 with Vickers VT 27 power steering pump

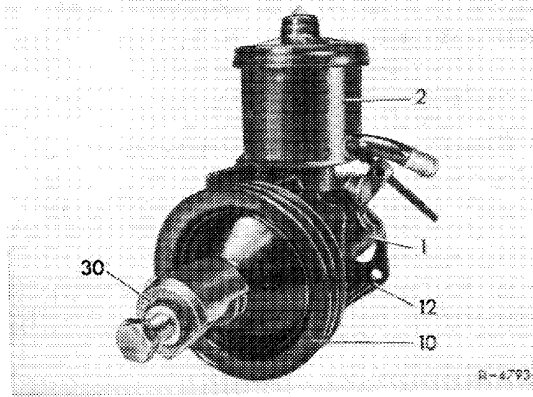
- 8 Loosen hex. nuts (22) at fastening plate and hex. screw (23) on support (14). Push power steering pump toward engine and take both vee-belts from pulley (10).
- 9 Unscrew hex. screws and nuts and remove power steering pump including carrier.



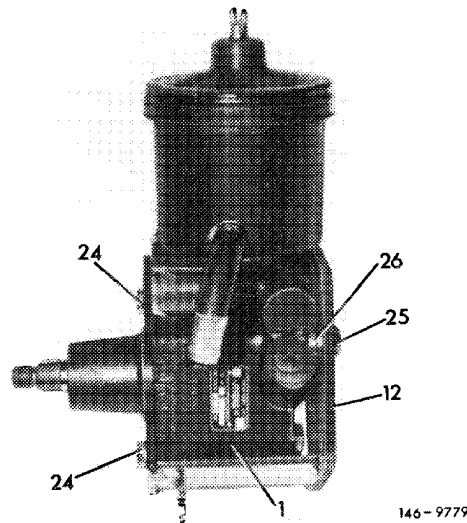
10 Unscrew hex. nut from drive shaft while applying counterhold at flats (36 mm) of pulley.

11 Remove pulley (10) from drive shaft with puller (30).

Note: Remove pulley only with puller 108 589 02 33 00, since otherwise the power steering pump will be damaged.

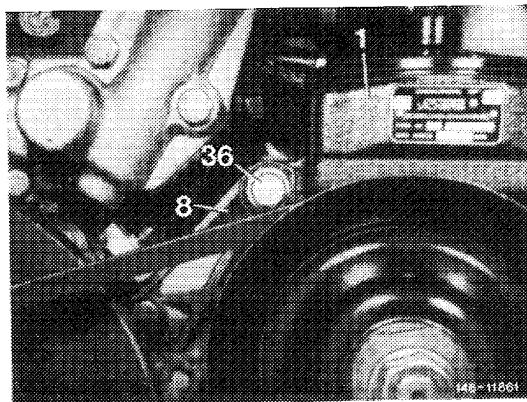


12 Unscrew hex. socket screws (24) (7 mm hex. socket) and hex. screw (25) (inch threads) and remove power steering pump from carrier (12), while paying attention to spacing sleeve (26).



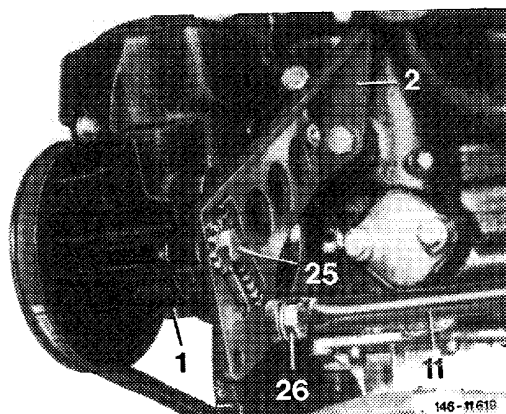
Models 107.022 and 107.042 with Vickers VT 49 and ZF power steering pump

13 Loosen hex. screw (36).



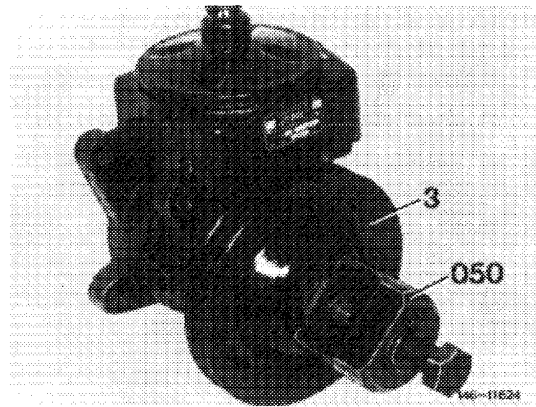
14 Loosen hex. nut on adjusting screw (25), then slacken vee-belt by turning adjusting screw. Remove vee-belt from pulley.

15 Unscrew hex. screw (36) and hex. nut at adjusting screw, remove power steering pump.



16 Unscrew hex. nut from drive shaft and remove pulley with puller.

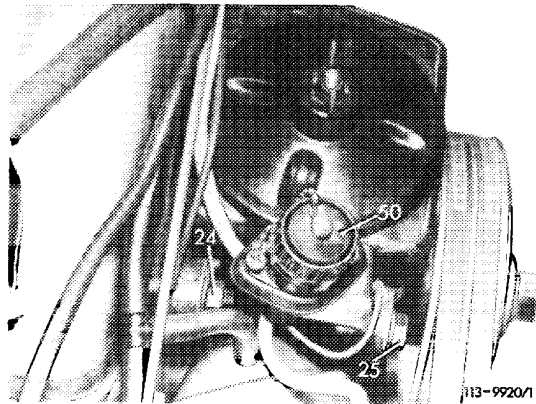
Note: Remove pulley only with puller 108 589 02 33 00, since otherwise the power steering pump will be damaged.



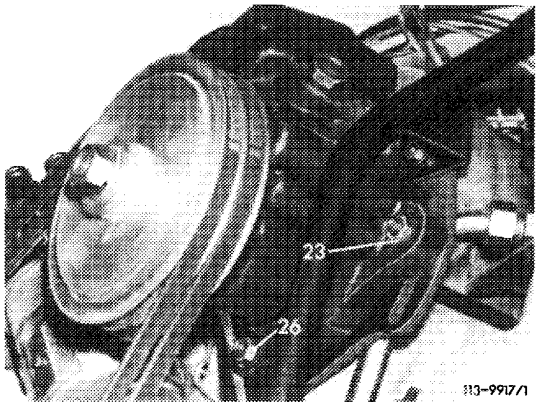
Models 107.023, 107.024, 107.025, 107.026, 107.043, 107.044, 107.045 and 107.046 with Vickers VT 49 and ZF power steering pump.

17 Remove diagnosis plug (5) from power steering pump.

18 Loosen hex. nut (24).

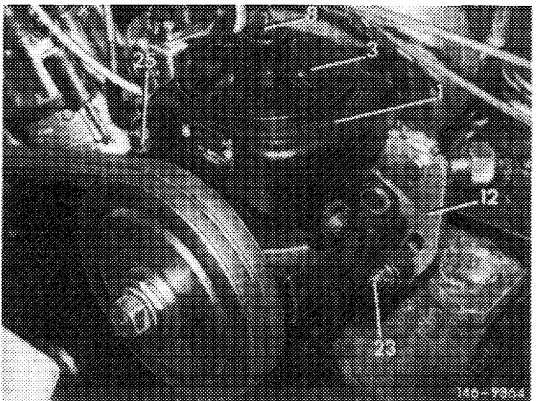


19 Loosen hex. nut (26) and (23).



20 Swivel power steering pump toward engine by means of tensioning screw (23) and remove vee-belt from pulley.

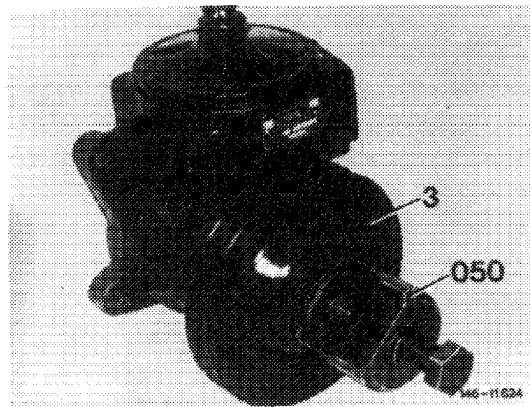
21 Unscrew hex. nut (23, 25 and 26) and remove power steering pump.



22 Unscrew hex. nut from drive shaft.

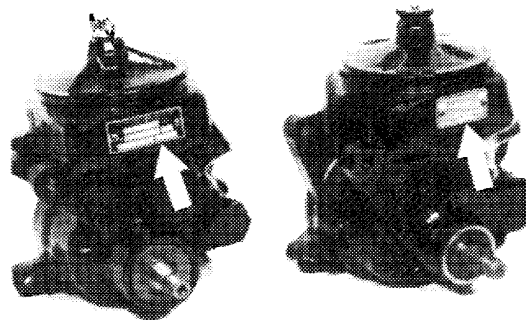
23 Remove pulley (3) from drive shaft with puller (050).

Note: Remove pulley only with puller 108 589 02 33 00, since otherwise the power steering pump will be damaged.



Installation

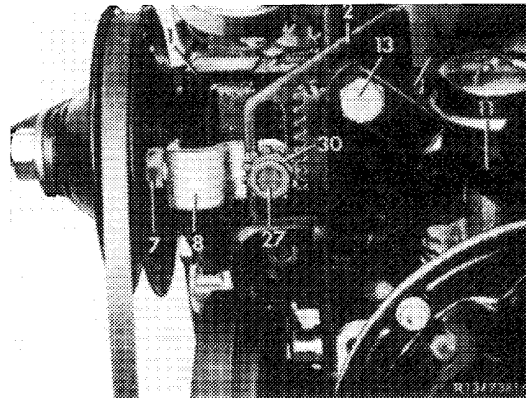
Note: Make sure that a power steering pump is installed on which the pressure relief valve will open at 65 bar (atü). The opening pressure is punched into type rating plate of pump. In addition, the type rating plate has a black basic color.



146-12095

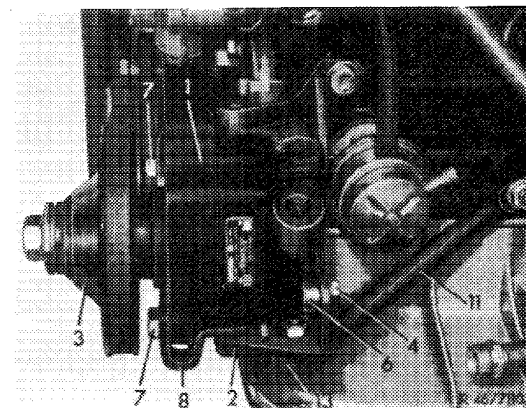
Models 107.022 and 107.042 with Vickers VT 27 power steering pump

24 Screw hex. screws (7) into pump housing and tighten to 65 to 70 Nm (6.5 to 7 kpm).

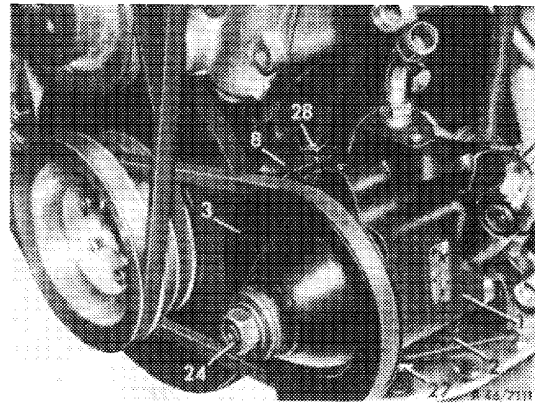


25 Place spacing sleeve (6) between pump and carrier and screw-in hex. screw (4), but do not yet tighten.

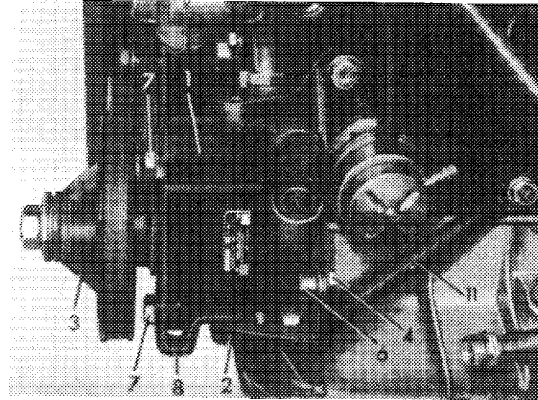
26 Attach pulley to drive shaft and tighten hex. nut 50 Nm (5 kpm), while applying counterhold to flats on pulley.



27 Mount vee-belt. Push power steering pump from crankcase by means of gear wheel until the correct belt tension is attained. Then tighten hex. socket screws (27) and (28).



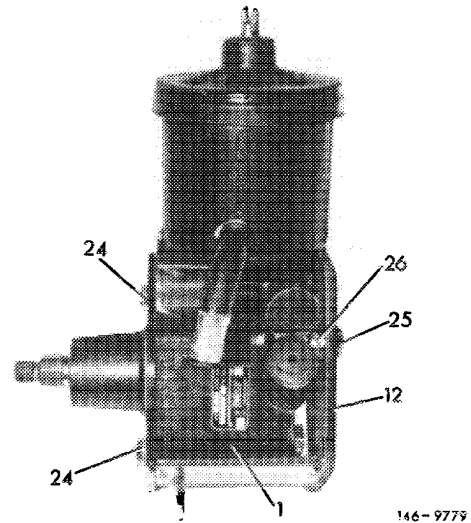
28 Tighten hex. screw (4).



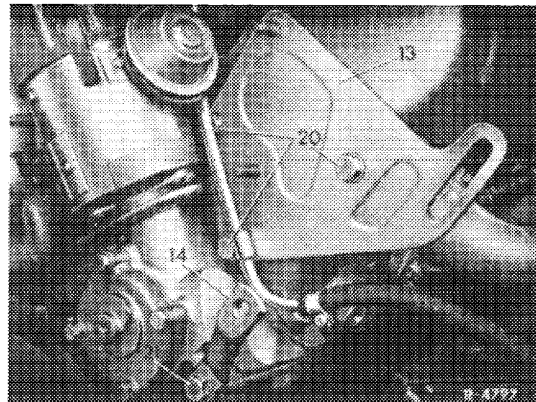
Types 107.023, 107.024, 107.043 and 107.044 with Vickers VT 27 power steering pump

29 Insert power steering pump into carrier (12) and attach with hex. screws. The rear screw (25) has inch threads.

30 Attach pulley to drive shaft, making sure that the cone of the drive shaft and the flange on the pulley are free of grease. Tighten hex. nut to 50 Nm (5 kpm).

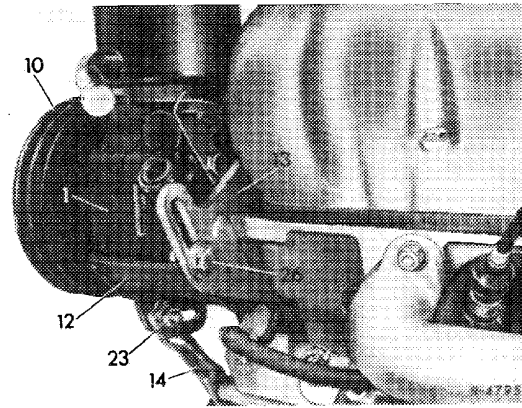


31 Retighten hex. screws (20) for attaching plate (13) to cylinder head.



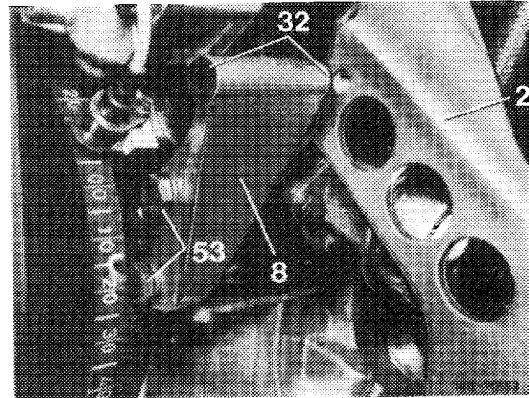
32 Attach power steering pump including carrier (12) to fastening plate (13) and to support. But do not yet tighten hex. screws or nuts.

Place both vee-belts on pulley (10). Tension vee-belt and tighten hex. screws or nuts.

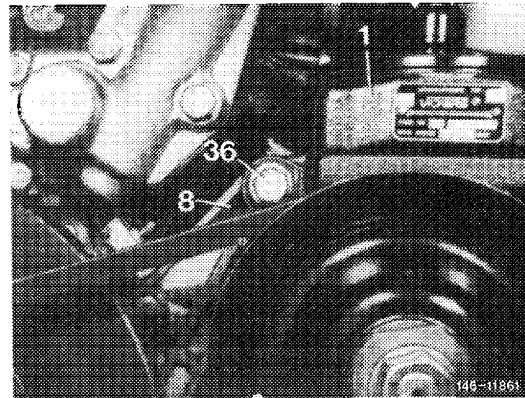


Types 107.022 and 107.042 with Vickers VT 49 and ZF power steering pump

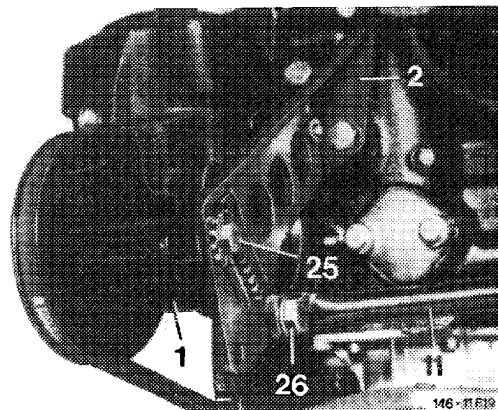
33 Check plastic bushings (32) in holder, renew bushings, if required.



34 Attach pump in holder (8) or carrier with hex. screw (36), but do not yet tighten.

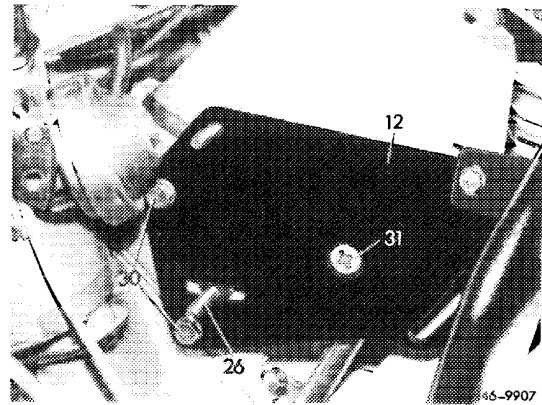


35 Screw hex. nut on adjusting screw (25). Place vee-belt on pulley. Tension vee-belt with adjusting screw. Tighten hex. screw and hex. nut at adjusting screw.

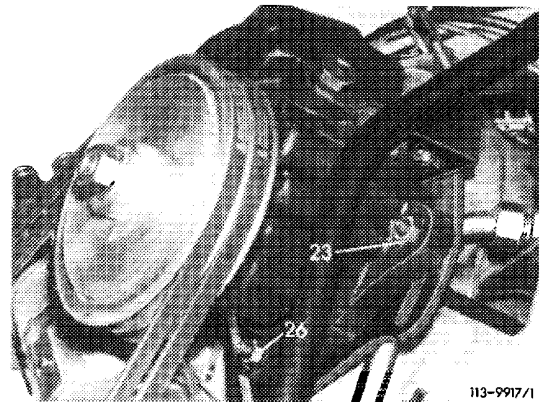


Models 107.023, 107.024, 107.025, 107.026, 107.043, 107.044, 107.045 and 107.046 with Vickers VT 49 and ZF power steering pump.

36 Retighten hex. screws (30) and Phillips screw (31) for attaching plate (12) to cylinder head.

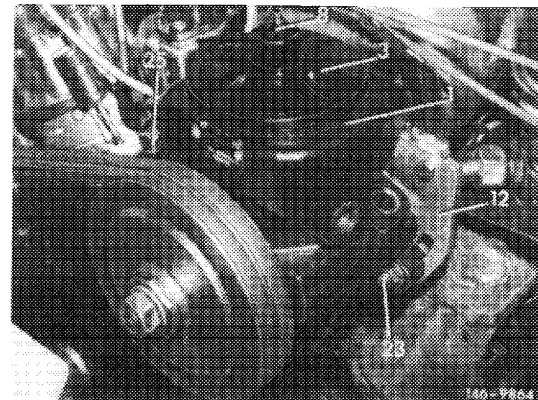


37 Attach power steering pump with hex. nuts and hex. screws (23 and 26) to fastening plate, but do not yet tighten hex. nuts and hex. screws.



38 Attach power steering pump with hex. nuts and hex. screws (23, 25 and 26) to fastening plate, but do not yet tighten hex. nuts and hex. screws.

39 Attach pulley to drive shaft, mount vee-belt and tension. Tighten hex. nuts.



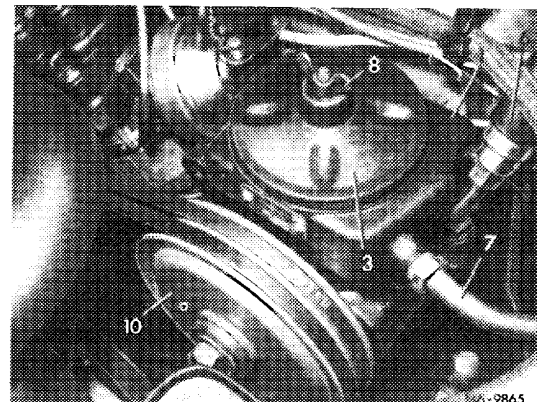
All models

40 Connect high-pressure expansion hose and return hose to pump housing. Pay attention to perfect installation of hose.

41 Fill servo-system with specified oil, add oil up to mark with the engine running.

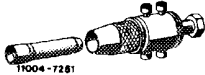





42 Turn steering several times to full lock left and right to bleed system.

43 Check oil level and servo-system for leaks.



46-720 Disassembly, checkup and reconditioning of power steering pump

Special tools

Puller for radial sealing ring (basic unit)		116 589 24 33 00
Claw 33 mm dia. for VT 27 2nd version VT 49 and ZF pump		116 589 06 34 00
Claw 30 mm dia. for 1st version VT 49		116 589 05 34 00
Installation mandrel 33 mm dia. for VT 27 2nd version VT 49 and ZF pump		116 589 14 15 00
Installation mandrel 30 mm dia. for 1st version VT 49		116 589 13 15 00
Puller for pulley		108 589 02 33 00

Self-made tools

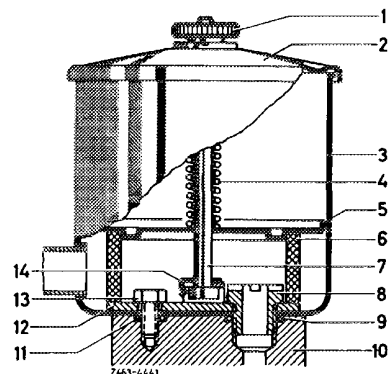
Punch	refer to section B item 19, remark
Assembly sleeve	refer to section B and C item 10, remark

A. Vickers power steering pump VT 27

Disassembly

Supply tank

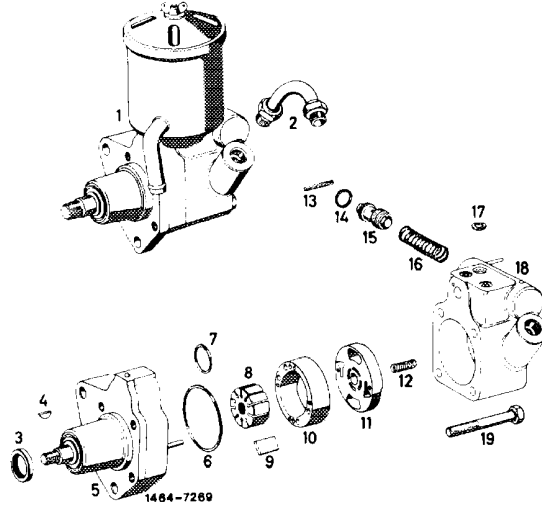
1 On power steering pump with screwed-on supply tank unscrew knurled nut (1) and remove closing cover (2) with paper gasket. Remove compression spring (4), settling plate (5) and filter ring (6). Unscrew hex. screw (13) and hollow screw (8). Remove supply tank (3) and O-rings (9 and 11) from pump housing (10).



Rotor and cam ring

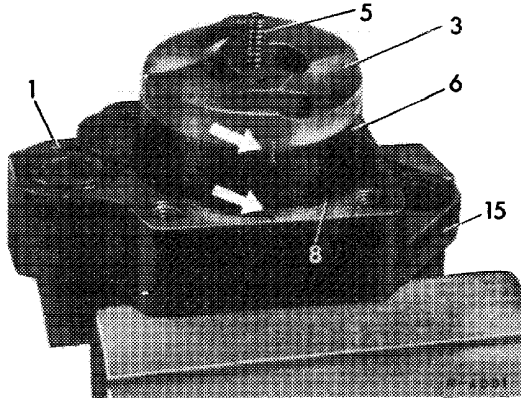
2 Unscrew hex. screws (19) by means of which the housing cover (5) is attached to pump housing (18) and remove pump housing.

- 3 Radial sealing ring
- 4 Woodruff key
- 5 Housing cover
- 6 O-ring (pump housing)
- 7 O-ring (oil feed bore)
- 8 Rotor
- 9 Blade
- 10 Cam ring
- 11 Thrust plate
- 12 Compression spring for thrust plate
- 13 Locking pin
- 14 O-ring (closing plug)
- 15 Volume control valve with pressure relief valve
- 16 Spring for volume control valve
- 17 O-ring (supply tank)
- 18 Pump housing
- 19 Hex. screw

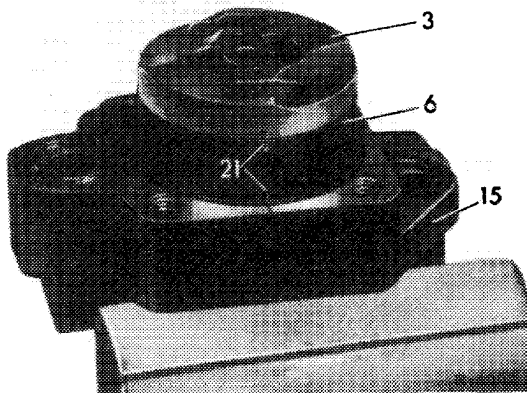


3 Remove compression spring (12) from thrust plate (11). Mark thrust plate (11), cam ring (10) and housing cover (15) together (refer to arrows).

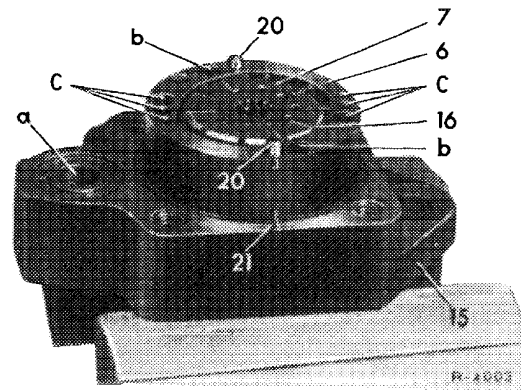
4 Remove O-ring (7 and 8) from housing cover (15).



5 Remove thrust plate (11) from set pins, then remove cam ring (10).



6 Remove rotor (7) including blade (16) from splining of drive shaft

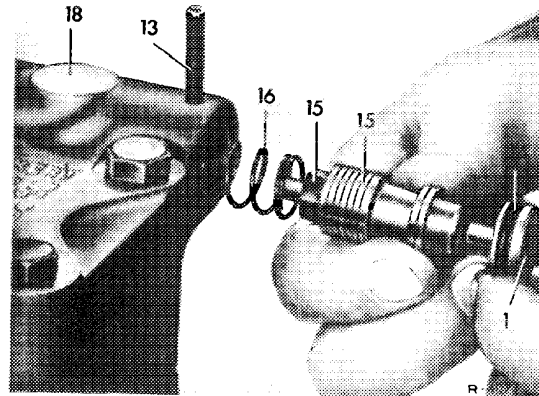


- a Oil feed from supply tank
- b Pressure oil outlet from cam ring
- c Intake bore
- 6 Cam ring
- 7 Rotor
- 15 Housing cover
- 16 Pump blade
- 20 Set pin
- 21 Marking line

7 Thoroughly clean all parts and flush.

Volume control valve

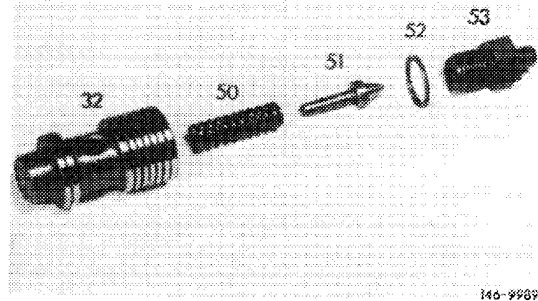
8 Carefully knock locking pin (13) out of pump housing (18). The closing plug and the volume control valve will then generally be pushed out of housing by compression spring.



9 Remove closing plug (1), volume control valve (15) and compression spring (16) from pump housing.

Note: If the closing plug remains seated in housing loosen plug in housing by means of light hammer blows against plug. **Make sure that volume control valve is not damaged.**

10 Clamp volume control valve (32) at its unground surface into vise and unscrew valve screw (53) of pressure relief valve. Make sure that no spacing washer (52) is lost.

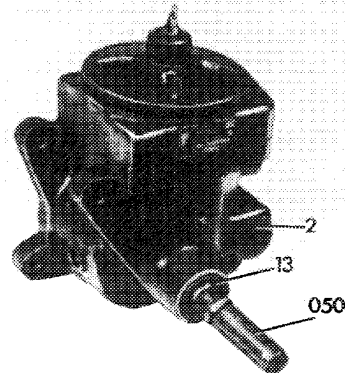


Remove valve cone (51) and compression spring (50) from volume control valve.

Drive shaft and sealing ring

11 Remove Woodruff key from drive shaft.

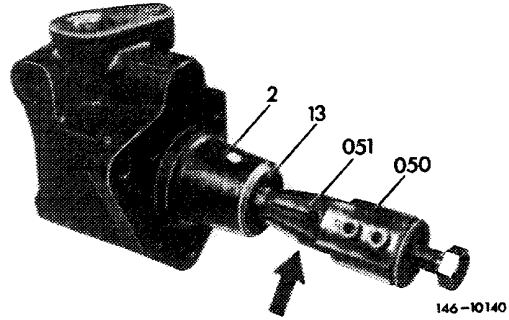
12 Screw guide sleeve (050) on drive shaft.



13 Screw back hex. screw of puller (050) and slip device on drive shaft, while punching with claws (051) through sealing lips of radial sealing ring (13).

Note: Power steering pump VT 27 requires claws of 33 mm dia.

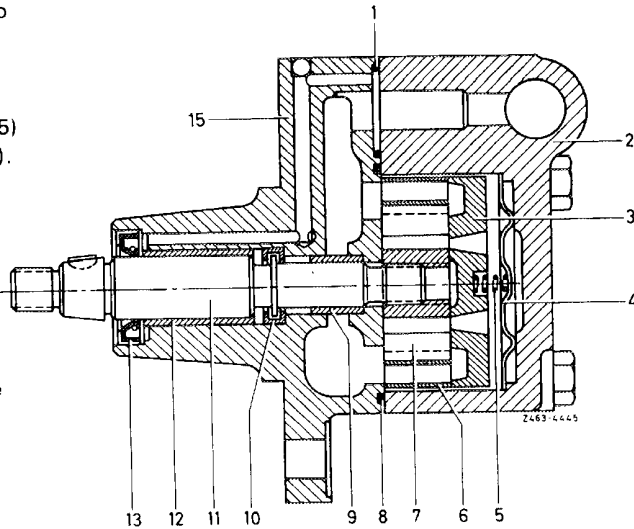
Attach respective claws to puller. The claw diameter is punched in.



14 Turn clamping cone (arrow) of puller (050) to the right up to stop and pull sealing ring out of housing.

15 Press drive shaft (11) out of housing cover (15) while paying attention to the two shell halves (10).

- 1 O-ring
- 2 Pump housing
- 3 Pressure plate
- 4 Oil guide plate
- 5 Pressure spring
- 6 Cam ring
- 7 Rotor with blade
- 8 O-ring
- 9 Bearing bushing
- 10 Shell half
- 11 Drive shaft
- 12 Bearing bushing
- 13 Sealing ring
- 15 Housing cover



Checking and reconditioning

Repair set

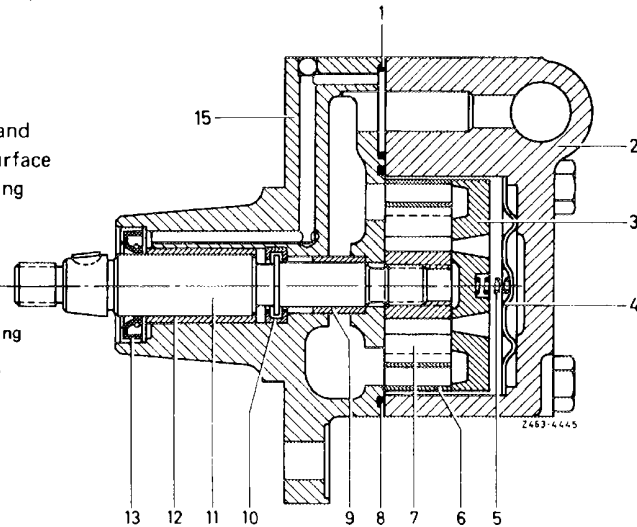
Designation	Vickers power steering pump VT 27	
Set of seals	000 586 72 46	
Pump insert	000 586 07 46	
Drive shaft	000 586 56 46	
Volume control valve	65 bar	000 586 00 46
	82 bar	000 586 42 46

End play of drive shaft

New pump	max. 0.7
Used pump	max. 1

16 Check parting surface of housing cover (15) and ground side surfaces of rotor (7). If the parting surface shows score marks, replace complete power steering pump.

- 1 O-ring
- 2 Pump housing
- 3 Pressure plate
- 4 Oil guide plate
- 5 Compression spring
- 6 Cam ring
- 7 Rotor with blade
- 8 O-ring
- 9 Bearing bushing
- 10 Shell half
- 11 Drive shaft
- 12 Bearing bushing
- 13 Sealing ring
- 15 Housing cover



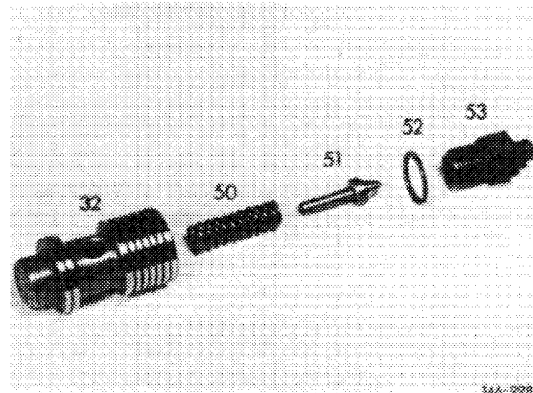
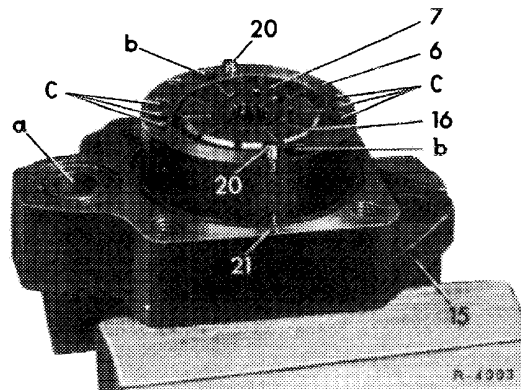
17 Check end play of drive shaft (11), which is max. 0.7 mm on a new pump and should not exceed 1 mm on a used pump.

If end play is higher, press drive shaft out of housing.

18 Check blades in grooves of rotor (7), they should slide easily in rotor. Check slide surface of blades on cam ring (6) for wear. If required, recondition power steering pump by using repair kit "pump insert".

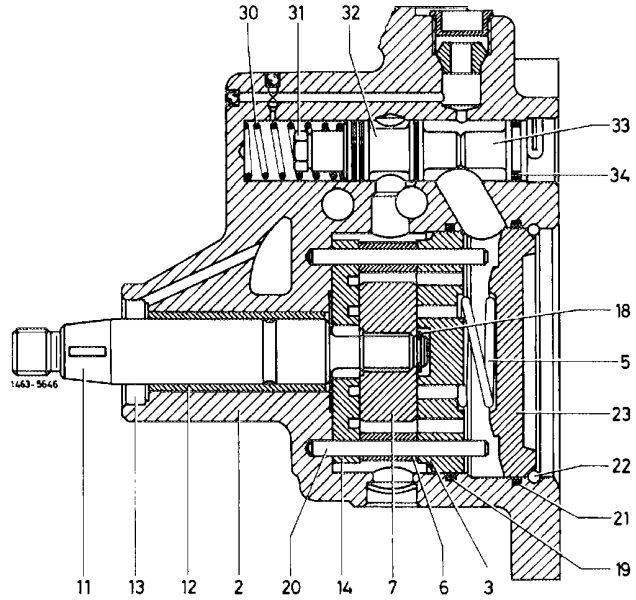
Note: No noticeable marks should show up at slide surface of cam ring, since delivery capacity and smooth running of power steering pump depend on that surface.

19 Check ground surfaces of volume control valve (32) and bore in pump housing for wear and damage. If the slide surfaces are showing score marks, **renew complete power steering pump**. Never replace volume control valve only.

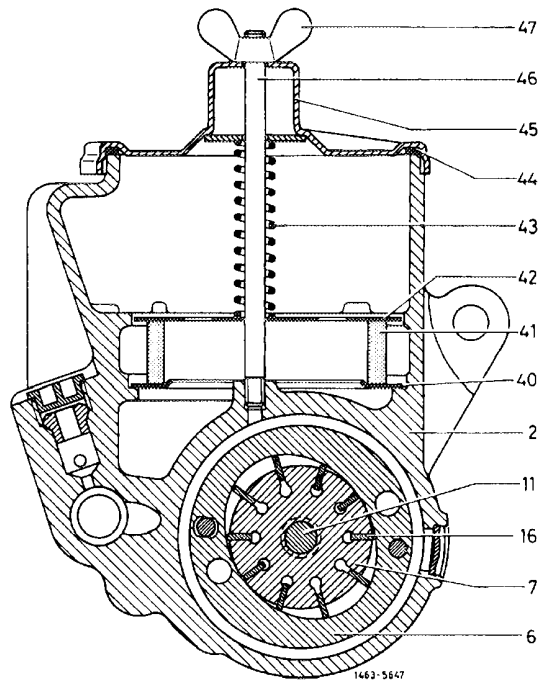


B. Vickers power steering pump VT 49 (grey iron and light alloy version)
 ZF power steering pump (light alloy version)

Disassembly



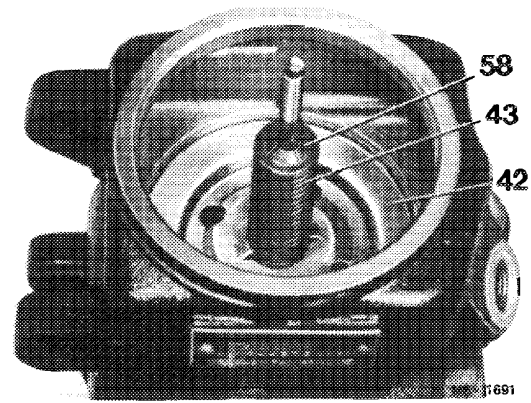
- 2 Pump housing
- 3 Pressure plate at cover end
- 5 Compression spring
- 6 Cam ring
- 7 Rotor with blade
- 11 Drive shaft
- 12 Bearing bushing
- 13 Radial sealing ring
- 14 Pressure plate at drive end
- 18 Locking ring
- 19 O-ring
- 20 Cyl. pin
- 21 O-ring
- 22 Circlip
- 23 Cover
- 30 Compression spring
- 31 Valve screw
- 32 Volume control valve
- 33 Closing plug
- 34 O-ring
- 40 Steadying plate
- 41 Filter ring
- 42 Steadying plate
- 43 Compression spring
- 44 Gasket
- 45 Closing cover
- 46 Stud
- 47 Wing nut



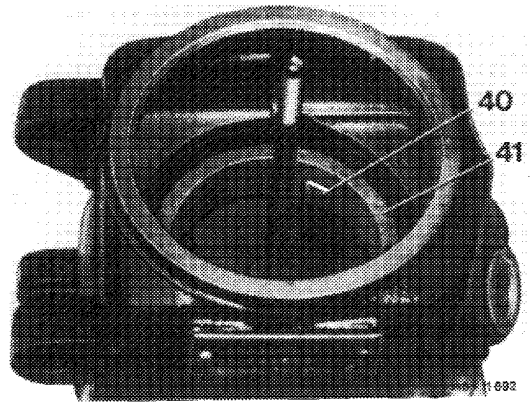
1 Remove wing nut or knurled nut as well as closing cover.

2 On grey iron pump and on light alloy pump 2nd version, remove detent spring (58), compression spring (43) and upper steadying plate (42).

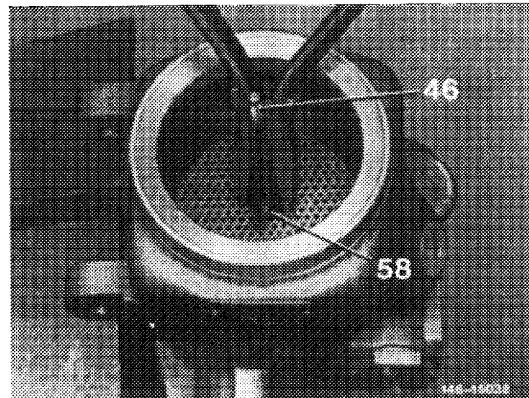
Note: On grey iron pump 1st version a washer is included between compression spring and closing cover, on second version this washer is attached to cover.



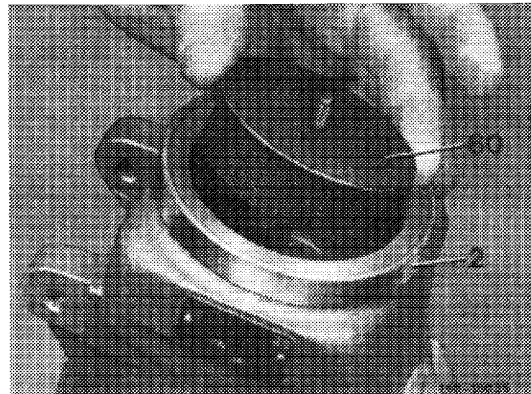
3 On grey iron pump and on light alloy pump 2nd version, remove filter ring (41) and lower steadying plate (40).



4 On light alloy pump 1st version, remove detent spring (58) from stud.

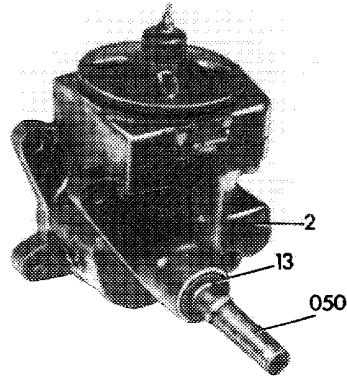


5 On light alloy pump 1st version, take steadying basket (60) out of pump housing.



6 Remove Woodruff key from drive shaft.

7 Screw guide sleeve (050) on drive shaft.



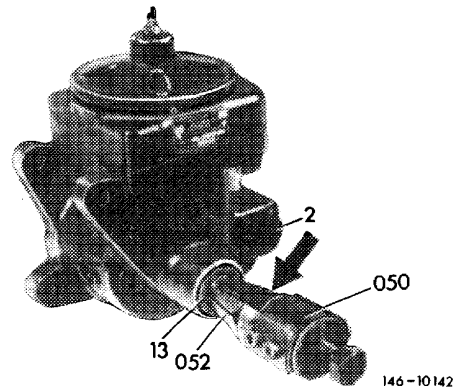
8 Turn hex. screw of puller (050) back and slip device on drive shaft, while punching through lips of radial sealing ring (13) by means of claws (052).

Note: Power steering pumps require the following claws for puller:

VT 49 1st version 30 mm dia.

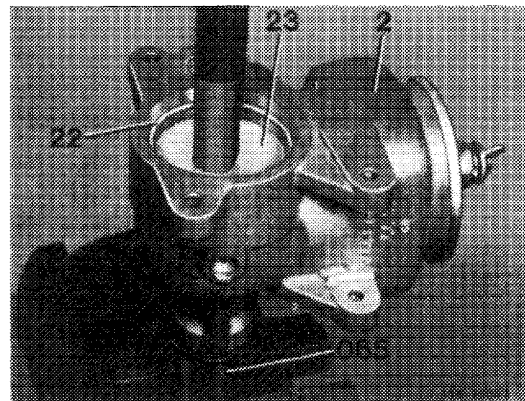
VT 49 2nd version 33 mm dia.

Fasten respective claws to puller. The claw dia. is punched in.

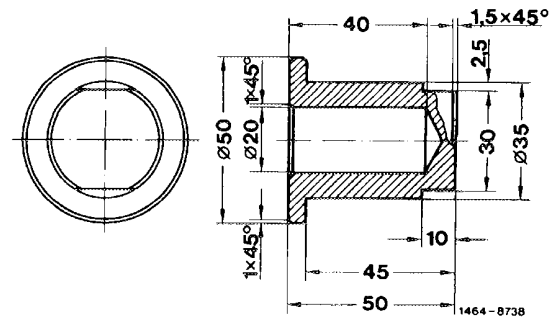


9 Turn clamping cone (arrow) of puller to the right up to stop, then pull sealing ring out of housing.

10 Place assembly sleeve (065) on power steering pump and push cover (23) slightly into housing by means of a hand press or a screw clamp.

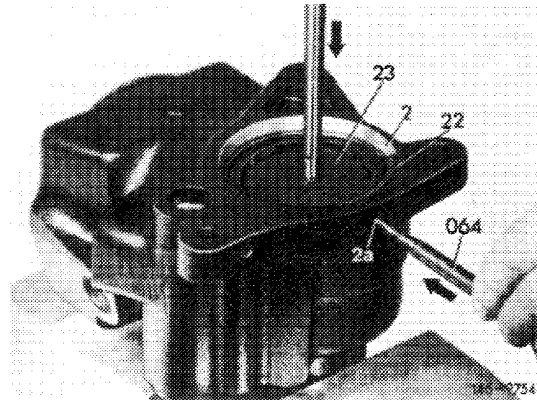


Note: The assembly sleeve is self-made according to specified dimensions.



11 Remove circlip (22) from housing and take off cover.

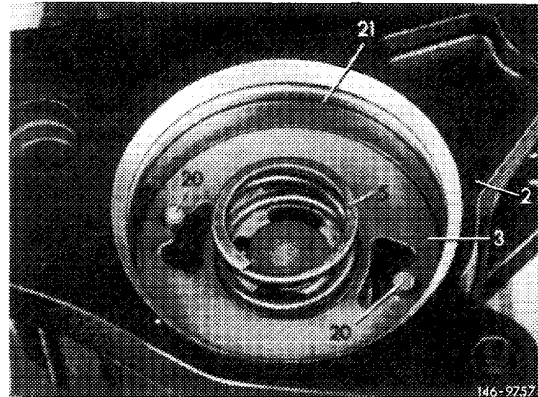
Note: On grey iron pump the circlip can be pushed out of steering case through bore (2a) by means of a punch.



12 Remove spring (5) and O-ring (21) from pump housing (2).

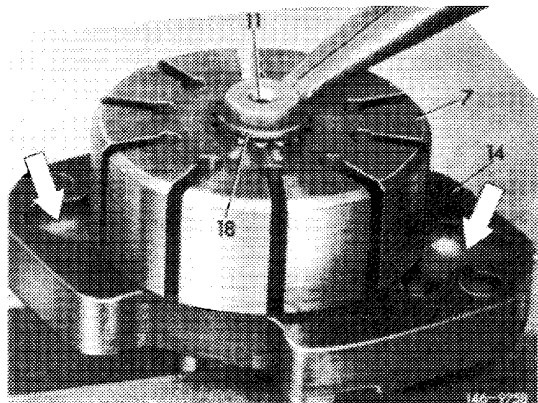
13 Push drive shaft complete with pressure plate at cover end, rotor, cam ring and pressure plate at drive end toward the rear out of housing.

14 Remove pressure plate, cam ring and blade (10 each).

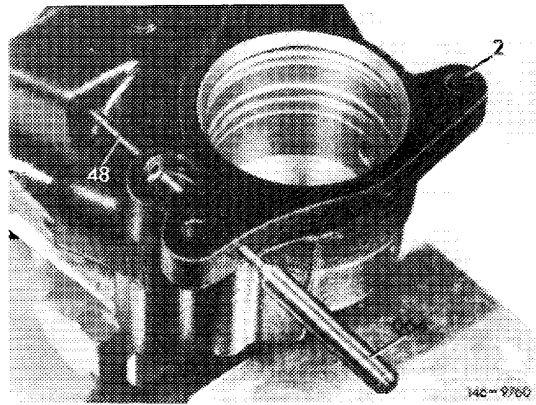


15 Remove locking ring (18) from drive shaft (11), then remove rotor (7) and pressure plate (14).

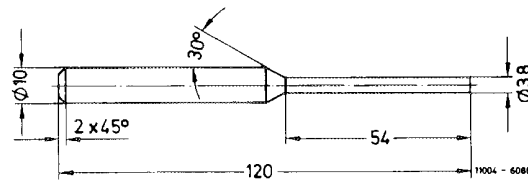
16 Take cyl. pins (20) out of pump housing.



17 On grey iron power steering pump, knock locking pin (48) out of pump housing (2) with punch (064).

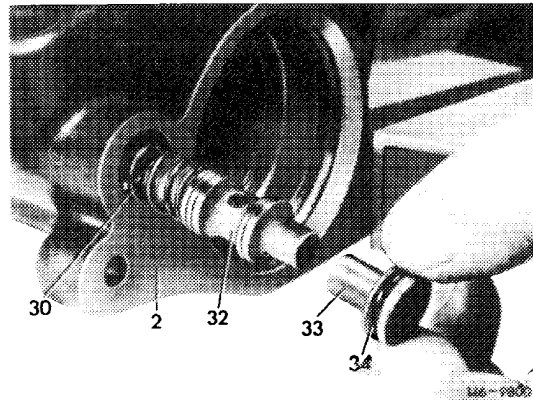


Note: The punch is self-made according to specified data.



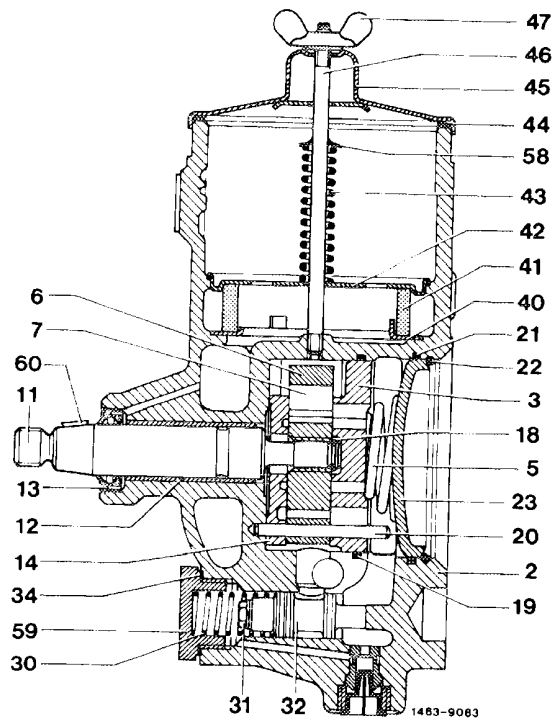
18 Remove closing plug (34), volume control valve (32) and compression spring (30) from housing.

Note: If closing plug remains seated in housing, loosen by means of light hammer blows against closing plug. **Make sure that the volume control valve is not damaged.**

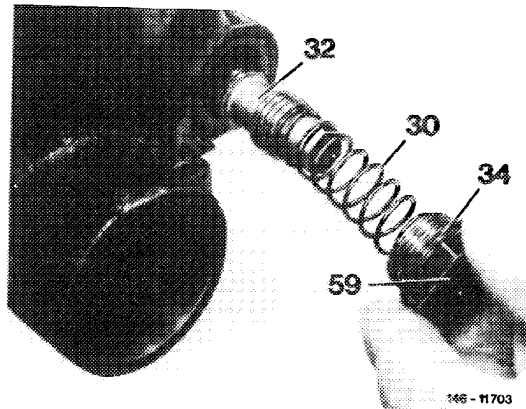


Light alloy power steering pump

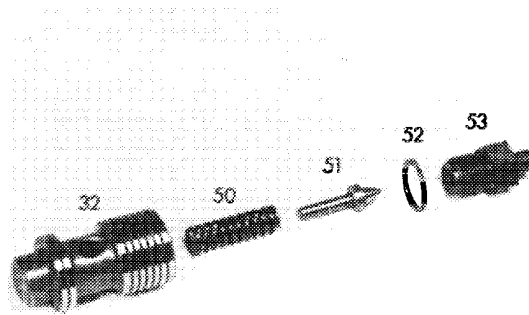
- 2 Pump housing
- 3 Pressure plate at cover end
- 5 Compression spring
- 6 Cam ring
- 7 Rotor with blade
- 11 Drive shaft
- 12 Bearing bushing
- 13 Radial sealing ring
- 14 Pressure plate at drive end
- 18 Locking ring
- 19 O-ring
- 20 Cyl. pin
- 21 O-ring
- 22 Circlip
- 23 Cover
- 30 Compression spring
- 31 Valve screw
- 32 Volume control valve
- 34 Sealing ring
- 40 Lower steadying plate
- 41 Filter ring
- 42 Upper steadying plate
- 43 Compression spring
- 44 Gasket
- 45 Closing cover
- 46 Stud
- 58 Detent spring
- 59 Closing plug
- 60 Woodruff key



19 On light alloy power steering pump, unscrew closing plug (59) from housing, remove compression spring (30) and volume control valve.



20 Clamp volume control valve (32) of both pump versions with its unground part into vise and unscrew valve screw (53) of pressure relief valve. Make sure that no spacing washer (52) is lost. Remove valve cone (51) and compression spring (50) from volume control valve.

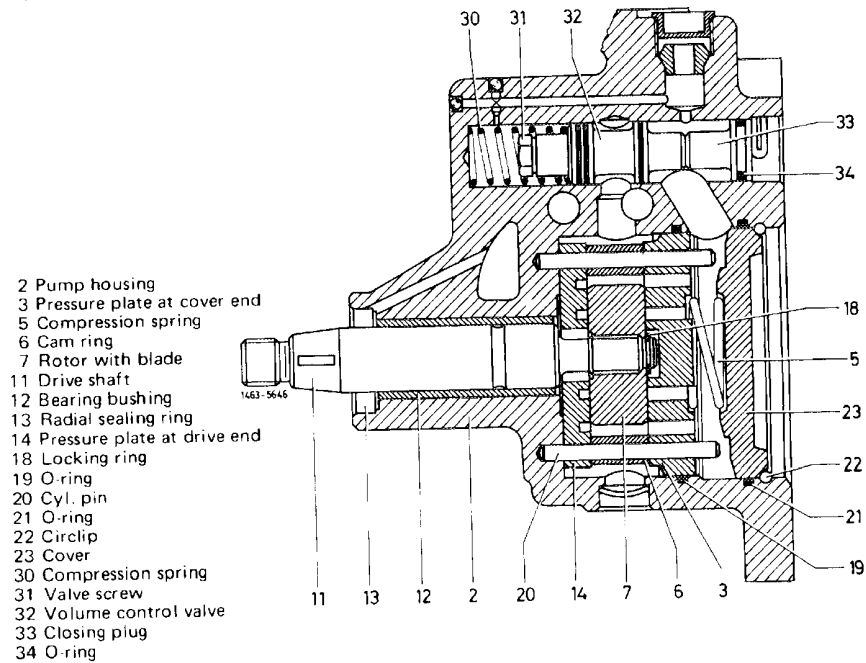


Checking and reconditioning

Repair sets

Designation	Power steering pump Vickers VT 49		ZF
	Grey iron	Light alloy	Light alloy
Set of seals	000 586 52 42		000 586 84 46
Pump insert	000 586 67 46		000 586 86 46
Drive shaft	000 586 53 46		000 586 85 46
Volume control valve	65 bar	000 586 70 46	000 586 87 46
	82 bar	000 586 69 46	000 586 88 46

21 Check ground surface of pressure plates (3 and 14).
With score marks on pressure plates, recondition power steering pump by means of repair set "pump insert".

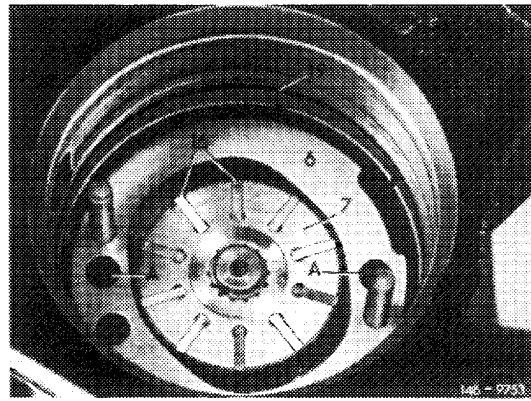


22 Check drive shaft (11) and bearing bushing (12) for wear. If required, install bushing from repair set "drive shaft".

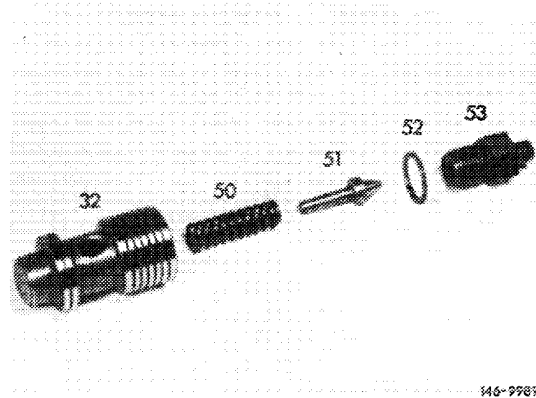
Note: Install slotted bushing in such a manner that the slot is located opposite to pulling direction of V-belt.

23 Check blades in grooves of rotor (7), they should slide easily in rotor. Check slide surface of blades on cam ring (6) for wear. If required, recondition power steering pump by using repair set "pump insert".

Note: No noticeable marks should show up at slide surface of cam ring, since delivery capacity and smooth running of power steering pump depend on that surface.

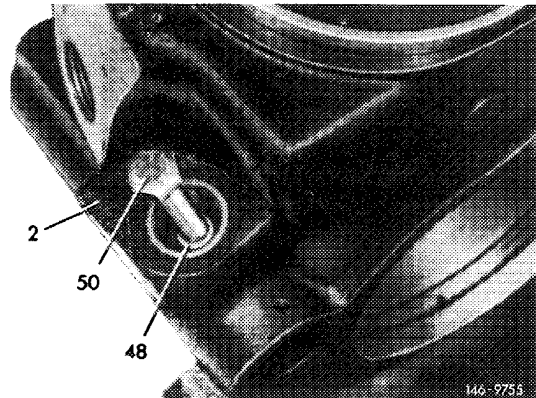


24 Check ground surfaces of volume control valve (32) and bore in pump housing for wear and damage. If the sliding surfaces are showing score marks, **renew complete power steering pump**. Never replace volume control valve only.



25 Check both sealing cones (connection high-pressure expanding hose, return flow pipe). Replace distorted sealing cones. For this purpose, cut several 7 or 10 mm threads into sealing cone. Pull sealing cone out of housing by means of a 7 or 10 mm screw.

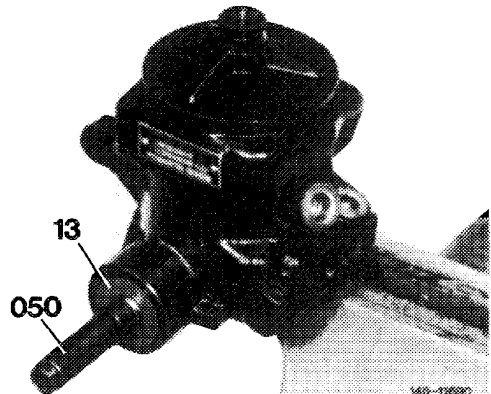
26 Position new sealing cones (48) in housing and push in by screwing high-pressure expanding hose or return flow pipe into housing.



C. ZF power steering pump (grey iron version)

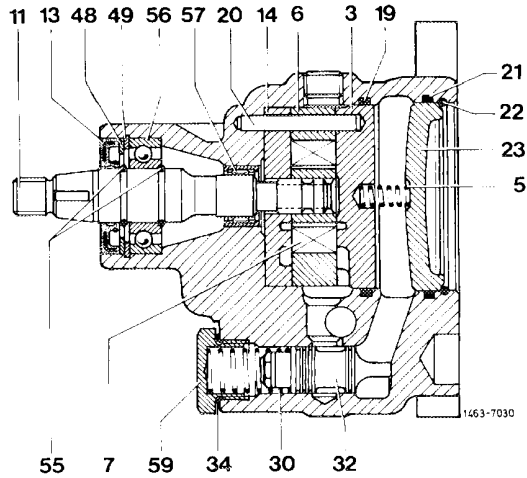
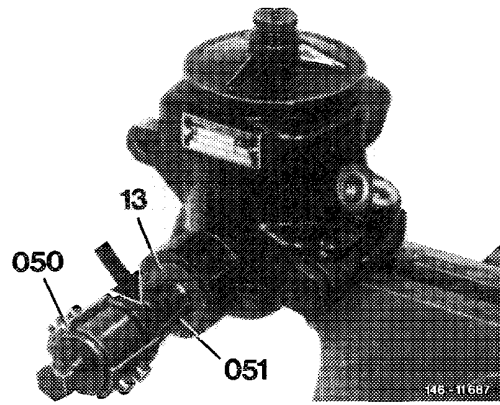
Disassembly

- 1 Remove Woodruff key from drive shaft.
- 2 Screw guide sleeve (050) on drive shaft.

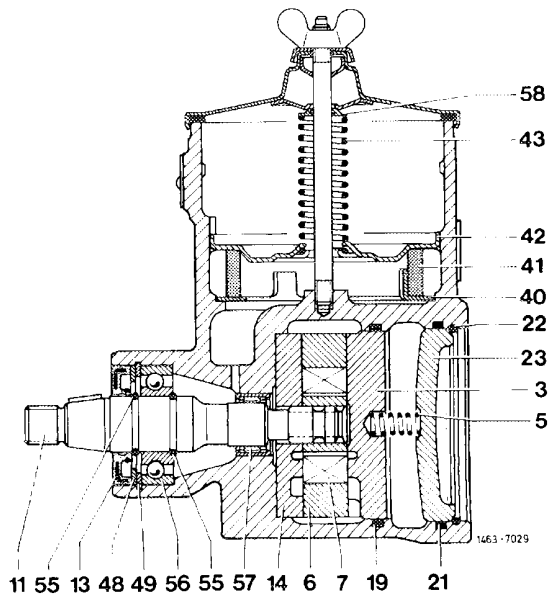


3 Screw back hex. screw of puller (050) and slip device on drive shaft, while punching sealing lips of radial sealing ring (13) by means of 13 mm claws (051).

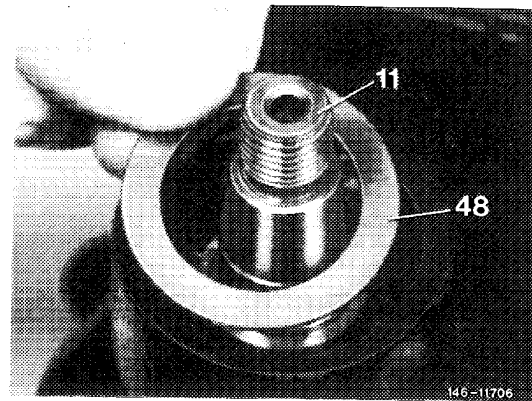
4 Turn clamping cone (arrow) of puller to the right up to stop, then pull sealing ring out of housing.



- 3 Pressure plate at cover end
- 5 Compression spring
- 6 Cam ring
- 7 Rotor with blade
- 11 Drive shaft
- 13 Sealing ring
- 14 Pressure plate at drive end
- 19 O-ring
- 20 Cyl. pin
- 21 O-ring
- 22 Hooked circlip
- 23 Cover
- 30 Compression spring
- 32 Volume control valve
- 34 Sealing ring
- 40 Lower steadying plate
- 41 Filter ring
- 42 Upper steadying plate
- 43 Compression spring
- 48 Washer
- 49 Locking ring
- 55 Circlip
- 56 Radial ball bearing
- 57 Needle bearing
- 58 Detent spring
- 59 Closing plug

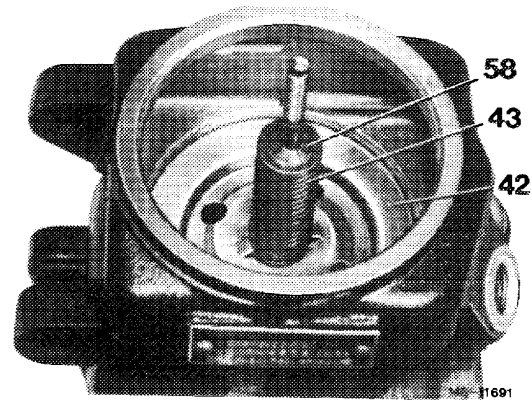


5 Remove washer (48).

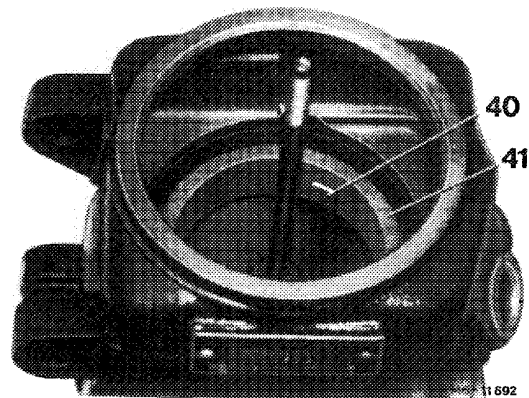


6 Unscrew knurled nut and remove closing cover.

7 Remove detent spring (58), compression spring (43) and upper steadying plate (42).

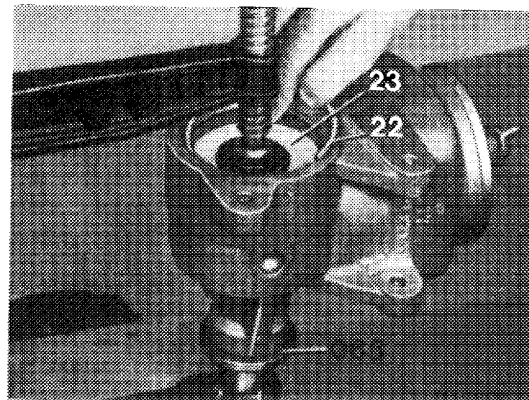


8 Remove filter ring (41) and lower steadying plate (40).

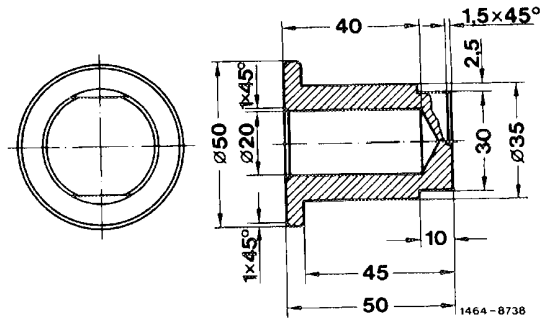


9 Place assembly sleeve (065) on power steering pump and push cover (23) slightly into housing by means of a screw clamp or a hand press.

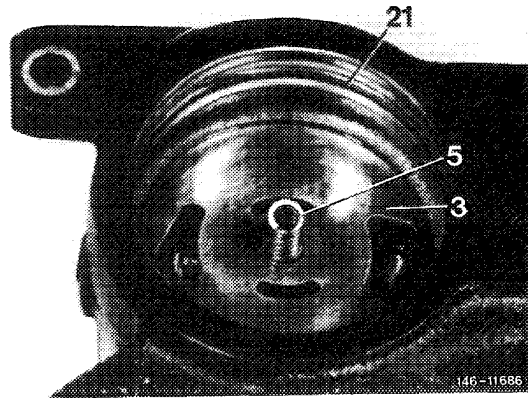
10 Remove hooked circlip (22) from housing by means of a screwdriver. Then take off cover.



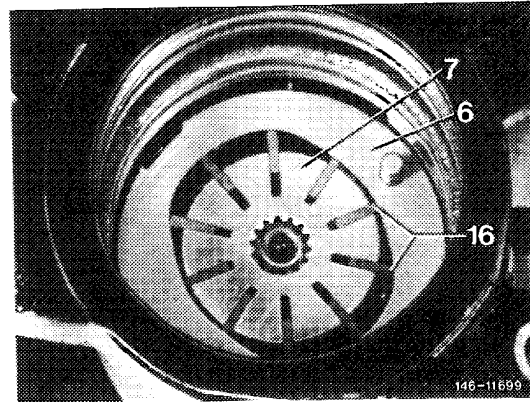
Note: The assembly sleeve is self-made according to specified dimensions.



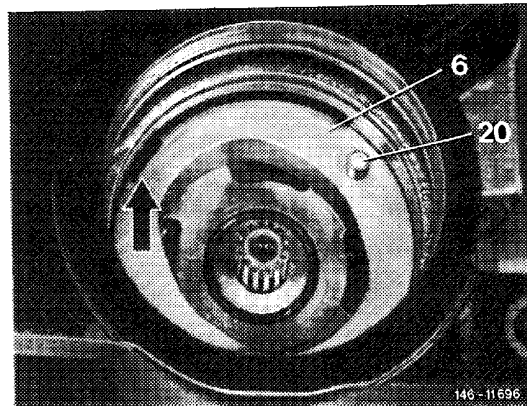
11 Remove O-ring (21), compression spring (5) and pressure plate (3) at cover end.



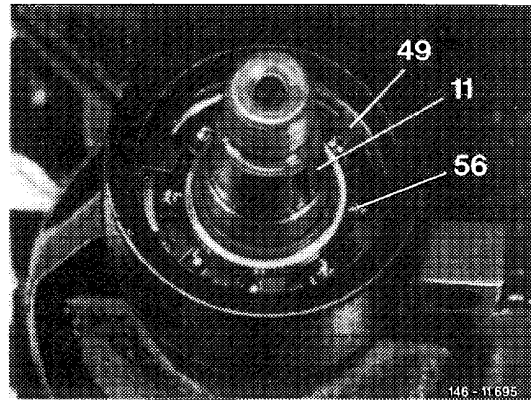
12 Remove rotor (7) with blades (16) from drive shaft.



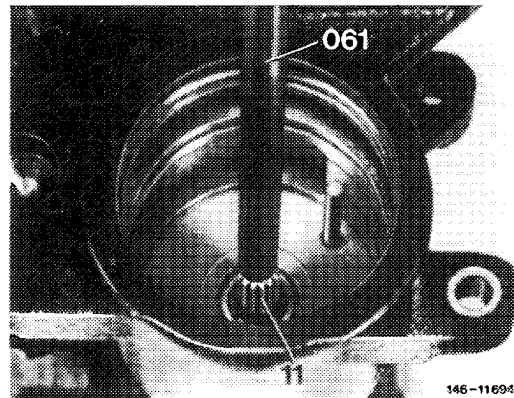
13 Remove O-ring and cam ring (6).



14 Remove locking ring (49) from housing.

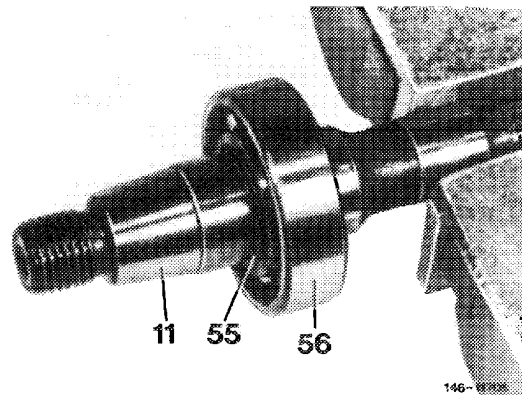


15 Press drive shaft out of housing.

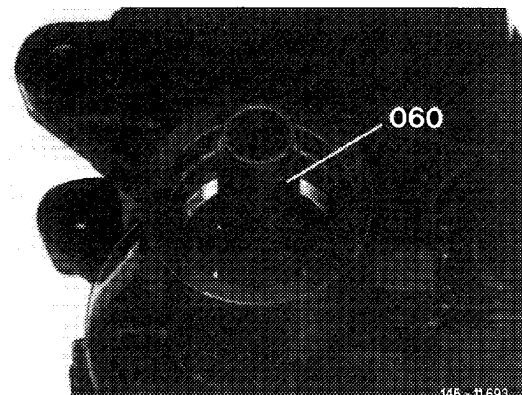


16 Remove circlips (55) from drive shaft and press bearing from shaft toward the rear in direction of splining.

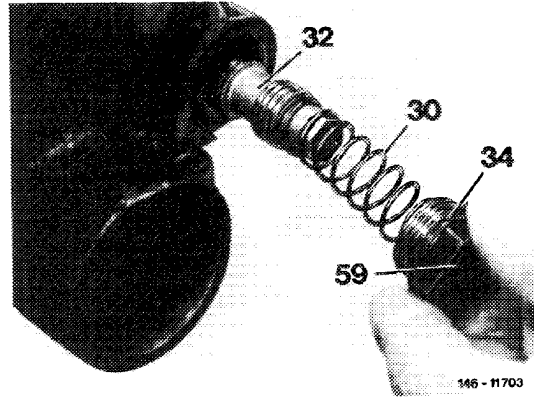
Note: To make sure that the running surface for radial sealing ring is not damaged, remove circlips and radial ball bearing only toward the rear in direction of splining.



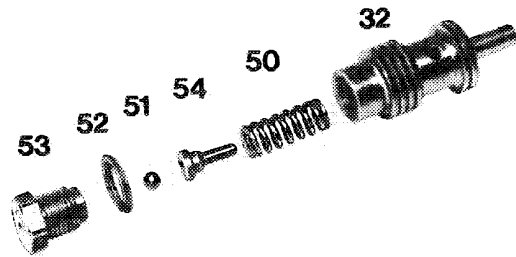
17 Knock needle bearing out of housing by means of a suitable mandrel.



18 Screw closing plug (59) out of housing, remove compression spring (30) and volume control valve.

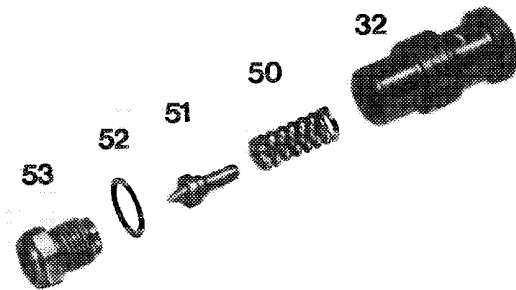


19 Clamp volume control valve (32) with its unground part into vise and unscrew valve screw. Pay attention to spacing washers (52). Remove ball (51) or valve cone (51) and compression spring (50).



Pressure relief valve 1st version with ball

146-11707



Pressure relief valve 2nd version with valve cone

146-16436

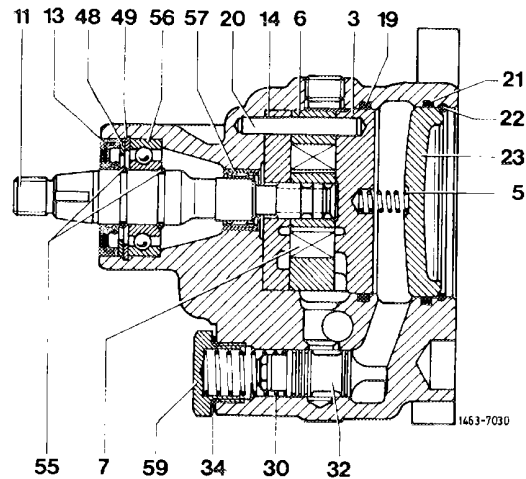
Checking and reconditioning

Repair set

Designation	ZF power steering pump Grey iron	
Set of seals	000 586 84 46	
Pump insert	000 586 65 46	
Drive shaft	000 586 64 46	
Volume control valve	65 bar	000 586 62 46
	82 bar	000 586 63 46

20 Check ground surfaces of volume control valve (32) and bore in housing for wear and damage. If score marks show up on slide surfaces, replace complete power steering pump. Never replace volume control valve only.

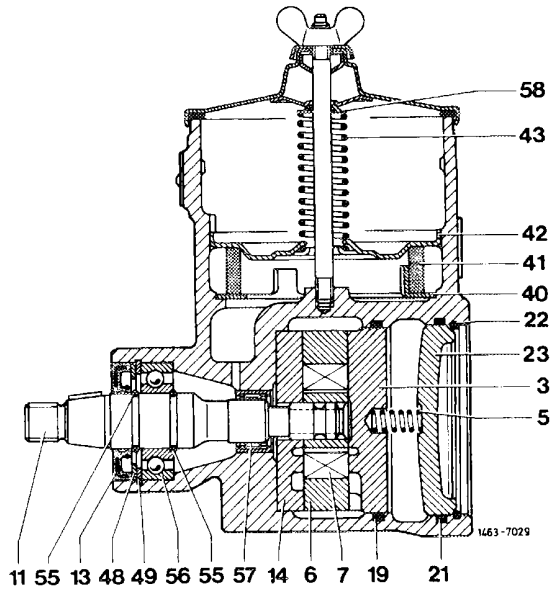
- 3 Pressure plate at cover end
- 5 Compression spring
- 6 Cam ring
- 7 Rotor with blade
- 11 Drive shaft
- 13 Sealing ring
- 14 Pressure plate at drive end
- 19 O-ring
- 20 Cyl. pin
- 21 O-ring
- 22 Hooked circlip
- 23 Cover
- 30 Compression spring
- 32 Volume control valve
- 34 Sealing ring
- 48 Washer
- 49 Locking ring
- 55 Circlip
- 56 Radial ball bearing
- 57 Needle bearing
- 59 Closing plug



21 Check blades in grooves of rotor (7), they should slide easily in rotor. Check sliding surface of blades on cam ring (6) for wear. If required, recondition power steering pump by using repair set "pump insert".

Note: No noticeable marks should show up at slide surface of cam ring, since delivery capacity and smooth running of power steering pump depend on that surface.

- 3 Pressure plate at cover end
- 5 Compression spring
- 6 Cam ring
- 7 Rotor with blade
- 11 Drive shaft
- 13 Sealing ring
- 14 Pressure plate at drive end
- 19 O-ring
- 21 O-ring
- 22 Hooked circlip
- 23 Cover
- 40 Lower steadying plate
- 41 Filter ring
- 42 Upper steadying plate
- 43 Compression spring
- 48 Washer
- 49 Locking ring
- 55 Circlip
- 56 Radial ball bearing
- 57 Needle bearing
- 58 Detent spring



22 Check ground surfaces of pressure plates (3 and 14). If pressure plates are showing score marks, recondition power steering pump by using repair set "pump insert".

46-740 Assembly of power steering pump

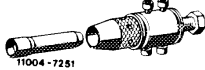
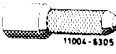


Data

End play of drive shaft	on new pumps	max. 0.7
	on used pumps	max. 1.0

Tightening torques

	Nm
Hex. screws on pump housing	35-40
Hollow screw for fastening supply tank	35-40

Special tools

Puller for radial sealing ring (basic unit)		116 589 24 33 00
Mandrel 33 mm dia. VT 27, VT 49 2nd version, ZF		116 589 14 15 00
Mandrel 30 mm dia. VT 49 1st version		116 589 13 15 00
Assembly mandrel for locking ring		116 589 18 15 00

Self-made tools

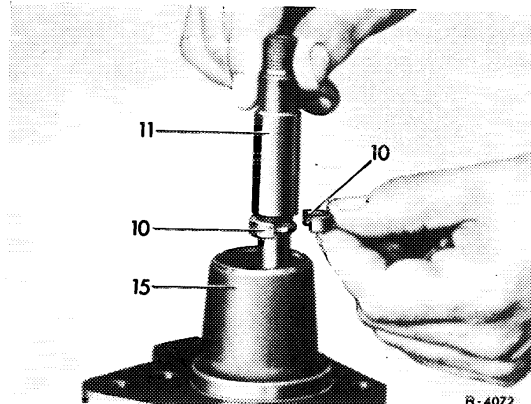
Pressing-in tool for bearing bushing	refer to Fig. item 2, note
Assembly sleeve	refer to section B fig. item 9, note
Assembly mandrel for needle bearing	refer to section B fig. item 2, note
Pressing-in mandrel for radial ball bearing and radial sealing ring	refer to section C fig. item 3, note

A. Vickers power steering pump VT 27

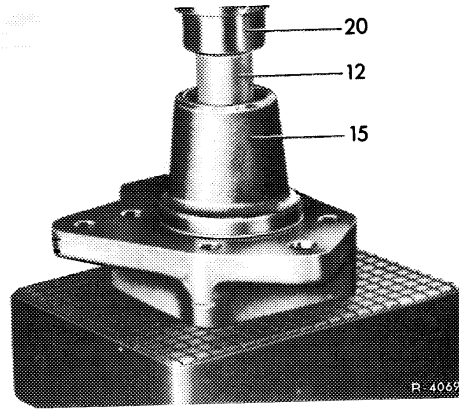
Drive shaft and sealing ring

- Place both shell halves (10) on drive shaft (11).

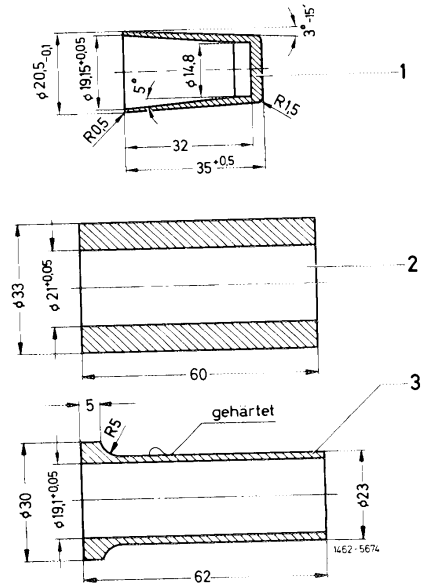
Note: Shell halves determine end play of drive shaft and are contained in repair set "drive shaft".



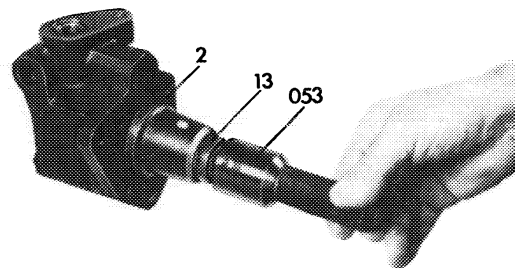
2 Press bearing bushing (12) into housing cover (15) by means of pressing-in tool (20).



Note: The pressing-in tool can be self-made according to specified dimensions.



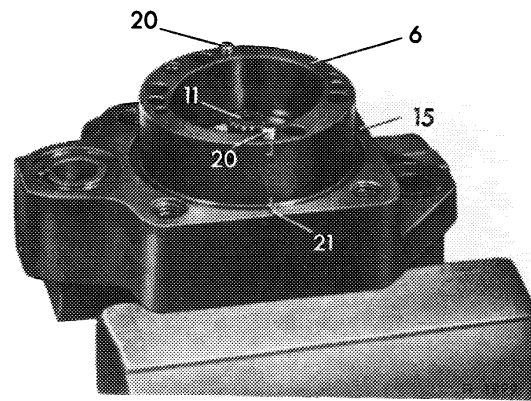
3 Screw guide sleeve from 116 589 24 33 00 on drive shaft and press sealing ring (13) into housing cover (2) by means of mandrel (053).



146-10144

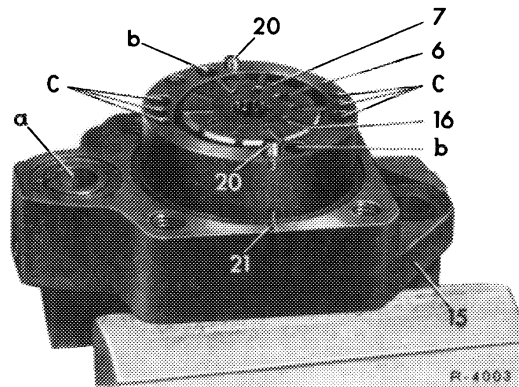
Rotor and cam ring

- 4 Coat all parts with manual transmission oil.
- 5 Plug cam ring (6) on setpins (20) in such a manner that the respective marks (21) on housing cover (15) and on cam ring are in alignment.



- 6 Place rotor (7) on drive shaft (11) in such a manner that the countersunk side of splined bore is facing housing cover.

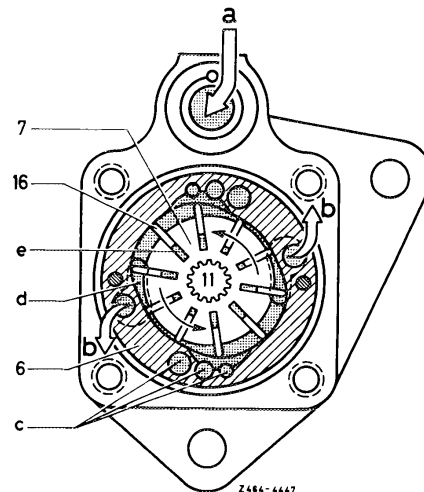
Note: If a new cam ring is installed, position ring in such a manner that the pressure oil bores (b) are exactly above recesses (d) in housing cover.



- 7 Insert pump blades (16) into grooves of rotor (7) in such a manner that the rounded off sides are pointing outwards toward cam ring (6).

- a Oil feed from supply tank
- b Pressure oil outlet from cam ring
- c Intake bores
- d Recess in housing for pressure oil inlet into pressure bore
- e Pressure oil under pump blade

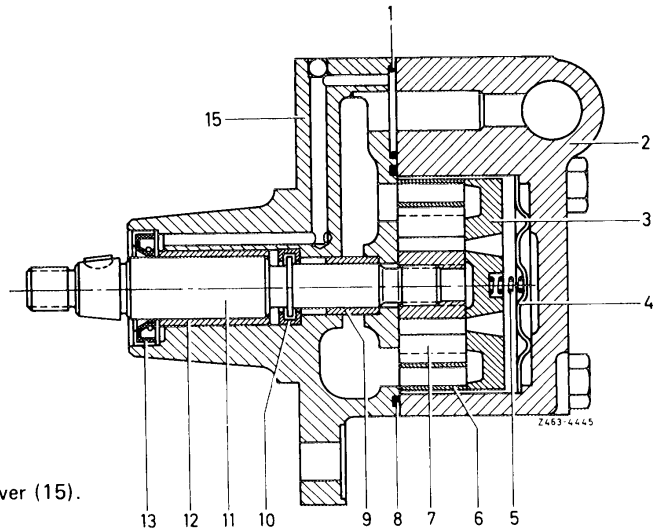
- 6 Cam ring
- 7 Rotor
- 11 Drive shaft
- 16 Pump blade



- 8 Place pressure plate (3) on cam ring (6) and setpins, pay attention to respective mark.

Note: The outlet holes for pressure oil should be above pressure oil bores of cam ring.

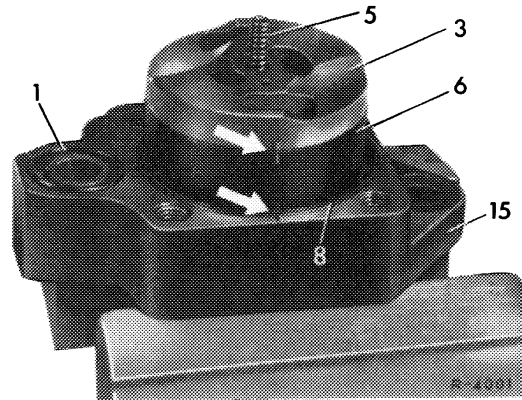
- 1 O-ring
- 2 Pump housing
- 3 Pressure plate
- 4 Oil guide plate
- 5 Compression spring
- 6 Cam ring
- 7 Rotor with blade
- 8 O-ring
- 9 Bearing bushing
- 10 Shell haft
- 11 Drive shaft
- 12 Bearing bushing
- 13 Sealing ring
- 15 Housing cover



9 Place both O-rings (1 and 8) on housing cover (15).

10 Insert compression spring (5) into bore of pressure plate (3). If the oil guide plate (4) pressed into pump housing (2) has been removed, put back into housing in such a manner that the recess for the compression spring points toward pump housing.

11 Place pump housing (2) on housing cover (15). Screw in the four hex. head screws and tighten to a torque of 35 to 40 Nm.



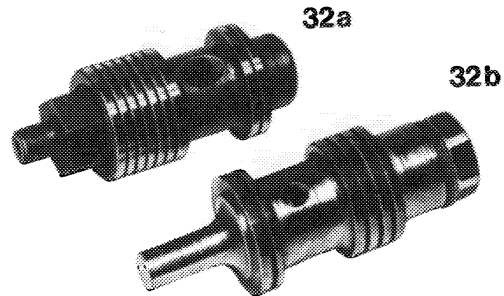
Volume control valve

12 Clean volume control valve prior to assembly, immerse in manual transmission oil and introduce into housing bore. Valve should slide easily in housing bore. Pay attention to manufacturer of volume control valve:

- 32a = Vickers valve
- 32b = ZF valve

Note: When installing a new volume control valve, pay attention to the following:

The pressure relief valve in volume control valve of repair set 000 586 00 46 opens at 65 bar gauge pressure.

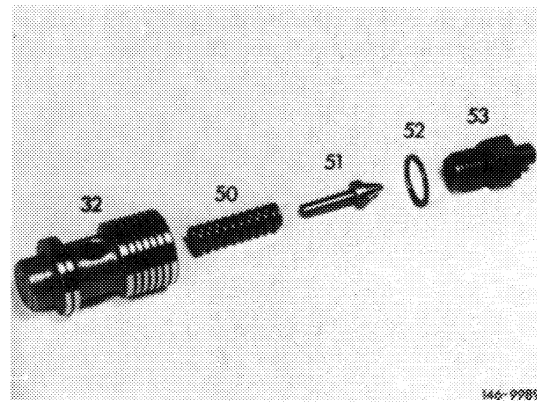


13 Install pressure relief valve into volume control valve. Insert compression spring (50) first, then valve cone (51). Then place spacing washers (52) for adjustment of opening pressure into valve screw (53).

Attention!

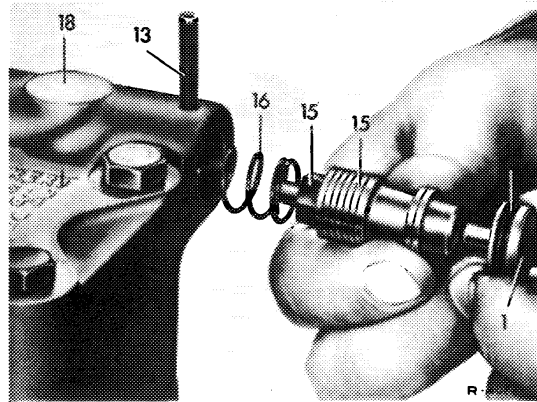
Use the same washers which were previously installed.

14 Clamp volume control valve (32) with its unground part into vise, screw in valve screw (53) and tighten.



15 Insert compression spring (16) into bore of pump housing (18). Flush volume control valve once again, immerse in manual transmission oil and introduce into housing bore in such a manner that the pressure relief valve is pointing inwards.

16 Fit new O-ring (14) to closing cover (1). Force closing cover by means of a bolt inwards into housing bore and secure by knocking-in locking pin (13).

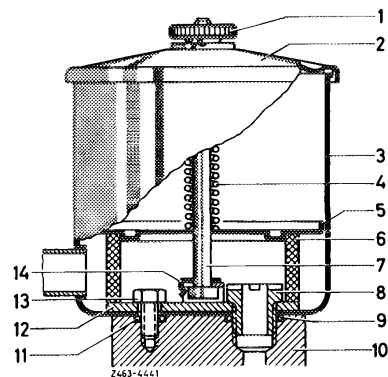


Supply tank

17 Place O-rings (9 and 11) on pump housing (10).

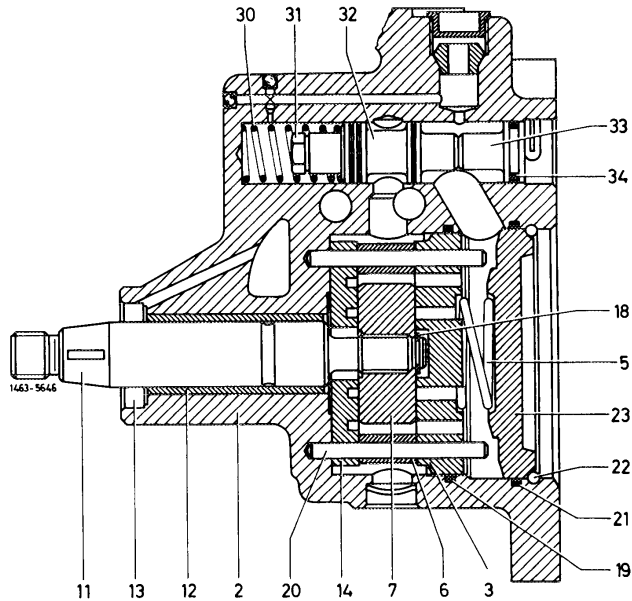
18 Insert reinforcing plate (12) into supply tank. Screw in hollow screw (8) and hex. head screw (13). Insert filter ring (6), steadying plate (5) and compression spring (4). Place cover (2) with paper gasket on supply tank. Screw on knurled nut.

- | | |
|----------------------|----------------------|
| 1 Knurled nut | 8 Hollow screw |
| 2 Closing cover | 9 O-ring |
| 3 Supply tank | 10 Pump housing |
| 4 Compression spring | 11 O-ring |
| 5 Steadying plate | 12 Reinforcing plate |
| 6 Filter ring | 13 Hex. head screw |
| 7 Screw | 14 Lock |



B. Vickers power steering pump VT 49 (grey iron and light alloy version)
 ZF power steering pump (light alloy version)

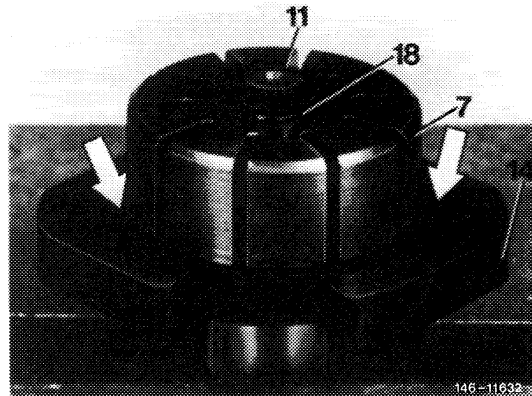
- 2 Pump housing
- 3 Pressure plate at cover end
- 5 Compression spring
- 6 Cam ring
- 7 Rotor with blade
- 11 Drive shaft
- 12 Bearing bushing
- 13 Radial sealing ring
- 14 Pressure plate at drive end
- 18 Locking ring
- 19 O-ring
- 20 Cyl. pin
- 21 O-ring
- 22 Circlip
- 23 Cover
- 30 Compression spring
- 31 Valve screw
- 32 Volume control valve
- 33 Closing plug
- 34 O-ring



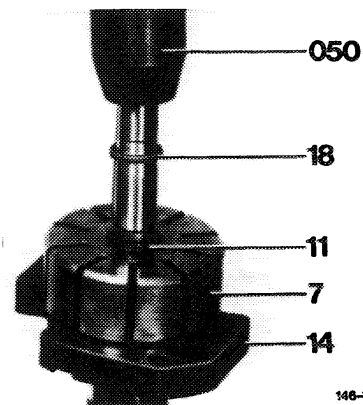
Note

Prior to assembly, coat all parts with manual transmission oil.

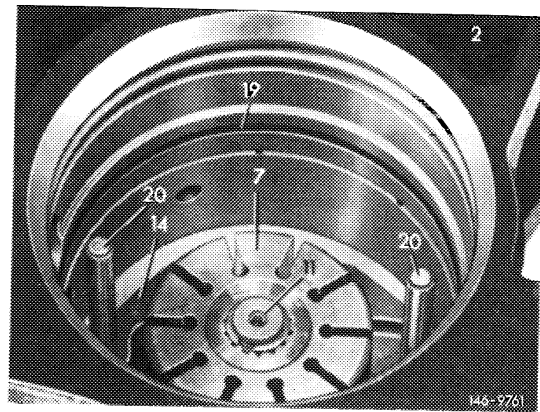
1 Place pressure plate at input end (14) with recesses (refer to arrow) toward splining on drive shaft (11). Place rotor (7) on splining of drive shaft (11).



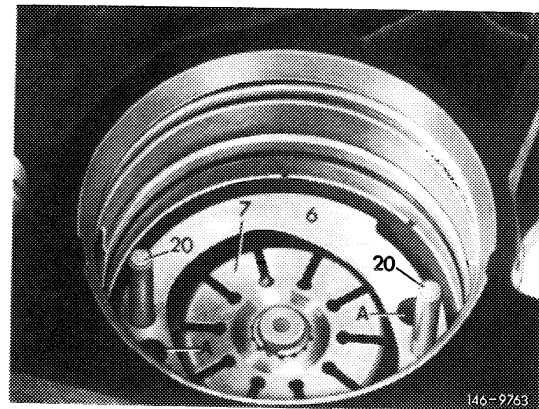
2 Insert locking ring (18) into groove of drive shaft (11) by means of assembly mandrel (050).



3 Insert both cyl. pins (20) into pump housing, then insert pre-assembled drive shaft.

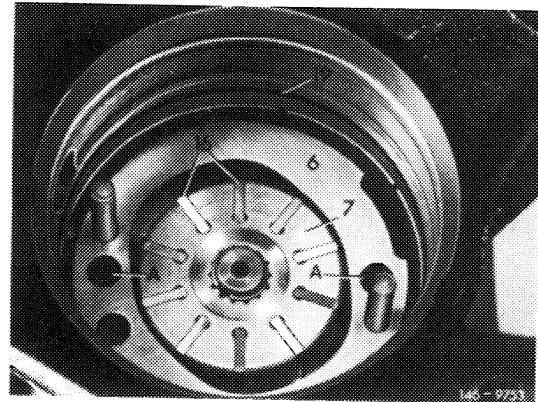


4 Place cam ring (6) with cast-in direction of rotation arrow in upward direction on cyl. pins (20). Pay attention to correct location of cam ring.

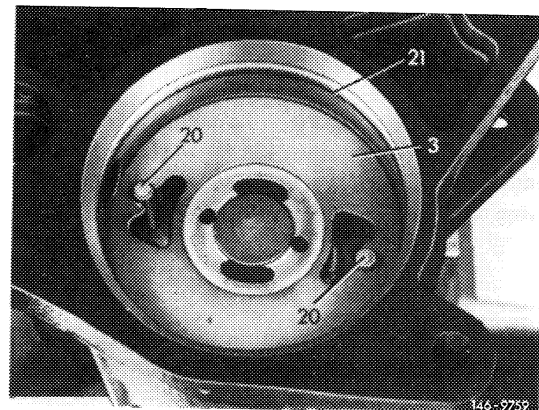


5 Insert blades (16) (10 each) into rotor (7) with rounded-off sides toward cam ring (6).

6 Insert O-ring (19) into housing.

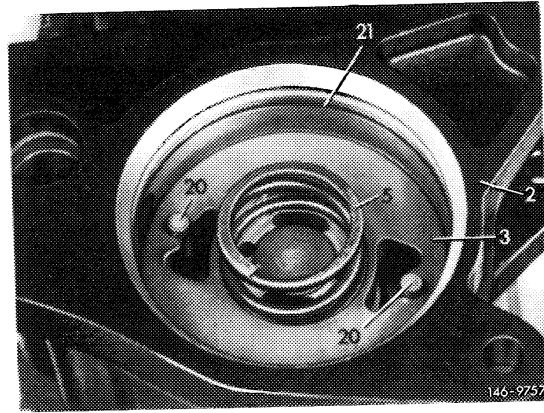


7 Insert pressure plate (3) into housing.

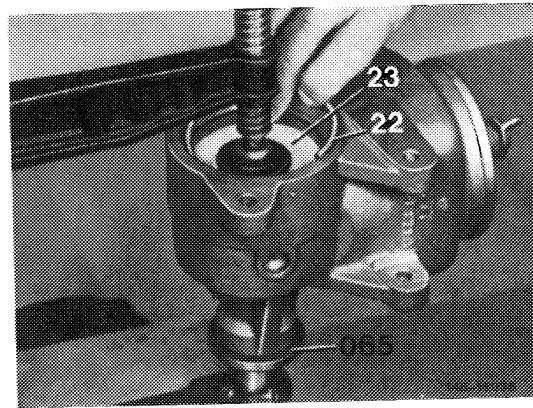


8 Insert O-ring (21) into housing. Place compression spring (5) on pressure plate (3).

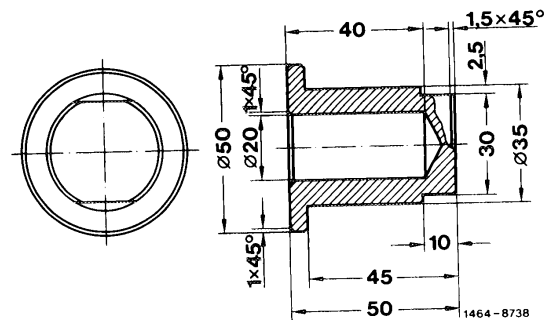
Note: O-ring (19) and (21) have different diameters. The O-ring (19) with the smaller diameter seals pressure plate (3), the larger O-ring (21) seals cover (23) in relation to housing.



9 Place assembly sleeve (065) on power steering pump and mount cover (23). Then press cover slightly into housing by means of a hand press. Insert circlip (22) into groove of housing, pay attention to correct location of ring.

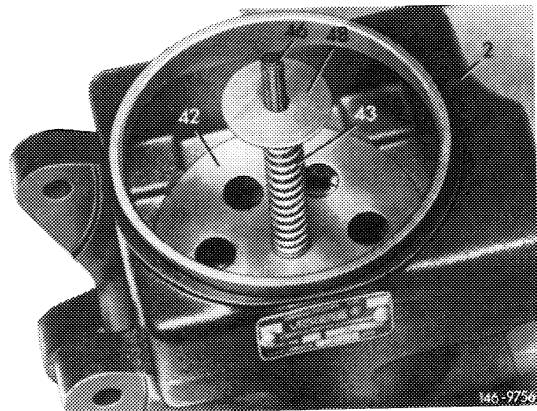


Note: The assembly sleeve is self-made according to specified dimensions.



10 On grey iron pump, insert lower steadying plate (40), filter ring (41), upper steadying plate (42) and compression spring (43) into housing.

11 On grey iron power steering pump 1st version, place washer (48) on stud (46), fasten closing cover (45) together with paper gasket (44) by means of wing nut (47).





A. Testing battery

Visual checkup		for external leaks	
Checking acid level. If the battery level must be corrected by adding distilled water, recharge battery afterwards up to gassing.		should reach up to mark. On batteries on which the fluid level cannot be seen, keep adding distilled water until water is no longer flowing off at overfill guard.	
Battery state of charge	Climatic conditions	Density at 20 °C (kg/dm ³)	Procedure
charged	normal	1.28*)	—
	tropics	1.23*)	
half-charged	normal	1.20	recharging required
	tropics	1.16	
discharged	normal	1.12	recharge immediately
	tropics	1.08	
*) Tolerance ± 0.01 kg/dm ³			
Test acid density in individual cells		Acid density should be the same in all cells	

Example for defective batteries

a) Acid density in one cell deviates noticeably in downward direction.

-	1	2	3	4	5	6
	1,28	1,28	1,28	1,28	1,16	1,28

Condition: Short-circuit in cell 5

b) Acid density deviates in two adjacent cells (e. g. 2 and 3) clearly from remaining measuring values in downward direction.

-	1	2	3	4	5	6
	1,28	1,16	1,16	1,28	1,28	1,28

Condition: Leak in cell wall between cell 2 and 3.

The leaking cell wall and the connector operate as a conductor through which the cells are discharged.

Testing battery under load

(perform only if no fault has been found during previous tests)

This test is possible only at uniform acid density of cells and an acid density of at least 1.24 kg/dm³.

Capacity	Ah	44	55	66	88	90
Load current (approx. 3 times capacity)	A	135	165	200	265	270
Minimum voltage ¹⁾ after 10 s at acid density	V	9		10		
	kg/dm ³	1.24		1.28		

¹⁾ The test voltage should attain a constant value after 10 seconds. Slight deviations have no influence. If the voltage drops considerably or collapses, the battery is defective.

B. Charging the battery

Batteries can be charged with DC only. For charging, the battery is separated from electric circuit of vehicle and connected to a charger:

Positive pole (+) of battery to positive pole of charger,
negative pole (-) of battery to negative pole of charger.

The loading current (A) should amount to 10% of battery capacity, e. g. at 55 Ah a charging current of 5.5 A.

For recharging, higher currents may be employed up to start of gassing (2.4 V / cell).

Charge until acid density and charging voltage are no longer increasing within 2 hours. Note that the measuring value of the acid density changes by 0.01 per 15 °C temperature difference. If, for example, an acid temperature of 34 °C is measured, the simultaneously measured acid density should be higher by 0.01 to obtain the value referenced to 20 °C.

C. Handling battery when laying-up vehicle

Prerequisite: Battery state of charge in order

Acid density min. 1.26 kg/dm³ (tropics 1.21 kg/dm³)

- 1 Disconnect negative terminal of battery.

This will prevent discharging by rest potential consumers or time clock.

- 2 Recharge battery after 3 months. (Acid density 1.28 kg/dm³, tropics 1.23 kg/dm³).

Attention!

Never leave battery standing about in discharged condition, since otherwise the plates will sulfate. Sulfated plates will cause initial damage to battery and will lead to early breakdown.

Antifreeze in charged condition

		normal	tropics
charged		- 65	- 40
half-charged	in °C	- 30	- 13
discharged		- 12	- 6

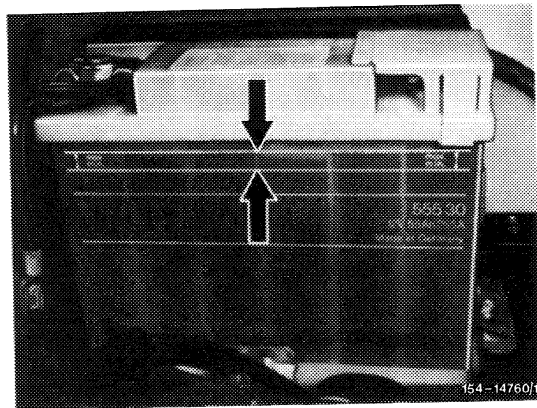
D. Batteries with overfill protection

These batteries are provided with rubber diaphragm elements and vent ducts in filler neck of battery cover. This will prevent an increase of fluid level above "max" mark when the batteries are filled.

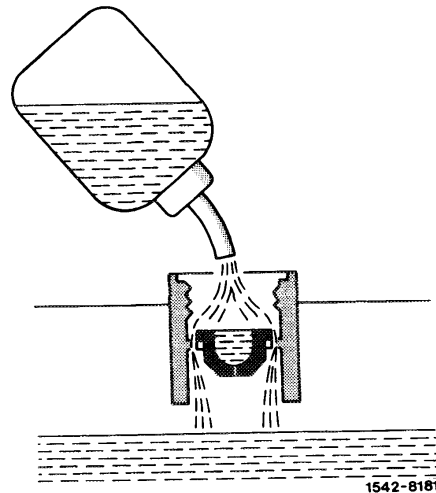
When refilling with distilled water, make sure that the diaphragm is not punched through or removed. Also make sure that on batteries with overfill protection no cell closing plug of former batteries (without overfill protection) is used. This type of cell closing plug has a vent bore at the top in cover.

Checking fluid level and adding distilled water

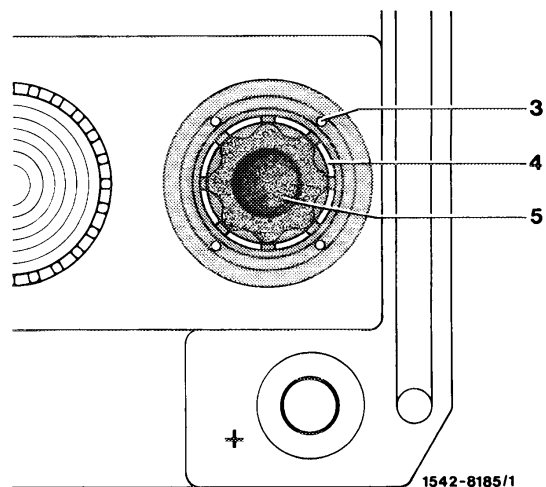
On batteries with overfill protection the fluid level is determined by means of the marks on outside of battery.



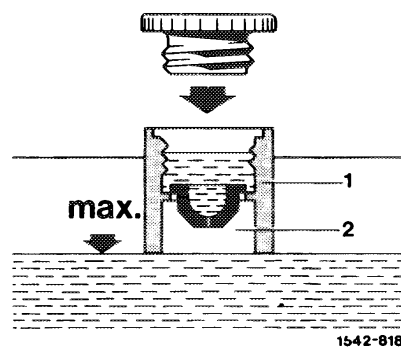
Refilling with distilled water



The distilled water flows through circularly located slots (4) into cell. The air displaced from cell flows through 4 vent bores (3) into the open air.

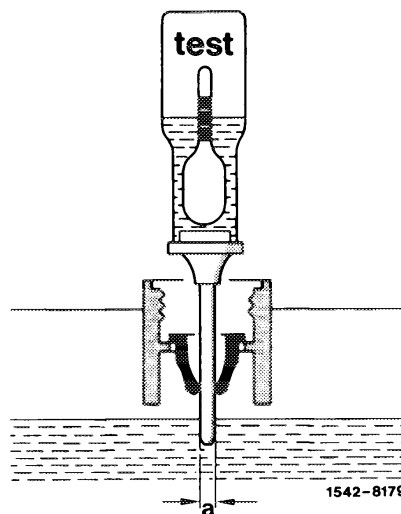


When the fluid level is at "max" mark it will simultaneously close the vent ducts. As a result, the air can no longer escape and an air cushion (2) is established in cell. This air cushion prevents that additional fluid can flow into cell from filler chamber. The battery is filled up to max. capacity.



Checking acid density

To check acid density, insert syphon through triple-slotted diaphragm and remove required quantity of fluid. Upon removal of syphon, the diaphragm will again be watertight.

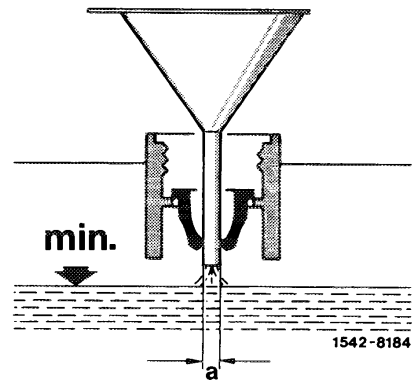
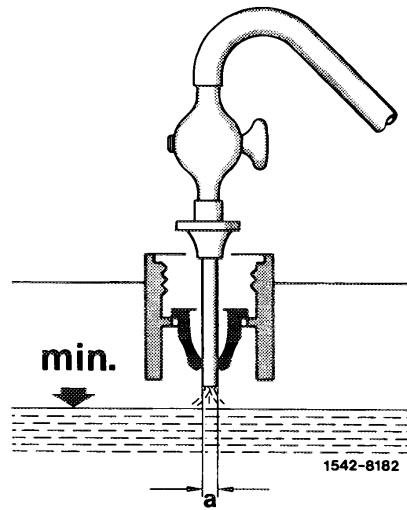


a = max. 9 mm

Initial filling of battery with acid

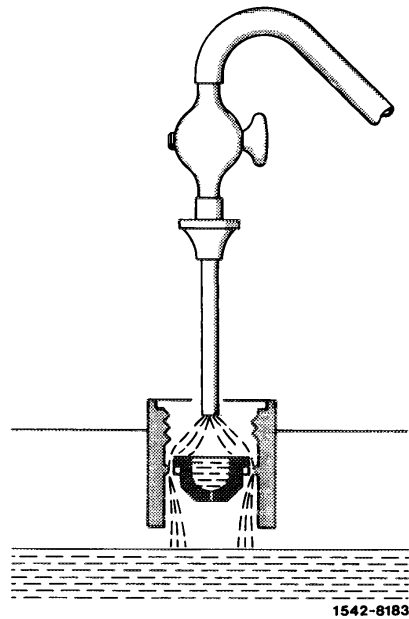
During initial filling with acid insert the filling device or a conventional funnel through diaphragm and fill battery up to "min" mark.

a = max. 9 mm



Continue filling-in acid up to "max" mark through slots with diaphragm closed.

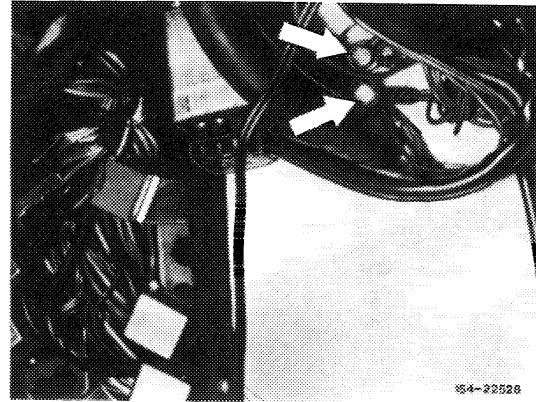
Note: If a battery with overfill protection is scrapped, remove rubber diaphragms for emptying.



54-100 **Designation and layout of ground connecting points**

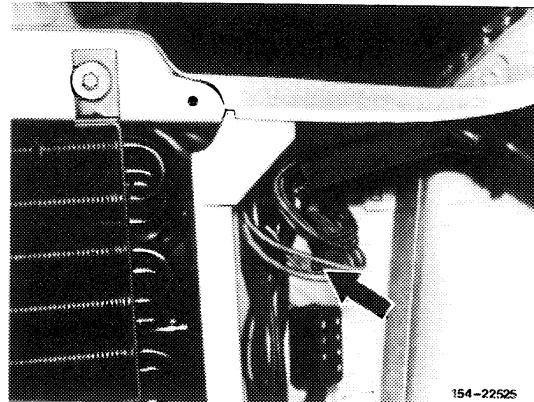
Designation: M 1

Layout: Under instrument panel right, fuse box



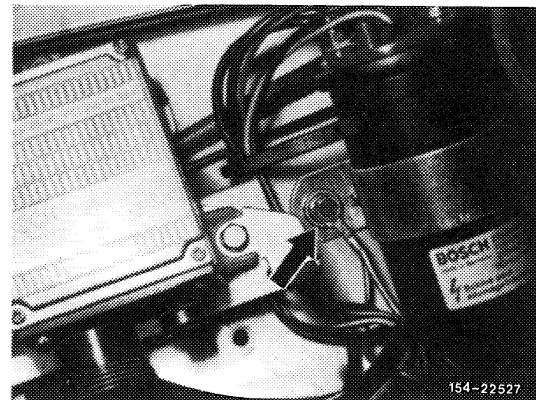
Designation: M 2

Layout: Ground at front right, lamp unit



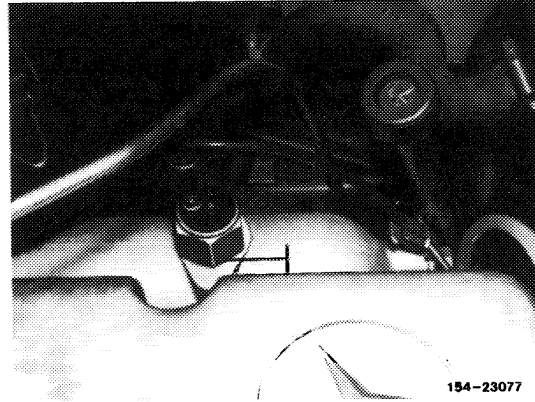
Designation: M 3

Layout: Ground wheelhouse front left,
 ignition coil



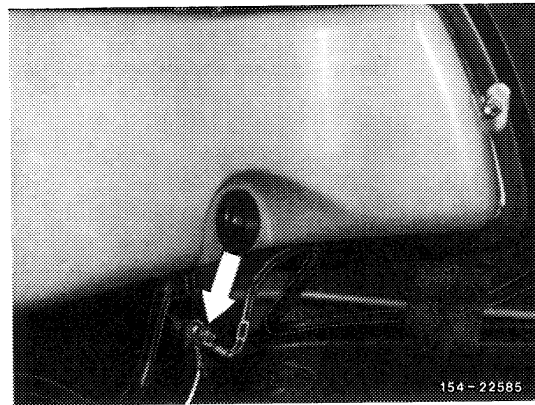
Designation: M 5

Layout: Ground, engine (instrument screwed into engine) e. g. temperature sensor



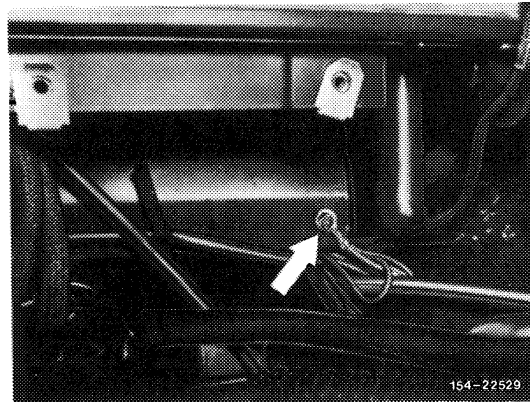
Designation: M 6

Layout: Ground, trunk, at left on tail lamp unit



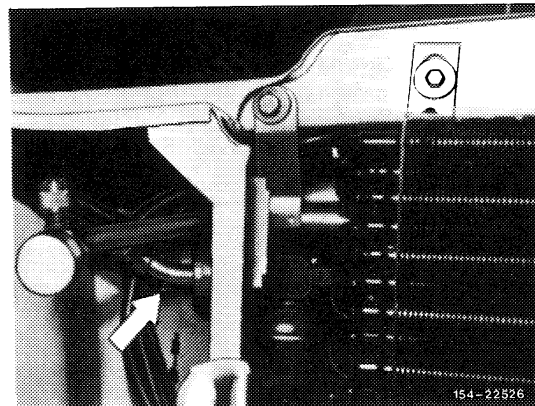
Designation: M 7

Layout: Ground, trunk, at right, behind tank bulkhead



Designation: M 9

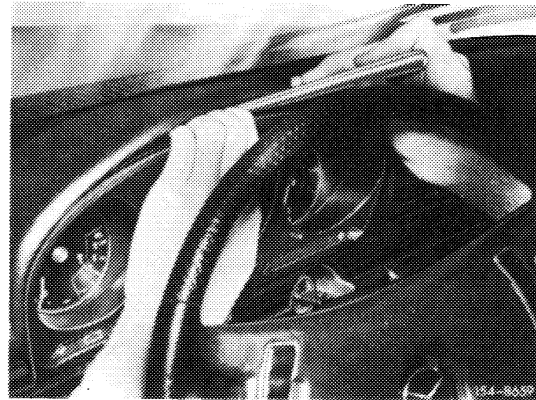
Layout: Ground front left, lamp unit



Note

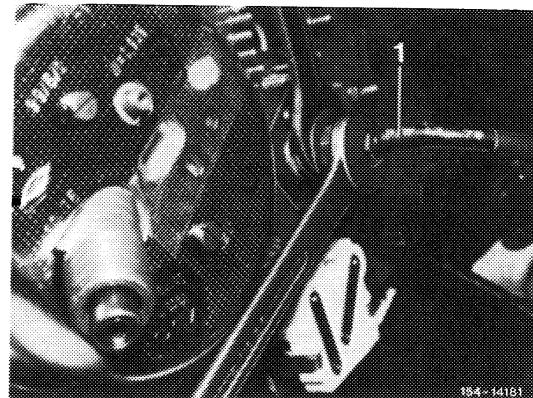
The instrument cluster is held in cutout by means of a rubber profile strip.

For pulling out instrument cluster, the instrument panel can be slightly raised above cluster or pushed out from below. To prevent any damage of front frame, do not force out instrument cluster by means of a screwdriver or the like.



Removal

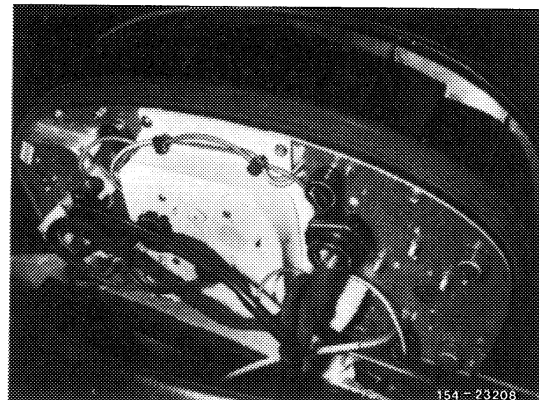
- 1 Remove steering wheel (46-610).
- 2 Pull out instrument cluster as far as possible, loosen tachometer shaft, the two electric plug connections and the oil pressure line, then remove instrument cluster.



Installation

- 3 For installation proceed vice versa.

Note: When connecting tachometer, make sure that the tachometer shaft is not bent too much, since this might cause running noises.



Instrument cluster with electronic tachometer

Line-up of couplers

Vehicles with mechanical tachometer

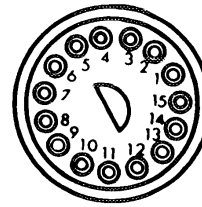
- | | |
|---------------|--|
| 1 blue/green | 9 brown/green |
| 2 black/red | 10 white/blue |
| 3 green | 11 vacant |
| 4 blue/black | 12 brown/red/white |
| 5 brown | 13 black/green |
| 6 black/white | 14 grey/green/purple
(or grey/purple) |
| 7 blue/red | 15 grey/red |
| 8 blue | |



1544-7974

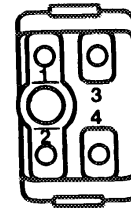
Vehicles with electronic tachometer

- | | |
|----------------|--------------------|
| 1 blue/green | 9 blue/red |
| 2 black/blue | 10 brown/green |
| 3 green | 11 white/blue |
| 4 blue/black | 12 brown/red/white |
| 5 brown/yellow | 13 black/green |
| 6 black/white | 14 grey/purple |
| 7 brown/red | 15 grey/red |
| 8 blue | |



1544-7974

- | |
|---|
| 1 brown |
| 2 white |
| 3 black/blue |
| 4 green/yellow (J) (USA) only |
| (J) catalyst temperature warning system |
| (USA) O ₂ sensor alternating indicator |



1544-10689

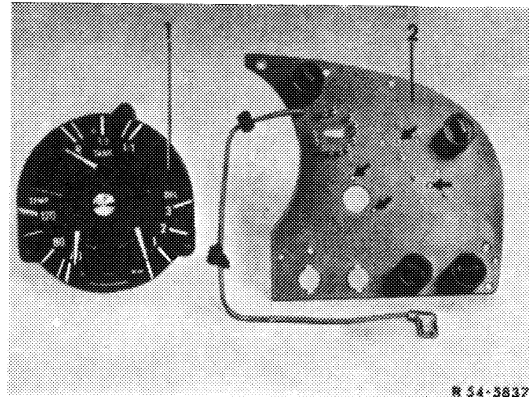
54-251 Removal and installation of indicating instruments

Removal

- 1 Remove instrument cluster (54-250).
- 2 Remove tachometer (54-253).

Note: The indicating instruments for temperature, fuel and oil pressure can be exchanged complete only.

- 3 Loosen fastening screws (2) of righthand switch plate and completely remove switch plate with indicating instrument.



- 4 The indicating instrument can be removed after loosening screws and nuts from switch plate.

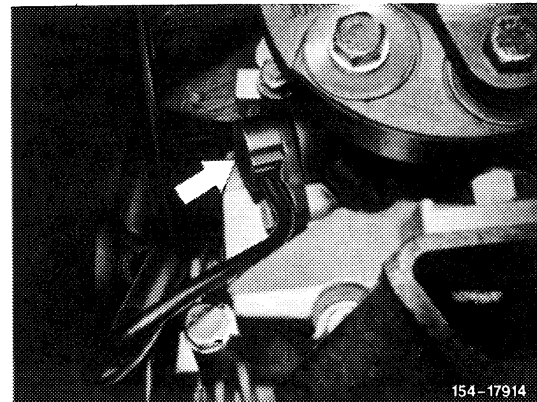
Installation

- 5 For installation proceed vice versa.

Note

The electronic tachometer (E-tacho) comprises an inductance transmitter on transmission and an indicator in instrument cluster.

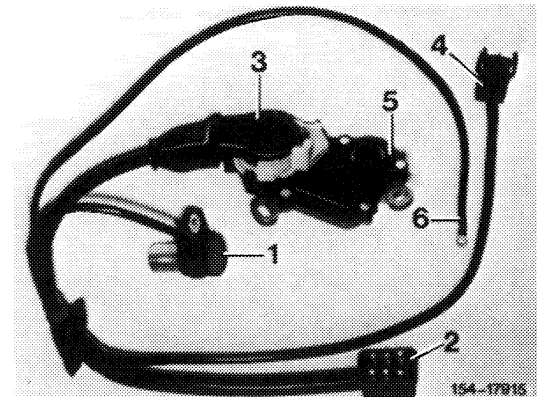
The inductance transmitter on transmission translates the speed of the transmission main or input shaft into an electric signal. The number of signal impulses is in accordance with vehicle speed. The signals are converted in tachometer into a mechanical readout (speed and odometer).



Layout of inductive transmitter on transmission (arrow)

On vehicles with automatic transmission the inductive transmitter (1) is combined in a harness together with the electric connections of starter lockout and backup lamp switch and can be exchanged only complete with harness.

- 1 Inductive transmitter
- 2 6-point plug on main harness
- 3 4-point coupler on starter lockout and backup lamp switch
- 4 2-point coupler on kickdown switch
- 5 Starter lockout and backup lamp switch
- 6 On magnetic valve automatic transmission

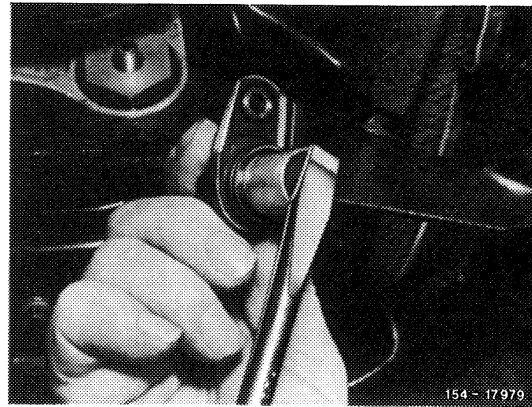


If the E-tacho does not indicate, the following check-up can be made for diagnosis "inductive transmitter with line" or "E-tacho" defective.

Checkup

- 1 Remove inductive transmitter on transmission, unscrewing screw M 6 on inductive transmitter for this purpose and pull out inductive transmitter.

2 Switch on ignition. Place a wide screwdriver against underside of transmitter.

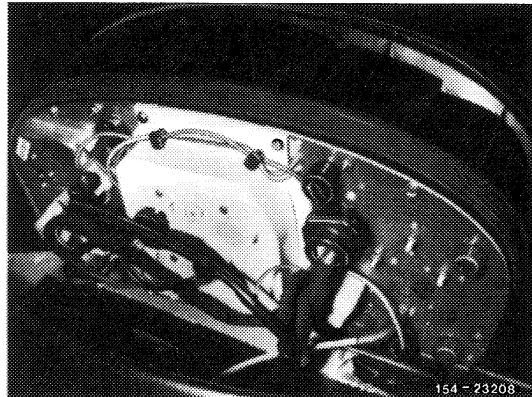


3 Pull off screwdriver with quick movements and put back again.

This fast pulling and pulling back will generate a signal on intact transmitter which will cause the tachometer needle to perform a slight deflection.

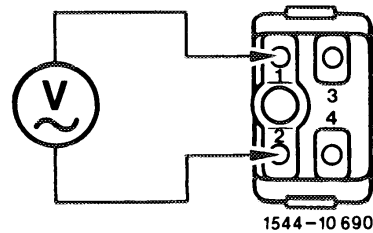


4 If not, remove instrument cluster and pull off 4-point coupler (2).



5 Connect a voltmeter (measuring range 0–3 volts, AC) to jack 1 and 3 and repeat test.

If the needle on voltmeter deflects when the screwdriver is pulled away from transmitter, the transmitter with its line is in order and the E-tacho is defective. If the needle is not deflecting, the transmitter is defective or the line to instrument cluster is interrupted.



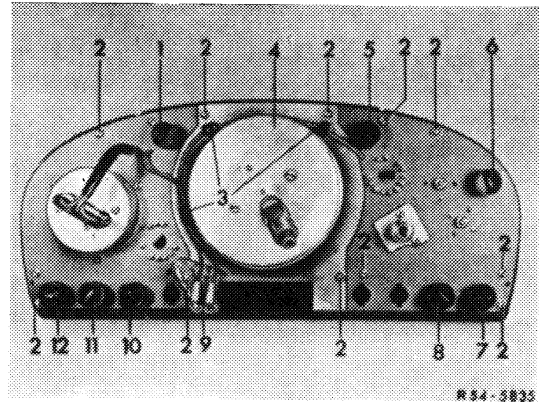
54-253 Removal and installation of tachometer

Removal

- 1 Remove instrument cluster (54-250).
- 2 Loosen fastening screws (2) on tachometer. Pull out potentiometer (9) and plug-in clips (3) for electric line. Remove tachometer (4).

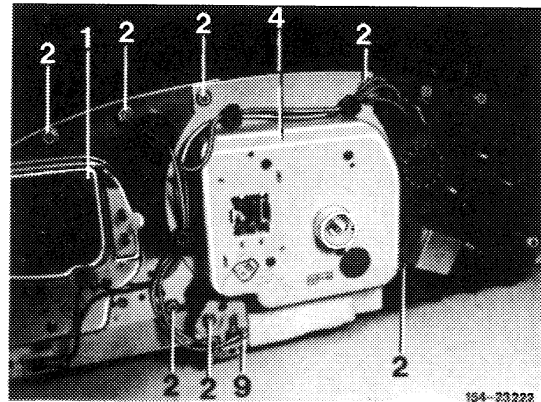
Mechanical tachometer

- 1 Light, revolution counter and tachometer
- 2 Fastening screws
- 3 Plug-in clips
- 4 Tachometer
- 5 Light, tachometer and indicating instrument
- 6 Warning lamp tank readout
- 7 Indicator lamp turnsignal (flasher) left
- 8 Indicator lamp brake
- 9 Potentiometer
- 10 Indicator lamp battery charge
- 11 Indicator lamp high beam
- 12 Indicator lamp turnsignal (flasher) right



Electronic tachometer

- 1 Revolution counter
- 2 Fastening screws
- 3 Plug-in clips
- 4 Tachometer
- 9 Potentiometer



Installation

- 3 For installation proceed vice versa.

Test values

Pressure (bar)	Resistance (ohm)
0	approx. 10
1	approx. 69
2	approx. 129
3	approx. 184

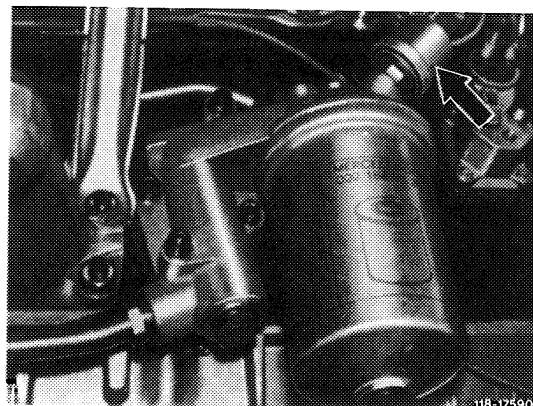
Resistance values of pressure transmitter in dependence of prevailing pressure.

Note

The oil pressure gauge is electrically controlled.

A pressure transmitter located in oil filter activates the indicator in instrument cluster.

With the ignition switched on, the indicator in instrument cluster is continuously connected to positive current. Negative is connected to indicator via pressure transmitter. With increasing pressure, the ohmic resistance of pressure transmitter increases and the readout is thereby changed.



Layout of pressure transmitter for engine 110

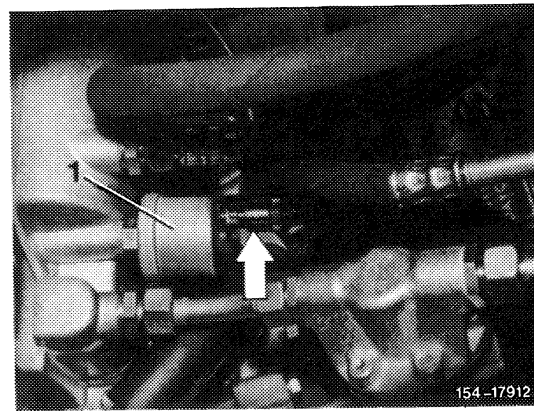
If no oil pressure is indicated, the following checkup can be made for diagnosis "transmitter, line or indicator defective".

Testing

1 Switch on ignition, pull electric connection from transmitter (1-pole coupler, arrow).

Indicated nominal value 3 bar.

Layout of pressure transmitter
for engine 116, 117



2 If readout is still 0 bar, test line from transmitter to indicator for ground connection. If line is in order, renew indicator.

3 If, with the ignition switched on and the engine stopped, the indicator shows continuously 3 bar, pull line from transmitter and connect with negative.

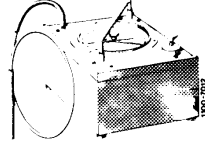
If readout is 0 bar, renew transmitter.

If readout remains at 3 bar, the line is interrupted.

54–255 Testing readout for economic driving (ECONOMY)

Special tools

Tester for vacuum 0–1000 mbar

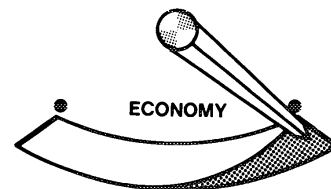
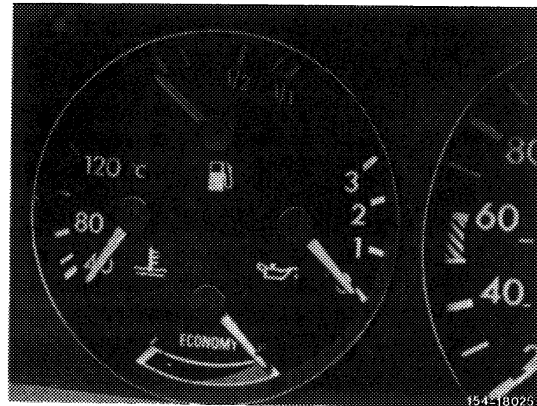


116 589 25 21 00

Operation

The indicator is connected to intake manifold by way of a vacuum line and indicates the momentary fuel consumption in dependence of intake manifold vacuum.

At high intake manifold vacuum the needle is in black field of readout (fuel consumption low), with decreasing intake manifold vacuum the needle will move into red field. The momentary fuel consumption increases.



1544 – 10 868

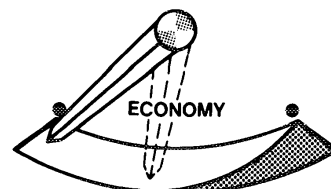
On stopped engine the needle rests in red field against righthand stop pin.

Vacuum \leq 0.08 bar.

Following start of engine, the needle moves to the left and remains in range of black readout field depending on vacuum.

Needle against lefthand stop \geq 0.585 bar.

Needle at beginning of red field approx. 0.4 bar.



1544 – 10 869

Note

If the needle stops at righthand stop in red field, a leak in vacuum line to indicator is indicated (connection point, line) or the indicator is defective.

Renew vacuum line and/or indicator.

If the readout is very slow, the cause may be oil in vacuum line and/or in indicator. A defective diaphragm of vacuum control unit on automatic transmission may result in oil flowing into vacuum system, which will then lead to a breakdown of indicator.

Testing

1 Pull off vacuum line coming from intake manifold at distributor and test vacuum at engine idle.

Nominal value: approx. 0.4 – 0.6 bar.

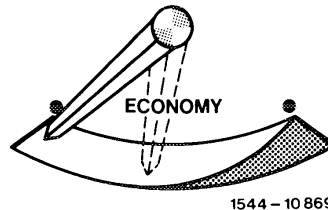
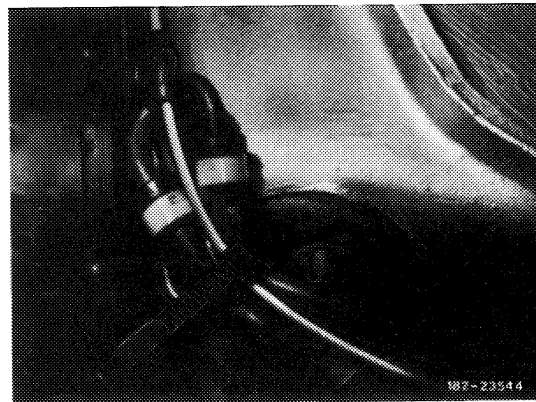
If the nominal value is not attained, the vacuum line is contaminated or leaking. Clean vacuum line or renew.

If the nominal value is attained, connect vacuum lines with each other, switch vacuum tester in-between. Run engine at idle.

With vacuum ≥ 0.585 bar, needle of indicator should be at lefthand stop, with vacuum approx. 0.4 bar at beginning of red field.

If so, a leak in vacuum system of light range regulation and/or air conditioning system is indicated.

Repair leaks.



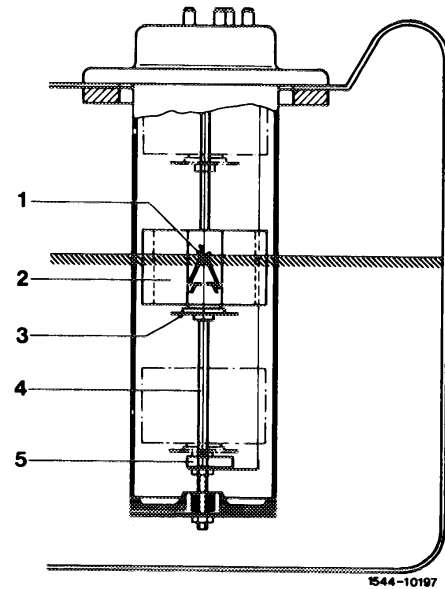
If on vehicles with automatic transmission a vacuum control unit on transmission is defective, oil may also be present in indicator and its line.

Clean line and renew indicator.

Electrical operation

Under influence of decreasing fuel level the sliding contact (1) on float (2) of immersion tube transmitter will increase the resistance value, the current will decrease and the indicator needle in instrument will then fall back.

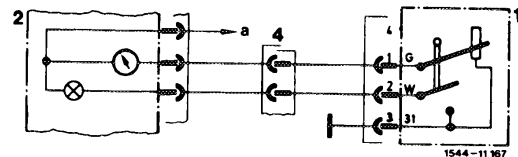
If the fuel level drops still further, the reserve warning contact (5) in immersion tube transmitter, which connects to reserve warning lamp ground, is closed.



- Immersion tube transmitter
- 1 Sliding contact
 - 2 Float
 - 3 Contact plate
 - 4 Guide and contact rod
 - 5 Reserve warning contact

Up to August 1982

- 1 Immersion tube transmitter
- 2 Fuel indicating instrument
- 4 Plug connection tail lamp harness
- a Fuse terminal 15

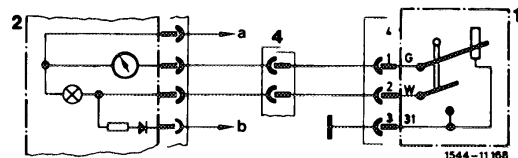


The circuit has been changed starting September 1982. With the ignition switched on, the reserve warning lamp will light up (checkup function). As soon as the engine is running, the lamp will go out, provided the fuel tank holds more fuel than reserve.

Note: During control function, the reserve warning lamp lights up weaker, with reserve stronger.

Starting September 1982

- 1 Immersion tube transmitter
- 2 Fuel indicating instrument
- 4 Plug connection tail lamp harness
- a Fuse terminal 15
- b D+ terminal 61



54-257 Testing fuel gauge

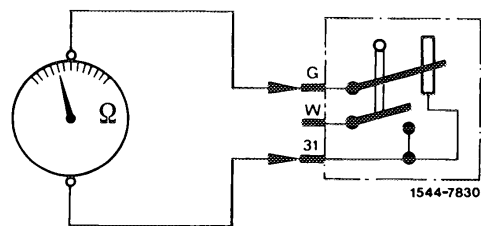
Test values immersion tube transmitter in ohms

Model	Resistance, readout full	Resistance, readout reserve
107.04	3.2 ± 0.7	69.1 ± 2.1
107.02	3.2 ± 0.8	69.3 ± 2.5

Testing immersion tube transmitter (removed)

Connect ohmmeter to terminal G and terminal 31 and measure resistance.

- In installation position, (readout reserve, float below).
- Rotated by 180° , (readout full, float at top).



Testing reserve warning contact

Connect ohmmeter to terminal W and terminal 31 and measure resistance.

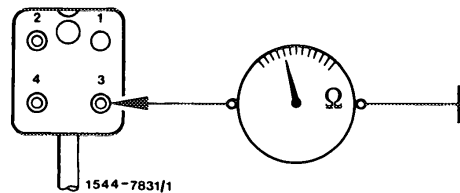
- Nominal value 0 ohm in installation position.
- Nominal value ∞ ohm turned by 180° .

Testing harness

1 Pull coupler from immersion tube transmitter and measure resistance on jack 3 and vehicle ground.

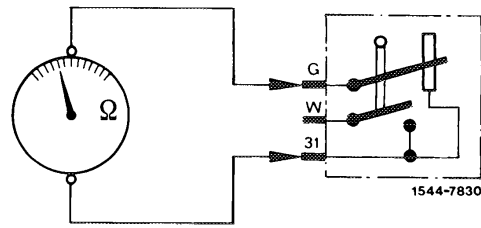
Nominal value 0 ohm

(At test value ∞ ohm the grounding line is interrupted).



2 Measure resistance on terminal G and terminal 31 on installed immersion tube transmitter. Value depends on amount of fuel in tank.

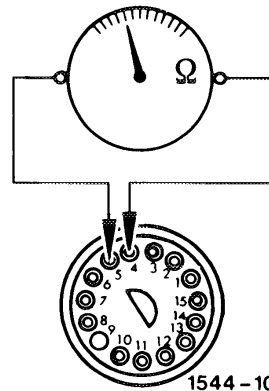
Plug coupler back on immersion tube transmitter.



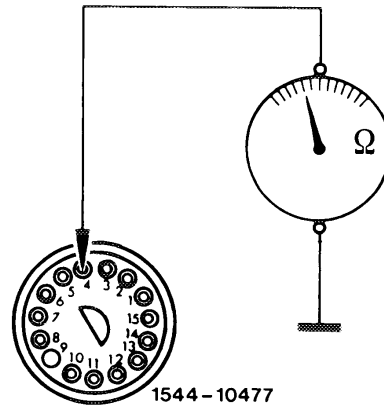
3 Pull coupler from instrument cluster and measure resistance between jack 4 and jack 5 on vehicles with mechanical tachometer.

On vehicles with electronic tachometer between jack 4 and ground.

Nominal value: the value measured under 2. If the value is attained, the harness is in order (slight deviation caused by length of line possible).



Measuring instrument connection
Vehicles with mechanical tachometer



Measuring instrument connection
Vehicles with electronic tachometer

4 If the measured value is higher or at ∞ ohm, the harness couplers (on instrument cluster, on main harness/tail harness or on immersion tube transmitter) are having poor contact, a dry joint or a line is interrupted.

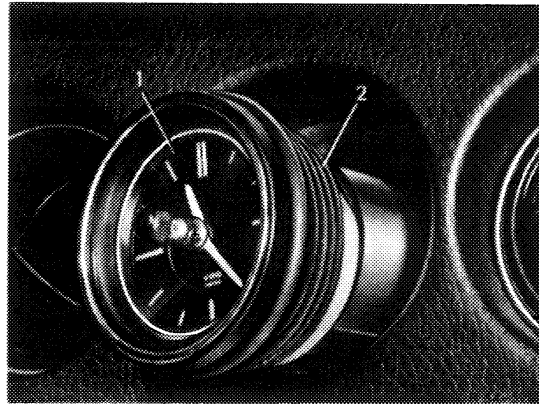
Indicating instrument

5 If no fault is found during tests, exchange indicator.

54-258 Removal and installation of time clock

Removal

1 Carefully force time clock out of instrument panel by means of a plastic wedge. Loosen electric connection. Remove time clock.



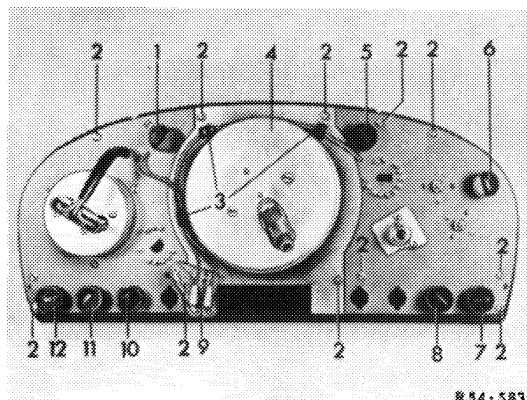
Installation

2 For installation proceed vice versa.

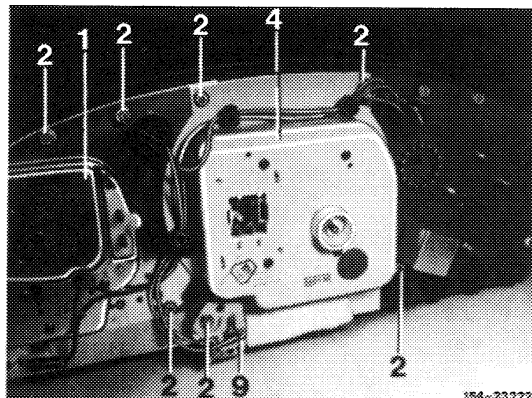
54-259 Removal and installation of revolution counter

Removal

- 1 Remove instrument cluster (54-250).
- 2 Remove tachometer (54-253).
- 3 Loosen fastening screws (2) of lefthand switch plate and remove switch plate with revolution counter.



Instrument cluster with
mechanical tachometer



Instrument cluster with
electronic tachometer

Installation

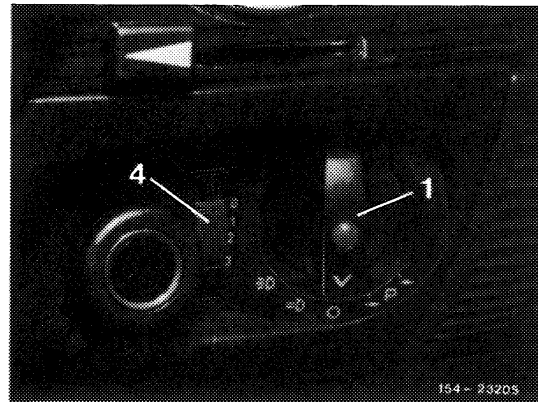
- 4 For installation proceed vice versa.

54-305 Removal and installation of rotary light switch

Removal

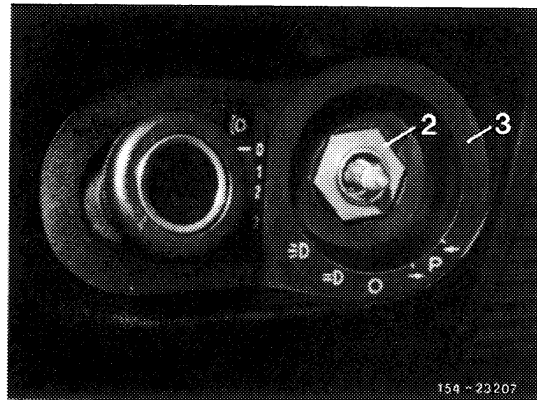
1 Disconnect battery negative terminal.

2 Pull off knob (1) (mounted conically).

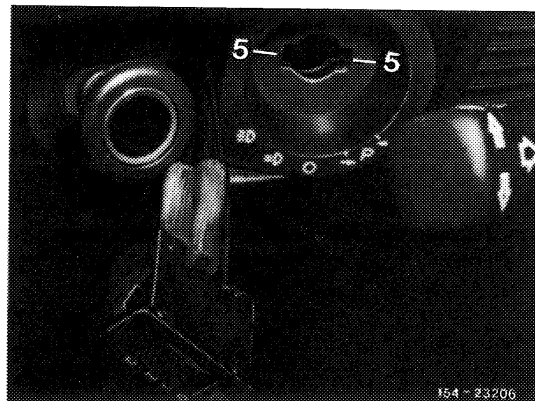


3 Unscrew nut (2) and remove cover with symbol (3).

4 Remove cover under instrument panel left (68-150).

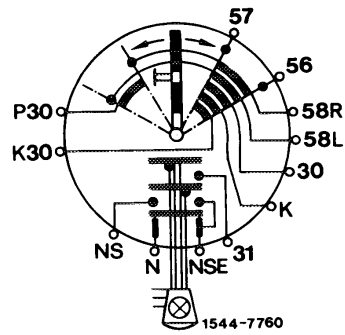


5 Remove rotary light switch from instrument panel in downward direction.



Installation

6 For installation proceed vice versa. Make sure that rotary light switch engages in recess (5).



Connection diagram rotary light switch

Terminal	Designation	Line cross section	Cable color
30	Battery plus	6	red
K 30	Licence plate lamp input	0.75	grey/red
P 30	Standing lamp input	0.75	green/white
31	Ground for rear fog lamp	1.5	brown
56	Driving lamp	2.5	white/yellow
57	—	—	—
58 L	Parking-, tail lamp left	2.5	grey/white
58 R	Parking-, tail lamp right	1.5	grey
NSE	Rear fog and fog lamp input	1.5	grey/yellow/green
NS	Rear fog lamp output	1.5	grey/green
N	Fog lamp output	1.5	grey/green
K	Instrument lamps input	0.5	grey/purple
	Licence plate lamps	0.75	grey/purple
	Switch lamps	0.75	grey/blue

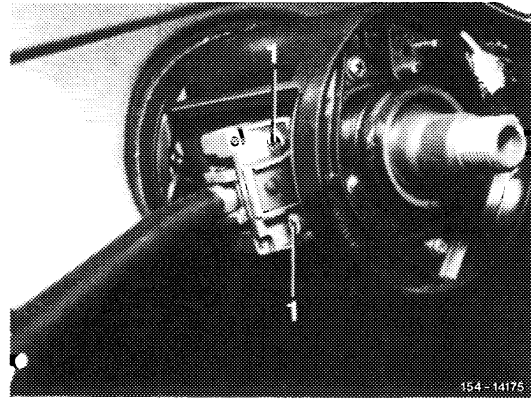
54-310 Removal and installation of combination switch

Note

Steering wheel need not be removed for removal of combination switch.

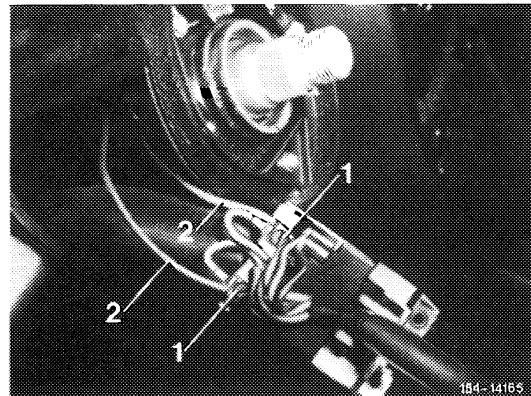
Removal

- 1 Remove rubber sleeve on combination switch.
- 2 Unscrew fastening screws (1).



- 3 Slightly pull out combination switch, loosen screws (1) for cable connection of twin carbon contacts and pull out cable (2).

- 4 Remove cover under instrument panel left (68-150).



- 5 Pull off 14-point plug (arrow) and remove combination switch.

Installation

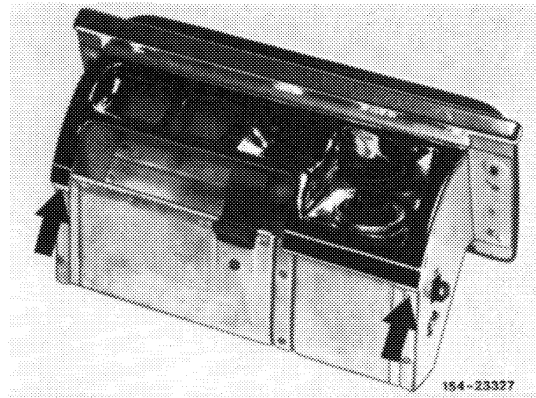
- 6 For installation proceed vice versa.



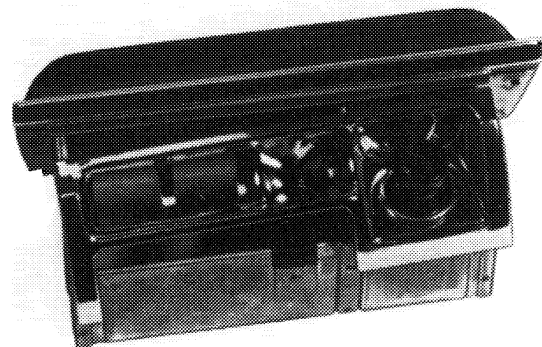
54-391 Renewing bulb for ashtray light

1 Take ashtray out of holder.

2 Unclip ashtray top.

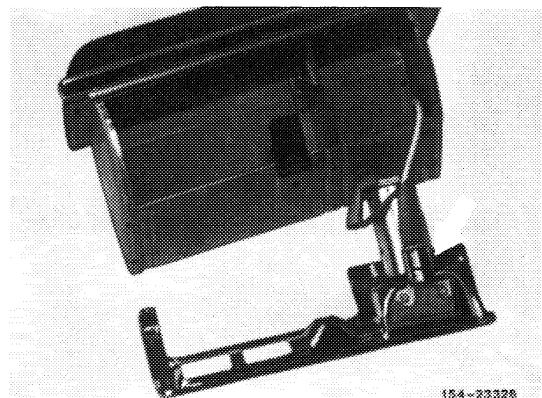


3 Slightly pull out ashtray top under covering strip and remove in upward direction.



4 Pull socket with bulb out of blade receptable contact and exchange bulb.

5 For assembly of ashtray proceed vice versa.



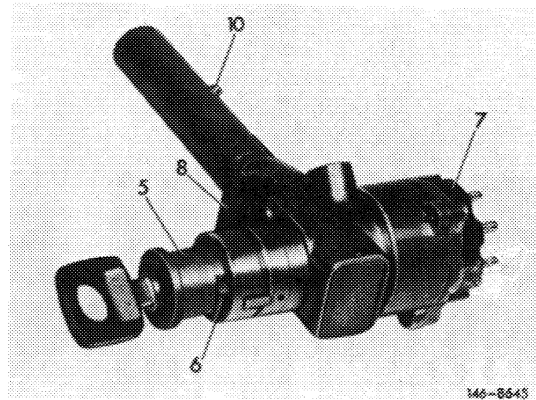
The warning device comprises three functions:

- 1st warning when seat belt is not worn (buckled).
- 2nd warning when ignition key is not pulled out.
- 3rd warning when light is not switched off.

Operation

1. If with the ignition switched on and the driver's door closed (door contact switch left (7) opened) the seat belt is not worn (buckled) by driver, the warning buzzer will sound for 4-8 seconds. In such a case, the electronic system of the warning device (2) will connect positive current to warning buzzer in warning device from terminal 10 via closed belt switch (terminal 9 of warning device).

8 Warning buzzer contact



When the seat belt is put on (buckled) the belt switch will interrupt the circuit and the warning buzzer is switched off.

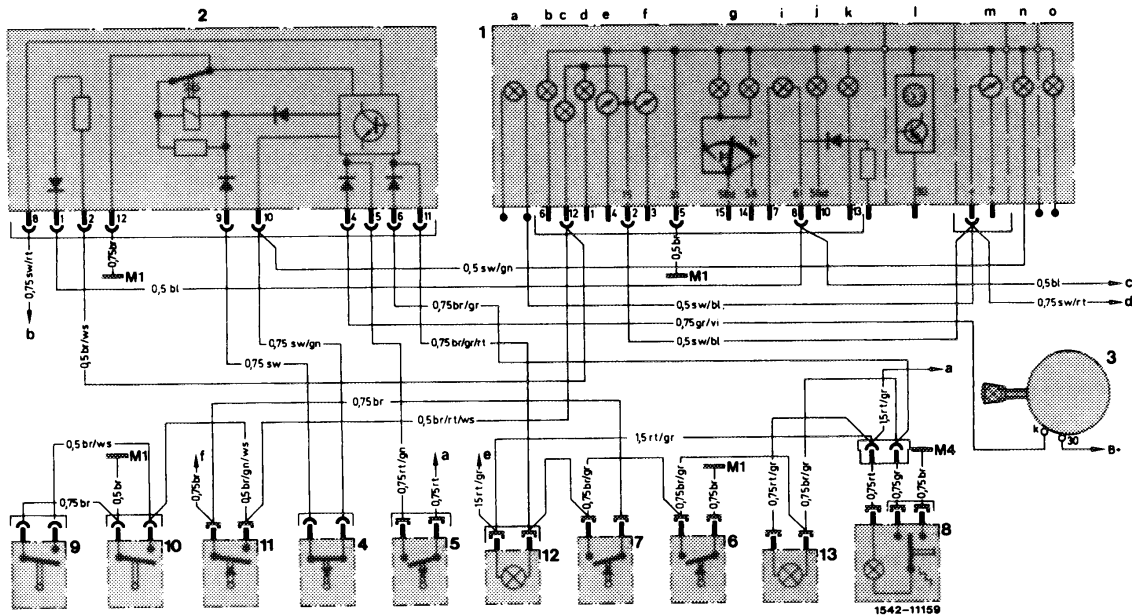
The indicator lamp (1 n) connected in parallel with belt switch is operational up to end of respective period (4-8 seconds).

2. If with the driver's door open (door contact switch left (7) closed) the ignition key is not pulled off, the warning buzzer is activated with positive current by the electronic system via closed warning buzzer contact on ignition lock (5), terminal 5 on warning device. The warning buzzer is switched off when the ignition key is pulled off or after 4-8 seconds.

3. If the high beam, the low beam or the parking lamps are not switched off, the warning buzzer will also sound when the ignition is switched off and the driver's door is opened.

The warning buzzer is activated with positive current by terminal K on rotary light switch via electronic system in warning device (terminal 4). When the driver's door is opened, the electronic system is activated with negative current via closed door contact switch left (7), the warning buzzer will sound.

Note: The door contact switches have been changed to negative control.



- 1 Instrument cluster
- 1c Indicator brake fluid and parking brake
- 1n Warning lamp seat belt
- 2 Warning device
- 3 Rotary light switch
- 4 Switch in belt lock, driver's seat
- 5 Warning buzzer contact
- 6 Door contact switch front right
- 7 Door contact switch front left
- 8 Dome lamp front with switch

- 9 Switch brake fluid checkup
- 10 Switch brake fluid checkup
- 11 Switch parking brake
- 12 Entrance lamp left
- 13 Entrance lamp right
- a Fuse box terminal 30 (fuse No. 1)
- b Fuse box terminal 15 (fuse No. 8)
- c Alternator D+/61
- D Fuse No. 10 terminal 15
- e Diagnosis socket connection No. 6

The cruise-control system is ready for operation when the ignition is switched on. For actual operation, the vehicle speed should be around approx. 40 km/h. When the vehicle is running at the desired speed, brief tipping against switch in direction "ACCEL-SET" or "DECEL-SET" is enough to keep this speed constant until the driver sets a new speed or the brake pedal is depressed. To match this set speed, for example, to traffic conditions, hold switch in direction "ACCEL-SET" or "DECEL-SET" until the desired speed is attained. Upon release of switch the new speed is held constant. Short tipping against switch in direction "OFF" or stepping down on brake or clutch pedal will switch off the cruise-control system. But the system remains ready for operation until the ignition is switched off. If following deceleration, operation of clutch or after switching off, the switch is briefly tipped in the direction of "RESUME" at a vehicle speed above approx. 40 km/h, the vehicle will automatically accelerate to the speed "SET" last.

If the speed is exceeded by acceleration, for example while passing, the vehicle will automatically return to the previously set speed when the accelerator pedal is released.

Resume: On the 1st version up to approx. March 1976 with the exception of model 116.036 the speed set last will remain for several hours also after stopping the vehicle. On the 2nd version starting approx. March 1976 (model 116.036 and 123 from begin of production) the speed set last will be cancelled when the ignition is switched on. In addition, the 8-cylinder models will accelerate in switch position "RESUME" approx. 4 s later and will only then move to full acceleration.

For safety reasons, the cruise-control system is switched off if for some reason or other the selected speed is reduced by more than approx. 20%. For example, if the speed drops while driving up hill or when the vehicle is decelerated as a result of a defective brake light switch.

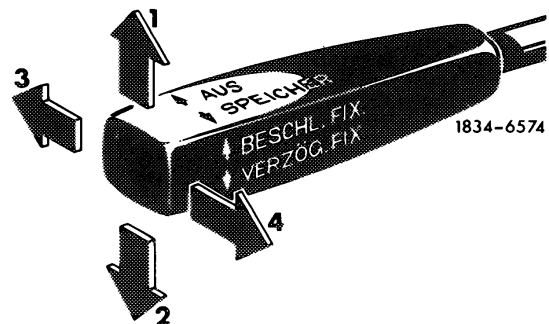
Attention! While driving with the cruise-control system, do not engage the selector lever position "N" of the automatic transmission, since this will speed up the engine.

The cruise-control system comprises essentially four design elements: the switch, the sensor, the control unit and the actuator.

Vehicles with manual transmission are provided with an additional switch which is operated by clutch pedal.

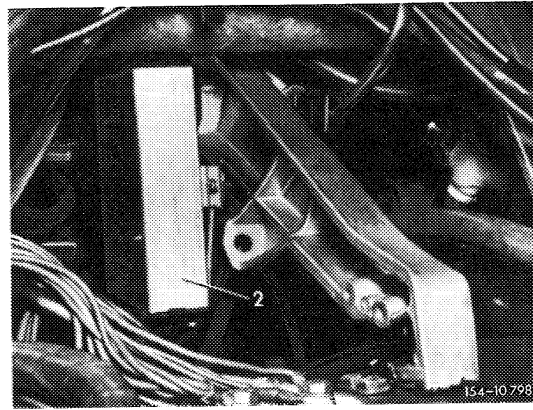
Switch

- Position "1" or "2" touch = speed is set
- Position "1" hold = set speed is increased
- Position "2" hold = set speed is reduced
- Position "3" touch = cruise-control is switched off
- Position "4" touch = speed set prior to switching-off returns automatically at a speed above approx. 40 km/h



Control unit

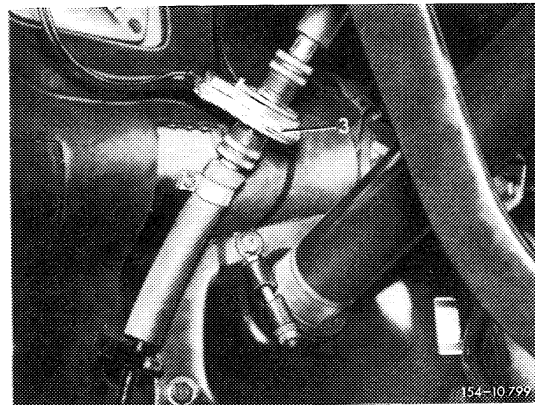
The control unit (2) compares the actual and the selected speed. In the event of a deviation from the selected speed the control unit (2) sends pertinent control signals to the vacuum operated actuator (4) until the actual and the selected speeds are again in agreement.



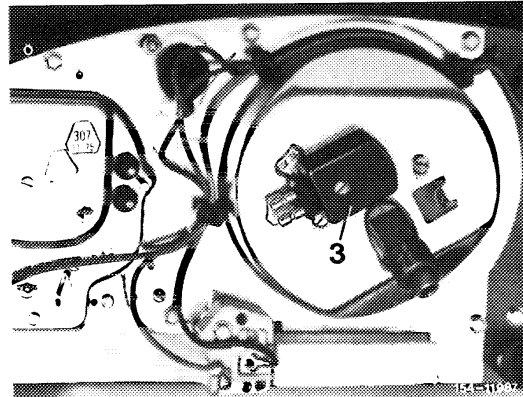
Sensor

Sensor (3); transmits the actual speed to the control unit (2).

Note: The sensor (3) of the 1st version is mounted between the two-piece speedometer shaft. The sensor of the 2nd version is screwed to speedometer.



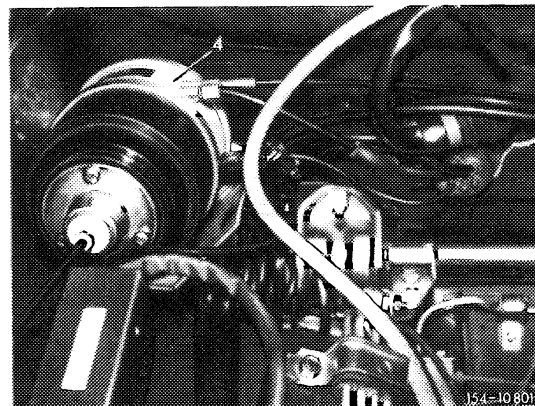
1st version



2nd version

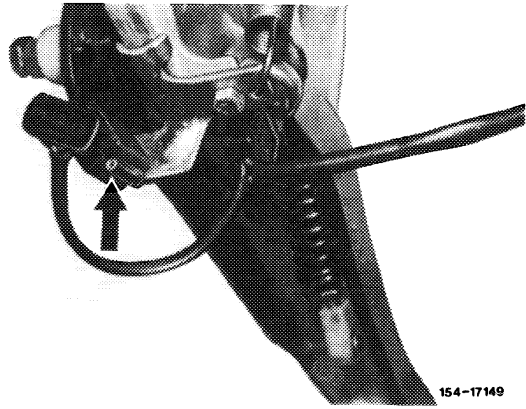
Actuator

The vacuum-operated actuator (4) receives its control impulses from the control unit and actuates the control linkage by means of a cable control system.



Switch actuated by clutch pedal

When stepping down on clutch pedal, the ground connection from stop lamps to control unit will be interrupted by switch (arrow). As a result, cruise control will be switched off similar to braking or when tipping cruise control switch in direction of "off".



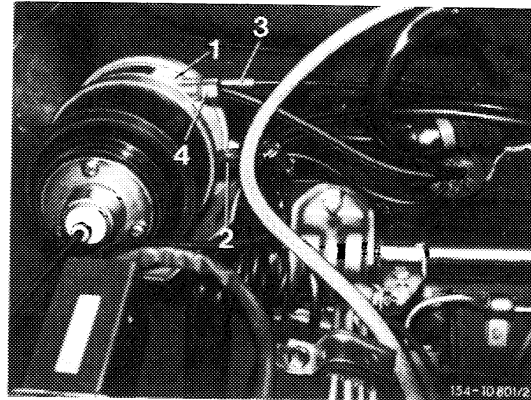
154-17149

54–505 Checking the actuator

A. Electrical checkup

- 1 Pull 2-pole coupler (2) from actuator (1).
- 2 Connect Ohmmeter to connection of actuator (1).

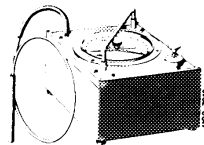
- 3 The resistance should be between 10–22 Ohms.
- 4 If this value is exceeded or not attained, replace actuator (1).



B. Checking vacuum supply for actuator

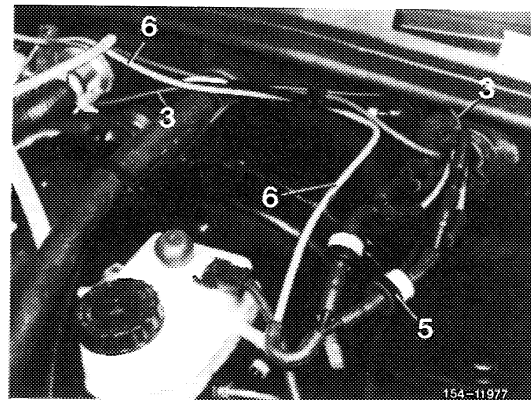
Special tool

Tester for vacuum systems

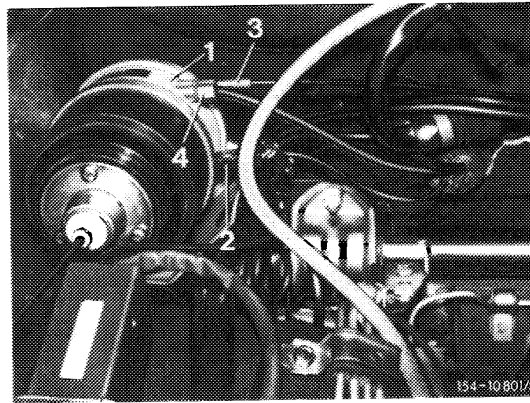


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- 1 Check vacuum line (6) from engine to check valve (5) and vacuum line (3) from check valve (5) to actuator for correct connection.



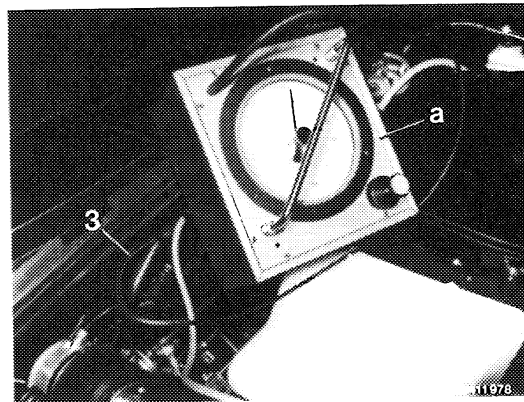
2 Check vacuum line (3) and venting line (4) for correct connection on actuator (1).



3 Pull vacuum line (3) from actuator (1) and connect with tester (a).

4 Start engine, under sudden acceleration, the vacuum on tester (a) should not drop to zero.

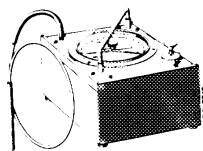
5 Check vacuum system, if indication is negative.



C. Mechanical and pneumatic checkup of actuator, including cable control and control linkage

Special tool

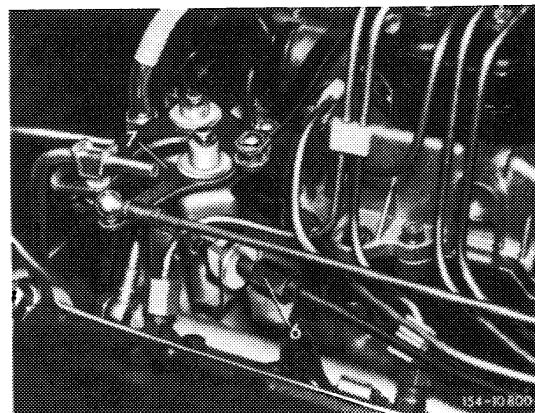
Tester for vacuum system



116 589 25 21 00

1 Remove air filter (not required for engines 110.98, 616 and 617).

2 Check adjustment of cable control (6) on regulating lever (7) and adjust, if required (54–560).

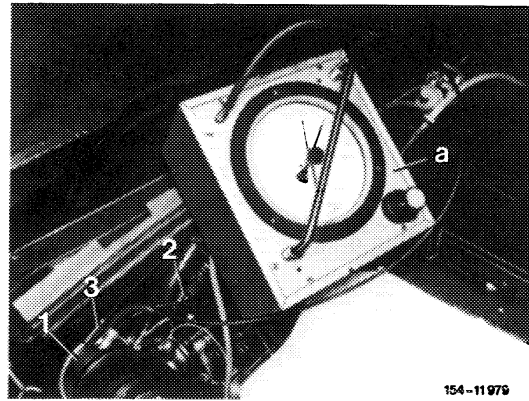


3 Check full throttle position of control linkage with accelerator pedal depressed.

4 Connect tester (a) to connection of actuator (1), pull off vacuum line (3) for this purpose.

5 Pull off 2-pole coupling (2) on actuator (1)

6 Connect one connection of actuator with battery+, the other connection with battery-.



154-11979

7 Complete the following test steps:

Test step	Required condition	Remedy for negative indication
1	Set up vacuum with tester (a), while watching operation of control linkage and cable control. Control linkage should move uniformly. At approx. 300 mbar vacuum the control linkage should be at full throttle position. A vacuum drop to 100 mbar in 1 minute is permitted.	Check control linkage for easy operation. Check cable control for easy operation. Replace actuator.
2	Disconnect battery from actuator. Control linkage moves into idle position. A noticeable vacuum drop on tester within one minute is not permitted. The previously set up vacuum must remain constant.	Replace actuator.

54–510 Checking switch, control unit and line harness

1 Make test line harness yourself with the following parts:

1 Coupling, comprising:

- 1 body 008 545 08 28
- 1 cover 008 545 11 28
- 2 bushings 001 545 26 26

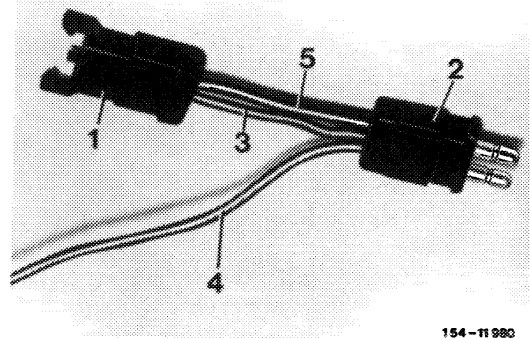
2 Plugs, comprising:

- 1 body 008 545 09 28
- 1 cover 008 545 11 28
- 2 pins 008 545 18 28

3 Line brown/black 1.0 mm²

4 Line brown/black 1.0 mm² (3 m long)

5 Line black 1.0 mm²

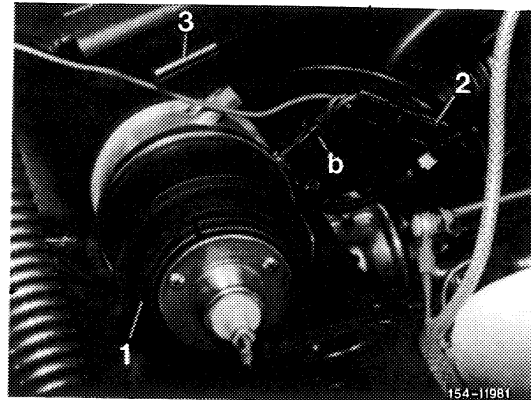


154–11 980

2 Install test line harness (6) between actuator and line harness (2).

3 Connect voltmeter, while clamping + connection to test line (4) and – connection to seat rail.

4 Switch on ignition and check stop light for function.

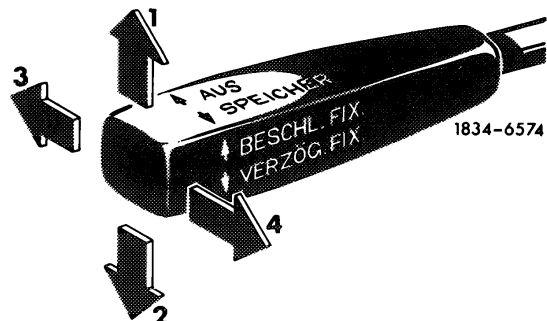


154–11981

5 Actuate switch, brake and ignition key as follows:

Position	Nominal value
Off	0 V
Accelerate	> 11 V
Actuate brake pedal	0 V
Memory	> 11 V
Ignition off/on	0 V
Decelerate	> 11 V
Actuate clutch pedal	0 V

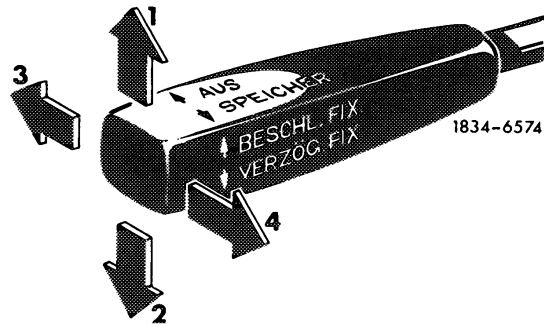
6 With negative indication, check connection of line harness on stop light switch (refer to wiring diagramm 54–580). If connection is correct, check switch. If switch is in order, connect new control unit on trial.



54–515 Checking switch

- 1 Check brake light for function.
- 2 Pull off 12-pole coupling on control unit, remove lefthand cover under instrument panel for this purpose.
- 3 Switch on ignition and complete test with voltmeter as follows.

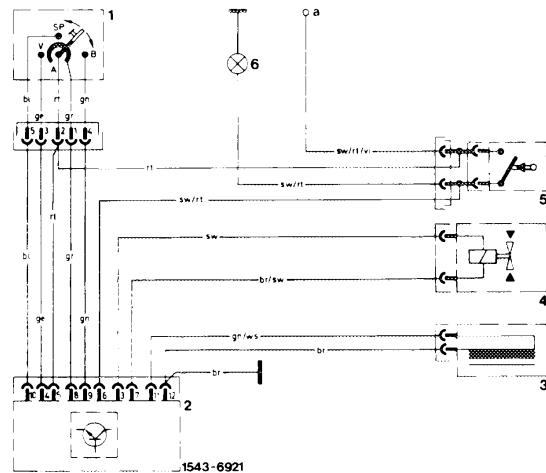
Terminal on coupling of control unit	Position of switch	Nominal value
– to 12 + to 8	Rest position	> 11 V
– to 12 + to 8	3 (off)	0 V
– to 12 + to 5	Rest position	> 11 V
– to 12 + to 6	Actuate brake	> 11 V
– to 12 + to 9	1 (accelerate)	> 11 V
– to 12 + to 4	2 (decelerate)	> 11 V
– to 12 + to 10	4 (resume)	> 11 V



- 4 If the voltmeter does not indicate in rest position on terminal 12/8, check connection of line harness on stop light switch (5).
- 5 If connection is in order, renew switch (1) if indication is negative.

Wiring diagram

- | | |
|----------------|---------------------|
| 1 Switch | 3 Sensor |
| SP = resume | 4 Actuator |
| V = decelerate | 5 Stop light switch |
| A = off | 6 Stop light |
| B = accelerate | a Terminal 15 |
| 2 Control unit | |



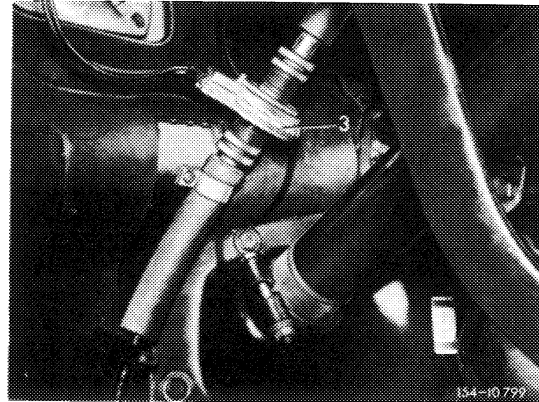
54–520 Checking sensor

1 Remove cover under instrument panel or instrument cluster.

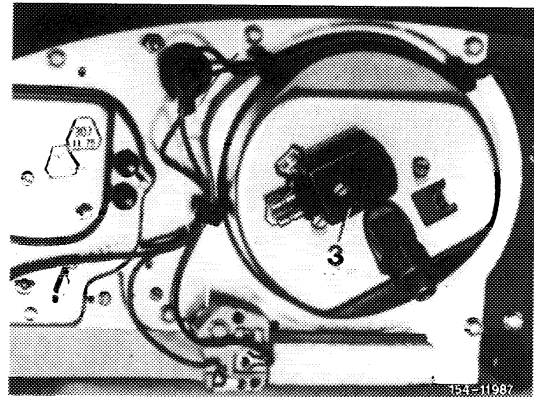
2 Pull 2-pole coupling from sensor (3).

3 Connect Ohmmeter to sensor (3). On 1st version resistance should amount to 50–106 Ohms and on 2nd version to 650–1370 Ohms.

4 If this value is exceeded or not attained, replace sensor (3).



1st version



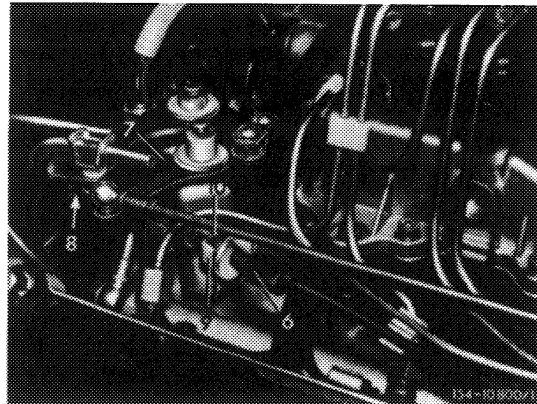
2nd version

54–525 Checking cable control

1 Remove air cleaner (not required for engines 110.98, 616 and 617).

2 Advance control linkage to full throttle, the wire strand (8) should move within cable control envelope for approx. 20 mm without any resistance.

3 Check adjustment, wire strand should rest against control free of tension at lowest possible play.



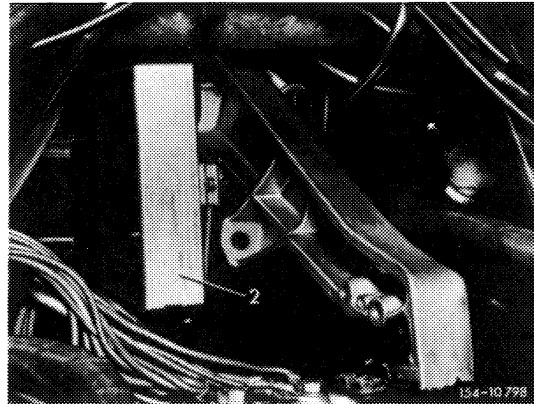
4 Replace cable control at the slightest suspicion of strain (54–555).

5 Adjust cable control, if required (54–560).

6 Reinstall air cleaner.

54-530 Checking control unit

1 If no fault has been found during previous tests (54-505 to 54-525), install new control unit as a tryout.



54–540 Removal and installation of actuator

Removal

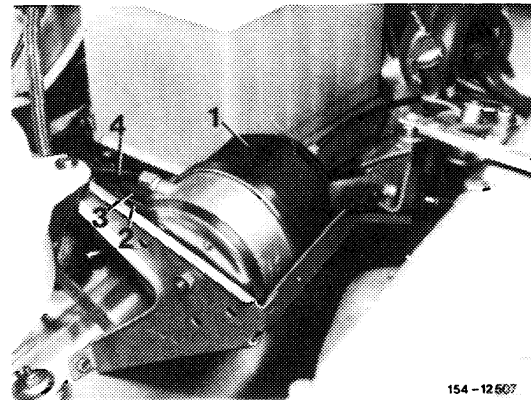
1 Disconnect cable control at control end and then at actuator (1) (54–555).

2 Remove line harness (2), vacuum line (3) and venting line (4) from actuator (1).

3 On models 107.023/024/026/043/044 unscrew actuator (1) with bracket (5) from side member.

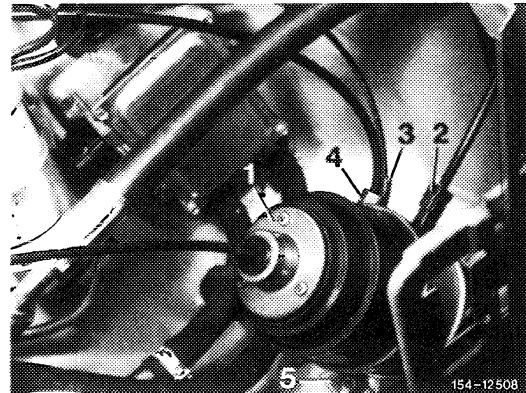
4 Loosen nut at rear on bracket of actuator (1) and remove actuator (1).

Models 107.022/042



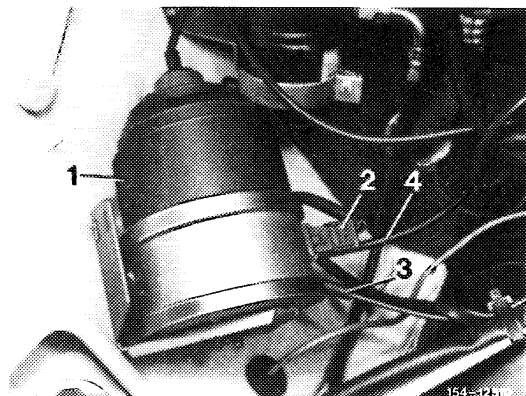
154-12507

Models 107.023/024/026/043/044



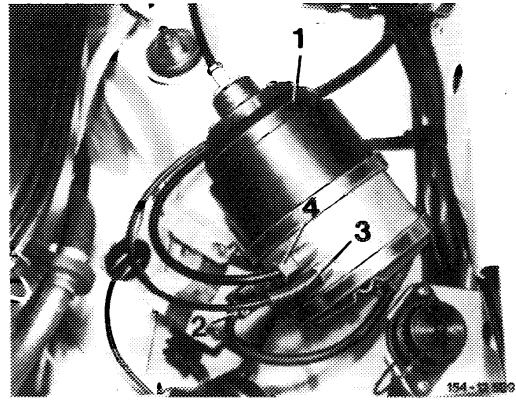
154-12508

Models 114, 115

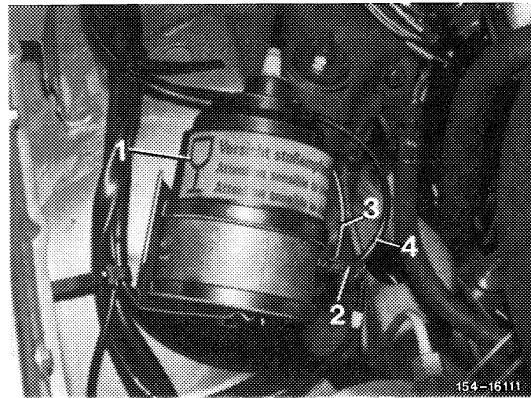


154-12509

Model 123, lefthand steering



Model 123.033/053/093, righthand steering



Installation

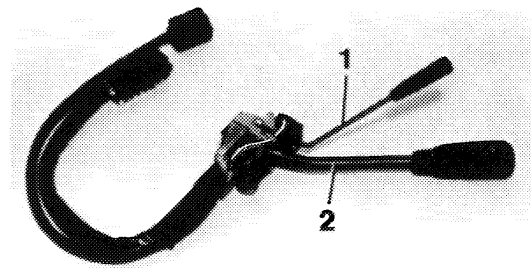
- 5 For installation proceed vice versa.
- 6 Adjust cable control (54--560).
- 7 Perform function test on road.

54-545 Removal and installation of switch

Removal

- 1 Remove combination switch.

- 2 Remove switch (1) from combination switch (2).



154-11976/1

Installation

- 3 For installation proceed vice versa.
- 4 Perform function test on road.

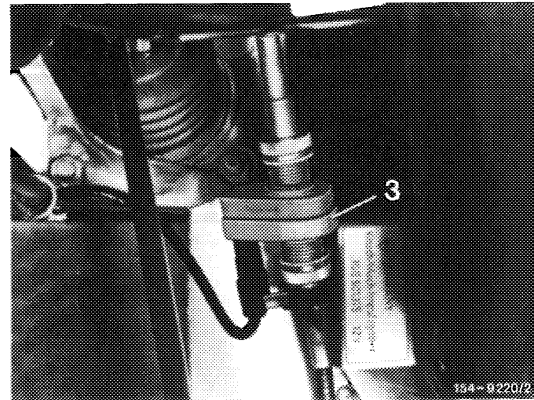
54–550 Removal and installation of sensor

Removal

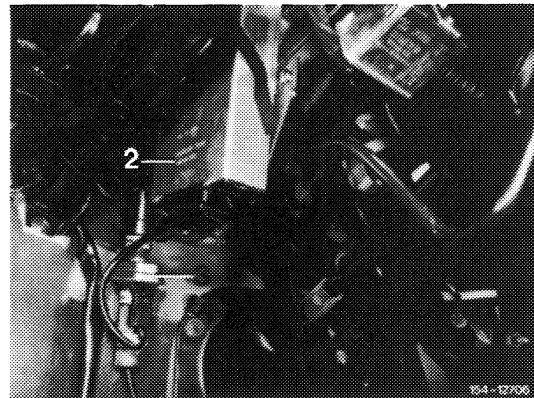
1 Remove cover under instrument panel on driver's side.

2 On 1st version, pull line harness from sensor (3).

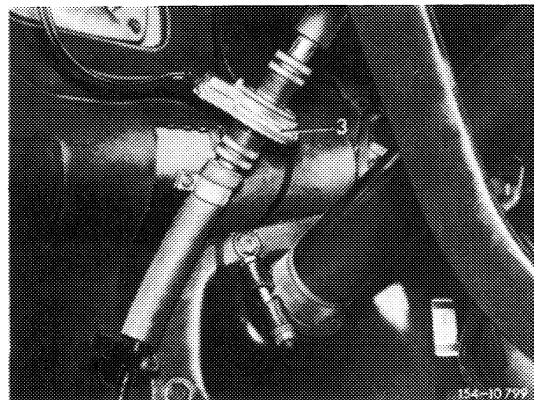
3 Unscrew coupling nuts of speedometer shaft from sensor (3) and remove sensor.



Model 107



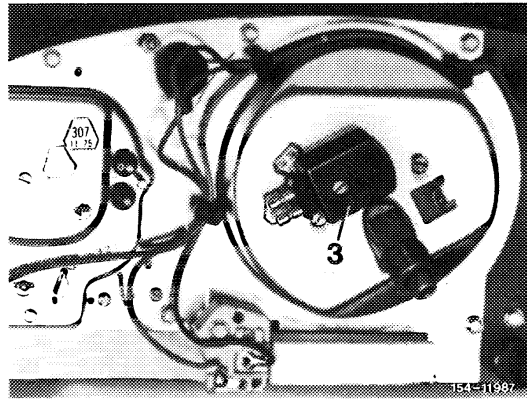
Models 114, 115



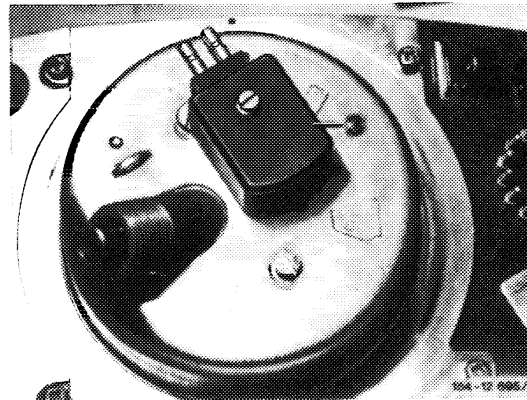
Model 116

- 4 On 2nd version, remove instrument cluster.
- 5 Pull line harness from sensor (3).
- 6 Unscrew sensor (3) from instrument cluster.

Models 107, 116



Model 123



Installation

- 7 For installation proceed vice versa.
- 8 Perform function test on road.

54–555 Removal and installation of cable control

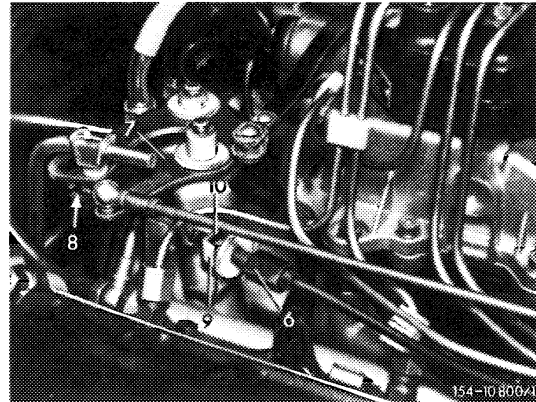
Removal

1 Remove air filter (not required for engines 110.98, 616 and 617).

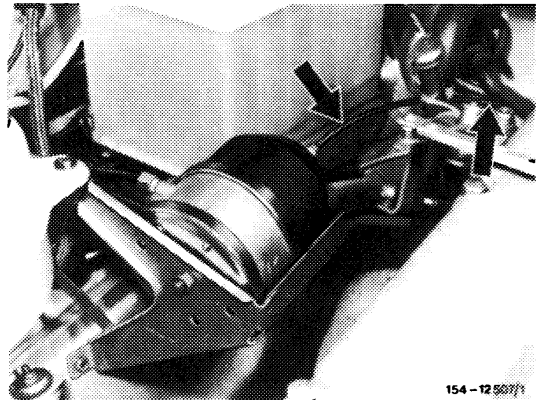
2 Push control lever (7) forward and disconnect clip (8) of wire strand.

3 Remove lock (10) on clips (9) of cable control envelope.

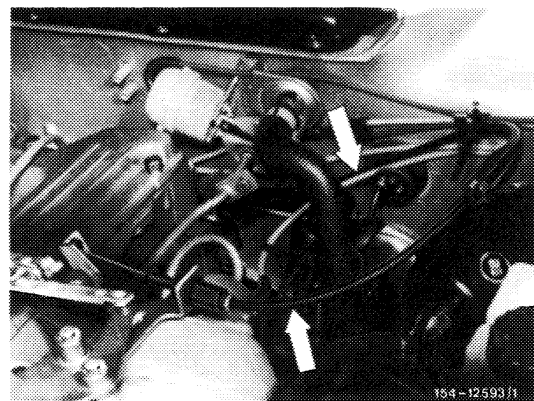
4 Compress clips (9) of cable control envelope and take control out of bracket.



5 Loosen cable control from fastening members of engine and body and remove.

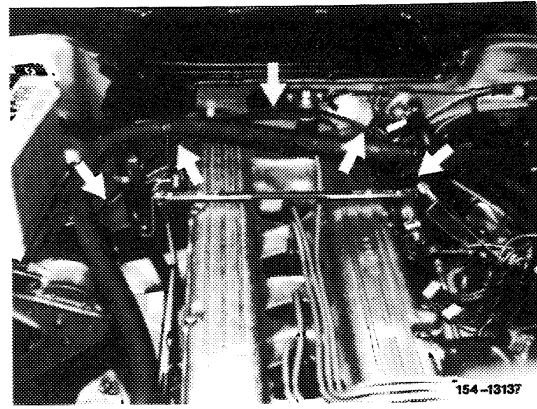


Install cable control model 107.022/042 with electronic injection system from actuator to front wall

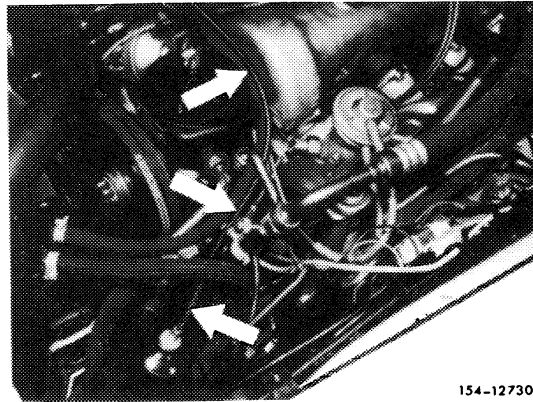


Install cable control model 107.022/042 with electronic injection system from front wall to control

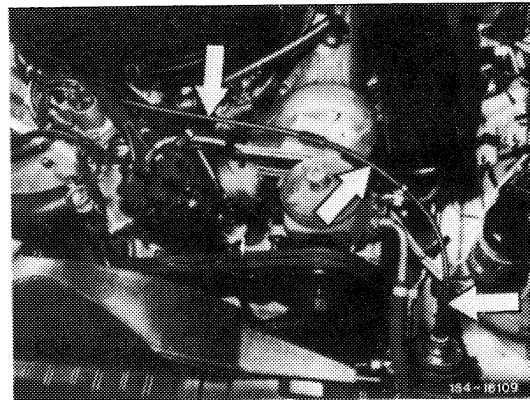
Install cable control model 107.022/043 with CIS injection system from front wall to control.



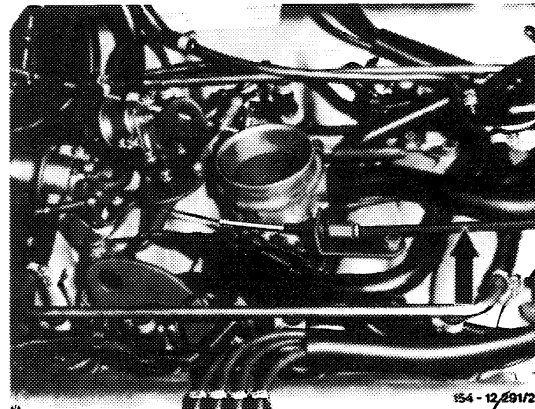
Install cable control model 107.023/024/043/044 from actuator to engine.



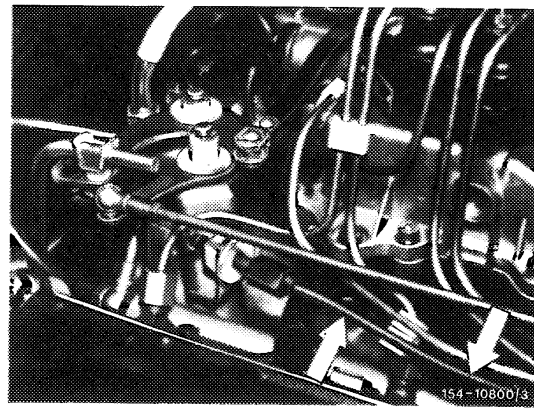
Install cable control model 107.026 from actuator to engine.



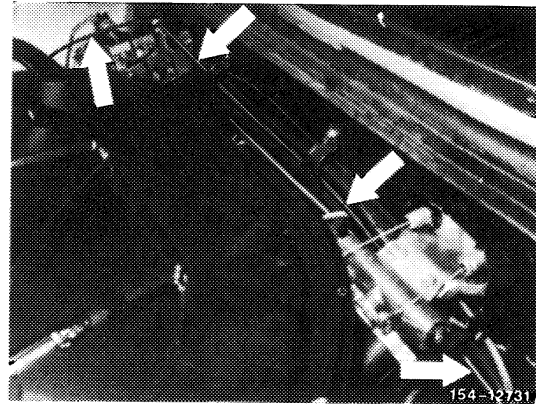
Install cable control model 107.023/024/043/044 with electronic injection system on engine.



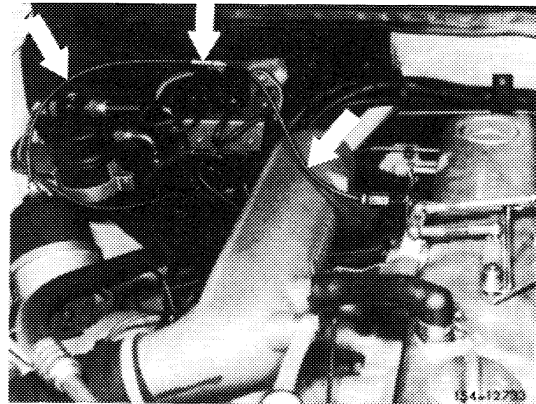
Install cable control model 107.023/024/026/043/044 with CIS injection system on engine.



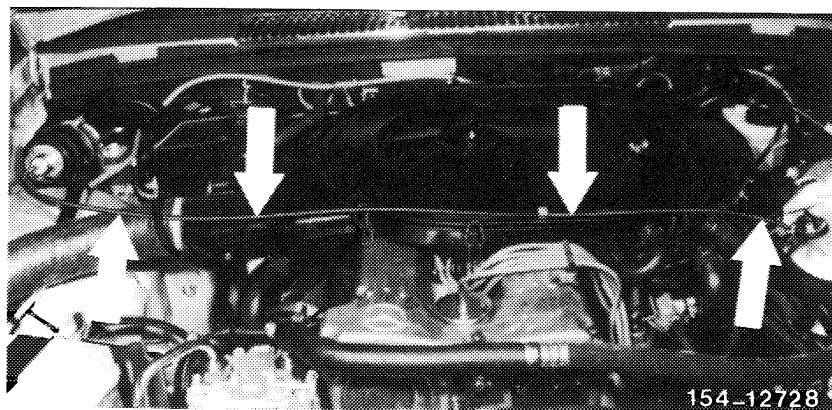
Install cable control models 114.060/073 on front wall



Install cable control model 115.114

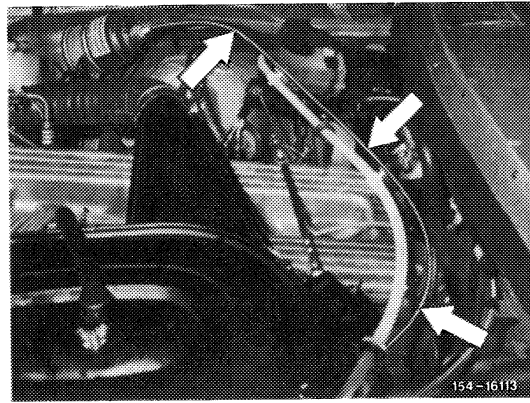


Install cable control model 116.020

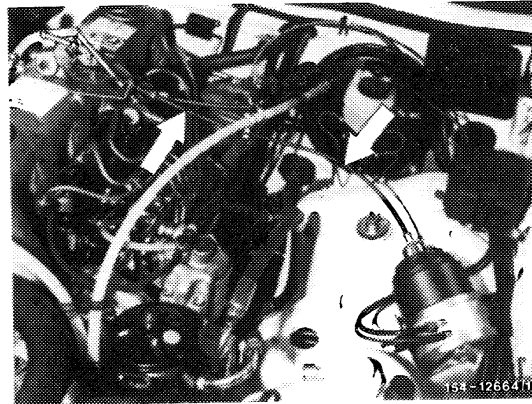


54.6-555/3 F2

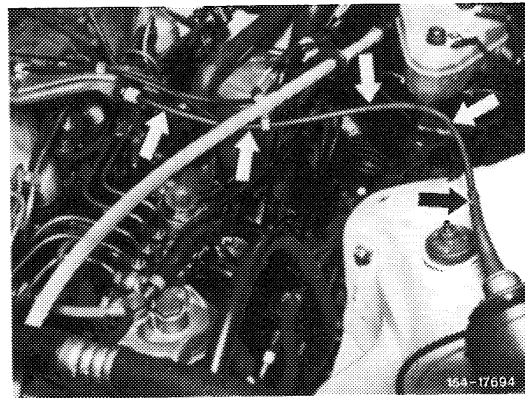
Cable control layout model 123.033/053/093,
righthand steering vehicle



Cable control layout model 123.123/130/150/183/190
lefthand steering vehicle without longitudinal regulating
shaft



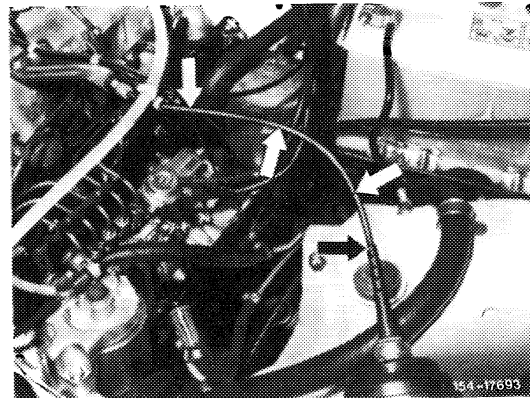
Cable control layout model 123.123/130/150/183/190
lefthand steering vehicle with longitudinal regulating shaft



Installation

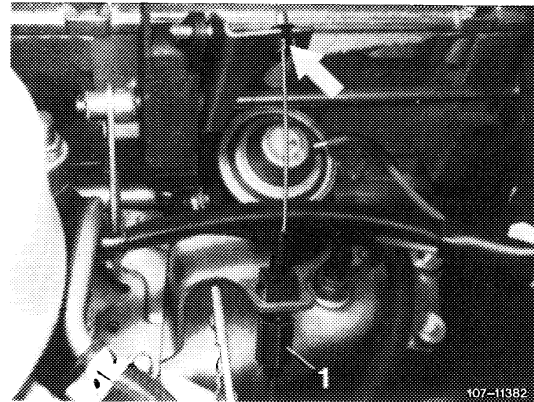
- 6 For installation proceed vice versa.
- 7 Adjust cable control (54-560).
- 8 Operational checkup on road.

Cable control layout model 123.123/130
righthand steering vehicle

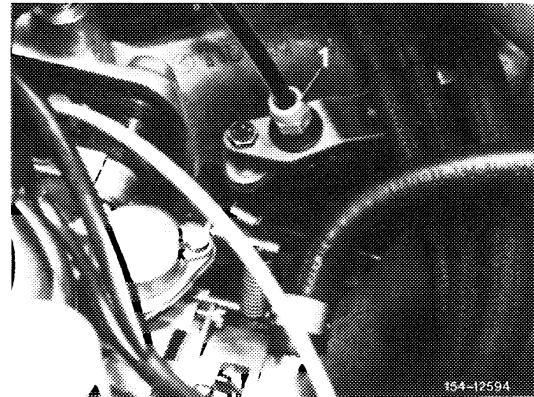


A. Gasoline engines with carburetor

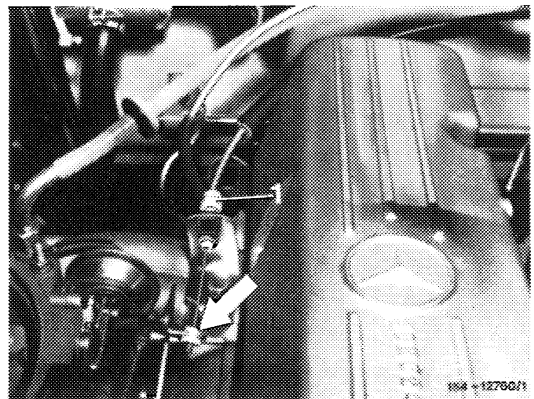
1 Turn adjusting nut (1) at idle speed and with engine at operating temperature in such a manner that the wire strand rests free of stress against regulation with the least possible play.



Engine 110

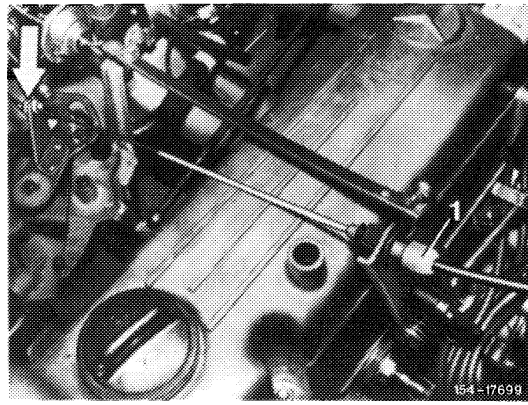


Engine 115



Engine 123 without longitudinal regulating shaft

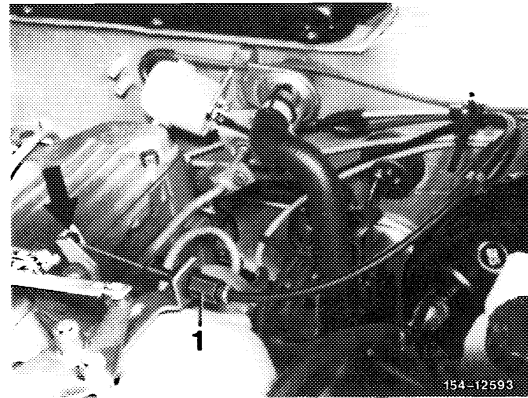
Engine 123 with longitudinal regulating shaft



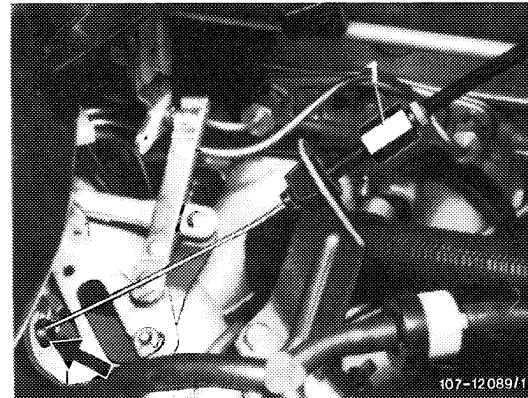
B. Gasoline engines with injection system

1 Turn adjusting nut (1) in such a manner that the wire strand rests free of stress against regulation with the least possible play.

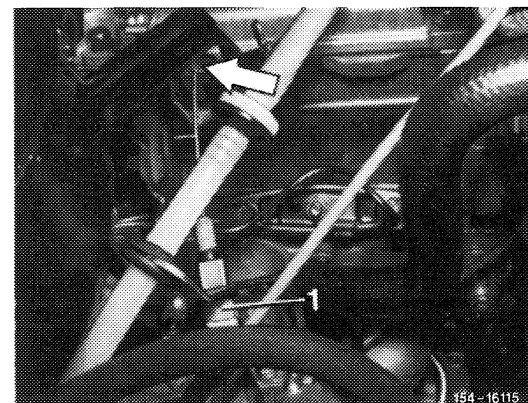
Engine 110 with electronic injection system



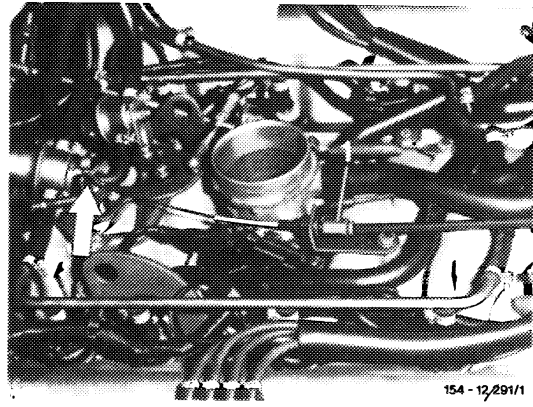
Engine 110 with CIS injection system, left-hand steering



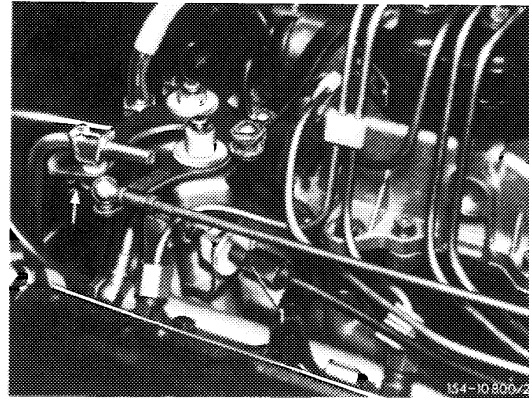
Engine 110 with CIS injection system, right-hand steering



Engines 116, 117 with electronic injection system



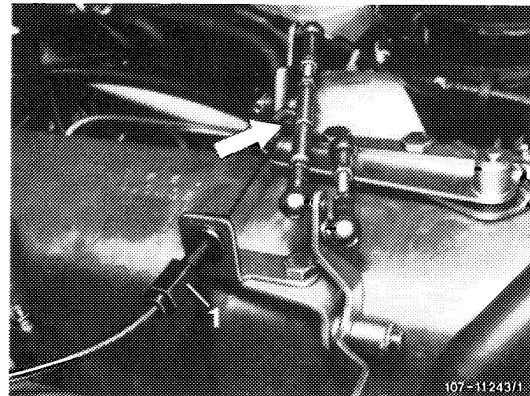
Engines 100, 116, 117 with CIS injection system



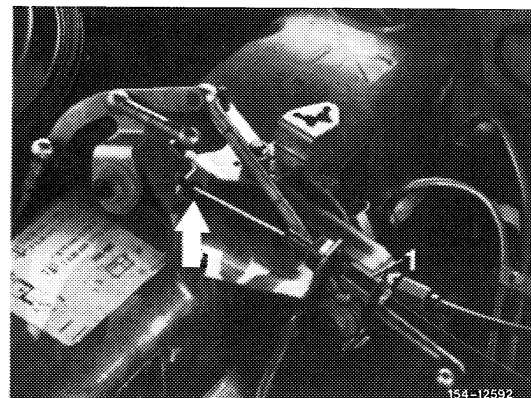
C. Diesel engines

1 Turn idle speed adjuster completely to the right. Push emergency stop button and turn adjusting nut (1) so that the wire strand rests free of stress against regulation with the lowest possible play.

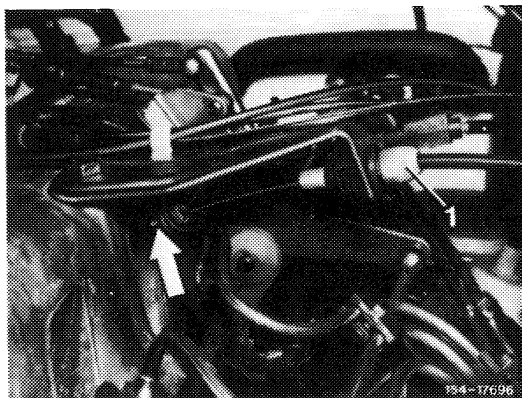
Engine 617 (model 115)



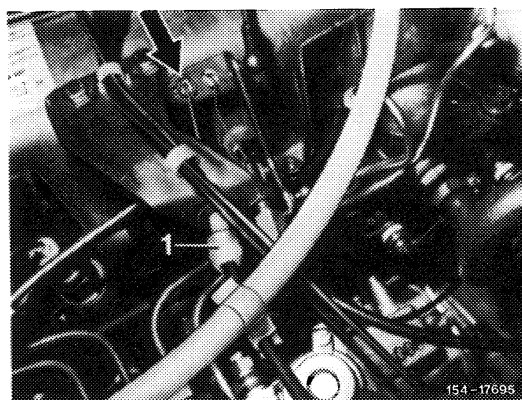
Engines 616 and 617 (model 123) without longitudinal regulating shaft



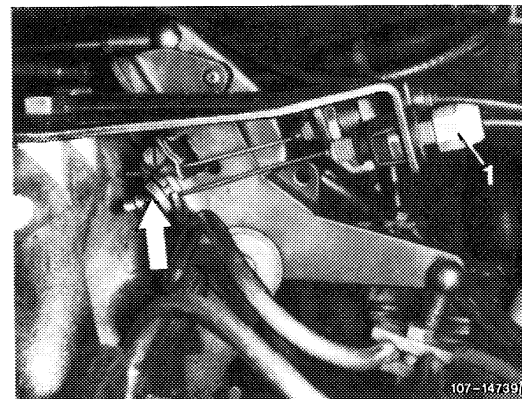
Engine 616 and 617 with longitudinal regulating shaft (model 123, lefthand steering)



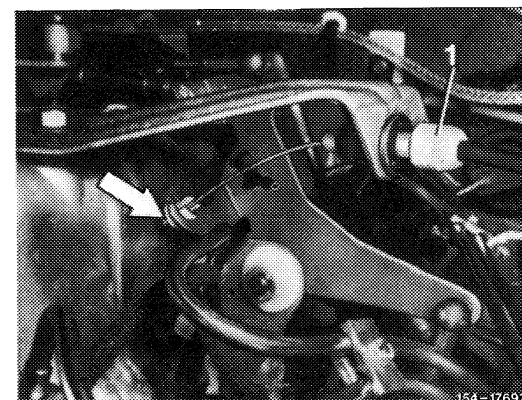
Engine 616 and 617 (model 123 righthand steering)



Engine 617 up to USA model year 1979 (model 116)



Engine 617 starting USA model year 1980 (model 116)

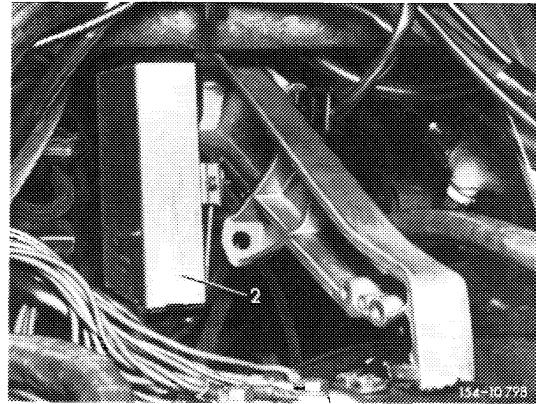


54-565 Removal and installation of control unit

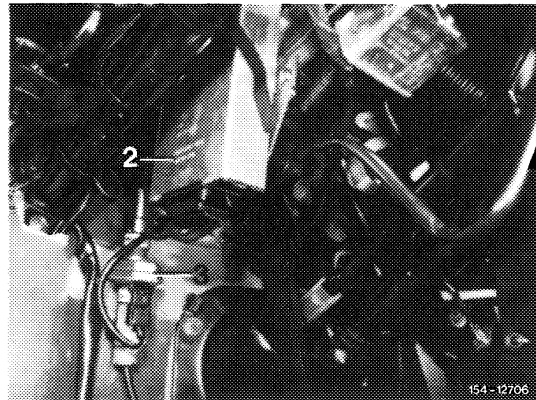
Removal

- 1 Remove cover under instrument panel on driver's side.
- 2 Remove plug coupling from control unit (2) and from bracket.
- 3 On vehicles with automatic transmission unscrew control unit (2) with holder from pedal bearing bracket. Then remove control unit (2) from holder.

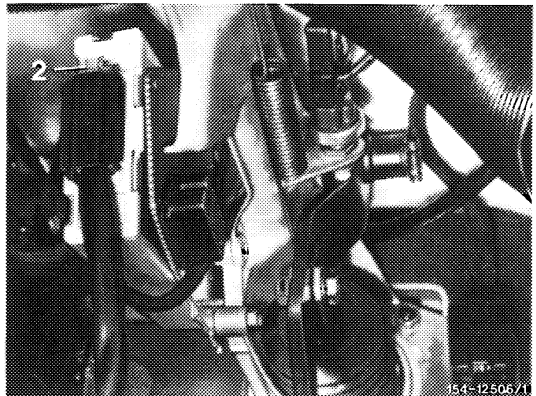
Model 107 and 1st version model 116



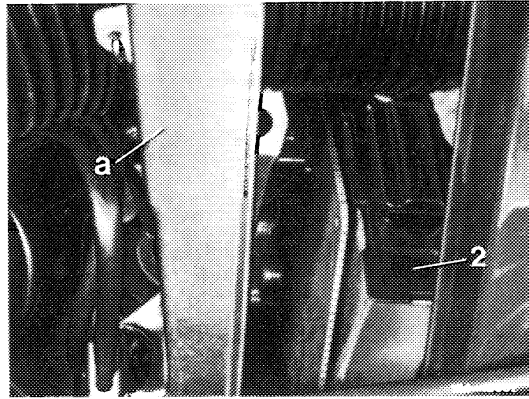
Models 114, 115



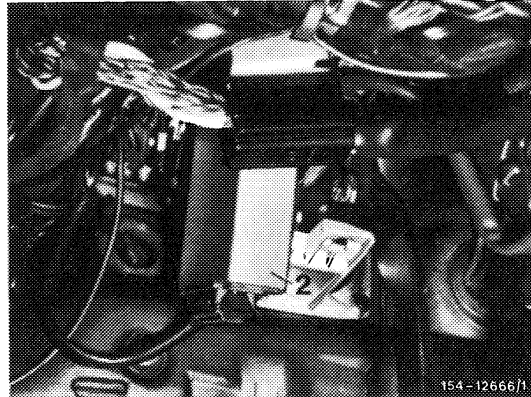
2nd version model 116



Model 116 righthand steering
a Pedal bearing bracket

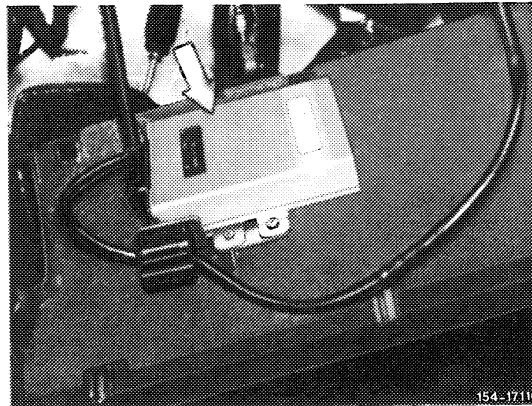


Model 123
with automatic transmission



4 On vehicles with manual transmission, unscrew control unit from holder of cover.

Model 123 with manual transmission

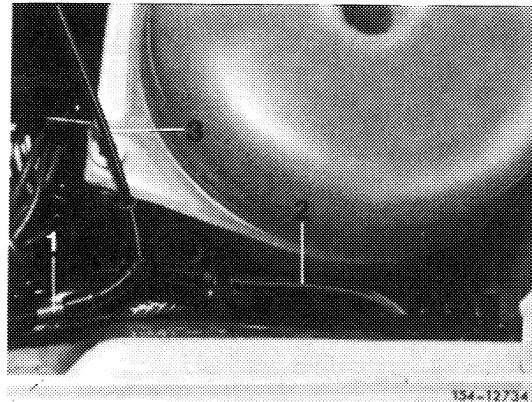


54–570 Vacuum connection for throttle servo unit

The vacuum required for the throttle servo unit is taken from a vacuum supply tank, except on model 115.114/123.130/140. The vacuum supply tank is identical with the tank for the central locking system. If the vehicle is provided with cruise-control and a central locking system, both are connected to the same vacuum supply tank.

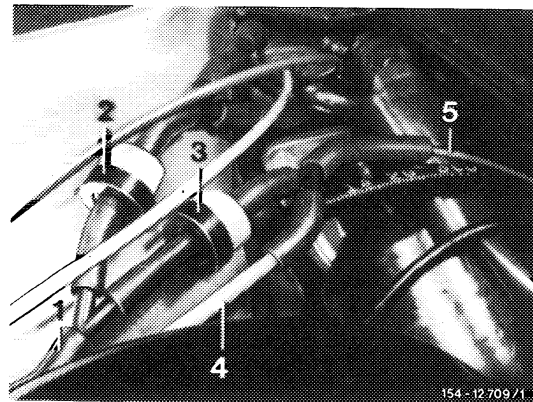
Vacuum connection models 107.022/042

- 1 Vacuum line (yellow) from vacuum connection
- 2 Vacuum line (yellow) to vacuum supply tank
- 3 Vacuum line (black/yellow) to actuator



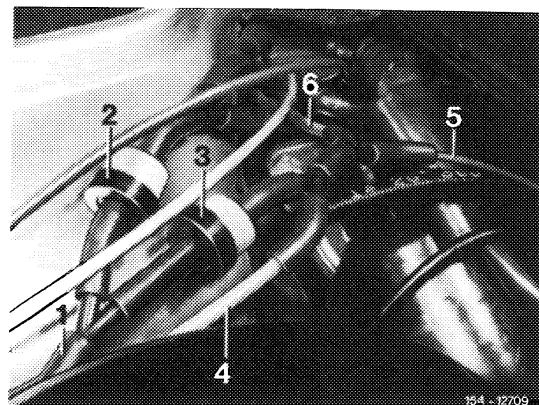
Vacuum connection cruise-control models 107.023/024/026/043/044

- 1 Vacuum line from vacuum connection
- 2 Check valve heating/air conditioning
- 3 Check valve cruise-control
- 4 Vacuum line (yellow) to vacuum supply tank
- 5 Vacuum line (black/yellow) to actuator



Vacuum connection cruise-control/central locking system models 107.023/024/026/043/044

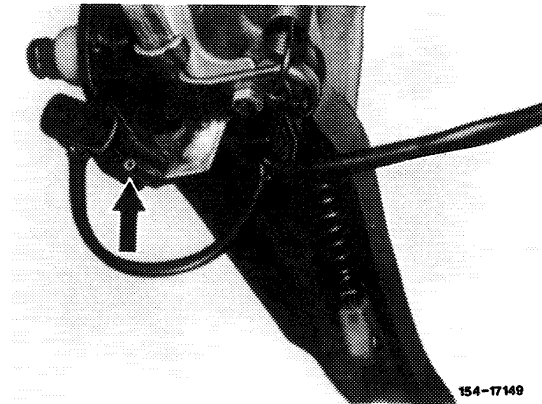
- 1 Vacuum line from vacuum connection
- 2 Check valve for heating/air conditioning
- 3 Check valve cruise-control/central locking system
- 4 Vacuum line (yellow) to vacuum supply tank
- 5 Vacuum line (black/yellow) to actuator
- 6 Vacuum line (gray/yellow) to vacuum switch



54–575 Removal and installation of switch on clutch pedal with manual transmission

Removal

- 1 Remove cover under instrument panel on driver's side.
- 2 Pull harness from switch (arrow).
- 3 Loosen switch (arrow) and remove.



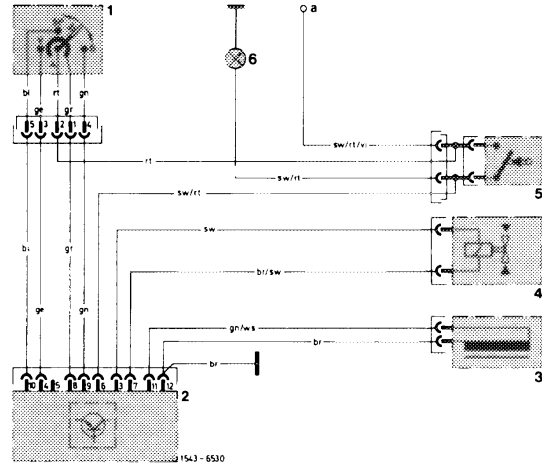
Installation

- 4 Installation begins in reverse order.
- 5 Perform function test on road.

54—580 Wiring diagram

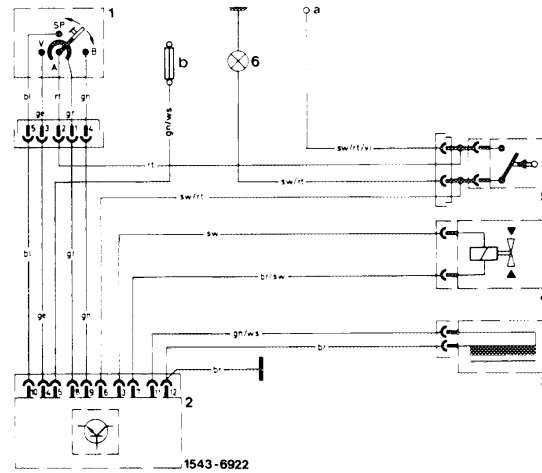
Version 1 (except model 116.036 and 123)

- 1 Switch
 - SP = Resume
 - V = Decel
 - A = Off
 - B = Accel
- 2 Control unir
- 3 Sensor
- 4 Actuator
- 5 Stop lamp switch
- 6 Stop lamp
- a Terminal 15



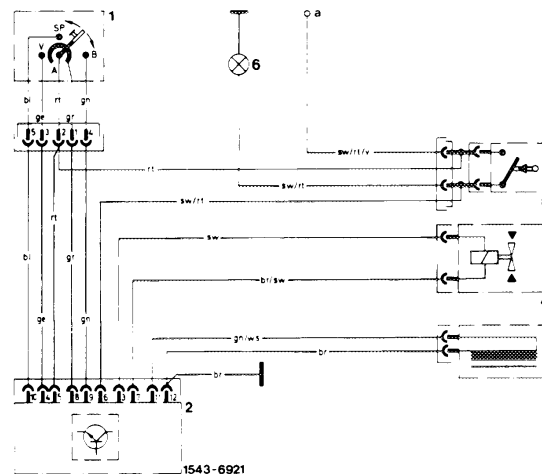
Version 1 (model 116.036 up to chassis end No. 000 689)

- 1 Switch
 - SP = Resume
 - V = Decel
 - A = Off
 - B = Accel
- 2 Control unir
- 3 Sensor
- 4 Actuator
- 5 Stop lamp switch
- 6 Stop lamp
- a Terminal 15
- b Fuse 4 in main fuse box



Version 2 all models (model 123 with automatic transmission from start of production)

- 1 Switch
 - SP = Resume
 - V = Decel
 - A = Off
 - B = Accel
- 2 Control unir
- 3 Sensor
- 4 Actuator
- 5 Stop lamp switch
- 6 Stop lamp
- a Terminal 15



The cruise control system is ready for operation when the ignition is switched on. However, for actual operation, the vehicle speed should be above approx. 40 km/h (approx. 30 mph). As soon as the vehicle is running at the desired speed, touching switch for a short moment in direction of "Accel – Set" or "Decel – Set" will keep this speed constant until the driver engages a different speed or the system is switched off. To adapt this set speed e.g. to the prevailing traffic situation, hold switch in direction of "Accel – Set" or "Decel – Set" until the desired speed is attained. On vehicles starting approx. 12.86, touching switch in direction of „accel – set“ or „decel – set“ will increase or reduce speed by 1 km each time. Acceleration or deceleration of the vehicle proceeds at a controlled speed of 0.7 m/s^2 . When the switch is released, the new speed will be maintained. When tipping switch in direction of „off“ for a short moment and stepping down on brake pedal or clutch pedal, the cruise control/Tempomat will be switched off and the regulating linkage will move into idle position.

When switching off with switch, the actuator motor which moves the regulating linkage into idle position will be activated. On the other hand, when switching off by means of stepping down on brake pedal or clutch pedal, the power flow in actuator is immediately interrupted by the electromagnetic clutch by means of disengaging a gear wheel. The retracting springs will pull the regulating linkage into idle position. Following disengagement, the system remains operational until the ignition is switched off. If upon actuation of brake or clutch or after switching off the switch is quickly tipped in the direction of "resume" at a vehicle speed above approx. 40 km/h, the vehicle will accelerate independently at 1 m/s^2 to the previously "set" speed. The previously set speed is cancelled when the ignition is switched on.

If the set speed is exceeded by acceleration, e.g. while passing other vehicles, the vehicle will automatically return to the previously set speed when the accelerator pedal is released.

If the engine power is not enough when driving uphill, the set speed drops and will be automatically recovered when the gradient is easing off and the speed has not dropped to below approx. 40 km/h (30 mph).

Attention!

While driving with cruise control, do not engage selector lever "N" of automatic transmission, since this will lead to revving up of engine.

The following safety circuits are installed in system:

In the event of a defective stop lamp switch, the electromagnetic clutch in actuator will be activated by control unit at a deceleration of more than 1.5 m/s^2 and will disengage a gear wheel, so that the power flows in actuator (engine/drive axle) is immediately interrupted and the regulating linkage will be moving into idle position.

Operation of electromagnetic clutch in actuator is monitored by control unit during each braking operation. If the power flow in actuator is not interrupted in the event of a defective clutch, the control unit will activate the actuator motor, which will then move the regulating linkage into idle position. This procedure is recorded by control unit, and the system will be made inoperative until the ignition is switched off. When the ignition is switched on again, the system functions normally until it is again made inoperative during the next braking operation as a result of the defective electromagnetic clutch.

If for any reason, the specified speed is exceeded by more than 6 km/h (4 mph), the control unit activates the electromagnetic clutch in actuator, which interrupts the power flow in actuator (engine/drive axle). If the specified speed is again attained, the electromagnetic clutch reestablishes the power flow.

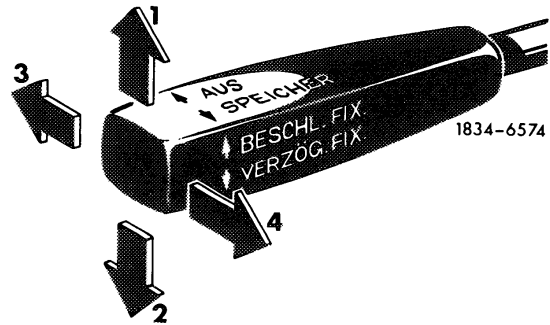
The cruise control/Tempomat comprises essentially four structural elements:

Switch, control unit, speedometer with cruise control/Tempomat connection and actuator.

In vehicles equipet with manual transmission an additional switch is installed which is actuated by the clutch pedal.

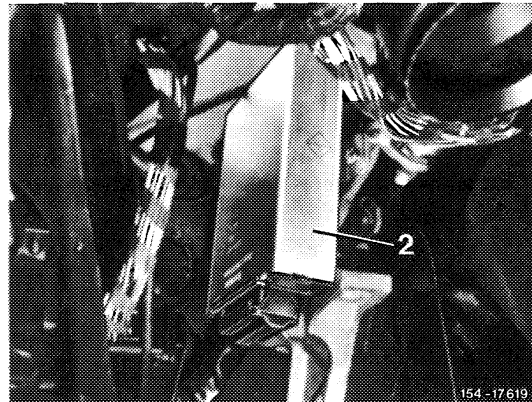
Switch

- Position "1" or "2" touch = speed is set
- Position "1" hold = set speed is increased.
- Position "2" hold = set speed is reduced.
- Position "3" touch = cruise control is switched off.
- Position "4" touch = the speed set prior to switching-off is automatically recovered at a speed above approx. 40 km/h (30 mph).



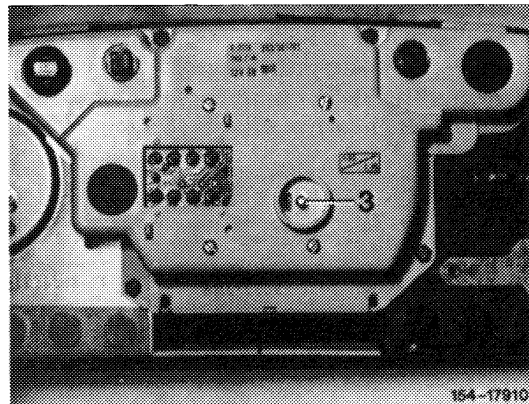
Control unit

The control unit (2) compares the actual speed and the selected speed. In the event of a deviation from the selected speed, the control unit (2) will send pertinent control signals to the actuator (4) until the actual speed and the selected speed are again in agreement.



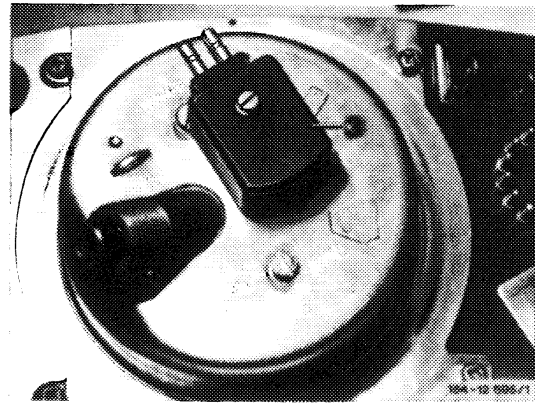
Electronic speedometer with cruise control/Tempomat connection

Control unit (2) receives the actual speed signals from cruise control/Tempomat connection (3) of speedometer.



Mechanical speedometer with sensor

The control unit is provided with the actual speed signals from sensor (3) of speedometer.



Actuator

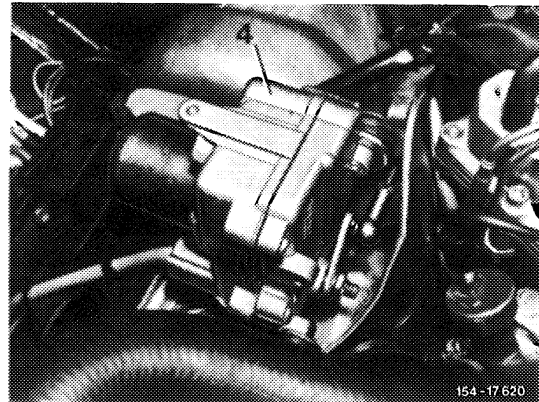
The actuator (4) receives its control signals from control unit (2) and actuates the regulating system by means of a connecting rod. The actuator comprises an electric motor with gear unit, a free-wheeling unit, a potentiometer and an electromagnetic clutch.

The electric motor drives the drive axle, which is provided with a free-wheeling unit, by way of the gear unit.

The free-wheeling unit permits, e.g. at set speed, acceleration by means of accelerator pedal for passing other vehicles, without actuating cruise control.

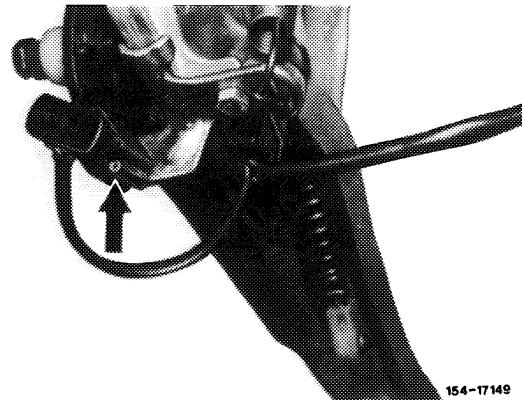
The potentiometer reports the position of the output shaft back to control unit.

The electromagnetic clutch establishes the power flow between electric motor and output shaft. The clutch is engaged by the following switch positions: Accel – Set, Decel – Set and Resume. The electromagnetic clutch interrupts the power flow immediately when the brake or the clutch is actuated, but also when the system is switched off with switch and the regulating linkage has attained the idle position.



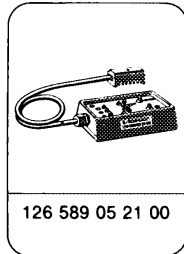
Switch actuated by clutch pedal on manual transmission

When stepping down on clutch pedal, the switch (arrow) interrupts the ground connection from stop lamps to control unit. The cruise control will then be immediately switched off similar to braking.



54–504 Testing with adapter

Special tool



Notes

Test cruise control/Tempomat with adapter only. If other testing and measuring instruments are used, the cruise control/Tempomat may be destroyed. During this test, the cruise control/Tempomat system is tested with the exception of the control unit.

Faults can be found by means of the adapter only if cruise control/Tempomat is permanently not functioning. Complaints such as temporary failure or poor control characteristics (e.g. shaking) cannot be checked with adapter. In such cases, proceed according to programmed repairs.

If testing with adapter indicates a faulty component, check plug connections for good contacting prior to replacement, e.g. the plug sockets should not be widened. Reshape widened plug sockets. Then check respective component once again.

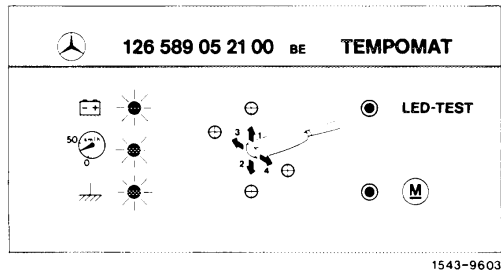
Prior to testing by means of adapter, check battery voltage (> 11 V), stop lamps and speed indication for function. Repair, if required, and check cruise control/Tempomat for function prior to testing with adapter.

Preparation for test

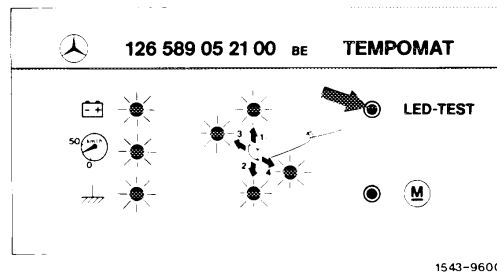
- 1 Remove cover under instrument panel on side of driver.
- 2 Pull 14-point plug from control unit.
- 3 Connect test adapter to 14-point plug.
- 4 Test jacks in 14-point plug, reshape widened bushings.

5 Switch on ignition. The following LED readouts will light up, if no fault is indicated.

Symbol	Models
Battery	all
km/h	123 with sensor on mechanical speedometer
Ground	107 with engine 103, 116.960 (USA) (J) 116.962 except (CH) up to 83, (AUS) 116.964 and 117, 123 with engine 617.95 except (USA) 81, 126 with engine 116.96, (USA) 116.963 except (CH) (S) up to 83, (AUS) 116.965 and 117



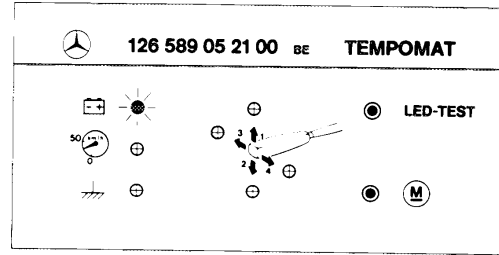
5 Push "LED-TEST" push-button of test adapter and check whether all LED readouts are lighting up. If no LED readout is lighting up check connection of voltage supply and line-up of 14-pole coupler (refer to wiring diagram 54-580).



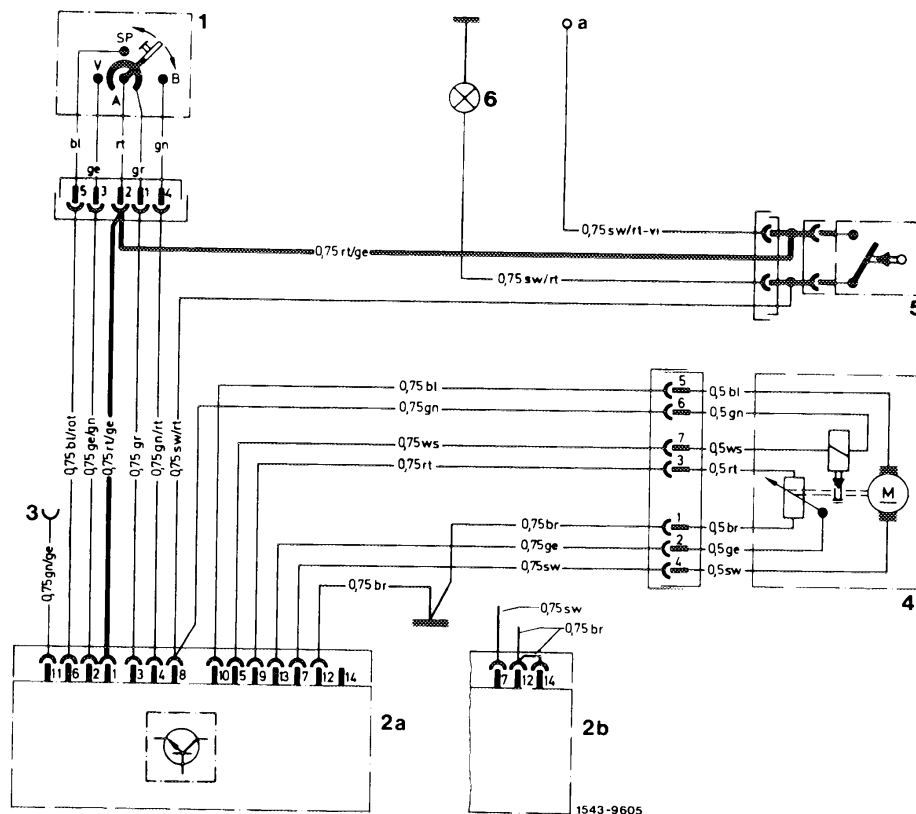
Test

Voltage supply on all models	
LED readout lighting up	
yes	no

Check lines for correct connection and passage, while paying attention to changed voltage supply (refer to 54–580).



1543-9604



1543-9605

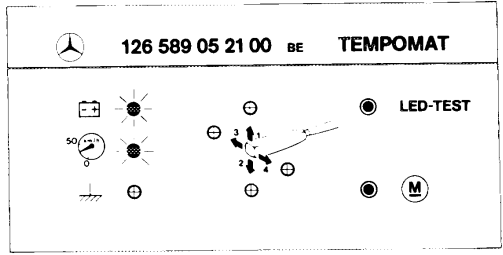
Wiring diagram up to 08/81

- 1 Switch
- 2 a Control unit
- 2 b Control unit
- 5 Stop lamp switch

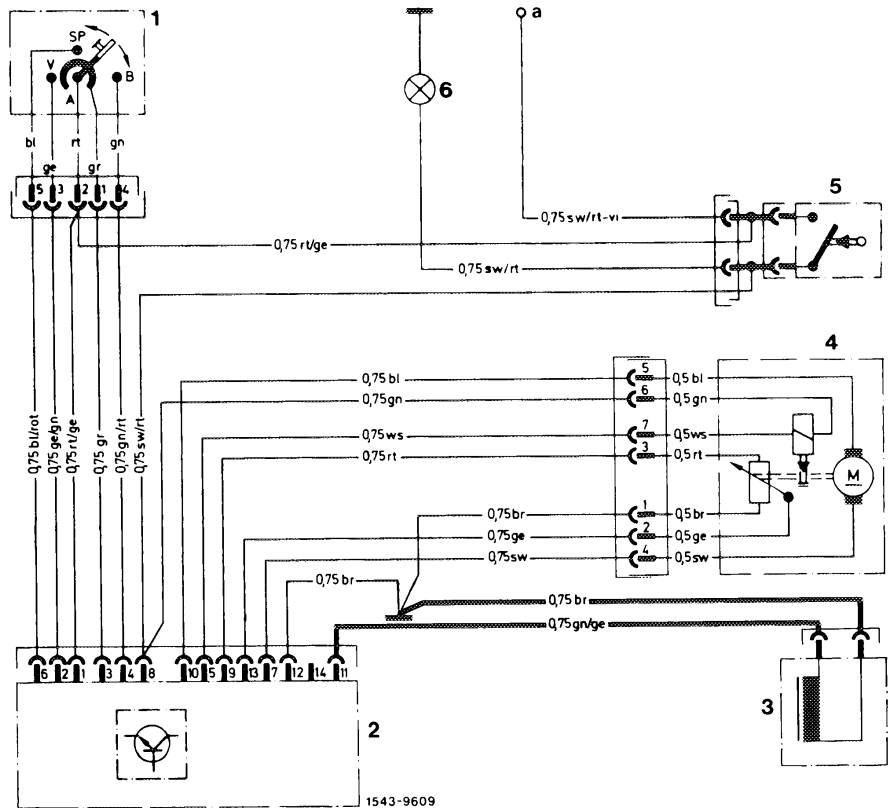
Sensor on mechanical speedometer
 model 123 (except 123.033/053 (J) 1981 and 123.193 (USA) 1981)

LED readout lighting up

yes | no



Test lines for correct connection
 and passage.
 Replace sensor.



2 Control unit
 3 Sensor
 for model 123 except 123.033/053 (J) 1981 and 123.193 (USA) 1981

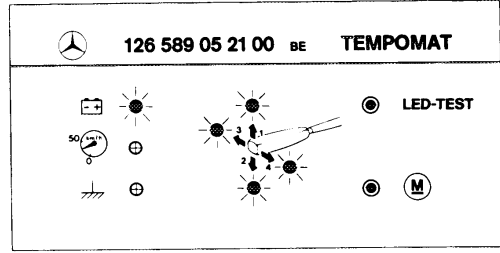
Checking line harness and cruise control switch

Cruise control switch position	LED readout
Accel	1
Decel	2
Off	3
Resume	4

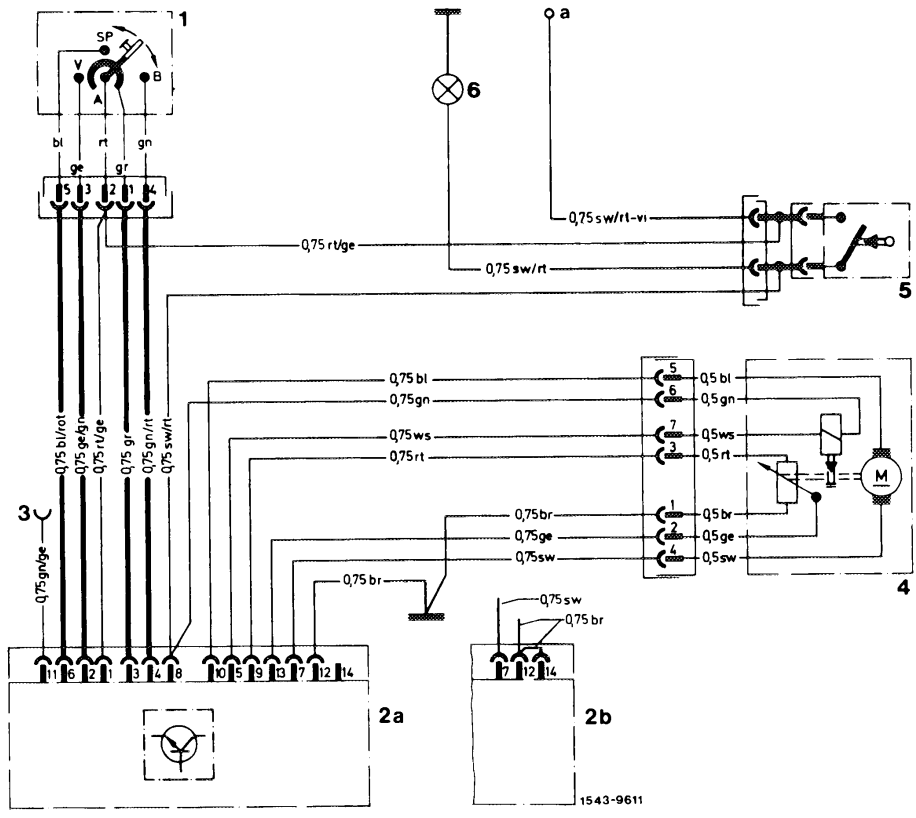
Respective LED readout lighting up

yes	no

Test lines for correct connection and passage.
Replace switch.



1543-9610

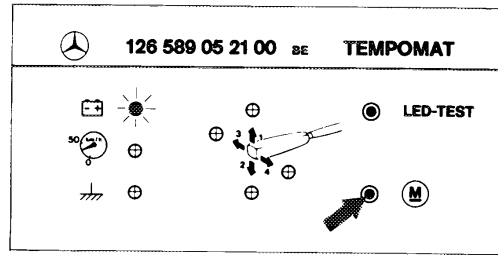


- 1 Switch
- B Accel
- V Decel
- A Off
- SP Resume
- 2a Control unit
- 2b Control unit

Testing actuator.
Depress push-button switch M.

Regulating linkage and accelerator pedal are moving uniformly to full throttle position and remain there.

yes | no



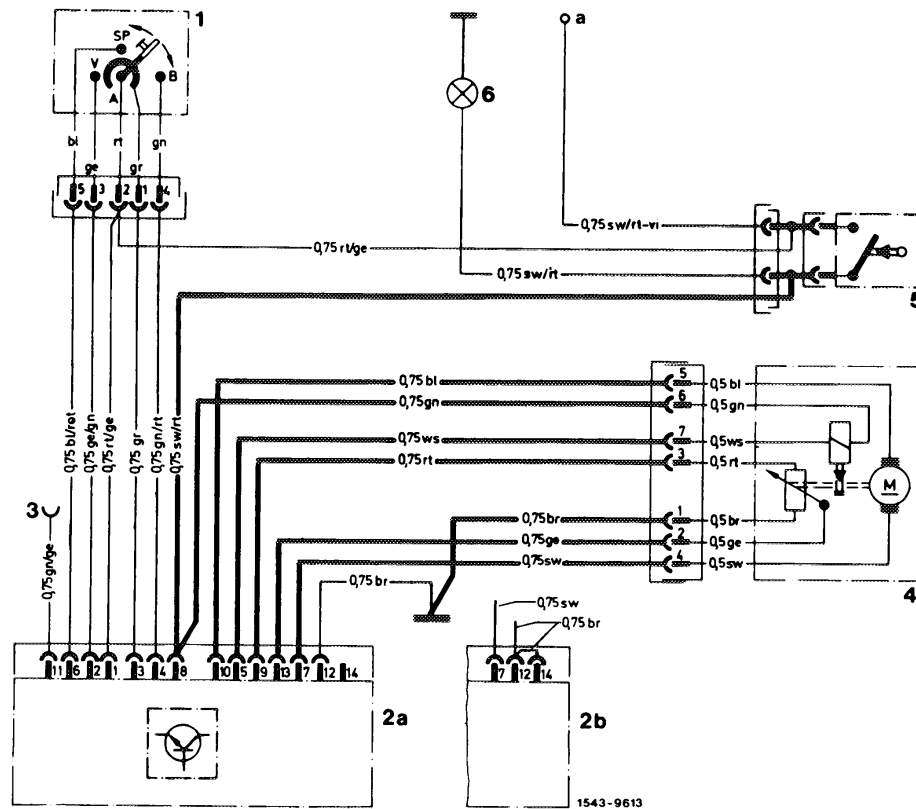
1543-9612

Regulating linkage and accelerator pedal are not moving:

- 1 Check regulating linkage.
- 2 Check lines for correct connection or passage, pay attention to changed voltage supply (54–580).
- 3 Replace actuator.

Regulating linkage and accelerator pedal are constantly moving back and forth:

- 1 Test contacting of plug connection line harness/actuator harness.
- 2 Replace actuator.



1543-9613

Wiring diagram up to 08/81 2 Control unit 4 Actuator 5 Stop lamp switch

Test cruise control cutout while braking.
 Depress push-button **M**.
 Regulating linkage and accelerator pedal
 in full throttle position!
 Push brake pedal.

Regulating linkage and accelerator pedal are
 immediately moving into idle position.
 Then release push-button switch.

yes | no

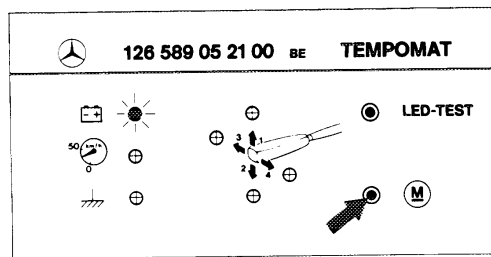
Test regulating linkage for
 easy operation.

Replace actuator.

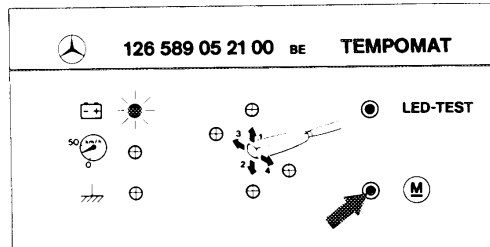
Test cruise control cutout while declutching
 (manual transmission only).
 Pushbutton **M** is pushed.
 Regulating linkage and accelerator
 pedal are in full throttle position!
 Depress clutch pedal.

Regulating linkage and accelerator pedal will
 move immediately into idle position. Then
 release pushbutton switch.

yes | no



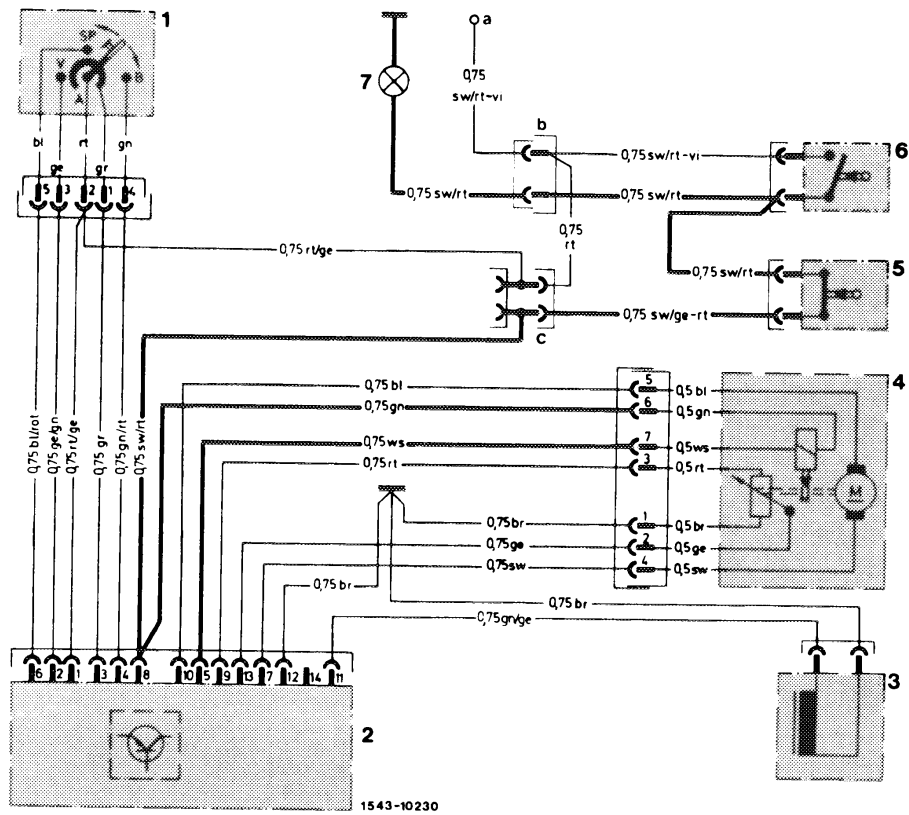
1543-9612



1543-9612

Lines are shorted.

Switch on clutch pedal defective.



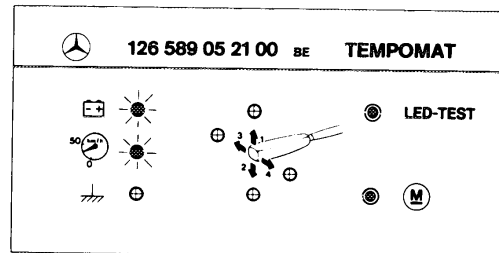
Test harness and cruise control connection of electronic speedometer, speed readout should be in order.

Models 107, 123.033/053 (J) 1981, 123.193 USA 1981 and 126, drive vehicle at max. 50 km/h.

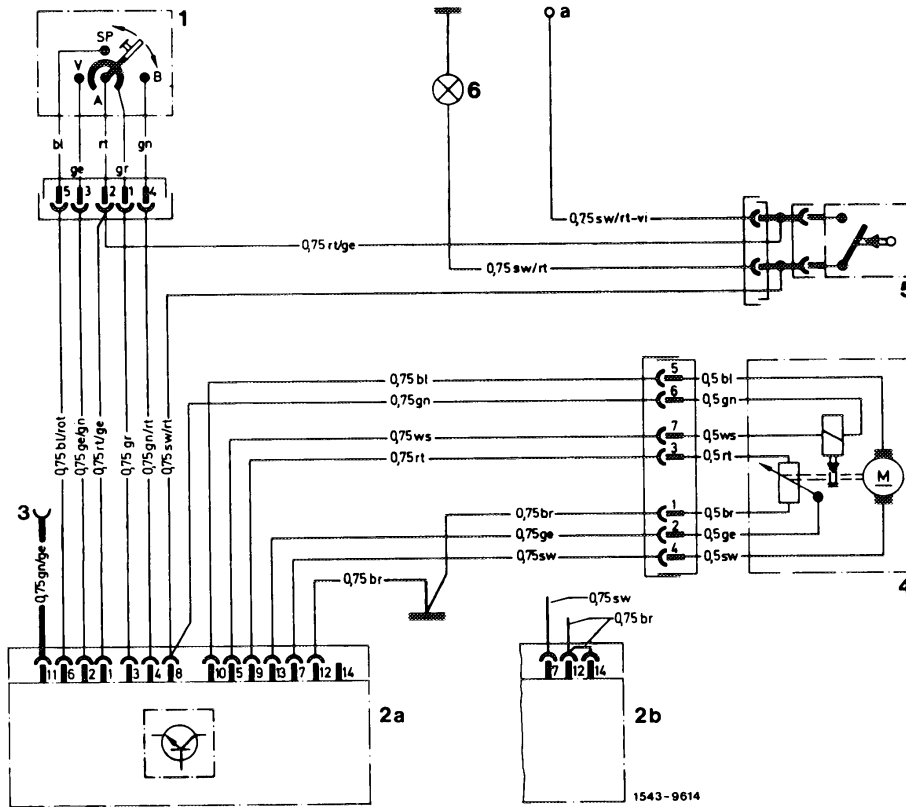
LED readout flashes or lights up.

yes

no



Test lines for correct connection and passage.
 Replace speedometer.



- 2a Control unit
- 2b Control unit
- 3 Cruise control connection on speedometer

Disconnect test adapter.

End of test.

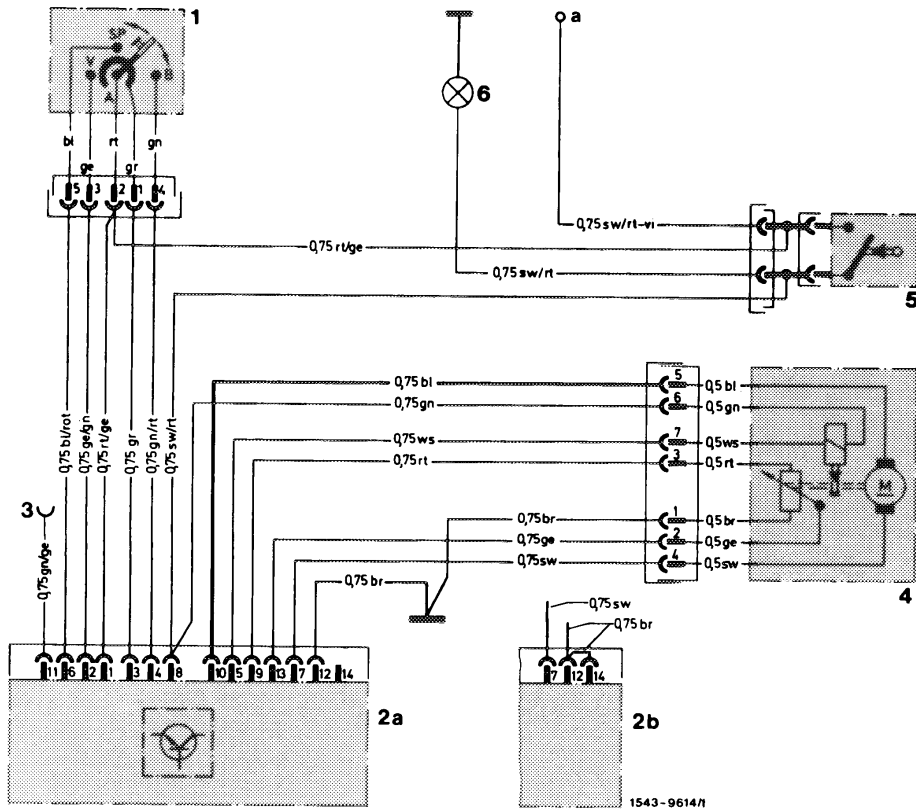
Check blue line from plug connection actuator jack 5 to plug connection control unit plug 10 for ground connection.

Ground connection

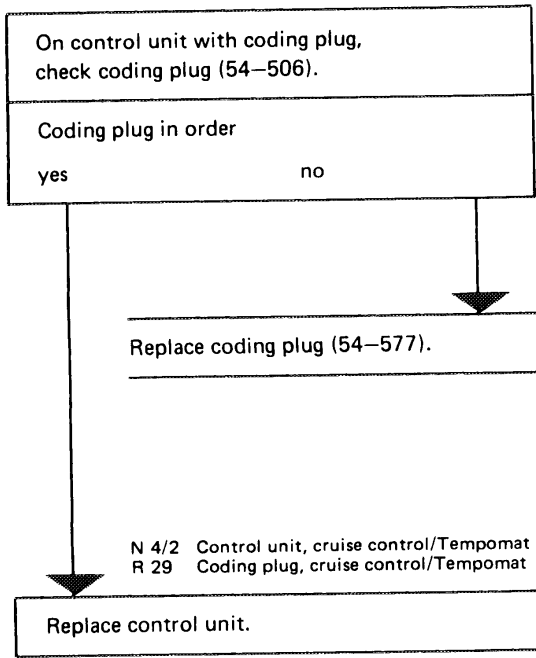
no

yes

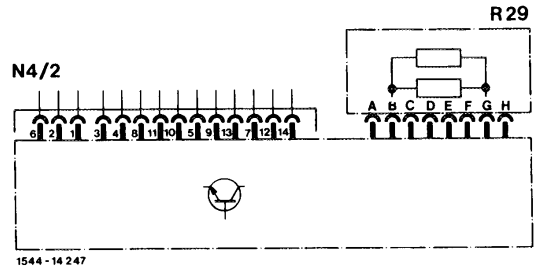
Recondition blue line or replace.



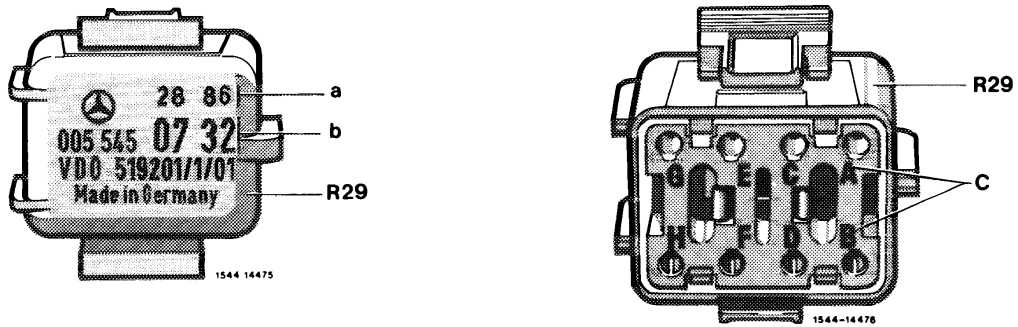
2a Control unit
2b Control unit
4 Actuator



End of test.



54-506 Testing coding plug



Coding plug (R 29) Remove (54-577)
 Ohmmeter Connect (refer to table)
 Resistance values Check (refer to table), replace coding plug (R 29) if values are deviating.

- a Production date
- b Part number
- c Designation of jack

Test table – resistance values

Part number	Connection ohmmeter on jack designation						
	A-D	B-E	D-C	D-H	E-D	E-F	E-G
005 545 07 32	∞	1470-1530 kΩ	0.01-15 Ω	3.21-3.27 kΩ	∞	26.2-27.2 kΩ	501-521 kΩ
005 545 08 32	∞	1470-1530 kΩ	0.01-15 Ω	1.18-2.02 kΩ	∞	25.2-27.2 kΩ	501-521 kΩ

Conventional tool

Multimeter	SUN	DMM-5
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54-541 Removal and installation of actuator

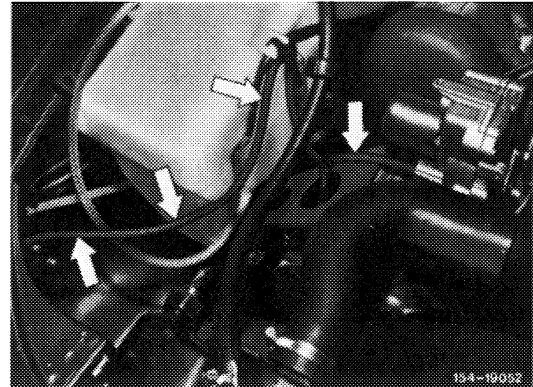
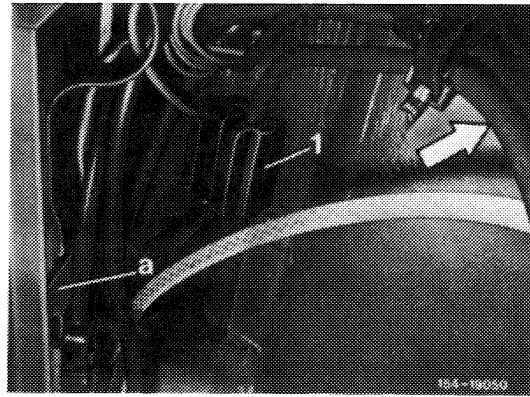
B. Models 107.025/026/045/046/047/048
126.03/04

Removal

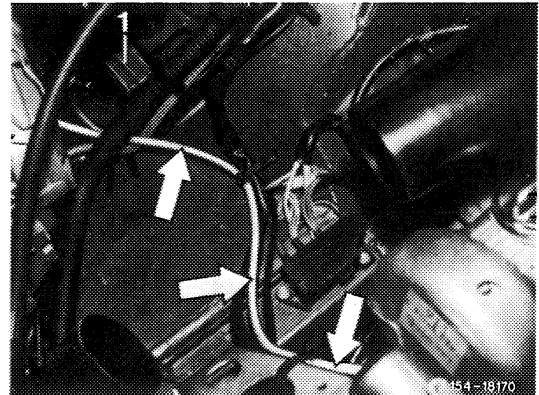
1 Separate plug connection (1) and loosen harness of actuator.

Models 107.025/026/045/046/047/048

- 1 Plug connection
- a Radiator supporting frame inside right



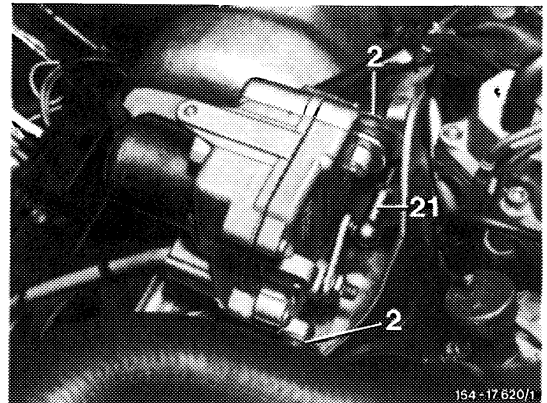
Models 107.025/026/045/046/047/048

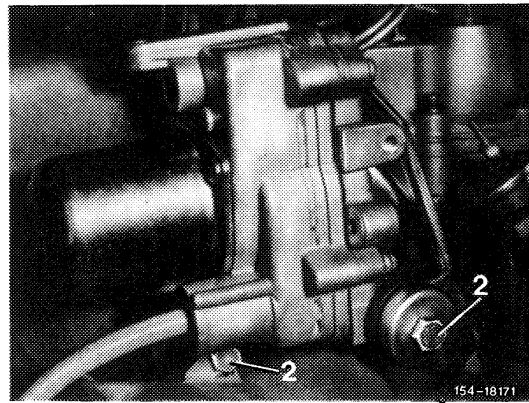


Models 126.03/04

2 Disconnect connecting rod (21) on actuator.

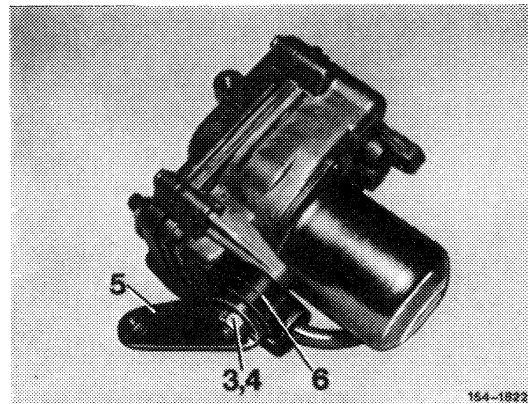
3 Unscrew screws (2) and remove actuator.





4 Loosen nut (3) with washer (4) for holder (5). Then unscrew rubber mount (6) with holder (5) from actuator.

5 Remove lever from actuator.



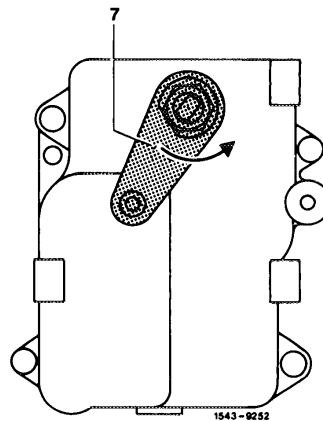
Installation

6 Turn output shaft of actuator opposite to direction of arrow against stop. Mount lever (7) and secure nut.

7 For installation proceed vice versa. Make sure that rubber mount (6) is not distorted.

8 Adjust connecting rod (21) (54-561).

9 Perform function test on road.



54-545 Removal and installation of switch

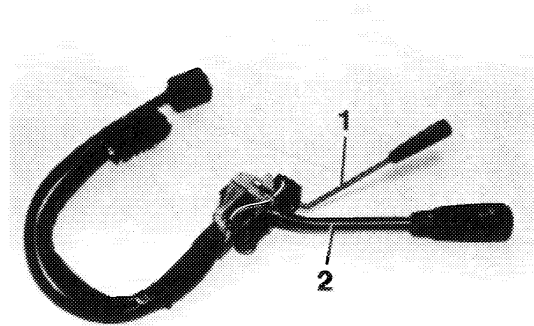
A. Models 107, 123

Removal

- 1 Remove combination switch.
- 2 Remove switch (1) from combination switch (2).

Installation

- 3 For installation proceed vice versa.
- 4 Operational checkup on road.

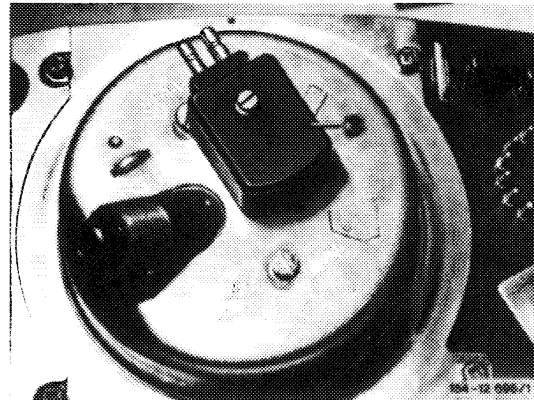


154 - 11976/1

54–550 Removal and installation of sensor on mechanical tachometer

Removal

- 1 Remove instrument cluster.
- 2 Pull harness from sensor (3).
- 3 Unscrew sensor (3) from tachometer.



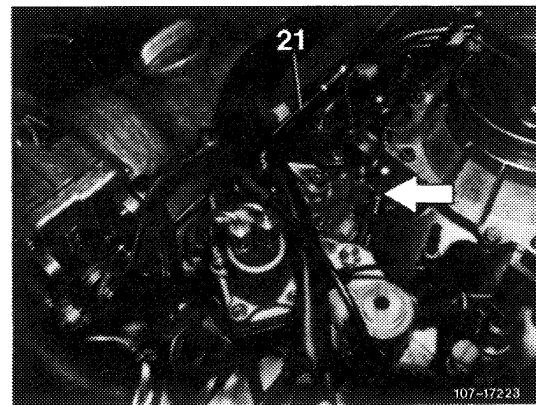
Model 123

Installation

- 4 For installation proceed vice versa.
- 5 Perform function test on road.

F. Engines 116 and 117

- 1 Disconnect connecting rod (21) on actuator.
- 2 Push lever of actuator clockwise to idle.
- 3 Turn ball head of connecting rod (21) in such a manner that it is approx. 1 mm longer.
- 4 Attach connecting rod (21) and counterlock ball head.



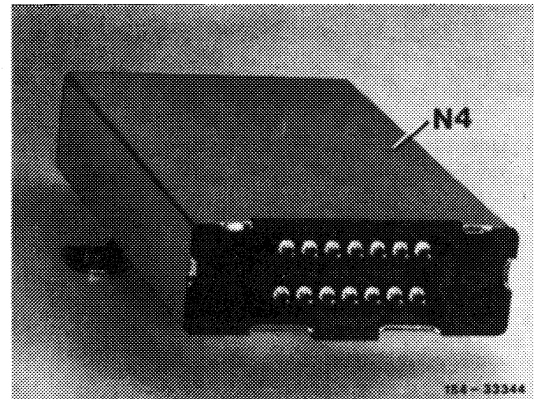
A. General

On models 107 and 126 with 8-cylinder engine a new control unit with coding plug will be installed starting approx. 12.86. The 6-cylinder models will be phased in.

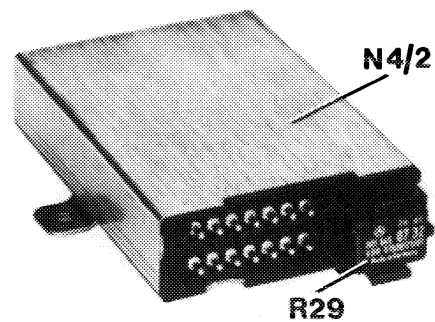
After using up spare parts stocks, only the new control unit and the respective coding plug will be available.

The new control unit with coding plug has no influence on cable lines and thereby also on wiring diagrams. Installation can proceed without changing harness.

N4 Control unit cruise control/Tempomat without coding plug



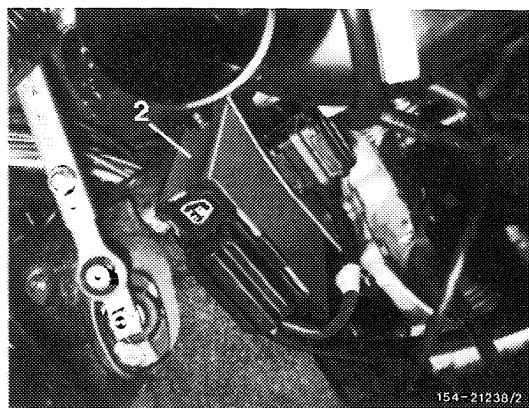
N4/2 Control unit, cruise control/Tempomat
R 29 Coding plug, cruise control/Tempomat



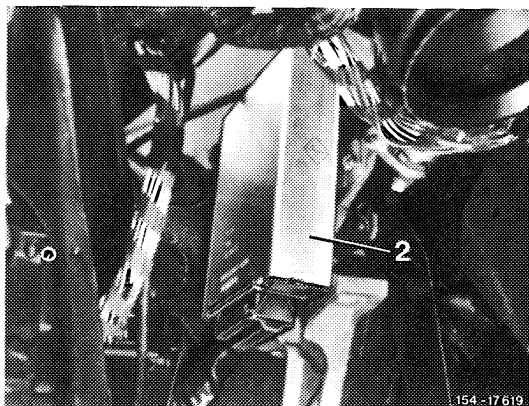
B. Models 107, 123, 126 lefthand steering with automatic transmission

Removal

- 1 Remove cover under instrument panel on driver's side.
- 2 Pull plug from control unit (2).
- 3 Unscrew control unit (2) with holder on pedal bearing bracket.
- 4 Unscrew control unit (2) from holder.



Model 107



Models 123, 126

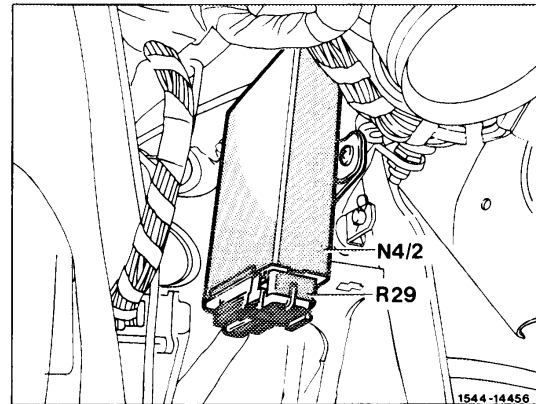
Installation

- 5 For installation proceed vice-versa.
- 6 Check adjustment of connecting rod (21) and re-adjust, if required (54–561).
- 7 Perform function test on road.

54—566 Removal and installation of control unit coding plug (models 107, 126 starting approx. 12.86)

Removal

- 1 Disconnect battery.
- 2 Remove cover under instrument panel on driver's side.
- 3 Pull coding plug R 29 from control unit N 4/2, while compressing the two lateral locking lugs.



Installation

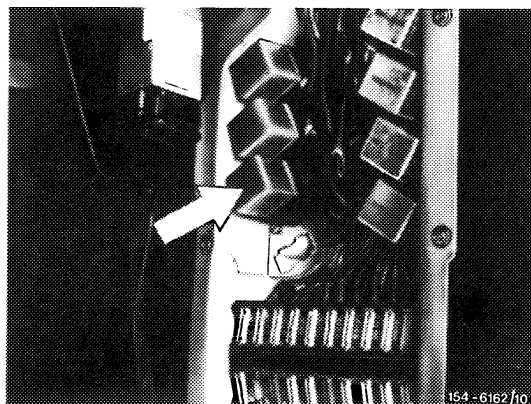
- 4 For installation proceed vice versa.
- 5 Perform function test on road.

54–577 Removal and installation of relay decel shutoff / cruise control

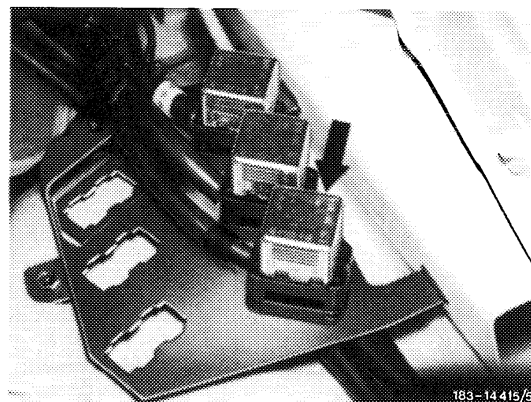
Removal

- 1 On model 107, remove air duct and panelling on front passenger's side.
- 2 On models 123 and 126, remove cover from relay holder or from fuse box.
- 3 Pull off relay (identification, surface painted yellow) and remove.

Layout model 107



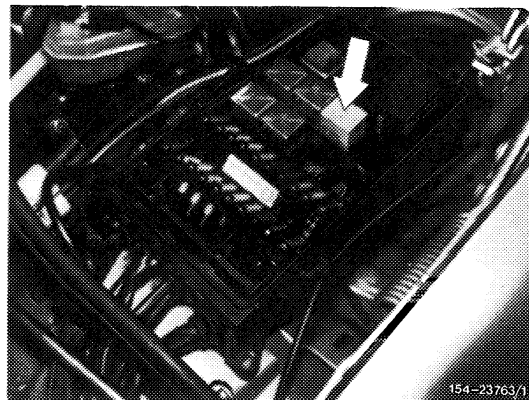
Layout model 123



Installation

- 4 For installation proceed vice versa.
- 5 Perform function test on road, vehicle should not start shaking not even during deceleration.

Layout model 126



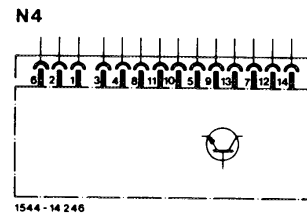
A. General

On models 107 and 126 with 8-cylinder engine a new control unit with coding plug will be installed starting approx. 12.86. The 6-cylinder models will be phased in.

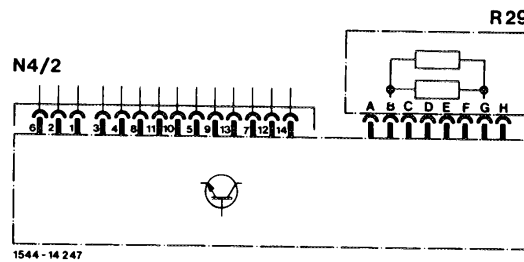
After using up spare parts stocks, only the new control unit and the respective coding plug will be available.

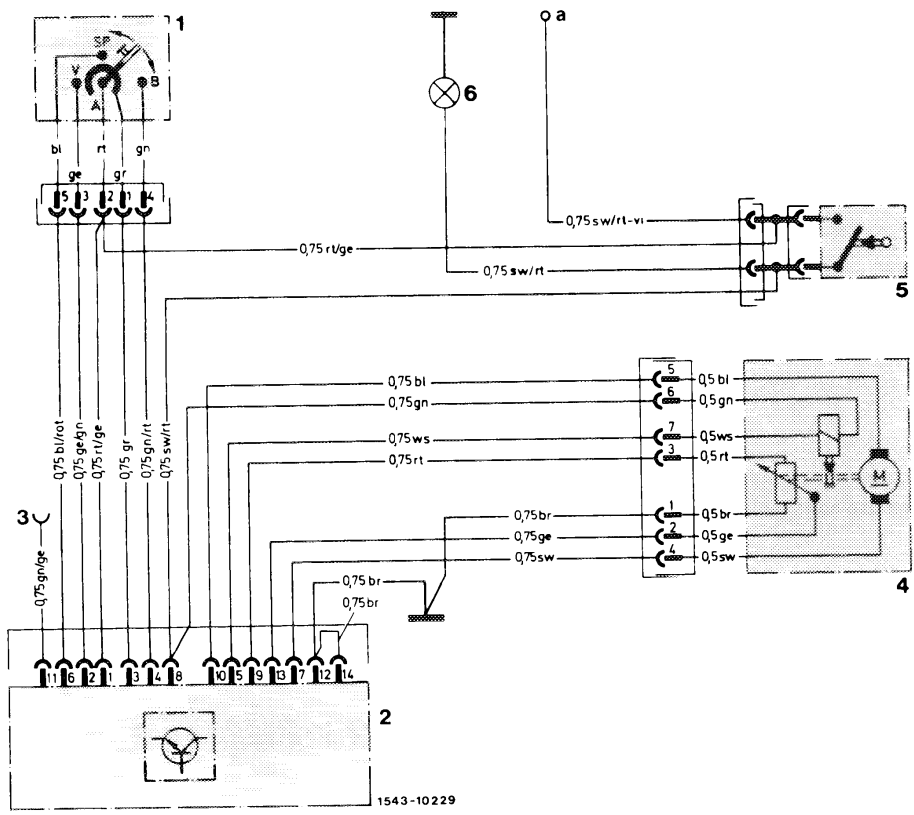
The new control unit with coding plug has no influence on cable lines and thereby also on wiring diagrams. Installation can proceed without changing harness.

N 4 Control unit, cruise control/Tempomat without coding plug



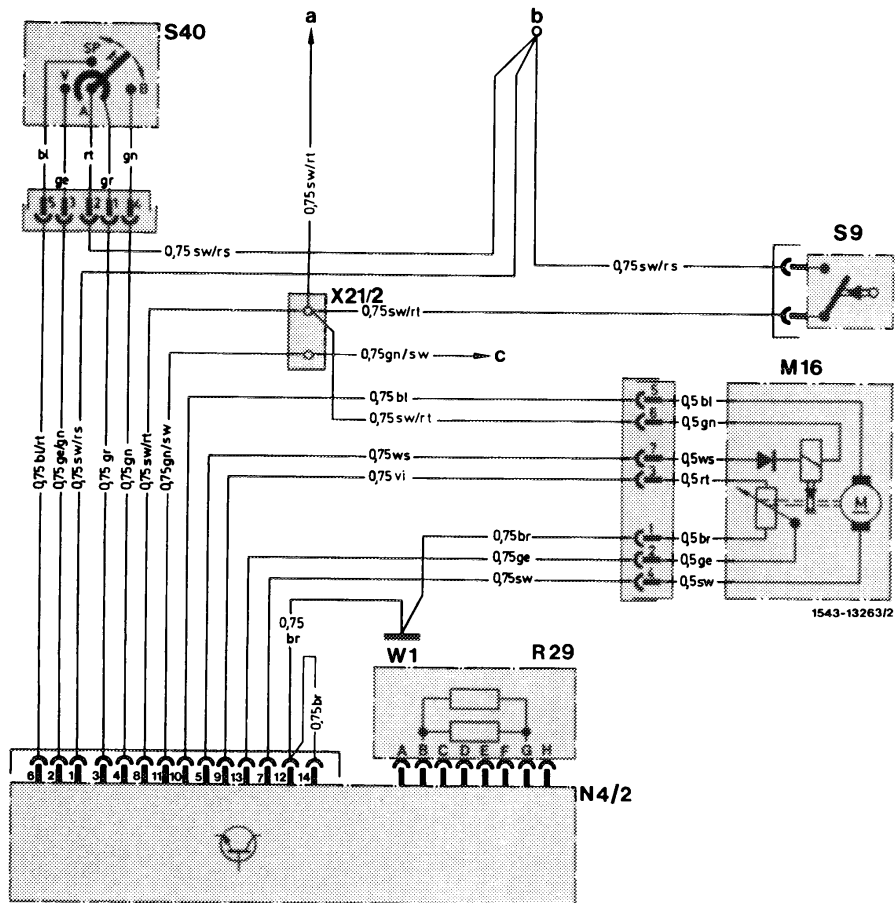
N4/2 Control unit, cruise control/Tempomat
R 29 Coding plug, cruise control/Tempomat





Model 107 with engine 116.960/962 (USA) (J) and 117.960 up to approx. 02/80

- | | | |
|-------------|--------------------------|--------------------|
| 1 Switch | 2 Control unit | 5 Stop lamp switch |
| SP = Resume | 3 Speedometer connection | 6 Stop lamp |
| V = Decel | 4 Actuator | a Terminal 15 |
| A = Off | | |
| B = Accel | | |



Model 107 with engine 116.964, 117.964/967 starting approx. 12.86

M 16 Actuator, cruise control/Tempomat
 N 4/2 Control unit, cruise control/Tempomat with coding plug
 R 29 Coding plug, cruise control/Tempomat
 S 9 Stop lamp switch
 S 40 Pushbutton switch cruise control/Tempomat

W 1 Main ground (behind instrument cluster)
 X 21/2 Cable connector stop lamp switch/electronic speedometer
 a To N 7 lamp monitoring unit, assignment 15
 b To fuse 5, terminal 15
 c To speedometer (speed signal)

SP = Resume
 V = Decel
 A = Off
 B = Accel





Mercedes-Benz

Service

**Service Manual
Chassis and Body
Model 107
Volume 2**

Mercedes-Benz of North America Inc.

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Mercedes-Benz

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Caution

Our service manuals contain descriptions of important assembly, adjustment and inspection jobs. Special tools required in performing certain service jobs are identified in the manual and recommended for use. Any part numbers given are only used for identification and easier differentiation between individual components, and are not intended for ordering purposes.

All procedures, illustrations and specifications contained in these manuals were based on the latest information available at the time of publication. If your Mercedes-Benz model differs from the specifications contained in the manual you select, consult your authorized Mercedes-Benz dealer.

Remember, the proper performance of services is essential for both the safety of the mechanic and the efficient operation of the vehicle. The procedures in these manuals are described in such a manner that the service may be performed safely and accurately.

However, it is always assumed that the reader is familiar with basic automotive repair procedures and Mercedes-Benz vehicles.

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Introduction

This Service Manual is the product of existing technical publications. Special care has been taken to provide accurate information on removal, disassembly, assembly, inspection, installation, and adjusting procedures, backed with the technical data necessary to do the job.

The material in this manual is divided according to the Mercedes-Benz Component Group System as outlined on the GROUP INDEX page. This page will quickly direct the reader to the Major Component Group. Each Major Component Group begins with a JOB INDEX listing all jobs within that group.

Mercedes-Benz of North America, Inc. recommends that repairs to, and maintenance of, Mercedes-Benz automobiles be performed only by Mercedes-Benz **trained personnel** at authorized Mercedes-Benz dealerships.

The information contained in this special publication is ordinarily issued by Mercedes-Benz of North America, Inc., in conjunction with supplementary service literature and special tools supplied only to its authorized dealers. The repair and maintenance procedures outlined herein are procedures to be used by **trained Mercedes-Benz service and dealership personnel**. Supplementary service literature will not be provided with this publication, but may be contained in reprints of this Service Manual.

Please note that this manual has been compiled from various sources, some of which cover models other than the subject of this book. Always refer to the engine and vehicle identification table for model and component information.

The information contained in this manual was accurate to the best of our knowledge at the time the manual was approved for publication. However, the right is reserved to make production, design and specification changes at any time, without notice and without obligation to give notice. Any such changes will not be contained in this manual.

Mercedes-Benz of North America, Inc. assumes no liability for any damage to person or property caused by the utilization of this publication to effect maintenance or repair work on Mercedes-Benz automobiles.

MERCEDES-BENZ OF NORTH AMERICA, INC.
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67—100 Removal and installation of windshield

Data

Rim for primer on windshield	Width: 10 mm
------------------------------	--------------

Conventional tools

Syphon	e.g. made by Karl Assfalg KG Buchstr. 149 D-7070 Schwäbisch Gmünd order No.: 602-2
Removing tool (Glas-Ex and cutting wire)	e.g. made by Manfred Herrmann Johann-Sebastian-Bach-Str. 6 D-8023 Pullach im Isartal order No. 58 671 Glas-Ex order No. 58 672 cutting wire refill package 200 m

Note

The windshield glass on model 107 can be glued-in with varying glueing materials: Solbit, Betaseal or Butyl.

Solbit: Solbit is an electrothermically fully curing synthetic rubber compound with inserted heating wire.

Characteristics: Firm glueing compound, inserted heating wire. This material has been used in series production for model 107.02 up to May 1979, and for model 107.04 up to December 1980.

Betaseal: Betaseal is a pumpable polyurethane single-component adhesive sealing compound for making very firm, but elastic connections.

Characteristics: Permanently elastic glueing compound, without heating wire. This material is included in repair package 107 586 03 67 available up to now.

Butyl: Butyl is a permanently elastic adhesive molding with inserted heating wire (adhesive cord).

Characteristics: Permanently elastic glueing compound, with heating wire. This material is included in repair package 126 586 00 67.

Introduction into series: May 1979, model 107.02; January 1981, model 107.04.

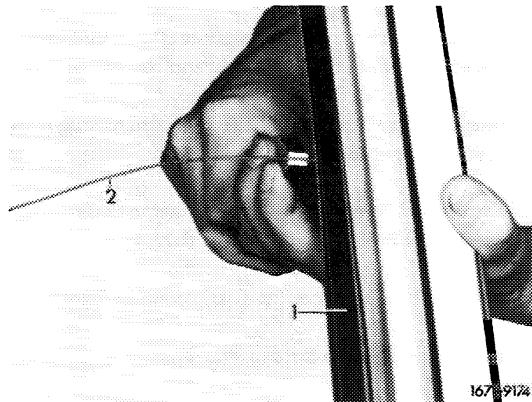
Prior to removing windshield glass, check in accordance with characteristics named above which type of glueing material has been used for installation. For removal, use method fitting the respective adhesive material.

- Removal with cutting wire (Solbit and Betaseal).
- Removal by heating resistance wire (Butyl).

Removal

- 1 Fold back roadster top or remove coupe top.
- 2 Remove ornamental frame on windshield (68–540).
- 3 Remove reveal molding on windshield (68–400 or 410).
- 4 Cover weather strips, front wall pillar and center piece under windshield with adhesive tape as a protection against damage.
- 5 Cut off cutting wire to approx. 900 mm.
- 6 Introduce cutting wire (2) on long removing tool (14) laterally into end of handle and tighten with knurled nut. Guide cutting wire (2) at lower end through bore in outward direction (Fig. refer to item 8).

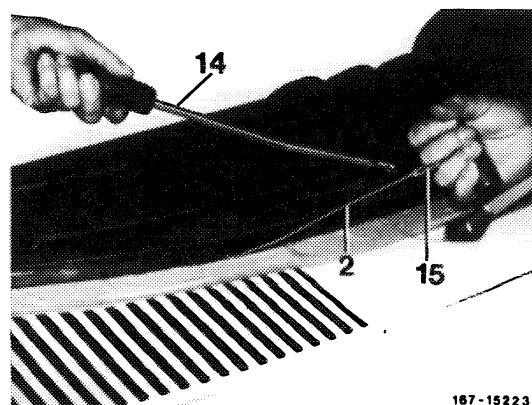
7 Stick end of cutting wire (2) with pliers from inside through glueing cord (1) (as closely as possible near flange).



8 Thread other end of cutting wire at short handle (15) and clamp down with knurled screw.

9 Tension cutting wire (2) inside with removing tool (14).

Note: To make sure that the cutting wire (2) is not damaging front sealing strip on instrument panel, push cutting wire with a spatula against inside of windshield pane while cutting.

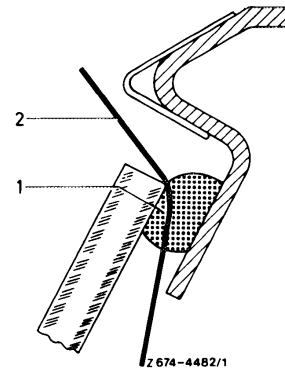


10 Let a helper pull on short handle and cut adhesive cord (1), while guiding the cutting wire (2) in such a manner that the glass edge is not damaged. If required, push cutting wire (2) along cutting edge against body flange by means of a wedge. Cut glass edges carefully in steps of 10 mm each.

11 Remove windshield glass.

12 Clean body flange mechanically by means of a wedge made of wood or plastics.

Note: When reusing the removed windshield, clean likewise.



Removal by heating resistance wire

Note

The windshield is glued to body by means of an adhesive cord. For removal and installation of a windshield, the adhesive cord is converted into a plastic condition by heating. This is done best by connecting the copper wire located in center of adhesive cord to a source of electric energy. Such a source is a well charged 12-volt vehicle battery.

The heating-up period of the adhesive cord generally amounts to approx. 15 minutes for a wire dia. of 0.3 mm. At the end of this period, the adhesive cord has a temperature of approx. 50°C in connection range of copper wire. This temperature is enough for removing the glass free of damage.

The following factors are influencing the heating-up period:

- a) Diameter of copper wire: 0.3, 0.4, 0.7 mm (the thicker, the shorter the heating period).
- b) Aging of adhesive cord (the older, the longer the heating period).
- c) Temperature of glass and body (the colder, the longer the heating period).
- d) Condition of glass (glass already damaged can be pushed out by applying increased force after a short heating-up period).

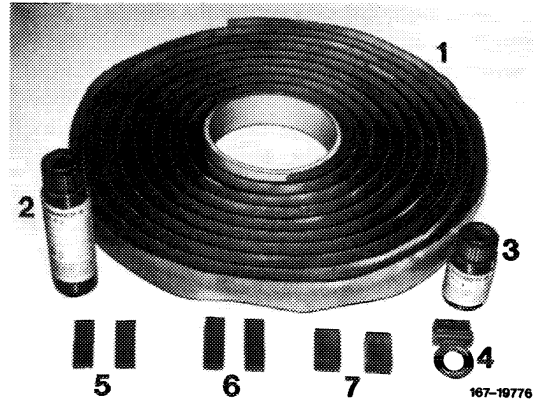
Replacement of windshield glass requires repair kit for glazing, part No. 126 586 00 67.

The contents of this repair kit are selected for use both on model 126 and on model 107.

Contents of repair kit

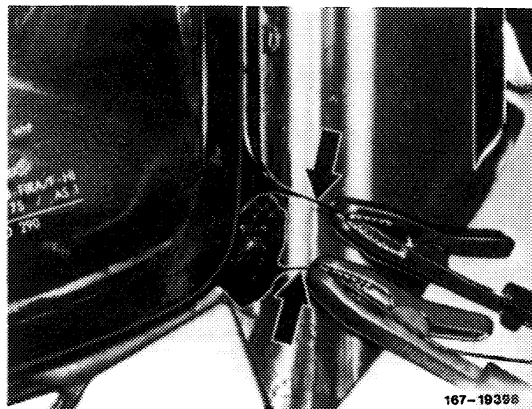
1. Adhesive cord, 4200 mm long, 10 ± 0.7 mm dia.
2. Glass bottle with primer, component part A.
3. Glass bottle with primer, component part B.
4. Sponge for applying primer.
5. Spacing blocks for windshield.*
Dimensions: 30 mm x 10 mm x 3.5 mm.
6. Spacing blocks for side window.*
Dimensions: 30 mm x 10 mm x 6 mm.
7. Spacing blocks for rear window.*
Dimensions: 20 mm x 13 mm x 10 mm.

* These parts are required for model 107 only.



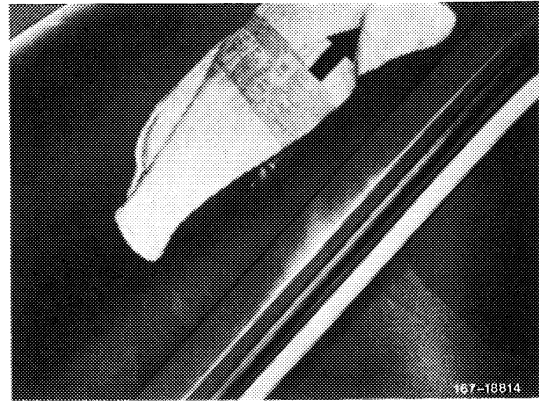
- 1 Remove ornamental frame on windshield (68–540).
- 2 Expose copper wire in adhesive cord at left on front wall pillar and bare end with emery paper.

- 3 Connect copper wire to vehicle battery (12 V) (connection should result in a spark to start current flow). Heat copper wire of 0.3 mm dia. for approx. 15 minutes.



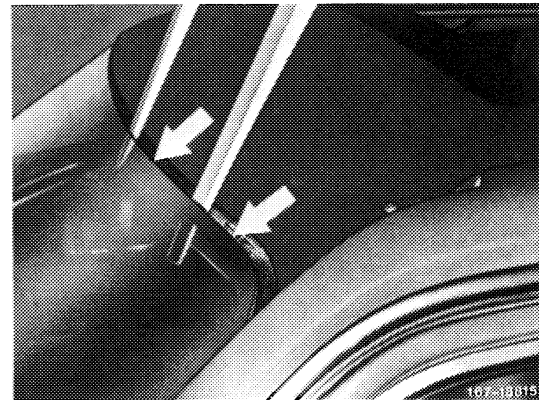
4 Push glass in upper range with foot in outward direction (start at lefthand top).

Shown on model 126



5 Insert assembly wedges into gap established between glass and body.

Shown on model 126

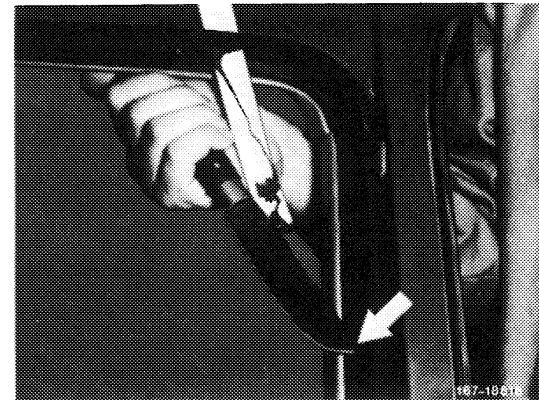


6 Carefully cut all around through adhesive cord with an industrial knife, while inserting additional assembly wedges at cut spots to prevent renewed glueing.

7 Remove windshield glass.

8 Disconnect vehicle battery.

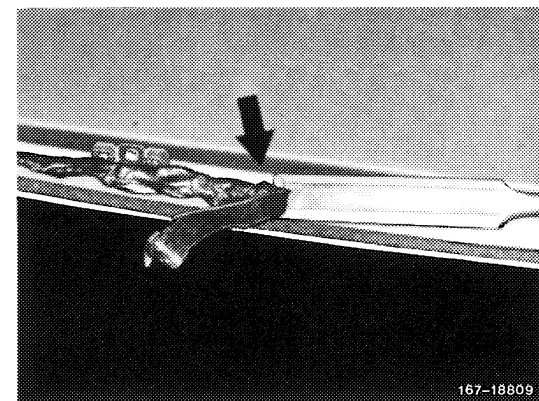
Shown on model 126



Installation with Butyl tape

9 Separate remains of adhesive cord from body flange with a scraper or the like, while making sure that the paintwork is not damaged.

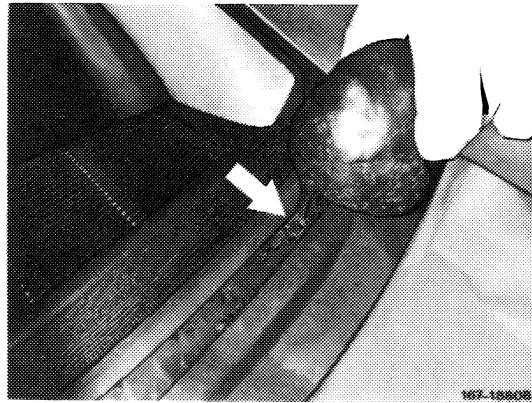
Shown on model 126



10 If Butyl has been used for the former glazing job, knead adhesive cord into a ball and dab the remaining adhesive on body flange with this ball.

Note: For reuse, clean removed windshield glass likewise.

Shown on model 126



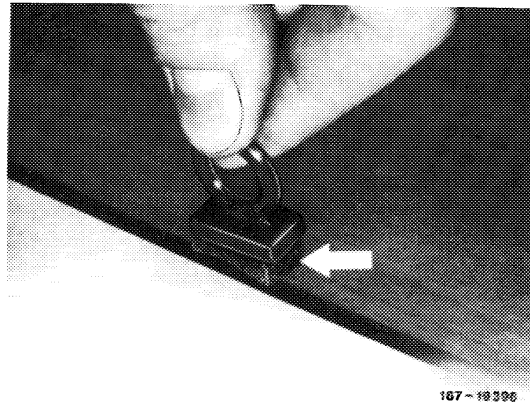
11 Clean adhesive surface on body flange and on windshield glass with benzine.

12 Check body flange for damage to paintwork, if any, and touch up, if required (pay attention to drying time).

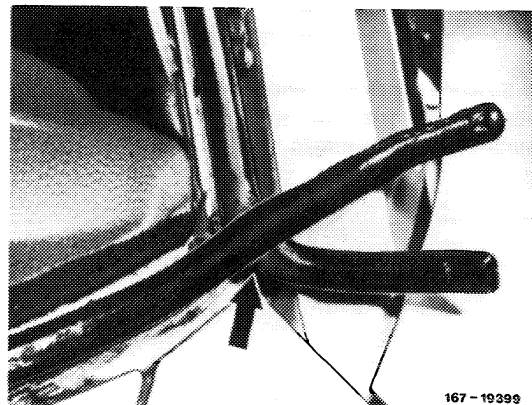
13 Mix primer from repair kit. For this purpose, pour contents of small glass bottle with component B into large glass bottle with component A and shake energetically.

14 Apply primer to windshield glass and body flange with application sponge from repair kit. Width of primer edge approx. 10 mm.

Note: Air-dry primer for 5 minutes.

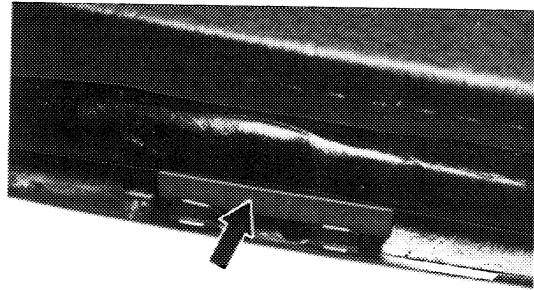


15 Place adhesive cord from repair kit into center of body flange. Start at left bottom on front wall pillar.



16 Place two spacing blocks (5), 30 mm x 10 mm x 3.5 mm, from repair kit on second clip from outside for lower fastening point of trim strip.

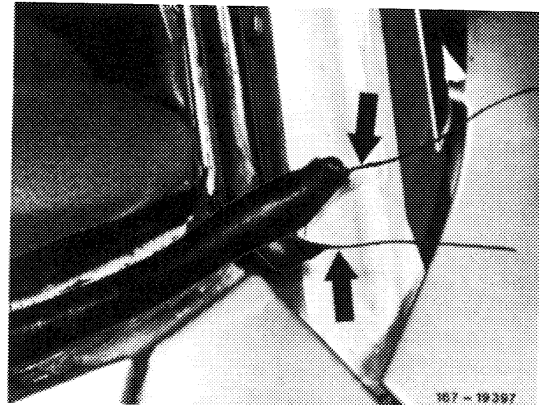
17 Taper adhesive cord in range of spacing blocks so that the glueing compound is not visibly pushed out in upward direction when pressing-on windshield glass.



167-19391

18 Expose copper wire at end of adhesive cord and bare with emery paper.

19 Center windshield glass and place on adhesive cord.



167-19397

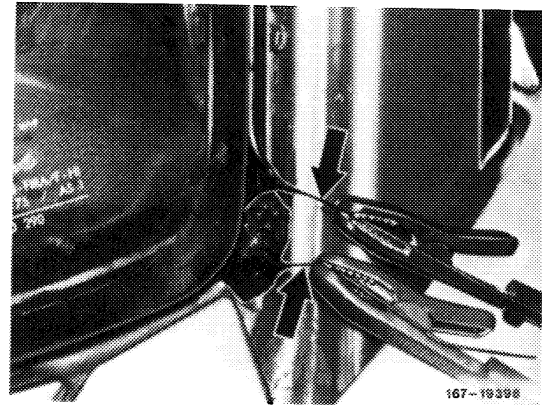
20 Connect vehicle battery (12 V) to both wire ends and heat up adhesive cord. Push uniformly against glass and mount ornamental frame. (The immersion depth is determined when the ornamental frame is fitted).

21 Disconnect vehicle battery.

22 Place wire end of adhesive cord into gap between glass and front wall pillar (do not cut off).

23 For further installation proceed vice-versa.

Note: Glueing requires no drying time. The rain test can be made at end of assembly jobs. Any leaks can be sealed by means of MB universal sealing compound part No. 003 989 01 71 (tube) or 002 989 98 71 (cartridge).



167-19398

67–200 Removal and installation of rear window

A. Roadster

Data

Rim for primer on windshield	Width: 10 mm
------------------------------	--------------

Conventional tools

Syphon	e.g. made by Karl Assfalg KG Buchstr. 149 D-7070 Schwäbisch Gmünd order No.: 602-2
Removing tool (Glas-Ex and cutting wire)	e.g. made by Manfred Herrmann Johann-Sebastian-Bach-Str. 6 D-8023 Pullach im Isartal order No. 58 671 Glas-Ex order No. 58 672 cutting wire filling-up package 200 m

Note

The rear window on model 107 can be glued-in with varying glueing materials: Solbit, Betaseal or Butyl.

Solbit: Solbit is an electrothermically fully curing synthetic rubber profile with inserted heating wire.

Characteristics: Firm glueing compound, inserted heating wire. This material has been used in series production.

Betaseal: Betaseal is a pumpable polyurethane single-compound adhesive compound for making very firm, but elastic connections.

Characteristics: Permanently elastic glueing compound, without heating wire. This material is included in repair package 107 586 03 67 available up to now.

Butyl: Butyl is a permanently elastic adhesive molding with inserted heating wire (adhesive cord).

Characteristics: Permanently elastic glueing compound, with heating wire. This material is included in repair package 126 586 00 67.

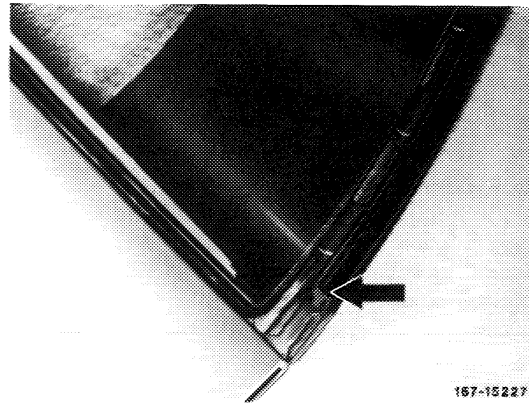
Prior to removing glass, check in accordance with characteristics named above which type of glueing material has been used for installation. For removal, use method fitting the respective adhesive material.

- Removal with cutting wire (Solbit and Betaseal).
- Removal by heating resistance wire (Butyl).

Removal with cutting wire

1 Remove ornamental frame on rear window (68–560).

2 Remove rubber molding (arrow).



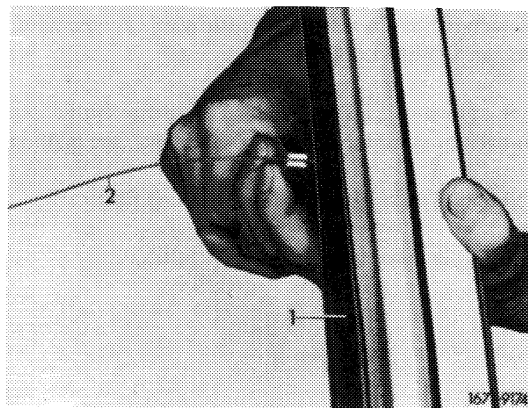
3 Remove reveal molding in range of rear window (68–420 and 425).

4 To avoid damaging paintwork, cover painted surfaces on rear window cutout with adhesive tape.

5 Cut off cutting wire to approx. 900 mm.

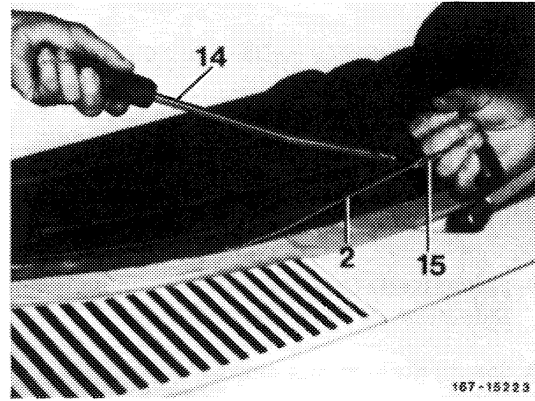
6 Introduce cutting wire (2) on long removing tool (14) laterally into end of handle and clamp down with knurled nut. Guide cutting wire (2) at lower end through bore in outward direction (Fig, refer to item 8).

7 Stick end of cutting wire (2) with pliers from inside through adhesive cord (1) (if possible, close to flange).



8 Thread other end of cutting wire at short handle (15) and clamp down with knurled screw.

9 Tension cutting wire (2) inside with removing tool (14).



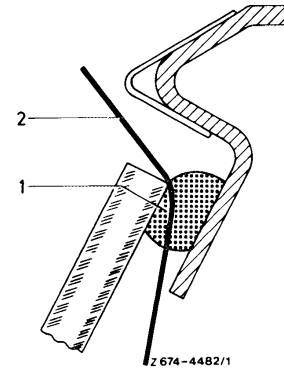
Shown on windshield

10 Let a second person pull on short handle and cut adhesive cord (1), while guiding cutting wire (2) in such a manner that the glass edge is not damaged. If required, push cutting wire (2) at cutting edge against body flange by means of a wedge. Cut carefully at glass corners in steps of 10 mm.

11 Remove rear window.

12 Mechanically clean body flange by means of a wooden or plastic wedge.

Note: When using removed glass again, clean likewise.



Removal by heating-up resistance wire

Note

The rear window is glued to body by means of an adhesive cord. For removal and installation of a rear window, the adhesive cord is converted into a plastic condition by heating. This is done best by connecting the copper wire located in center of adhesive cord to a source of electric energy. Such a source is a well charged 12-volt vehicle battery.

The heating-up period of the adhesive cord generally amounts to approx. 15 minutes for a wire dia. of 0.3 mm. At the end of this period, the adhesive cord has a temperature of approx. 50°C in connection range of copper wire. This temperature is enough for removing the glass free of damage.

The following factors are influencing the heating-up period:

- a) Diameter of copper wire: 0.3, 0.4, 0.7 mm (the thicker, the shorter the heating period).
- b) Aging of adhesive cord (the older, the longer the heating period).
- c) Temperature of glass and body (the colder, the longer the heating period).
- d) Condition of glass (glass already damaged can be pushed out by applying increased force after a short heating-up period).

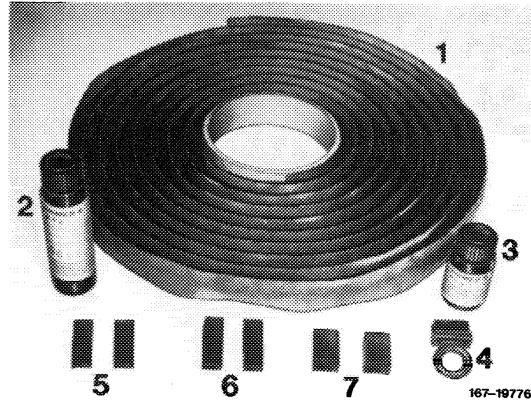
Replacement of rear window glass requires kit for glazing, part No. 126 586 00 67.

The contents of the repair kit are selected for use both on model 126 and on model 107.

Contents of repair kit:

1. Adhesive cord, 4200 mm long, 10 ± 0.7 mm dia.
2. Glass bottle with primer, component part A.
3. Glass bottle with primer, component part B.
4. Sponge for applying primer.
5. Spacing blocks for windshield.*
Dimensions: 30 mm x 10 mm x 3.5 mm.
6. Spacing blocks for side window.*
Dimensions: 30 mm x 10 mm x 6 mm.
7. Spacing blocks for rear window.*
Dimensions: 20 mm x 13 mm x 10 mm.

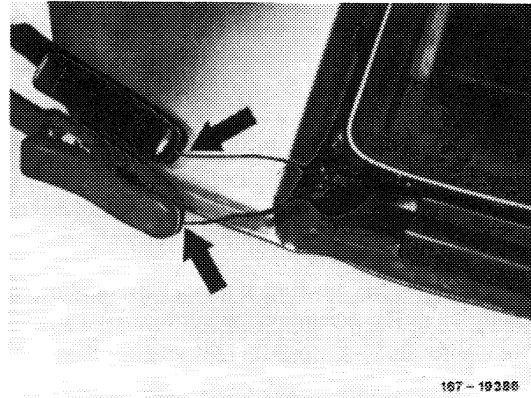
* These parts are required for model 107 only.



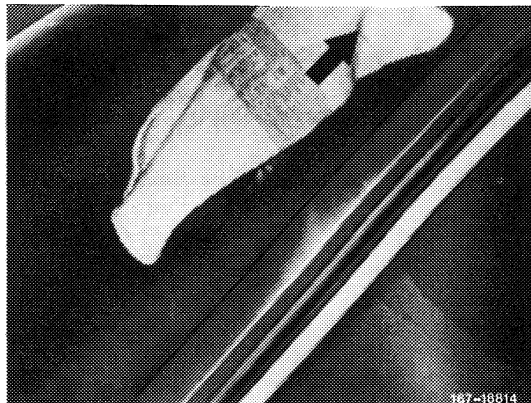
1 Remove ornamental frame on rear window (68–560).

2 Expose copper wire in adhesive cord on rear pillar left bottom and bare ends with emery paper.

3 Connect copper wire to vehicle battery (12 V) (connection should result in a spark to start current flow). Heat copper wire of 0.3 mm dia. for approx. 10 minutes.



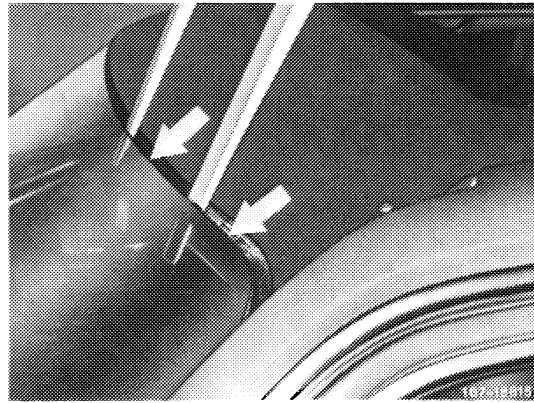
4 Push glass in upper range outwards (e.g. with foot).



Shown on model 126 windshield

5 Insert assembly wedges into gap established between glass and body.

Shown on model 126 windshield

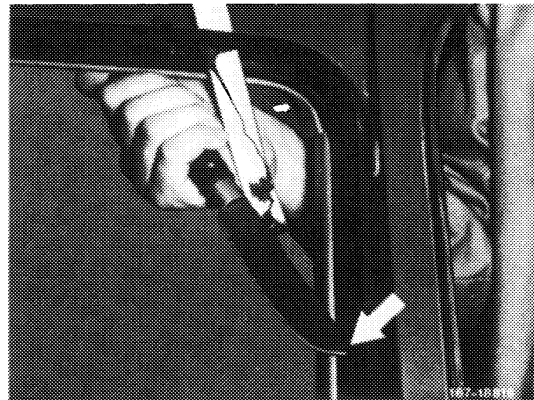


6 Carefully cut all-around through adhesive cord by means of an industrial knife, while inserting additional assembly wedges at cut spots to prevent renewed glueing down.

7 Remove rear window.

8 Disconnect vehicle battery.

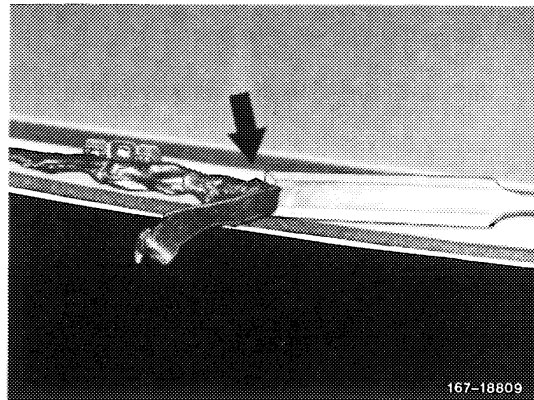
Shown on model 126 windshield



Installation

9 Remove remains of adhesive cord from body flange by means of a scraper or the like, while making sure that the paintwork is not damaged.

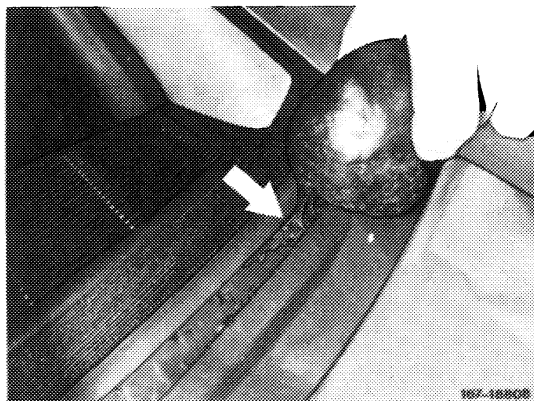
Shown on model 126 windshield



10 If Butyl has been used for the previous job, glue cut-off adhesive cord into a ball and dab the remaining adhesive on body flange with ball.

Note: When the removed windshield glass is used again, clean in a similar manner.

Shown on model 126 windshield



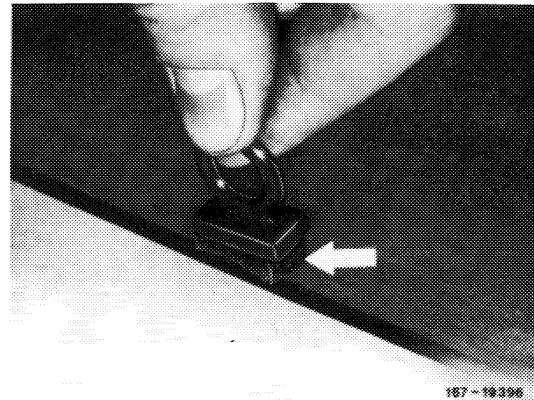
11 Clean adhesive surface on body flange and on rear window with benzine.

12 Check body flange for damage to paintwork, if any, and touch up, if required (pay attention to drying time).

13 Mix primer from repair kit. For this purpose, fill contents of small bottle with component B into large glass bottle with component A and shake energetically.

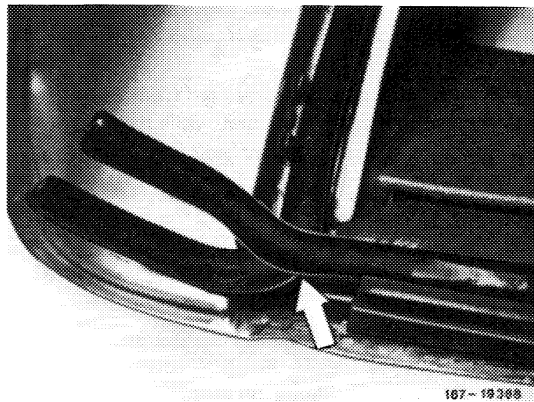
14 Apply primer to rear window and body flange with coating sponge from repair kit. Width of primer rim approx. 10 mm.

Note: Air-dry primer for 5 minutes.



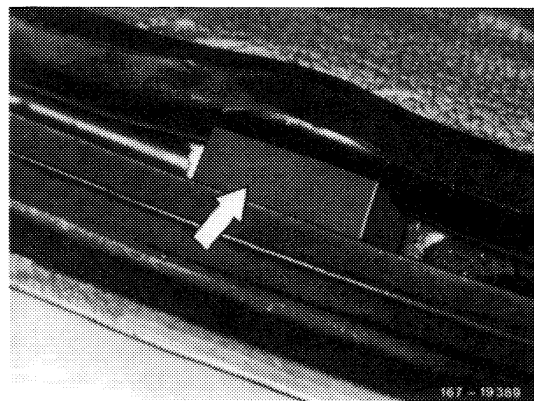
15 Place adhesive cord from repair kit into center of body flange. Start at rear pillar bottom left.

16 Cut off remaining length of adhesive cord.



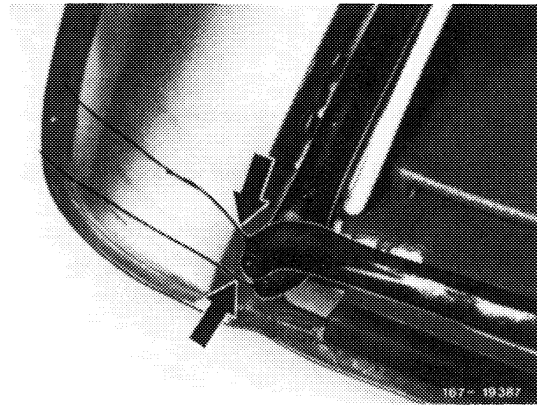
17 Insert two spacing blocks (7), 20 mm x 13 mm x 10 mm, from repair kit into lower channel.

18 Taper adhesive cord in range of spacing blocks so that the glueing compound cannot be visibly pushed out in upward direction when applying pressure to glass.



19 Expose copper wire at end of adhesive cord and bare.

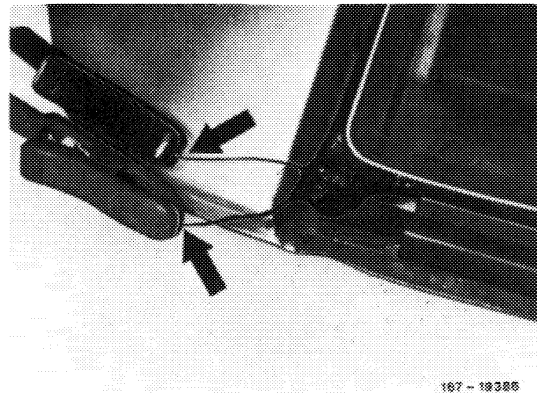
20 Center rear window and place on adhesive cord.



21 Connect vehicle battery (12 V) at both wire ends and heat-up adhesive cord. Push-in glass uniformly and mount ornamental frame. (The immersion depth is determined when the ornamental frame is fitted).

22 Disconnect vehicle battery.

23 Place wire ends of adhesive cord into gap between glass and rear pillar (do not cut off).



24 For further installation proceed vice-versa.

Note: Glueing requires no drying time. The rain test can be made at end of assembly jobs. Any leaks can be sealed by means of MB universal sealing compound, part No. 003 989 01 71 (tube) or 002 989 98 71 (cartridge).

B. Coupe

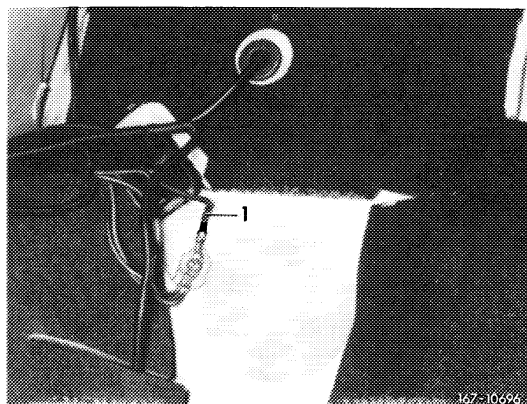
Removal

1 Remove reveal molding on rear window (68–410).

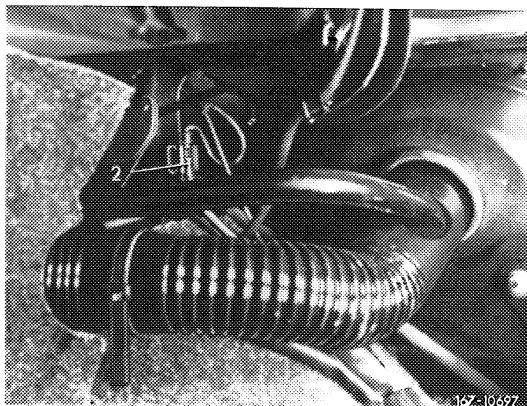
2 Loosen rubber frame inside vehicle with a plastic wedge and push back behind spot-weld flange of window cutout.

3 If rear window is heatable, remove rear seat and rear seat backrest (91–170).

4 Unscrew ground cable (1) on rear wall at the right and slip-through into trunk.



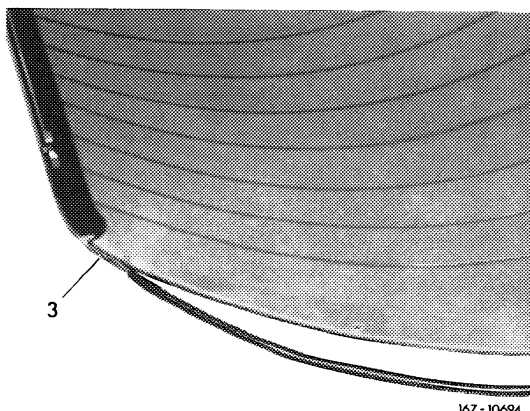
5 Disconnect positive cable on coupler (2) (accessible from trunk).



6 Push rear window from inside carefully in outward direction and remove.

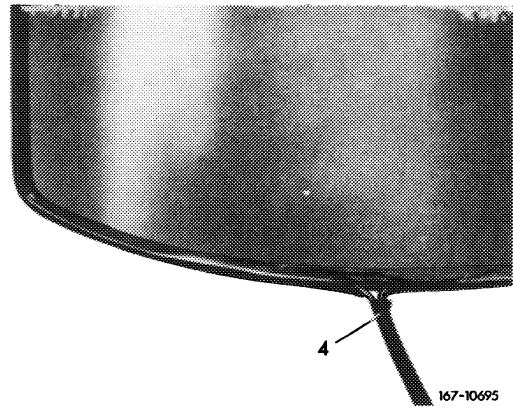
7 Remove ornamental frame on rear window (68–575).

8 Remove sealing frame from rear window.



Attention!

When removing sealing frame from a heatable rear window, make sure that the lateral contact rails (3) for single-pane safety glass or the contact wires (4) for compound glass are not broken off.



167-10695

Installation

- 9 Place rear wail window with crown in downward direction on a pertinent support.
 - 10 Mount sealing frame to rear window.
 - 11 Insert two greased cords into holding slot of sealing frame and coat sealing frame with glycerin or tallow.
 - 12 Insert pre-assembled rear window including sealing frame from outside into window cutout and align.
 - 13 Then install rear window under slight pressure, while simultaneously — using a helper — lifting the rubber lip of the sealing frame beginning from **below** over spot-weld flange of window cutout, while carefully pulling-out greased cord.
- Note:** Pull cord always in parallel with glass to prevent damaging rubber lip.
- 14 Seal with MB glass sealing compound, part No. 001 989 31 20, between glass- and sealing frame, as well as between spot-weld flange and sealing frame.
 - 15 For further installation proceed vice-versa.

67–300 Removal and installation of side window on coupe top

Data

Rim for primer on windshield	Width: 10 mm
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Conventional tool

Syphon	e.g. made by Karl Assfalg KG Buchstr. 149 D-7070 Schwäbisch Gmünd order No.: 602-2
Removing tool (Glas-Ex and cutting wire)	e.g. made by Manfred Herrmann Johann-Sebastian-Bach-Str. 6 D-8023 Pullach im Isartal order No. 58 671 Glas-Ex order No. 58 672 cutting wire filling-up package 200 m

Note

The rear window on model 107 can be glued-in with varying glueing materials: Solbit, Betaseal or Butyl.

Solbit: Solbit is an electrothermically fully curing synthetic rubber profile with inserted heating wire.

Characteristics: Firm glueing compound, inserted heating wire. This material has been used in series production.

Betaseal: Betaseal is a pumpable polyurethane single-component adhesive compound for making very firm, but elastic connections.

Characteristics: Permanently elastic glueing compound, without heating wire. This material is included in repair package 107 586 03 67 available up to now.

Butyl: Butyl is a permanently elastic adhesive molding with inserted heating wire (adhesive cord).

Characteristics: Permanently elastic glueing compound, with heating wire. This material is included in repair package 126 586 00 67.

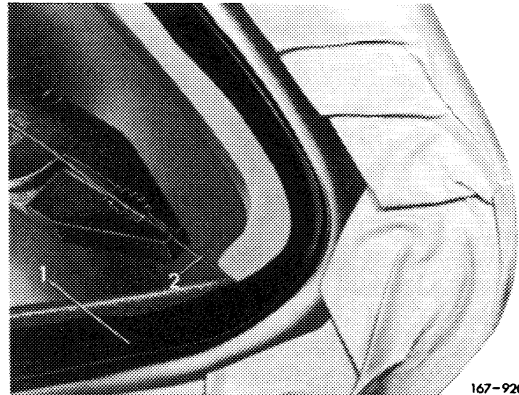
Prior to removing glass, check in accordance with characteristics named above which type of glueing material has been used for installation. For removal, use method fitting the respective adhesive material.

- Removal with cutting wire (Solbit and Betaseal).
- Removal by heating resistance wire (Butyl).

Removal with cutting wire

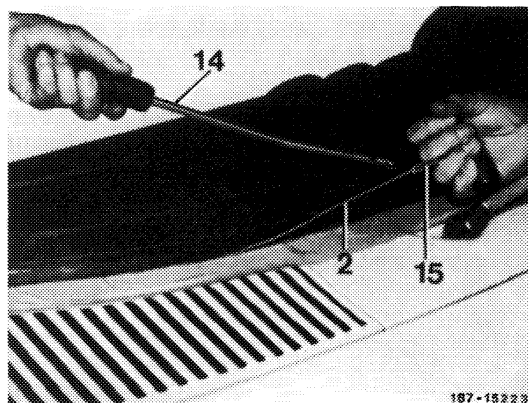
- 1 Remove ornamental frame on side window (68–570).
- 2 Remove reveal molding top and bottom on side window (68–420 or 425).
- 3 Cover coupe top in range of side window with adhesive tape to avoid damaging paintwork.
- 4 Cut-off cutting wire to approx. 900 mm.
- 5 Introduce cutting wire (2) on long removing tool (14) laterally into end of handle and clamp down with knurled nut. Guide cutting wire (2) at lower end through bore in outward direction (Fig, refer to item 7).

6 Stick end of cutting wire (2) with pliers from inside through adhesive cord (1) (if possible, close to flange).



7 Thread other end of cutting wire at short handle (15) and clamp down with knurled screw.

8 Tension cutting wire (2) inside with removing tool (14).



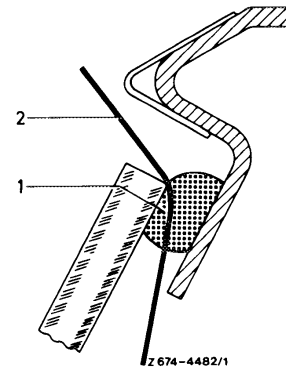
Shown on windshield glass

9 Let a second person pull on short handle and cut adhesive cord (1), while guiding cutting wire (2) in such a manner that the glass edge is not damaged. If required, push cutting wire (2) and cutting edge against body flange by means of a wedge. Cut carefully at glass corners in steps of 10 mm.

10 Remove side window.

11 Mechanically clean body flange by means of a wooden or plastic wedge.

Note: When using removed glass again, clean likewise.



Removal by heating-up resistance wire

Note

The side window is glued to body by means of an adhesive cord. For removal and installation of a side window, the adhesive cord is converted into a plastic condition by heating. This is done best by connecting the copper wire located in center of adhesive cord to a source of electric energy. Such a source is a well charged 12-volt vehicle battery.

The heating-up period of adhesive cord generally amounts to approx. 15 minutes for a wire dia. of 0.3 mm. At the end of this period, the adhesive cord has a temperature of approx. 50°C in connection range of copper wire. This temperature is enough for removing the glass free of damage.

The following factors are influencing the heating-up period:

- a) Diameter of copper wire: 0.3, 0.4, 0.7 mm (the thicker, the shorter the heating period).
- b) Aging of adhesive cord (the older, the longer the heating period).
- c) Temperature of glass and body (the colder, the longer the heating period).
- d) Condition of glass (glass already damaged can be pushed out by applying increased force after a short heating-up period).

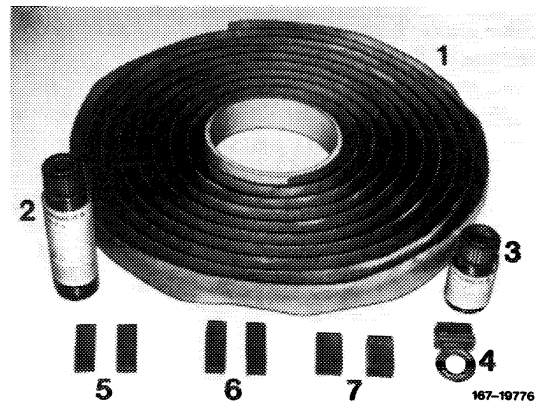
Replacement of side window glass requires repair kit for glazing, part No. 126 586 00 67.

The contents of the repair kit are selected for use both on model 126 and on model 107.

Contents of repair kit:

1. Adhesive cord, 4200 mm long, 10 ± 0.7 mm dia.
2. Glass bottle with primer, component part A.
3. Glass bottle with primer, component part B.
4. Sponge for applying primer.
5. Spacing blocks for windshield.*
Dimensions: 30 mm x 10 mm x 3.5 mm.
6. Spacing blocks for side window.*
Dimensions: 30 mm x 10 mm x 6 mm.
7. Spacing blocks for rear window.*
Dimensions: 20 mm x 13 mm x 10 mm.

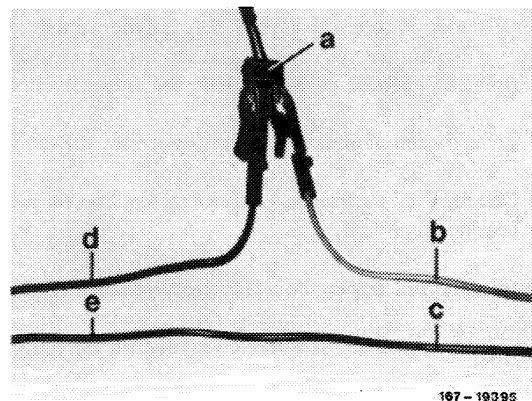
* These parts are required for model 107 only.



- 1 Remove ornamental frame on side window (68–570).
- 2 Expose copper wire in adhesive cord on side window bottom front and bare ends with emery paper.

- 3 Connect consumers with a capacity of approx. 200 watts between adhesive cord and battery in series. For example, the heatable rear window of coupe top.

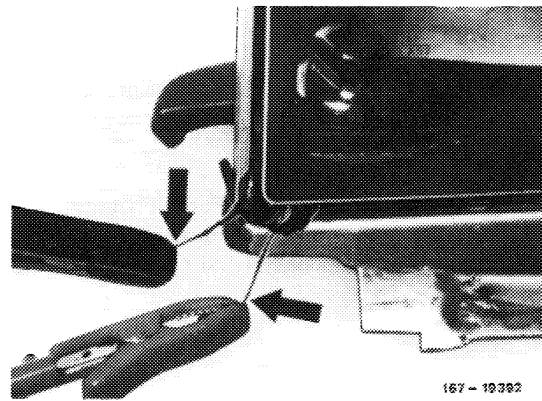
- a = Plug connection of heatable rear window
- b = Positive line to power source (vehicle battery)
- c = Negative line to power source (vehicle battery)
- d = Positive line to copper wire in adhesive cord
- e = Negative line to copper wire in adhesive cord



4 Connect copper wire in adhesive cord and with a wire dia. of 0.3 mm heat-up for approx. 10 minutes.

5 Push glass outward in upper range.

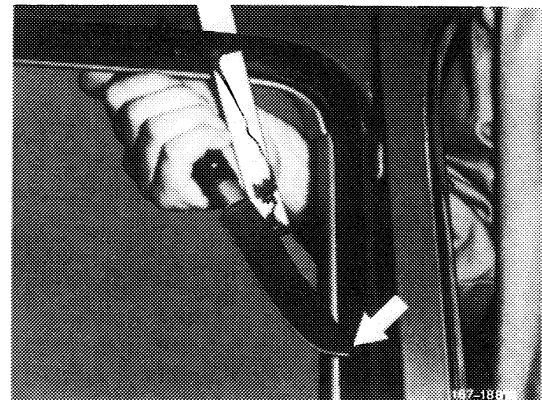
6 Insert assembly wedges into gap established between glass and body.



7 Carefully cut all-around through adhesive cord by means of an industrial knife, while inserting additional assembly wedges at cut spots to prevent renewed glueing down.

8 Remove side window.

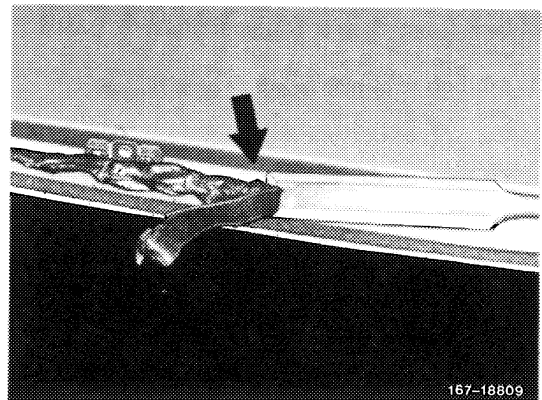
9 Disconnect vehicle battery.



Shown on model 126 windshield

Installation

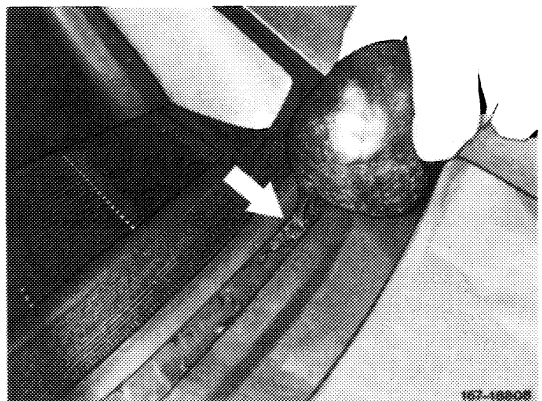
10 Remove remains of adhesive cord from body flange by means of a scraper or the like, while making sure that the paintwork is not damaged.



Shown on model 126 windshield

11 If Butyl has been used for the previous glazing job, glue cut-off adhesive cord into a ball and dab the remaining adhesive on body flange with ball.

Note: When the removed windshield glass is used again, clean in a similar manner.



Shown on model 126 windshield

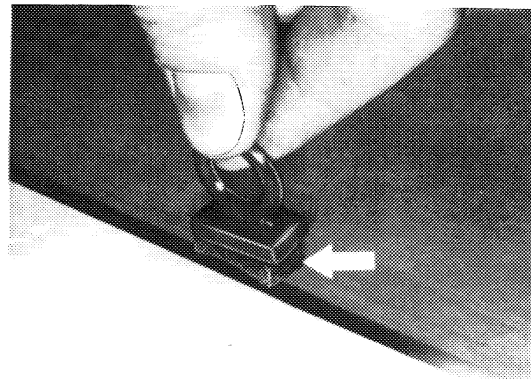
12 Clean adhesive surface on body flange and on side window with benzine.

13 Check body flange for damage to paintwork, if any, and touch up, if required (pay attention to drying time).

14 Mix primer from repair kit. For this purpose, fill contents of small bottle with component B into large glass bottle with component A and shake energetically.

15 Apply primer to side window and body flange with coating sponge from repair kit. Width of primer rim approx. 10 mm.

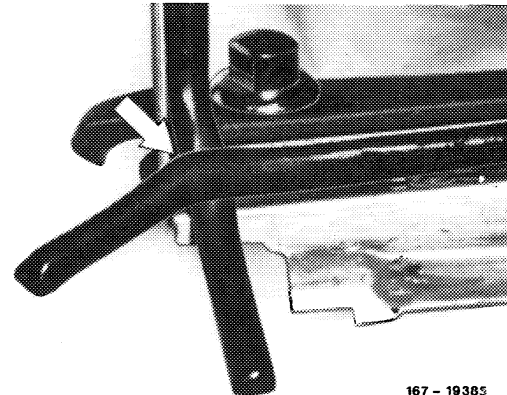
Note: Air-dry primer for 5 minutes.



167 - 19396

16 Place adhesive cord from repair kit into center of body flange. Start at bottom front.

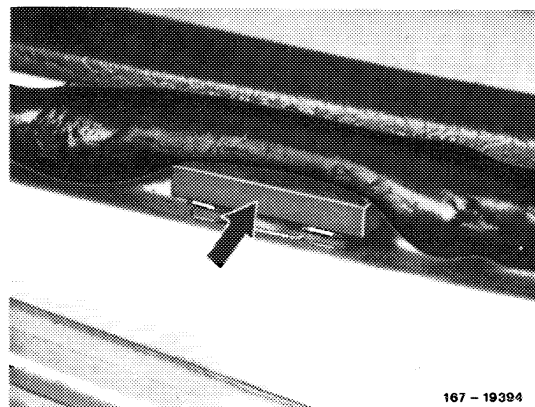
17 Cut off remaining length of adhesive cord.



167 - 19385

18 Place two spacing blocks (6), 30 mm x 10 mm x 6 mm, from repair kit on clips for fastening lower trim strip.

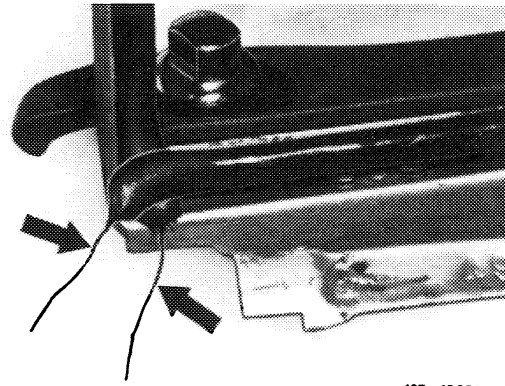
19 Taper adhesive cord in range of spacing blocks so that the glueing compound cannot be visibly pushed out in upward direction when applying pressure to glass.



167 - 19394

20 Expose copper wire at end of adhesive cord and bare.

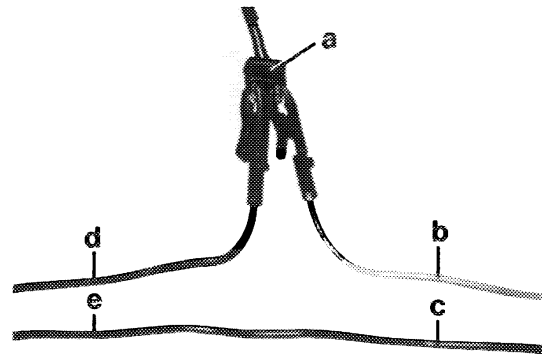
21 Center side window and place on adhesive cord.



167 - 19393

22 Connect consumers with a capacity of approx. 200 watts between adhesive cord and battery in series, for example, the heatable rear window of coupe top.

- a = Plug connection of heatable rear window
- b = Positive line to power source (vehicle battery)
- c = Negative line to power source (vehicle battery)
- d = Positive line to copper wire in adhesive cord
- e = Negative line to copper wire in adhesive cord

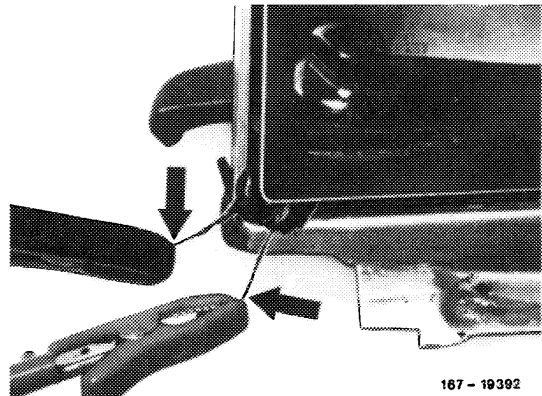


167 - 19395

23 Connect vehicle battery (12 V) at both wire ends and heat-up adhesive cord. Push-in glass uniformly and mount ornamental frame. (The immersion depth is determined when the ornamental frame is fitted).

24 Disconnect vehicle battery.

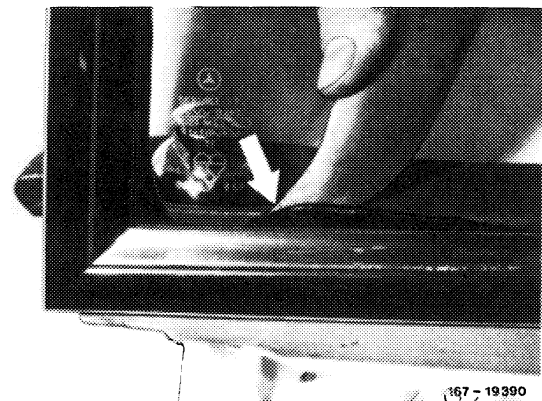
25 Place wire ends of adhesive cord into gap between glass and body flange (do not cut off).



167 - 19392

Note: Adhesive material which is visibly pushed-out at linings can be cut off with a moistened industrial knife.

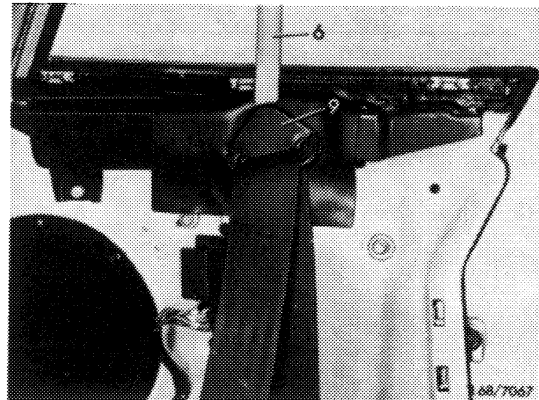
26 For further installation proceed vice-versa.



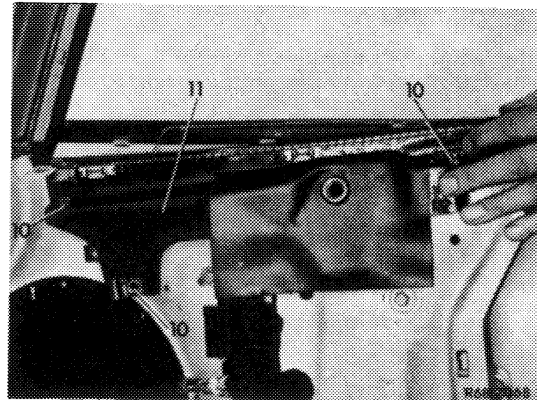
167 - 19390

Removal

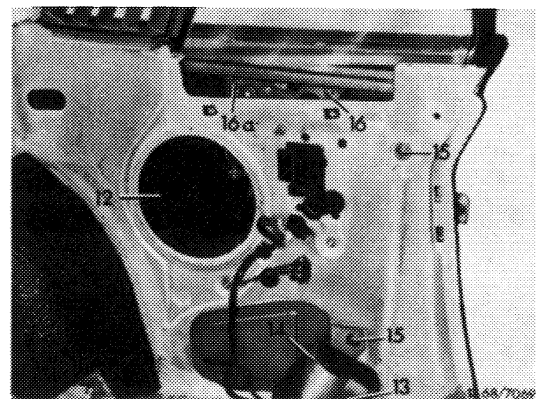
- 1 Remove side wall in rear end (68-456).
- 2 Remove cap (9) from safety belt by means of plastic wedge (6).
- 3 Remove screw from behind cap (9).



- 4 Remove shaft cover (11), 5 screws (10).



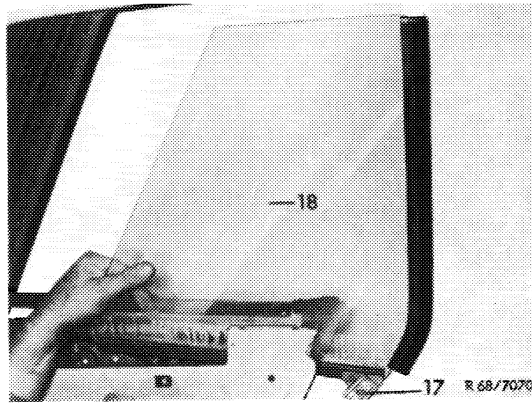
- 5 Unscrew cover from assembly hole (12).
- 6 Move side window upwards.
- 7 Loosen screw (13) of reel (14) from safety belt and turn reel aside.
- 8 Remove both screws (15) of window guide rail.
- 9 Unscrew screws (16 and 16a).



10 Lift guide shoe (17) out of window guide rail and remove pane (18) in forward direction.

Installation

11 For installation proceed vice versa. Guide shoe should run in window guide rail in such a manner that spring end of guide shoe runs at close bend of guide rail.

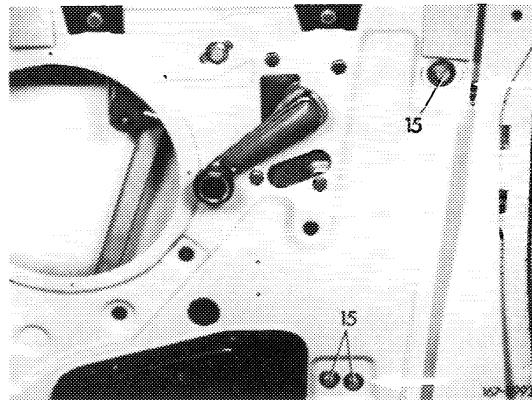


Adjustment

12 Crank side window up.

13 Loosen screws (15) on guide rail and push side window toward the rear into window guide rail.

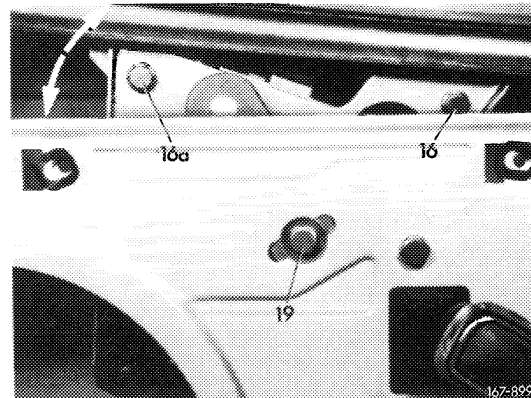
14 Tighten screws (15) in this position.



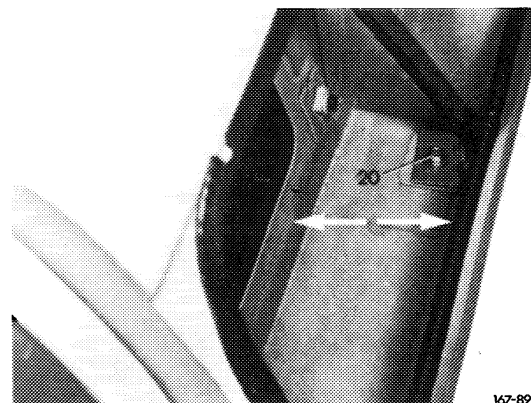
15 Loosen screws (16 and 16a).

16 Adjust front edge of side window in parallel with rear edge of crank window on oblong hole by means of screw (16a).

17 Adjust stop for upper stroke limit with screw (19).



18 Adjust lateral contact pressure of side window on oblong hole by means of screw (20).

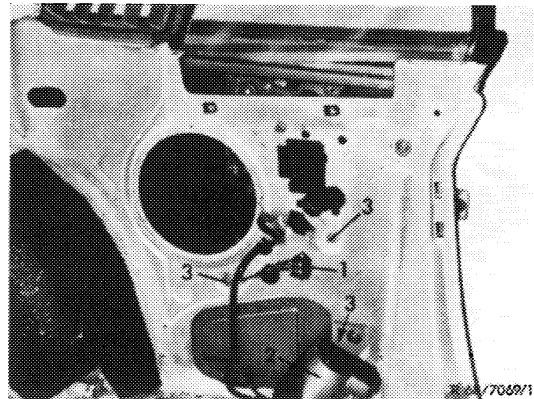


Shown on a model

67-410 Removal and installation of window opener for rear crank-type window

Removal

- 1 Remove side wall in rear of vehicle (68-456).
- 2 Remove side window in rear of vehicle (67-400).
- 3 On electric window opener, loosen electrical connections on cable connector (1).
- 4 Remove reel (2) of safety belt.
- 5 Unscrew three fastening nuts (3) from window opener.



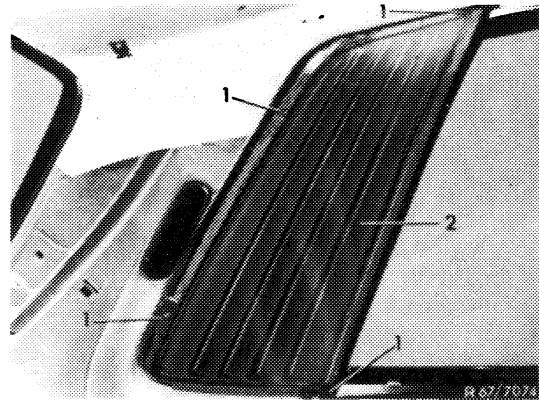
Installation

- 6 For installation proceed vice versa.

67-420 Removal and installation of shutter

Removal

- 1 Remove side wall in rear of vehicle (68-456).
- 2 Remove window molding strip laterally on roof (68-410).
- 3 Remove screws (1) from shutter (2).



Installation

- 4 For installation proceed vice versa.

For sealing, glue a Moltopren strip to shutter starting from below. Apply double Moltopren strip in upper range. Watch out for water leaks during assembly.



68–100 Removal and installation of instrument panel

Special Tool

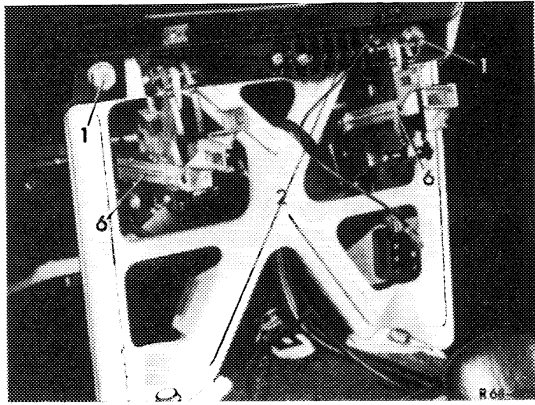
Clip fastener for heater cable controls

108 589 01 37 00

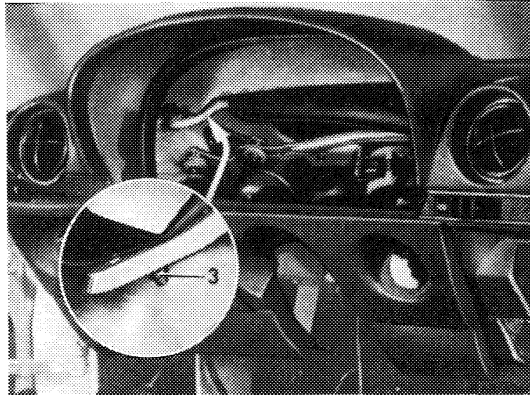
Removal

- 1 Remove center console (68–200).
- 2 Remove interior mirror from holding bracket.
- 3 Loosen steering column jacket on cross member and foot plate (46–620).
- 4 Remove glovebox (68–140).
- 5 Remove clock.
- 6 Pull air duct for center summer air nozzles from heater housing.
- 7 Disconnect regulating linkage for summer air on ball socket of summer air flap.
- 8 Pull off air hose for both lateral ring nozzles on air duct bottom left and right.
- 9 Disconnect cable control for two lateral ring nozzles on flap in air duct and loosen holding clip.
- 10 Loosen rotary light switch from instrument panel.
- 11 Unscrew knob on pull rod of pedal-operated parking brake and remove rubber disc.
- 12 Pull plug on switch for heatable rear window.
- 13 Remove window molding left and right on windshield.

14 Unscrew both bolts (1) on support (2).



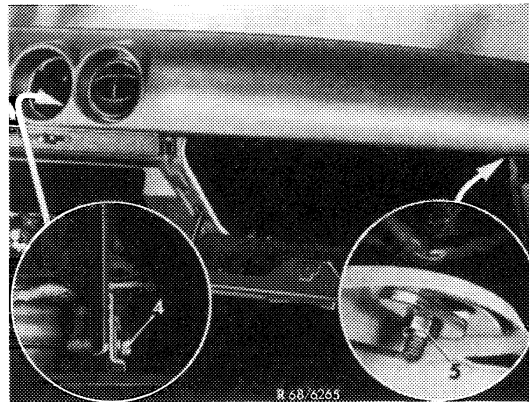
15 Reach through cutout for instrument cluster and unscrew nut (3).



3 Nut (SW 8)

16 Reach through hole for glovebox and unscrew bolt (4) except for a few final threads.

17 Also unscrew nut (5) through cutout for glovebox.



18 Disconnect connecting cable on plug coupling of loudspeakers, if installed.

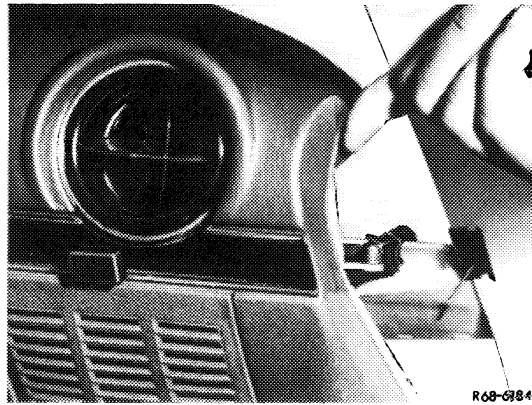
19 Set control lever for heater all the way down.

Installation

Note: Make sure that prior to the installation of the instrument panel the clip (7) on both front wall pillars is inserted.

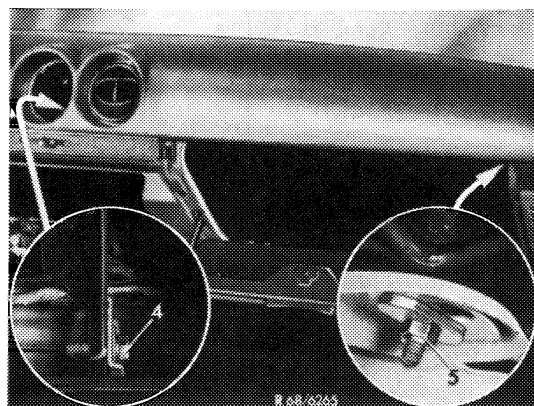
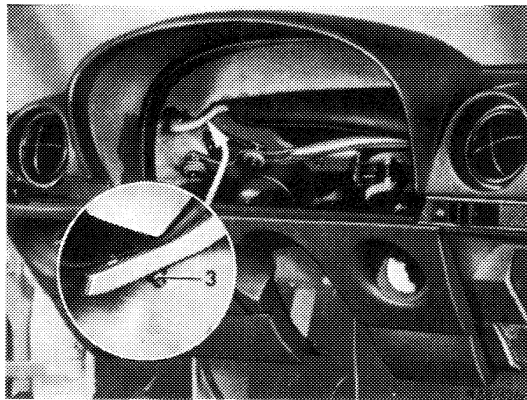
24 Lubricate rubber seal on defroster nozzles with soap solution or the like.

25 Slide instrument panel from the right into left-hand corner against front wall pillar.

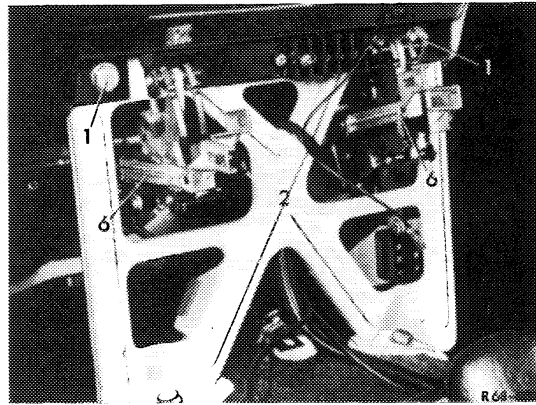


26 Lift instrument panel at bottom center over controls against cross member, while simultaneously bending the righthand edge **down** and placing the instrument panel with the defroster nozzles on the heater.

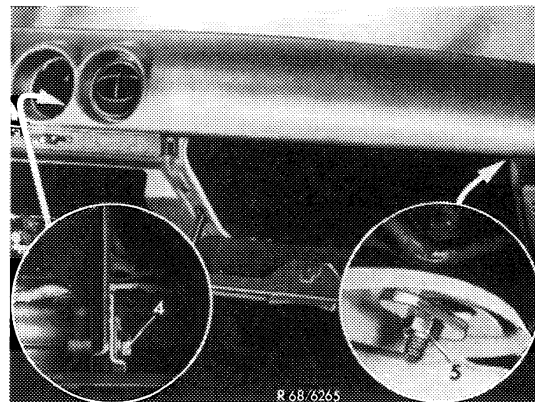
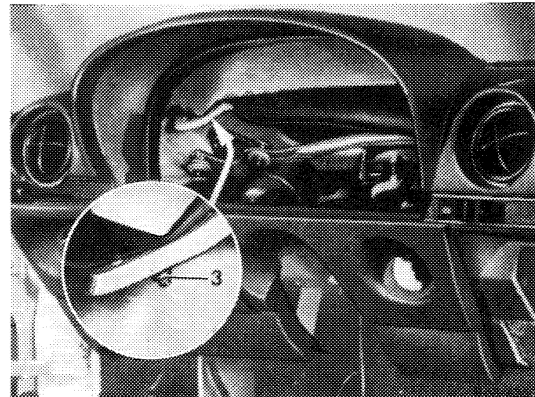
27 Insert screws (3 and 5) into pertinent bracket.



20 Pull instrument panel on lower end in center over controls (6).

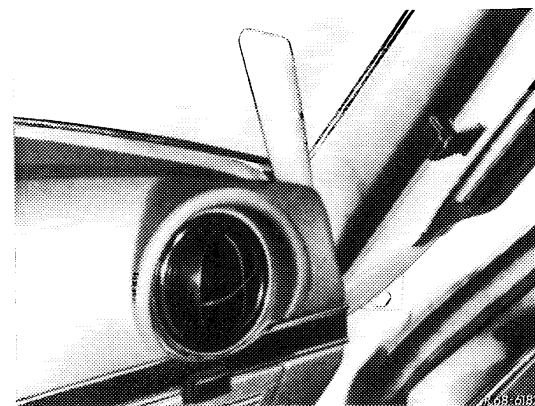


21 Disconnect instrument panel on screws 3, 4 and 5.

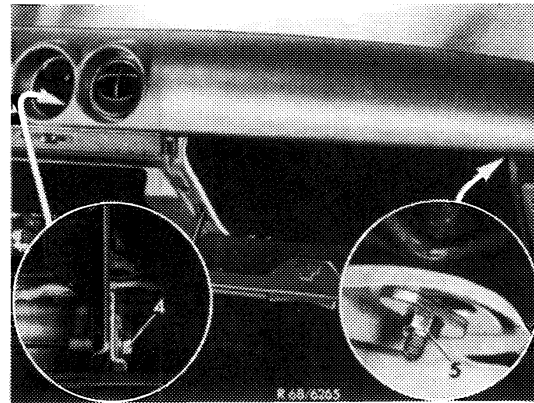


22 Bend upper righthand corner of instrument panel **downwards** with a plastic wedge.

23 Remove instrument panel at the right first.



28 Push instrument panel forward for accurate connection of defroster nozzles to heater box, while inserting the center screw (4) into holder.



29 For further installation proceed vice versa to removal.

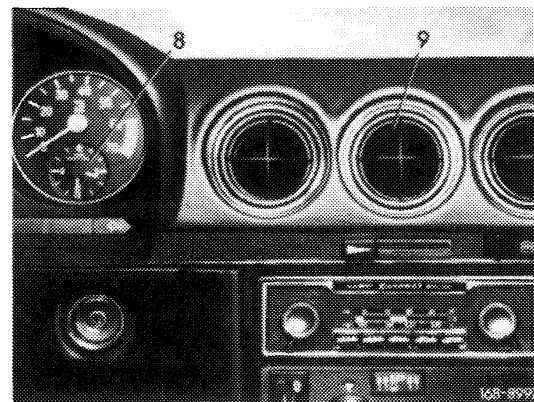
Adjust cable controls on both outer ring nozzles and controls for summer air during assembly.

Note

As from September 1973, the time clock (8) in center of instrument panel is replaced by a third ball nozzle (9).

As from this period, time clock (8) is located in instrument cluster.

When replacing instrument panel of version 1 against instrument panel of version 2, use flange ring Part No. 107 991 00 45 between the two ball nozzles.



68–105 Removal and installation of cover for loudspeaker left and right

Removal

- 1 Unscrew both screws on bottom of cover.
- 2 Pull out cover in downward direction.

Installation

- 3 For installation proceed vice versa.

Note: When inserting cover, slide holding springs under clips on instrument panel.

68–110 Removal and installation of trimstrip on instrument panel

Trimstrip Left and Right

Removal

- 1 Remove instrument cluster at lefthand trimstrip.
- 2 Remove glovebox at righthand trimstrip (68–140).
- 3 Pull knob from lever of ring nozzle.
- 4 Pull connecting hose from ring nozzle.
- 5 Unscrew both nuts on lever assembly from inside.
- 6 Remove trimstrip.

Installation

- 7 For installation proceed vice versa.
Make sure that the lever assembly is again screwed back together with trimstrip.

Trimstrip Center

Removal

- 1 Remove instrument cluster (54–310).
- 2 Remove glovebox (68–140).
- 3 Pull off knob for actuating summer air nozzle.
- 4 Pull duo clips from trimstrip from inside with small screw driver.
- 5 Remove trimstrip.

Installation

- 6 For installation proceed vice versa. Be sure to use new clips.

Removing Glovebox Cover

Unscrew both hinge screws.

Unscrew both stop screws.

Note: Remove screw in range of center console with offset screw driver.

Removing Trimstrip for Glovebox Cover

Unscrew trimstrip screws.

Remove trimstrip with lock.

Removal of Lock for Glovebox Cover

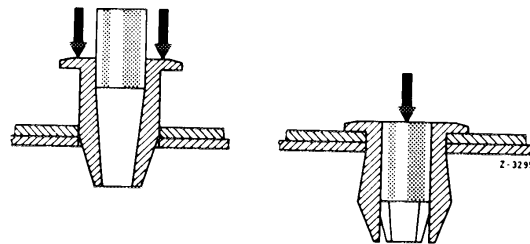
Remove trimstrip with lock.

Unscrew lock from trimstrip.

68-140 Removal and installation of glovebox

Removal

- 1 Pull out glovebox light together with plug and pull off plug socket.
- 2 Remove pin of expanding clamps.
- 3 Remove expanding clamp with plastic wedge.
- 4 Remove glovebox.



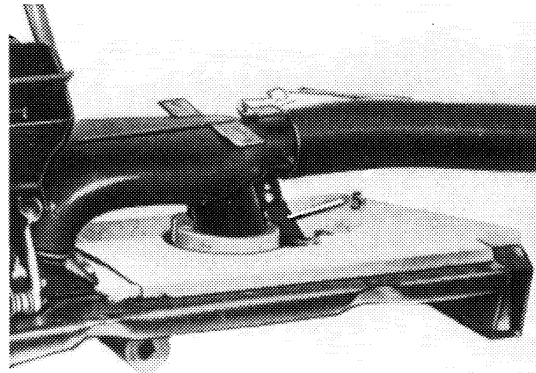
Installation

- 5 For installation proceed vice versa.

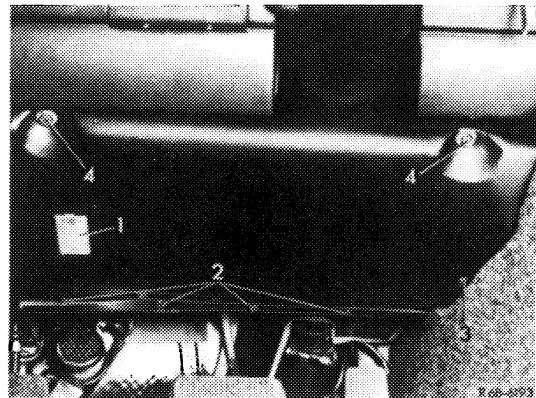
Removal

- 1 For righthand cover only:

Remove glovebox (68–140) and loosen holder (5) for righthand air duct on cover.



- 2 Remove legroom light (1) and pull plug.
- 3 Loosen snap fasteners (2).
- 4 Remove screw (3) on heater box.
- 5 Remove both screws (4) and remove cover.



Installation

- 6 For installation proceed vice versa.

Note: The cover at left and right under instrument panel serves as an air duct between the heater box and the floor lining, which is designed as an air duct for the side windows.

Complete all installation jobs with the required care.

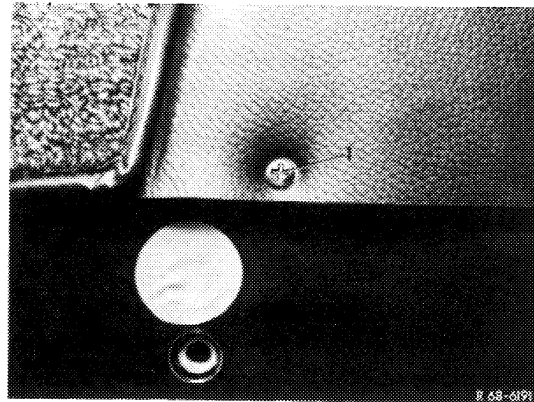
68–200 Removal and installation of center console

1st version center console

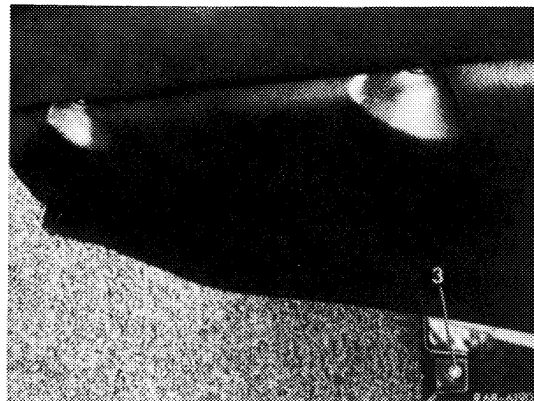
Installed into model	up to chassis end number
107.042	011 568
107.045	009 131
107.046	000 986

Removal

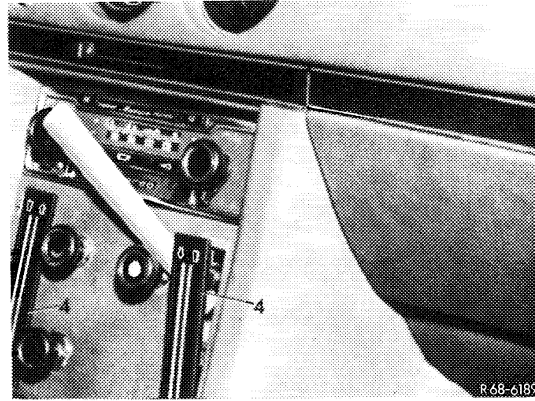
- 1 Remove steering wheel (46–610).
- 2 Remove driver's and front passenger's seat (91–100).
- 3 Remove both floor mats in front.
- 4 Remove cover on shift lever (68–230).
- 5 Remove both covers under instrument panel (68–150).
- 6 Remove screws (1) at rear tunnel.
- 7 Loosen carpet (2) on tunnel from center console.



- 8 Remove screws (3) left and right on front wall.
- 9 Pull out heater control lever.



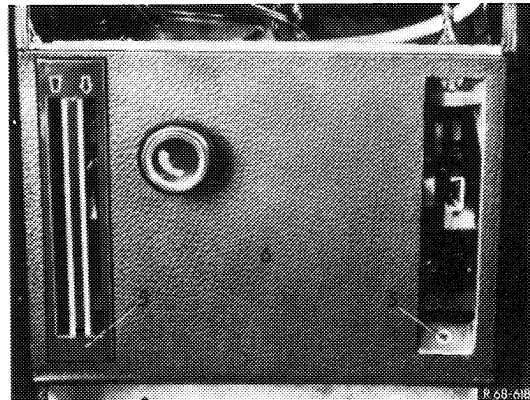
10 Force molding (4) on control levers at upper end out of housing with plastic wedge.



11 Unscrew the two screws (5) on cover (6).

12 Remove cover with switches and pull off plugs.

13 Remove radio.

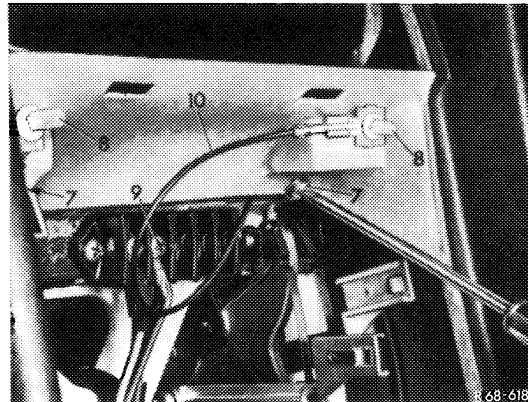


14 Remove screws (7).

15 Disconnect connecting cable for both lights (8) on cable connector (9) and pull off lighting cable (10).

16 Only with automatic transmission: Loosen gate plate on floor shift.

17 Remove center console in rearward direction.



Installation

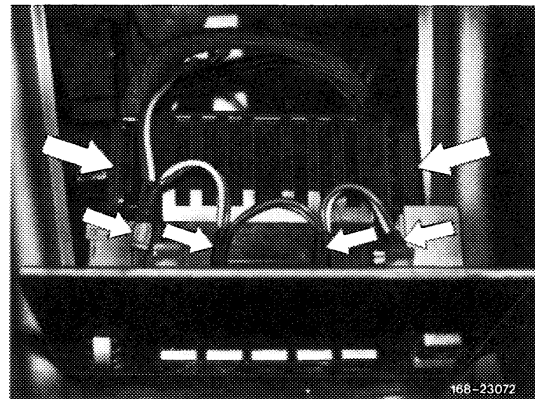
18 For installation proceed vice versa.

2nd version center console

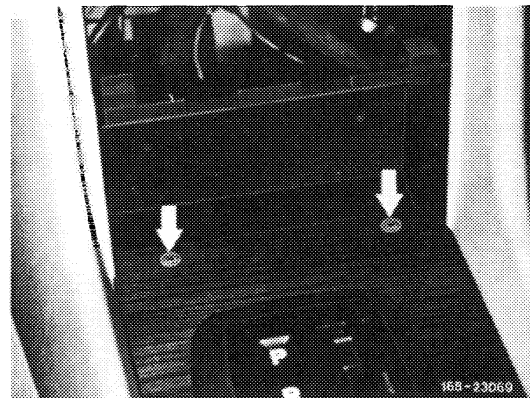
Installed into model	up to chassis end number
107.042	011 569
107.045	009 132
107.046	000 987

Removal

- 1 Push front seats to the rear and take both floor mats out of front footwells.
- 2 Remove ashtray with frame.
- 3 Remove cover of heater control switch downward and pull off electrical connections.



- 4 Remove screws (arrows) on forward cover and pull out cover to the rear.
- 5 Pull plug connector from hazard warning flasher switch.
- 6 Remove radio.

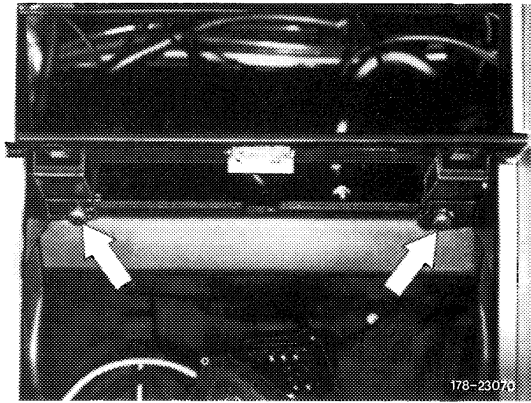


- 7 Remove LH and RH radio clips.

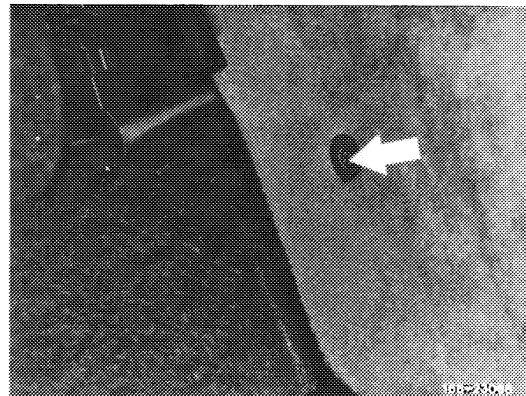


8 Unscrew both screws on center console forward end.

9 Remove accelerator.



10 Remove screws on the forward end of the footwell, LH and RH sides.

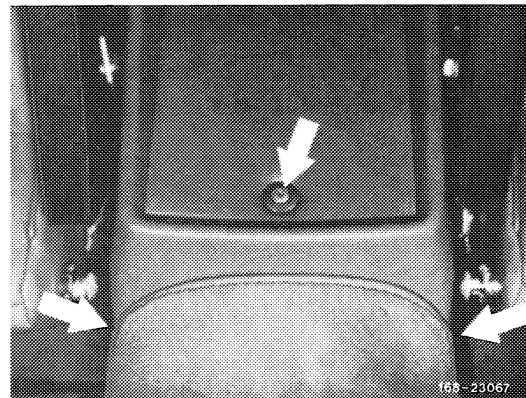


11 Remove rug from oddments tray and unscrew securing screw.

12 Remove screws of tunnel covering and loosen forward end of covering.

13 Remove arm rest at driver's seat.

14 Push both seats to the rear.

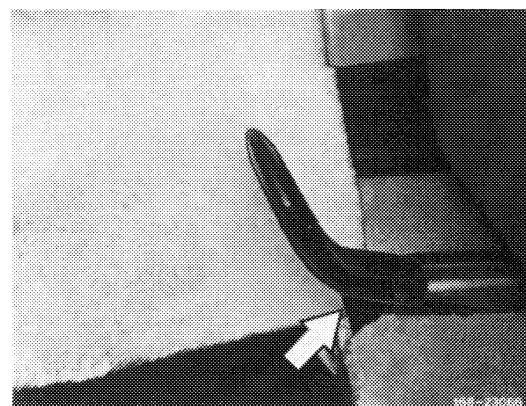


15 Lift up center console at rear end and pull to the rear by approx. 90 mm. In doing this, pull outward the lateral sections of the covering in the region and rest them on the cross member.

Caution:

To prevent damage, use a rag to cover up the center console end which joins the instrument panel.

16 Pull out center console to the rear and take it out above the front passenger seat.



Installation

17 Install center console by pushing it from the rear to the front .

Note: To prevent damage to the instrument panel, cover up the center console upper region with a rag during the installation.

18 Bolt on center console forward end.

19 Further installation takes place in reverse order.

68–220 Removal and installation of rating plate on center console

Removal

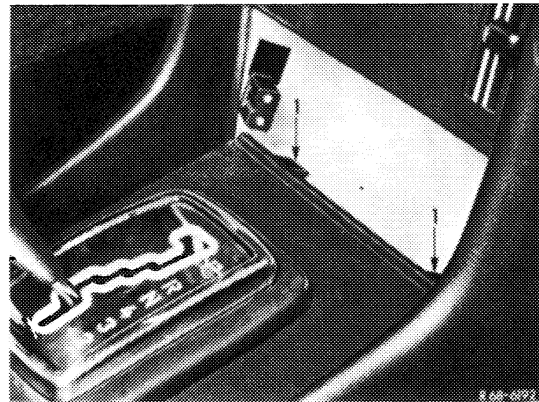
- 1** Pull rating plate on center console at upper end slightly forward and push down.
- 2** Pull rating plate on upper end out of center console.

Installation

- 3** Insert rating plate with lower end at front into center console and push downwards.
- 4** Push rating plate at upper end into cutout in center console and push upwards until the rating plate covers the cutout.

Removal

- 1 Remove ashtray with frame.
- 2 Loosen sleeve on shift lever from cover.
- 3 Remove both screws (1).
- 4 Pull cover in upward direction out of lateral clips.
- 5 Pull plug coupling from warning light switch.
- 6 Remove cover.



Installation

- 7 For installation proceed vice versa.

68–400 Removal and installation of reveal molding on windshield

Molding Strip on Side of Windshield

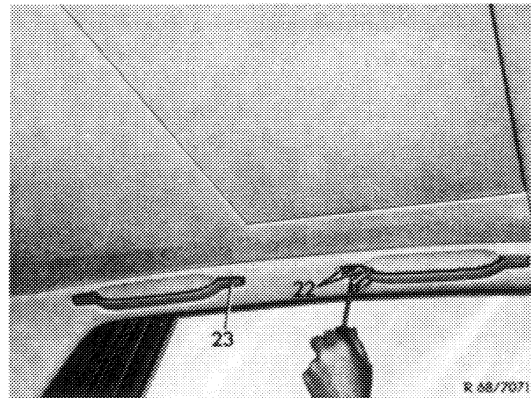
- 1 Remove screw from holder of sun visor.
- 2 Remove screw on molding strip bottom.
- 3 Remove molding strip with plastic wedge.

Molding Strip on Top of Windshield

- 1 Remove inside rear view mirror.
- 2 Unscrew base plate for rear view mirror.
- 3 Unscrew counter support of sun visor.
- 4 Unscrew outer screw on molding strip.
- 5 Remove molding strip.

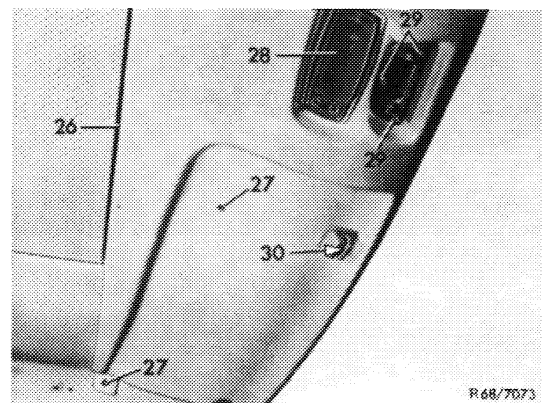
Lateral Molding Strip on Roof

- 1 Remove molding strip on rear window.
- 2 Remove cap from handle by means of plastic wedge.
- 3 Remove screws (22) from handle (23).
- 4 Remove sun visor.
- 5 Push lateral window strip in range of sun visor down.
- 6 Pull molding strip at an angle in upward and forward direction out of rear pillar holding clips.



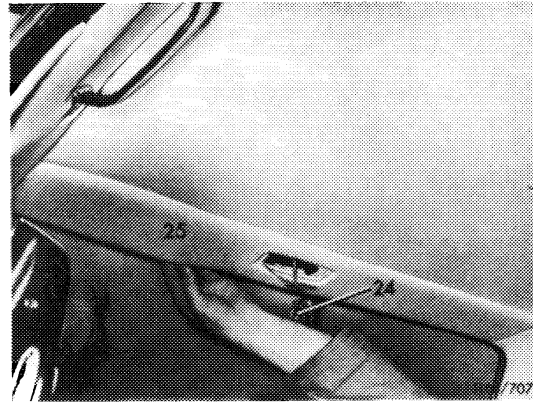
Molding Strip on Top of Windshield

- 1 Remove both lateral molding strips on window.
- 2 Remove rear view mirror.
- 3 Remove base plate (29).
- 4 Remove interior light (28).
- 5 Remove counter support of sun visor (30).
- 6 Remove chrome-plated rail (26).
- 7 Unscrew screws (27).
- 8 Remove molding strip.



Molding Strip on Rear Window

- 1** Pull out ceiling light (24) and leave hanging.
- 2** Pull molding strip rear left and right slightly down and knock with hand out holding clips in forward direction.
- 3** Pull molding strip in center slightly downwards and remove out of lateral molding strips at the left and right.



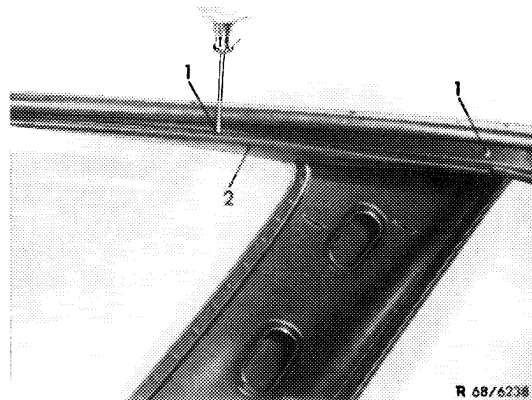
Lateral Molding Strip on Windshield

Refer to 68–400.

68-420 Reveal molding on Coupé top laterally and rear bottom

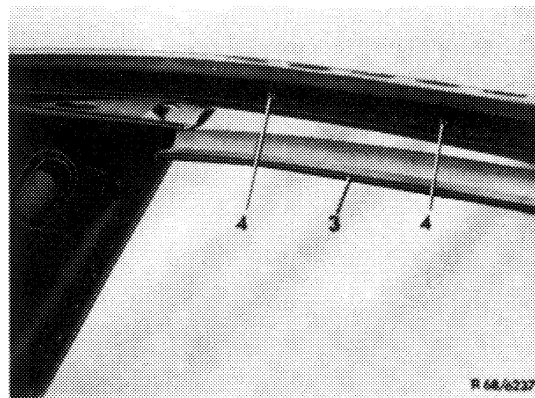
Removal

- 1 Remove lock on coupe top below (77-430).
- 2 Remove window molding laterally on top (68-425).
- 3 Remove screws (1) and (4).
- 4 Remove window molding laterally below (2).

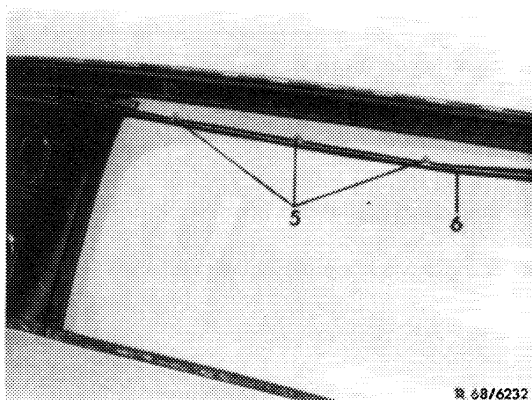
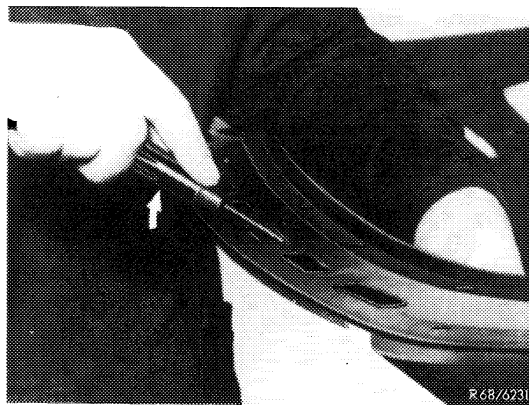


- 5 Remove window molding center (3).

Note: If only the window molding (3) is removed, loosen lateral window molding (2) only.



6 Remove expanding clamp (5) on window molding (6) and remove window molding (6).

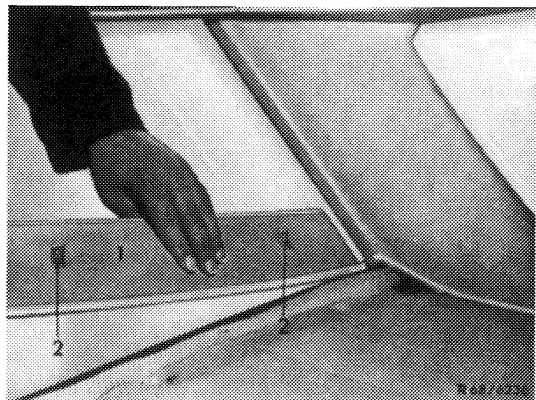
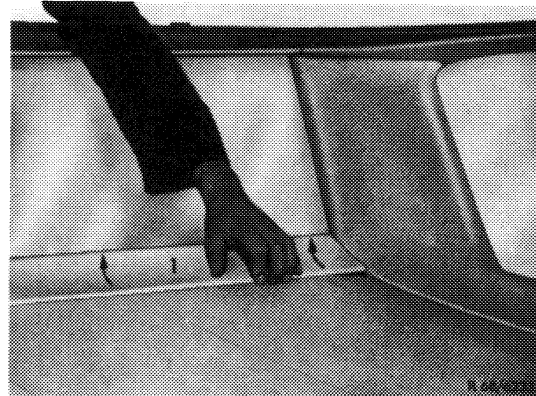


Installation

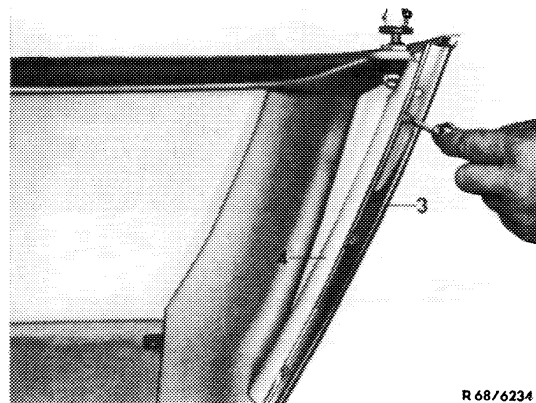
7 For installation proceed vice versa.

Removal

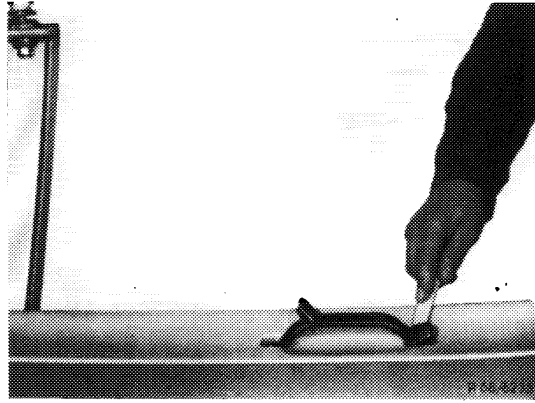
- 1 Pull window molding center top (1) from clips (2).



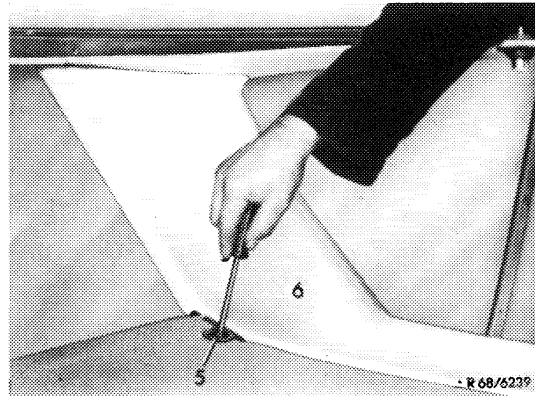
- 2 Remove sealing strip (3).
- 3 Remove window molding (4) on window flange.



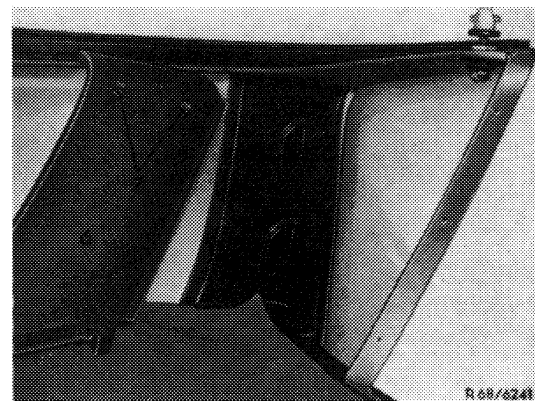
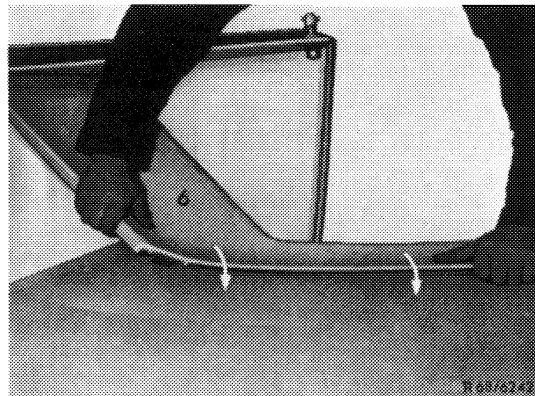
4 Remove handle.



5 Remove screw (5) on lateral window molding (6).



6 Pull window molding (6) out of clip (7) in direction of arrow.



Installation

7 For installation proceed vice versa.

68–430 Removal and installation of headlining on Coupé top

Removal

- 1 Remove coupe roof and place in inverted condition on a pertinent bench.
- 2 Remove lateral molding strip on coupe roof and center top (68–425).
- 3 Remove weather strip on coupe roof (68–570).
- 4 Remove seal and sealing strip on coupe roof front.
- 5 Remove lock on coupe roof top (77–420).
- 6 Loosen headlining on outer edges of roof.
- 7 Bend up sheet metal clips on both struts.
- 8 Lift off headlining.

Installation

- 9 For installation proceed vice versa.

Note: For gluing headlining use MB-universal glue, part No. 000 989 92 71 only.

68—440 Removal and installation of rug on entrance

Removal

- 1 Remove seat.
- 2 Remove cover rail on entrance.
- 3 Remove cable cover in legroom.
- 4 Remove carpet in driver's legroom.
- 5 Remove carpet on rear floor.
- 6 Pull out carpet at entrance.

Note: The carpet will be damaged during removal and should always be replaced.

Installation

- 7 For installation proceed vice versa. For gluing use MB-universal glue, part No. 000 989 92 71.

68–450 Removal and installation of panelling in rear center

Removal

- 1 Remove coupe roof.
- 2 Open well lid.
- 3 Remove rear side wall (68–455).
- 4 Pull off carpet from top down.

Note: The carpet will be damaged during removal and should always be replaced.

Installation

- 5 For installation proceed vice versa. For gluing use MB-universal glue, part No. 000 989 92 71.

68–455 Removal and installation of rear side wall

Removal

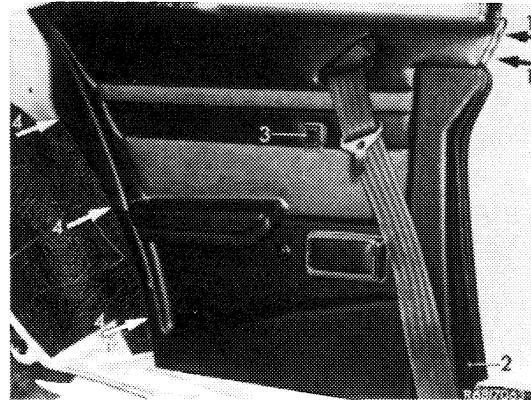
- 1** Remove crank arm (72–110).
- 2** Remove rear floor lining.
- 3** Unscrew three philips head screws on lining.
- 4** Move side wall in downward direction out of groove.
- 5** Remove side wall.

Installation

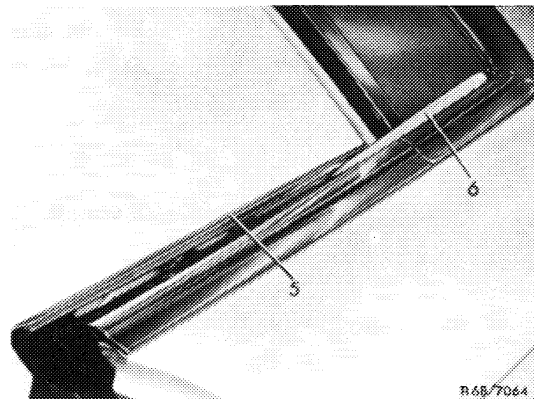
- 6** For installation proceed vice versa.

Removal

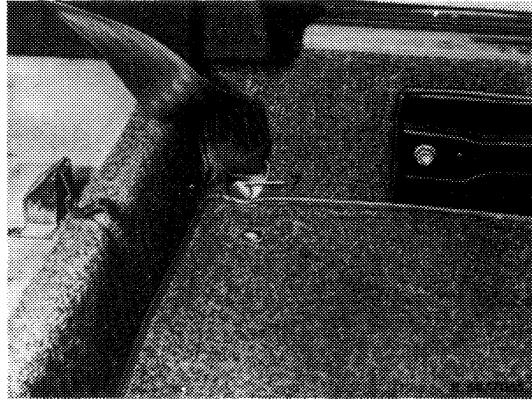
- 1 Remove rear seat and rear backrest (91-170).
- 2 Remove screws of cover plate (refer to arrows 1).
- 3 Remove cover plate, separating plate from sealing rubber (attached to side wall with clips)
- 4 Remove screw (2) on side wall.
- 5 Remove switch for window opener (3).
- 6 Pull off lateral molding strip on shutter in forward direction.
- 7 Remove three screws (4) from side wall on wheel housing rear (refer to arrow 4).



- 8 Push side wall top (5) out of clips with plastic wedge (6).

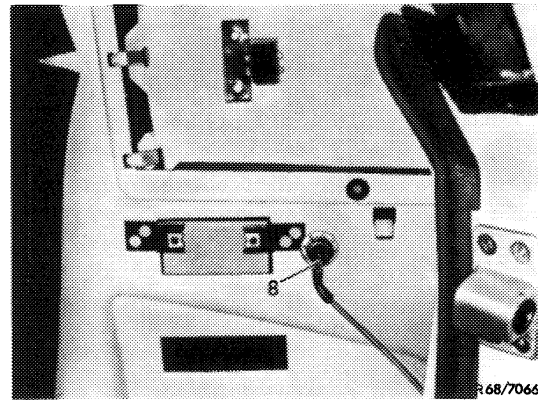


9 Remove screw from safety belt (7) on side member.



10 Pull vacuum hose (8) behind side wall from switch.

11 Remove side wall.



Installation

12 For installation proceed vice versa.

68–458 Removal and installation of hat rack and tray for first aid kit

Hat Rack

- 1 Remove rear seat and rear backrest (91–170).
- 2 Remove partition between fuel tank and trunk compartment.
- 3 Remove the 3 nuts on hat rack from trunk compartment end.
- 4 Lift out hat rack.
- 5 For installation proceed vice versa.

Tray for First Aid Kit

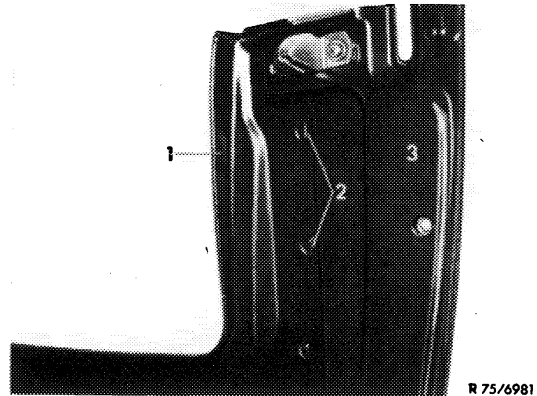
- 1 Push tray out of rear wall sheet metal with a plastic wedge.

The hat rack is **not** removed for this purpose.

Removal

Note: Always replace lining following removal.

- 1 Loosen lining inside (1).
- 2 Unbend tab (2) of fastening rail.
- 3 Remove fastening rail from anchoring of top well lid.
- 4 Remove fastening rail together with lining.
- 5 Loosen lining and Moltopren layer from rail.



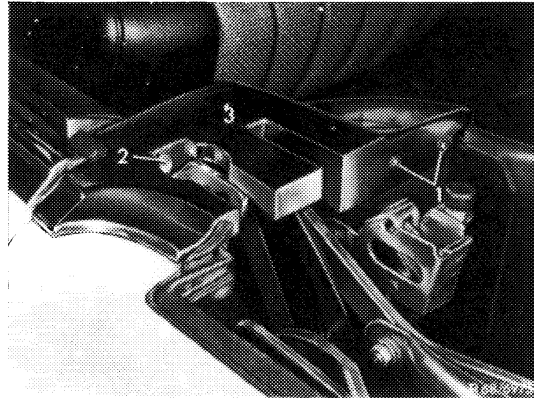
Installation

- 6 For installation proceed vice versa. Remove glue residuals with test gasoline. Glue lining back to rail.

68-470 Removal and installation of cover on box-type pillar

Removal

- 1 Remove coupe top.
- 2 Open top well lid.
- 3 Remove screws (1 and 2).
- 4 Remove covering.



Installation

- 5 For installation proceed vice versa.

Note: Match covering to top well lid.

68–500 Removal and installation of trim strips

Note

Plastic clips should be removed from packages which have been opened and placed in water in order to ensure that their elasticity is maintained.

Trimstrip Above Light Unit

- 1 Remove light unit (82–210).
- 2 Unscrew sheet metal screws on trimstrip.
- 3 Remove trimstrip.

Trimstrip Laterally on Front Fender

- 1 Unscrew front nut on trimstrip.
- 2 Push trimstrip in center out of clip hole by means of a plastic wedge.
- 3 Slide trimstrip forward and remove.

Trimstrip on Windshield Post

- 1 Remove coupe top or open roadster top.
- 2 Remove seal for side window from sealing rail on windshield post.
- 3 Unscrew the 5 screws on sealing rail.
- 4 Remove sealing rail.
- 5 Remove the 3 screws from trimstrip.
- 6 Remove trimstrip.

Trimstrip at Entrance

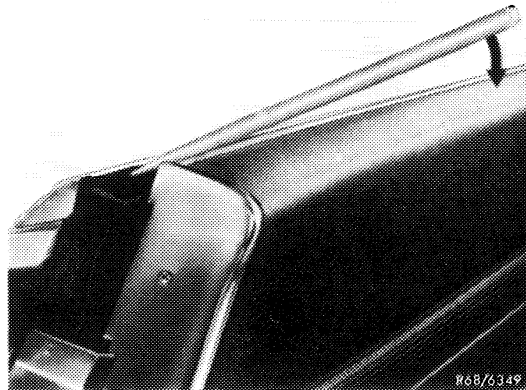
- 1 Unscrew screw on trimstrip front and nut rear.
- 2 Push trimstrip from clip holes with plastic wedge and remove.

Trimstrip on Driver's Door

- 1 Pull out sealing frame of driver's door at rear in trimstrip range.
- 2 Unscrew nut of trimstrip screw.
- 3 Push trimstrip out of clip holes with plastic wedge.
- 4 Remove trimstrip in rear direction.

Trimstrip on Upper Edge of Driver's Door

- 1 Remove outside rear view mirror on driver's door (72–270).
- 2 Lift trimstrip from clips.



Trimstrip Laterally on Rear Fender

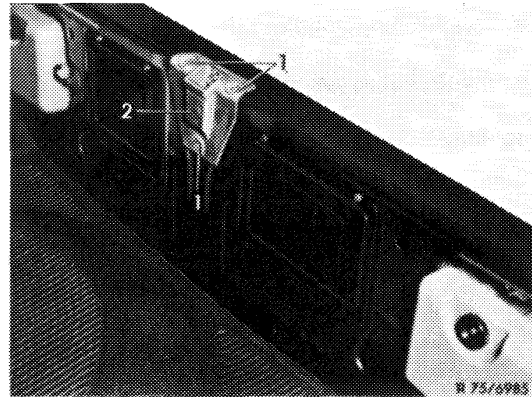
- 1 Unscrew nut on trimstrip in wheel housing.
- 2 Slide trimstrip forward and remove.

Trimstrip on Top of Coupe Top

- 1 Remove headlining on coupe top (68–430).
- 2 Remove foam rubber insert from top.
- 3 Drill pop rivets on trimstrip and remove.
- 4 Remove trimstrip.
- 5 Prior to assembly, glue paper tape to trimstrip as a protection against noise on outside surface.

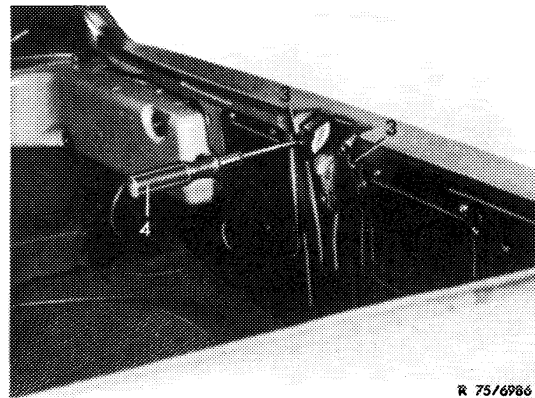
Trimstrip on Snap Lock of Trunk Lid

- 1 Pull out sealing frame of trunk lid in trimstrip range.
- 2 Remove rear lights.
- 3 Remove lower half of lock (2) on rear center panel.



- 4 Unscrew fastening nuts (3) on trimstrip.
- 5 Remove three-part trimstrip with rubber shim.
- 6 For installation proceed vice versa.

Attention! Watch out for water leaks when mounting parts.



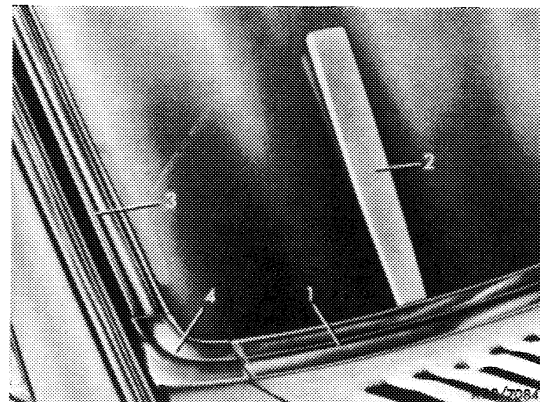
Trimstrip on Well Lid

- 1** Unscrew fastening nuts of rosette.
- 2** Remove rosette and trimstrip cover.
- 3** Unscrew sealing nuts on trimstrip.
- 4** Remove trimstrip.
- 5** Lightly grease trimstrip shim with vaseline as a protection against noise.
- 6** Mount intermediate layer on trimstrip.
- 7** Slide square head screws into trimstrip.
- 8** Attach trimstrip outside first.
- 9** Tighten sealing nuts starting in center.
- 10** Mount trimstrip cover and rosette.

Removal

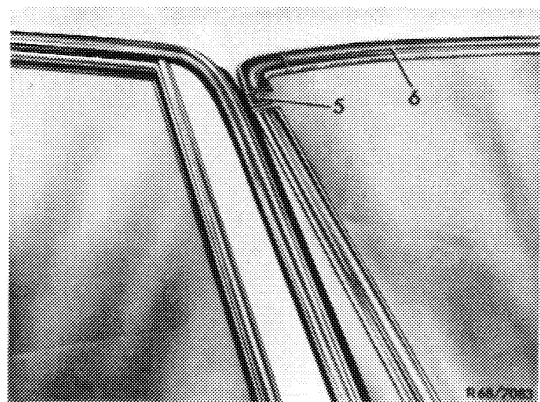
1 Push lower trimstrip (1) outwards by means of plastic wedge (2) starting at center.

2 Push trimstrip out of clips starting laterally (3) from below.



3 Pull lateral trimstrip (3) out of connecting piece (5) in downward direction.

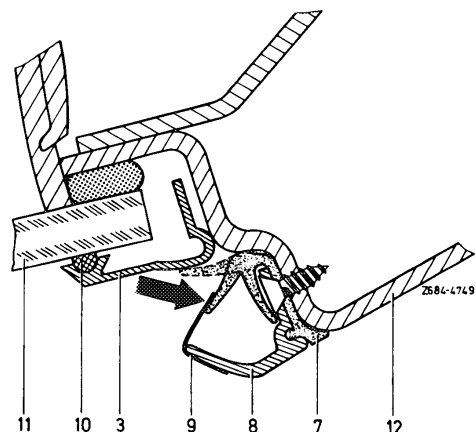
4 Remove trimstrip top (6) as described under item 1.



Installation

5 To facilitate assembly, attach rubber lip (7) to weather strip (8) by means of adhesive tape (9).

6 For further installation proceed vice versa to installation. Make sure that the sealing strip (10) on contact surface of windshield is properly pulled into trimstrip.



- | | |
|-----------------|----------------------|
| 3 Trimstrip | 10 Sealing strip |
| 7 Rubber lip | 11 Windshield |
| 8 Weather strip | 12 Front wall pillar |
| 9 Adhesive tape | |

68.1—540/1

Weather Strip on Roadster

Removal

- 1 Remove coupe top or open roadster top.
- 2 Lift rubber lip in range of fastening screws from weather strip by means of a wedge.
- 3 Remove the four screws.
- 4 Remove weather strip from base and lift off.

Installation

- 5 For installation proceed vice versa. Insert screws starting at the top, while simultaneously pushing weather strip against windshield post.

Weather Strip on Coupe

Removal

- 1 Remove sealing rail at top in range of crank window
- 2 Unscrew the four screws on weather strip.
- 3 Pull weather strip on front wall pillar out of clips and remove.

Installation

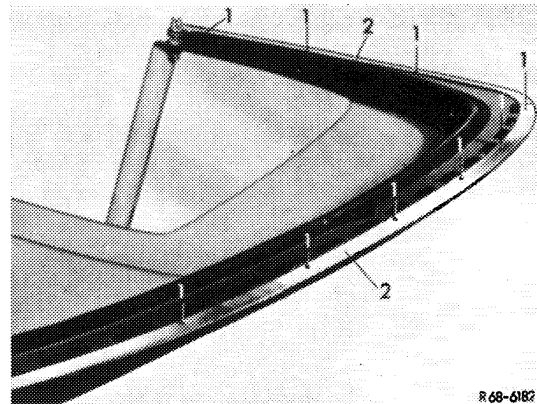
- 4 For installation proceed vice versa.

68-560 Removal and installation of ornamental frame on rear window of Coupé top

Removal

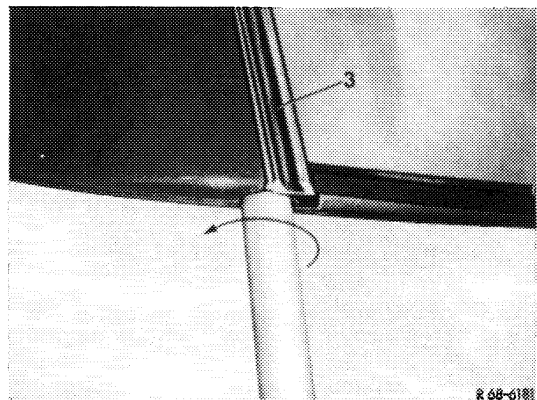
1 Remove coupe top and place turned-around on a suitable work bench.

2 Unscrew screws (1) and remove lower trimstrips (2).

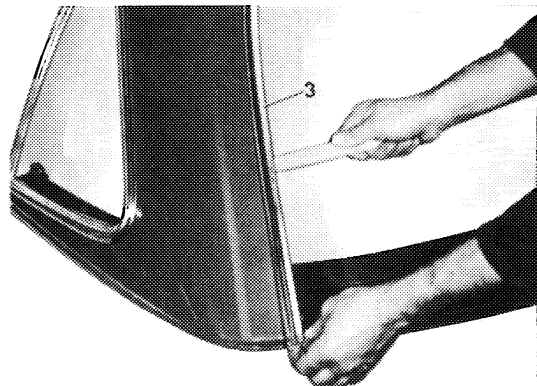


3 Turn coupe top around.

4 Push lateral trimstrip (3) out of lower clip with plastic wedge.

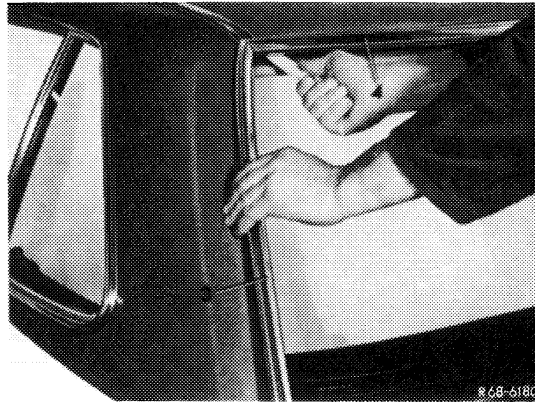


5 Pull trimstrip (3) out of remaining clips starting from below and using the plastic wedge.



6 Lift upper trimstrip (4) and pull trimstrip (3) out of connecting piece in downward direction. Watch out for plastic support in corner.

7 Remove upper trimstrip (4) similar to lateral trimstrip.



Installation

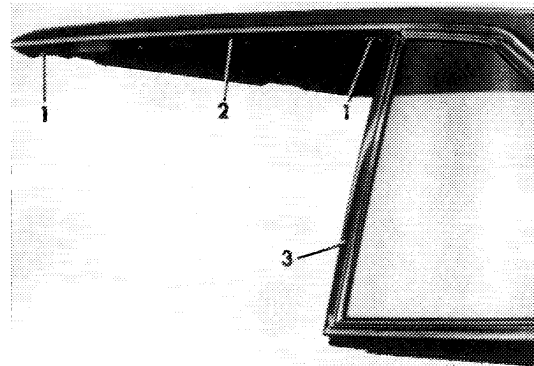
8 For installation proceed vice versa.

Note: Make sure that the sealing strip on contact surface of pane is correctly pulled into trimstrip and that the plastic support is installed in upper corners of trimstrips.

68-570 Removal and installation of ornamental frame on side window of Coupé top

Removal

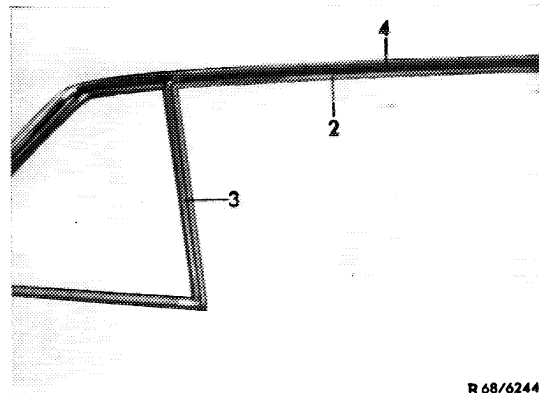
- 1 Remove sealing strip top and rear.
- 2 Unscrew two screws (1) from weather strip (2).
- 3 Remove weather strip (2) together with ornamental frame (3) from side window.



R 68/6243

Installation

- 4 For installation proceed vice versa, but watch out for plastic support (4).



R 68/6244

68–575 Removal and installation of ornamental frame on rear window of Coupé

Removal

- 1 Remove rear window.
- 2 Push covers for ornamental frame joint on rear window bottom at left and right sideways.
- 3 Remove ornamental frame at top and laterally from sealing frame.
- 4 Push ornamental frame at bottom out of sealing frame.

Installation

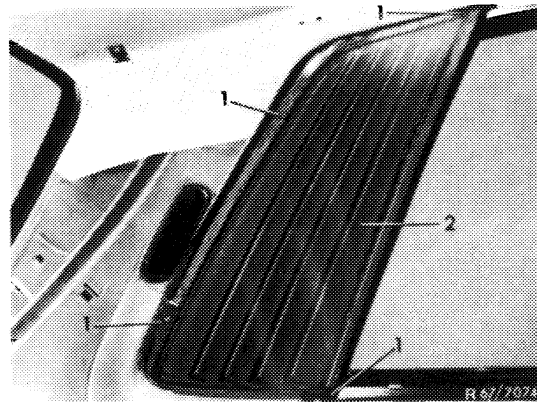
- 5 For installation proceed vice versa.

Push ornamental frame into sealing frame prior to installation of rear window.

68–580 Removal and installation of ornamental frame on shutter

Removal

- 1 Remove side wall in rear of vehicle (68–456).
- 2 Remove lateral molding strip on top (68–410).
- 3 Push trimstrip from rear crank window with plastic wedge.
- 4 Screw the two rear screws (1) and the lower screw (1) out of shutter (2). (Shutter is then held only by the upper screw (1)).
- 5 Remove ornamental frame in outward direction.



Installation

- 6 For installation proceed vice versa.

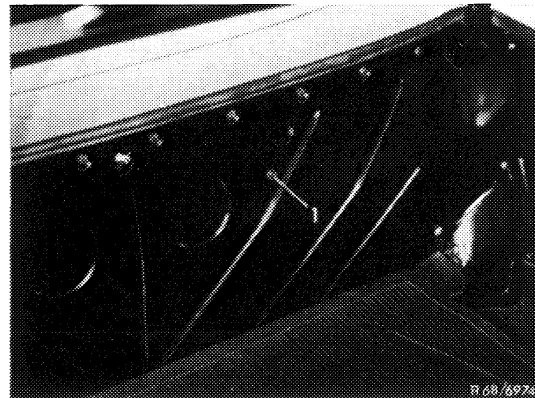
68–700 Removal and installation of partition between tank and trunk

Removal

- 1 Unscrew sheet metal screw (1) holding compensating tank to partition.
- 2 Remove screws from partition.
- 3 Remove partition.

Installation

- 4 For installation proceed vice versa.

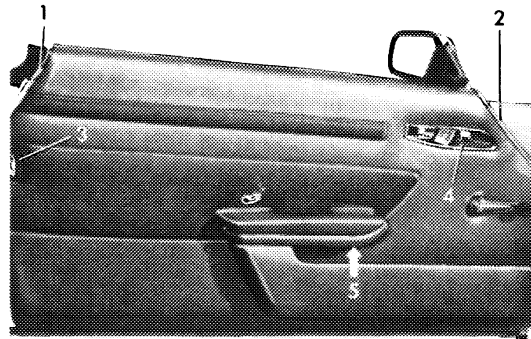




72-100 Removal and installation of door lining

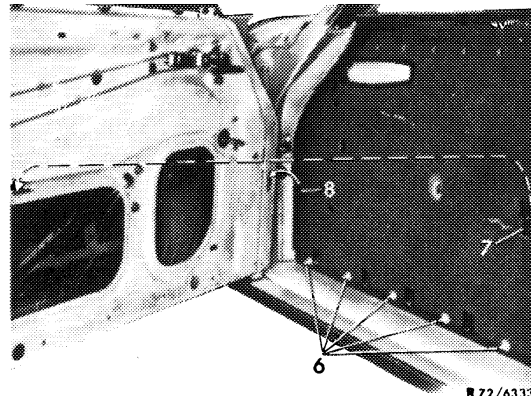
Removal

- 1 Remove cover molding (1) at lock end (72-130).
- 2 Remove cover molding (2) at hinge end.
- 3 Remove escutcheon (3) on door lock.
- 4 Remove window crank (72-110).
- 5 Remove inset (4) on inside door actuation (72-120)
- 6 Unscrew screw (5) at front of arm rest.



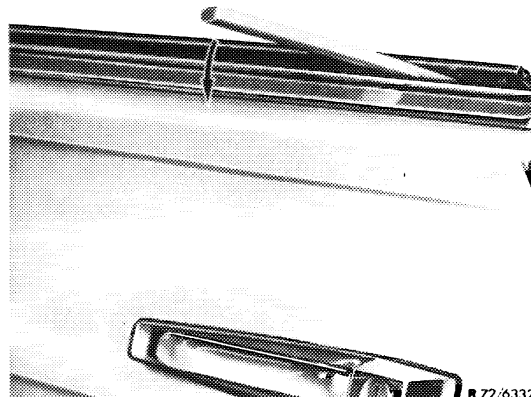
R 72/6331

- 7 Pull door lining at bottom and rear from inside door panel, while lifting the clips (6) individually by means of a plastic wedge.



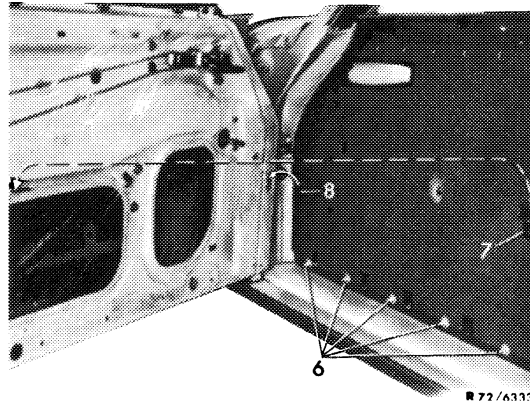
R 72/6331

- 8 Push door lining with a plastic wedge against upper edge out of clips in upward direction.



R 72/6332

9 Separate door lining first on rear hook (7) and then on front hook (8) in upward direction.



Installation

10 For installation proceed vice versa.

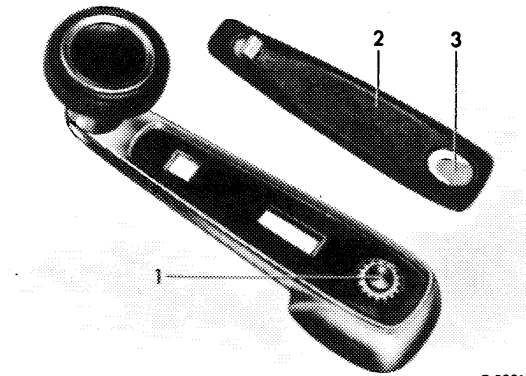
72-110 Removal and installation of window crank

Removal

- 1 Raise padding (2) at knob end.
- 2 Pull padding toward knob and separate from recess (3).
- 3 Remove window crank from shaft (1) of crank unit including spacing washer and rosette.

Installation

- 4 For installation proceed vice versa.



R-3996

72–120 Removal and installation of inset on inside door actuation

Removal

Driver's Door

1a Lift molding at inset for inside actuation by means of a plastic wedge applied against lower end.

Front Seat Passenger Door

1b Pull cover cap from grip by means of a plastic wedge.

2 Remove screw on molding behind cap. Lift inset slightly and remove in forward direction.

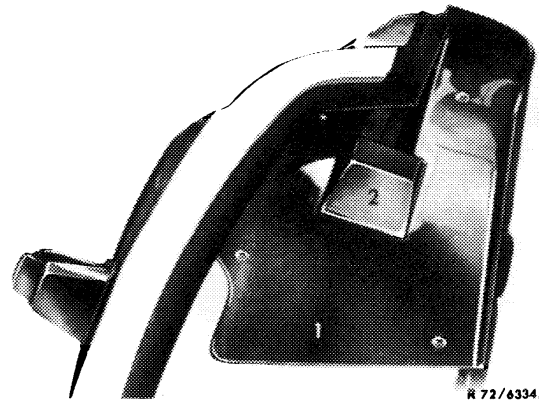
Installation

3 For installation proceed vice versa.

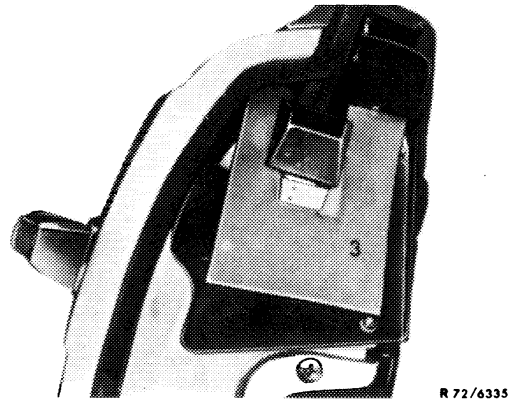
72-130 Removal and installation of cover molding at lock end

Removal

- 1 Remove screws on molding (1).

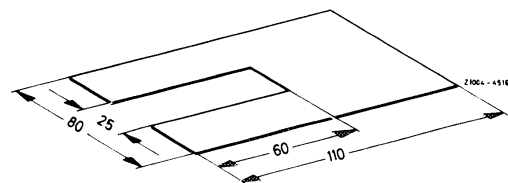


- 2 Insert assembly shim (3) between guiding bracket (2) and molding (1).



Note: The assembly shim is cut from a plastic sheet 0.6 mm thick according to the figure.

- 3 Carefully slide molding downwards and lift slightly with plastic wedge at top of door lining, if required.



0.6 mm thick

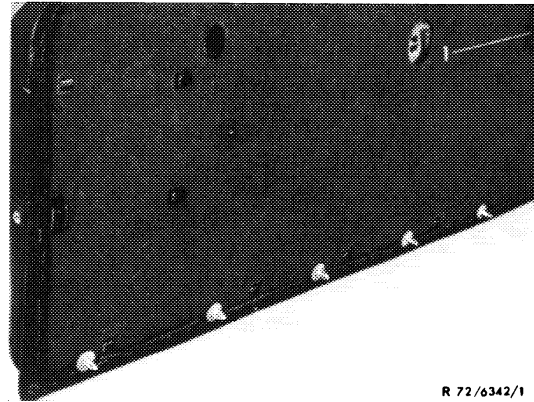
Installation

- 4 For installation proceed vice versa.

72–140 Removal and installation of armrest with grip

Removal

- 1 Remove door lining (72–100).
- 2 Unscrew screw (1) on rear hook of door lining.
- 3 Remove arm rest with grip.



R 72/6342/1

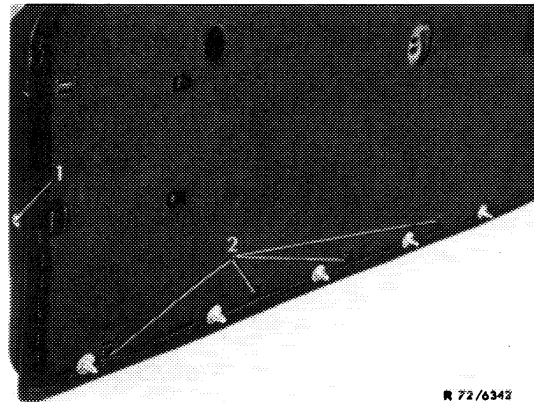
Installation

- 4 For installation proceed vice versa.

72–150 Removal and installation of door bag

Removal

- 1 Remove door lining (72–100).
- 2 Remove armrest with grip (72–140).
- 3 Remove screw (1) from under door heating duct.
- 4 Fold door pocket downwards and thereby disconnect from hooks (2).



R 72/6342

Installation

- 5 For installation proceed vice versa.

72–160 Removal and installation of inside sealing strip

Removal

- 1 Remove door lining (72–100).
- 2 Remove clips for sealing strip in upward direction.
- 3 Remove sealing strip.

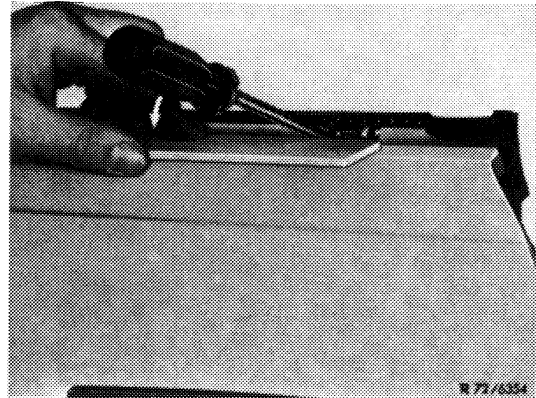
Installation

- 4 For installation proceed vice versa.

72-170 Removal and installation of outer sealing strip

Removal

- 1 Remove trimstrip on edge of outer door panel. (68-516).
- 2 Remove clips together with sealing strip from rabbet.



Installation

- 3 For installation proceed vice versa.

72–180 Removal and installation of window opener

Removal

1 Remove door lining (72–100).

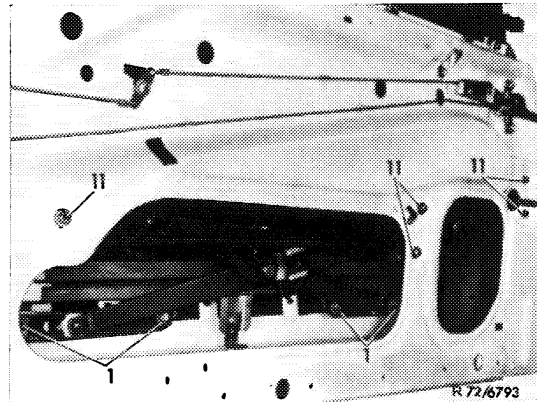
2 Remove door sheeting.

Note: On electric window opener: loosen connections on cable connector.

3 Remove screws (1) on window lifting rail.

4 Pull up window and clamp with wedge.

5 Remove screws (11) and remove window opener.



Installation

6 For installation proceed vice versa.

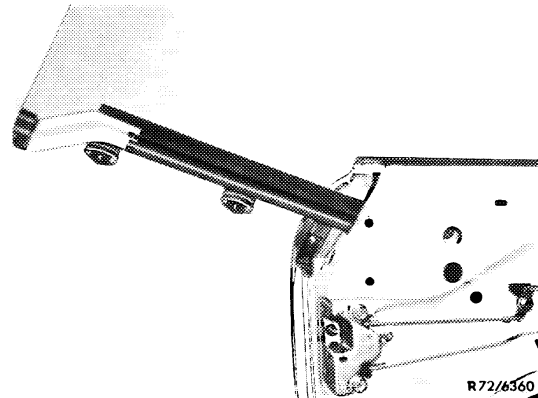
Note: First insert window opener together with crank pin.

7 Then adjust crank window (72–195).

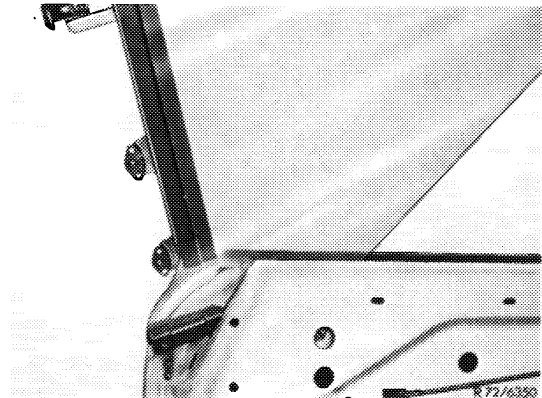
72–190 Removal and installation of crank window

Removal

- 1 Remove window guide rear (72–200).
- 2 Pull crank window out toward the rear,



- 3 Tilt crank window and remove with care.



Installation

- 4 For installation proceed vice versa.

Adjust crank window prior to installing door lining (72–195).

72-195 Adjustment of crank window

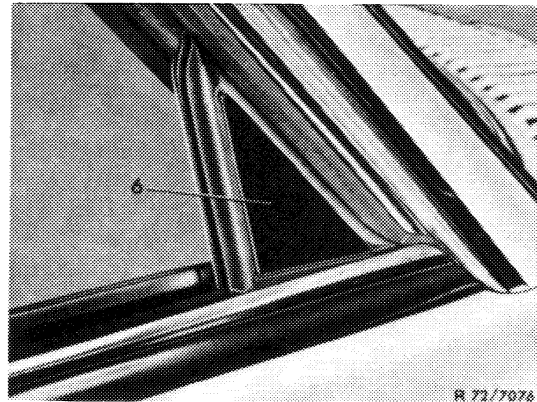
Correct adjustment of crank window system of Models 350 SL/SLC requires particular care and knowledge.

Note

The adjusting jobs described below should be made first with roadster top mounted. Then align coupe top to adjusted crank window. Coupe top can be fitted to crank window by aligning ornamental frame of coupe top or by means of suitable placement of sealing strips.

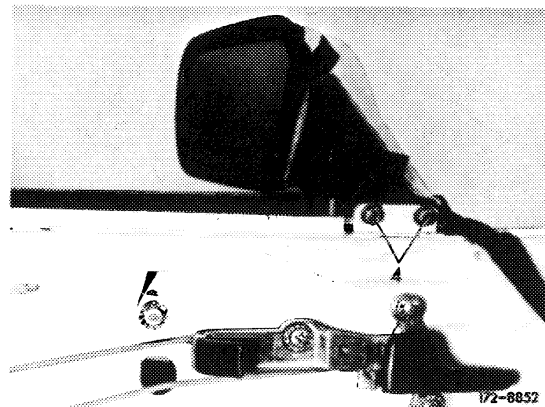
Adjustment

- 1 Remove door lining (72-100).
- 2 Adjust guide bracket front (6) in such a manner that bracket rests at moderate pressure against front sealing rubber when door is closed.

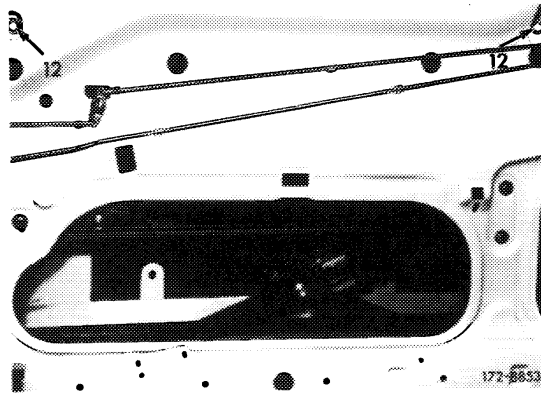


For this purpose, loosen both screws (4) on guide bracket (6) front.

Note: Rubber should not be squeezed when door is closed.



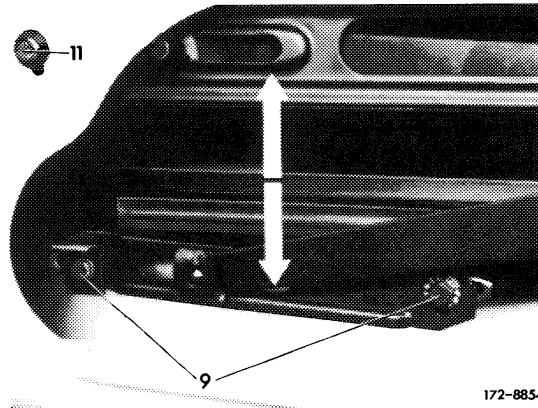
3 Loosen both screws (12) for upper angle stop.



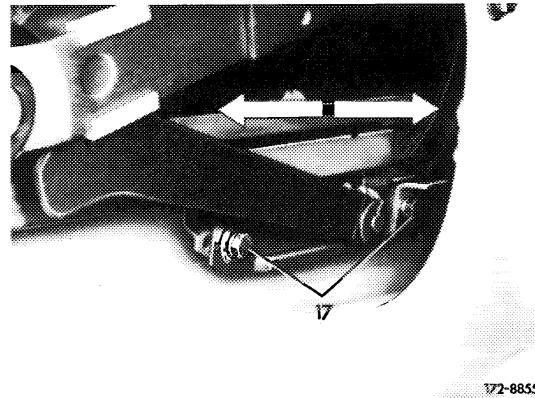
4 Crank window up until guide bracket (6) and front edge of pane are in alignment.

Corrections can be made by means of the two rear screws (9) on window lifting rail.

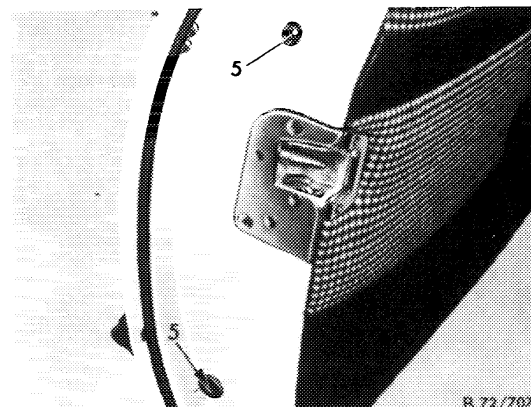
Note: Additional adjustments can be made by means of rear screw (11) of window opener.



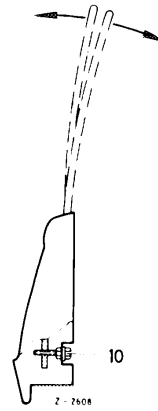
5 Adjust pane by means of the two front screws (17) in such a manner that pane rests against front sealing rubber at moderate pressure when door is closed.



6 Loosen both screws (5) on rear guide rail.

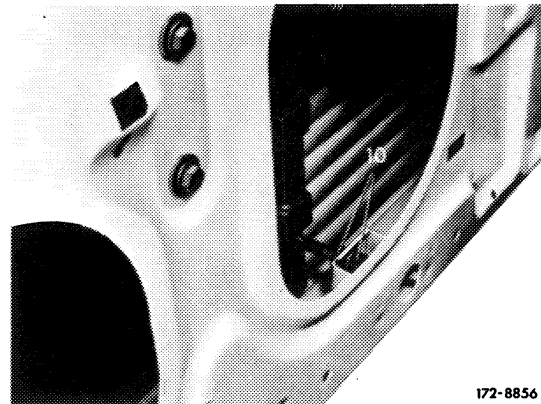


Note: Adjust lateral preload of pane by means of screws (5) and nuts (10).



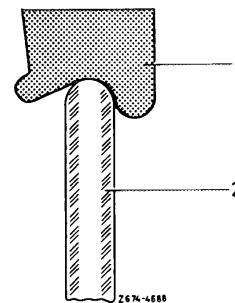
10 Adjusting nuts of front guide rail

7 Loosen adjusting nuts (10) on front window guide rail.



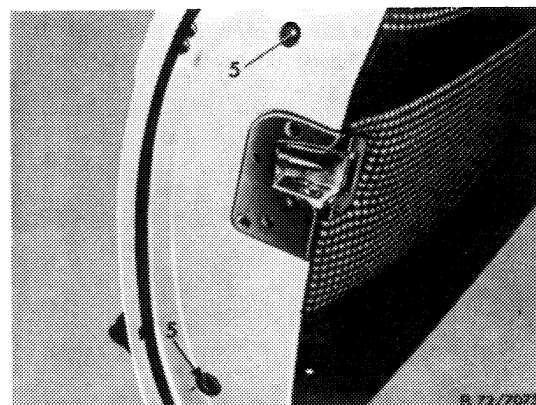
172-8856

Note: When preload is correctly adjusted, the front upper edge of opened window will just touch rubber seal when door engages in first stage of door lock. With the door completely closed, pane (2) should now rest in its complete length against inner lip of front rubber seal (1).



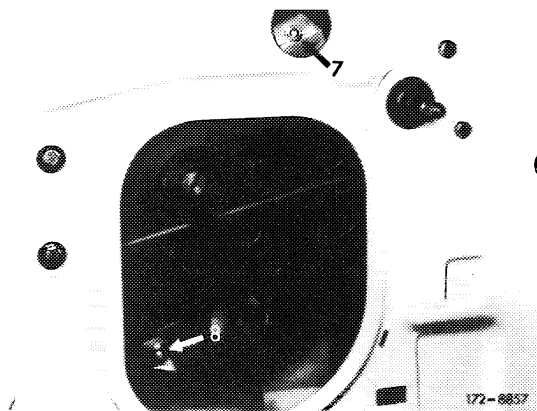
8 Adjust rear guide rail with holding screws (5) in such a manner that rear edge of pane rests against rear rubber seal along its entire length.

Note: If required, a suitable support (felt strip or the like) can be placed against rubber seal of roadster top or coupe top of Model 350 SL.

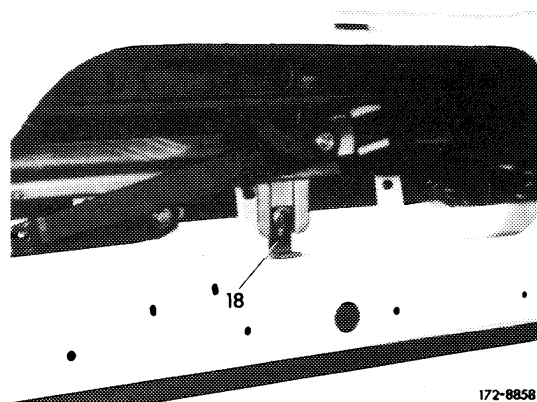


9 Adjust upper stroke restriction with adjusting screws (12) and stop (7) on window opener.

10 Adjust lower stroke restriction with stop (8) on window opener in such a manner that upper edge of pane is flush with sealing strips.

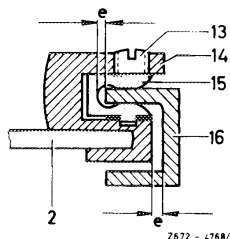


Note: On vehicles with window openers first version, this adjustment must be made at lower angle stop (18).



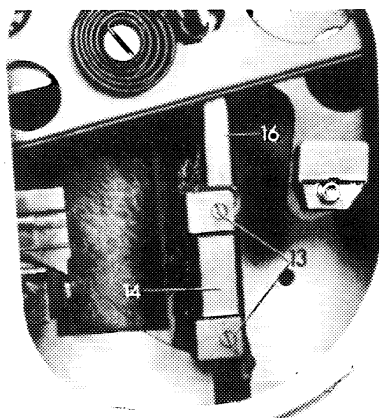
11 Compress slide pieces (15) with threaded pins (13) until crank window is free of play and yet remains easily movable.

- | | |
|----------------------------|----------------------|
| 2 Pane | 15 Slide piece |
| 13 Threaded pin | 16 Window guide rail |
| 14 Guide shoe front bottom | |

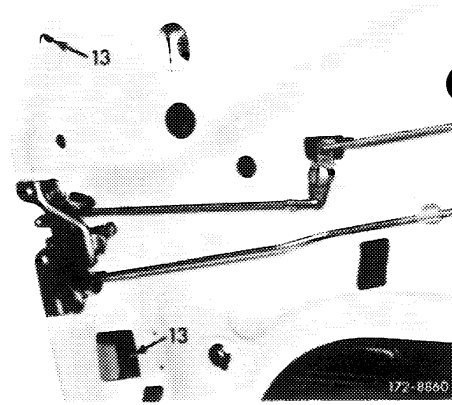


For this purpose, screw both threaded studs (13) on **front** slide piece completely down, then screw threaded studs (13) back for approx. one 3/4 turn.

- | | |
|-----------------|----------------------------|
| 13 Threaded pin | 16 Window guide rail front |
| 14 Guide shoe | |



12 Screw both threaded pins (13) on **rear** window guide rail also completely down, then screw pins back for approx. one turn.



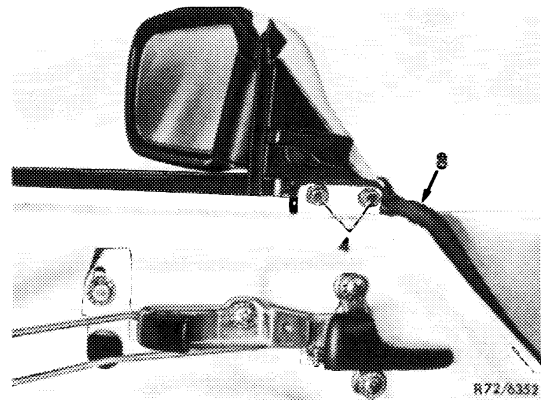
13 Following adjustments, lubricate all slide surfaces on window guide rails with anti-corrosion grease Part No. 000 989 31 51.

Caution! For supplementary installation of a coupe top, refer to installation instructions.

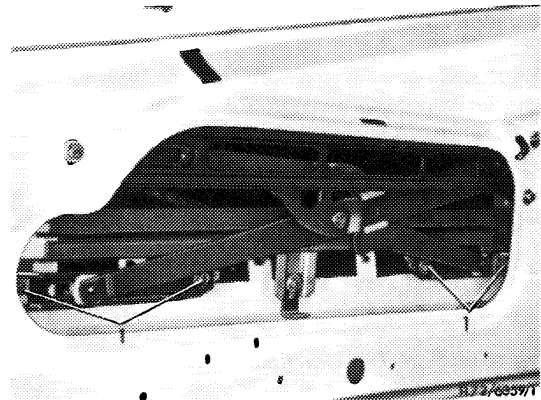
72-200 Removal and installation of window guides, front and rear

Removal

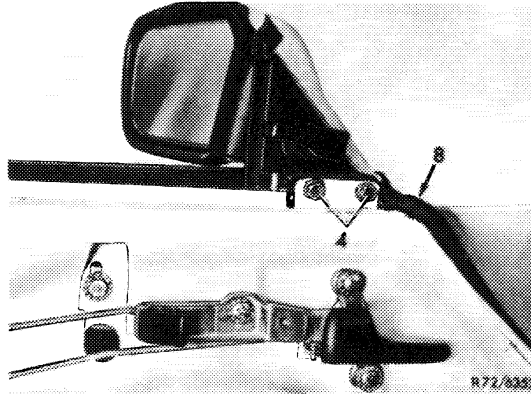
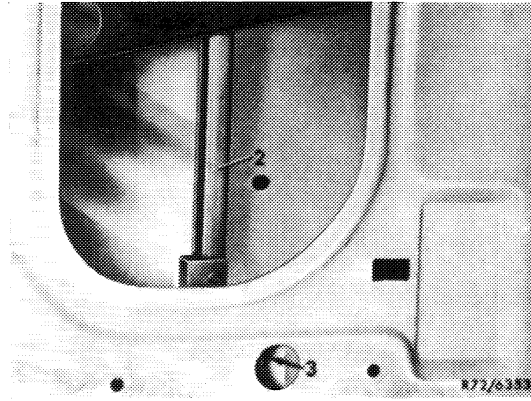
- 1 Remove inside sealing strip (72-160).
- 2 Remove plastic sheeting.
- 3 Loosen sealing frame on clip (8).



- 4 Loosen crank-operated window from window opener on screws (1).



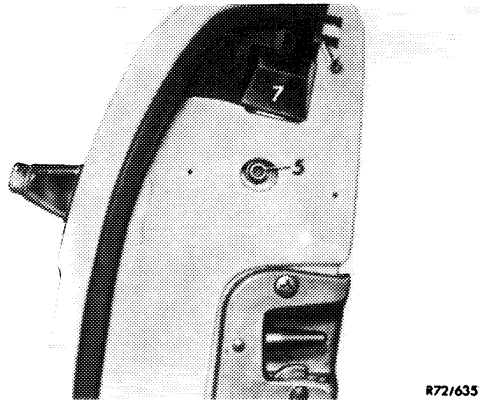
- 5 Loosen window guide front (2) on lower fastening (3) and upper fastening (4).



- 6 Loosen upper fastening (5) and lower fastening on window guide rear.

Note: Make sure that screw (5) and the undulated washer will not drop into door shaft during assembly jobs, since this might require removing the door lock.

- 7 Remove clip (6).
- 8 Push crank-operated window forward.
- 9 Remove window guide at rear together with guide bracket (7) in upward direction.
- 10 Remove crank-operated window (72–190).
- 11 Remove front window guide toward rear.



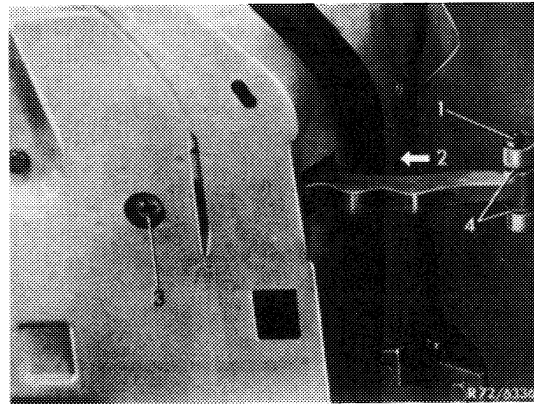
Installation

- 12 For installation proceed vice versa.

Then adjust crank-operated window (72–195).

Removal

- 1 Remove door lining (72–100) and pull off plastic sheeting in front range.
- 2 Crank up side window.
- 3 Pull off lock on bolt (1) and remove bolt. Watch out for the two spacing washers (4).
- 4 Slightly raise door sealing frame in range of hex. socket screw (2).



- 5 Unscrew hexagon socket screw (2).
- 6 Unscrew Philips head screw (3).
- 7 Remove door catch.

Installation

- 8 For installation proceed vice versa.
- 9 When assembling bolt, watch out for plastic spacing washers, which are available 1 and 2 mm thick.

72–220 Removal and installation of door sealing frame

Removal

- 1 Remove cover molding on lock end (72–130).
- 2 Raise trim strip on edge of side panelling in rear range somewhat.
- 3 Remove rubber frame top at lock end.
- 4 Place plastic wedge under rubber frame at hinge end and knock out clips.
- 5 Remove sealing frame.

Installation

- 6 For installation proceed vice versa.

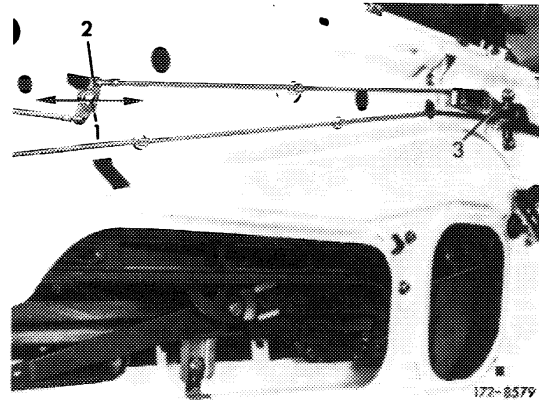
Note: always replace clips.

Removal

- 1 Remove door lining (72–100).
- 2 Disconnect pulling and safety linkage.
- 3 Unscrew three screws on inside actuation (3).
- 4 Remove inside actuation (3).

Installation

- 5 For installation proceed vice versa.

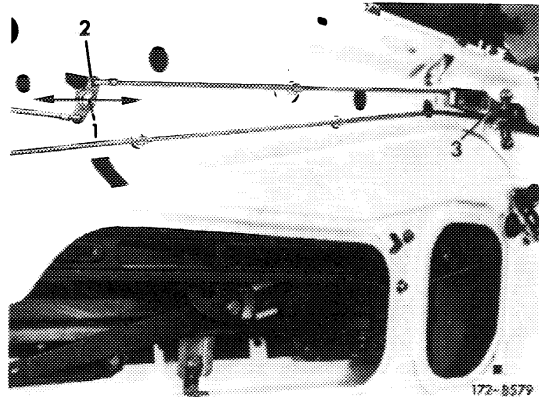


Adjustment of Safety Linkage

- 1 Loosen screw (1) on guide lever (2).
- 2 Set inner door safety lock to position (unlocked).

Note: If for reasons of noise a slight pre-tension is required, install safety linkage only with pre-tension in relation to pressure, but not in relation to pull.

- 3 Tighten guide lever (2) in this position.
- 4 Make final check of adjustment, making sure that the door locked with the **inner safety lock** cannot be opened with the **outer door handle**.



72–240 Removal and installation of outside door handle

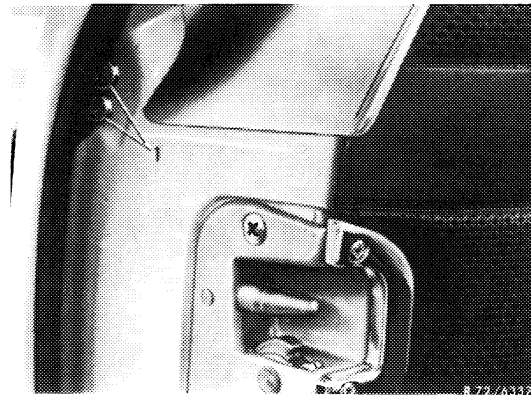
Data

Relief play between pull hook and door lock

1 mm

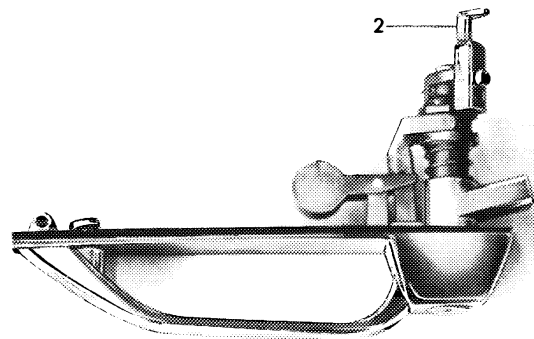
Removal

- 1 Unscrew the two screws (1).
- 2 Push door handle forward.
- 3 Pull grip and remove entire door handle.



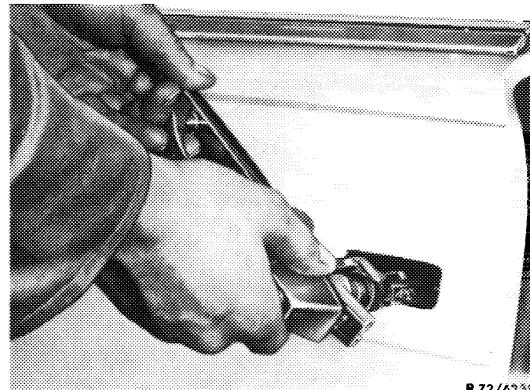
Installation

- 4 Turn pull hook (2) on door handle upward.



R 72/6338

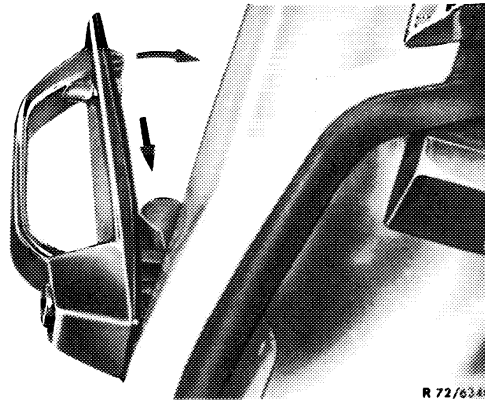
- 5 Insert door handle into door cutout.



R 72/6339

6 Turn door handle into horizontal position and insert.

7 Slide door handle toward rear and screw down.



72–250 Removal and installation of door lock

Data

Relief play between pull hook on door handle and door lock

1 mm

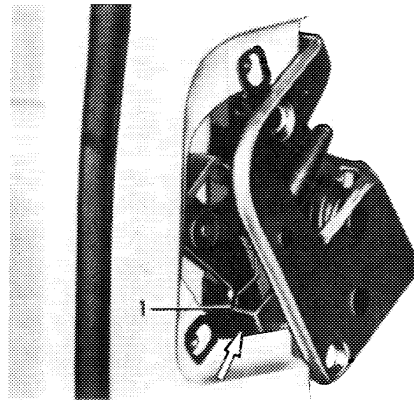
Removal

- 1 Remove door lining (72–100).
- 2 Loosen plastic sheeting in range of door lock.
- 3 Disconnect pull linkage on door lock.
- 4 Screw out the four screws for attaching lock.
- 5 Pull clip on door handle and remove door lock in downward direction.

Installation

- 6 Turn pull hook on door handle upwards.
- 7 Install door lock while pushing lever in direction of arrow.

Note: Coat latch and striker pin with **SHELL RETINAX G** and the inside of the lock with **CALYPSOL H 729**.



R 72/6341

72–260 Removal and installation of striker eye

Removal

- 1 Unscrew fastening bolts and remove striker eye together with compensating shims.

Installation

- 2 Insert striker eye and slightly tighten bolts.
- 3 Close door so that the striker eye can align itself in relation to striker pin.

Note: If required, correct position of striker eye in relation to compensating shims. Compensating shims are available 0.5 and 1.5 mm thick.

- 4 Adjust closed door in such a manner that door is flush with outer skin or projects by max. 1 mm.
- 5 Open door and tighten striker eye.

Note: Grease newly installed striker eyes with **SHELL RETINAX G**.

72--270 Removal and installation of outside rear view mirror

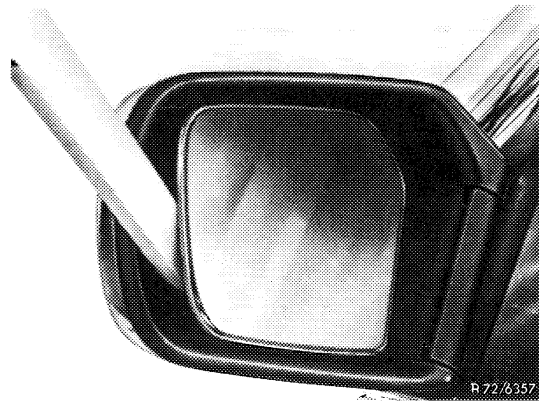
Note

If outside mirror changes its position by itself, remove mirror, lift rubber cover and tighten clamping screw on adjusting mechanism as required.

Removal

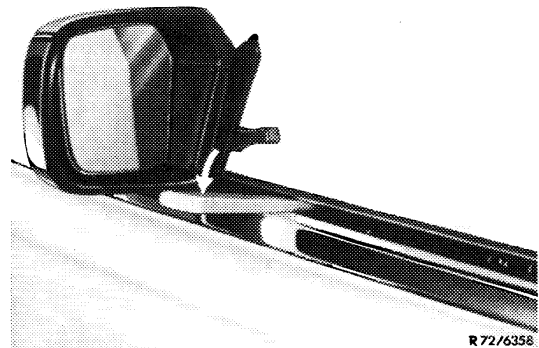
Mirror glass

- 1 Remove glass from ball socket by means of a plastic wedge and pull out laterally.

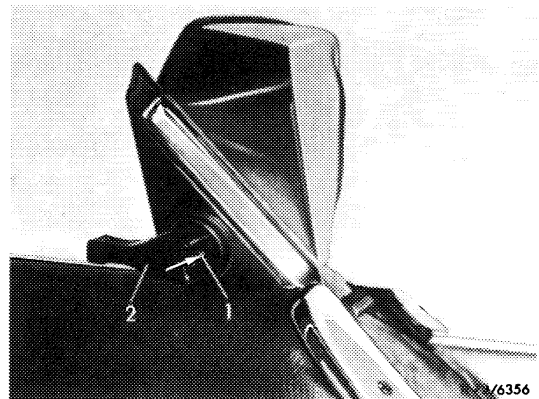


Complete outside mirror

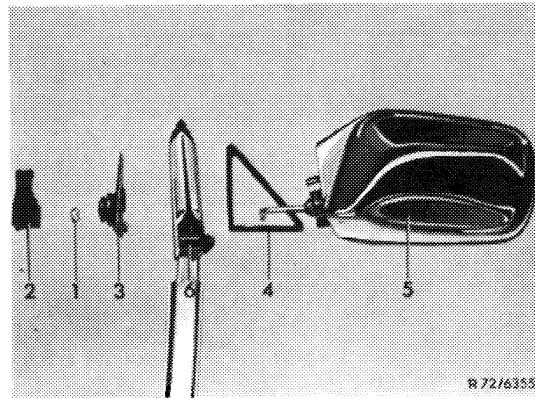
- 2 Disconnect door lining at top from clips.



- 3 Push lock washer (1) out of handle (2) in direction of arrow.



- 4 Pull off cover plate (3).
- 5 Unscrew the three screws behind cover plate.
- 6 Remove mirror (5) with intermediate shim (4) from guide holder (6).



Installation

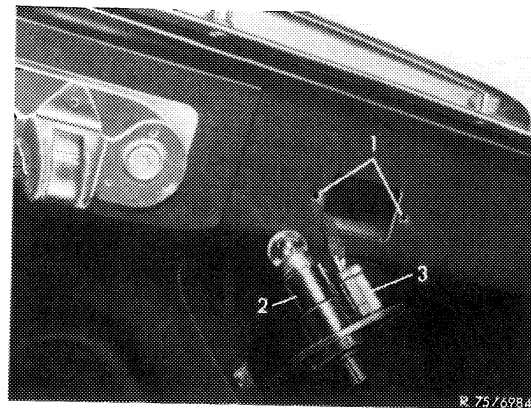
- 7 For installation proceed vice versa.



75–100 Removal and installation of trunk lid

Removal

- 1 Remove screws (1) of light (2).
- 2 Pull out light slightly.
- 3 Pull plug (3) for trunk light from light (2).
- 4 Remove cable and plug from frame of trunk lid.



- 5 Place one rag each between the two ends on trunk lid and rear wall window as a protection against damage.
- 6 Mark position of lid in relation to hinge.
- 7 Remove screws on both trunk lid hinges.

Installation

- 8 For installation proceed vice versa.

75–102 Removal and installation of trunk lid lock and snap lock

Removal

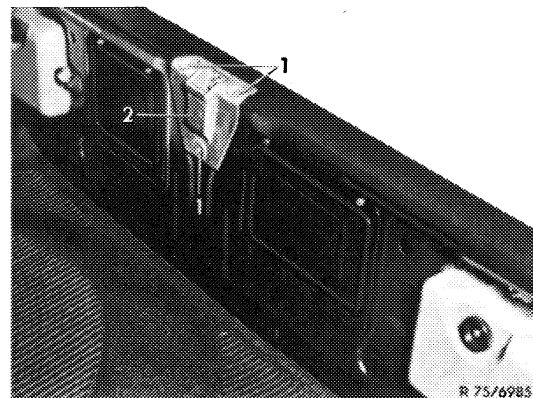
Up to the following chassis end numbers, remove trim strip on snap lock first (68–500).

This will permit removal of snap lock from trim strip.

Model	Chassis End No.
107,023	001 286
107,043	007 743
107,044	005 296

Starting with these chassis end numbers, proceed as follows:

- 1 Remove fastening strip for carpet lining left and right.
- 2 Pull off carpet lining in range of lock lower half (2).
- 3 Unscrew screws (1) and remove lock lower half (2).
- 4 Unscrew the two fastening screws for snap lock and pull snap lock out in forward direction through rear center panel.



Installation

For installation proceed vice versa.

75–110 Removal and installation of hinged lever for trunk lid and top well cover

Removal

- 1** Remove trunk lid (75–100).
- 2** Remove torsion bars (75–130 or 135).
- 3** Unbend locking tooth hex. screw on bearing bolt.
- 4** Knock out bearing bolt slightly with plastic hammer and pull off with pliers.

Installation

- 5** For installation proceed vice versa.

75–130 Removal and installation of torsion bar spring

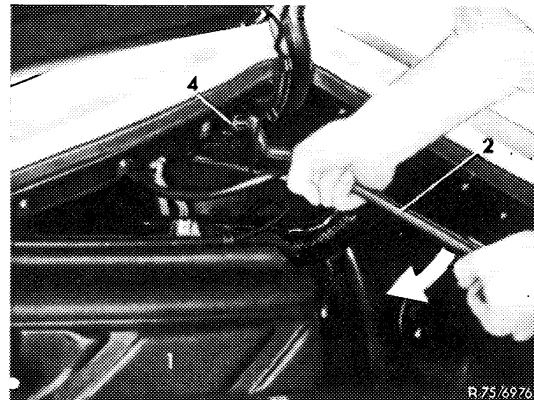
Special Tool

Mounting lever

107 589 00 37 00

Removal

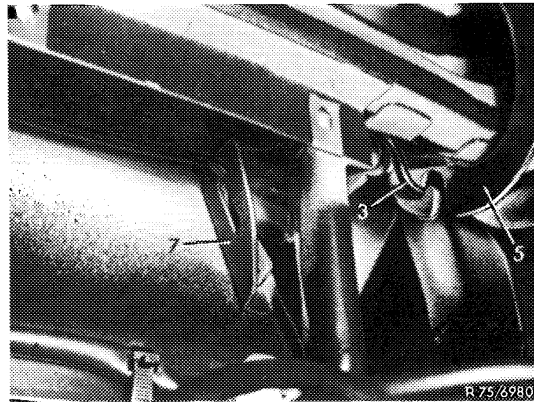
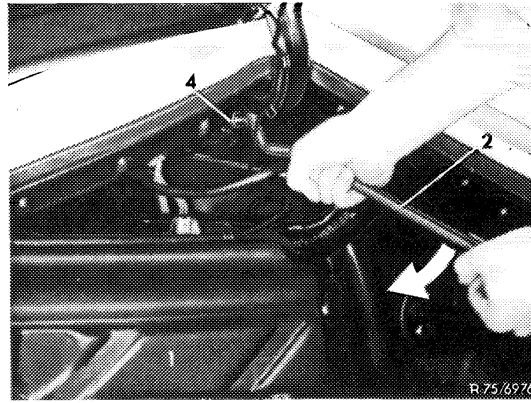
- 1 Remove partition between tank and trunk (68–700).
- 2 Loosen compensating tank (1). (Two sheet metal screws in top well.)
- 3 Unscrew fastening clips of torsion bars.
- 4 Position mounting lever (2) above torsion bar spring and tighten screw (4) well.



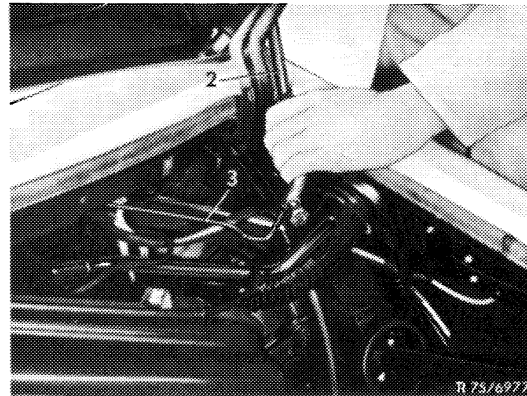
5 Support trunk lid.

6 Turn mounting lever downwards (refer to arrow) and lift torsion bar spring with both hands out of hinge lever (5).

Caution! Torsion bar spring is heavily loaded.



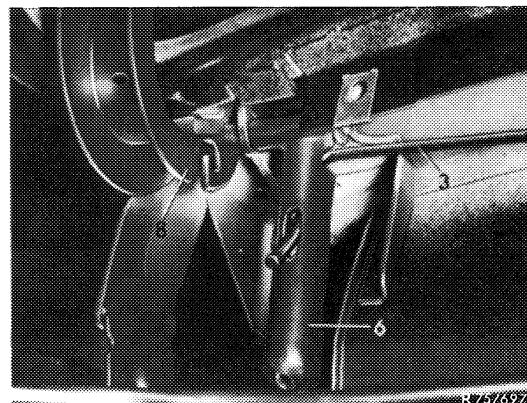
7 For slackening spring, push mounting lever slowly forward.



- 2 Mounting lever
- 3 Torsion bar spring slackened

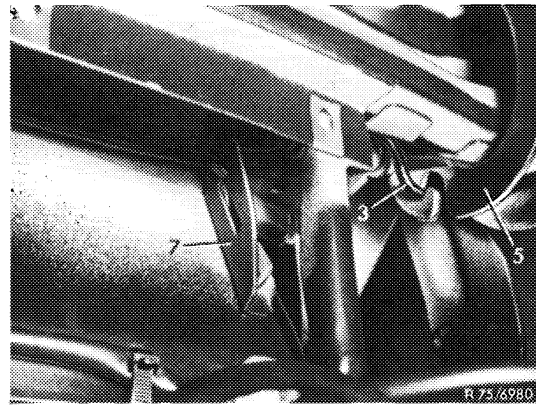
8 Loosen screw on mounting lever and remove from torsion bar spring.

9 Remove torsion bar spring (3) at left from hinge lever for top well lid (6).



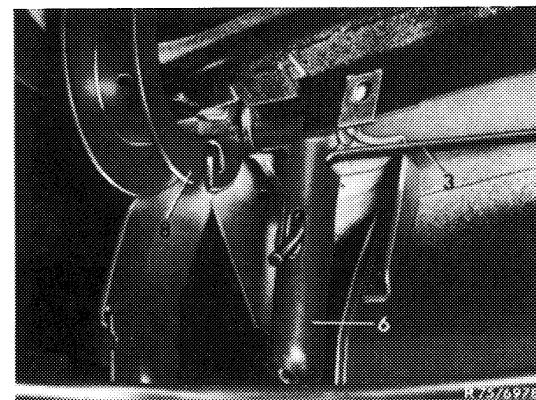
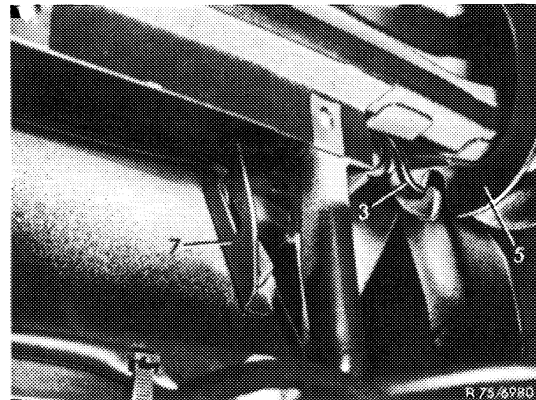
10 Disconnect second torsion bar spring in the same manner from trunk lid hinge.

11 Remove torsion bar spring from holder (7).

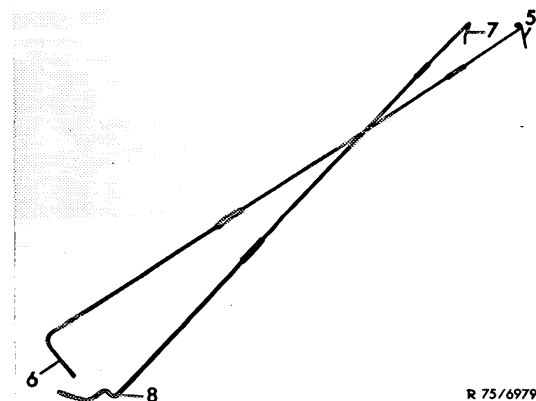


Installation

12 For installation proceed vice versa. Make sure that the shorter torsion bar 6 mm thick is attached first to mounting (7) and then to trunk lid hinge (8). Tension spring by approx. 1/2 turn for connection to trunk lid hinge.



Attach second, longer torsion bar 5.5 mm thick first to hinge lever for top well lid (6). Tension spring by 1/2 turn and attach to trunk lid hinge (5).



75–135 Removal and installation of torsion bar spring

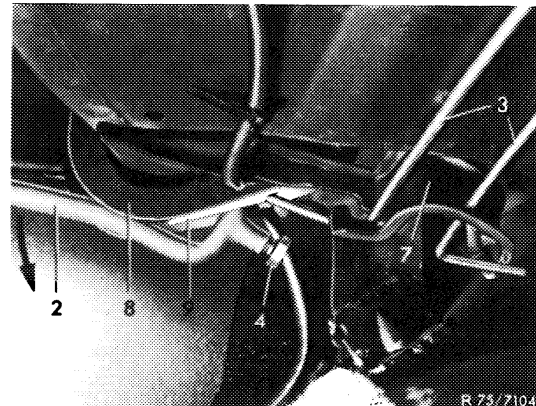
Special Tool

Mounting lever

107 589 00 37 00

Removal

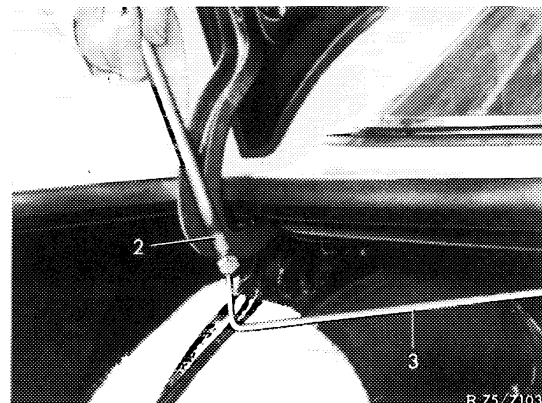
- 1 Remove fuel tank (47–020).
- 2 Open torsion bar holding bracket below in center.
- 3 Position mounting lever (2) above torsion bar spring left and tighten screw (4).
- 4 Support trunk lid.
- 5 Turn mounting lever (2) downwards (refer to arrow) and lift torsion bar spring (3) with both hands out of mounting (7).



The slide piece (9) will then drop out of hinge lever (8).

Caution! Torsion bar spring is under heavy load.

- 6 Slowly turn mounting lever forward to slacken spring.
- 7 Loosen mounting lever.
- 8 Remove torsion bar spring (3) right out of mounting.
- 9 Disconnect second torsion bar spring in the same manner.



Installation

10 For installation proceed vice versa.

For attachment to mounting, the torsion bar must be tensioned by approx. 1/4 turn. Upon attachment, turn torsion bar lightly downwards and insert slide piece.

75–200 Removal and installation of top well cover

Removal

- 1 When cover is used again, identify location of hinge lever in relation to cover.
- 2 Remove screws from hinge levers.
- 3 Remove top well lid.

Installation

- 4 For installation proceed vice versa.

Adjust stop screw in such a manner that the cover can be closed under moderate pressure and is in alignment with the adjacent body members.

75-220 Removal and installation of top well cover lock

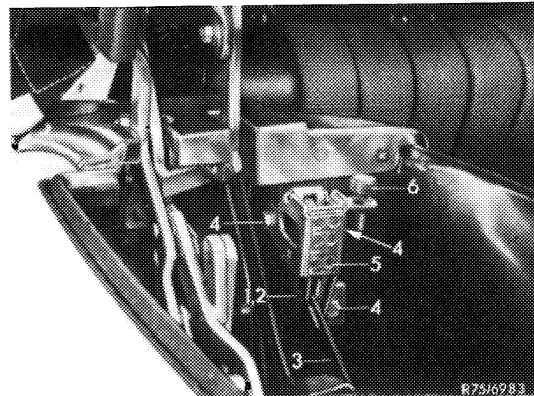
Removal

Lefthand End

- 1 Remove locking ring (1) from bolt (2) and disconnect push rod (3).
- 2 Remove screws (4) from lower half of lock (5).
- 3 Remove lower half of lock (5).

Righthand End

- 4 Removal similar to lefthand end, but instead of push rod disconnect top well lid cable control.



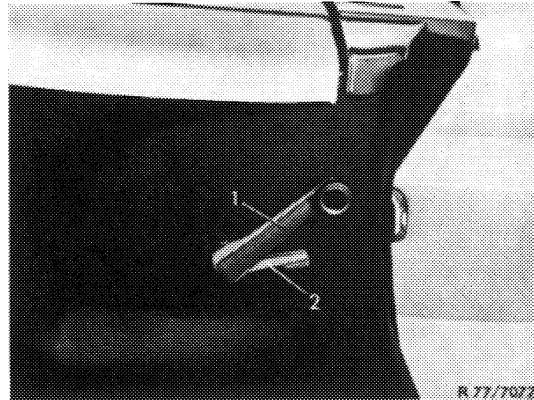
Installation

- 5 For installation proceed vice versa.

Adjust stop screw (6) on lower half of lock in such a manner that lid closes under moderate pressure.

Removal

- 1 Remove crank arm (1) on actuating lever (2).



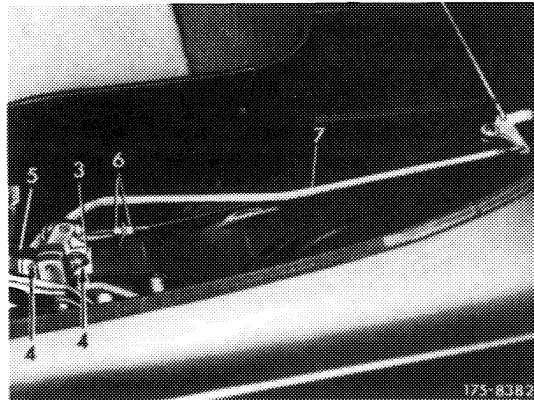
- 2 Remove push rod (5) from guide bearing (3).

- 3 Loosen knurled nut (6) and disconnect bowden wire on guide bearing (3).

- 4 Remove locking clip on guide lever from pull rod (7).

- 5a Model 107.043 up to Chassis End No. 006203
Model 107.044 up to Chassis End No. 003321

Unscrew fastening screws (4) on guide bearing (3).

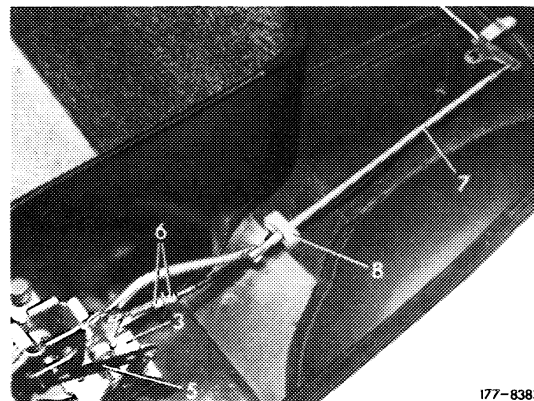


- 5b Model 107.043 up to Chassis End No. 006203
Model 107.044 up to Chassis End No. 003321

Push holder (8) out of oblong holes and push rearward over push rod (7).

Unscrew fastening screws on guide bearing (3).

- 6 Lift out guide bearing (3) with pull rod (7).



Installation

7 For installation proceed vice versa.

Note: In the event of repairs, install only changed guide bearing with push rod.

75–260 Conversion of guide bearing with pull rod

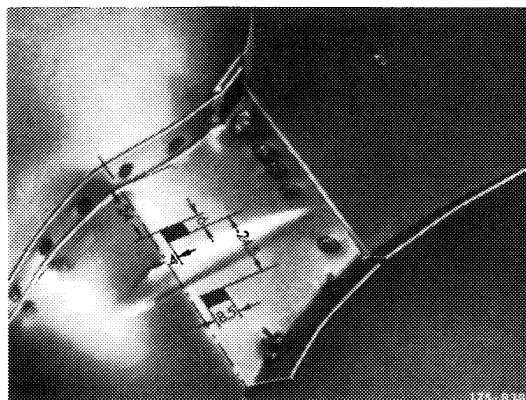
Note

In the event of repairs, install new guide bearing with pertinent pull rod (75–240).

For Conversion Proceed as Follows

- 1 Remove guide bearing with pull rod (75–140).
- 2 Refinish two oblong holes for receiving holder for pull rod in floor side member.

Layout of oblong holes in floor side member.



- 3 Push holder from the rear over pull rod and push into oblong holes.
- 4 Install guide bearing with pull rod (75–240).

Spare Parts

Guide bearing	Part No. 107 750 04 41
Pull rod	Part No. 107 758 08 23
Holder	Part No. 107 758 00 14

Responsible for delivery: ET Sindelfingen

75–300 Removal and installation of tank flap

Tank Flap with Holding Clip

Type 107.043 **up to** Chassis End No. 004 099

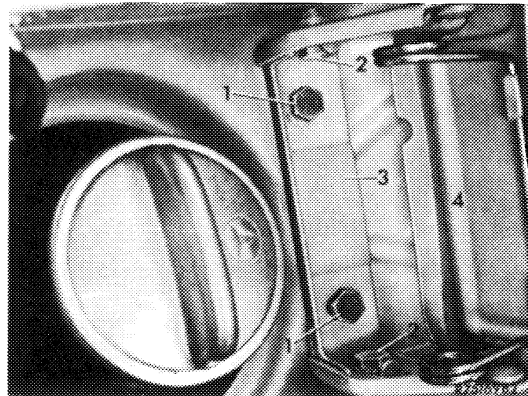
Type 107.044 **up to** Chassis End No. 001 777

- 1 Remove partition (68–700).
- 2 Remove both screws (1) while applying counterhold to nuts.
- 3 Remove tank flap with holding clip.

Type 107.043 **as from** Chassis End No. 004 100

Type 107.044 **as from** Chassis End No. 001 778

- 1 Remove both screws (1).
- 2 Remove tank flap with holding clip.



- | | |
|--------------------------|----------------|
| 1 Screws on holding clip | 3 Holding clip |
| 2 Screws for tank flap | 4 Tank flap |

75-305 Removal and installation of tank flap

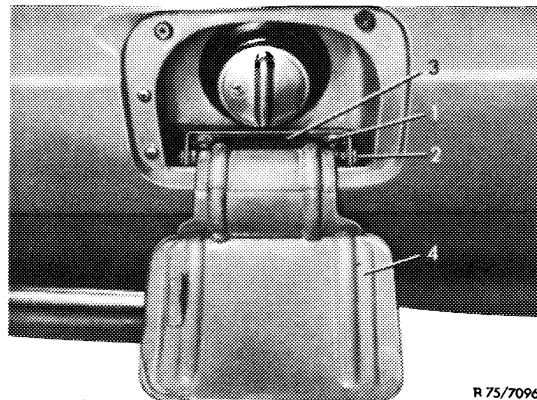
Removal

Tank flap with holding clip

- 1 Remove both screws (1).
- 2 Remove tank flap (4) with holding clip (3).

Tank flap without holding clip

- 3 Remove both screws (2).



R 75/7096

Installation

- 4 For installation proceed vice versa.

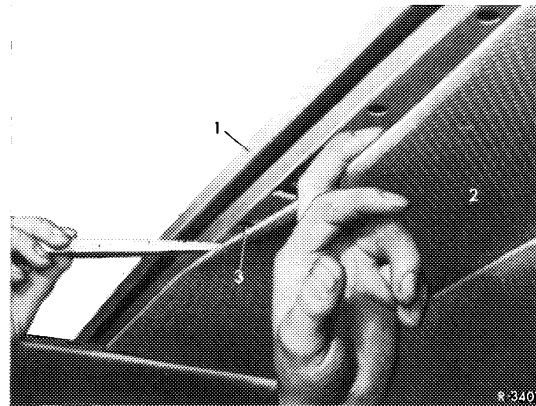
Make sure that the sealing washers under holding clip are correctly installed. Then adjust tank flap.



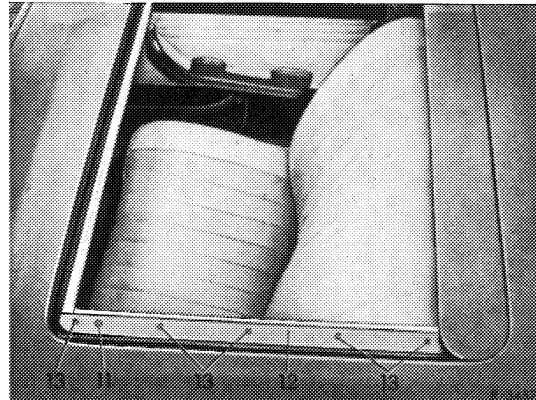
77-100 Removal and installation of sliding roof cover

Removal

1 With sliding roof 3/4 open, loosen sliding roof headlining (2) and remove in forward direction.

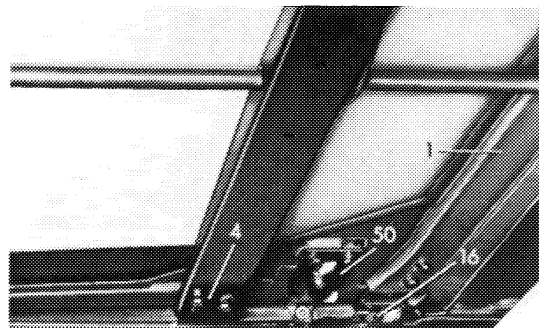


2 Open sliding roof completely and remove slide rail (12) at left and right.



(Shown on model 114/115)

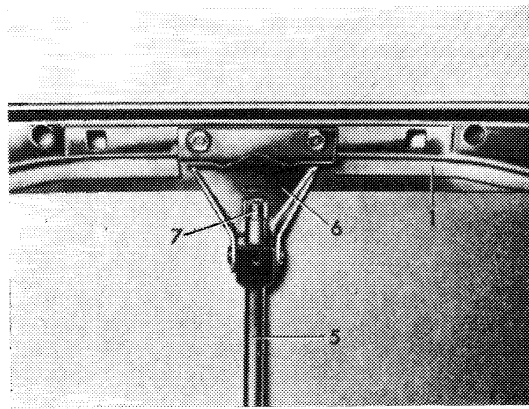
3 Close sliding roof and unscrew locking screw (16) left and right.



R 78/7095

4 With sliding roof 1/4 open, remove connecting clip (7).

5 Permit drive cable to return and remove sliding roof cover (1) in upward direction.



Installation

6 Prior to installation, thoroughly grease all sliding shoes, as well as the slide rails with Anticorit PRC II by means of a piece of felt attached to an extension or a brush up to rear end.

7 For installation proceed vice versa. Install sliding roof headlining following adjustment.

8 Adjust sliding shoes and sliding roof cover (77-110).

77–110 Adjustment of sliding roof cover

Note

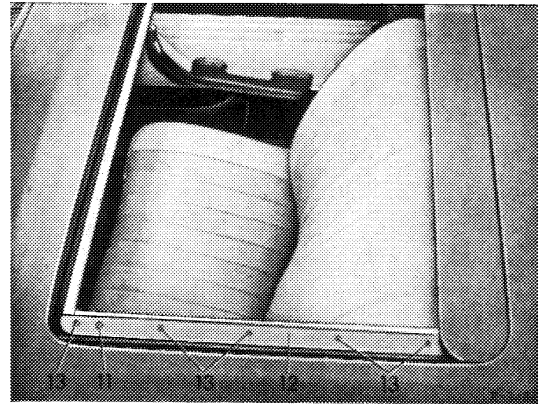
Leaks and wind noise can be avoided on sliding roofs, when the sliding roof cover is adjusted in such a manner that the front edge is 0 to 1 mm deeper and the rear edge is 0 to 1 mm higher than the outside skin of the roof.

Adjusting Sliding Shoes Front and Rear

- 1 Remove sliding roof headlining (77–100, item 1).
- 2 Adjust sliding roof free of play, that is, the sliding shoes should abut laterally and the sliding roof should be seated accurately in center of cutout. Since the sliding roof frame has tolerances with regard to its total width, the lateral clearance must be checked at several points. When checking, make sure that the sliding roof can be perfectly opened and closed.

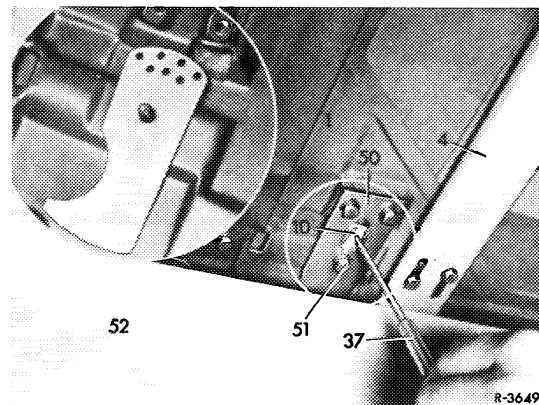
Height Adjustment Front

- 3 Slightly loosen screws (13) for slide rails.
- 4 Adjust both height adjustment screws (11) on slide rails (12) in such a manner that the front edge of the closed sliding roof is 0 to 1 mm **deeper** than the outer skin of the roof.
- 5 Tighten screws (13) for slide rails.



Height Adjustment Rear

- 6 Close sliding roof.
- 7 Loosen fastening nut (51) on lifting bracket (50).
- 8 Apply a mandrel to turn shim (10) under lifting bracket in such a manner that the rear edge of the sliding roof cover is 0 to 1 mm higher than the outer skin of the roof.
- 9 Tighten fastening nut (51).
- 10 Install sliding roof headlining.



Removal

1 Remove sliding roof cover (77-100).

2 Actuate slide roof switch in direction of "closing" permit drive cable control (27) to turn completely forward and pull out.

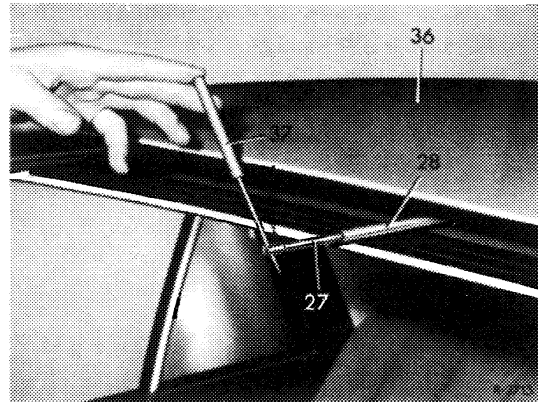
Note: If the drive cable control cannot be moved by means of the electric drive, use hand crank.

If the drive cable control cannot be activated in this manner, insert a mandrel into bore for connecting clip and move cable control by turning clockwise.

Do not continue turning, if too much force is required, since this would cause the cable control to untwist and become stuck in drive cable tube.

In such a case, the gear unit of the electric drive must be disassembled (77-180).

If upon disassembly of the gear unit the drive cable control can still not be removed, it is stuck in drive cable tube (28), which should then also be removed (77-150).

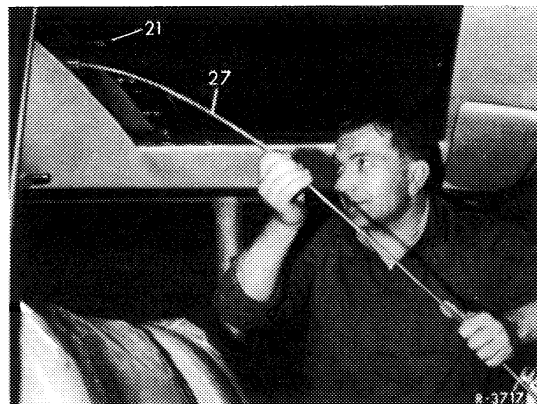


(shown on Model 114/115)

Installation

3 Grease coil at end of new drive cable (27) well with Anticrit PRC II and introduce carefully into drive cable tube (28).

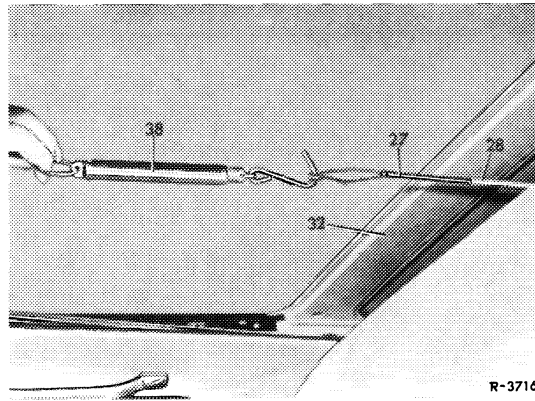
(shown on Model 100)



4 The drive cable control should slide in drive cable tube under a force of max. 50 N (5 kp). Check by means of spring scale (38).

Note: Starting installation of ball-mounted drive (end of 1976), max. thrust amounts to 70 N (7 kp).

27 Drive cable control	32 Roof frame
28 Drive cable tube	38 Spring scale



5 Slide drive cable completely into drive cable tube and permit to run into gear unit of electric drive by actuating the sliding roof switch.

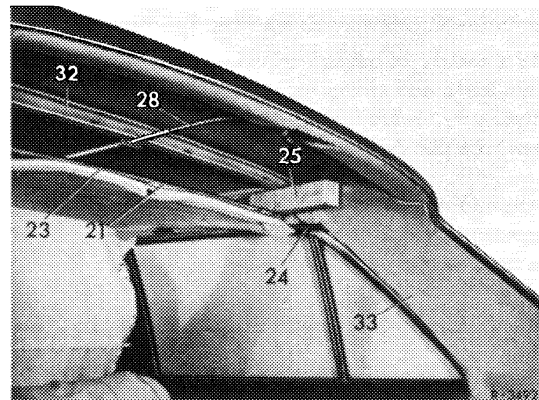
6 For further installation proceed vice versa.

77–150 Removal and installation of drive cable control

Removal

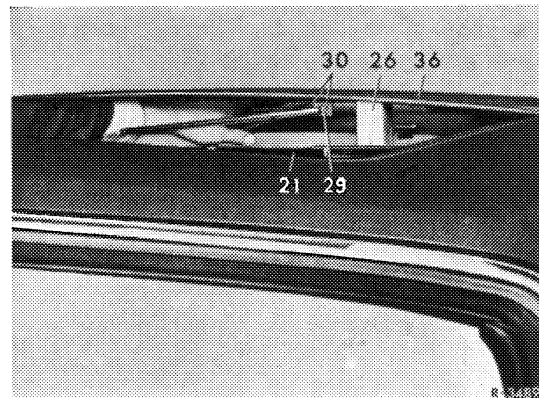
- 1 Remove drive cable control (77–140).
- 2 Remove holder with motor and gear unit (77–180).
- 3 Remove rear window.
- 4 Remove rear seat and backrest.
- 5 Loosen headlining from the rear up to center of vehicle.
- 6 Remove soundproofing (23) along rear edge of sliding roof frame (21).
- 7 Loosen sliding roof frame (21) up to roof cutout, pull slightly downwards at the rear and insert a wooden block (25) 5 cm high at corners.

(shown on Model 114/115)



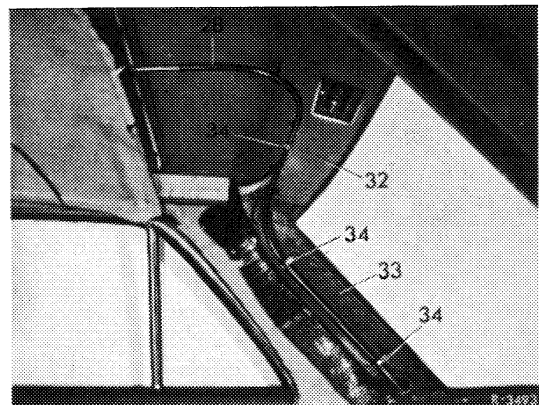
- 8 Insert wooden block (26) 6.5 cm high in roof cut-out between sliding roof frame (21) and roof panelling (36).

- 9 Unscrew fastening screws (30) of holding plate (29) for drive cable tube.



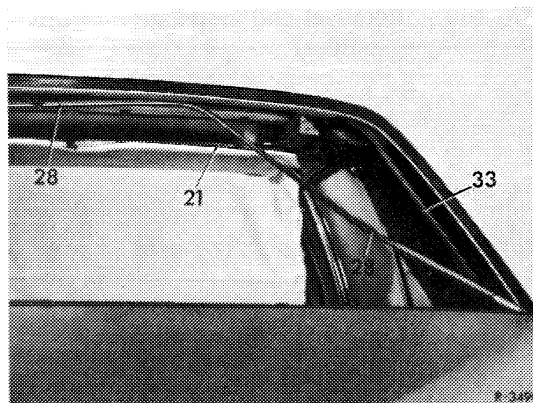
- 10 Unscrew pipe clips (34) on rear pillar and on roof frame.

(shown on Model 114/115)



11 Move drive cable tube (28) forward and simultaneously toward the left, so that the drive cable tube can be pulled out of rear pillar.

12 Remove drive cable tube through cutout for rear window.

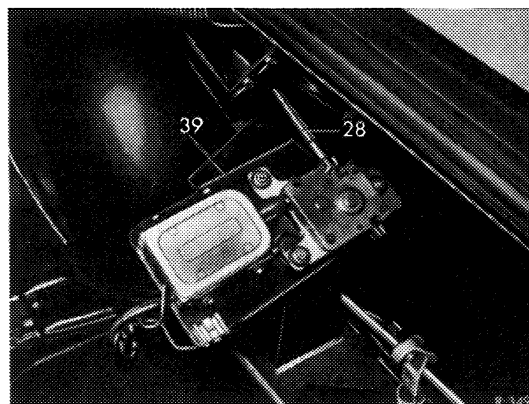


Installation

13 Carefully introduce new drive cable tube between roof frame and sliding roof frame (21), and move sufficiently toward the front and left until the teleflex tube can be introduced into the rear pillar (33).

Attention! Do not bend drive cable tube during installation, since this would make drive cable control hard to move.

(shown on Model 114/115)



14 Introduce drive cable tube into trunk compartment until the holder (39) can be flanged to the drive cable tube together with the gear unit.

15 Move holder (39) into correct position and screw on.

16 Attach drive cable tube to rear pillar and to roof frame.

17 For further installation proceed vice versa.

77—180 Removal and installation of holder with motor and gear unit

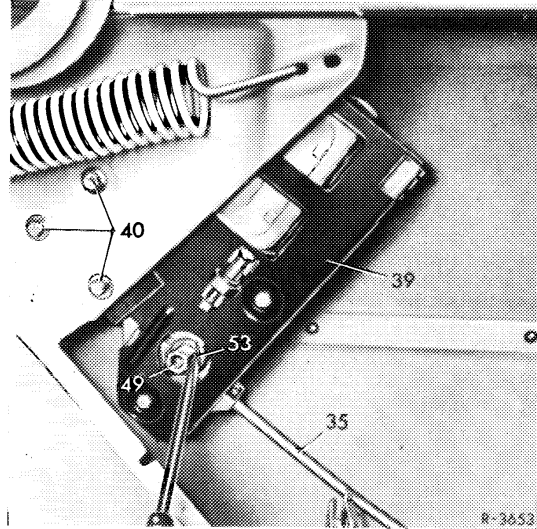
If the Drive Cable Control Can be Removed

Removal

- 1 Remove drive cable control (77—140).
- 2 Separate outlet pipe (35) from gear unit.
- 3 Loosen fastening screws (40) of holder (39).
- 4 Disconnect electric connection.
- 5 Separate holder with motor and gear unit from drive cable tube and remove.

Installation

- 6 For installation proceed vice versa.



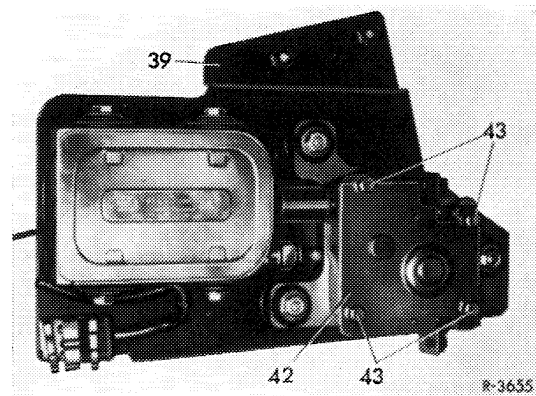
(shown on Model 114/115)

If the Drive Cable Control Cannot be Removed

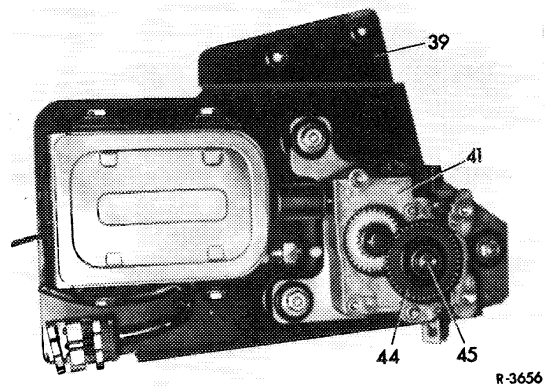
Removal

Note: First try to remove drive cable control as described in Job No. 77—140. If this is impossible, disassemble drive gear.

- 1 Loosen lock (53) of counter nut (49) on gear unit and unscrew counter nut.
- 2 Remove holder (39).
- 3 Screw fastening screws (43) out of gear unit cover (42).

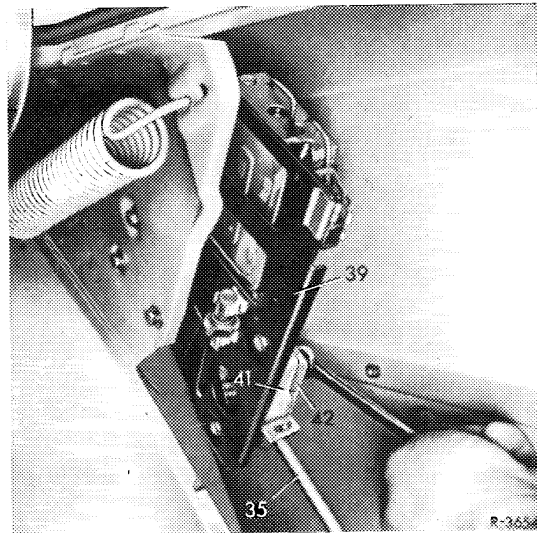


4 Remove gear unit cover (42) and take off large gear wheel (44) including drive shaft (45).



5 Disconnect drive cable tube and outlet pipe (35) from gear unit.

6 Remove drive cable control (27) (77—140).



Installation

7 Assemble gear unit.

8 Install holder with motor and gear unit.

9 Install drive cable control.

Attention! At end of assembly jobs, the slip coupling on gear unit must be readjusted (77—190).

If the electrical sliding roof is developing trouble and the causes cannot be immediately discovered, check electrical section first, then the slip clutch of the gear unit and finally the sliding roof cover and its power transmission elements for function.

Electrical Section

For checking the electrical section of the sliding roof system, actuate sliding roof switch in both directions. Touching the rubber clutch between the drive motor and the gear unit manually will show whether the drive motor is turning counterclockwise or clockwise. If a rotation or twist is felt, the electrical system is in order and the fault is in the mechanical section. Check with the vehicle engine running to make sure that the full operating voltage is available.

Note: The drive motor is provided with a thermo switch as an overload protection, which will interrupt the power supply under excessive loads. It is therefore recommended to permit the drive motor to cool down after actuating the sliding roof several times.

Cause	Remedy
Rubber coupling not moving during checkup	
Fuse blown	The drive of the electric sliding roof is fused with 25 Amps. Replace fuse.
Sliding roof switch defective	Carefully loosen sliding roof switch with a flat wedge. Disconnect electrical plug connection. Install new sliding roof switch.
Cable assembly for sliding roof drive damaged	Check cable assembly and install new cables, if required.
Drive motor defective	Remove holder with motor and gear unit (77—180) and install new drive motor.

Slip Clutch of Gear Unit

Trouble on slip clutch of gear unit will be evident if the slip clutch between the motor and the gear unit is turning too fast and the sliding roof is not opening or closing. In such a case, the slip clutch of the gear unit must be newly adjusted.

For this purpose, loosen lock of counter nut on gear unit (guide nut for emergency crank actuation). Hold shaft in place with a screw driver and keep tightening counter nut.

Slip clutch should slip slowly when the sliding roof is either closed or completely opened; no blocking should occur. Check by feeling rubber clutch between drive motor and gear unit. If slip clutch is correctly adjusted, the drive motor should not take up more than 17 Amps.

Lock counter nut again.

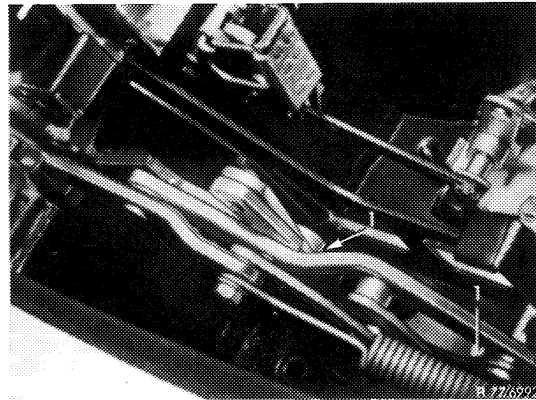
Sliding Roof Cover and Power Transmission Members

When the sliding roof is not opening and closing, even though the electrical section and the slip clutch are in order, check sliding roof cover and power transmission members.

Cause	Remedy
Sliding roof not opening and closing	
Sliding roof cover hard to move or stuck	<ol style="list-style-type: none">1. Remove sliding roof cover (77—100).2. Clean slide rails, gibs and sliding shoes and grease with Anticorit PRC II.3. Adjust sliding roof free of play, that is, the sliding shoes should abut laterally and the sliding roof should be accurately in center of cutout. Since the sliding roof frame has tolerances with regard to total width, the lateral clearance must be checked at several points.4. Adjust height of sliding roof cover (77—110).
Drive cable control hard to move	Remove drive cable control (77—140) check for damage and replace, if required.
Drive cable control stuck in drive cable tube	Replace drive cable tube (77—150).
Gear unit of sliding roof drive defective	Remove gear unit (77—180).

Removal

- 1 Fold top back.
- 2 Remove two screws (1) each on bearing for top frame left and right.
- 3 Remove top.



Installation

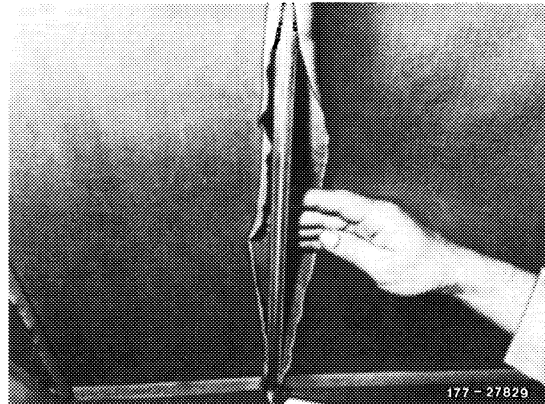
- 4 For installation proceed vice versa.

Note: The shims serve the purpose of aligning the top in relation to the body. Add enough shims on both sides so that the top will close perfectly at front and rear and does not bind. The top frame in range of rear sealing rail of side windows should be vertical.

Removal

1 Cover engine hood and trunk lid with a protective blanket.

2 Carefully loosen fastening strip on top bow with benzine and pull off without damage (Fig.).



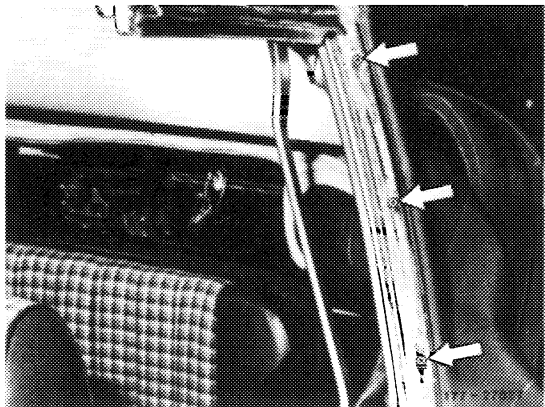
3 Open top at the rear and pull off rear sealing.

4 Unlock top at front.

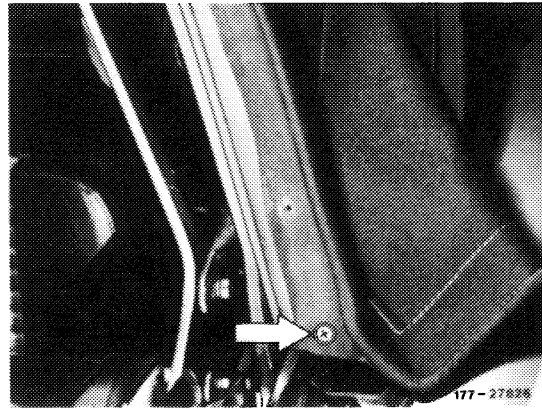


5 Pull out vertical sealing at left and right for side window.

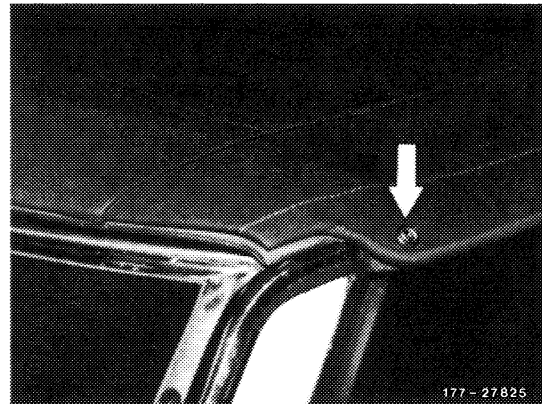
6 Unscrew holding strip underneath for sealing (Fig.).



7 Remove screw and carefully pull off roadster top cover in range of holding rail.

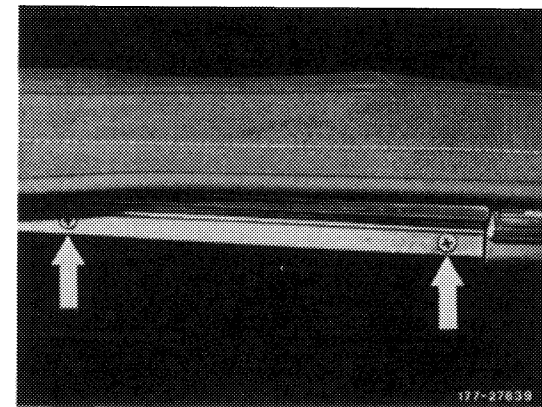


8 Remove screw at front for lateral bracing rope left and right.



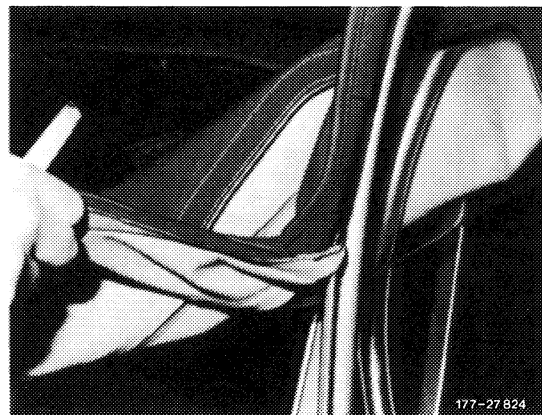
9 Unscrew bracing rope left and right on top frame rear and pull out of holding device.

10 Carefully pull off front sealing for side window.

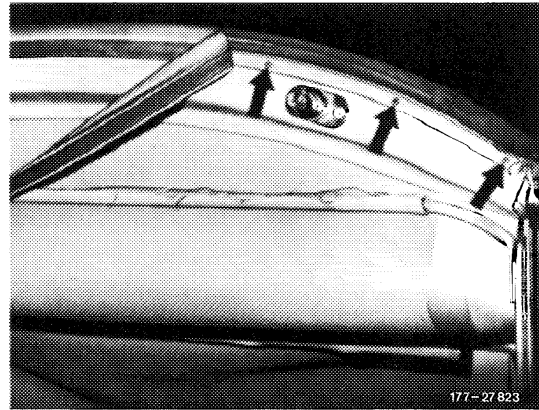


11 Unscrew holding rail for sealing underneath (Fig.).

12 Carefully pull roadster top cover from rear top frame. Assist with a plastic wedge, if required.

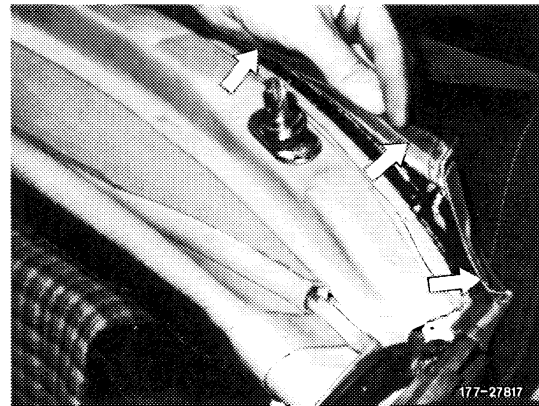


13 Pull sealing from front frame and unscrew rail located underneath.



14 Carefully pull roadster top cover from front frame, making sure that the sealing in left and right-hand corner is not damaged.

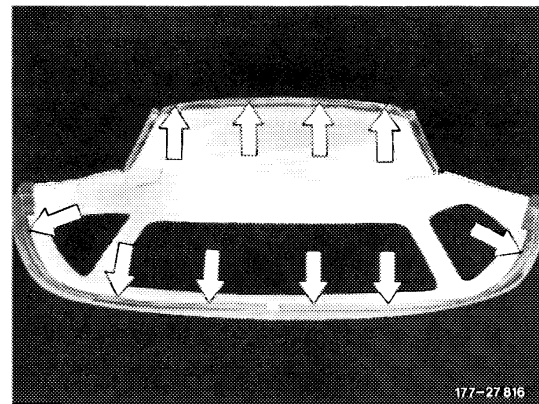
15 Completely remove roadster top cover.



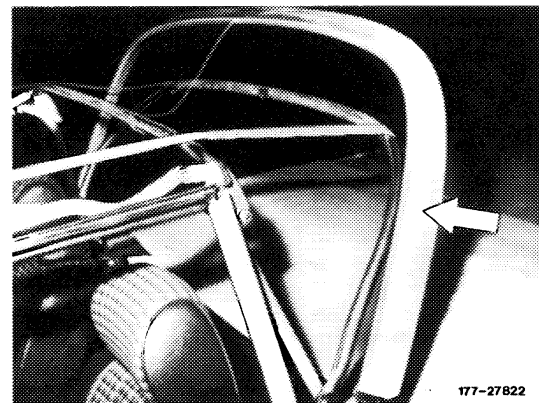
Installation

16 Spread roadster top cover on a clean base.

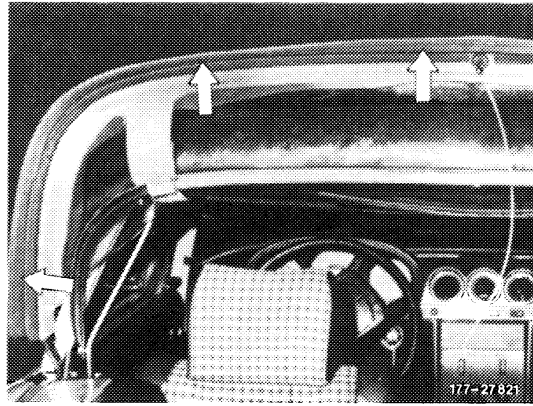
17 Thoroughly coat roadster top cover in range of rear and front top frame (arrows) across entire width with MB universal glue, part No. 000 989 82 71 (Fig.).



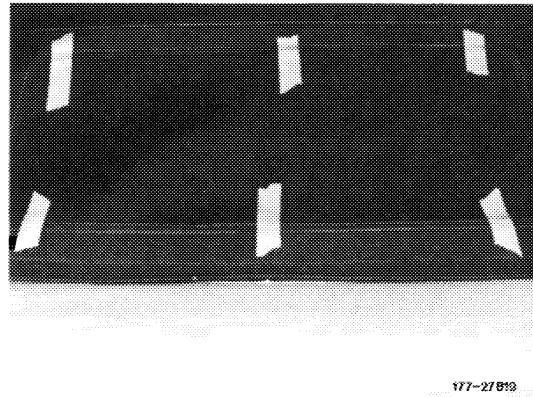
18 Completely coat rear top frame in mounting range of roadster top cover outside and inside with MB universal glue.



19 Mount roadster top cover and glue on tightly starting from center on rear frame.

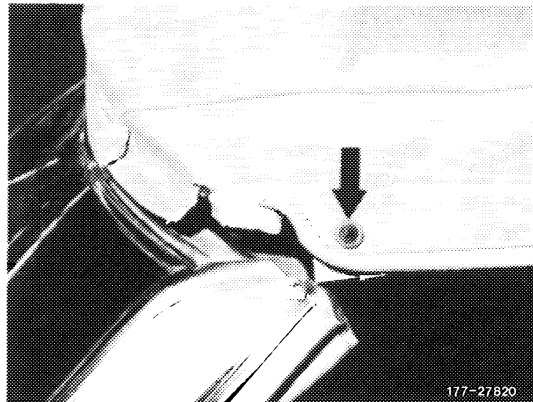


20 Cover back window with a protective blanket.



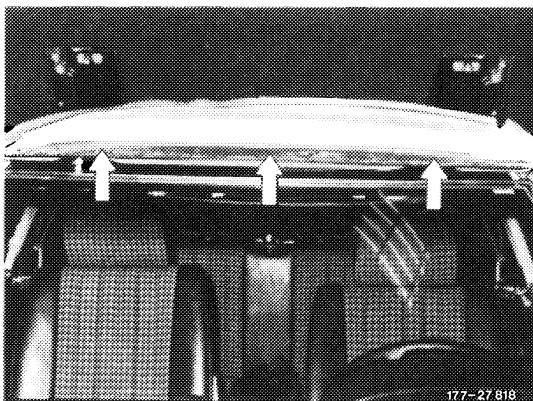
21 Screw on roadster top cover front left and right with screw for bracing rope.

22 Pull bracing rope at the rear left and right through fastening screw and insert laterally into top frame.



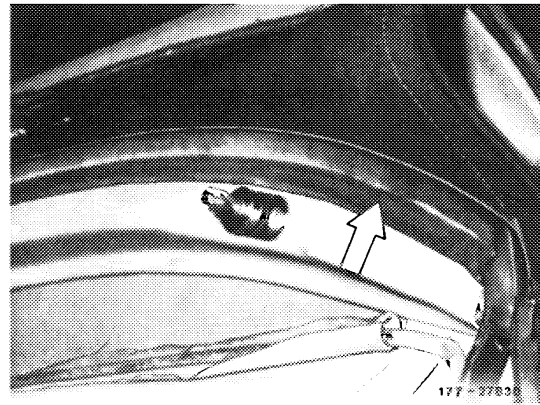
23 Completely coat front top frame at lower, narrow side and on top starting at the front up to half with MB universal glue.

24 Center roadster top cover at the front and glue to front top frame.

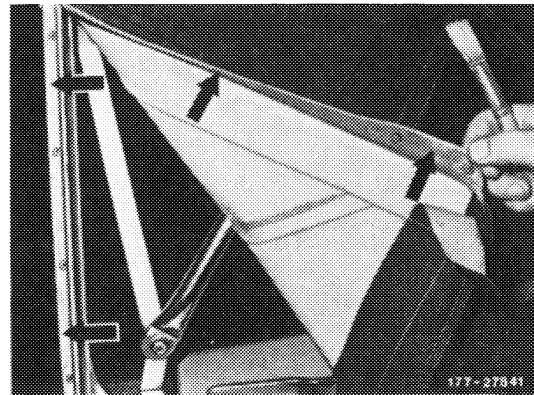


25 Screw rail to front top frame.

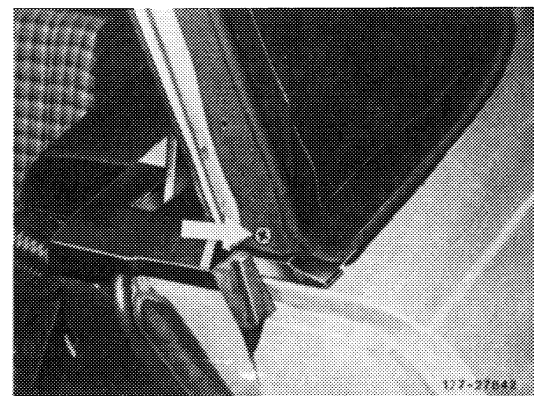
26 Coat rail with MB universal glue and insert sealing (Fig.).



27 Coat roadster top cover and top frame at rear left and right with MB universal glue.

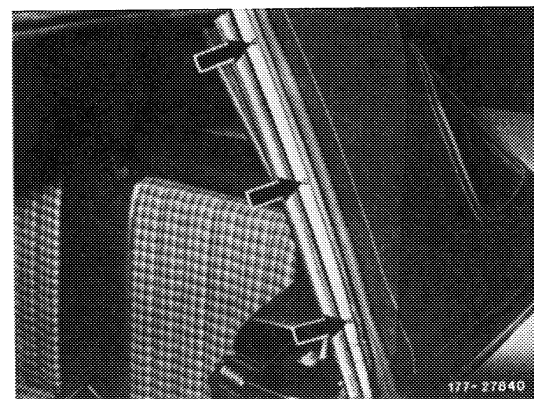


28 Glue roadster top cover laterally to top frame and fasten with screw.



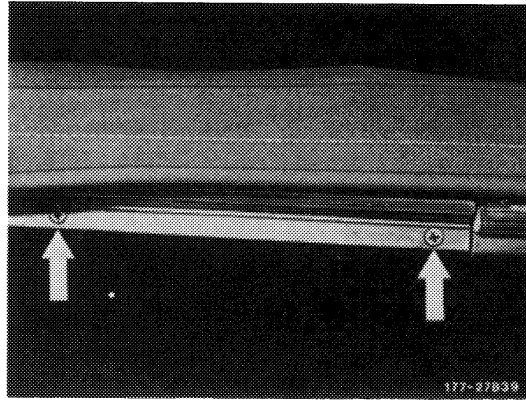
29 Screw on vertical holding rail for sealing at the rear left and right.

30 Coat holding rail and sealing with MB universal glue and push sealing into holding rail.

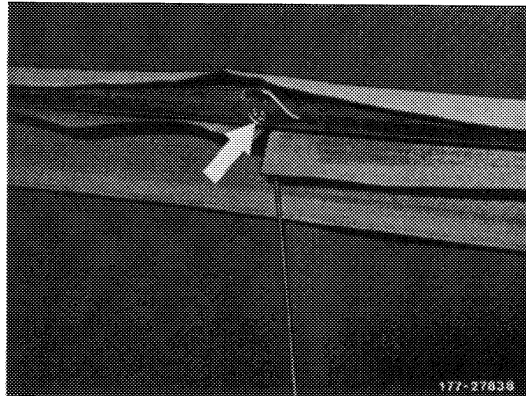


31 Screw on front holding rail for sealing side window left and right.

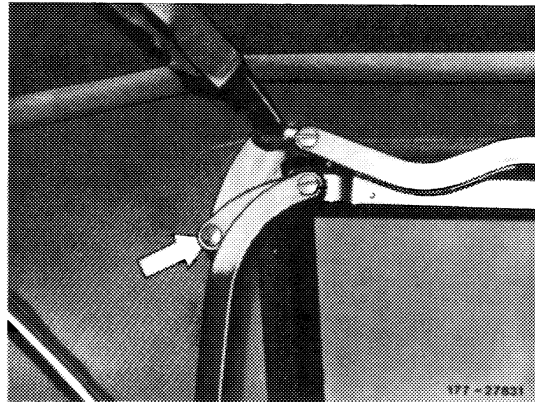
32 Coat holding rail and sealing with MB universal glue and push sealing into holding rail.



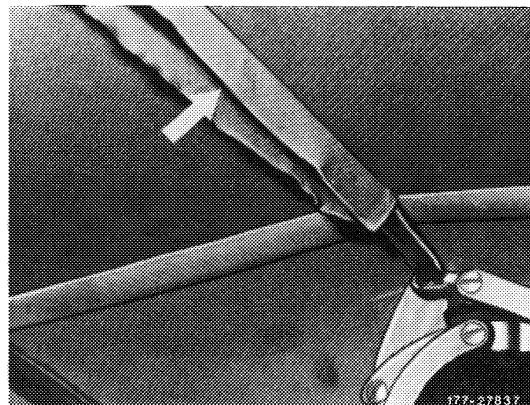
33 Lock roadster top front and rear and brace at the rear with bracing rope on back window.



34 Brace roadster top with lateral bracing rope left and right.



35 Coat top bow and fastening strip on roadster top cover with MB universal glue and glue on fastening strip. For optical reasons make sure that on both front top bows the front part of fastening strip is glued on first and then the rear part. Proceed vice versa on rear top bows.



36 Push sealing at the rear into top frame by means of a plastic wedge.

37 Close top.



77–310 Renewing window on roadster top

Note

This chapter describes renewing of back window. The side window is renewed analogously.

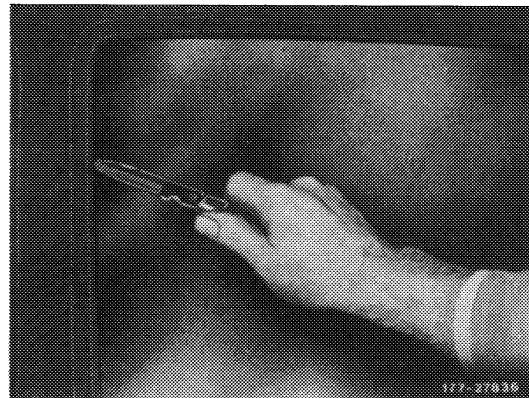
Conventional tools

Flat sewing machine

refer to Workshop and spare parts storage
equipment catalog No. 02200 3000 E 0001

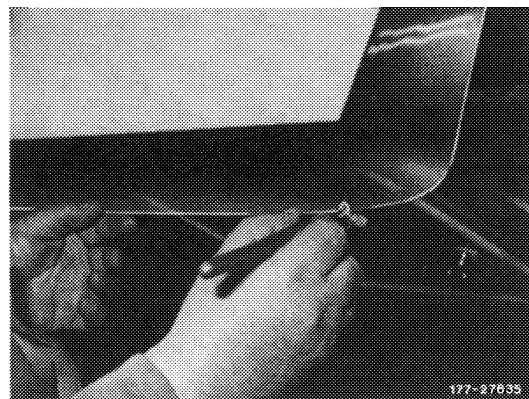
Removal

- 1 Remove roadster top cover (77–305).
- 2 Separate outer seam on back window with a knife and remove back window (Fig.).
- 3 Remove threads remaining on roadster top cover.



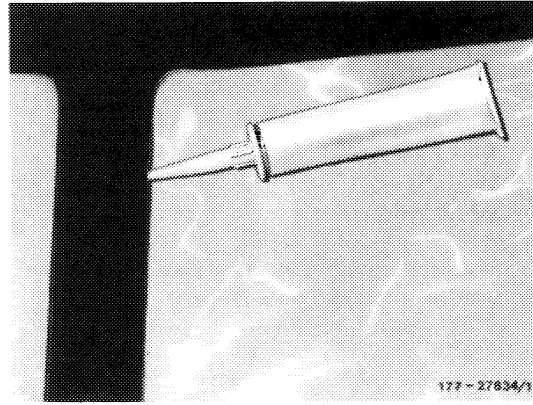
Installation

- 4 Coat back window inside along edge with MB universal glue, part No. 000 989 82 71 (not in visual range of back window).
- 5 Spread roadster top cover on a flat and clean base.
- 6 Coat inside support for back window on roadster top cover with MB universal glue.



7 Glue back window into cutout of roadster top cover in its correct installation position and let air-dry for approx. 2 hours.

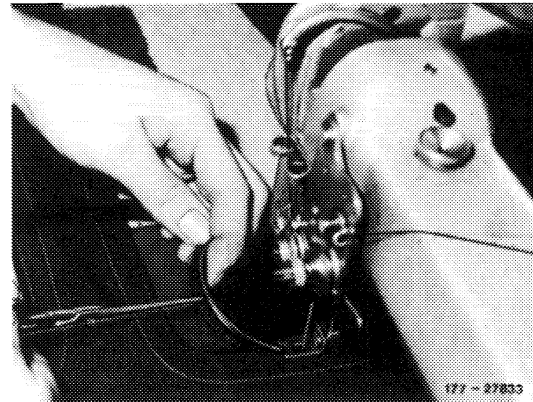
8 Push MB seam sealing compound, part No. 000 989 40 20, in-between back window and roadster top cover (not in visual range of back window).



9 Insert sealing strip between top cover and back window.

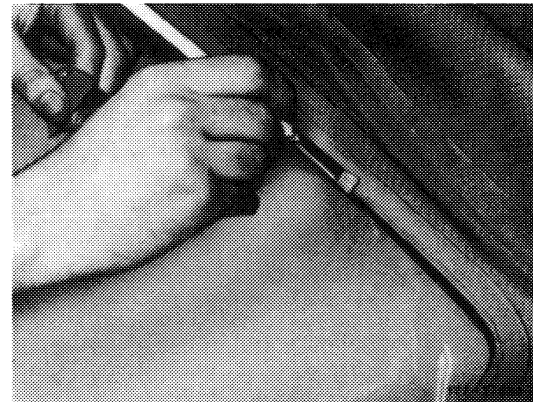
10 On flat sewing machine (with sealing strip bracket), sew-in back window, starting at center below up to radius.

11 Cut in radius range into sealing strip with scissors and sew-in back window all-around (Fig.).



12 Seal seam around back window inside with MB seam sealing compound, part No. 000 989 40 20 and spread with brush.

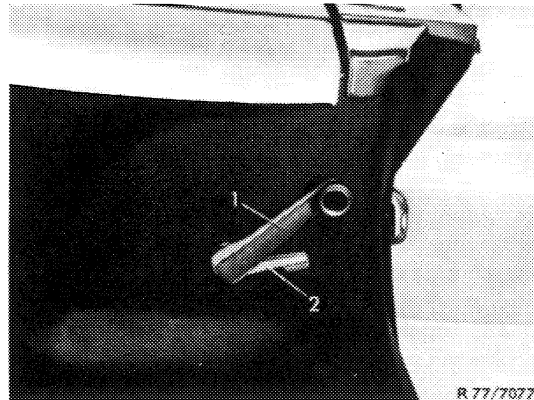
13 Install roadster top cover (77-305).



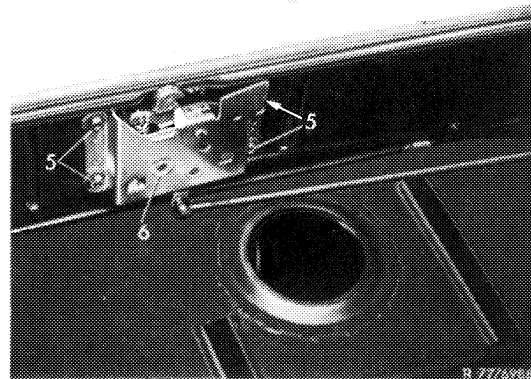
77-320 Removal and installation of top lock on top well

Removal

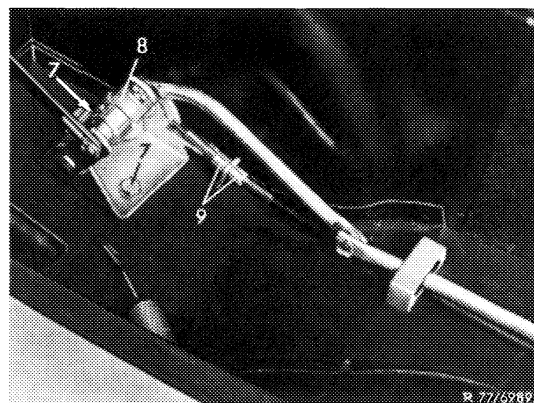
- 1 Remove top from top well.
- 2 Remove protective padding from crank lever (1) (72-110).
- 3 Remove crank lever (1) and actuating lever (2).
- 4 Remove lower half of lock left and right (75-220).



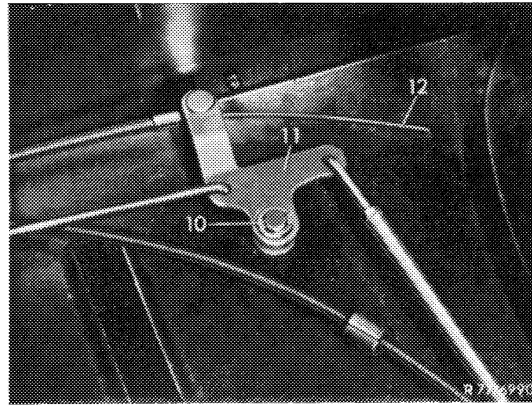
- 5 Identify location of center lock (6) in relation to top well.
- 6 Remove screws (5) and lock (6).



- 7 Remove fastening screws (7) on guide bearing (8) and remove guide bearing from top well.



- 8 Remove lock washer (10) on guide lever (11).
- 9 Remove guide lever (11) and disconnect top well lid cable control (12).



Installation

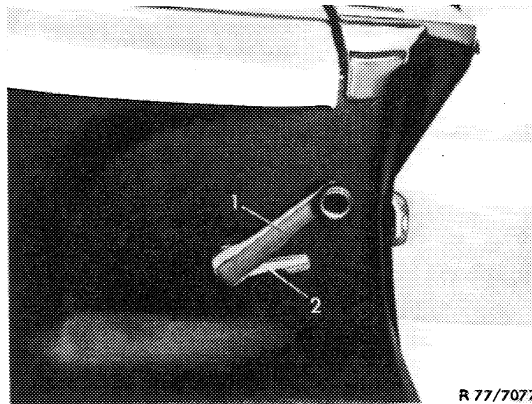
- 10 For installation proceed vice versa.

Secure knurled nut (9) for longitudinal adjustment of bowden wire with Loctite TL 270.

- 11 Adjust top well lock in its height in such a manner that the draw hook is under tension when the top is closed.

Check: Top should be seated free of play in draw hook when raised.

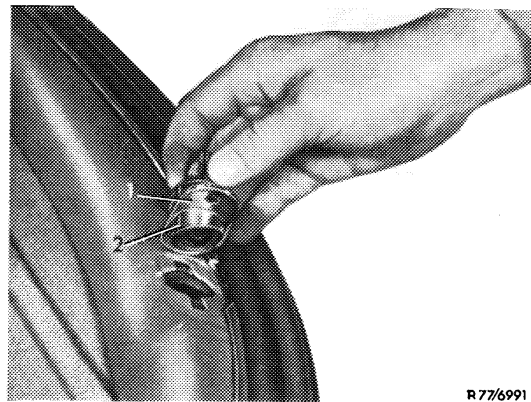
- 12 Install actuating lever (2) in such a manner that the handle plate faces the driving direction.



77–330 Removal and installation of top lock on top of frame

Removal

- 1 Open top and fold back.
- 2 Remove both screws on lock (1).
- 3 Remove lock (1).



R 77/6991

Installation

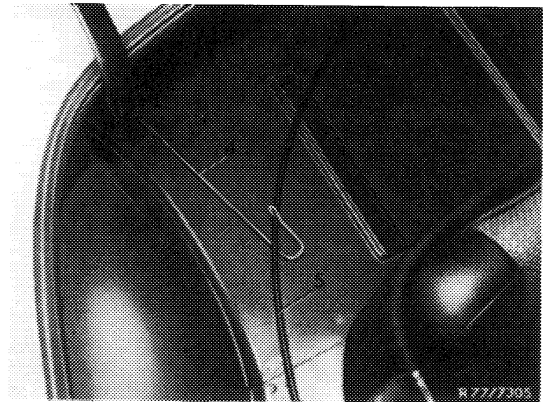
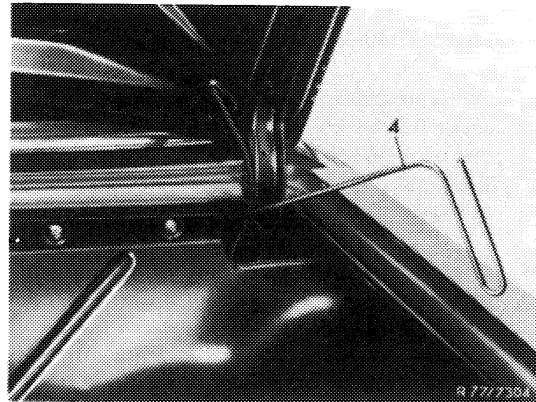
- 4 For installation proceed vice versa.

Caution! The high end (2) of the top lock (1) should face toward the rear.

Note: The lock is marked left and right.

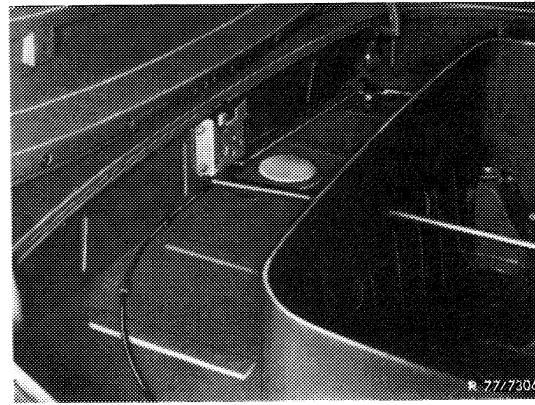
**Opening Folding Top Case Cover when
Clamping Sleeve is Sheared off**

- 1** Suitably bend welding wire with approx. 4 mm diameter.
- 2** Open trunk lid.
- 3** Pass welding wire (4) through right-hand opening of partition panel past left-hand side of hinge into the folding top case.
- 4** Pass welding wire (4) along floor of folding top case and connect it to cable (5) for actuating right-hand lock of folding top case.
- 5** Pull welding wire backward; right-hand folding top case lock opens.
- 6** Open left-hand lock of folding top case by operating crank.

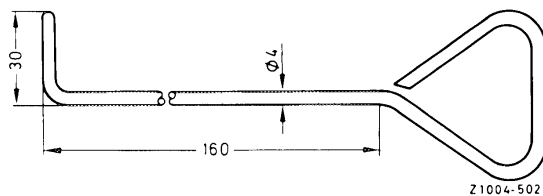


Opening Folding Top Case Cover in Case of other Forms of Damage to Locking Mechanism

- 1 Open front catches at windshield upper rail and side catches at coupe top.
- 2 Press operating lever downward as far as it will go, thereby moving draw hook of center folding top catch to the right.
- 3 If center folding top catch cannot be opened in this way, proceed as follows:
 - a) Remove side panel in rear compartment (68–455).
 - b) Pull off trim covering in rear compartment center upwards from the base (68–450).
 - c) Drill a hole with a diameter of approx. 10 mm about 160 mm below lower edge of folding top case cover and approx. 30 mm to the right of folding top cover center (measured in direction of travel).
 - d) Insert approx. 10 mm thick round bar – rounded off at the front – into the bore and press draw hook below center folding top catch to the right until coupe top or folding top is unlocked.
- 4 Remove coupe top or move folding top to the front.

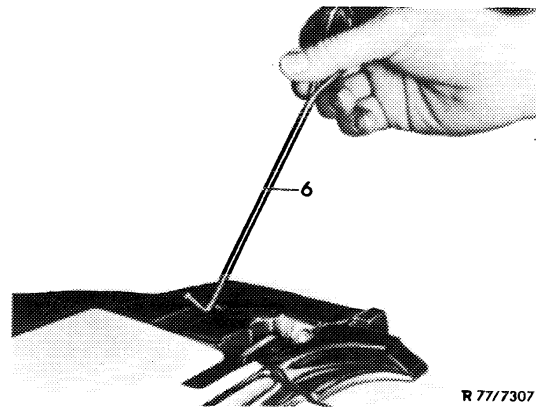


- 5 Make a hook as shown in the drawing below.



Length when straight approx. 335 mm

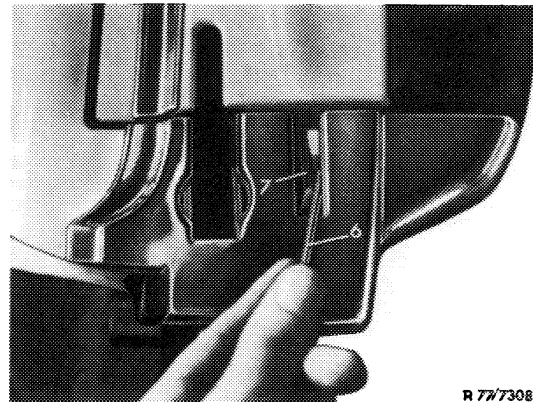
6 Insert hook (6) vertically downward between top hinge (7) and folding top case.



R 77/7307

7 Turn hook (6) 90° in direction of vehicle center.

8 Pull hook (6) upward as far as it will go and press draw hook of folding top cover lock toward the rear.



R 77/7308

77-360 Removal and installation of windshield header molding with guide bearing

Note

Since April 1972 a modified windshield header molding and modified guide bearings have been installed in these vehicles.

Production Breakpoint

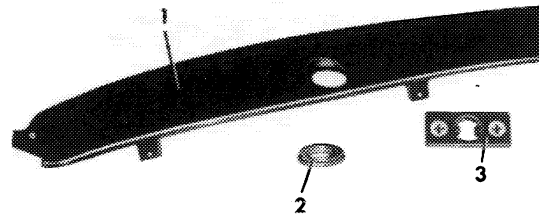
Type 107.043 as from Chassis End No. 006 914

Type 107.044 as from Chassis End No. 004 182

When installing the modified windshield header molding in vehicles with lower chassis end numbers, the two guide bearings and the two washers must also be replaced.

Removal

- 1 Unscrew windshield header molding (1) from front panel frame.
- 2 Remove both guide bearings.

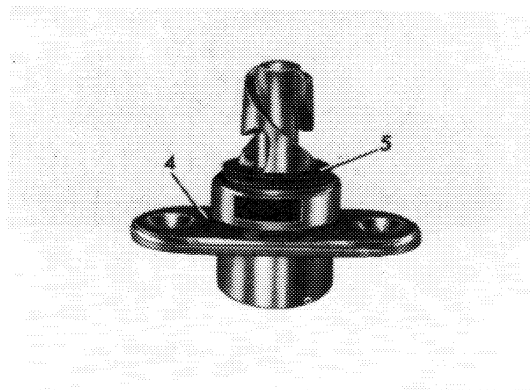


R 68/761

Installation

- 3 Install modified guide bearings (3).
- 4 Insert washers (2) into the two bores of windshield header molding (1).

Note: The top catch can also be installed in types of model series 113. On these vehicles, however, each catch should be fitted with an additional plastic washer Part No. 111 776 80 97.

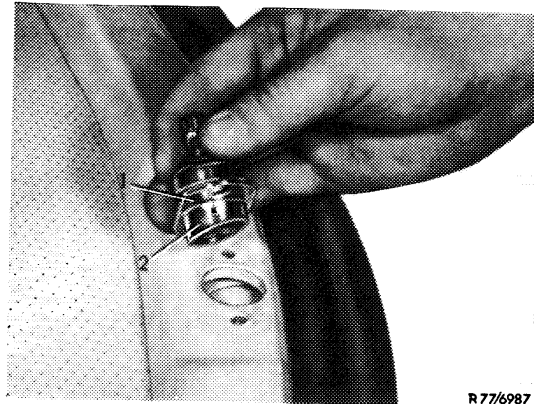


R 68/7612

77-420 Removal and installation of lock on top of coupé top

Removal

- 1 Remove coupe top and place on pertinent bench in inverted condition.
- 2 Remove both screws on lock (1).
- 3 Remove lock (1).



R 77/6987

Installation

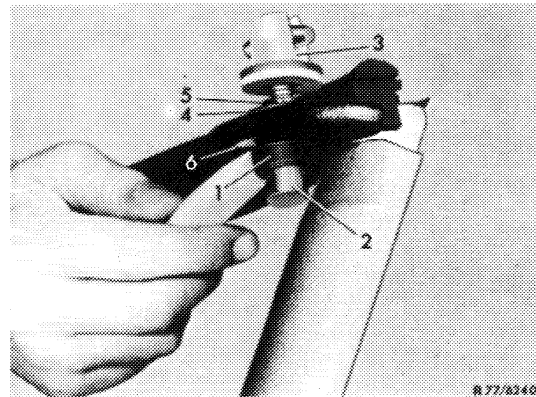
- 4 For installation proceed vice versa.

Caution! To prevent damaging the top, install lock in such a manner that the high end (2) faces toward the rear.

Note: The lock is marked left and right.

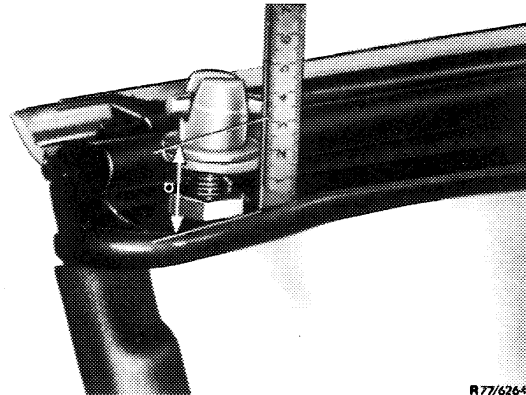
Removal

- 1 Remove coupe top and place on pertinent work bench in inverted condition.
- 2 Push closing cap (1) down with plastic wedge.
- 3 Remove closing cap and closing top (2).
- 4 Unscrew closing hook (3) manually.
- 5 Loosen nut (4) and remove bearing (5) with hole plate (6).



Installation

- 6 For installation proceed vice versa.
- Prior to assembly of closing cap (1) adjust closing hook (3) to a = 32 mm.





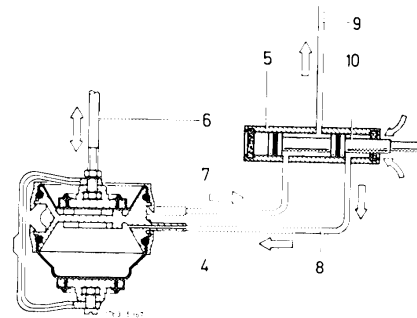
General

The utilization of pneumatic pressure-difference forces for completing certain functions in a vehicle is increasingly gaining in significance. Well known examples for the employment of such pneumatic forces are the adjustment of the firing point by means of a vacuum

as well as brake force boosters operating on the same principle. Likewise, pneumatic power is now also employed for a number of controlling and operating functions to provide additional safety and comfort.

Principle

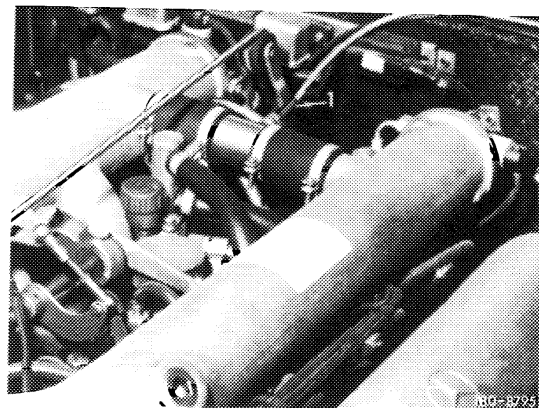
Pneumatic power is obtained when one chamber of a cylinder subdivided by a diaphragm or a piston is bled or evacuated, while the other chamber is filled with air. The evacuated chamber is subject to a vacuum, the air-filled chamber is under atmospheric pressure. The resulting difference in pressure between the two chambers will lead to a pertinent movement of the diaphragm or piston in the direction of the vacuum. When this movement of the diaphragm or piston is transmitted to a linkage, the available power can be effectively employed by means of the respective linkage. Pertinent reversal of the pressure and vacuum end permits double functions.



- | | |
|---------------------|------------------|
| 4 Operating element | 8 Charging line |
| 5 Vacuum switch | 9 Vacuum line |
| 6 Actuating rod | 10 Control valve |
| 7 Evacuating line | |

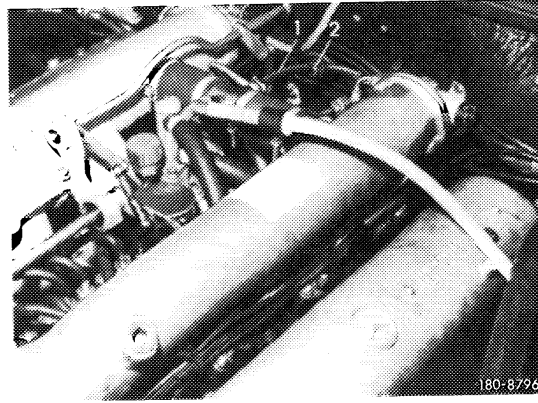
Vacuum sources in vehicle

A vacuum source for pneumatic systems in motor vehicles is provided by the intake pipe of the engine. The intake pipe of a 4-stroke Otto engine is providing particularly favorable pressure conditions for operating vacuum systems. On Diesel engines, on the other hand, the available vacuum is insufficient for such purposes and requires the assistance of a pump.

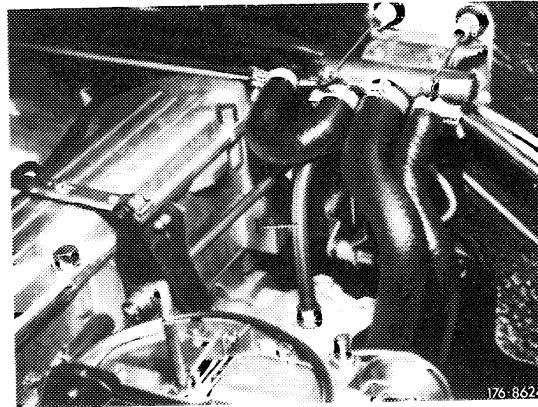


Vacuum connection on engine 100.980

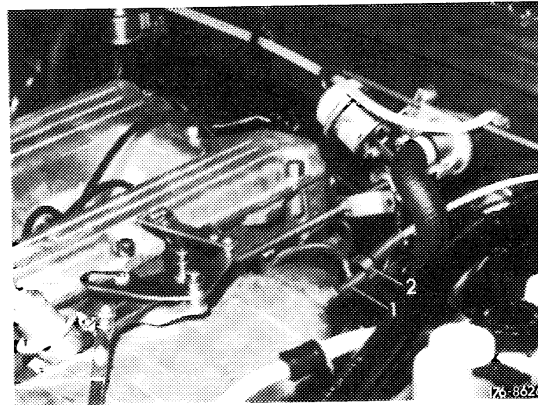
Vacuum connection on engine 100.981



Vacuum connection on engine 110.92



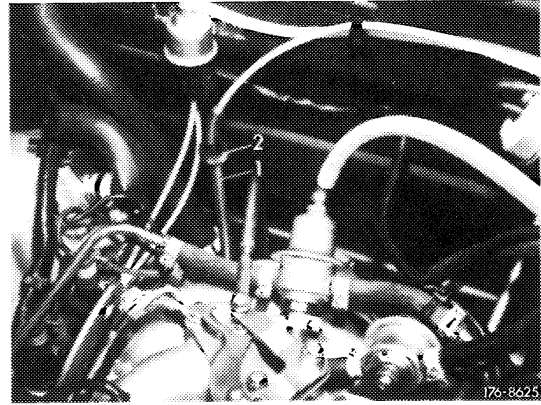
Vacuum connection on engine 110.98



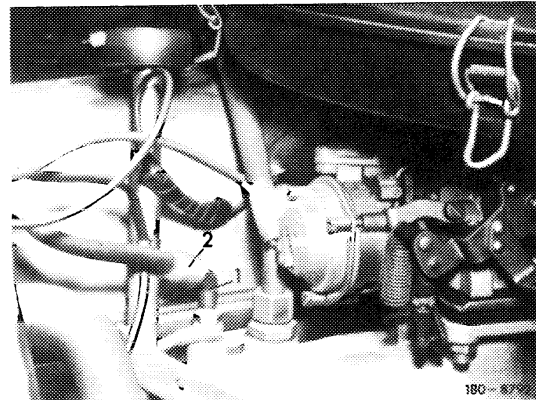
Vacuum connection on engine 115



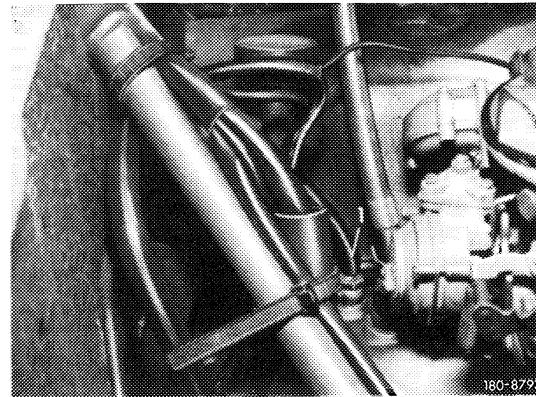
Vacuum connection on engine 116, 117



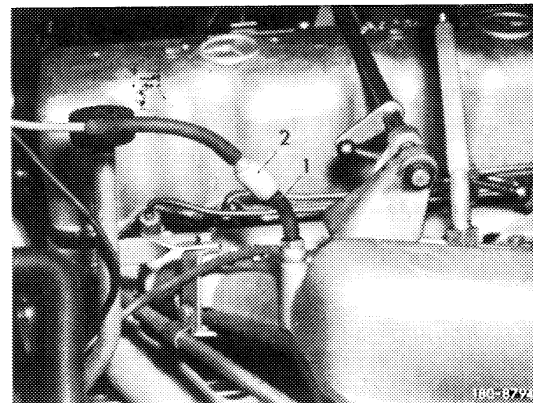
Vacuum connection on engine 130.920



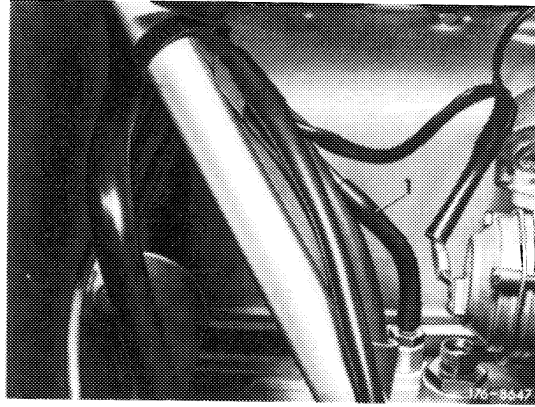
Vacuum connection on engine 130.923



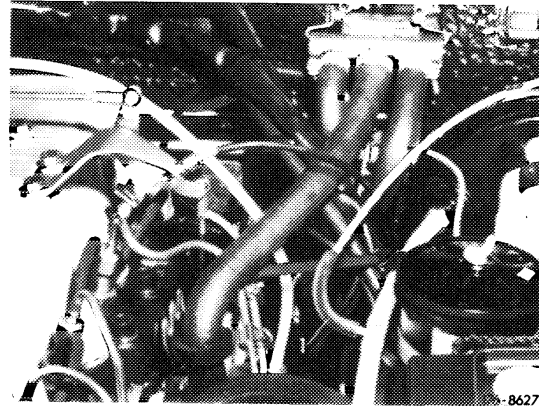
Vacuum connection on engine 130.980



Vacuum connection on engine 180



Vacuum connection on engine 615, 616, 617



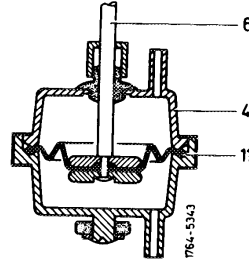
Vacuum lines, connecting elements, check valves and supply tanks

The transportation of the vacuum to the consumers, that is, to the operating elements, the switches and the control valves inside the vehicle is effected by means of dimensionally stable polyamide B lines. These lines are flexible only to a certain extent and must be cut around close bends and coupled by means of connecting rubber elements. These connecting elements are available in versatile shapes such as elbows, T-pieces, Y-pieces etc. A check valve is installed in intake line to protect the system. In the event of a vacuum loss in the engine, the vacuum in the system will remain intact, that is, when the pressure drops, the check valve will close and thereby separate the two systems in relation to each other. In addition, another check valve is installed in the line toward the vacuum-supply tank. This valve protects the stored vacuum in the supply tank, that is, when the engine is stopped and no more vacuum is established, the vacuum in the supply tank remains intact. As a result, the operating elements can be operated a few more times after the engine has been stopped, until the supply tank is empty.

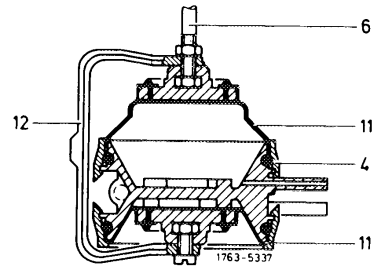
Operating elements

As explained in the paragraph covering the principle of the system the differential pressure between the pressure and the vacuum end is made available by means of a diaphragm.

The operating elements installed in the vehicles are pertinently designed. Additional refinements are double diaphragm elements instead of elements using just one diaphragm. The function of the respective operating element is shown in the various sectional illustrations.



4 Vacuum element with one diaphragm
6 Control rod
11 Diaphragm



4 Vacuum element with two diaphragms
6 Control rod
11 Diaphragm
12 Connection

Control by means of vacuum switch or spring force

Switches in the shape of control valves are provided for controlling the operating elements or direction of operation. Actuation of these switches will reverse the prevailing direction of pressure and vacuum. As a result, the operating direction of the operating element will reverse.

Single acting working elements, that is, elements influenced at one end by the vacuum, are controlled by means of a charging valve and draw spring combination. The controlling process proceeds in such a manner that the system is charged with air by means of the respective charging valve. As soon as the vacuum in the system has been sufficiently eliminated, the spring attached to the linkage will become effective for counteraction. When the charging valve is closed, the spring force is superimposed by the pneumatic force and cancelled.

Design and operation of central interlock

The central interlock permits the simultaneous locking and unlocking of all doors, of trunk lid and of flap for tank filler neck. Normal opening or closing of lefthand driver's door by means of key or interlocking knob is required. A vacuum switch on lock of driver's door serves to activate the vacuum required to operate the interlocking devices of the remaining doors, the trunk lid and the flap of the tank filler neck.

When the righthand driver's door of a centrally interlocked vehicle is opened with the key, this door is only mechanically unlocked and is still subject to central interlock upon closing.

On all USA version models separate opening of rear doors of passenger compartment is possible only when the respective door has first been mechanically unlocked by means of door safety button. However, the righthand driver's door can be opened without initial mechanical unlocking of door safety button. The righthand driver's door and both rear doors on all other versions can be opened without initial mechanical unlocking of door safety button.

The trunk lid, as well as the righthand driver's door of a centrally interlocked vehicle can be separately unlocked by means of the key.

If the trunk lid of a centrally interlocked vehicle is closed, opening of lid requires turning locking cylinder by means of key for approx. 60° from center position in counterclockwise direction (in this position, the key **cannot** be pulled out). The lid will be opened by simultaneously pushing locking cylinder. When the key is released, it will immediately snap back into center position.

When the lid is slammed closed, it is again in interlocked position. When the trunk lid is centrally interlocked and additionally mechanically locked, the lid can also be opened by turning the lid approx. 150° to the left and then pushing against locking cylinder without removing the key.

The vacuum supply tank permits closing a stopped vehicle approx. 8 to 10 times. When the vacuum is no longer available, the vehicle can be mechanically closed and interlocked.

The vacuum in the intake manifold (1) of the engine will evacuate the line system in vehicle including the vacuum supply tank (3) by means of check valve (2) to approx. 20% of its air capacity.

The vacuum switch (5), installed in driver's door is connected both to door safety knob and to lock of driver's door.

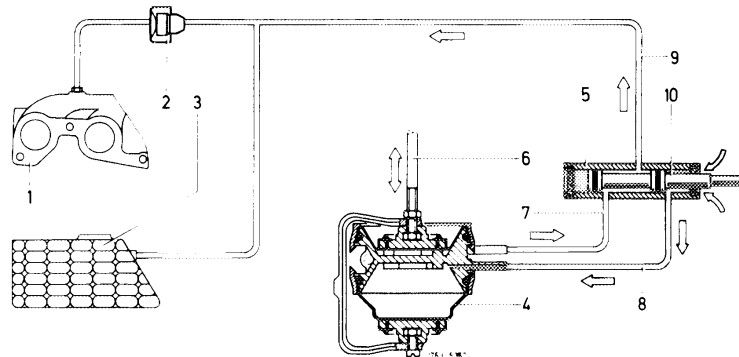
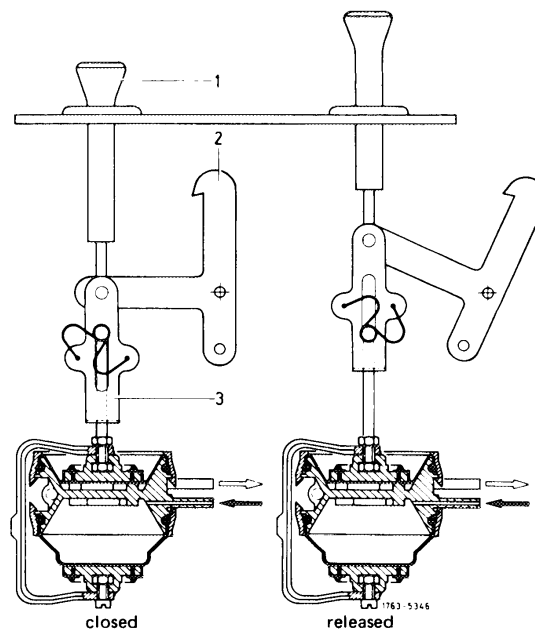


Diagram of central interlocking system (interlocked condition)

- | | | |
|-----------------------------|-------------------|------------------|
| 1 Intake manifold of engine | 5 Vacuum switch | 9 Vacuum line |
| 2 Check valve | 6 Actuating rod | 10 Control valve |
| 3 Vacuum supply tank | 7 Evacuating line | |
| 4 Operating element | 8 Charging line | |

When the door safety knob is actuated or the door is opened or locked from outside by means of key, the control valve (10) in vacuum switch (5) will move along; this will establish a vacuum in one chamber of the operating element (4), while the other chamber will be charged with air. The resulting differential pressure will reverse the direction of operation. The control rods of the diaphragm pistons will engage the door safety knobs of the remaining doors and the interlocking devices of the trunk lid and the flap of the tank filler neck for the desired joint pneumatic operation. For safety reasons, the mechanical actuation of the door safety knob (1) interlock is given priority in relation to vacuum actuation. For this purpose, the control rod is provided with a snap spring mechanism (3) which permits the separate mechanical release of each lock with the central interlocking system engaged. During the next central interlocking step, the snap spring mechanism will return automatically to its starting position.



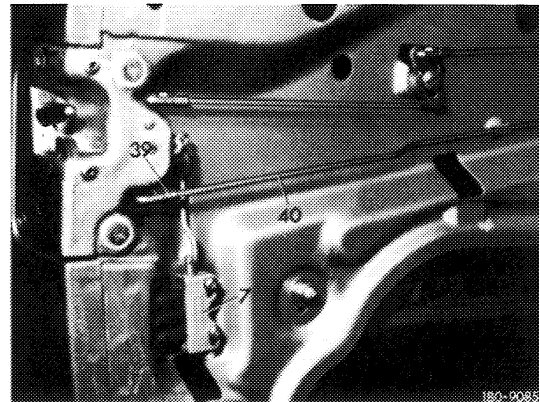
- 1 Door safety knob
- 2 Bolt
- 3 Snap lock mechanism

Color code of vacuum lines for central interlock

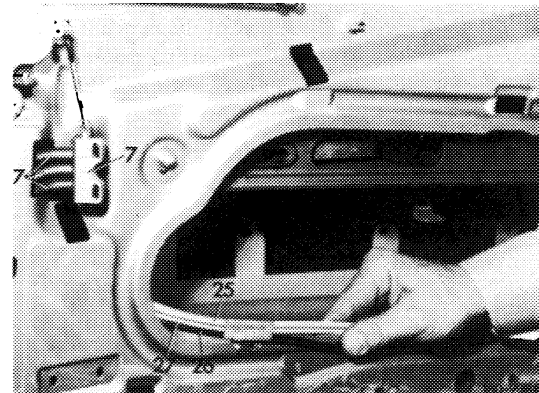
Vacuum line	Color code	
	1st version	2nd version
Suction line to vacuum switch (27)	yellow	yellow
Interlocking line (25)	white	yellow-red
Unlocking line (26)	black	yellow-green

Removal

- 1 Remove door lining.
- 2 Remove safety clip (39) of pull rod (40) and disconnect pull rod.
- 3 Unscrew oval head screws from vacuum switch (7).



- 4 Pull connections (17) together with interlocking line (25) at bottom, unlocking line (26) at top and suction line (27) in center from vacuum switch (7).
- 5 Disconnect vacuum switch on door lock.



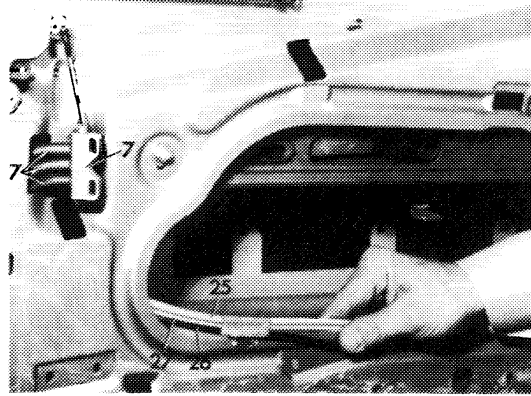
Attention!

Since June 1972, the suction line (27) of lefthand driver's door is provided with an additional check valve. Since August 1976, this check valve is replaced by a modified version (white-black).

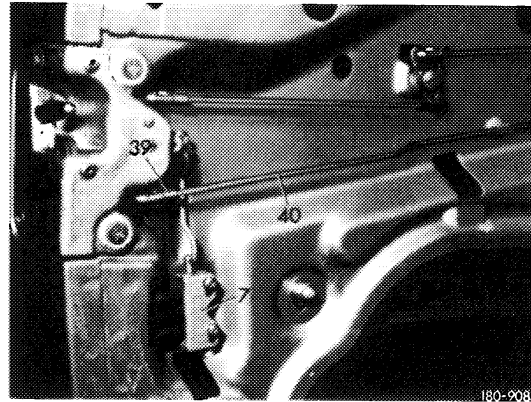
In contrast to the former version, the additional check valve of the new version may not be used at any other point of vacuum system, since otherwise the function of the system is no longer assured.

Installation

- 6 Connect vacuum switch to door lock.
- 7 Slip connections (17) with interlocking line (25) at bottom, unlocking line (26) at top and suction line (27) in center on vacuum switch (7).

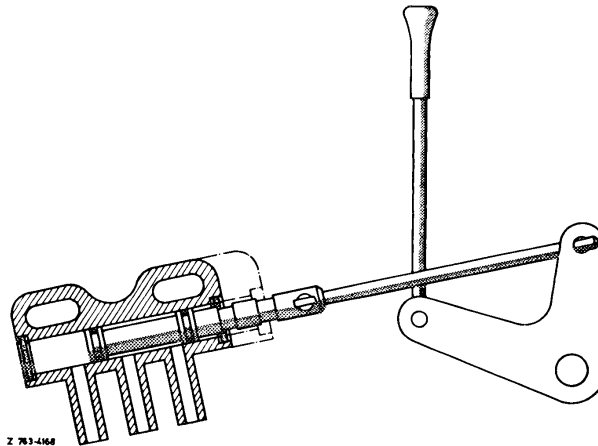


- 8 Attach vacuum switch (7) with oval head screws in such a manner that switch will be hard to move within its oblong holes.
- 9 Attach pull rod (40) and slip-on safety clip (39).
- 10 Run engine for a short moment, insert door key into lock and open and close.
- 11 Adjust vacuum switch.



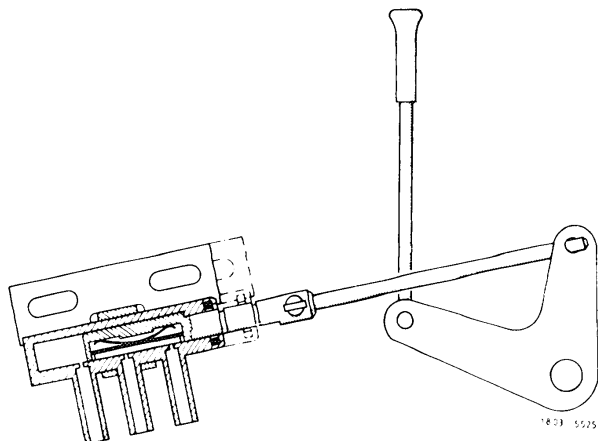
Version A (no longer installed):

Set vacuum switch of light alloy in such a manner that in locked condition the outer edge of the switch is in alignment with center of outer adjusting groove or in unlocked condition with center of inner adjusting groove.



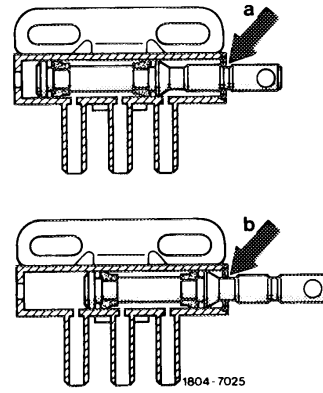
Version B (no longer installed):

Adjust plastic vacuum switch in such a manner that in locked condition the outer edge of the switch is in alignment with outer adjusting groove or in unlocked condition with inner adjusting groove.



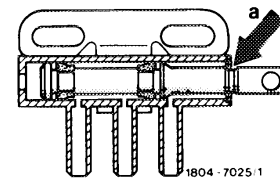
Version C (no longer installed):

Adjust plastic vacuum switch in such a manner that in locked condition the outer edge of the switch is in alignment with center of outer adjusting groove (refer to arrow a), or in unlocked condition with center of inner adjusting groove (refer to arrow b).



Version D:

Adjust plastic vacuum switch in such a manner that the outer edge of the switch in locked condition is in alignment with center of adjusting groove (refer to arrow a). This plastic vacuum switch replaced all former versions.



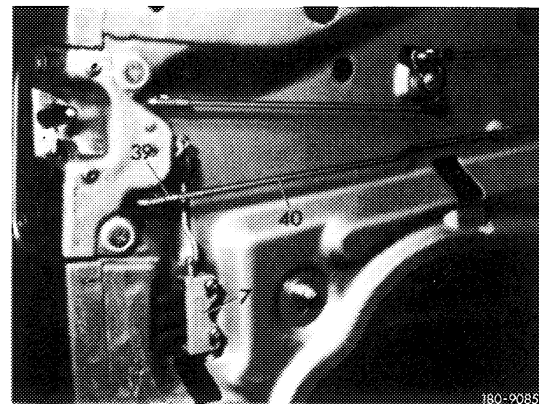
Attention!

If the adjusting range of version D is inadequate, extend onlong holes (slots) in holder by filing.

Note: The central locking system should already respond before the key is in its respective end position.

12 Tighten oval head screws of vacuum switch.

13 Install door lining.



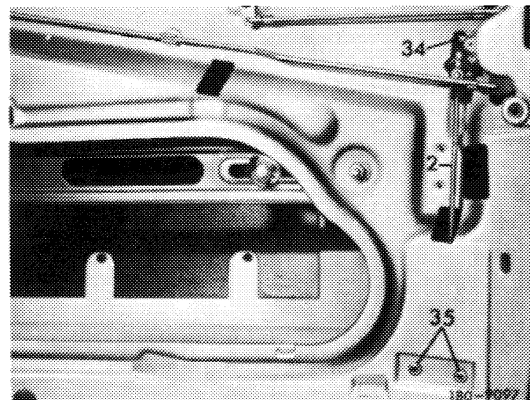
80–210 Removal and installation of vacuum element of front passenger's door

Color code of vacuum lines for central interlock

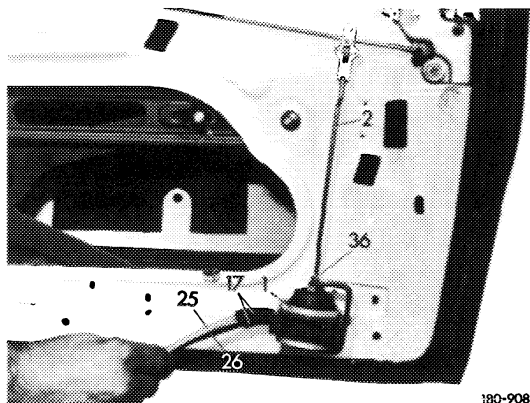
Vacuum line	Color code	
	1st version	2nd version
Interlocking line (25)	white	yellow-red
Unlocking line (26)	black	yellow-green

Removal

- 1 Remove door lining.
- 2 Disconnect safety clip (34) of control rod (2).
- 3 Unscrew oval head screws (35).



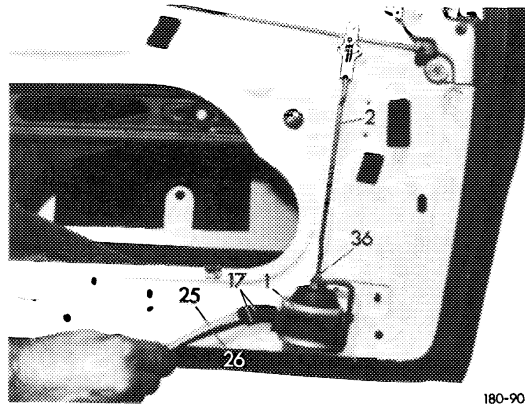
- 4 Remove vacuum element with control rod.
- 5 Pull connections (17) with interlocking line (25) on top and unlocking line (26) at bottom from vacuum element (1).
- 6 Loosen counternut (36) on vacuum element (1) and unscrew control rod (2).



Installation

7 Screw control rod (2) into vacuum element (1) up to stop and secure with conternut (36).

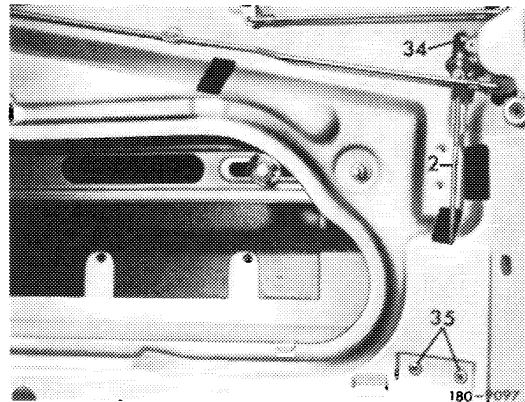
8 Slip interlocking line (25) at top and unlocking line (26) at bottom with connectors (17) on vacuum element (1).



9 Insert vacuum element with control rod into front passenger door in such a manner that the vacuum connections are pointing in driving direction. Screw-down with oval head screws (35).

10 Secure control rod (2) with safety clip (34) on door lock.

11 Install door lining.



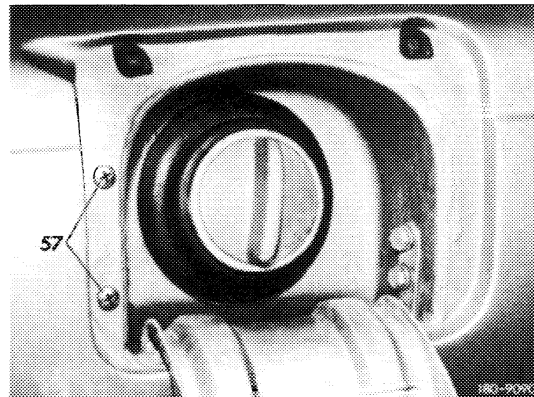
80–230 Removal and installation of vacuum element of tank filler neck flap

Color code of vacuum lines for central interlock

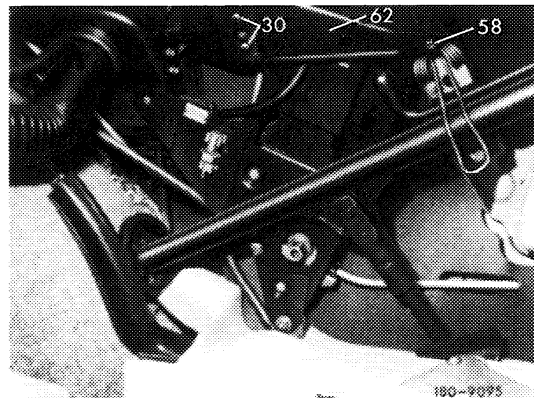
Vacuum line	Color code	
	1st version	2nd version
Interlocking line (25)	white	yellow-red

Removal

- 1 Unscrew oval head screws (57) on tank filler neck.



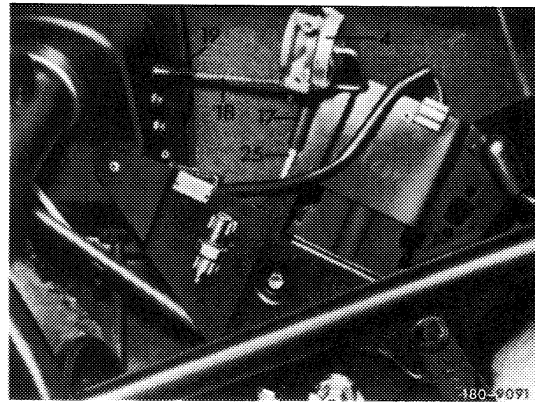
- 2 Unscrew hex. screw (58) from bracket (62).
- 3 Unscrew oval head screws (30) from vacuum element.



4 Remove bracket (62).

5 Pull connection (17) with interlocking line (25) from vacuum element (4).

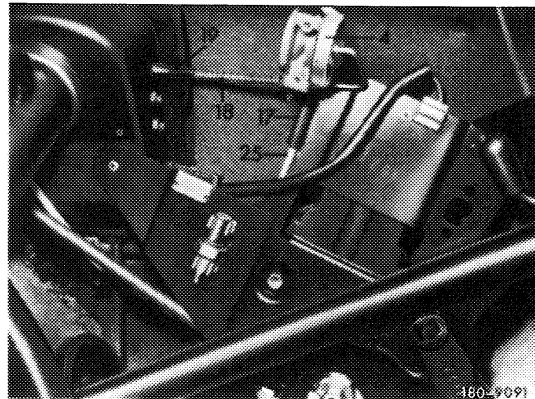
6 Pull vacuum element (4) with compression spring (18) out of sleeve (19).



Installation

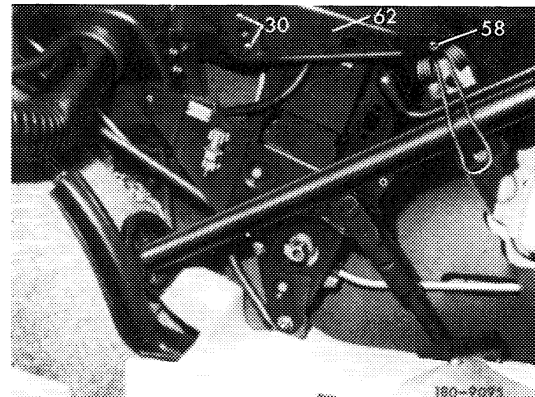
7 Introduce vacuum element (4) with compression spring (18) into sleeve (19).

8 Slip connection (17) with interlocking line (25) on vacuum element (4).

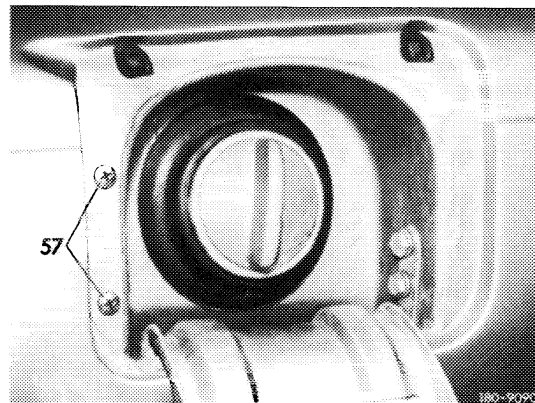


9 Screw bracket (62) with oval head screws (30) to vacuum element.

10 Screw bracket (62) with hex. screw (58) to mounting.



11 Screw oval head screws (57) to tank filler neck.



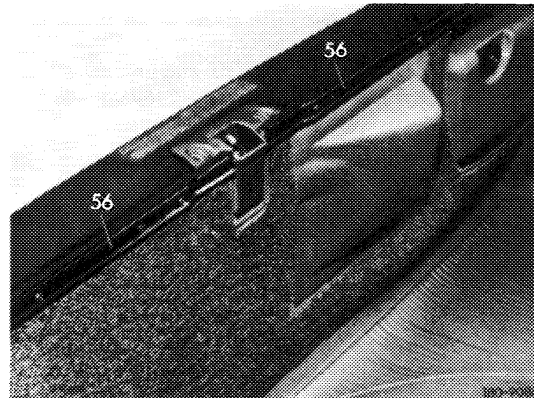
80–240 Removal and installation of vacuum element for trunk lid

Color code of vacuum lines for central interlock

Vacuum line	Color code	
	1st version	2nd version
Interlocking line (25)	white	yellow-red
Unlocking line (26)	black	yellow-green

Removal

1 Remove oval head screws from fastening rails (56) and remove fastening rails.



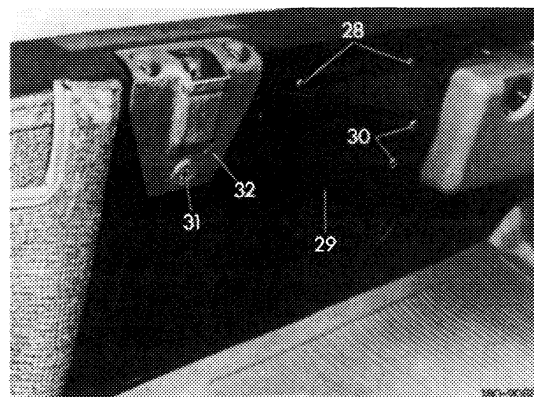
2 Loosen carpet lining and pull to the right.

3 Unscrew oval head screws (28) from lefthand cover of rear center piece (29).

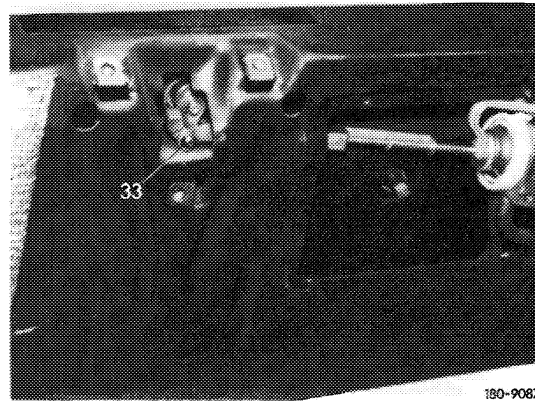
4 Unscrew oval head screws (30) for vacuum element.

5 Remove cover of rear center piece.

6 Unscrew countersunk screws (31) and remove lock body (32).



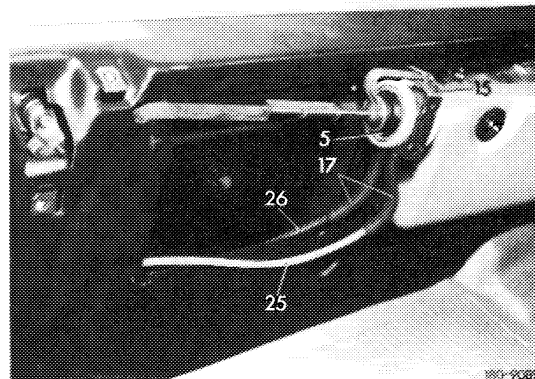
7 Remove locking ring (33) of control rod.



180-9087

8 Pull out vacuum element (5) and pull connection (17) with interlocking line (25) and unlocking line (26) from vacuum element.

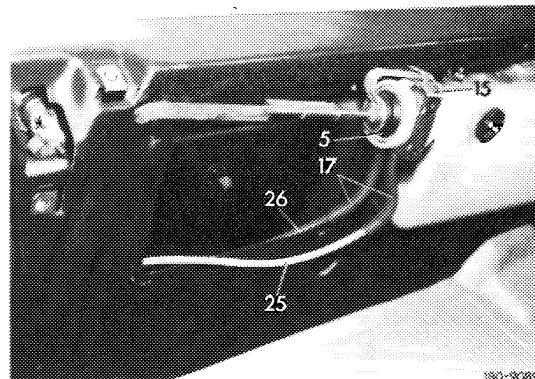
9 Remove holding spring (15) from vacuum element (5).



180-9088

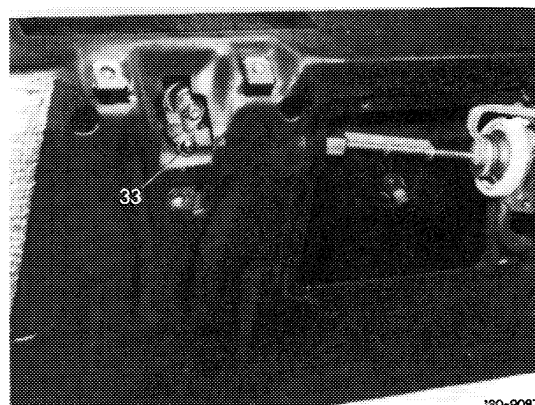
Installation

10 Connect interlocking line (25) and unlocking line (26) with connections (17) to vacuum element (5).



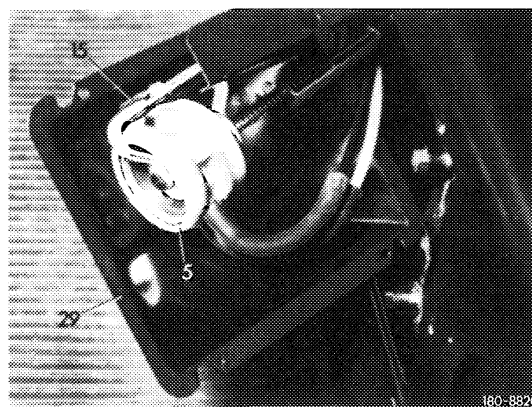
180-9089

11 Introduce vacuum element into rear center piece, attach control rod and secure with locking ring (33).

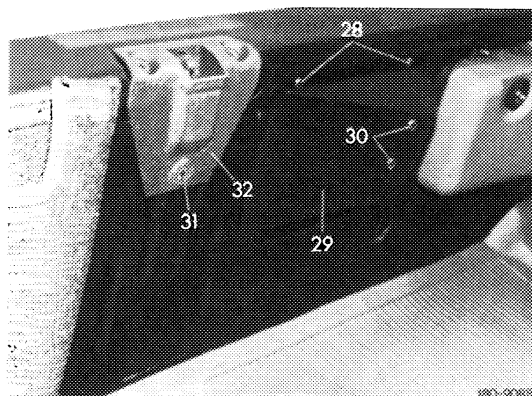


180-9087

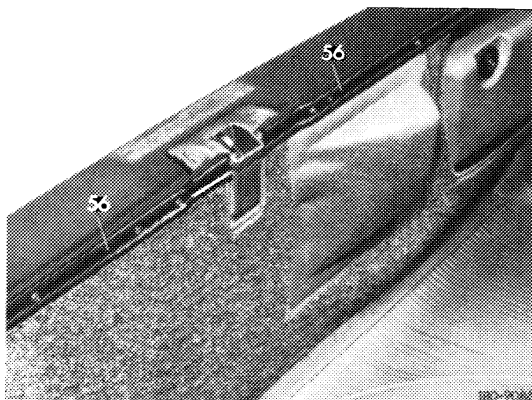
12 Attach holding spring (15) to vacuum element (5) and screw to lefthand cover of rear center piece (29) by means of oval head screws.



13 Insert lefthand cover of rear center piece (29) and screw down with oval head screws (28).



15 Glue-on carpet lining and screw down both fastening rails (56) by means of oval head screws.



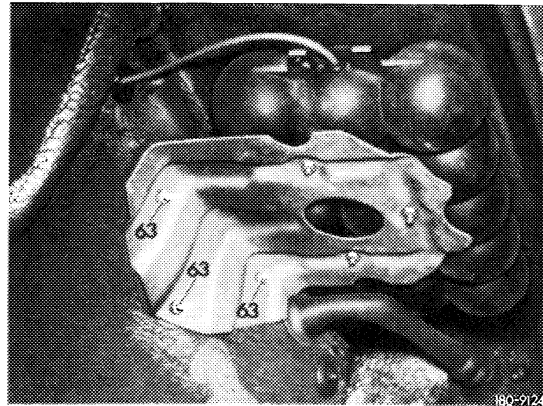
80–250 Removal and installation of vacuum supply tank

Color code of vacuum lines for central interlock

Vacuum line	Color code		
	1st version	2nd version	3rd version
Suction line from distributor to vacuum supply tank (23)	yellow	grey-yellow	yellow-grey

Removal

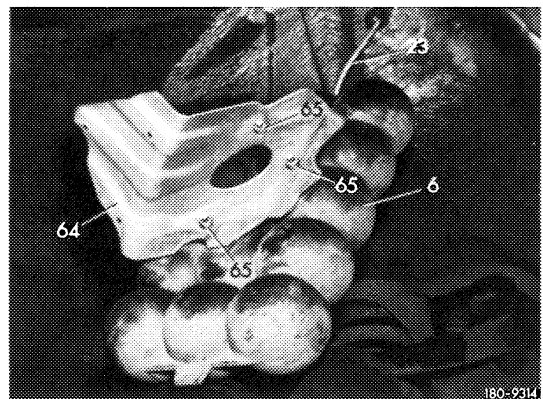
1 Unscrew hex. nuts (63) from holding plate front right under fender.



2 Remove vacuum supply tank (6) with bracket (64).

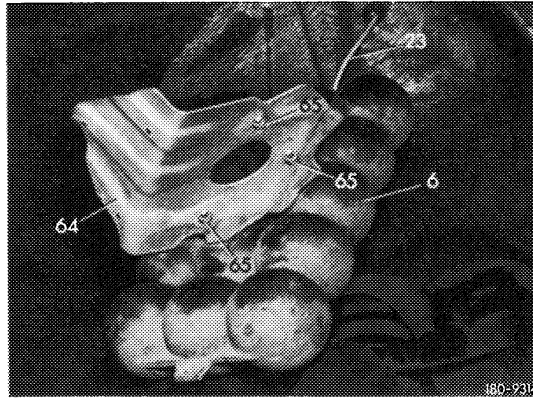
3 Unscrew hex. nuts (65) and remove bracket (64).

4 Pull suction line (23) out of seal.

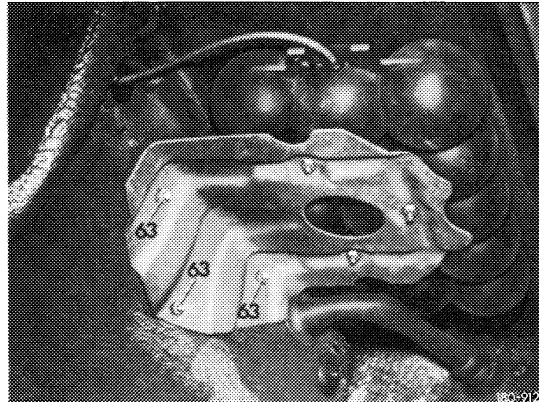


Installation

- 5 Push new seal into vacuum supply tank (6).
- 6 Slip vacuum line (23) into seal.
- 7 Screw bracket (64) to vacuum supply tank (6) by means of hex. nuts (65).



- 8 Screw vacuum supply tank (6) with bracket (64) to wheel house sheet metal by means of hex. nuts (63).



80–260 Checking central interlock

Data

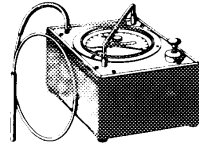
Perm. leaks in system (without vacuum supply tank)	6 mbar/min at 400 mbar vacuum
Perm. leaks of individual components	5 mbar/min at 300 mbar vacuum
Plug-on length of connections	12 ± 2

Color code of vacuum lines for central interlock

Vacuum line	Color code		
	1st version	2nd version	3rd version
Suction line from distributor to vacuum supply tank (96)	yellow	grey-yellow	yellow-grey
Interlocking line (85, 87, 90, 92)	white	yellow-red	yellow-red
Unlocking line (88, 91, 93)	black	yellow-green	yellow-green

Special tool

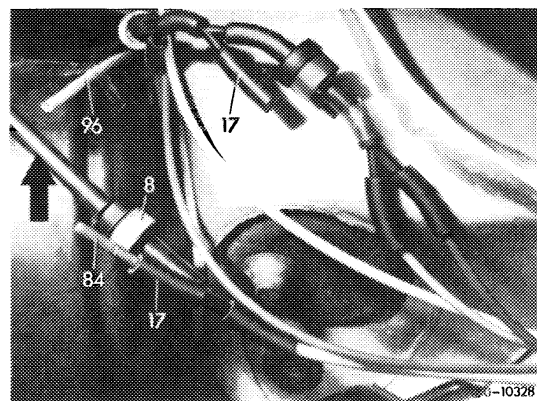
Tester for vacuum systems



116 589 25 21 00

Checking central interlock without vacuum reservoir

- 1 Pull suction line (96) out of connection (17) and close connection with blind plug (84).
- 2 Pull check valve (8) out of connection (17) and connect tester (refer to arrow).



3 Evacuate system in unlocked condition and read pressure increase at pressure gauge of tester. Check analogously in locked condition. Depending in which condition (locked or unlocked) the pressure rises, continue test "leaking locking or unlocking circuit". If a leak shows up in locked and unlocked condition, continue test "leaking locking and unlocking circuit".

Attention!

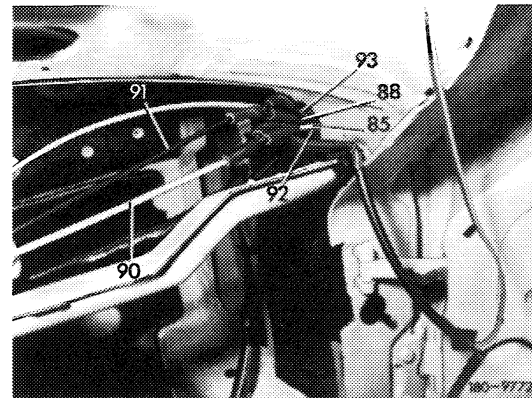
Prior to exchanging vacuum elements of leaking circuit, check hose lines and their connections.

Leaking locking or unlocking circuit

Note: If one circuit is leaking (the interlocking circuit or the unlocking circuit), systematically check the individual vacuum elements of this circuit one after the other. Upon replacement of a leaking vacuum element, check the circuit found leaking once again for leaks, starting at engine compartement.

4 Remove lateral and upper cover in legroom front right, so that the connections for checking the vacuum elements for the righthand driver's door, the flap for the tank filler neck and the trunk lid become accessible.

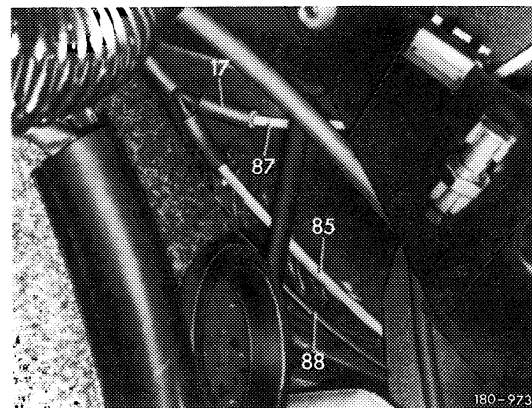
5 Check interlocking circuit of flap for tank filler neck and trunk lid with line (85).



6 If there is a leak, pull interlocking line (87) toward vacuum element of flap for tank filler socket in trunk rear right out of connection (17).

7 Connect tester to interlocking line (87) and evacuate.

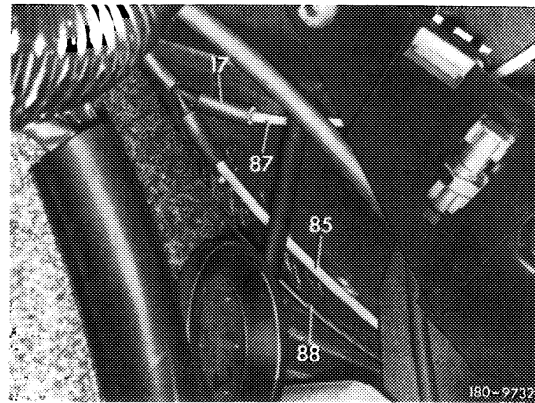
8 In the event of a leak, renew vacuum element of flap for tank filler neck (80-230).



9 If the readout on pressure gauge is not changing, the vacuum element of the flap for tank filler neck is sealtight. The prevailing leak is therefore in vacuum element for trunk lid.

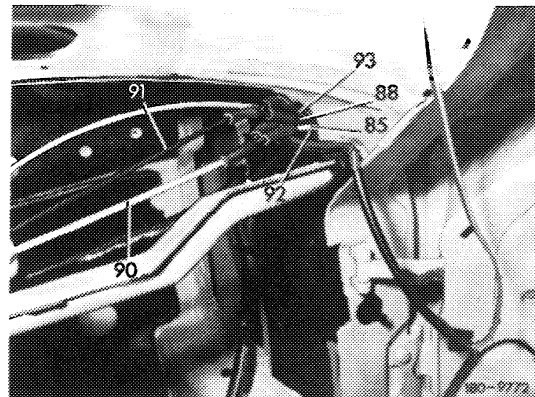
10 Renew vacuum element for trunk lid (80-240).

11 If the unlocking circuit line (88) toward rear end leaks, the vacuum element for trunk lid is the only source of leak.



12 Check right hand driver's door on line (92 or 93) of respective circuit. Connect tester and evacuate.

13 If the readout on pressure gauge changes when checking, renew vacuum element of righthand driver's door (80-210).



Leaking locking and unlocking circuit

14 If both circuits are leaking, the check valve may be leaking.

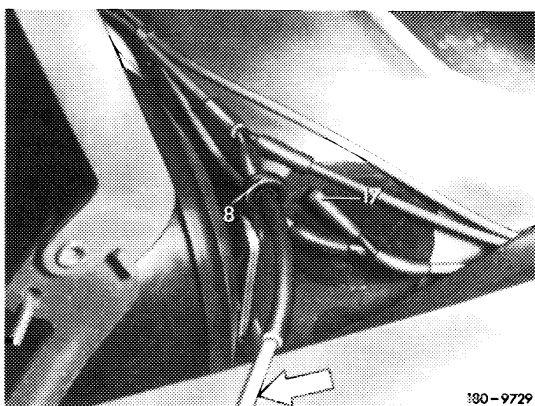
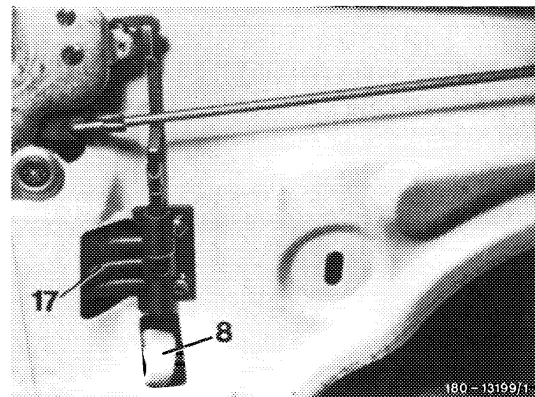
Attention!

Since June 1972, the suction line (27) of lefthand driver's door is provided with an additional check valve. Since August 1976, this check valve is replaced by a modified version (white-black).

In contrast to the former version, the additional check valve of the new version may not be used at any other point of vacuum system, since otherwise the function of the system is no longer assured.

15 Pull check valve (8) in engine compartment out of connection (17) and connect tester (refer to arrow), evacuate and read pressure gauge.

16 If the readout on pressure gauge is not changing, check valve in engine compartment is leaktight.

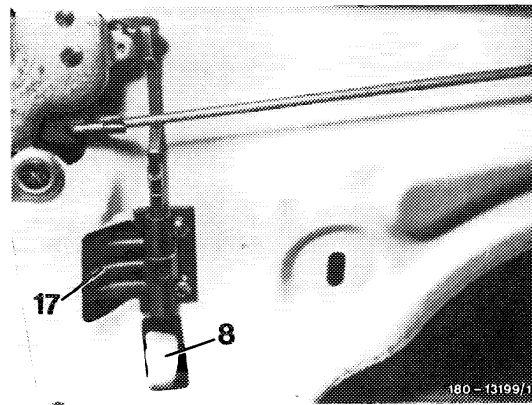


17 In such a case, remove door lining.

18 Pull check valve (8) out of connecting piece (17) and connect tester, evacuate and read pressure gauge.

19 If readout on pressure gauge changes, replace check valve (8).

20 If both check valves are leaktight, the fault is in vacuum switch of driver's door.

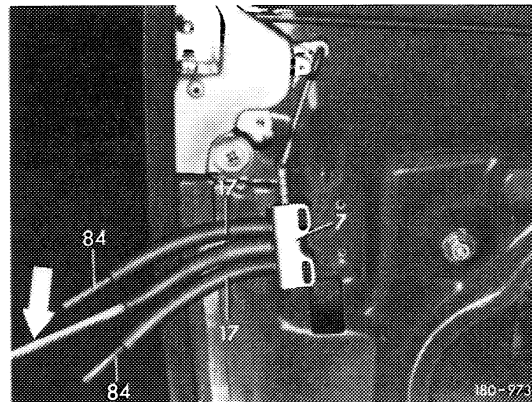


21 In such a case, remove locking and unlocking line on vacuum switch (7) and close connecting pieces (17) with blind plugs (84).

22 Pull off suction line, connect tester (refer to arrow) on center connection of vacuum switch and evacuate.

23 If the switch leaks, the readout on pressure gauge will change.

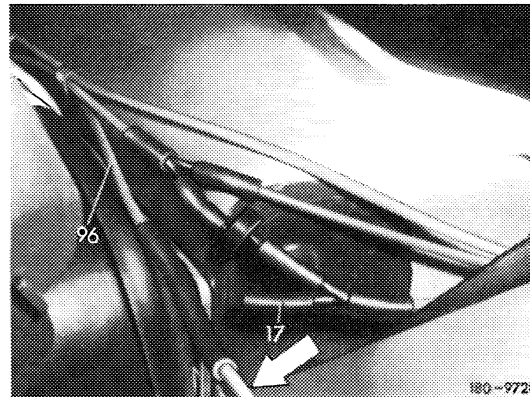
24 Replace vacuum switch (7) (80-200).



Checking vacuum reservoir

25 Pull suction line (96) out of connecting piece (17). Connect tester (refer to arrow) to suction line (96) and evacuate.

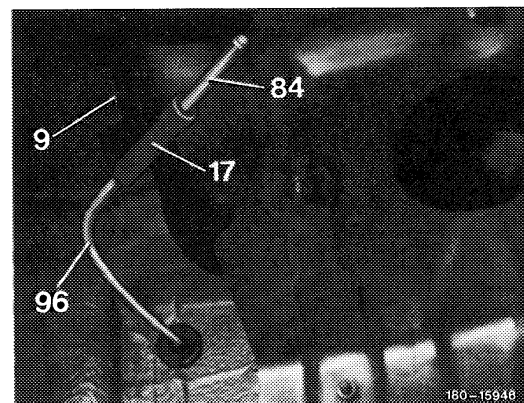
26 If readout on pressure gauge changes, replace seal of vacuum reservoir or replace reservoir (80-250).



Checking suction line to vacuum supply tank (reservoir)

27 Pull suction line (96) out of sealing (9).

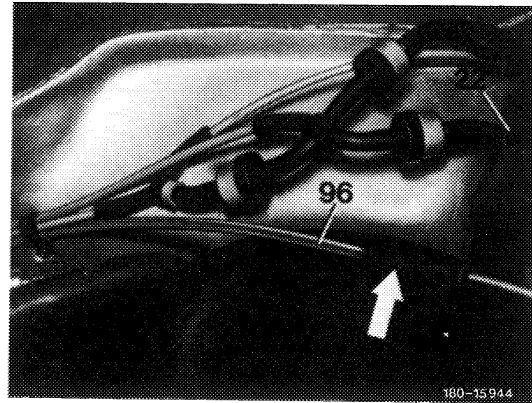
28 Close connection (17) with blind plug (84) and slip on suction line (96).



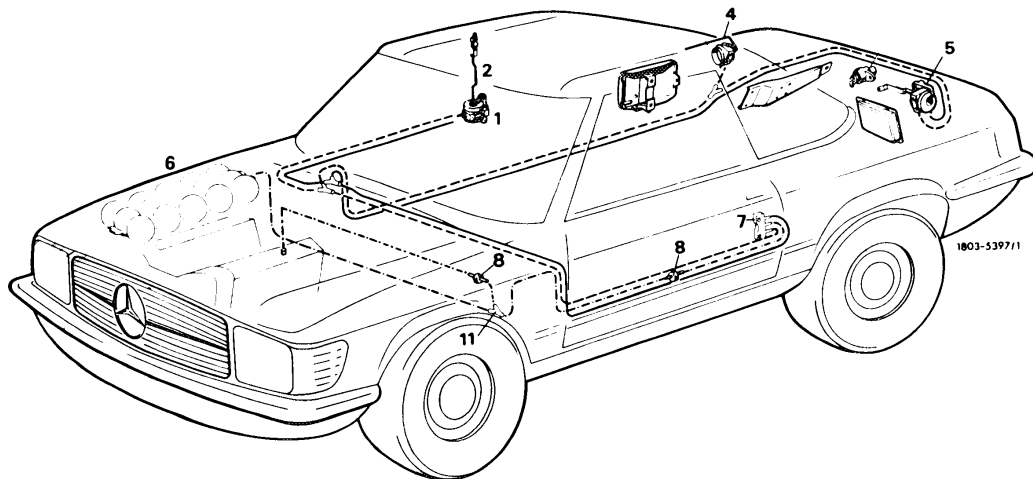
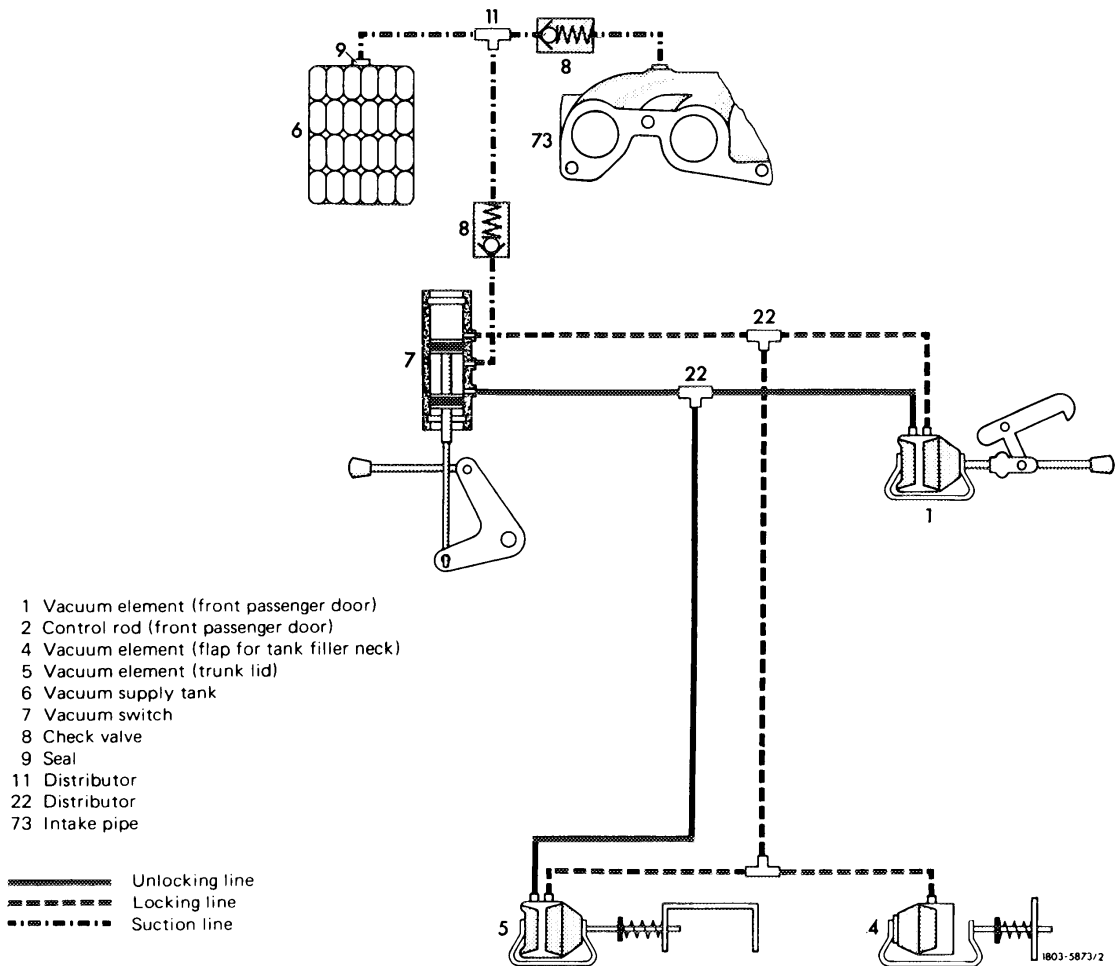
29 Pull suction line (96) out of distributor (22) in engine compartment, connect tester (refer to arrow) and evacuate.

30 Replace suction line if readout changes.

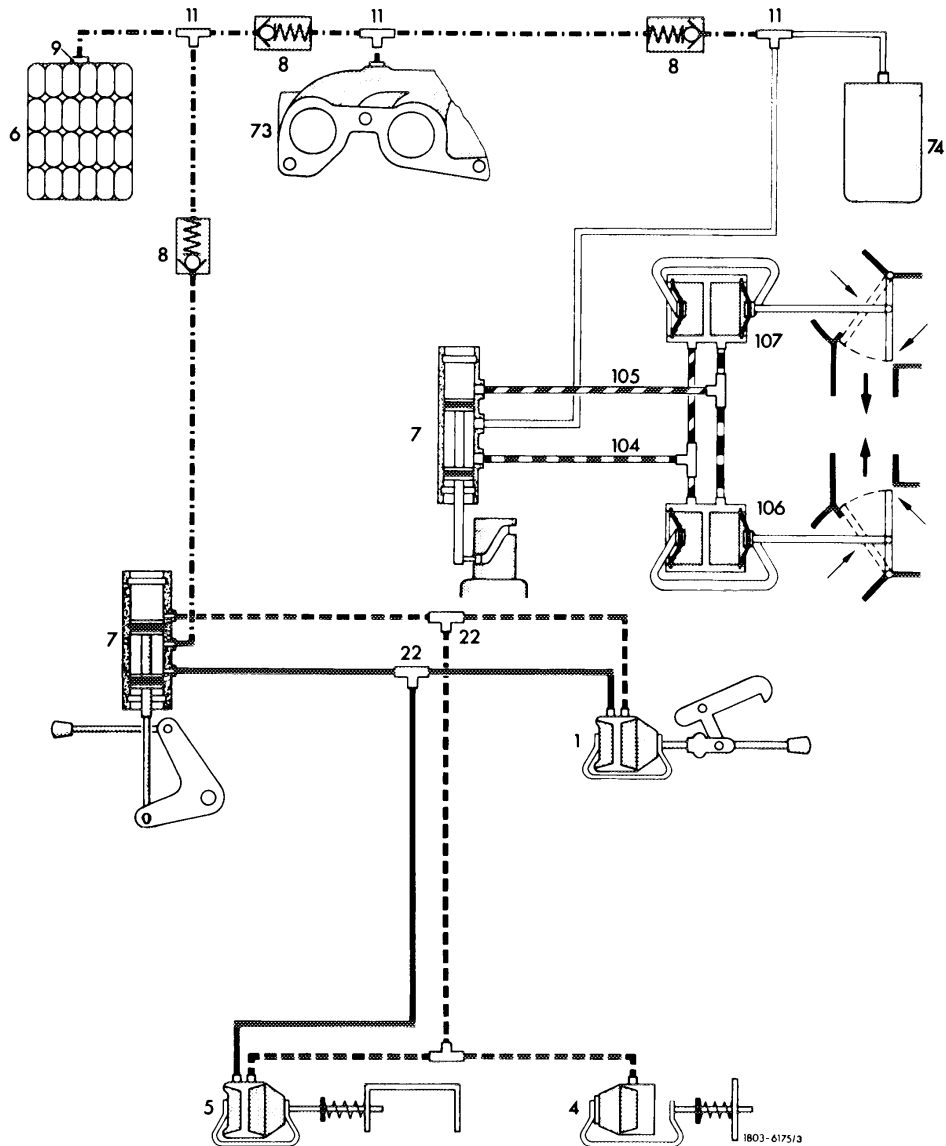
Note: Any other vacuum line in system can be tested for leaks as described under item 27–30.



80-900 Functional diagram central interlock



80-901 Functional diagram central interlock and air-conditioning system

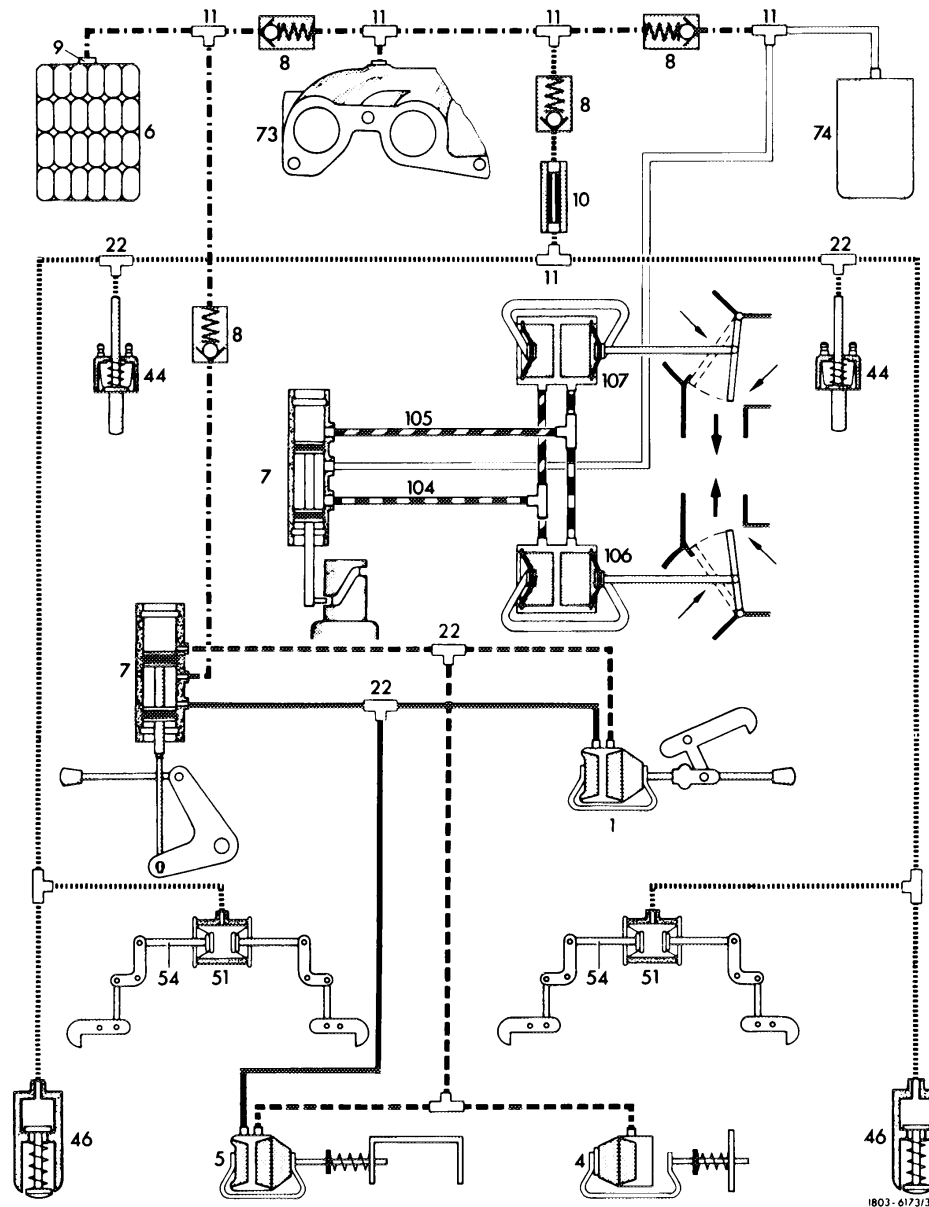


- 1 Vacuum element (front passenger door)
- 4 Vacuum element (flap for tank filler neck)
- 5 Vacuum element (trunk lid)
- 6 Vacuum supply tank
- 7 Vacuum switch
- 8 Check valve
- 9 Seal
- 11 Distributor
- 22 Distributor
- 73 Intake pipe
- 74 Vacuum supply tank (air-conditioner)
- 104 Control line (cooling circulating air)
- 105 Control line (cooling outside)
- 106 Vacuum element right (air-conditioner)
- 107 Vacuum element left (air-conditioner)

- Unlocking line
- - - Locking line
- · - · Suction line
- - - - Suction line (air-conditioner)
- - - - Control line (cooling outside air)
- ▨ Control line (cooling circulating air)

80-902 Functional diagram central and backrest interlock with air-conditioning system

Model 107.02



1803-6173/3

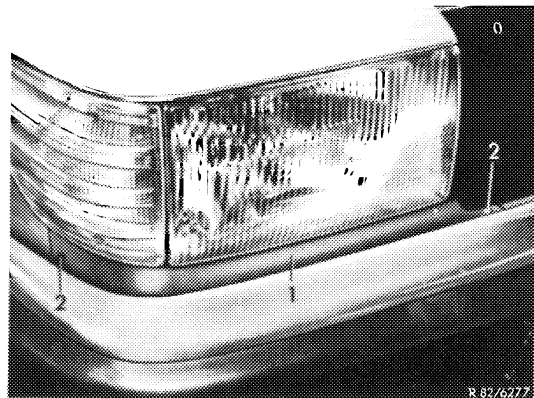
- Unlocking line
- Locking line
- · - · - Suction line
- · - · - Suction line (air-conditioner)
- · — · — Control line (cooling outside air)
- · — · — Control line (cooling circulating air)
- Control line

- | | |
|--|--|
| 1 Vacuum element (front passenger door) | 44 Door contact vacuum switch |
| 4 Vacuum element (flap for tank filler neck) | 46 Vacuum switch (rear compartment) |
| 5 Vacuum element (trunk lid) | 51 Vacuum element (seat) |
| 6 Vacuum supply tank | 54 Actuating rod |
| 7 Vacuum switch | 73 Intake manifold |
| 8 Check valve | 74 Vacuum supply tank (air-conditioner) |
| 9 Seal | 104 Control line (cooling circulating air) |
| 10 Choke | 105 Control line (cooling outside air) |
| 11 Distributor | 106 Vacuum element right (air-conditioner) |
| 22 Distributor | 107 Vacuum element left (air-conditioner) |



Removal

1 Loosen the two fastening screws (2) of cover plate (1). Lift cover plate (1) inside, push slightly outwards and remove.

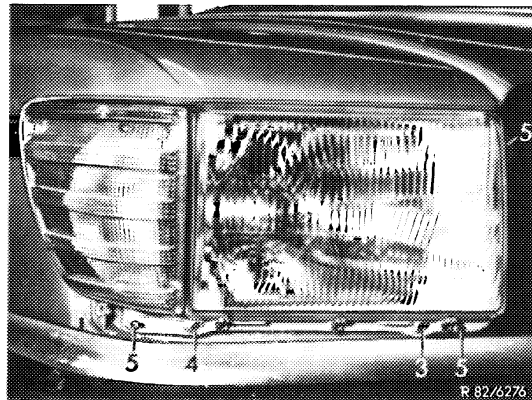


2 Loosen all three fastening screws (5). Push light unit slightly downwards and swivel in outward direction.

Note: To swivel headlamp unit, the bumper may require loosening and pushing slightly downwards.

Pull off electric plug connection at the rear.

- 3 Adjusting screw for lateral adjustment
- 4 Adjusting screw for height adjustment
- 5 Fastening screws for headlamp unit

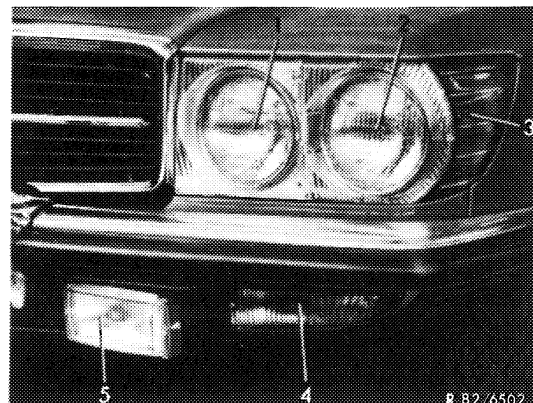


Installation

3 For installation proceed vice versa.

USA version

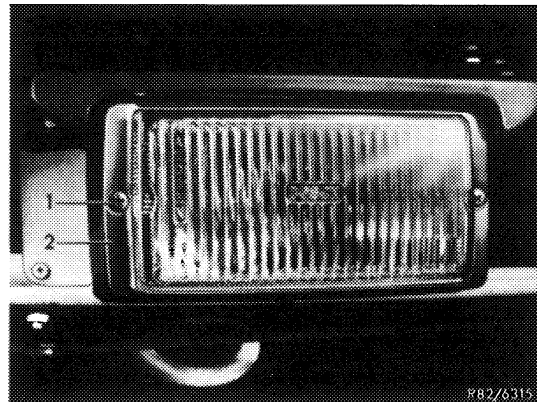
- 1 High beam
- 2 Low beam (dimmer)
- 3 Turn signal lamp and side marker lamp
- 4 Clearance and standing light
- 5 Fog lamp



82-063 Removal and installation of fog lamp bulb

Removal

- 1 Loosen both Phillips head screws (1) and pull off front part (2) of headlamp.
- 2 Loosen spring clip (3) and swivel to the right. Remove Halogen bulb (4) and loosen plug connection (5).



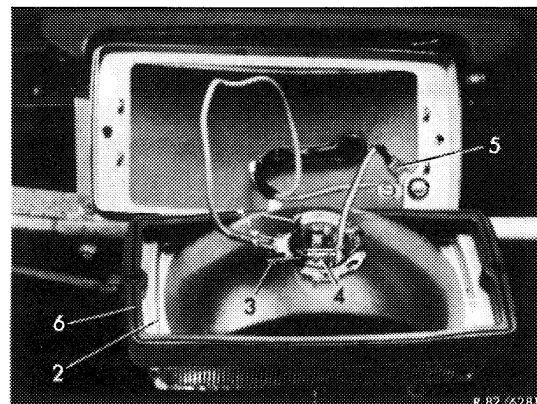
Installation

- 3 For installation of new bulb proceed similarly in vice versa sequence. Pay attention to correct location of rubber sealing frame (6).

Note: During installation of bulbs, pay attention to correct seat of locating pins.

Handle new bulb with tissue paper or the like only.

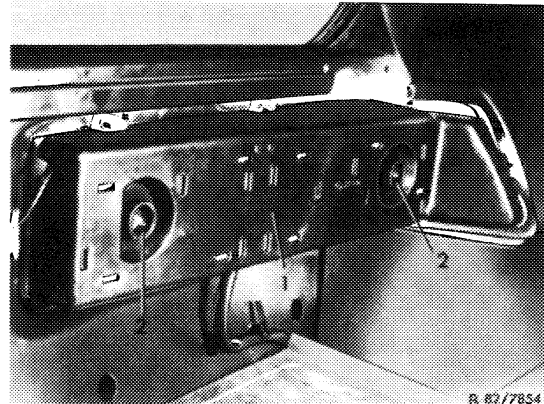
Insert only bulbs with specified number of watts.



82-252 Removal and installation of tail lamp unit

Removal

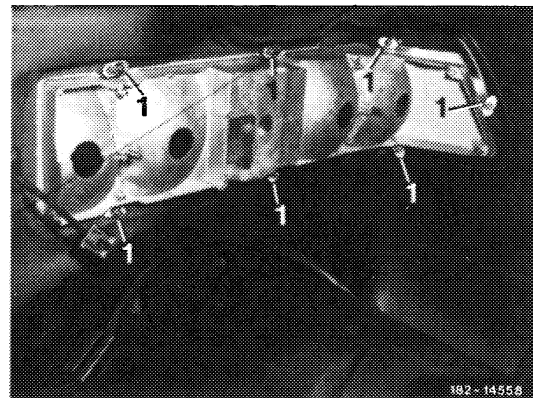
1 Unscrew knurled nuts (2). Remove lamp carrier (1) and pull off coupling for electric connections.



2 Unscrew fastening nuts (1). Remove housing in inward direction, light window with gasket in outward direction.

Installation

3 For installation proceed vice versa.



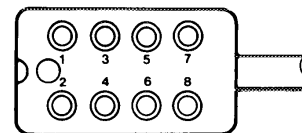
Cable layout of couplings

Left

- 1 vacant
- 2 brown
- 3 black/white
- 4 gray/yellow
- 5 black/red
- 6 gray/black
- 7 vacant
- 8 gray/green

Right

- gray/violet
- brown
- black/green
- gray/yellow
- black/red
- gray/black
- vacant
- vacant

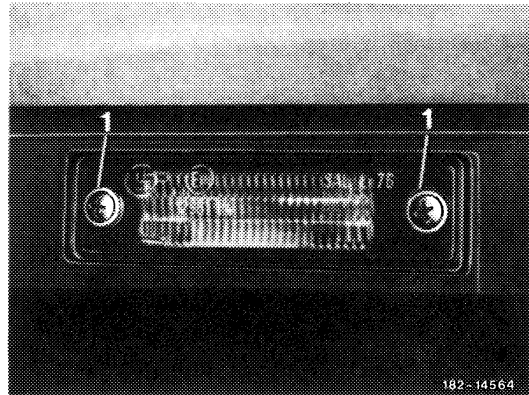


1544-8011

82-348 Removal and installation of license plate lamp

Removal

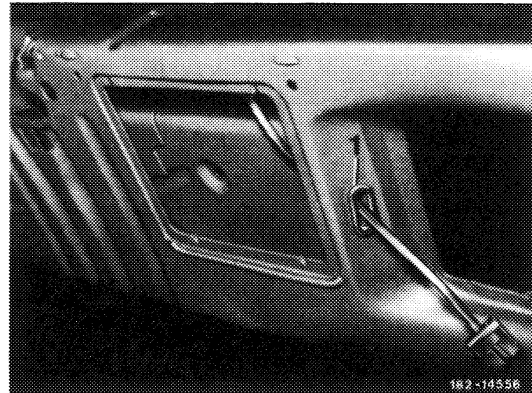
- 1 Remove lamp carrier of right or left rear lamp unit (82-252).
- 2 Unscrew fastening screws (1) on both license plate lamps. Remove glass with gasket and pull lamp carrier down at left.
- 3 Remove cover at inside on rear center piece.



- 4 Pull cable with coupling inwards upon removal of rubber grommet (1). Remove righthand and lefthand license plate lamp from inside.

Installation

- 5 For installation proceed vice versa.



82-349 Dome lamps

Function of dome lamps has been changed since September 1982, (USA) starting 1983.

The dome lamps can be continuously switched or by way of a time delay relay with a switch in instrument panel.

Position 1:

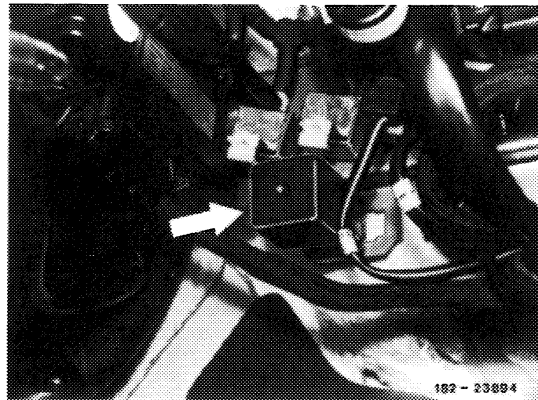
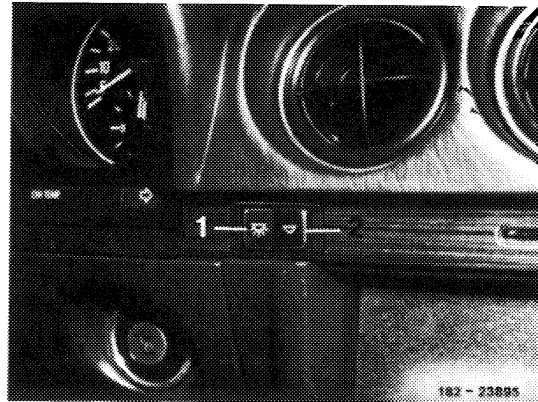
Dome lamps continuously switched on.

Position 2:

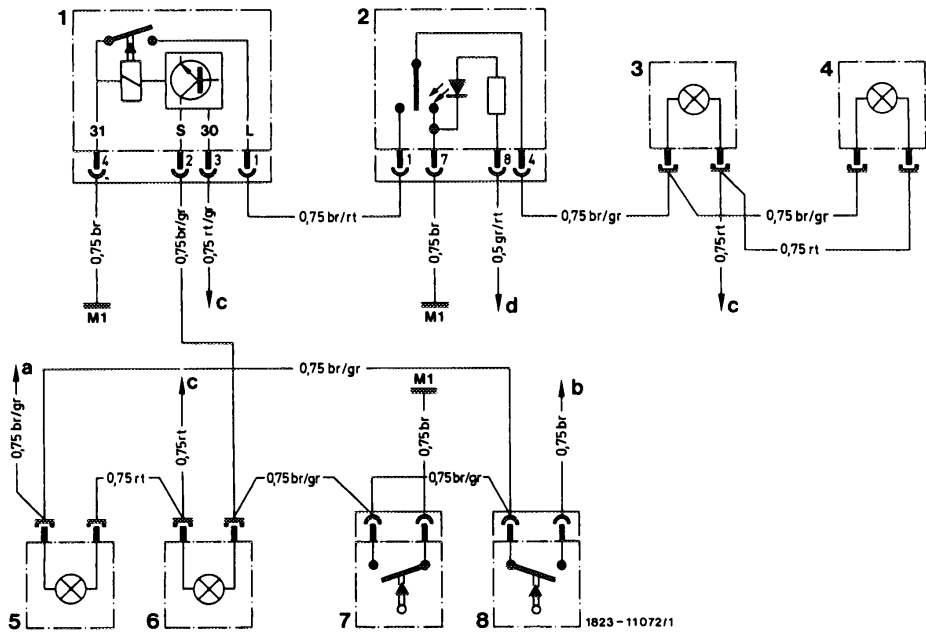
Dome lamps switched on after opening doors. Lamps will extinguish 15 seconds after closing of doors.

Center position (1 and 2 not pushed):

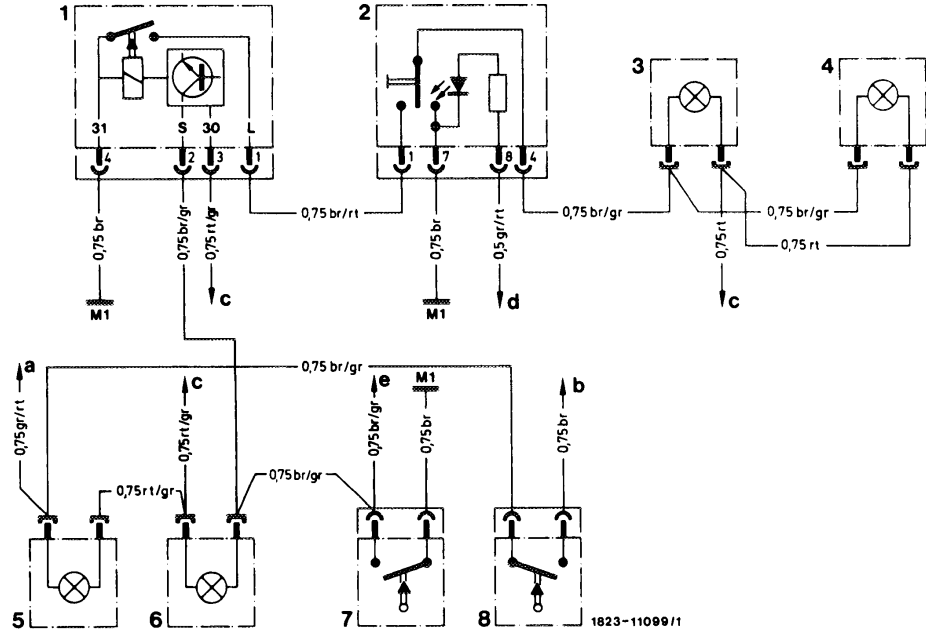
Dome lamps switched off.



Time delay relay for dome lamps



Wiring diagram dome lamps standard version



Wiring diagram dome lamps (USA) 1983

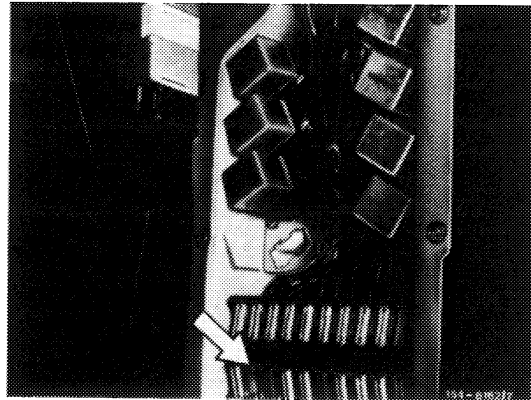
- | | | | |
|---|---------------------------|----|--|
| 1 | Time delay relay | M1 | Main ground at fuse box |
| 2 | Switch, dome lamps | a | Warning buzzer contact |
| 3 | Dome lamp right | b | Via coupler parking brake, brake lining wear indicator, wiper motor and rotary lamp switch on M1 |
| 4 | Dome lamp left | c | Fuse No. 11 (terminal 30) |
| 5 | Entrance lamp left | d | Lug terminal 58 d |
| 6 | Entrance lamp right | e | Warning instrument jack No. 6 |
| 7 | Door contact switch right | | |
| 8 | Door contact switch left | | |

82-500 Connection for radio

The electric connections for radio and automatic rear antenna, as well as the antenna cable are standard equipment on vehicles of series production.

Connecting cables for radio section are in radio cut-out blindly insulated on harness.

The required fuse must still be inserted into fuse box.



The connecting coupler for automatic rear antenna and the antenna cable are located under lamp carrier of lefthand tail lamp unit. Recesses for speakers are provided at instrument panel at the left and right.

Two additional speakers may be installed in hat rack.

The additional harness, as well as complete installation instructions, are included with respective radio set of radio manufacturer.

A. (USA) 1976

The antenna can be extended or retracted partially or completely depending on actuation of antenna switch.

The antenna switch is designed as a rocker-type switch.

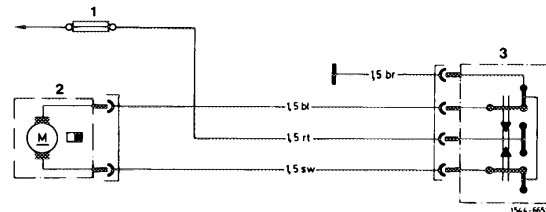
Electric function

Motor (2) is connected to negative current on both connections (blue and red) via switch (3). When switch (3) is actuated, the cable (blue) connected to negative current is separated from negative contact in switch and connected to positive current (red) on switch via fuse (1).

On motor, the cable (black) is now connected to negative current and on cable (blue) to positive current, the antenna will extend.

If switch (3) is actuated in the opposite direction, the polarity on motor is interchanged, that is: the (blue) cable is connected to negative current and the (black) cable to positive current, the antenna will retract.

- 1 Fuse
- 2 Antenna motor
- 3 Antenna rocker-type switch



B. (USA) starting 1977

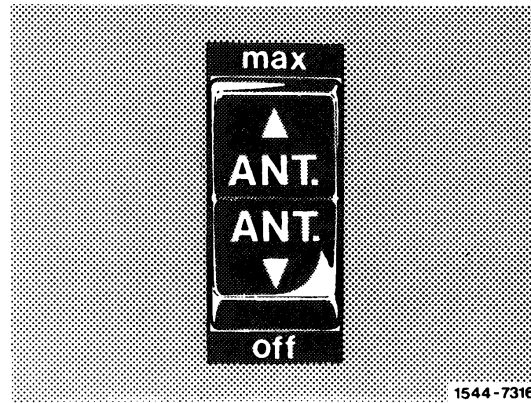
The antenna can be moved into three different positions by means of antenna switch with radio switched on.

Antenna switch in center position

When the radio is switched on, the antenna will automatically extend for approx. 30 cm. Quick actuation of switch permits extending antenna to position most favorable for reception.

Antenna switch engaged in extended position

Antenna extends in full length.



Antenna switch engaged in retracted position

Antenna is not extending e. g. when operating cassettes or antenna retracts completely from extended position.

If the ignition or the radio is switched off, the antenna will completely retract.

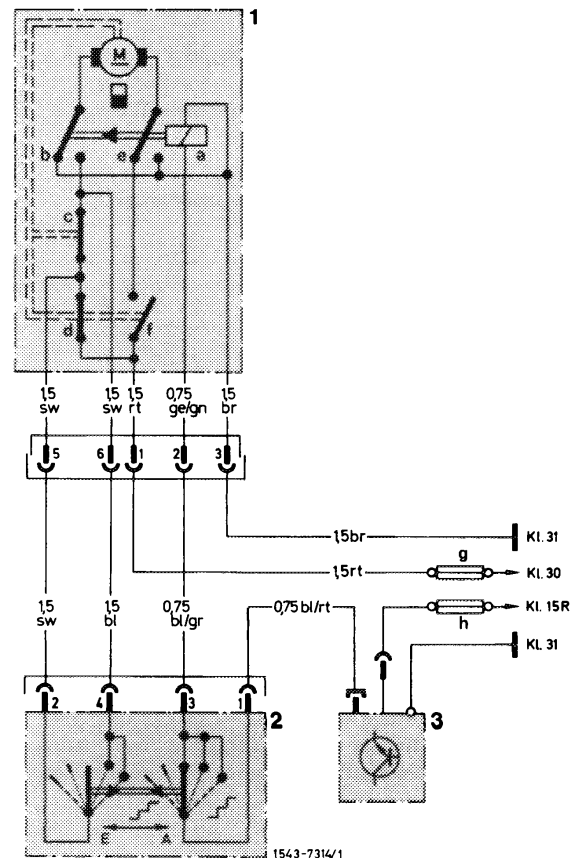
Electric function

Antenna switch in center position

When the radio is switched on, the relay coil a is energized via antenna switch and will close contacts b and e.

The antenna motor is connected to positive current from fuse g (terminal 30) via contacts d, c and b, and to negative current via contact e.

The motor starts and the antenna extends. When the antenna is extended for approx. 30 cm, contact c is automatically opened and interrupts the motor circuit.

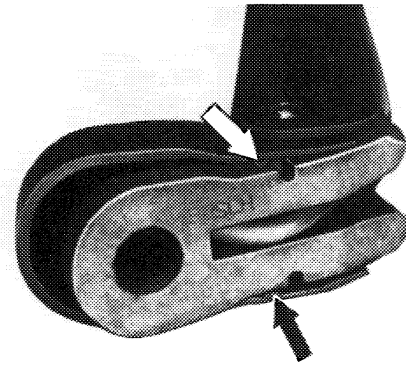


- 1 Automatic antenna
- 2 Antenna switch
- 3 Radio
- E Retracting position
- A Extending position
- ... Tipping position (in antenna switch 2)
- ... Detent position (in antenna switch 2)
- g Fuse automatic antenna (terminal 30)
- h Fuse radio (terminal 15 R)

82-610 Removal and installation of wiper arm

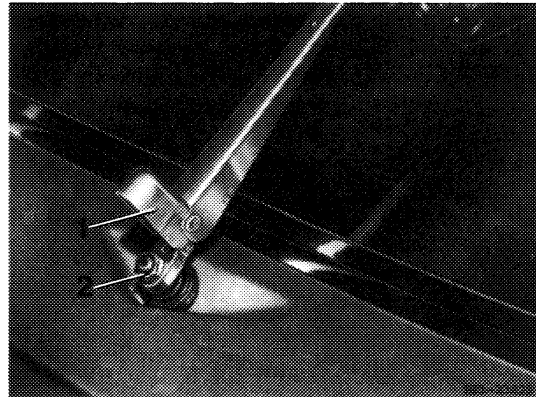
Removal

- 1 Lift wiper arm from windshield.
- 2 Disengage detent of covering cap by slightly lifting.



182-14102

- 3 Place wiper arm again against windshield glass while simultaneously completely lifting covering cap (1).
- 4 Unscrew fastening nut (2) and pull wiper arm from bearing shaft.



Installation

- 5 For installation proceed vice versa.

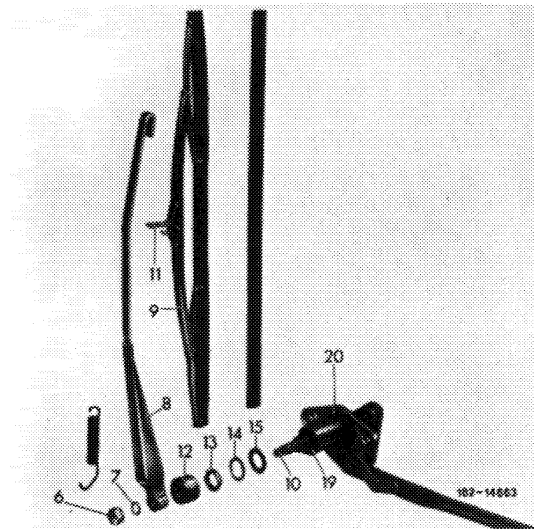
82-620 Removal and installation of wiper blade

Removal

1 Set up wiper arm (8) together with wiper blade. Push down holding spring (11) on wiper blade (9) and remove wiper blade from wiper arm.

Installation

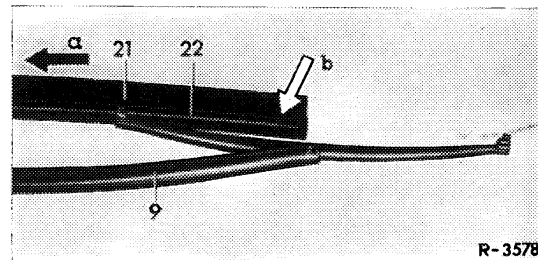
2 Place wiper blade in reverse direction on wiper arm and push in until holding spring is audibly engaging.



82-625 Removal and installation of wiper blade rubber profile strip

Removal

- 1 Remove wiper blade (82-620).
- 2 Slide rubber profile strip (21) with the two holding springs (22) with one end out of holder (b) of wiper blade (9) in direction of arrow (a).
- 3 Pull out both holding springs (22).
- 4 Remove rubber profile strip (21) from holder of wiper blade (9).

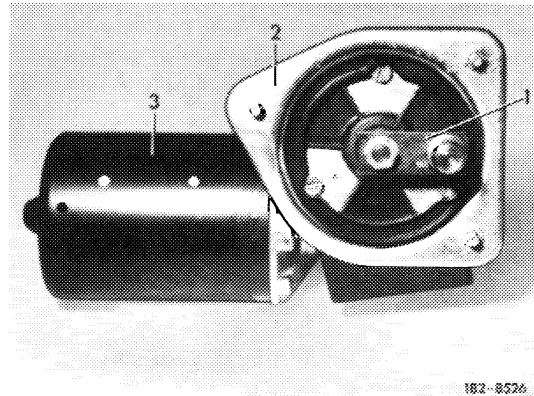


Installation

- 5 Loosely insert rubber profile strip (21) without holding springs (22) into a holder of wiper blade (9). Leave long end free.
- 6 Slip both holding springs (22) into rubber profile strip.
- 7 Introduce free end of rubber profile strip including holding spring into other holder of wiper blade to engage (arrow b).
- 8 Install wiper blade.

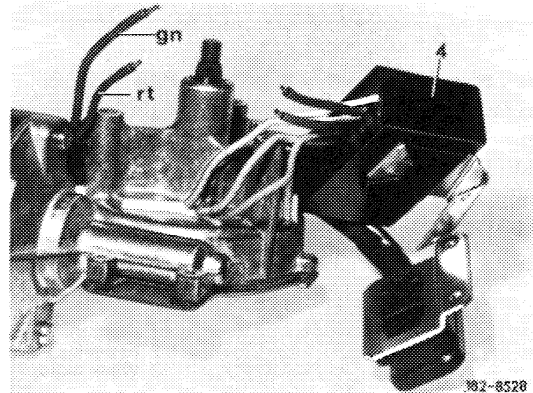
Removal

- 1 Remove wiper motor.
- 2 Mark crank position in relation to shaft, loosen hex. nut and remove crank (1).
- 3 Unscrew screws of fastening plate (2) and remove fastening plate.
- 4 Unscrew angle bracket with impulse switch and plug connection.



182-8526

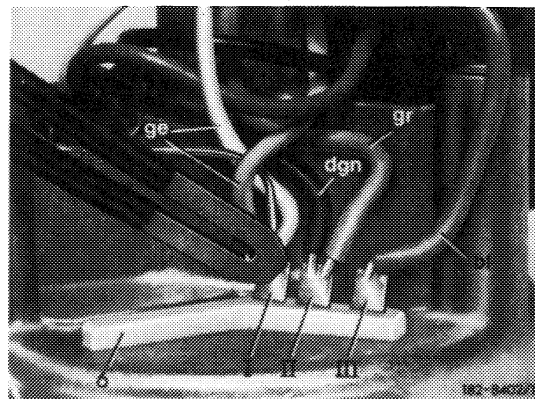
- 5 Separate green and red lines leading into wiper motor, strip ends and tin.



182-8528

- 4 Impulse switch
gn green
rt red

- 6 Unsolder yellow, grey and blue lines from soldering lugs of insulating part.
- 7 Cut red and green lines ("B and D") of new impulse switch to approx. 70 mm length: strip ends and tin.

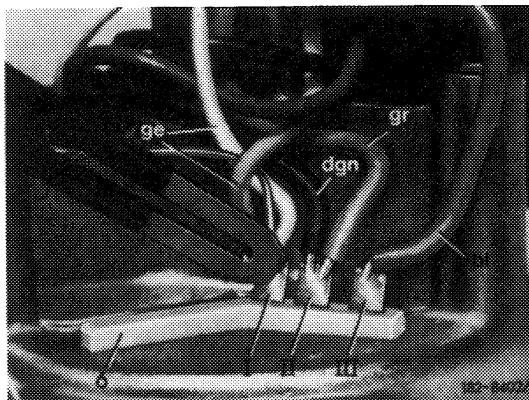


182-84278

- 6 Insulating part
I Soldering lug – yellow lines and grounding wire
II Soldering lug – grey and dark green line
III Soldering lug – blue line

8 Slip one insulating hose each 40 mm long over red and green lines leading into wiper motor. Then insert these lines into one soldering sleeve each (tubular rivets A 3 x 0.25 x 10, DIN 7340 MS) and solder to respective lines "B" and "D" of impulse switch. Then slip insulating hoses over soldering sleeve.

9 Solder yellow, grey and blue lines of impulse switch to soldering lugs. Make sure that the ground connecting wire is additionally soldered to soldering lug I and the dark green line additionally to soldering lug II.

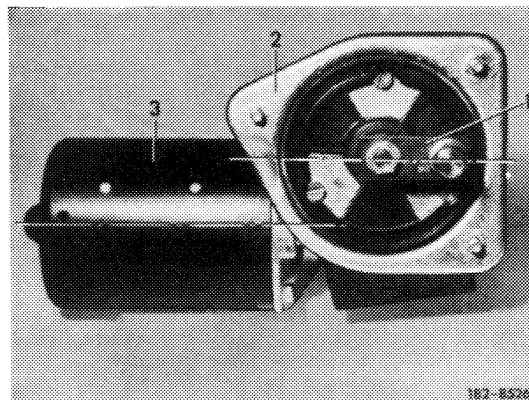


Installation

10 Screw angle bracket with impulse switch as well as fastening plate to wiper motor.

11 If mark of former crank position can still be seen, mount crank accordingly. If not, run motor into parking position, adjust crank and screw down.

- 1 Crankshaft
- 2 Fastening plate
- 3 Wiper motor

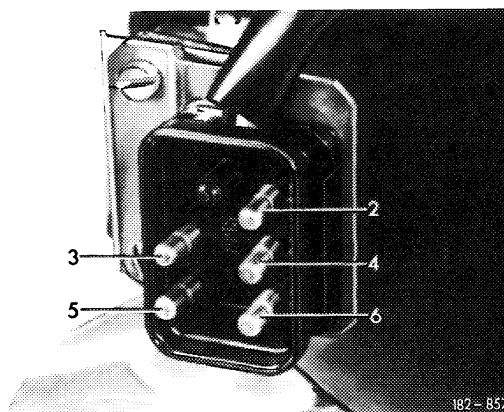


Testing wiper motor prior to installation

12 Connect a positive and a negative line to a 12-volt battery. Clamp positive line to plug pin No. 3, negative line to plug pin No. 6.

Connect an additional line to positive pole of battery and hold other end of this line against plug pins No. 2, 4 and 5 one after the other.

- Plug pin No. 2: connection for slow
- Plug pin No. 4: connection for fast
- Plug pin No. 5: connection for interval



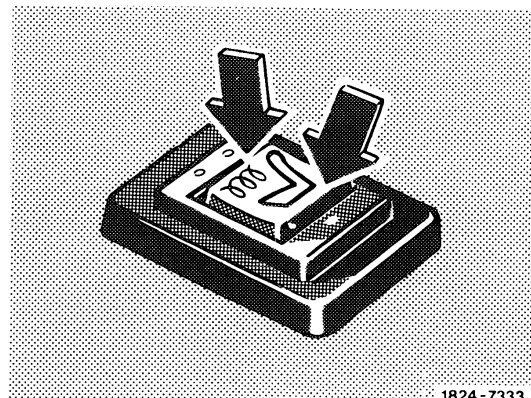
General

The seat heater of front seats can be switched on only in steering lock position 1 and 2, the rear seats only in steering lock position 2 by means of a pushbutton switch. With the seat heater switched on, an indicator lamp in pushbutton will light up. To protect the battery, do not switch on position ●● longer than absolutely necessary when the engine is stopped.

Pushbutton position center – seat heater switched off.

Pushbutton position ● – continuous operation.

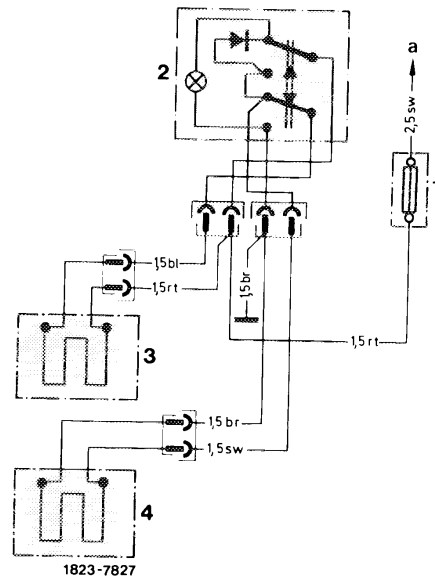
Pushbutton position ●● – fast heating up.



1824-7333

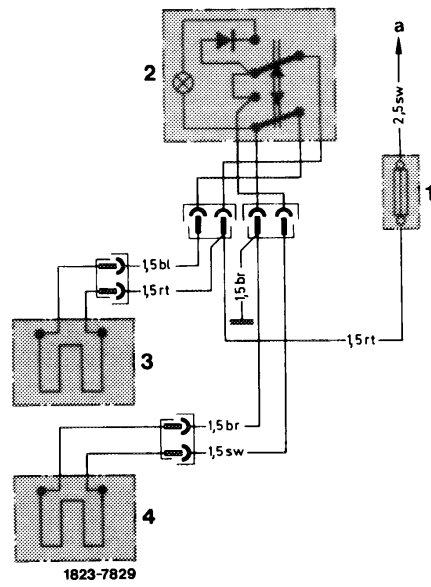
Electric function

In pushbutton position ● the two heating pads in seat are switched in line. The power input amounts to approx. 1.3 amps at 12 V battery voltage. The result is an electric output of approx. 15 W.



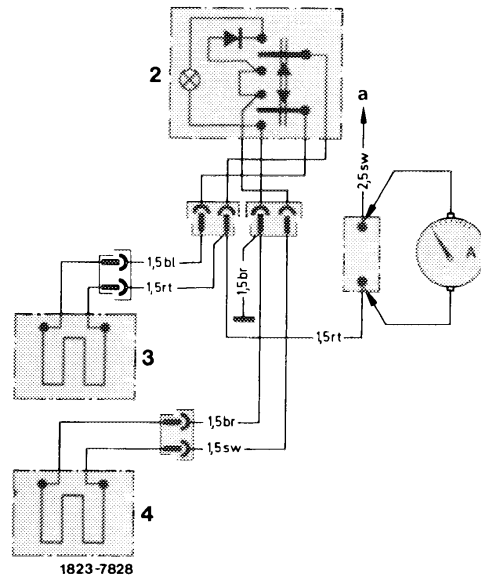
- 1 Fuse terminal 15/15 R
- 2 Pushbutton switch
- 3 Heating pad, seat
- 4 Heating pad, backrest
- a Connection terminal 15

In pushbutton position ●● the two heating pads in seat are connected in parallel. The power input amounts to approx. 5 A at 12 V battery voltage; the electric output amounts to approx. 60 W.

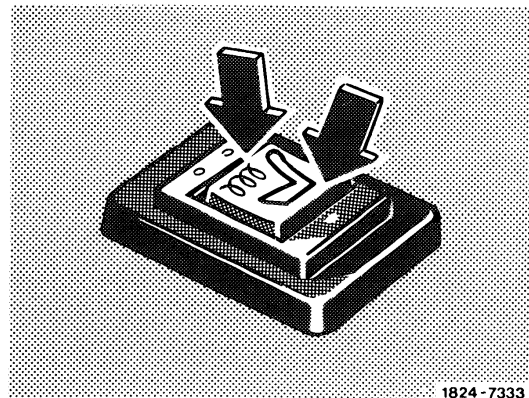


Testing power input

- 1 Remove fuse of seat to be tested.
- 2 Connect ammeter to terminals of fuse capsule.
- 3 Switch on ignition.



- 4 Set pushbutton switch to stage ●. Power input per seat (seat pad and backrest) should amount to approx. 1.3 A at 12 V battery voltage after a cut-in period of at least 20 s.
- 5 Set pushbutton switch to stage ●●. The power input per seat should now amount to approx. 5 A at 12 V battery voltage after a cut-in period of min. 20 s.
- 6 If values are considerably deviating, test heating pads or connection of pushbutton switch, couplers having the same color must be plugged together.



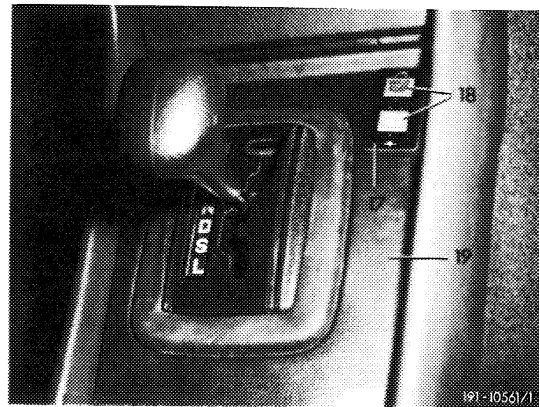
Testing heating pad

- 7 Separate plug connections harness/heating pad, for this purpose set front seat completely back or remove rear seat cushion.
- 8 Test heating pad with ohmmeter for a break or short and renew, if required (82–996).

82–820 Removal and installation of pushbutton switch for seat heating system and renewing bulb

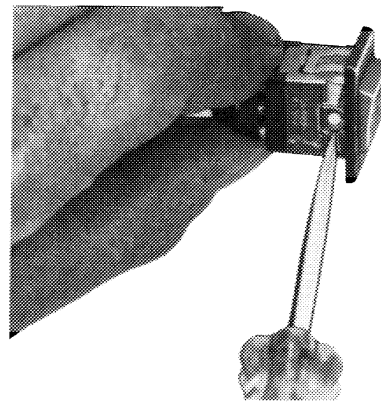
Removing pushbutton switch

- 1 Push switch (18) out of cover molding (17).
- 2 Separate switch from harness at couplers.

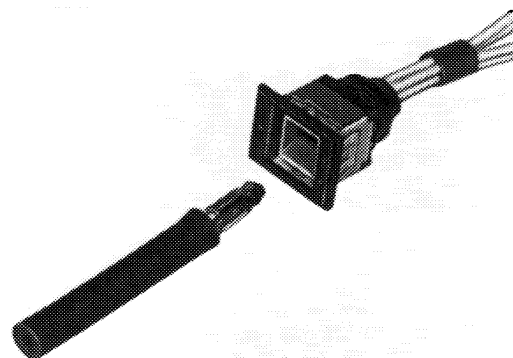


Renewing bulb (on 1st version only)

- 3 Carefully push off pushbutton on both sides in upward direction.



- 4 Pull bulb out of central interlock e. g. by means of a rubber hose.



5 Push in new bulb.

6 Press pushbutton on again.

Installing pushbutton switch

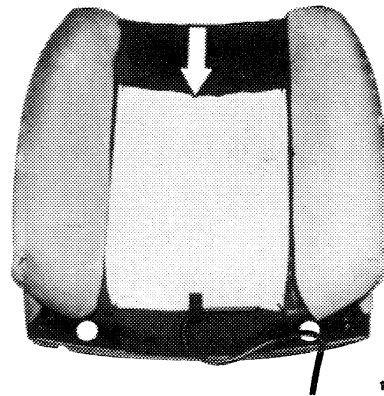
7 For installation proceed vice versa.

Note: When connecting switch to harness, couplers having the same color must be plugged together.

On switches of 2nd version, the bulb cannot be replaced. If bulb is not lighting up, replace complete switch.

82-830 Renewing heating pad of seat heating system

- 1 Remove front or rear seat.
- 2 Remove covering from seat or backrest.
- 3 Mark location of heating pad on rubber hair support.
- 4 Separate heating pad from rubber hair support and remove.
- 5 Tack new heating pad to rubber hair support.
- 6 Put back covering, while pulling electric line of heating pad through eyes.
- 7 Reinstall front or rear seat.



191-10852/1



88–100 Removal and installation of front fender

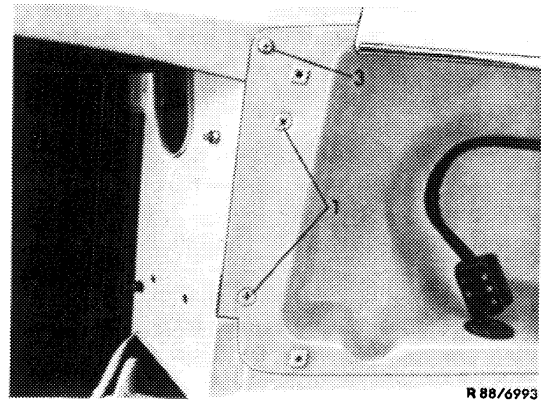
Conventional tool

Hot air blower approx. 600° C

e.g. Jumbotherm K 25, made by Zinser,
D-7333 Ebersbach/Fils

Removal

- 1 Remove headlight (82–210).
- 2 Remove fog lamp, bumper and air grille.
- 3 Remove bolt of door holder on front wall pillar.
- 4 Remove trim strip on side member at entrance.
- 5 Remove screws (1) or (2) on reinforcement.
- 6 Remove screws on cross member.
- 7 Remove screw (3) on connecting plate.



1st version

1st version

Model 107.043	up to chassis end No. 002 743
Model 107.044	000 545

2nd version

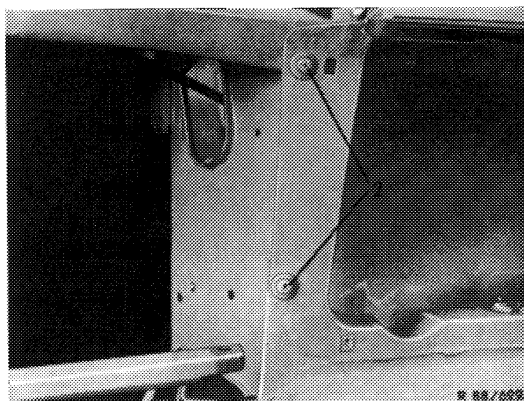
Model 107.043	starting chassis end No. 002 744
Model 107.044	000 546

8 Remove screws on side member at entrance and loosen fender from side member by means of a plastic wedge.

9 Remove partition.

10 Remove three screws on front wall pillar.

11 Remove screws on wheelhouse top.



2nd version

12 Cover electric lines at respective side of engine compartment with an asbestos blanket. If the fender is heated with a hot air blower, the asbestos cover is not required.

13 Heat front fender in range of sheet metal screws on channel at wheelhouse **from direction of engine compartment** slowly and uniformly. In individual cases, several minutes will be required to heat channel.

Note: For heating, a welding torch with a soft, long flame or a hot air blower, approx. 600°, may be used. When proceeding carefully, the fender can be heated without damaging the paintwork.

14 Loosen front fender first in range of headlight housing and then cut through the by now soft PVC with a sharp industrial knife from wheelhouse to sheet metal. The PVC will then be completely separated along channel, from front corner of front fender to end of coating.

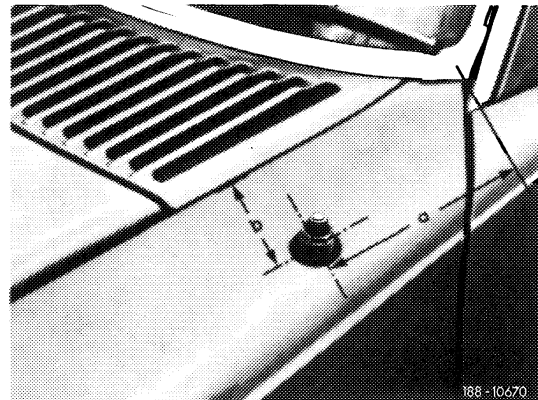
15 Lift front fender starting at the front and pull out in upward direction.

Installation

- 16 Provide replacement fender with permanent under-floor protection prior to assembly.
- 17 Clean front wall pillar and channel on wheelhouse from sealing residue.
- 18 If damaged, glue new shim to channel on wheelhouse and in range of side member, as well as to front wall pillar.
- 19 Match front fender in such a manner that the transition from the ornamental grille on front wall to driver's door is in perfect alignment.
- 20 Melt fastening holes out of shim and screw down fender.
- 21 Upon assembly, spray connections carefully with permanent underfloor protection.
- 22 Install headlights and aim.
- 23 When permanent underfloor protection is dry, perform repair preservation on front fender.
- 24 Install partition and seal.

Layout antenna front fender left

a = 215 mm b = 90 mm
Match bore to type of antenna



88–110 Removal and installation of panelling between front fender

Removal

- 1** Remove four screws at bottom on connection lower half of fender and air grille.
- 2** Remove screws from fender connection.
- 3** Remove lower half of fender.

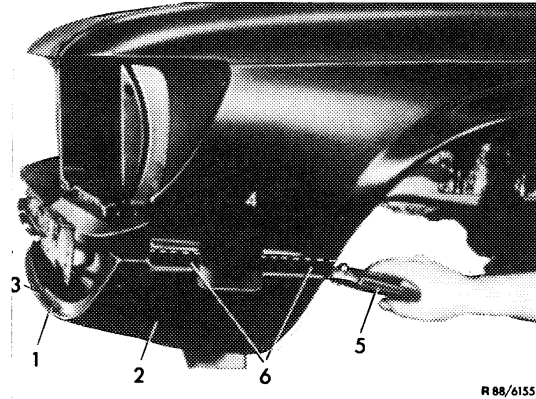
Installation

- 4** For installation proceed vice versa.

88—120 Replacement of bottom section of front fender

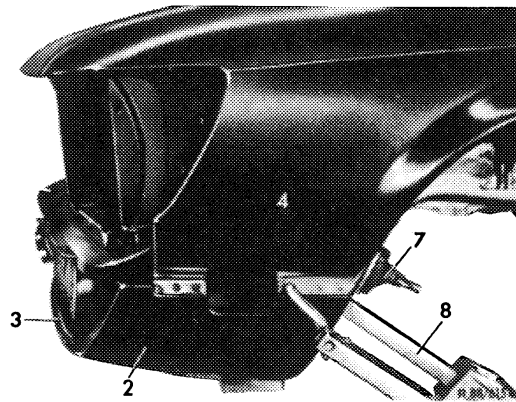
Removal

- 1 Jack-up vehicle.
- 2 Remove pertinent front wheel.
- 3 Remove bumper with holding bracket.
- 4 Remove air grille under bumper front.
- 5 Unscrew molding under lighting unit.
- 6 Loosen screw connection (1) of fender bottom (2) and molding (3) between front fender (4) front center.
- 7 Cut fender bottom (2) from fender (4) with shears (5).
- 8 Cut remaining section of spot weld flange (6) from inside of fender with grinding wheel and pull off.
- 9 Align spot weld flange and make bright.



Installation

- 10 Grind spot weld flange on fender bottom (2) bright.
- 11 Coat spot weld flanges with zinc dust paint, Part No. 000 986 34 42.
- 12 Fit fender bottom (2) to fender (4) and clamp with hand vise (7).
- 13 Screw fender bottom (2) with molding (3) between front fender front center.
- 14 Weld fender (4) and fender bottom (2) by means of spot welder (8).
- 15 Align spot welds and grind off spatter, if any.
- 16 Prime machined spots and paint.
- 17 Reinstall all removed parts.



88–200 Removal and installation, disassembly and assembly of front bumper

Removal

- 1 Remove air grill under bumper (88–410).
- 2 Remove one screw each on holder laterally inside on fender.
- 3 Remove screws on front holder.
- 4 Remove bumper with holder.

Disassembly

- 5 Remove the two nuts of the protective rubber rail from inside.
- 6 Pull off protective rubber rail.
- 7 Remove cover strip on bumper joint.
- 8 Unscrew both strips from reinforcement.

Assembly

- 9 For assembly proceed vice versa.

Installation

- 10 For installation proceed vice versa.

Note: For adjusting the bumper, the two front holding brackets between the cross beam and the front bumper can be laterally shifted.

88–220 Removal and installation, disassembly and assembly of rear bumper

Removal

- 1** Unscrew two nuts on rear center piece in trunk and two screws on rear fender left and right.
- 2** Remove complete bumper toward the rear.

Disassembly

- 3** Unscrew nuts of protective rubber rail left and right from inside bumper.
- 4** Pull off protective rubber rail.
- 5** Remove cover for bumper joint left and right.
- 6** Remove two screws each on joint of panelling under bumper.
- 7** Remove screws on panelling of bumper and remove panelling.
- 8** Remove screws on bumper shells and remove shells.
- 9** Disassemble reinforcement.

Assembly

- 10** For assembly proceed vice versa.

Installation

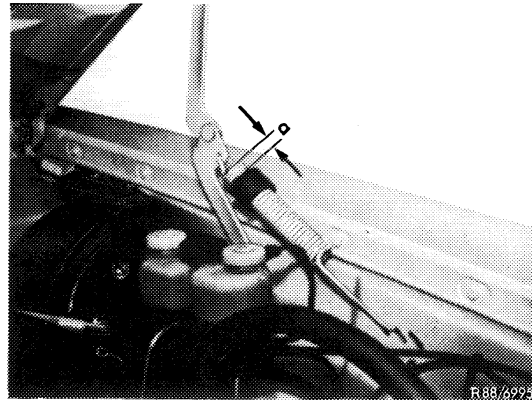
- 11** For installation proceed vice versa.

Watch out for rubber discs of bumper holding bracket (body seal).

Engine Hood

- 1 Loosen both hood supports from engine hood.
- 2 Unscrew screws on hinge lever.
- 3 Remove hood.

During installation, make sure that rubber roller is at a distance of $a = 40$ mm from rear end of draw spring.



Hinge Lever

- 1 Remove engine hood.
- 2 Remove ornamental grille for air inlet (83–140).
- 3 Loosen screws on hinge lever mounting.
- 4 Remove hinge lever with mounting and screw.

Caution! Adjust engine hood in such a manner that distance and transition to front fenders is the same on both sides and that engine hood closes perfectly. Lubricate safety hooks and check for easy operation.

Reach with hand through Mercedes Star on radiator grille and check whether safety hook on engaged and locked engine hood rests against stiffening panel and secures engine hood against bursting open.

88–310 Removal and installation of cable control for engine hood

Removal

- 1** Remove lining under instrument panel.
- 2** Unscrew handle for hood cable control.
- 3** Disconnect hood cable control on handle.
- 4** Disconnect engine hood cable control at front on lower portion of lock.
- 5** Loosen cable strips on engine hood cable control.
- 6** Remove cover plate above windshield wiper motor.
- 7** Pull-out hood cable control with rubber sleeve in engine compartment.

Installation

- 8** For installation proceed vice versa.

Adjust hood cable control free of play on lower portion of lock.

88–400 Removal and installation of radiator shell

Removal

- 1** Open engine hood.
- 2** Remove nine screws with corrugated washers on radiator grille from the rear.
- 3** Remove radiator grille with intermediate layer.

Installation

- 4** For installation proceed vice versa.

Make sure that the intermediate layer is glued to radiator grille.

88-410 Removal and installation of air flow grille under bumper

Removal

- 1** Loosen fog lamp with holding bracket from bumper.
- 2** Remove screws on air grille and remove grille.

Installation

- 3** For installation proceed vice versa.



91-050 Adjustment of friction torque on headrest

Note

Starting August 1975, safety headrests are installed with the modifications named below:

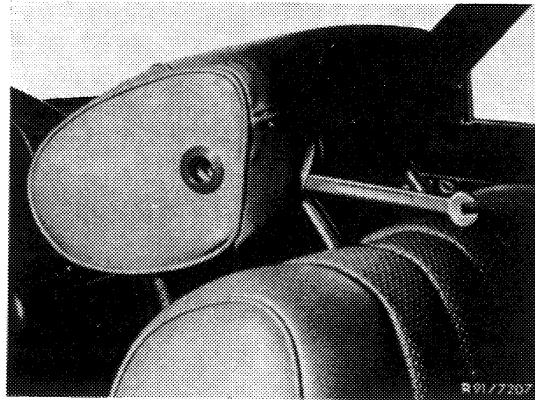
1. The adjusting bracket is a single component. To limit adjustments, only one detent is now located on arm of bracket.
2. The friction torque of the headrest is generated by uniform pressure of spring plate against bracket and is not adjustable.
The screws used up to now are no longer applicable.

Adjustment

- 1 Tilt headrest completely forward.
- 2 Tighten or loosen hexagon bolt on left and right-hand side through lower slots of headrest, using 10 mm open-end wrench.
- 3 Tighten or loosen both bolts uniformly so that headrest can be moved with little effort.

Note: If the adjusting bolts on the headrest have come loose, coat them with bolt locking compound „Loctite Produkt 241“ and screw them in again.

Since October 1973 these bolts have been coated in production with micro-capsuled adhesive.

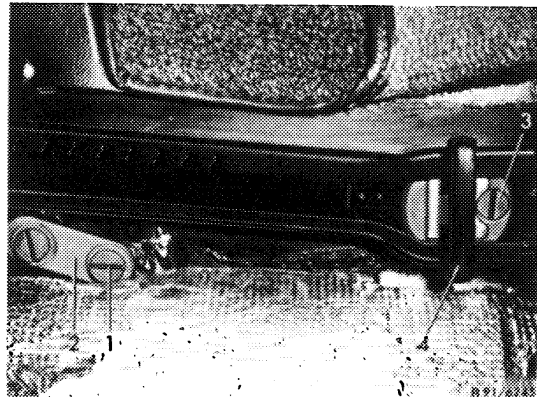


91–100 Removal and installation of driver's seat

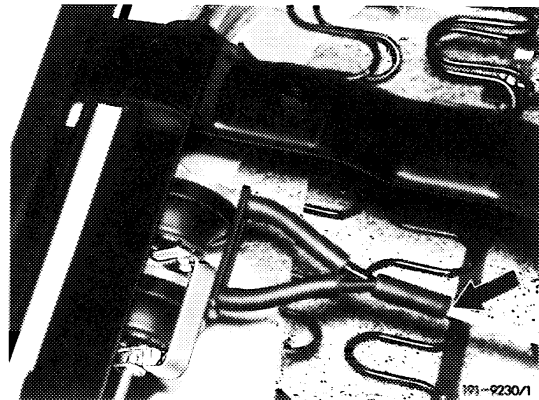
1st version driver's seat

Removal

- 1 Slide seat completely forward.
- 2 Loosen safety belt on outer end of seat.
- 3 Remove carpet behind driver's seat.
- 4 Remove screw (1) on connecting plate (2) as well as screw (3) at seat height adjustment (4).
- 5 Slide seat completely back.
- 6 Remove screws on both sides on seat guide rails front.



- 7 Pull vacuum hose from distributor (on model 107.02 only) and remove driver's seat.



Installation

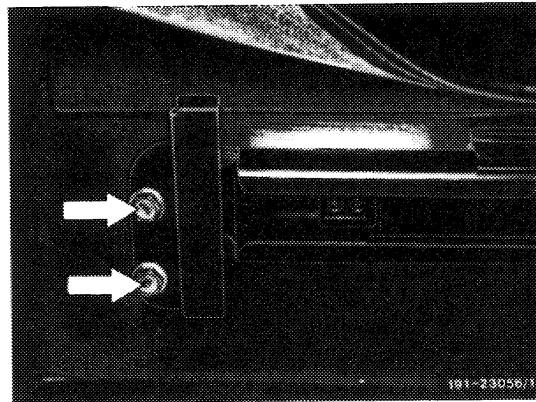
- 8 For installation proceed vice versa.

2nd version driver's seat

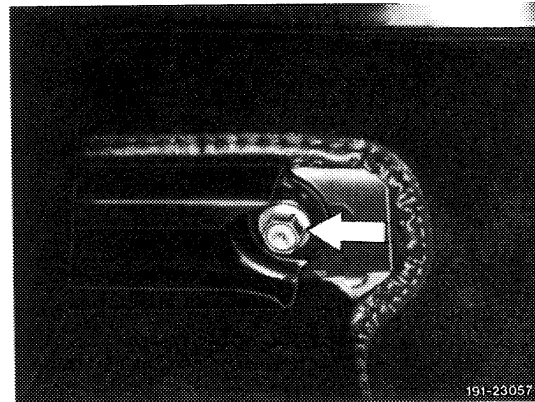
Removal

- 1 Remove front and rear floor mats.
- 2 Slide seat forward.
- 3 Detach safety belt from seat outer side.

- 4 Unscrew rear securing screws of the seat guide rail on both sides and detach guide jaws.
- 5 Slide seat completely back.

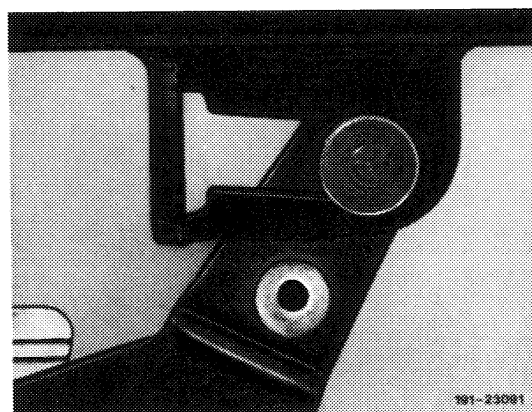


- 6 Unscrew forward screw of seat guide rail on both sides.



- 7 Slide seat somewhat to the rear and lift it up while disengaging the seat guide rail from the mount of the seat height adjuster.

- 8 Take out seat.



Installation

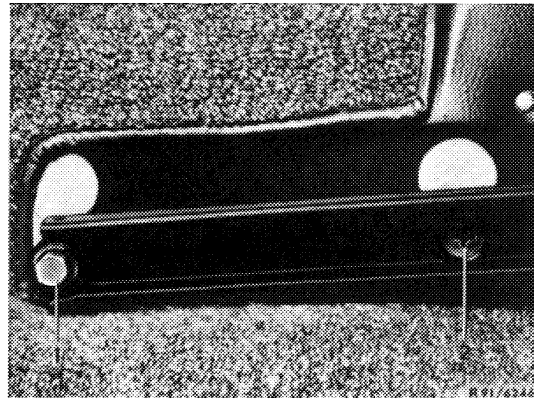
- 9 Slip seat with seat guide rail into the mount of the seat height adjuster and secure guide rail at front end on LH and RH sides.
- 10 For further installation, proceed vice versa.
- 11 Function-test seat adjusting mechanisms.

91–110 Removal and installation of front passenger seat

1st version front passenger seat

Removal

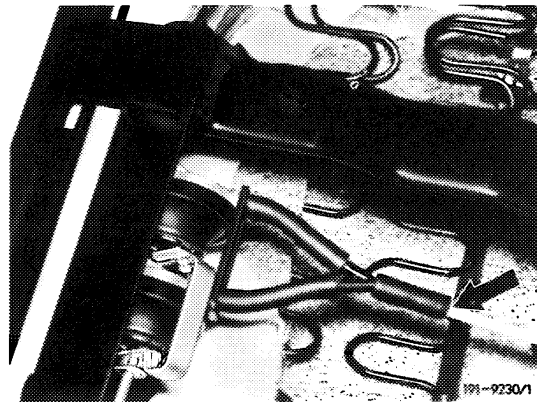
- 1 Slide passenger seat completely forward.
- 2 Loosen safety belt on outer end of seat.
- 3 Remove hex. screws (1) on both sides at rear and unscrew Philips head screws (2) on seat guide rail.
- 4 Slide passenger seat completely back.
- 5 Remove screws on both seat guide rails at front.



- 6 Pull vacuum hose from distributor (on model 107.02 only) and remove passenger seat.

Installation

- 7 For installation proceed vice versa.



2nd version front passenger seat

Removal and installation are the same as on 2nd version driver's seat (91–100).

Design and operation of backrest adjustment (Coupe)

The automatic backrest lock on coupe protects passengers because the backrest resists high impacts – in the event of an accident – and will not change its position. The system uses the vacuum established in intake pipe of operating engine.

The line system of the vacuum backrest locking system is directly connected to intake pipe of engine without a supply tank and the system functions only when the engine is running.

If both front doors are closed and if none of the two switches in rear of vehicle is actuated, the line system is also closed. With the engine running, a vacuum will be established which actuates the operating elements located under front seats. The power of the operating elements energizes the locking hooks via linkage and

guide levers. One hook each is located on sides of seat cushions to hold backrest fittings under preload by means of a pin.

This preload is required to prevent any chatter of backrest or locking mechanism in locked condition.

The moment a front door is opened or a switch in rear compartment is actuated, the line system is under atmospheric pressure and the vacuum elements will be ineffective. Return springs supply the required force to pull the locking hooks into their starting position.

The backrest can be swivelled forward again for easy entrance and access of rear passengers.

91-115 Removal and installation of vacuum element from driver's or front passenger's seat (Coupe)

Color code of vacuum lines for backrest lock

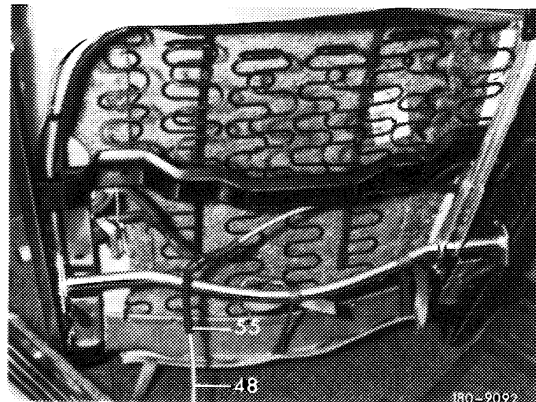
Control line	light blue
Throttle	dark blue

Note

Starting February 1975, the control lines of the backrest lock have been changed from 5 mm to 4 mm OD.

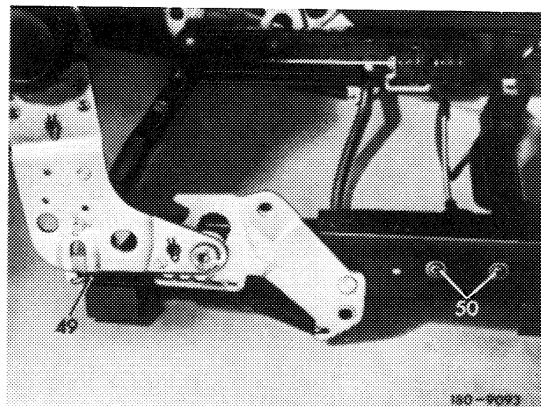
Removal

- 1 Remove driver's seat.
- 2 Separate control line (48) from hose line (55).

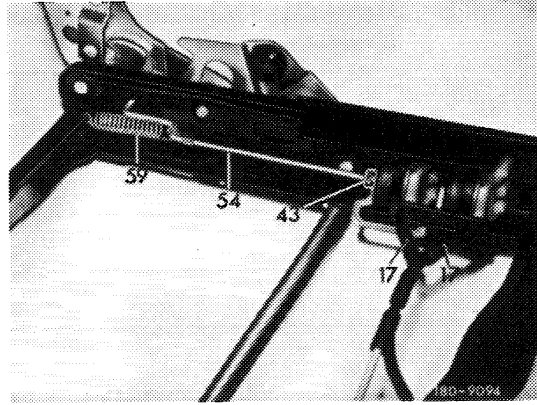


Note: For better illustration, the following jobs are shown on seat with covering removed.

- 3 Unscrew oval head screw (50).
- 4 Disconnect safety clip (49).

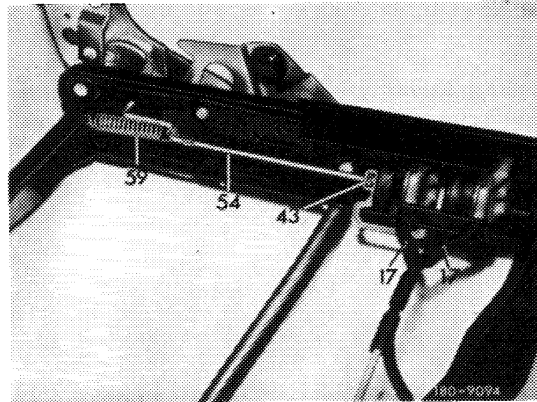


- 5 Pull connection (17) from vacuum element.
- 6 Disconnect return spring (59).
- 7 Remove vacuum element with actuating rod.
- 8 Pull out lock washer (43) and remove actuating rod.



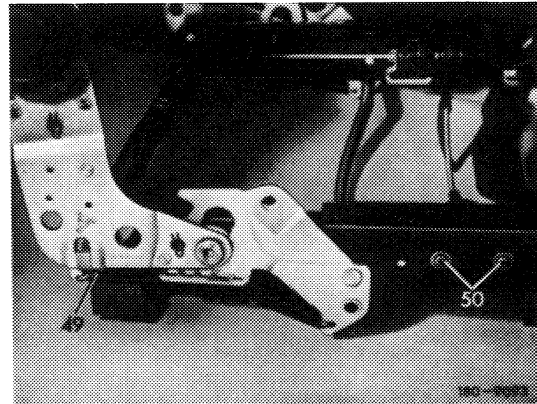
Installation

- 9 Insert actuating rod up to stop and secure with lock washer (43).

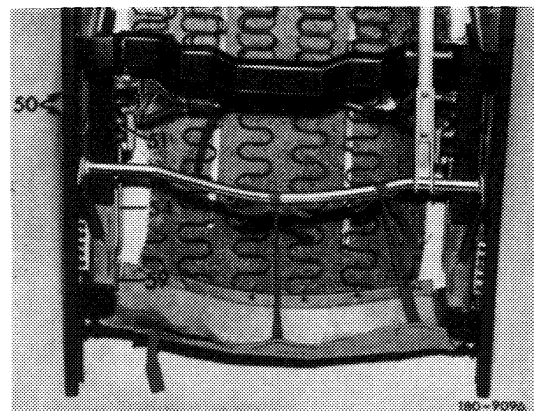


17 Connection	54 Actuating rod
43 Lock washer	59 Return spring

- 10 Insert vacuum element with actuating rod and tighten with oval head screws (50).
- 11 Secure actuating rod with locking clip (49).

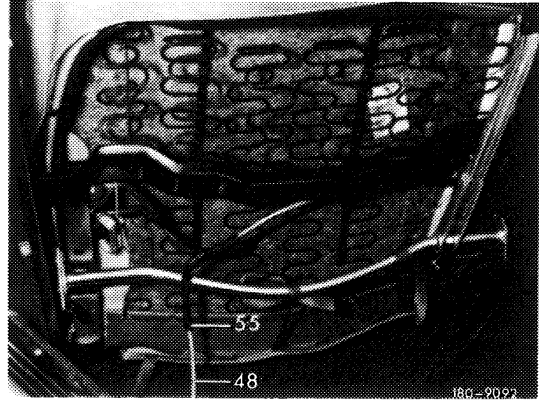


- 12 Attach return spring (59).
- 13 Slip connections (17) on vacuum element.



14 Connect control line (48) to hose line (55).

15 Install driver's seat.



91-117 Removal and installation of door contact vacuum switch (Coupe)

Color code of vacuum lines for backrest lock

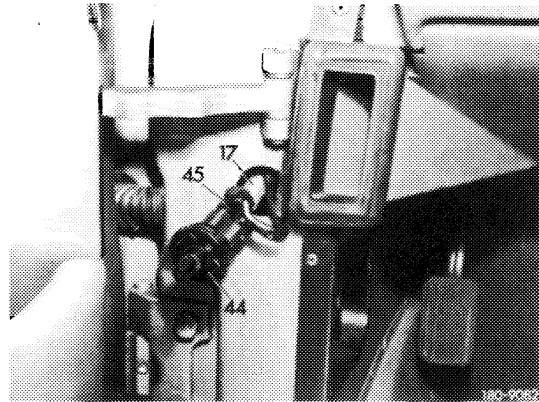
Control line	light blue
Throttle	dark blue

Note

Starting February 1975, the control lines for backrest lock have been changed from 5 mm to 4 mm OD.

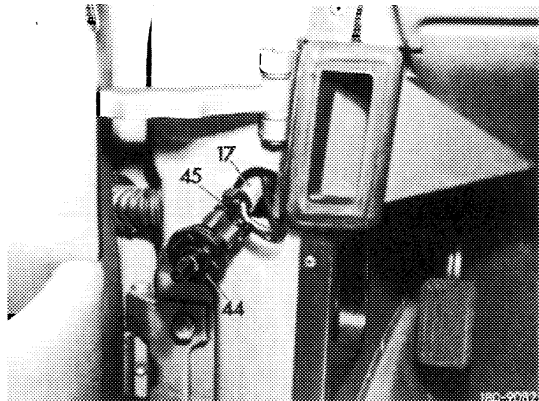
Removal

- 1 Pull door contact vacuum switch (44) from hinge column.
- 2 Pull off connection (17) with control line.
- 3 Pull coupling (45) from door contact vacuum switch (44).



Installation

- 4 Plug coupling (45) on door contact vacuum switch (44).
- 5 Slip-on connection (17) with control line.
- 6 Push door contact vacuum switch (44) into hinge column.



91-118 Removal and installation of vacuum switch in rear of vehicle (Coupe)

Color code of vacuum lines for backrest lock

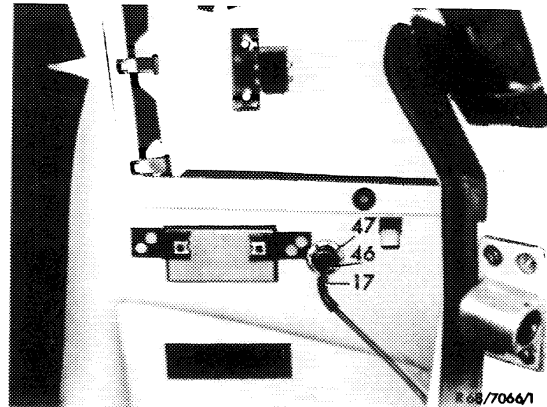
Control line	light blue
Throttle	dark blue

Note

Starting February 1975, the control lines for backrest lock have been changed from 5 mm to 4 mm OD.

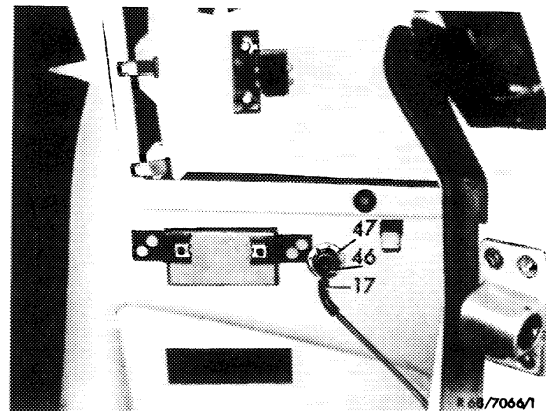
Removal

- 1 Remove rear seat cushion (91-170).
- 2 Remove side wall in vehicle rear (68-456).
- 3 Pull connection (17) with control line from vacuum switch (46).
- 4 Pull clamping spring (47) from vacuum switch (46).
- 5 Pull vacuum switch out of side wall.



Installation

- 6 Insert vacuum switch into side wall.
- 7 Plug clamping spring (47) on vacuum switch (46).
- 8 Slip-on connection (17) with control line.
- 9 Install rear side wall.
- 10 Install rear seat cushion.



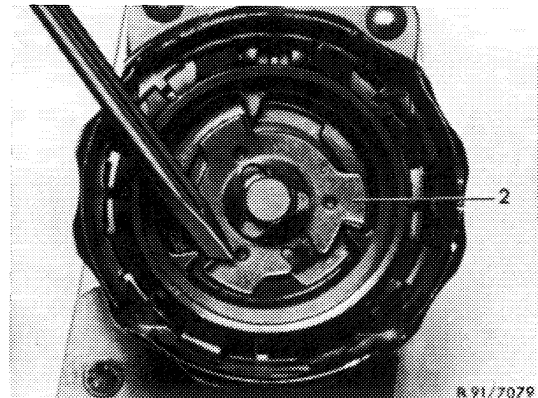
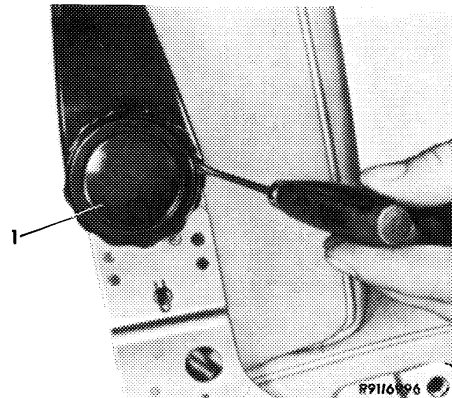
91–120 Removal and installation of seat rail and seat fitting

Seat Rail with Height Adjustment

- 1 Remove driver's seat (91–100).
- 2 Pull up lock and remove seat rails toward rear.

Seat Fittings

- 1 Remove driver's seat (91–100).
- 2 Remove cap from hand wheel.
- 3 Turn spring washer (2) with screw driver toward the left and remove hand wheel.



- 4 Remove cover molding top.
- 5 Unscrew Phillips head screws (2 each) on seat fittings.
- 6 Lift seat fittings and disconnect Bowden wire.

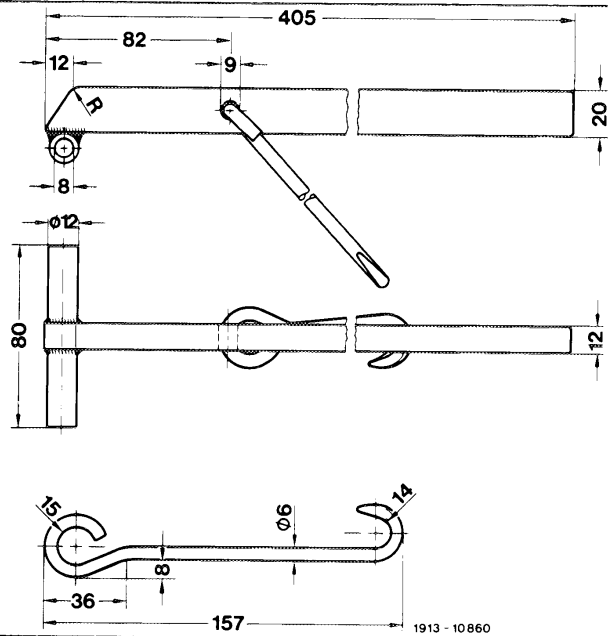
Prior to assembly of seat fittings, adjust Bowden wire in such a manner that lever of backrest lock completely releases locking lever upon actuation.

Caution! The two Phillips head screws on seat fittings are coated with locking paint, so that an impact screw driver should be used for loosening these screws.

91-130 Removal and installation of seat height adjuster (with lateral control lever)

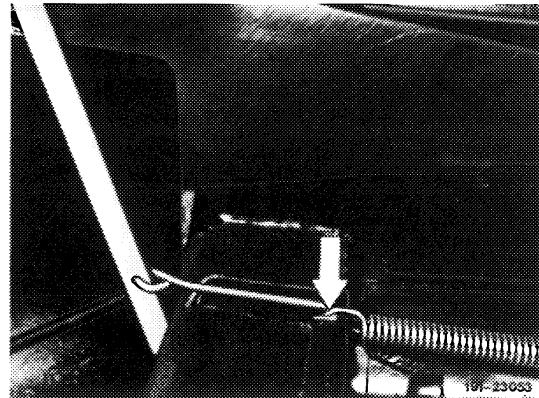
Tool for local manufacture

Spring tensioner

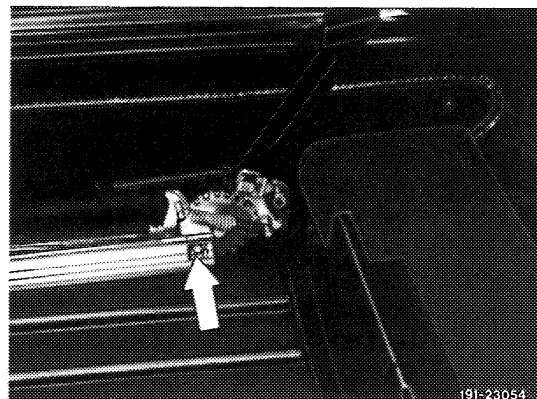


Removal

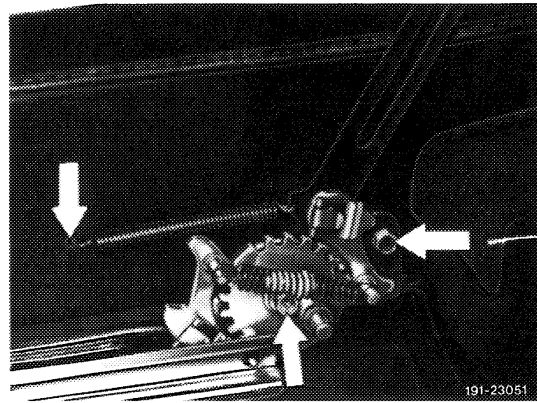
- 1 Remove 2nd version driver's seat (91-100).
- 2 Manufacture spring tensioner acc. to drawing.
- 3 Using spring tensioner, disengage return spring at cross member.



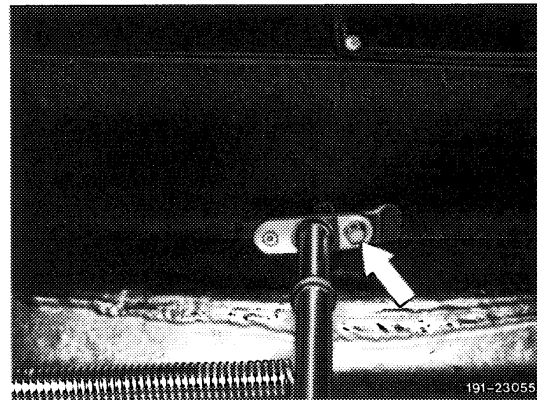
- 4 Remove lock from forward end of connecting rod and detach the latter.



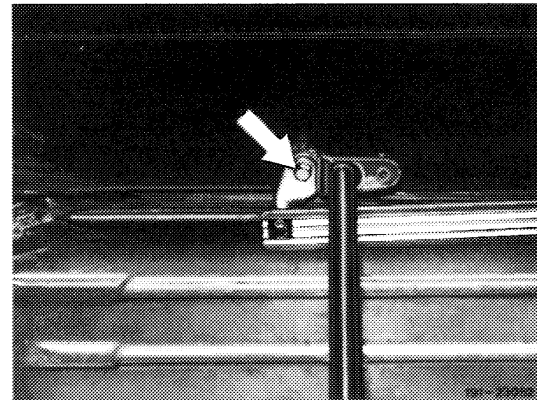
5 Disengage return spring at side member, unscrew securing screws of seat height adjusting mechanism and remove adjusting mechanism.



6 Screw out of the tunnel the screw of the connecting tube mount.



7 Turn screw of mount out of side member and take out connecting tube.



Installation

8 For installation proceed vice versa.

Note: The securing screws of the seat height adjuster are micro-encapsulated. They must either be renewed or be locked with bolt locking compound. In order to avoid malfunctions of the seat height adjuster, install it free of tension.

91–140 Bearing bolt on driver's cushion frame, driver's backrest

Special Tool

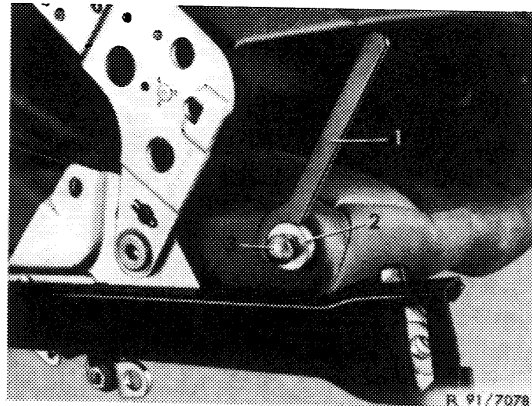
Pin spanner DIN 1810, dia. 25–28 mm

180 589 01 05 00

Bearing Bolts on Driver's Cushion Frame

Removal

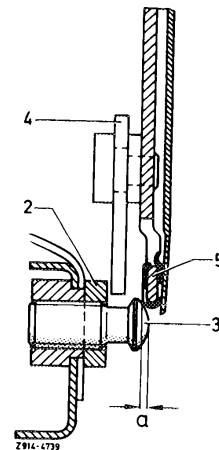
- 1 Remove driver's seat (91–100).
- 2 Fold backrest forward.
- 3 Loosen cross hole nut (2) by means of pin spanner (1).
- 4 Unscrew bearing bolt (3).



Installation

- 5 For installation proceed vice versa.
- 6 Adjustment of bearing bolt:
Adjust bolt to dimension „a“ approx. 2 mm in such a manner that seat fittings are not chattering and are not resting laterally against tunnel.
- 7 Counterlock cross hole nut (2) with pin spanner (1).

a = approx. 2 mm
2 Cross hole nut
3 Bearing bolt
4 Safety hook
5 Seat fittings



Driver's Backrest

Removal

- 1 Remove driver's seat (91–100).
- 2 Lift off cover molding lower half left and right.
- 3 Unscrew cheesehead screw on driver's cushion left and right.
- 4 Lift-off driver's seat backrest.

Installation

- 5 For installation proceed vice versa.

91–150 Checking backrest lock (Coupe)

Data

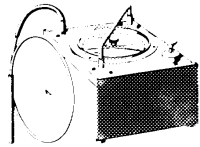
Leaks in system	10 mbar/min at 400 mbar vacuum
Permissible leaks of individual components	5 mbar/min at 300 mbar vacuum
Plug-on length of connection	10 ± 2

Color code of vacuum lines for backrest lock

Control line	light blue
Throttle	dark blue

Special tool

Tester for vacuum system



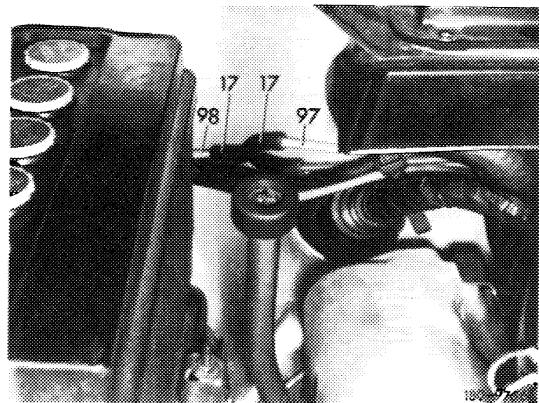
116 589 25 21 00

Note

Starting February 1975, the control lines for backrest lock have been changed from 5 mm to 4 mm OD.

Checking vacuum system

- 1 Check lefthand circuit with tester on control line (97) and righthand circuit on control line (98).



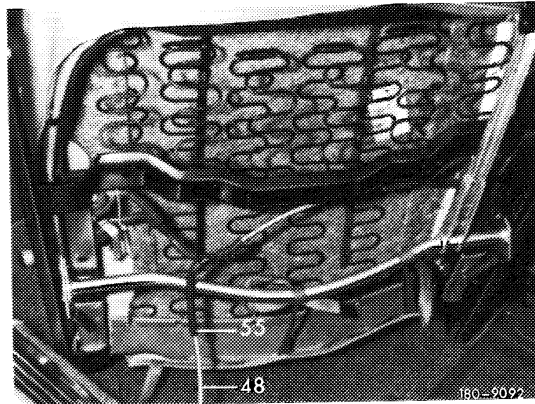
Attention!

Prior to exchanging vacuum element and vacuum switch, check hose lines and their connections on circuit found leaking.

2 Perform the following test on leaking circuit:

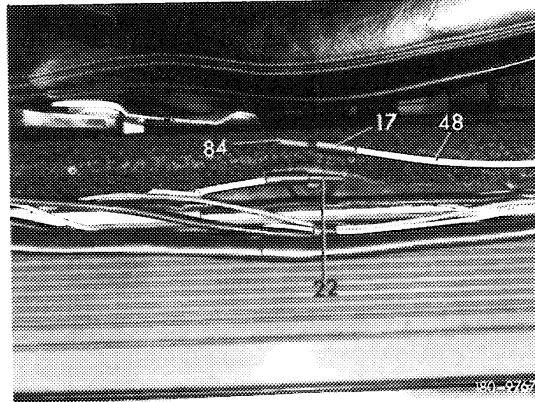
a) Vacuum elements for driver's or front passenger's seat

- 3 Disconnect control line (48) from hose line (55).
- 4 Connect tester to hose line (55) and evacuate.
- 5 In the event of a leak, replace vacuum elements for driver's or front passenger's seat (91–115).

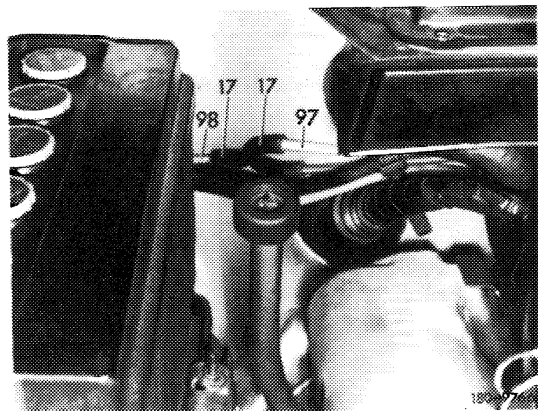


b) Door contact vacuum switch

- 6 Remove chrome-plated rail on righthand or left-hand entrance.
- 7 Pull control line (48) with connection (17) from distributor (22) and close with a blind plug (84).

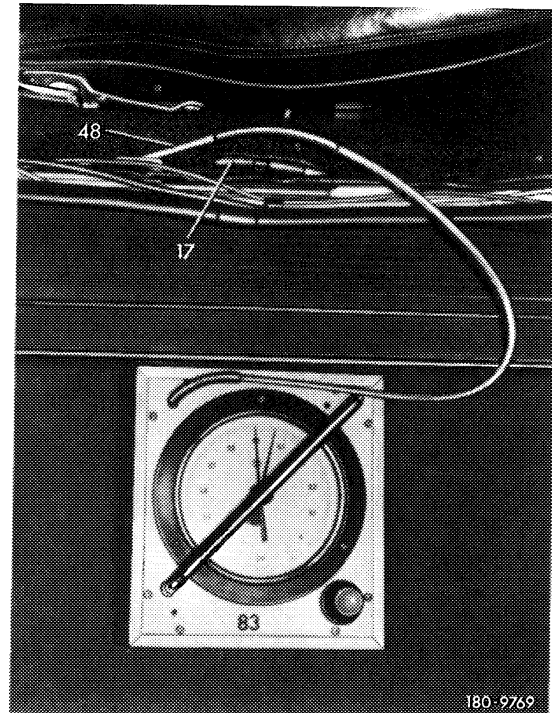


- 8 Connect tester to control line (97 or 98) and evacuate.
- 9 In the event of a leak, replace door contact vacuum switch left or right (91–117).

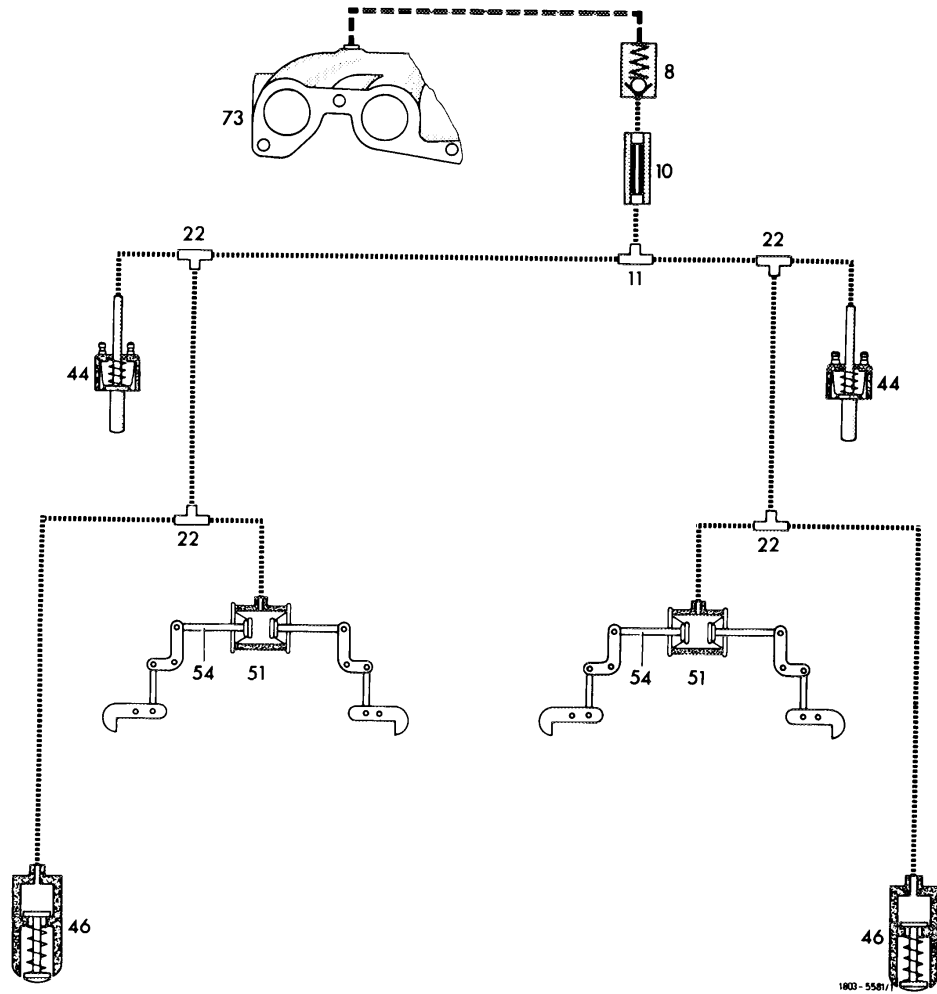


c) Vacuum switch in vehicle rear

- 10 Pull control line (48) out of connection (17).
- 11 Connect tester to control line (48) and evacuate.
- 12 If the vacuum switch in vehicle rear is leaking, readout of pressure gauge will change.
- 13 Replace vacuum switch in vehicle rear (91–118).

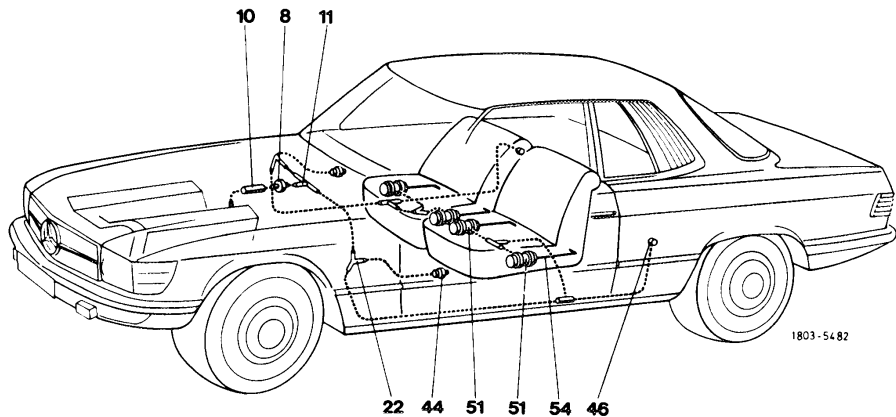


91-162 Functional diagram backrest lock (Coupe)



----- suction line
 control line

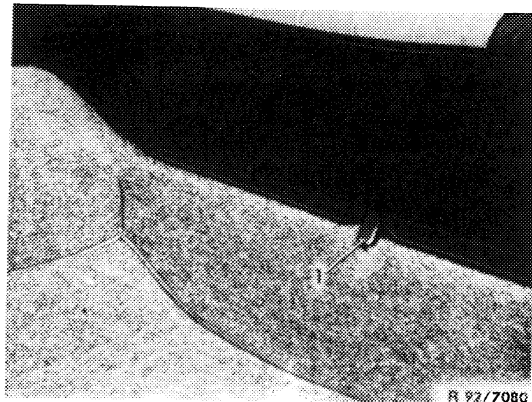
- | | |
|-------------------------------|--------------------------|
| 8 Check valve | 46 Vacuum switch (rear) |
| 10 Throttle | 51 Vacuum element (seat) |
| 11 Distributor | 54 Actuating rod |
| 22 Distributor | 73 Intake pipe |
| 44 Door contact vacuum switch | |



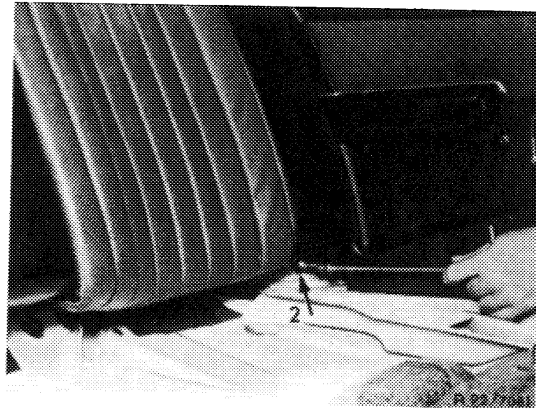
91-170 Removal and installation of rear seat and rear seat backrest

Removal

- 1 Push safety hook (1) toward rear and lift rear seat at front.
- 2 Lift off rear seat cushion in forward direction.



- 3 Remove the two nuts (2) right and left below on back seat rest.
- 4 Push back seat rest upwards and remove.



Installation

- 5 For installation proceed vice versa.

91–500 Removal and installation of safety belt

Notes

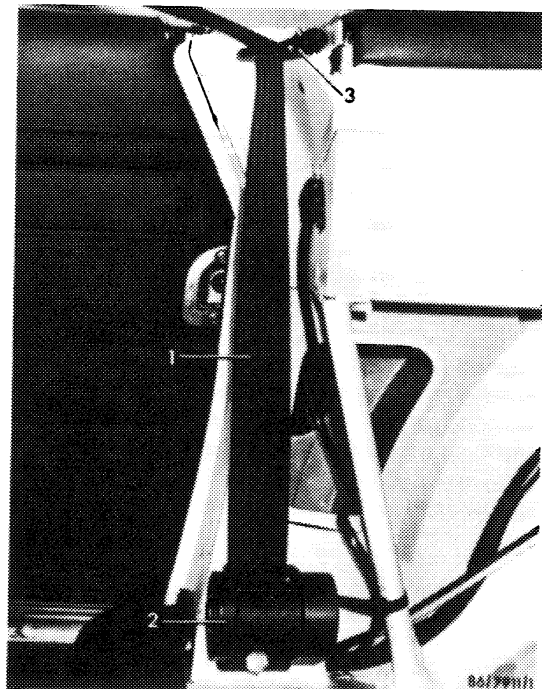
When reeling-up belt, any noise caused by inertia reel is strictly functional. In the event of a complaint, offending noises can be eliminated only by replacing the belt. **Never apply oil or grease in an attempt to eliminate noise.**

Also **never try to disassemble the inertia reel unit**, since the pre-loaded spring may be the cause of injuries. Opened inertia reel units will cancel any pertinent warranty.

A. Roadster

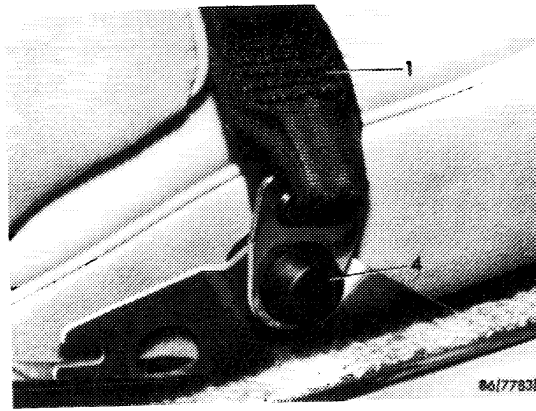
Removal

- 1 Remove coupé top or stow away roadster top (loosen plug connection on vehicles with heatable rear window).
- 2 Remove side wall in rear compartment (68–455).
- 3 Turn out screw on inertia reel unit (2).
- 4 Remove cap on belt guide fitting (3) and turn out screw.

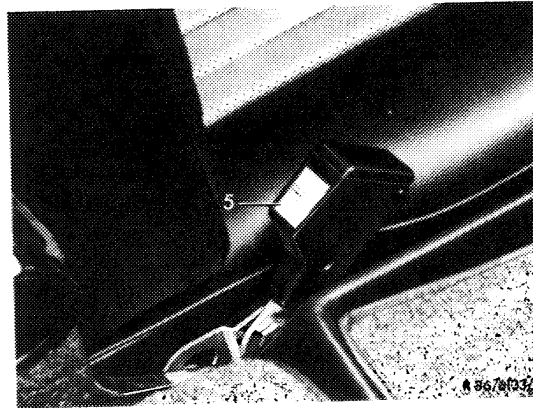


5 Remove cap (4) and turn out screw located behind on seat frame (outside)

6 Loosen seat rail (tunnel end) and slightly raise seat.



7 Turn out screw on cable lock (5) and remove cable lock from seat frame.



Installation

8 For installation proceed vice versa.

Note: During installation, make sure that the inertia reel unit is mounted horizontally. If installed diagonally, the belt will already be locked when the vehicle is only slightly tilted.

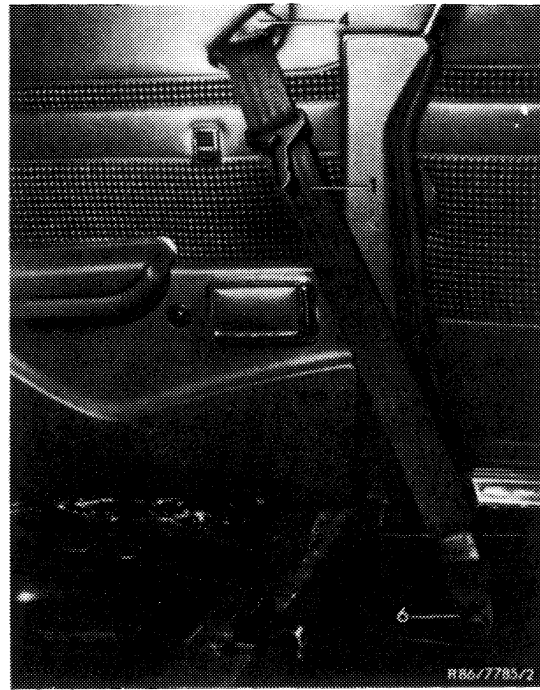
Upon installation, check whether belt is reeled up correctly.

To check, pull belt out diagonally in downward direction and return manually to belt guide fitting together with catch of lock. If the belt enters the roller at a bias and drags laterally, the inertia reel unit must be straightened. On vehicles where the inertia reel unit is held by a locking pin, the above complaints cannot occur.

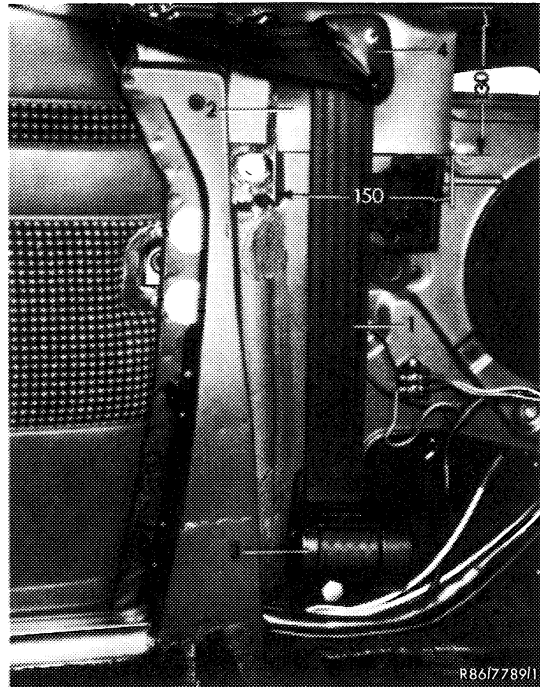
B. Coupé

Removal

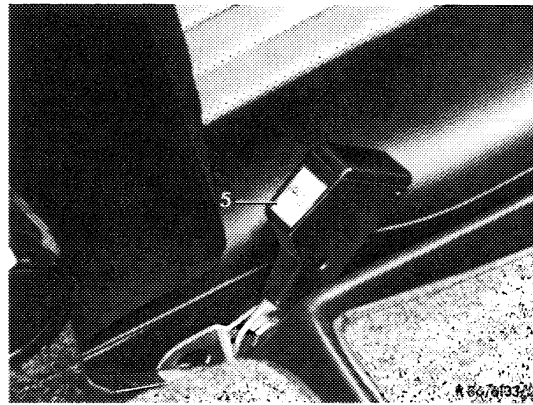
- 1 Remove cap on belt end fitting (6) and turn out screw located behind on side member.
- 2 Remove side wall in rear compartment (68–456).



- 3 Turn out screw on inertia reel unit (3).
- 4 Remove cap on belt guide fitting (4) and turn out screw.



5 Turn out screw on cable lock (5) and remove cable lock from seat frame.



Installation

6 For installation proceed vice versa.

Note: During installation, make sure that the inertia reel unit is mounted horizontally. If installed diagonally, the belt will already be locked when the vehicle is only slightly tilted.

Upon installation, check whether belt is reeled up correctly.

To check, pull belt out diagonally in downward direction and return manually to belt guide fitting together with catch of lock. If the belt enters the roller at a bias and drags laterally, the inertia reel unit must be straightened. On vehicles where the inertia reel unit is held by a locking pin, the above complaints cannot occur.

91-550 Safety belt — replacement instructions

Three-point belt with inertia reel

made by Klippan

Note

In the event of an accident at a front impact speed of more than approx. 30 km/h, the belt end fitting of the safety belts will be damaged. In such a case, replace safety belt.

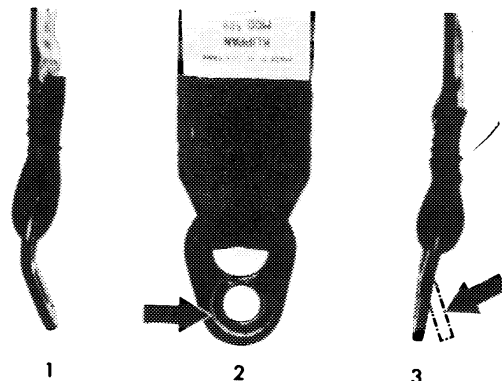
Characteristic Damage

Belt end fitting is deformed, that is, the formerly off-set end is now straight.

Belt end fitting is damaged by fastening screws (arrow).

In addition, the plastic coating of the lock catch may show chafe marks and there may be bright spots at belt in range of belt guide fitting and catch.

- 1 Belt end fitting undamaged
- 2 Belt end fitting damaged
- 3 Belt end fitting deformed during an accident



191-10606

B Supplement for model 107.048 (560 SL)



Suspension

Model 107

Springs

The springs on model 107 have a new spring rate tuned to the vehicle. In addition, the spring-rubber mount combination is determined according to a point system. Refer to tables for testing and adjusting values.

Shock absorbers – front axle

The shock absorbers, color code: one green stripe, are shorter and harder compared with the former version. An additional polyurethane (PU) bottoming spring, similar to that of model 126, has a length of 95 mm.

Do not install the previous shock absorbers (color code: four green stripes) on the new front axle.

Torsion stabilizer bar – front axle

The new torsion bar has a diameter of 26 mm (formerly 25 mm). Accordingly, the bore of the torsion bar mounts has been enlarged from 23.5 mm to 24.5 mm.

The frame floor mounting and the connection to lower control arm have not been changed.

Testing and adjusting values

Model 107

Cross-reference, springs – shock absorbers

Model	Front spring Part No.	Front shock absorber Part No.	Rear spring Part No.	Rear shock absorber Part No.
107.048	114 321 07 04	107 323 06 00	116 324 10 04	126 323 06 00 126 323 09 00

Spring adjustment

A point system, based on various optional equipment, is used to determine several weight groups. Additional points for each option must be added to the base points for the standard vehicle. The total points are then used to determine the proper front or rear spring/rubber mount combination. For some vehicles no additional points are added due to the small number of options not already included in the base vehicle.

Front springs – number of points

Model	Base points (standard vehicle)*
107.048	40

* The base points include: Automatic Transmission, ABS, Supplemental Restraint System, Automatic Climate Control, Power windows etc.

Cross reference, front springs – rubber mounts

Total points	Front spring Part No.	Height of rubber mounts (mm), depending on total points and spring color code	
		blue	red
38-43	114 321 07 04	8	13

Rear springs – number of points

Model	Base points (standard vehicle)
107.048	27

Cross reference, rear springs – rubber mounts

Model	Total points	Rear spring Part No.	Height of rubber mounts (mm), depending on total points and spring color code	
			blue	red
107.048	23-28	116 324 10 04	14	19

Front axle

Front axle model 107

Identical and modified parts from model 124 were used on the new front axle design.

The tire scrub-radius offset is reduced to approx. +8 mm, to further improve straight-line stability.

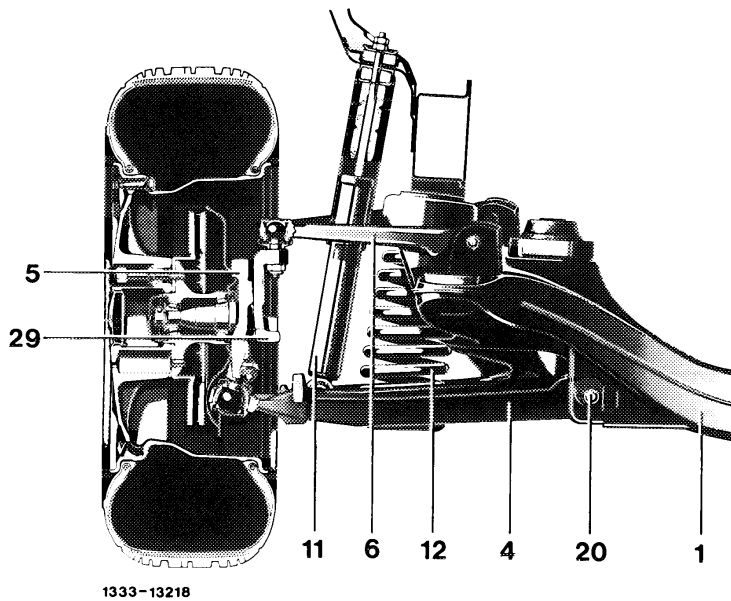
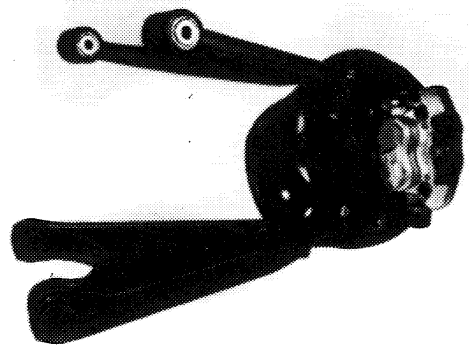


Fig. 33/1

- 1 Front axle carrier
- 4 Lower control arm
- 5 Steering knuckle
- 6 Upper control arm
- 11 Shock absorber
- 12 Front spring
- 20 Eccentric bolt, rear
- 29 Steering knuckle arm

The following parts were redesigned or are new:

- Front axle carrier
- Lower and upper control arm
- Steering knuckle
- Steering knuckle arm
- Front wheel hub with bearing



133-30712

Fig. 33/2

Front axle carrier

For compatability with all world-wide available engines in this chassis, the front axle carriers have a newly modified contour (arrow). In case of repairs, this carrier replaces the previous version.

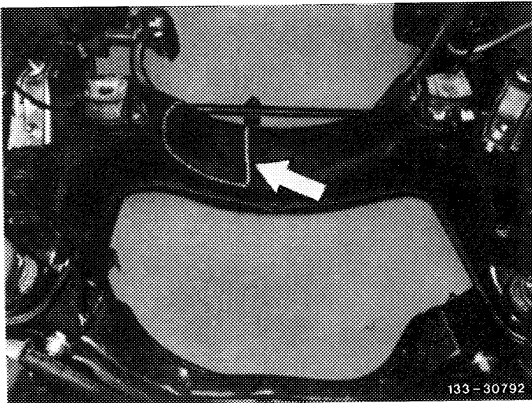


Fig. 33/3

Lower control arm

The lower control arm is lengthened and includes the replaceable lower ball joint from model 124 (Fig. 33/4).

The rubber bushings on the front axle carrier are the same as before. The stop bracket for max. steering lock is the same as on model 124.

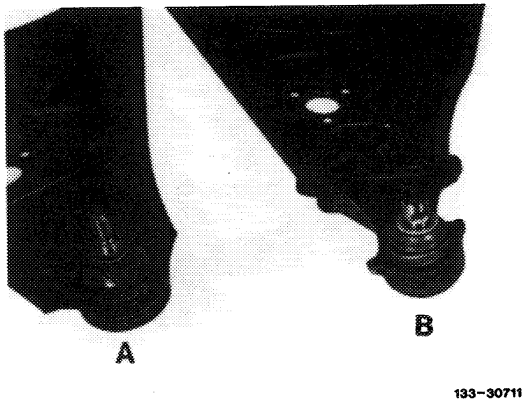


Fig. 33/4

A Old version B New version

Upper control arm

The control arm is now made of steel. The rubber bushings on the front axle carrier are the same as before.

The upper ball joint is connected to the control arm (Fig. 33/5). For removal of the ball joint, use special tool no. 186 589 10 33 00.

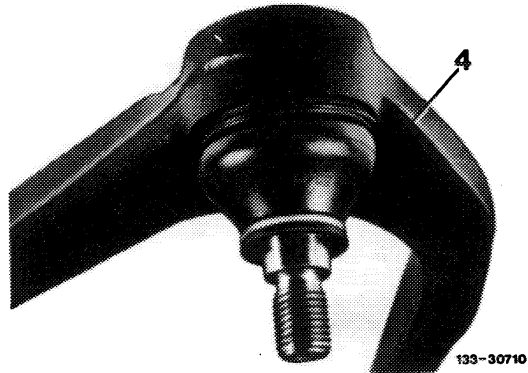


Fig. 33/5

4 Upper control arm

Steering knuckle

The tapered ball joint pin is attached to the tapered clamping bore of the steering knuckle. At the top the steering knuckle is attached to the ball joint bore of the steering knuckle arm.

Control measurements are the same as on model 124.

The maximum steering lock stop-screw has a plastic cap as on model 124.

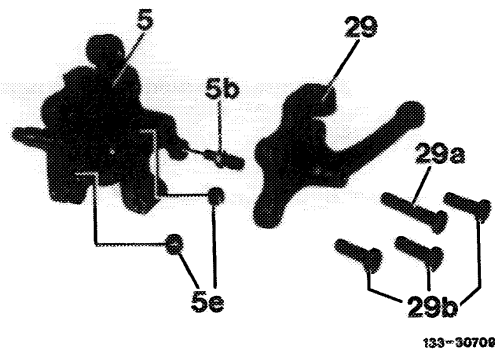


Fig. 33/6

- 5 Steering knuckle
- 5b Stop-screw
- 5e Locating sleeve
- 29 Steering knuckle arm
- 29a Self-locking screw (long)
- 29b Self-locking screws (short)

To prevent corrosion, following assembly, completely fill slot of clamping bore (arrow) with sealing compound, part no. 001 989 79 20.

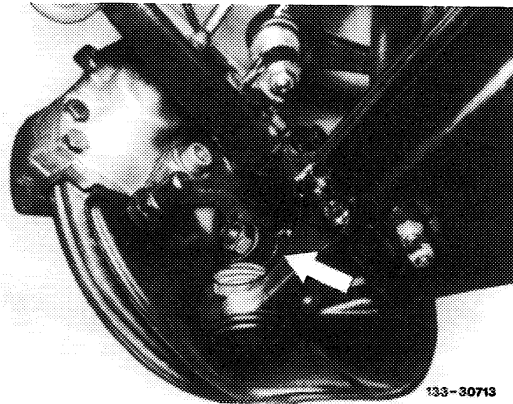


Fig. 33/7

Steering knuckle arm

Located on steering knuckle with 2 locating sleeves and fastened with 4 self-locking screws (Fig. 33/6).

To remove the ball joint from the tie rod use special tool no. 201 589 08 33 00.

Front wheel hub with bearing

Identical to models 124 and 201.034 (Fig. 33/8).

Grease quantity of front wheel bearing:

High-temperature bearing grease part no. 000 989 49 51 (150-g container).

Total capacity	approx. 65 g
Hub with bearing	approx. 50 g
Hub cap	approx. 15 g

Caution!

Use only MB high-temperature bearing grease, part no. 000 989 49 51 for all models.

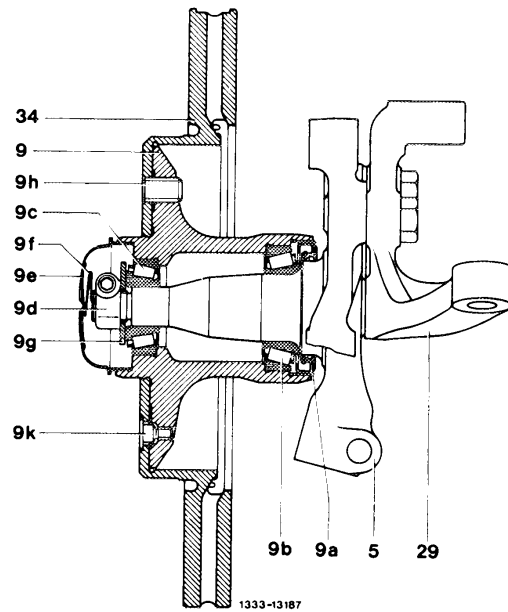


Fig. 33/8

- | | |
|----------------------------------|-------------------------|
| 5 Steering knuckle | 9f Contact spring |
| 9 Front wheel hub | 9g Washer |
| 9a Radial seal | 9h Roll pin |
| 9b Tapered roller bearing, inner | 9k Lock screw |
| 9c Tapered roller bearing, outer | 29 Steering knuckle arm |
| 9d Clamping nut | 34 Brake disc |
| 9e Dust cap | |

Tightening torques

Self-locking screws (steering knuckle arm to steering knuckle)	90 Nm
Clamping screw (lower ball joint to steering knuckle)	125 Nm
Stop-screw in steering knuckle	45 Nm
Nuts (eccentric screws on lower wishbone)	120 Nm
Screws of upper control arm bushing	60 Nm
Nut (upper ball joint on steering knuckle)	60 Nm

Rear axle

Limited slip differential rear axle

Model 107.048

With the limited slip differential there will be enough traction to move the vehicle in case one of the rear wheels starts slipping. More torque is transmitted to the wheel with good traction and driving-off, for example during the winter months, is improved. During straight ahead driving, vehicle straight-line stability is also improved.

The limited slip differential has clutch discs between the differential side gear and the axle shaft. On each axle shaft five clutch discs are installed with the friction lining on one or both sides. Five additional discs without friction lining are placed in-between and are prevented from rotating by tabs engaged in the differential case. The friction discs are splined to the axle shafts.

The remaining construction is similar to standard rear axle differentials.

Functional description

The differential pinions transfer a higher axial force to the non-turning differential side gear. From there the increased force is transmitted through the clutch discs, which are compressed, and transfer a portion of the differential case torque to the side gear and therefore to the non-spinning wheel.

Note:

In extreme cases (one wheel spinning on ice) the differential will only lock up slightly, because of the low transmitted torque and therefore the axial load on the pinion and side gear is relatively low.

In the above example, the friction discs will transfer only a slight additional torque to the stopped wheel. A limited slip differential cannot prevent spinning of a single wheel on glare ice.

Oil type:

M-B Limited Slip Differential Oil 000 583 09 04

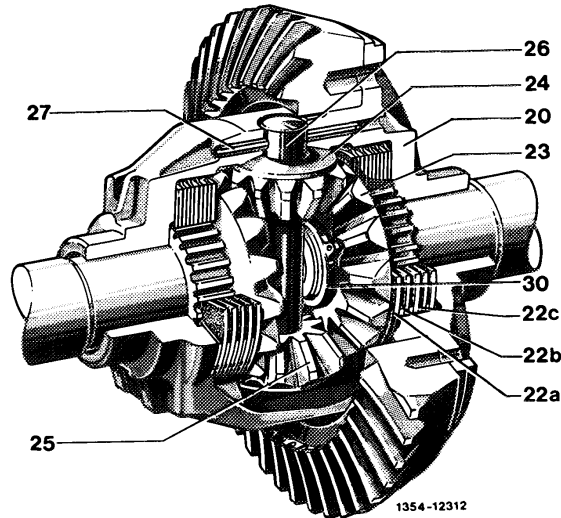


Fig. 35/1 Limited slip differential

- | | | | |
|-----|-------------------------------------|----|---------------------------|
| 20 | Differential case | 24 | Spherical washer |
| 22a | Friction disc with one-sided lining | 25 | Differential pinion |
| 22b | Friction disc without lining | 26 | Differential pinion shaft |
| 22c | Friction disc with two-sided lining | 27 | Roll pin |
| 23 | Differential side gear | 30 | Retaining ring |

Rear axle model 107

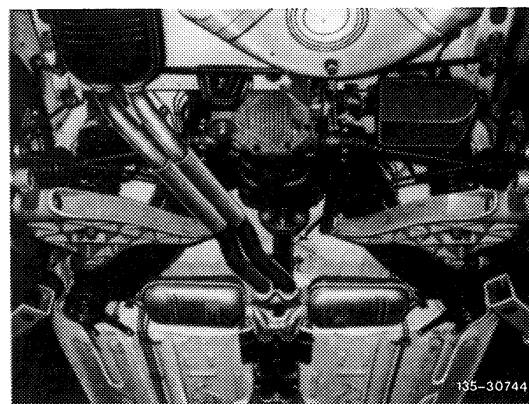


Fig. 35/2

Wheel guidance is basically the same as on the previous 107 model (Fig. 35/2).

Axle carrier

With the new elastically mounted rear axle center piece and available space, the rubber mounting at the rear has been offset by 124 mm to the left (Fig. 35/3). As a result, different loads must be carried by the left and right front rubber mounts respectively. The rubber mounts are therefore identified with L for left side and R for righthand side installation (Fig. 35/4).

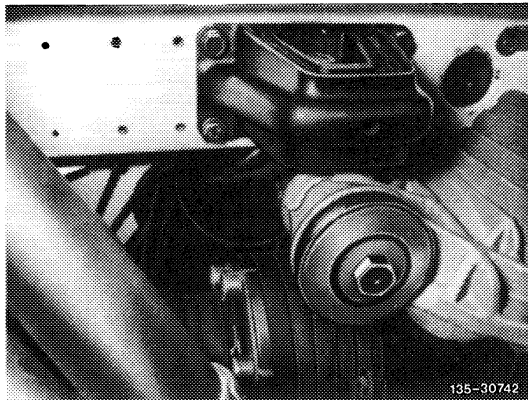


Fig. 35/3

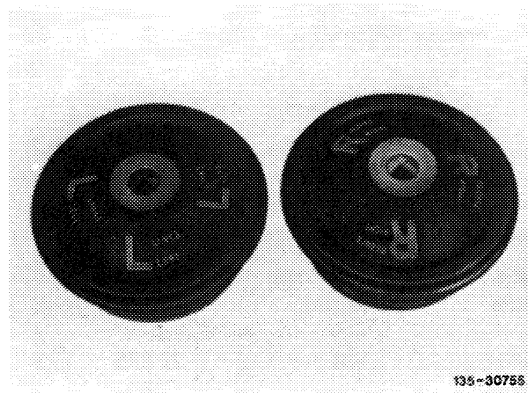


Fig. 35/4

Center piece mounting

The rear axle center piece is elastically mounted to the rear axle carrier, at the front in two, and at the rear in one rubber bushing. As a result good noise and vibration dampening are obtained. At the front mounting one rubber bushing each is installed at the bottom (54b) between the axle carrier and housing; on top there is one threaded rubber bushing (54a) at the axle carrier (Fig. 35/6).

The tightening torque of self-locking hex. socket screws is 60 Nm. At rear the mounting consists of a rubber bushing (57a) between the rear axle carrier and end cover, and a rubber bushing (57b) below the end cover (Fig. 35/6). Fastening is by a special screw (57d) with a spherical contact surface and sleeve (57c). The tightening torque is 110 Nm.

Rear axle shafts

To reduce vibration at higher rpms the rear axle shafts are provided with constant velocity joints similar to model 126 Coupe but without damping collars (Fig. 35/5). The screw tightening torque of the rear axle shaft is 70 Nm for M10 (threads and screw head lubricated) and 135 Nm for M 12 x 1.5 (unlubricated) screws.

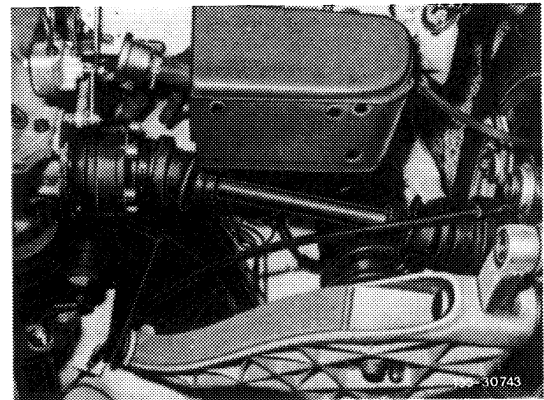


Fig. 35/5

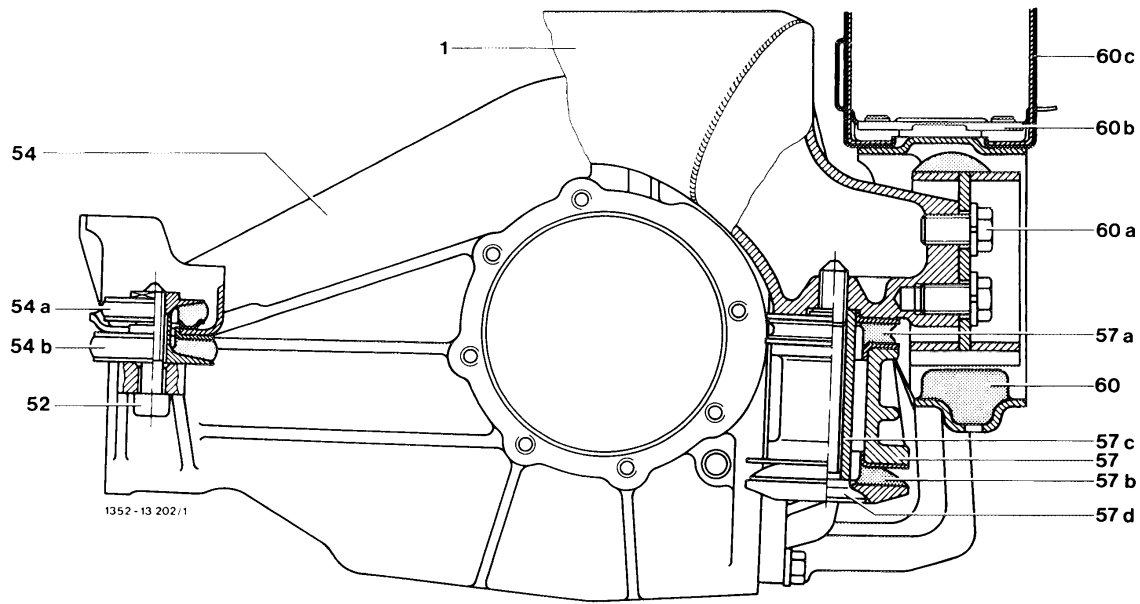


Fig. 35/6

- | | | | | | |
|-----|--------------------------------|-----|------------------------------|-----|--------------------------------------|
| 1 | Rear axle carrier | 54b | Rubber bushing front - below | 57c | Sleeve |
| 52 | Self-locking hex. socket screw | 57 | Rear axle end cover | 57d | Screw with spherical contact surface |
| 54 | Rear axle center piece | 57a | Rubber bushing - top | 60 | Rear rubber bushing |
| 54a | Rubber bushing front - top | 57b | Rubber bushing - below | 60a | Hex head screw |

Gear set

The rear axle ratio is shown in the table below.

Model	Rear axle center piece		Rear axle shaft with constant velocity		
	Ring gear dia. in mm	Ratio	Inner joint Ball dia. in mm	Outer joint Bolt circle dia. in mm	Ball dia. in mm
107.048	210	2.47	23.812 (15/16")	102	22.225 (7/8")

Wheels

Cross-reference, rims – tires – recommended tire brands

Model	Rim designation part no.	Summer tires Belted (radial) tubeless		Winter tires Belted (radial) tubeless	
		Tire size	Tire brand	Tire size	Tire brand
107.048	7 J x 15 H 2 ET 25	205/65 VR 15	CONTINENTAL CV 51	205/65 R 15 93 T M + S	CONTINENTAL SUPER CONTACT TS 740
	light alloy 126 400 30 02 or 126 400 34 02		MICHELIN MXV PIRELLI P6		GOODYEAR ULTRA GRIP 3

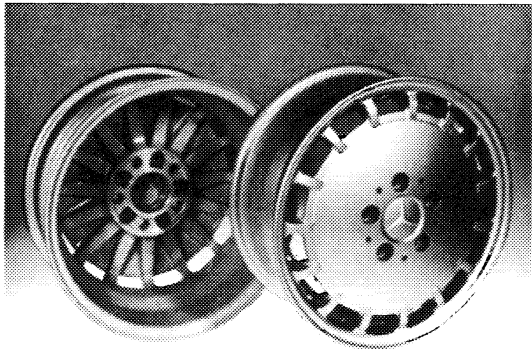
Wheels model 107

The forged light alloy wheels have an offset (ET) of 25 mm.

The construction and design are known from model 201.

Important:

Due to the new front brakes, 14" wheels **cannot** be used.



140 - 29439

Fig. 40/1 Cast light alloy wheel

Mounting of wheels

New wheel mounting screws are now used.

Use only M-B original wheel mounting screws!

Identification: Mercedes star stamped into face of screw shank.

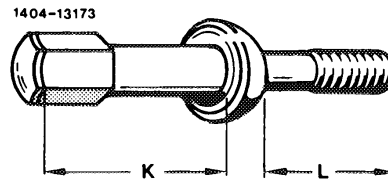


Fig. 40/2 Wheel mounting screw for light alloy wheels, model 107

Part no. 126 400 00 70
Height of screw head K = 43.5 mm
Length of shank L = 40 mm
(Screw head hollow and closed with light alloy cap)

Balancing of wheels

For balancing the wheels the same weights and the retaining springs as on model 124 are used.

A new tool, part no. 124 589 17 63 00 is now used to install and remove the balancing weights and retaining springs.

Tire inflation pressures

Model 107.048

Tire pressure label:
Background violet, lettering silver (Fig. 40/4).

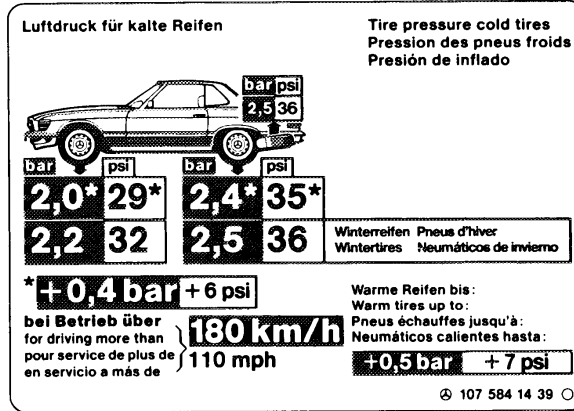


Fig. 40/4

Snow chains

Tire size	MB-anti-skid chain with gripping studs RUD-matic system	
	part no.	code no.¹)
205/65 R 15	107 583 01 16	46 384

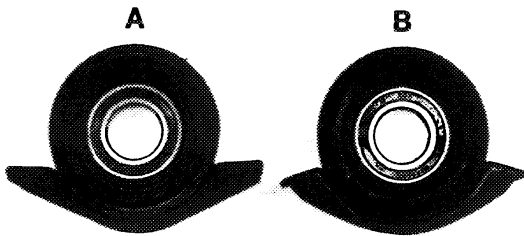
¹) The code no. is stamped into the closing hook of the tensioning chain.

Propeller shaft

Model 107

Model 107 uses a 2 piece propeller shaft with 60 mm diameter tubing the entire length.

The center support bearing mounting to the floor was changed to be compatible with a model 124 version support bearing (Fig. 41/1).



141-31019

Fig. 41/1

- A = previous version
- B = current version

The positioning shoulder for the centering sleeve is no longer used. For repairs, refer to the table indicating the correct press-fit dimension "a".

The outside diameter of the sleeve is now 31 mm instead of 32 mm.

Model	Dimension "a" Centering sleeve to propeller shaft flange	
	front	rear
107.048	20.4 mm	24 mm

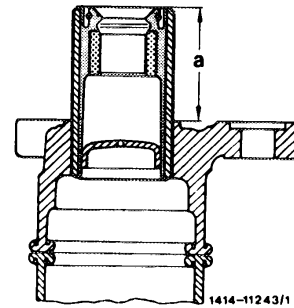


Fig. 41/2

Brakes

Front wheel brake, model 107

Four-piston fixed calipers with 40 mm piston dia. are installed. The opening for the brake pads is the same as before (90 mm).

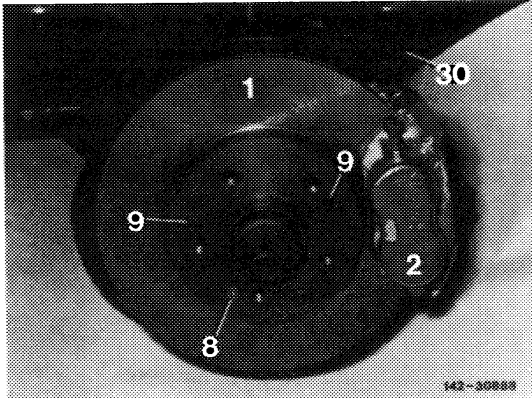


Fig. 42/1

The 4-piston fixed caliper has one bleed screw at the inside and one at the outside.

When bleeding the brake system, remove the front wheels so that the outer pressure chamber can also be bled.

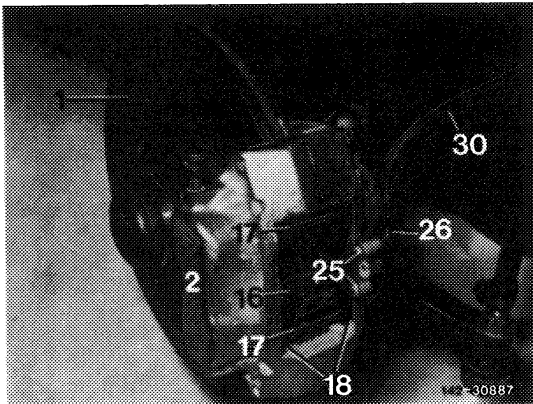


Fig. 42/2

The diameter of the brake discs is 284 mm.

The same brake discs are installed in models 124.030 and 201.034.

Tandem master cylinder, model 107

The tandem master cylinder with central check valve is made of light alloy. The diameter for the primary circuit is 25.4 mm, for the secondary circuit 19.1 mm.

Brake booster, model 107

Stepped double-diaphragm brake booster of light alloy construction. Diameter of diaphragms: 8/9".

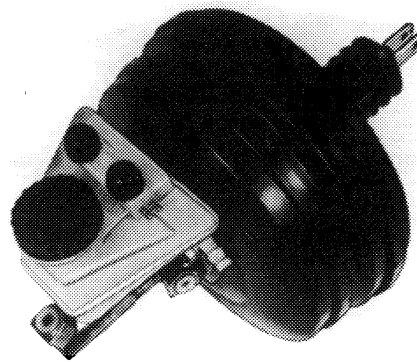


Fig. 42/3

Steering

Steering gear, model 107

Based on the redesigned front axle, the piston travel from center position to final stop has been reduced. For this reason the inside stop had to be modified.

The power steering carries the designation 765.707 (LS80).

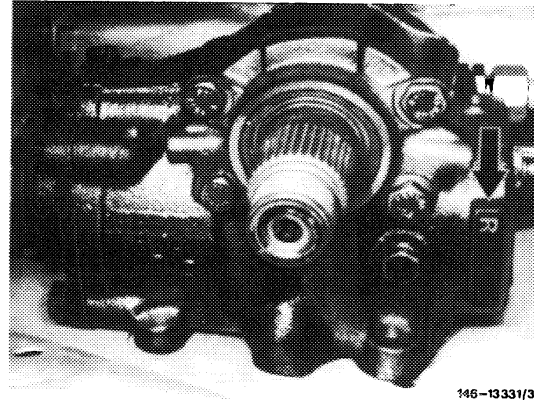
For identification, the code letter "R" is stamped into the steering gear housing (arrow).

Repair note:

This steering gear can only be installed with the redesigned front axle.

Power steering pump, model 107

The opening pressure of the pressure relief valve is 82 ± 5 bar.



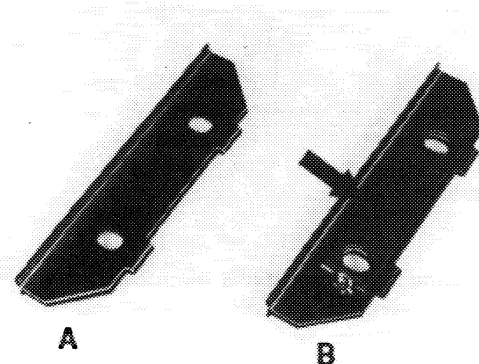
146-13331/3

Fig. 46/1

Fuel system

Fuel tank, model 107

To accommodate the new rear axle mounting, the sheet metal floor under the fuel tank includes two welded-in 3 mm thick reinforcement plates. The mounting positions of the tank and filler neck are changed accordingly.



147-30967

Fig. 47/1

- A Previous reinforcing plate
- B Modified reinforcing plate

Electrical system

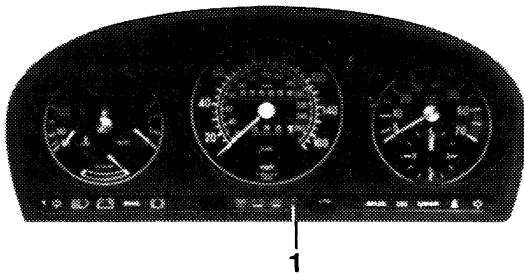
Outside temperature indicator, model 107

The outside temperature indicator was changed from Celsius to Fahrenheit degrees.

Instrument cluster, model 107

The indicating instruments and lamps are functionally the same as on model 201 model year 1985.

An exterior lamp failure indicator has been added.

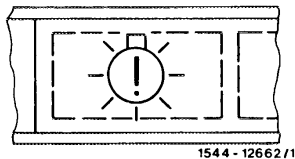


154-31474

Fig. 54/1

1 Exterior lamp failure indicator

Exterior lamp failure indicator



1544-12662/1

Fig. 54/2

The system is comprised of a lamp monitoring unit (located under the right legroom panel) and a lamp failure indicator (located on the instrument cluster). The following bulb functions are monitored:

Low beam, high beam, fog lamp, parking lamp, tail lamp, license plate lamp, stop lamp, turn signal lamp, high mounted stop lamp, backup lamp.

If a bulb in one of these circuits fails the failure indicator lights up, indicating a fault (open circuit), as long as the faulty lamp is turned on.

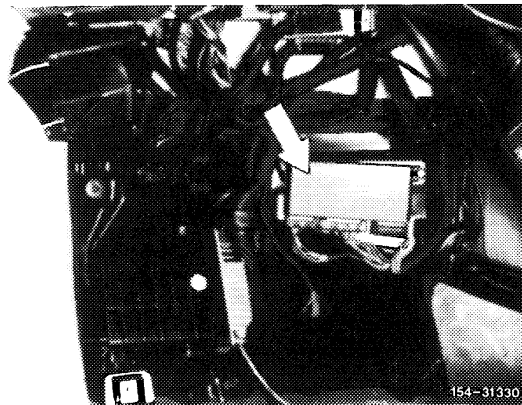
The stop lamp and the turn signal lamp have a trouble memory, that is, in the event of a bulb failure in one of these circuits the failure indicator remains lighted until the key in the steering lock is turned back to "1" or "0".

To identify the fault, turn key from position "0" to position "2" and switch on turn signal or step on brake pedal.

Since switching on the illumination will simultaneously activate several lamps, a visual check is required to identify where the fault is located.

Note: The indicator lamp lights up for a self-check in key position "2" (at reduced brightness) and will go out when the engine is running.

To avoid malfunction or damage to the failure indicator system, be certain to connect any additional lighting equipment (e. g. auxiliary headlamps etc.) to the fuse **before** the failure indicator monitor unit.



154-31330

Fig. 54/3

Fuse information, Model 107

Fuse No.	Connection to circuit	Fuse Amperage	Fused consumer
1	15 R	8 (16)*	Cigar lighter, Glove box lamp, Switch for heated rear window, Radio, (heated seats, front)* optional
2	15 R	16	Windshield wiper system, Windshield washer pump, Headlamp flasher
3	15 R	16	Right power window
4	15 R	16	Left power window
5	15	8	Turn signal lamps, Stop lamps, Tachometer, Exterior lamp failure unit, Instrument cluster (voltage supply), Exterior lamp failure unit indicator, Cruise control
6	15 X	16	Blower motor, A/C compressor clutch, A/C compressor cut-out control unit
7	15	8	ACC Pushbutton switch unit, Monovalve, Auxiliary coolant pump, Heated windshield washer nozzle, Back-up lamp (via exterior lamp failure unit), Auxiliary fan relay (terminal 86), Fasten seat belt control unit, Kickdown solenoid valve, Outside temperature indicator, Air injection pump clutch
8	15	16	Horn, Heated exterior rear view mirror left, Adjustable heated exterior rear view mirror right
10	15	16	Heated rear window, Anti-theft alarm system
11	30	8	Central locking system, Anti-theft alarm system
12	30	8	Diagnostic socket terminal 6, Exit lights, Clock, Warning flasher, Dome lamp front, Trunk lamp, Fasten seat belt control unit, Automatic antenna, Warning buzzer, Radio
13	58 R	8	Side-marker lamp right, Tail lamp right, License plate/outside lamp switch terminal 30 (via exterior lamp failure unit), Instrument cluster, ACC pushbutton switch unit illumination, Radio illumination
14	30	16	Auxiliary fan
15	58 L	8	Fog lamps
16	58 L	8	Left side-marker lamp, Left tail lamp
17	56 a	8	Right high beam
18	56 a	8	Left high beam, High beam indicator lamp
19	56 b	8	Right low beam
20	56 b	8	Left low beam

Body, general

Model 107

As a result of changes to the engine, front and rear axles, power brake booster, exhaust catalyst, and door handles, the following body parts have been changed for this model year:

- Radiator mounting
- Hood
- Firewall
- Side-member connecting point, front right
- A-pillars
- Doors
- B-pillars
- Main floor
- Rear floor
- Cross-member under the driver seat
- Sheet metal shrouds
- plus various stiffeners and small parts

The correct part numbers can be found in the latest Spare Parts microfiche.

Doors

Doors, model 107

The outside door handles from the model 126, with some modifications, are installed. The door outer sheetmetal includes a door handle recess.

Door lock and striker are new, therefore, the B-pillar was modified.

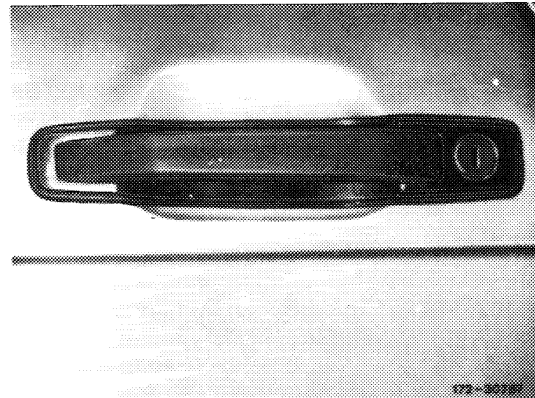


Fig. 72/1 Outside door handle

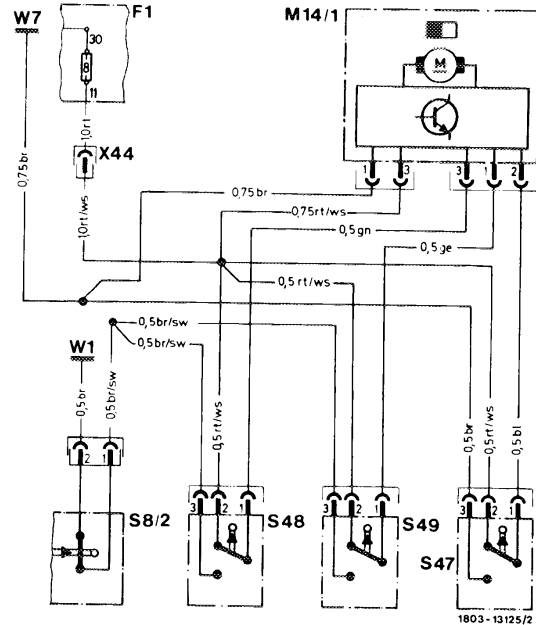
Central locking system

Three-point central locking system, model 107

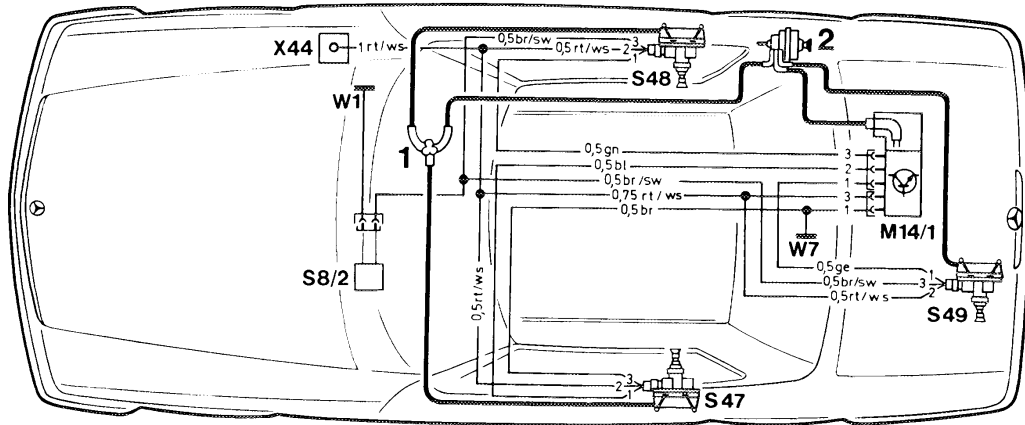
The single line central locking system known from models 126 and 201 and which can be operated from both front door locks and the trunk lock is installed. For description of function see Introduction Manual, Model Year 1985.

Fig. 80/1 Wiring diagram

- | | |
|--------|---|
| F 1 | Main fuse box |
| M 14/1 | Supply pump |
| S 47 | Control actuator, left front door |
| S 48 | Control actuator, right front door |
| S 49 | Control actuator, trunk lock |
| S 8/2 | Warning buzzer contact, exterior lamps/central locking system |
| W 1 | Main ground, legroom right |
| W 7 | Ground, trunk right |
| X 44 | Plug, supply pump |



1803-1325/2



1803-13216

Fig. 80/2 Function diagram, model 107

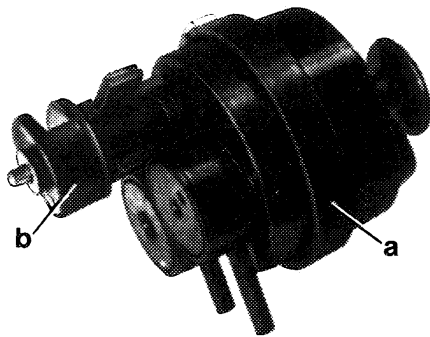
- | | | | |
|--------|------------------------------------|-------|--|
| 1 | Y-connector (below glove box) | S 8/2 | Warning buzzer contact exterior lamps/central locking system |
| 2 | Actuator, fuel filler flap | W 1 | Main ground, legroom right |
| M 14/1 | Supply pump | W 7 | Ground, trunk right |
| S 47 | Control actuator, left front door | X 44 | Plug, supply pump |
| S 48 | Control actuator, right front door | | |
| S 49 | Control actuator, trunk lock | | |

Element, fuel tank flap

Model 107

The fuel tank flap actuating element and the guide bushing were changed (Fig. 80/5).

In case of noise (squeaking) complaints, this fuel tank flap element and the guide bushing can be installed in Model Year 1985 vehicles.



180-31137

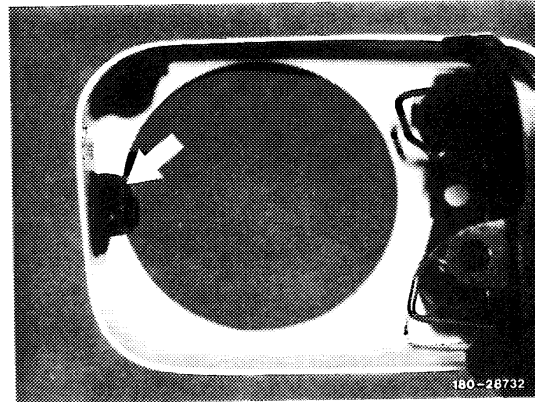


Fig. 80/6

Fig. 80/5

- a Element, fuel tank flap
- b Guide bushing

Electrical system, body

Model 107

Outside heated rear view mirrors

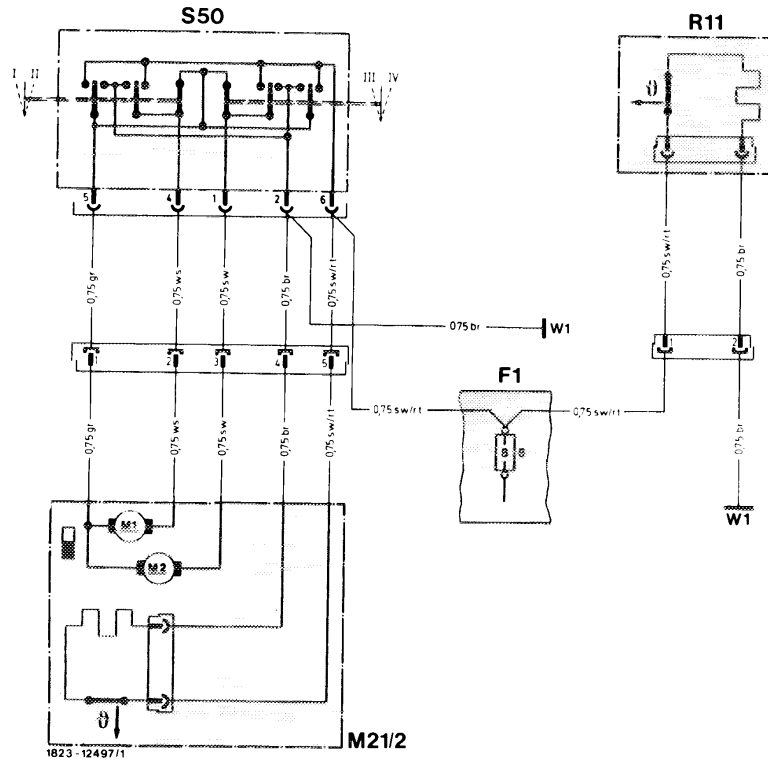


Fig. 82/1 Wiring diagram for outside heated rear view mirror

- | | |
|---|---|
| <p>F 1 Fuse box, fuse no. 8 (circuit 15)</p> <p>M 21/2 Electrically adjustable and heated outside rear view mirror, right</p> <p>R 11 Heated outside rear view mirror, left</p> | <p>S 50 Switch for electric mirror adjustment</p> <p>I Vertical-up adjustment</p> <p>II Vertical-down adjustment</p> <p>III Horizontal-outward adjustment</p> <p>IV Horizontal-outward adjustment</p> <p>W 1 Main ground (under instrument panel, right, at fuse box)</p> |
|---|---|

High mounted stop lamp

A third, high mounted, stop lamp is located in the center of the trunk lid. It operates parallel to the other stop lamps and is connected to socket 11 of the exterior lamp failure monitoring unit. To exchange bulbs, unbolt and remove from the trunk lid; then remove the bottom rubber gasket.

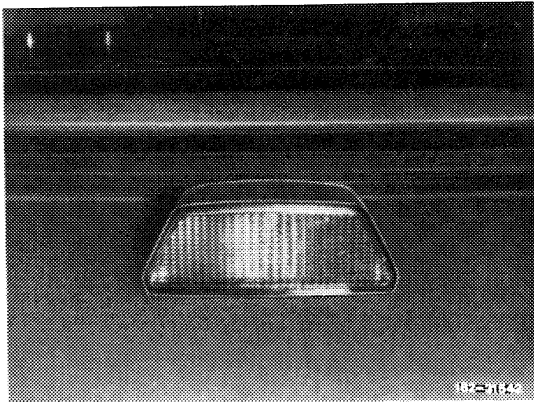
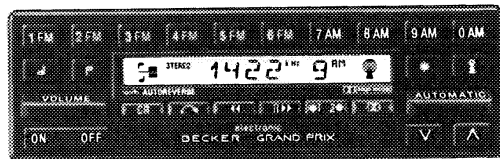


Fig. 82/2

Radio



182-30968

Fig. 82/13

The new Grand Prix radio for model year 1986 contains the following new features:

- Larger display indicator with tone setting and tuning sensitivity.

- Manually selectable sensitivity (3 levels) for automatic station seeker.
- Switched off, radio returns to "least sensitive"
- AM-Stereo (Motorola system)
- Individual buttons for manual tuning
- AM tuning in 10 kHz increments.
- DOLBY B¹⁾ noise reduction button and tape selector for CrO₂ cassettes.
- Power output increased to 20 watts per channel.

¹⁾ Registered trademark of Dolby Laboratories Licensing Corporation.

Note:

The radio can now also be turned-on in steering lock position 0.

Cassette Deck Cleaning

To maintain the proper function and good sound quality of the cassette player, tape head cleaning is required during each Maintenance Service 24000 km (15000 miles) using Cassette Deck Cleaning System 903 589 00 68 00. Refer to the maintenance manual for details.

If the cassette player is used daily more frequent cleaning may be required.

Radio anti-theft protection



182-30969

Fig. 82/14 Theft indication display (dashed line)

Detachable body components

Front bumper, model 107

The skirt under the front bumper is formed as a spoiler to improve aerodynamics. The lower edge of the spoiler is painted black, the upper portion is painted in the vehicle color.

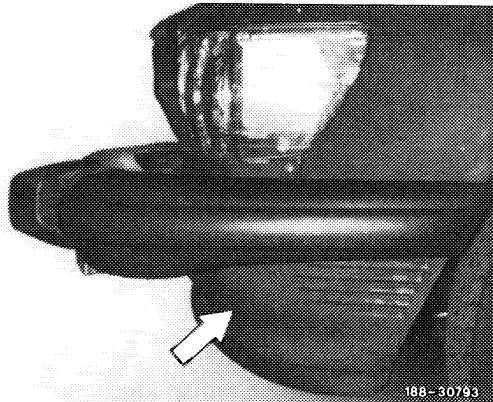


Fig. 88/1 Spoiler under front bumper

Hood, model 107

A depression (arrow) was incorporated into the left and right side of the rear hood reinforcement due to the modified brake booster. The previous version hood will no longer fit on new vehicles and can be used only on older vehicles.

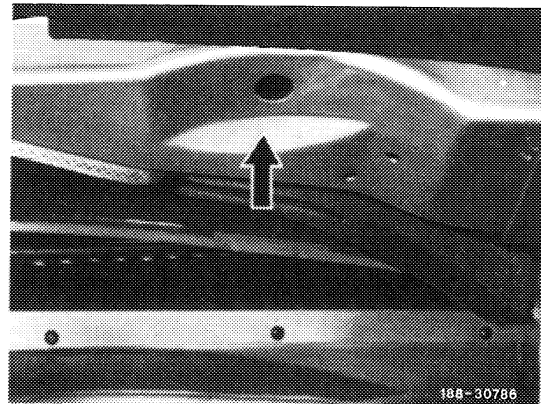


Fig. 88/3 Depression for brake booster clearance

Front fender, model 107

The front fenders are equipped with inner fender liners as all other models.

Seats

Front seats, model 107

The front seats were changed to improve the lateral support. The pattern of the seat covering was changed and is similar to model 124.

The shape of the backrest adjusting wheel was changed to improve operation.

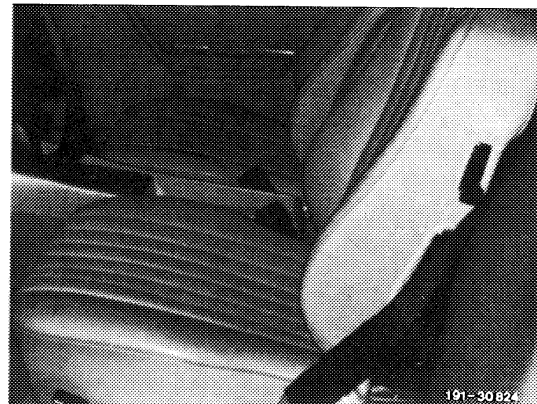


Fig. 91/1 Front seat

