PORSCHE

968

Repair Manual

Supplement 8

Printed in Germany - March 1993

WKD 482820.08

Supplement - Contents

For Vol. 1

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* = Replacement sheets

Please file the supplement in the usual manner in the appropriate groups of the Repair Manual and exchange existing sheets for replacement sheets.

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Important Note

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* = Replacement sheets

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page

General

Maintenance, Self-diagnosis general

Engine, Crankcase, Engine Mounts

Engine, Crankshaft, Pistons

Engine, Cylinder Head, Valve Drive

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The following topics of Repair group 15 are described in the Repair Manual Type 944, vol. 1 - A:

Engine, Lubrication

Engine, Cooling

Fuel Supply

The following topics of Repair group 20 are described in the Repair Manual Type 944, vol. 1 - A:

Fuel System - Electronic Injection

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page

The following topics of Repair group 24 are described in the Repair Manual Type 944, vol. 1 - A:

Ignition system

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No.	Designation	Qty.	Note: Removal	Note: Installation
21	Crankshaft	1		Check end clearance and radial play
22	Closed main-bearing bushing, bearing No. 1	1		Make sure the bearing engages in the roll pin
23	Main bearing No. 2	1		Place bearing insert **without** lubrication groove into lower crankcase section
24	Thrust bearing No. 3 (pilot bearing)	1		Place bearing insert **without** lubrication groove into lower crankcase section
25	Main bearing No. 4	1		Place bearing insert **without** lubrication groove into lower crankcase section
26	Main bearing No. 5	1		Place bearing insert **without** lubrication groove into lower crankcase section
27	Lower crankcase section	1		Clean and degrease sealing surface in oil suction passage and flywheel areas
28	Roll pin 4 x 8	1		Check for correct seating

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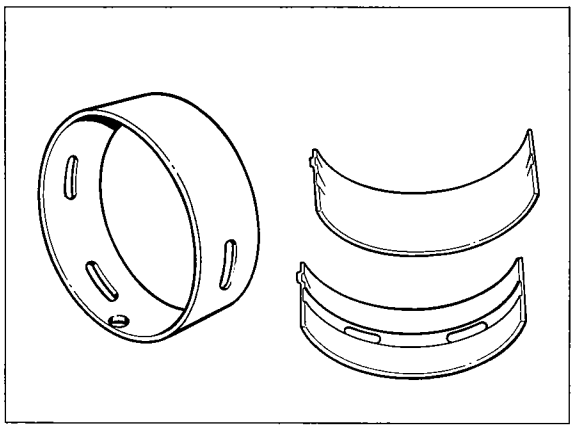
Dismantling and assembling crankcase and crankshaft

Main bearing no. 1

The closed main bearing sleeve for bearing no. 1 has a lubricating groove around one half.

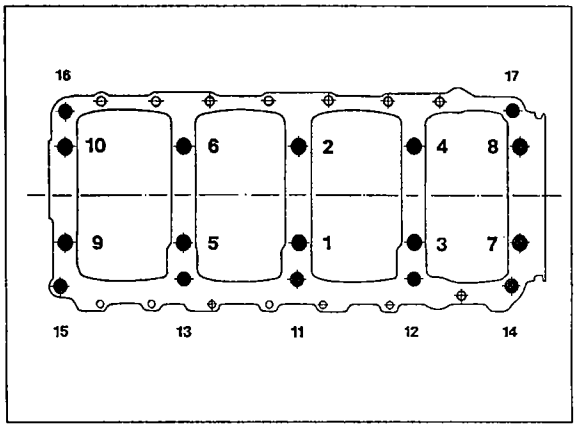
Main bearings no. 2, 4 and 5

When installing it is important, that bearing shells **with** lubricating grooves are placed in the upper crankcase section and bearing shells **without** lubricating grooves in the lower crankcase section.



1231-13

Tightening sequence - tightening torque



1359-13

Tightening sequence:

Nos. 1 to 10 in 2 steps:
Thread M 12 x 1.5

1st step	30 Nm (22 ftlb.)
2nd step	60 deg. rotating angle

Nos. 11 to 17 in 2 steps:
Thread M 10

1st step	20 Nm (15 ftlb.)
2nd step	50 Nm (37 ftlb)

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Removing and installing double-mass flywheel and grooved ball bearing

Removal

1. Fit double-mass flywheel to engine support adapter using Special Tool 9538/1.

2. Unbolt clutch pressure plate evenly and take off pressure plate complete with drive plate.

3. Undo cylinder bolt (multi-tooth bolt) from double-mass flywheel and lift off. Caution! Take care not to damage the reference mark sender.

Installation

Tighten cylinder bolts in two steps.

1st step	40 Nm (30 ftlb.)
2nd step	90 Nm (66 ftlb.)

Removing and installing grooved ball bearing

Removal

Pull out grooved ball bearing with internal puller, e.g. Kukko 21/2 (14.5 to 18.5 mm).

Installation

Push in with Special Tool VW 295 A until it is seated against the stop.

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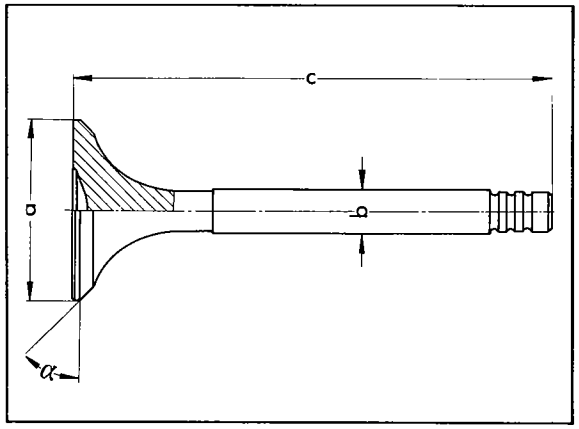
Valve dimensions



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Valve dimensions

Engine type M 44.43/44

Dimens.	Inlet	Exhaust
a	**39** mm	33 mm
b	6.98 mm	6.97 mm
c	114.70 mm	113.60 mm
α	45°	45°

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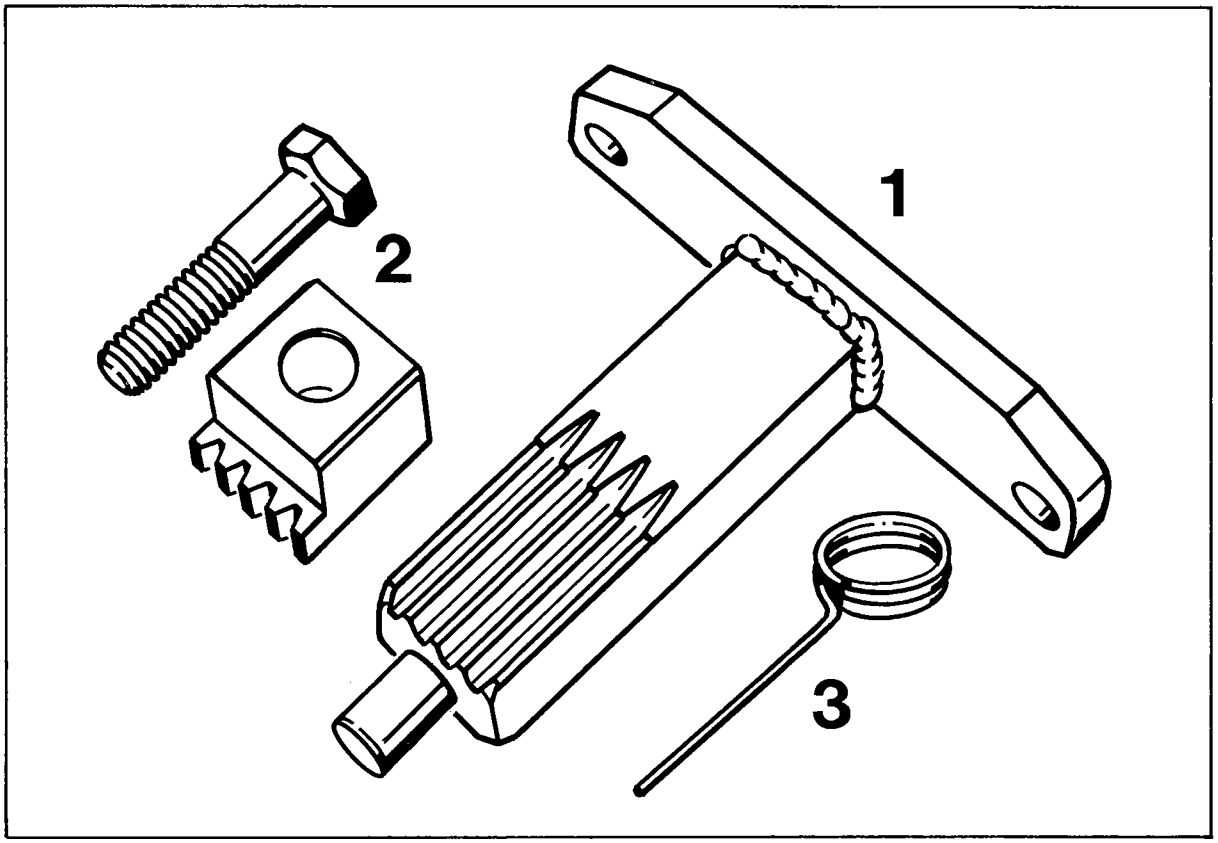
Dismantling and assembling camshaft drive

Tools



No.	Designation	Special tool	Order number	Explanation
1	Toothed sector	9206/1	000.721.920.61	Engine installed
2	Toothed sector with hexagon bolt M 12 x 1.5 x 60	9238/1	000.721.953.81	
3	Assembly tool for toothed belt tensioner	9530	000.721.953.00	
–	Spacer sleeve			refer to page 15 - 30
–	Piston retracting tool			refer to page 15 - 30

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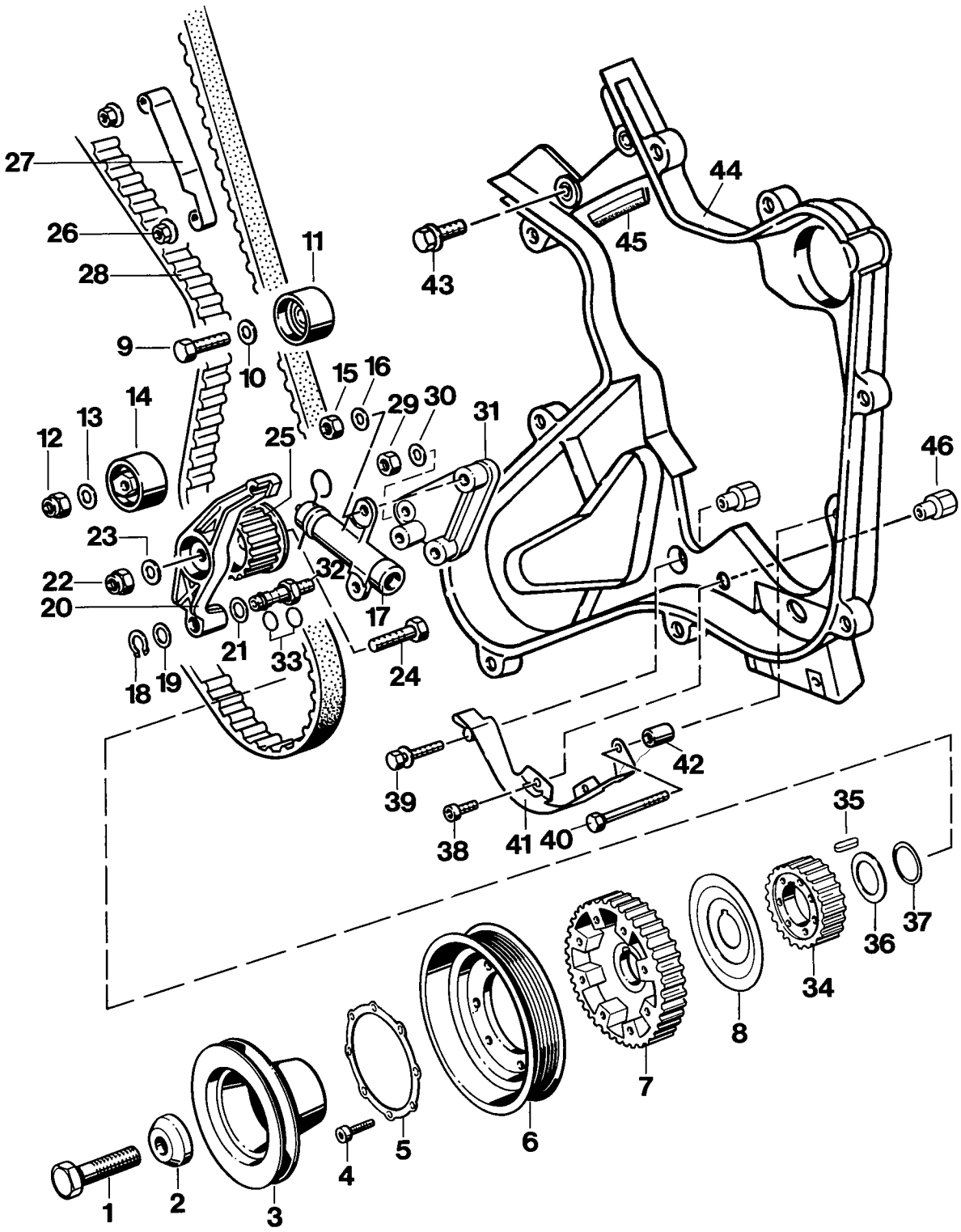
Dismantling and assembling camshaft drive



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No.	Designation	Qty.	Note: Removal	Installation
42	Spacer sleeve	1		
43	Combination screw	2		
44	Toothed belt cover	1		
45	Anti-chafing protection	1		
46	Spacer	3		

Special note on toothed belts and drive belts

As a rule, make sure the toothed belts and drive belts are **not kinked** during assembly, packing and storage. Improper handling may cause incipient damage to the camshaft toothed belts and may eventually lead to engine damage.

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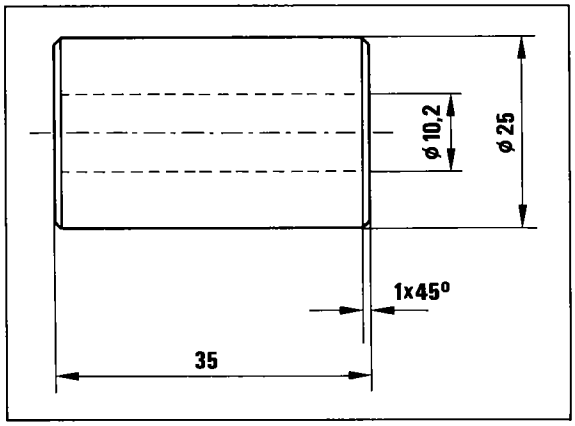
Assembly note

Slackening camshaft toothed belt

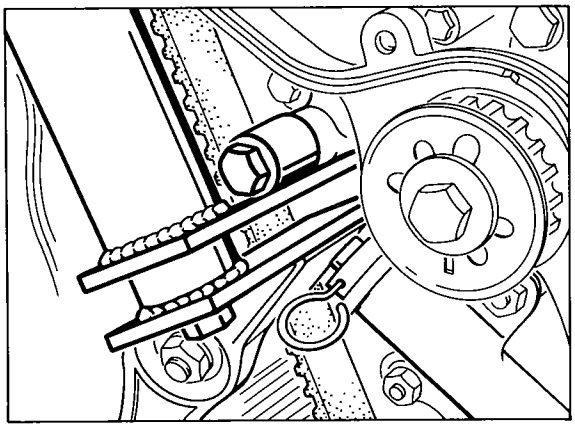
1. Remove idler pulley. Fit spacer sleeve (shop-made tool) with a M 10 x 55 hexagon head bolt.



1349-15

2. Align piston retracting tool between spacer sleeve and toothed belt tensioning lever. Compress toothed belt tensioner slowly until a resistance is felt. Wait for a few seconds and rotate somewhat more.

3. Keep on rotating in this sequence until the pushrod-to-housing holes are lined up and the pushrod can be locked with **Special Tool 9530**.



1350-15

Illustration shows tensioned belt tensioner locked with **Special Tool 9530, assembly tool (pin)**.

Note

Never rotate the engine **if the camshaft toothed belt is not fitted or tensioned** as this may cause damage to the valves.

The piston retracting tool is available from tool suppliers.
Order No.:
03.9314-4950.3/01

Supplier:

Messrs.
Alfred Teves GmbH
Postfach 900 120
D-60441 Frankfurt 90

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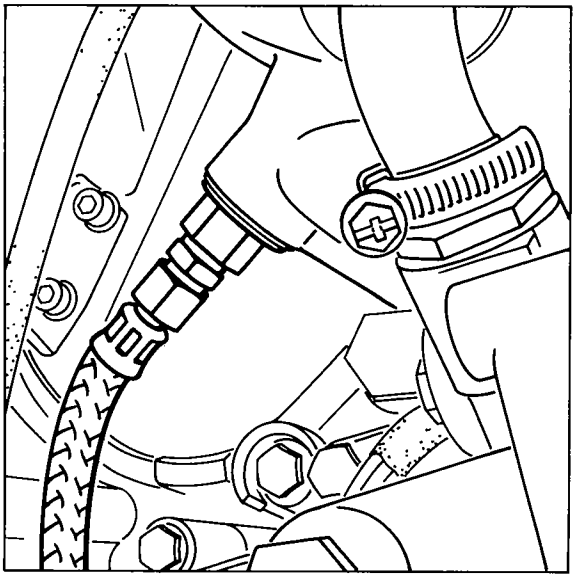
Checking oil pressure

1. Remove oil pressure transmitter and screw oil pressure tester VW 1342 together with M 10 x 1 adapter, and M 10 x 1/M 18 x 1.5 adapter, in its place in the oil/water cooler housing.



2. Run engine to operating temperature (80° C oil temperature), checking the temperature with, for example, an oil temperature tester (Special Tool 9122 + 9122/2).

3. At idle speed the oil pressure should be 2.5 bar or more.
   Have a second person accelerate the engine speed to 4000 rpm.
   Read oil pressure from tester. The value should be greater than 4.5 bar.

4. Install oil pressure transmitter with a new A 18 x 24 seal.
   Tightening torque: 35 Nm.

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Cleaning the entire engine oil system after an engine failure (bearing failure)

Note

This cleaning sequence is only intended to give pointers as to whereyou may find chips. The actual amount of work involved will depend oneach individual case of engine damage.

Replace the following parts:

- Hydraulic valve tappets
- Oil pressure relief valve (crankcase)
- Oil filter

The following parts must be dismantled, inspected and cleaned thoroughly:

- Oil pump
- Thermostat housing
- Oil restraining valve in cylinder head

The following parts must be cleaned thoroughly and/or rinsedthrough repeatedly:

Note:

All oil bores may be rinsed through thoroughly with benzine and a commercially available oil/benzine syringe.

- Oil pan
- Oil intake pipe
- Oil drain pipe
- Crankcase
- Crankshaft
- Cylinder head
- Oil lines
- Oil cooler
- Oil filler neck

Change oil filter and engine oil after approx. 500 km.

Note:

After an engine failure, the entire intake system must be inspected for foreign bodies and/or oil and cleaned before assembly.

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Removing and installing knock sensor

1. To remove and install the knock sensors, unbolt the intake rail from the engine. Refer to page 15 - 21 to 15 - 22.
   The coolant hoses remain connected. The intake rail remains in the engine compartment.

2. Undo and take out knock sensors. Disconnect connector.

3. Reinstall with a new genuine M 8 x 30 bolt (micro-sealed) **without washer**.

Tightening torque: 20 Nm (15 ftlb.)

Note

Handle the knock sensor very carefully. The knock sensor must never drop to the ground from greater heights as this may damage the piezocrystal.

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Important Vehicle Information

- Always turn off the ignition or disconnect the battery for resistance tests. (If this is not done, the tester may be destroyed).
- Always disconnect the rpm sensor plug for compression tests. (If this is not done, hazardous high voltages and insulation damage to the ignition coil, high-voltage distributor and ignition leads may result).
- The specified ignition coil (refer to Order No.) must not be replaced by a different coil.
- Never connect a suppression capacitor to ignition coil teminals 1 and 15.
- Never connect ignition coil terminal 1 to ground for burglar alarm. (Ignition coil and control unit may be destroyed).
- Never connect the positive battery terminal or a test lamp to ignition coil terminal 1. (The control unit will be destroyed)
- Never disconnect the ignition lead from ignition coil terminal 4 to high-voltage distributor terminal 4 while the engine is running.
- Voltage flashover from ignition coil terminal 4 to coil terminals 1 and 15 must not occur. (Control unit may be destroyed).
- To avoid destruction of the control unit, the secondary circuit of the ignition system must be suppressed with at least 4 kΩ, the original distributor rotor with 1 kΩ suppression resistance having to be installed.
- Disconnect DME control unit only after turning off the ignition.
- Flashover or disruptive discharge in the area of the high-voltage distributor cap (poor insulation) may destroy the control unit.
- Never disconnect the battery when the engine is running.
- Battery polarity reversal could lead to destruction of the ignition coil and the DME control unit.
- External engine starting with more than 16 V or with a boost battery charger is not permitted.
- When pulling off the connectors, e.g. for air mass sensor, throttle valve switch, injection valves etc., make sure the inside gasket is not lost.
- Always follow the accident prevention regulations when working on the fuel system.

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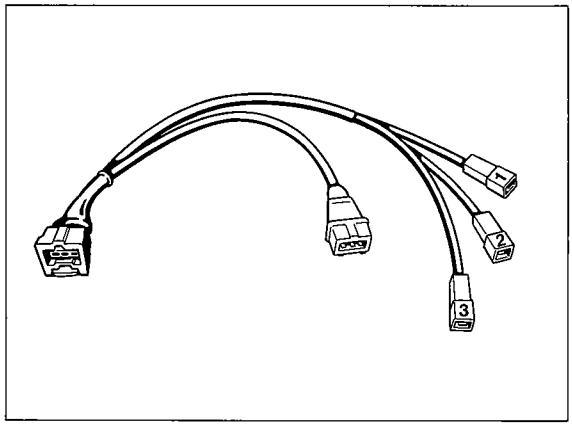
Equipment Required for DME Testing:

- Diagnostics tester 9288 with connecting leads
- 1 oscilloscope approved by Porsche
- 1 digital display multimeter with an internal resistance of at least 50 kΩ
- 1 Bosch L-Jetronic test lead, Bosch No. 1684 463 093 (check lead for correct polarity at plugs)
- 2 control unit plug test leads (shop-made) with 2 tab connectors no. 17.457.2 fitted to avoid damage to the plug terminals in the control unit plug during testing.
- 2 adapter test leads, consisting of: 4 plug connectors N 017.483.1 with 2 leads approx. 150 mm long, soledered.
- 1 three-pin test lead (e.g. VAG 1501).



958-24/28

- 2 control unit plug test leads (shop-made) with 4 tab connectors N 17.457.2.

The test leads must always be used for the tests!

All sender and ignition timing signals of Porsche vehicles can be checked with the engine testers recommended by Porsche. Since instructions for connection of testers on a car will differ depending on the equipment manufacturer, these instructions must always be followed to ensure correct tester connection.

The following signals can be checked with the oscilloscope:

- Engine speed
- Vehicle speed
- t_i (injection time)
- Idle stabilizer
- Hall signal
- Tank venting signal
- VarioCam

Note for USA:

If a fault that affects exhaust gas composition is detected by the Check Engine lamp and is read out, repair is possible with standard workshop tools.

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Technical Data

Tightening torques for manual transmission G 44

Location	Thread	Tightening torque Nm (ftlb.)
Selector shaft cover to transmission housing	M 8	25 (18)
Lock bolts to transmission housing and end shield	M 24 x 1.5	70 (52)
Reverse light switch to cover	12 x 1.5	20 (15)
End shield to transmission housing	M 8	25 (18)
Drive shaft four-point bearing	M 17 x 1	150 (111)
End cover to end shield	M 8	25 (18)
Retainer plate to end shield	M 8 (with collar)	25 (18)
Deflection lever for reverse gear to end shield	M 14 x 1.5	35 (26)
Oil filler and oil drain plug	M 22 x 1.5	35 (26)
Threaded flange for guide plate to transmission housing	M 6	10 (7) (with Loctite 271)
Side transmission cover to transmission housing	M 8	25 (18)
Halfshaft flange to differential	M 10	44 (32)
Crown wheel to differential housing (Verbus-Ripp bolt)	M 12 x 1.25	200 (148)

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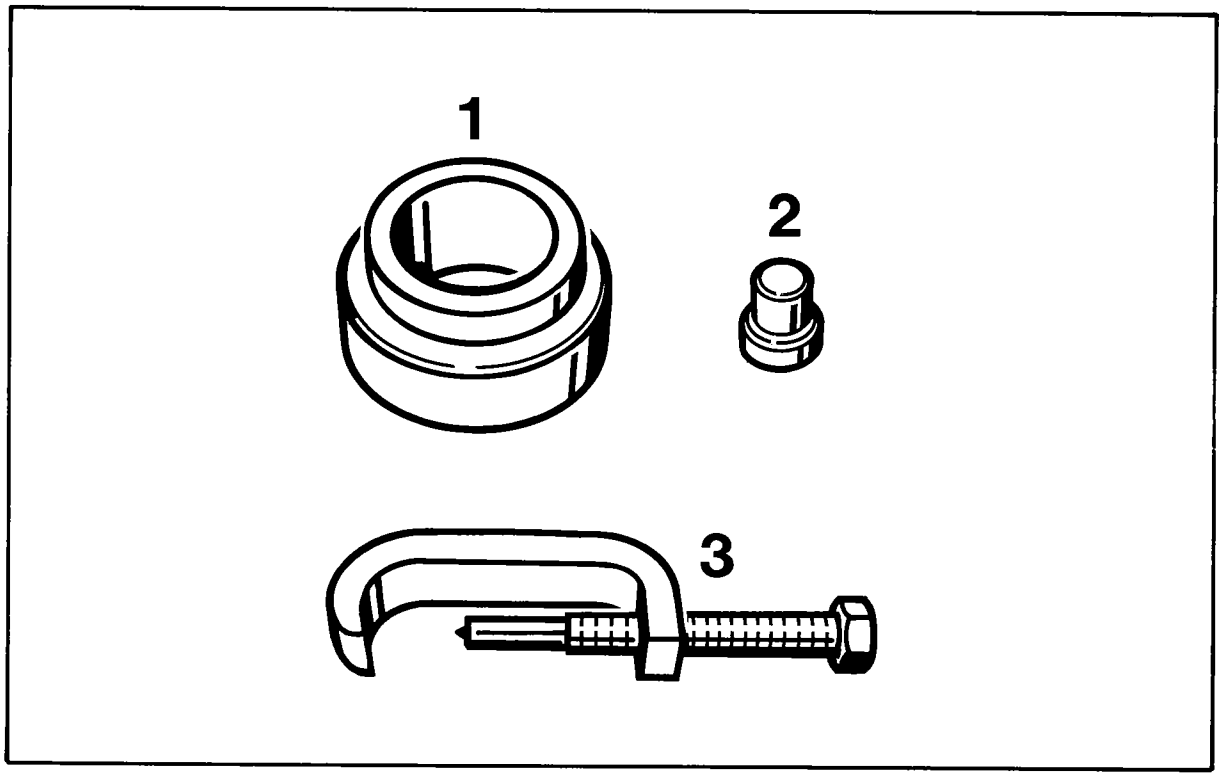
Removing and installing 5th and 6th gear

Tools



1201-34

No.	Designation	Special Tool	Order number	Explanation
1	Thrust piece	9535	000.721.953.50	
2	Thrust piece	9536	000.721.953.60	
3	Pressing device	3276	—	VW Special Tool

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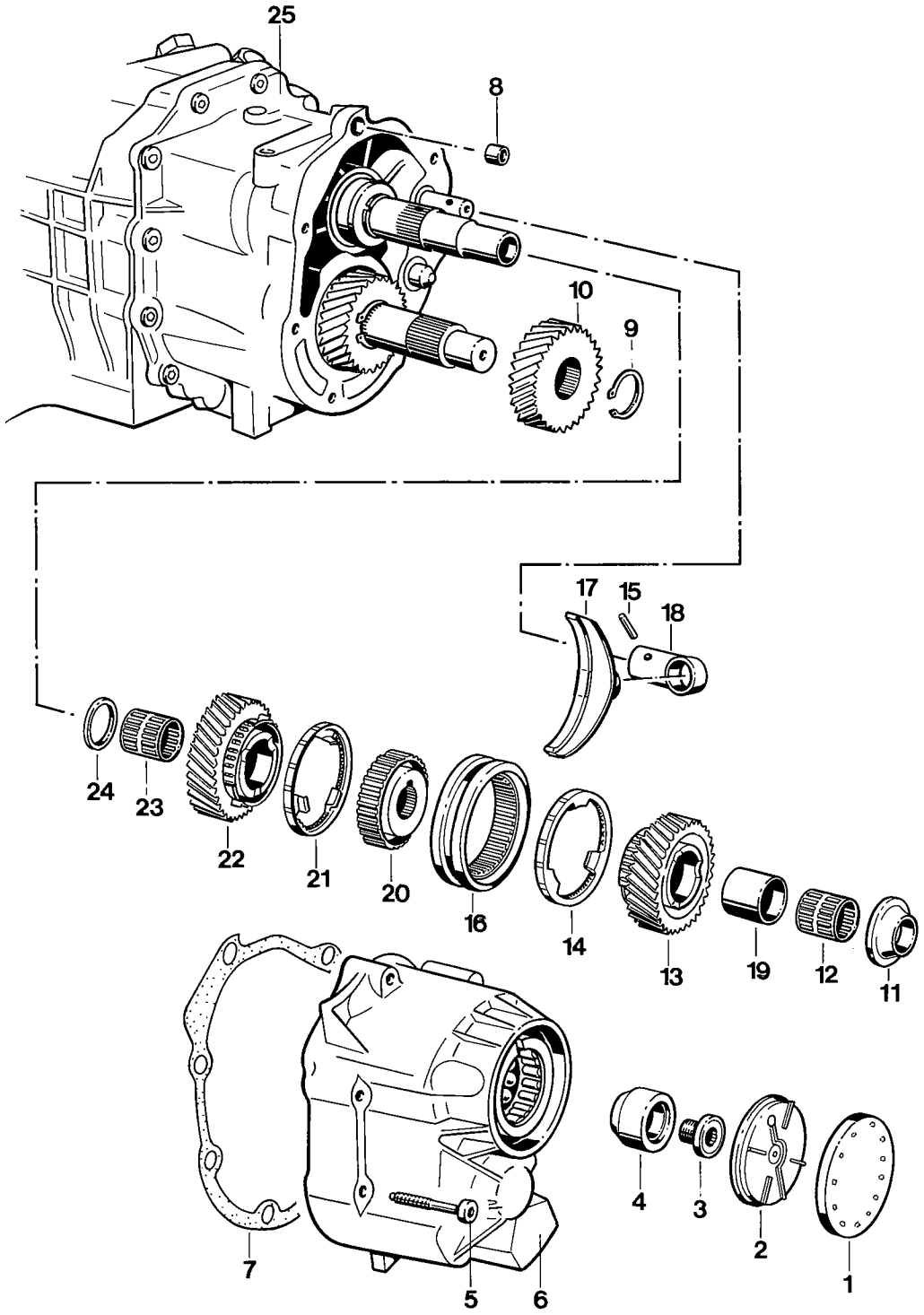
Removing and installing 5th and 6th gear



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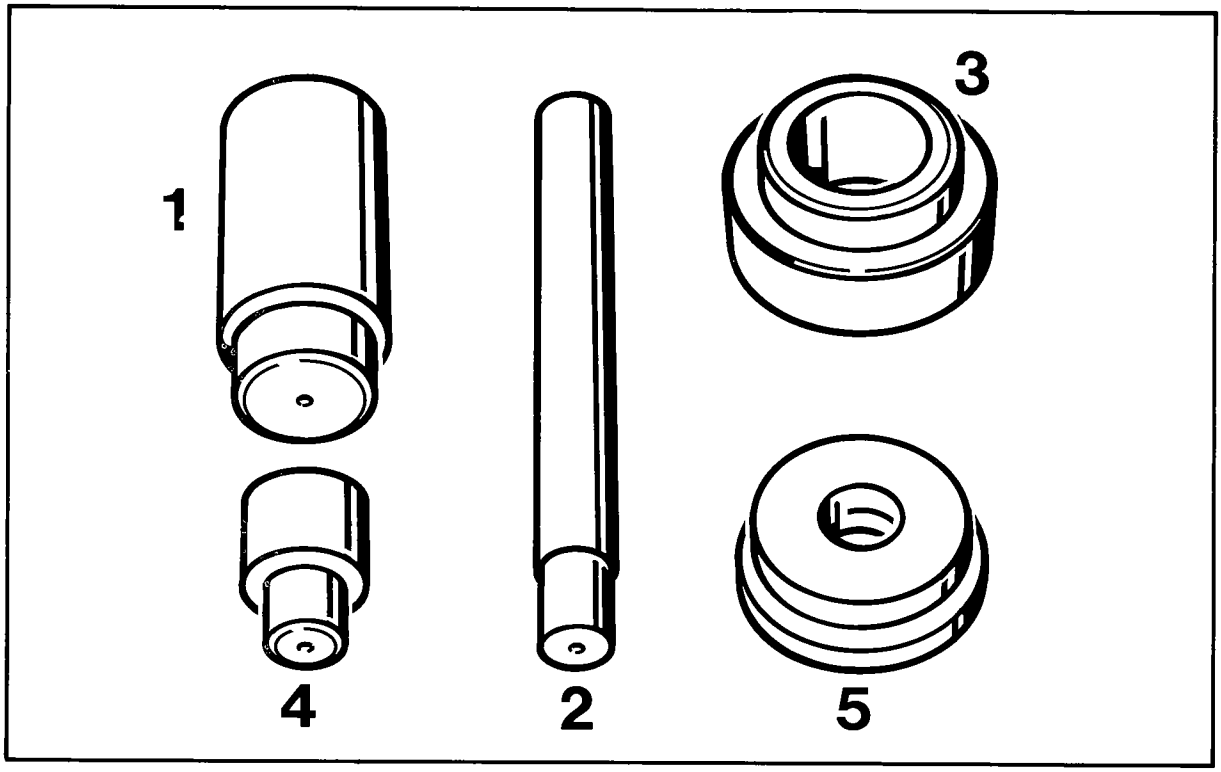
Dismantling and assembling end cover

Tools



1196-34

No.	Designation	Special tool	Order number	Explanation
1	Thrust piece	VW 432	—	VW Special Tool
2	Drift	P 375	000.721.375.00	
3	Thrust piece	9535	000.721.953.50	
4	Thrust piece	VW 295 A	—	VW Special Tool
5	Thrust piece	30 - 205	—	VW Special Tool

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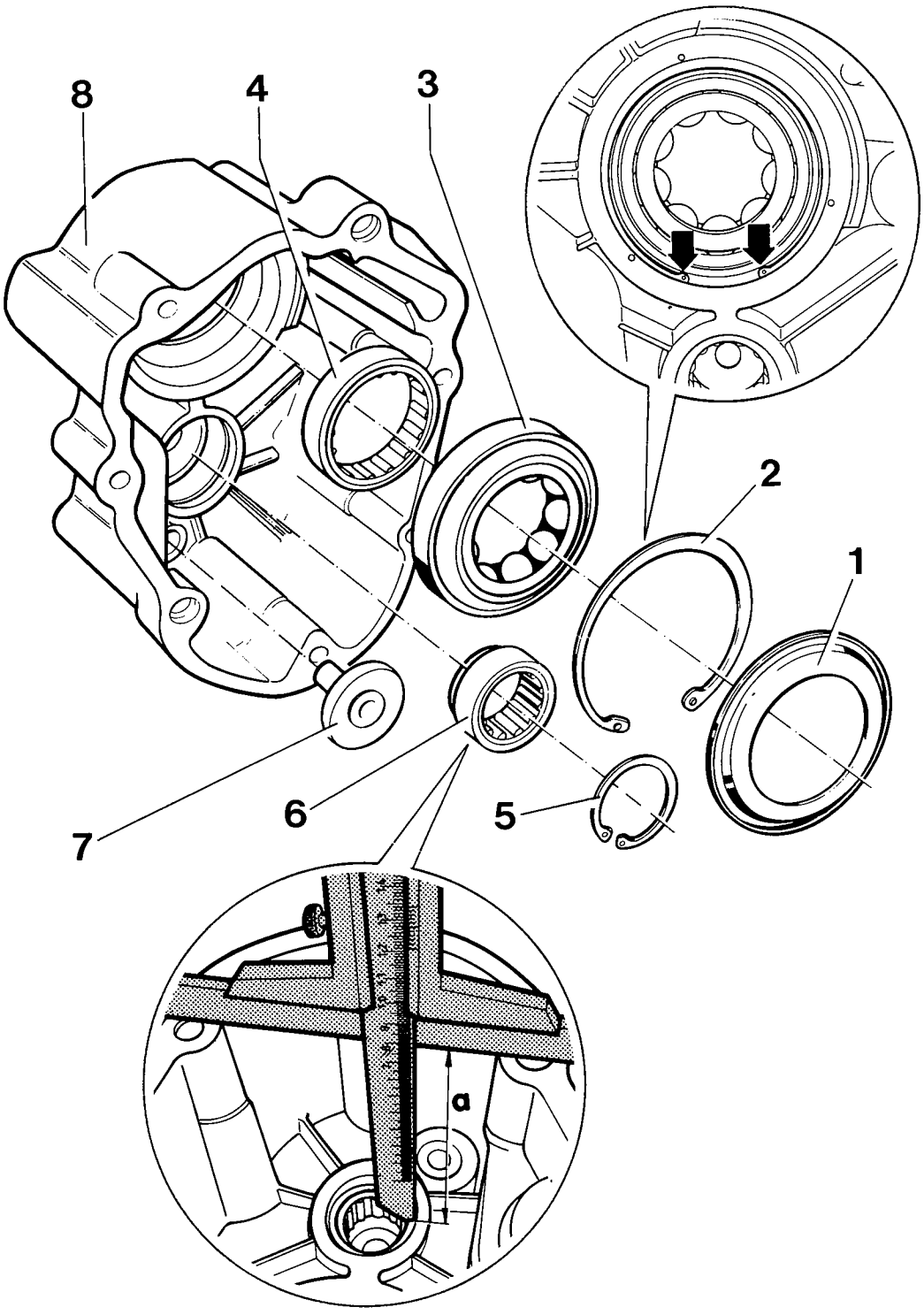
Dismantling and assembling end cover



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No.	Designation	Qty.	Note: Removal	Installation
26	Tapered roller bearing outer race	1	Drive out using Special Tool 9247/4 and VW 771/1	Heat transmission housing to approx. 120°C and press in with Special Tool 9247/3 and P 254, using a shop press. Continue pressing for 1 to 2 minutes until heat exchange has occurred
27	Adjusting shim „S3"	X	Note thickness for reinstallation	If required, recalculate thickness (refer to page 39 - 17)
28	Cap	1	Pull off manually	
29	Bleeder tube	1		Observe correct pressing depth. „a" = 18 ± 0.5 mm
30	Transmission housing	1		

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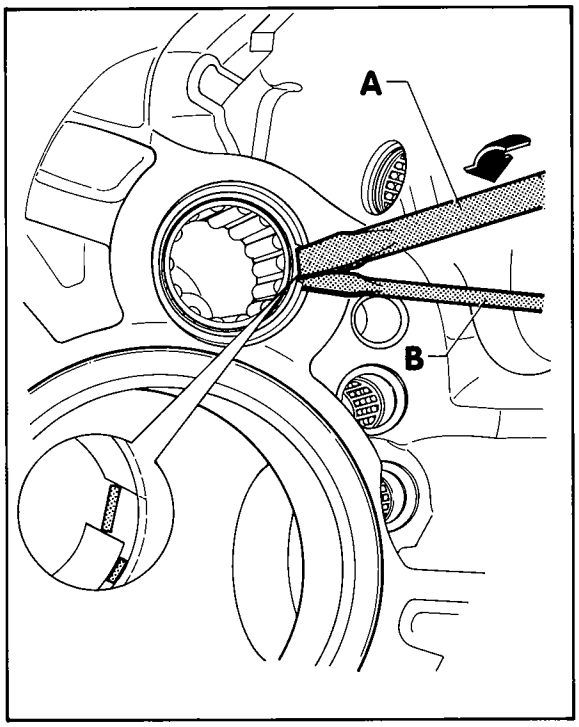
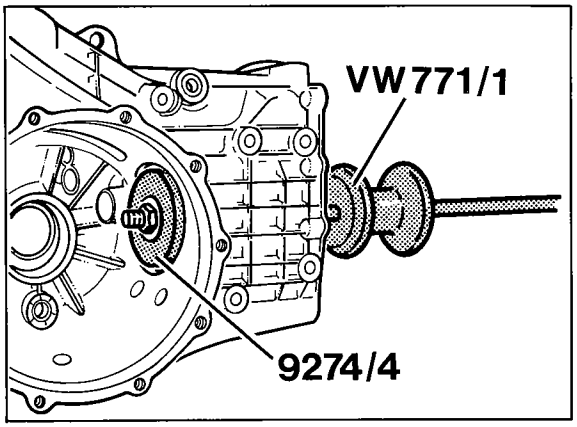
Dismantling and assembly notes

Dismantling

1. Remove snap ring (No. 22), disengaging one end of the snap ring from the groove by turning with screwdriver „A".
   Secure disengaged end with screwdriver "B".
   Continue levering out ring with screwdriver „A".



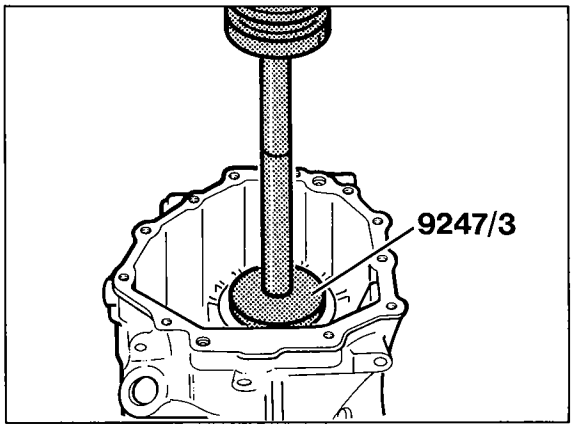
2. Drive out tapered roller bearing for drive pinion with Special Tool 9247/4 and punch tool VW 771/1.



1176-34

Assembly

1. Place tapered roller bearing outer race for drive pinion into heated transmission housing. Always fit with a shop press as the bearing race might otherwise be tilted in the bore and get stuck.
   Use Special Tool 9247/3 and pin P 254.
   Keep up preload under the press for approx. two more minutes until heat exchange has occurred.



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page

General

Clutch, autom. torque converter

Automatic Transmission, Operation, Housing

Automatic Transmission, Gears, Controls

Differential / Transaxle System

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Removing and installing torque converter

Removing

1. Remove transmission
   (refer to page 37 - 201).

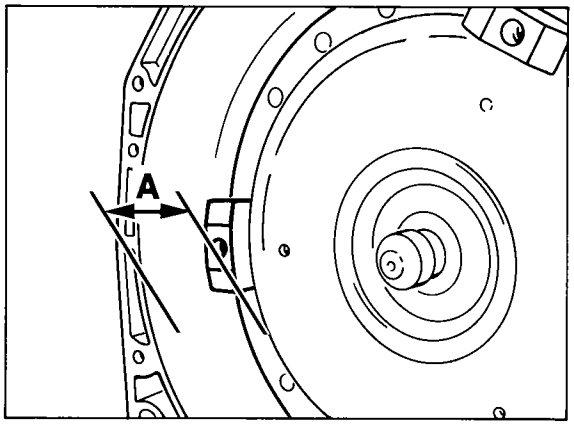
2. Remove converter, with transmission in horizontal position.

Note

Do not damage converter bearing assembly and rotary shaft seal.

Installing

1. Carefully insert converter, with transmission in horizontal position. Turn the converter to and fro until the gear toothing engages and the installation position is reached.



412-32

A = approx. 10 mm

2. Make sure the converter does not drop out.

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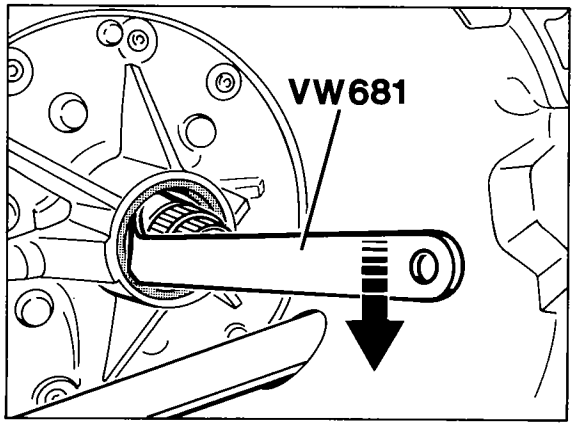
Removing and installing the rotary shaft seal for the torque converter

Removing

1. Remove transmission and converter.

2. Lever out sealing ring with **VW 681.** Take care not to damage the housing sealing face.



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Installing

Installation takes place in reverse order.

1. Wet sealing lip with ATF.

2. Using Special Tool **9344**, press in seal until it is seated against the stop.

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Removing and installing transmission - Model A 44

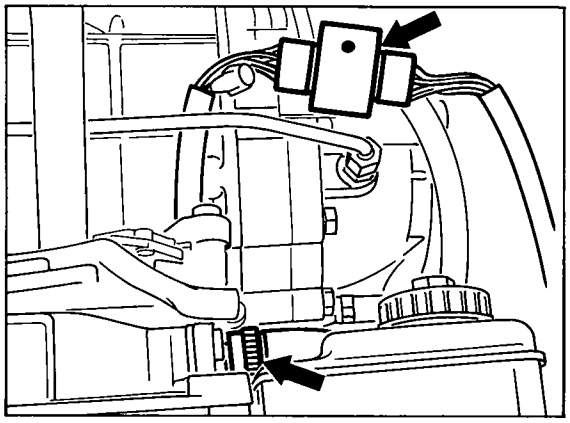
Removal

1. Remove rear muffler and heat shield.

2. Unbolt drive shafts on transmission side and suspend horizontally on vehicle.

3. Pull off rpm sensor (inductive sensor) and unclip wire from transmission housing. On USA vehicles, remove support at rear transmission cover.

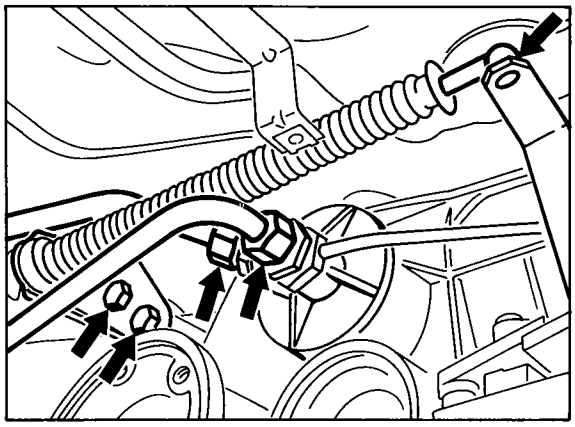
4. Disconnect wiring connectors at transmission.



1144-37

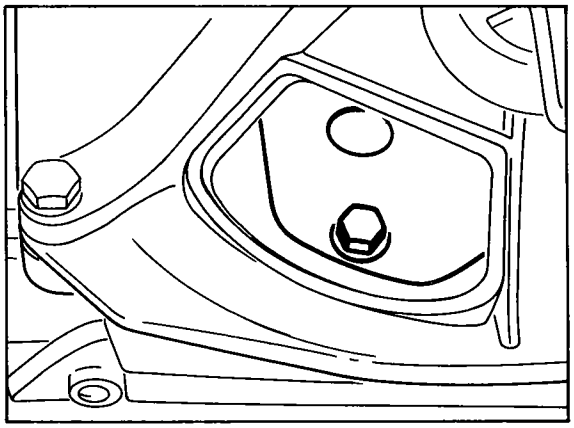
5. Disconnect ATF lines from transmission housing, using a second open-ended wrench to lock. Plug oil bores to avoid ingress of dirt.

6. Disconnect selector lever cable from lever and bracket from transmission. The ball socket keeps the cable from jumping out of position.



1145-37

7. Remove cover for service hole and undo torque converter fastening bolts. If required, lock pulley to keep assembly from turning.



1146-37

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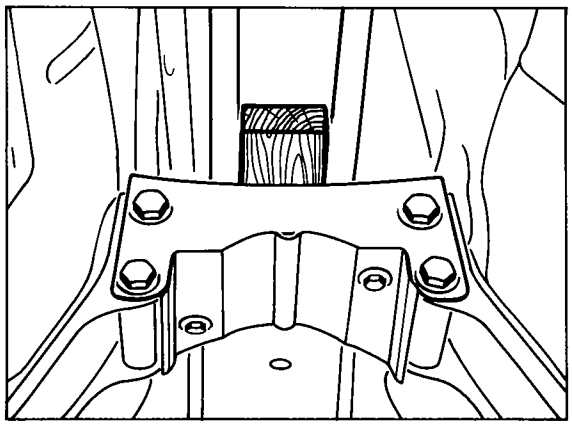
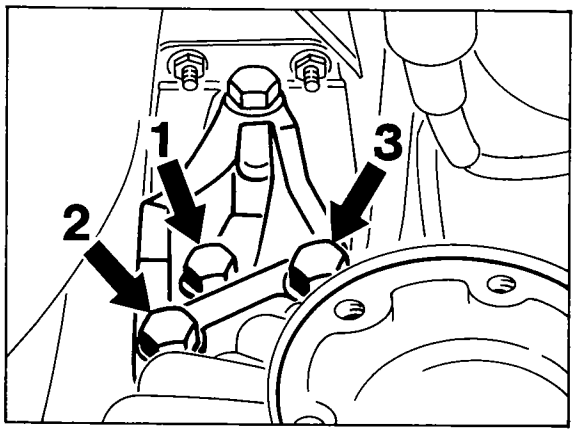
8. Keep transmission complete with central tube in installation position, placing a suitable wooden block between crosslink and central tube. Make sure the oil lines have enough clearance.



1147-37

9. Place transmission jack below transmission and secure with mounting strap.

10. Remove fastening bolts for transmission mounts.



1148-37

11. Remove fastening bolts for transmis sion/central tube housing. Pull back transmission with torque converter and extract carefully towards bottom. Secure torque converter against dropping out.

Installation

1. Fit transmission using the transmission jack. Apply a light coat of multipurpose grease to the lug at the torque converter and guide in the driver plate.

2. Put transmission into place and fit flange bolts. Tighten all fastening bolts to the specified torque.

3. Retain transmission in installation position and fit transmission mount.

Note

Tighten the mounting bolts of the transmission suspension in a 1-2-3 sequence (refer to Fig. 1148-37).

4. Tighten ATF lines to the transmission, fitting new seals.

5. Fit bracket to transmission and engage selector lever cable in D position.

6. Check adjustment. Select all gears and check if the respective gears are indicated on the tachometer. Also check gate change from „D“ to „M“. A straight movement must be possible without binding of the lever.

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Removing and installing solenoids

Removal

Note

When the solenoids are removed and fitted, the control unit may remain installed.

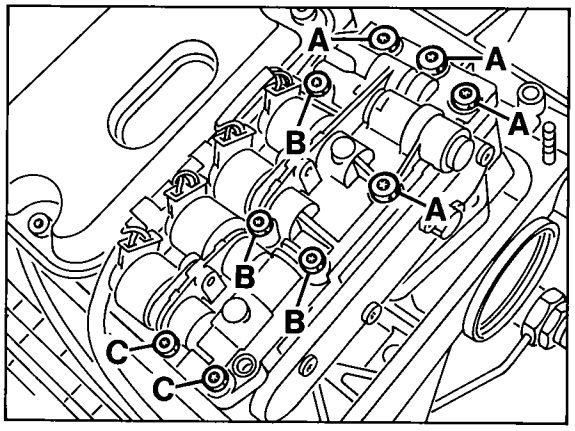
To replace solenoids 1, 2 and 3, however, the solenoid housing (1) must be removed.

The installation position of solenoid 4 is shown on page 38-211.

1. Remove ATF pan (refer to page 38 - 207).

2. Pull connector sleeves off the solenoids.

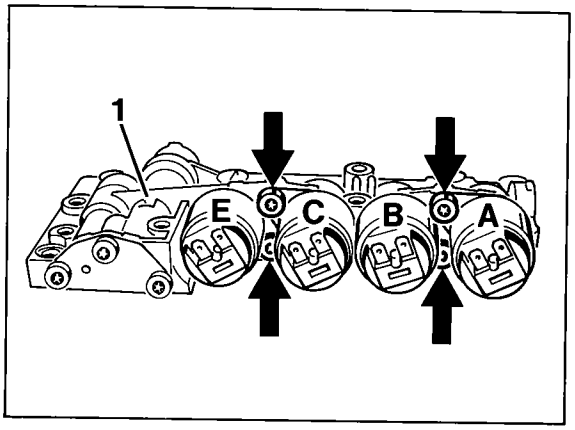
3. Screw out fastening screws and and take off valve housing complete with valves. (Transmission is removed in figure)



1273-38

A = Bolt M 6 x 80
B = Bolt M 5 x 70
C = Bolt M 5 x 65

4. Mark installation position of solenoids for re-assembly, remove retaining brackets and take out solenoids.



1274-38

A = Solenoid 1
B = Solenoid 3
C = Solenoid 2
E = Solenoid for pressure regulator
1 = Solenoid housing

Installation

Note

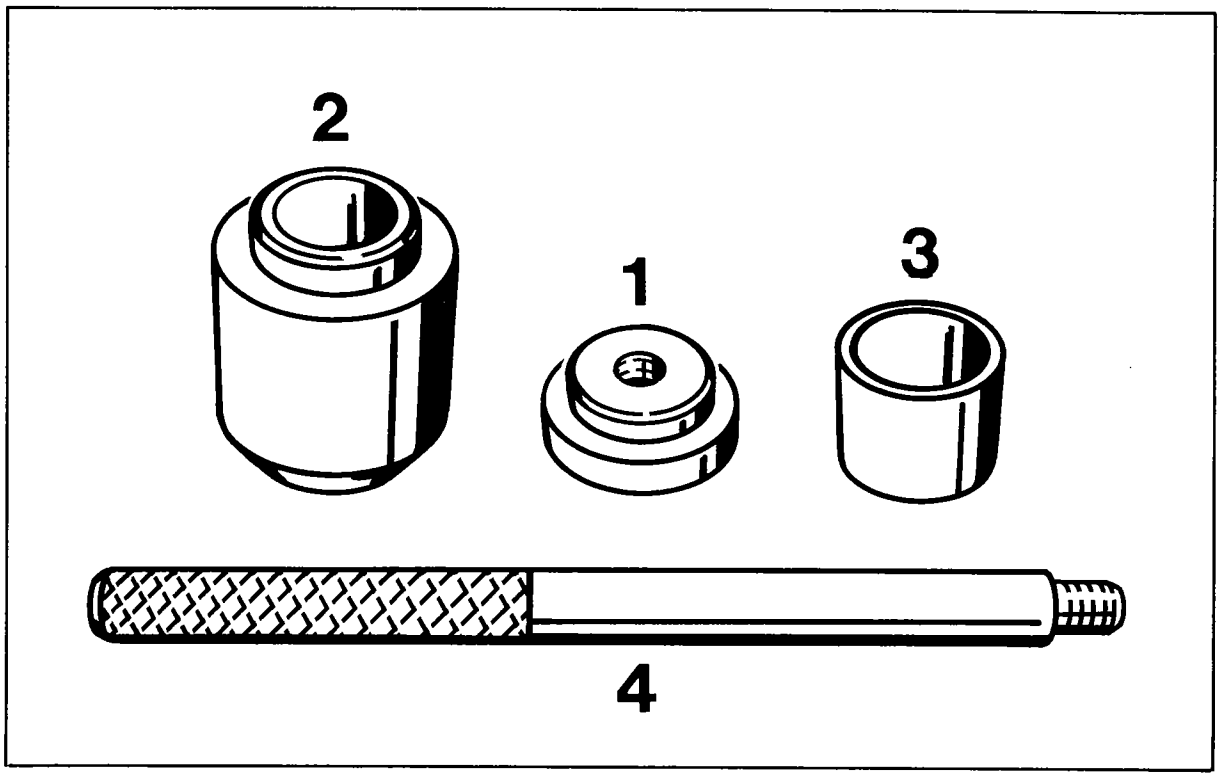
The solenoid for the pressure regulator (E) may only be replaced complete with the solenoid housing (1).

Install in reverse order.

1. Fit retaining brackets for solenoids with the lugs facing the solenoid housing.

Removing and installing output shaft

Tools



No.	Designation	Special Tool	Order number	Explanation
1	Thrust piece	9345	000.721.934.50	
2	Thrust piece	9347	000.721.934.70	
3	Thrust piece	9349	000.721.934.90	
4	Threaded pin	P 254	000.721.254.00	

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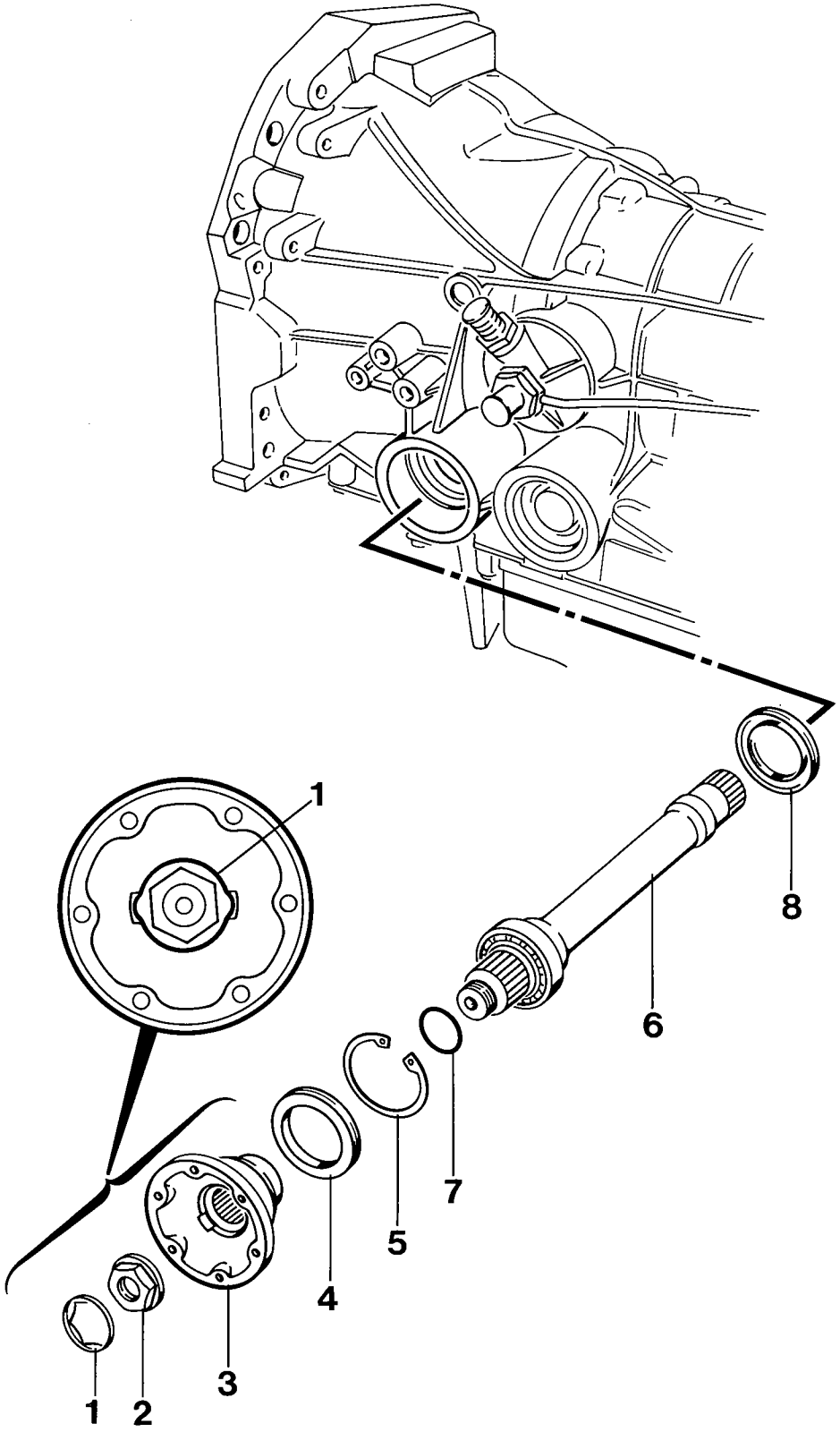
Removing and installing output shaft



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No.	Designation	Qty.	Note: Removal	Installation
1	Tab washer	1	Lever out with suitable screwdriver	Replace. Use Special Tool 9349 to press into stop.
2	Collar nut	1	Screw two M8 bolts into output flange and lock flange with suitable lever	Tighten **to 100 Nm** (74 ftlb.) and lock with tab washer.
3	Output flange	1		
4	Shaft seal	1	Lever out carefully with Special Tool **VW 681**, taking care not to damage the sealing face in the housing.	Replace. Pack space between dust lip and sealing lip with multi-purpose grease. Coat outside with a thin coat of vaseline and press in manually using Special Tool **9347** until it is seated at the snap ring. If required, apply light hammer blows to drive it in up to the stop. The sealing lip must face the snap ring.
5	Snap ring	1		Check for correct seating
6	Output shaft (with ball bearing)	1	Tighten output flange with collar nut and pull out complete with shaft.	Pack ball bearing with approx. 25 grams of grease (e.g. Shell Alvania R3).
7	Round seal	1		Replace, coat lightly

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No.	Designation	Qty.	Note: Removal	Note: Installation
8	Shaft seal	1	Pull out with suitable internal puller (e. g. Kukko, No. 21/6) and puller tool **VW 771/1**	Replace. Pack space between dust lip and sealing lip with multi-purpose grease. Coat outside with a thin coat of vaseline and press in manually using Special Tool **9345** until it is seated against the stop. If required, apply light hammer blows to drive it in up to the stop. **The sealing lip must face the ball bearing of the output shaft.**

Note

The output shaft may also be removed and installed with the transmission remaining installed.

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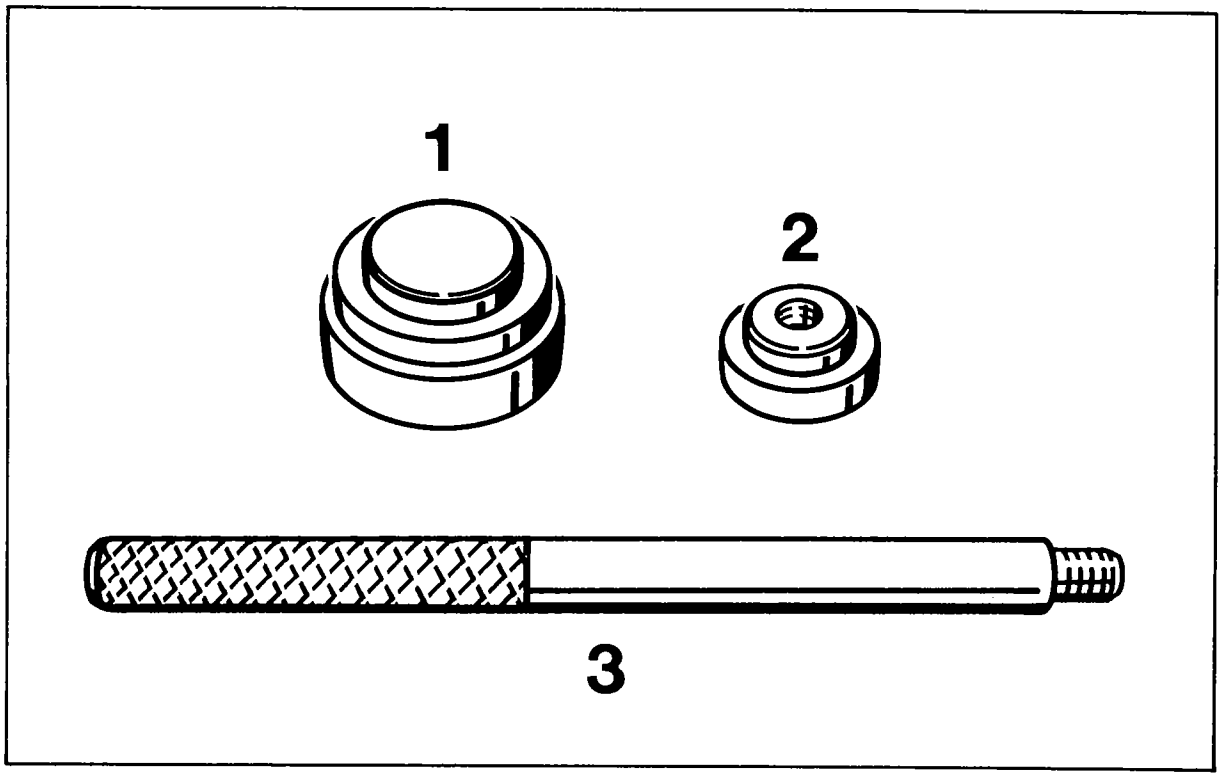
Removing and installing differential

Tools



No.	Designation	Special Tool	Order number	Explanation
1	Thrust piece	9346	000.721.934.60	
2	Thrust piece	9348	000.721.934.80	
3	Threaded stud	P 254	000.721.254.00	

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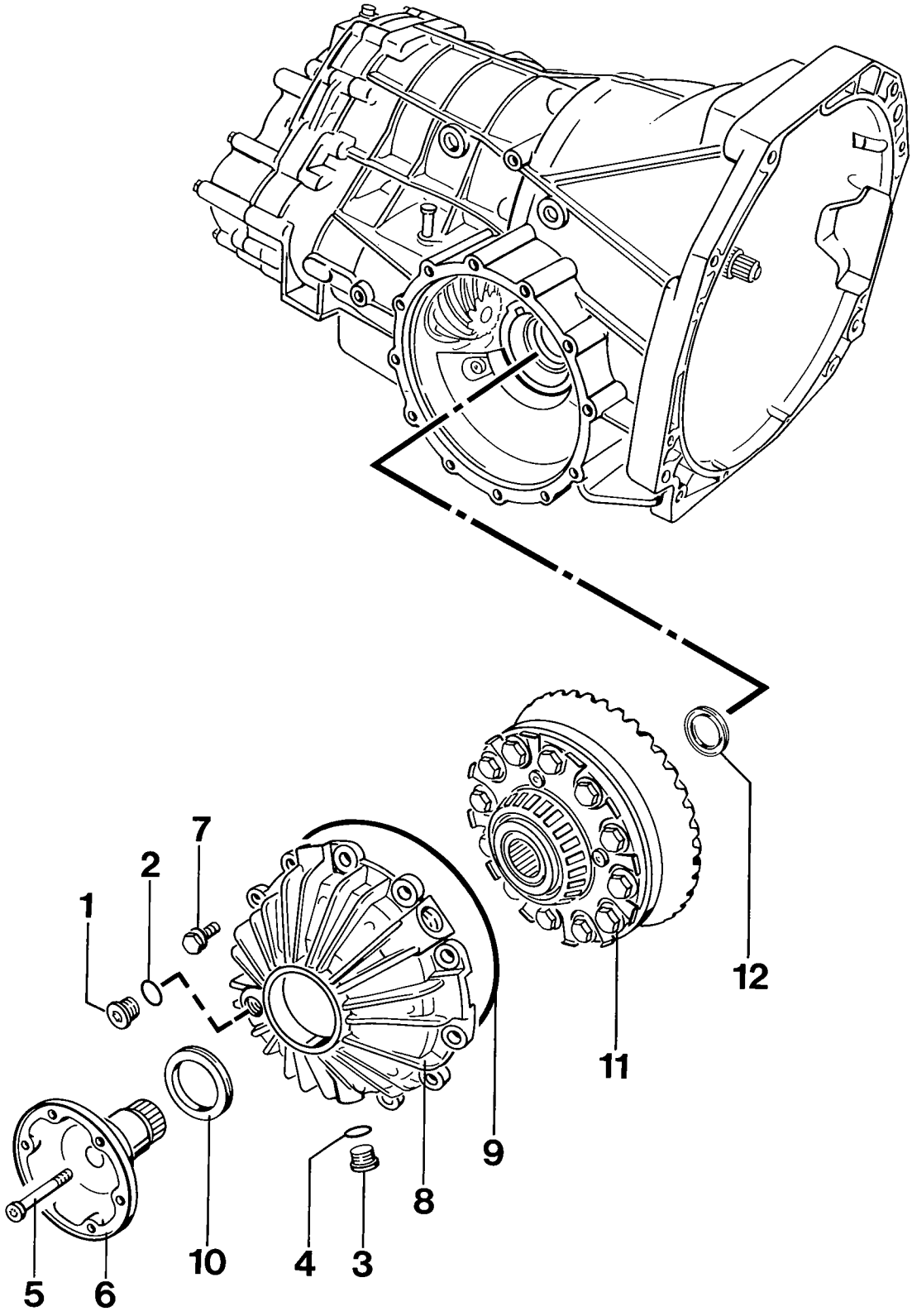
Removing and installing differential



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No.	Designation	Qty.	Note: Removal	Installation
1	Plug (M 18 x 1.5)	1		Tighten to **50 Nm** (37 ftlb.)
2	Seal	1		Replace
3	Plug M 16 x 1.5	1		Tighten to **40 Nm** (30 ftlb.)
4	Seal	1		Replace
5	Waisted-shank bolt	1		Must always be replaced, tighten to **25 Nm** (18 ftlb.)
6	Output flange	1		
7	Hexagon head bolt	12		Tighten to **23 Nm** (17 ftlb.)
8	Cover	1		
9	Round seal	1		Replace, oil lightly
10	Shaft seal	1	Lever out with **VW 681** with the transmission remaining fitted. Make sure the sealing face of the cover is not damaged.	Replace. Pack space between dust lip and sealing lip with multi-purpose grease. Drive in with Special Tool **9346** until it is seated against the stop.
11	Differential	1		
12	Shaft seal	1	Remove output shaft (refer to page 39 - 207). If the transmission remains installed, use a suitable lever (e.g. hook of twin-arm puller) to lever it out carefully. If the transmission has been removed, push out from inside. Make sure the sealing face of the housing is not damaged.	Replace. Pack space between dust lip and sealing lip with multi-purpose grase. Coat outside lightly with vaseline and push in manually with Special Tool **9348**, observing correct position **(sealing lip faces differential)**. If required, apply light hammer blows to drive it in to stop.

Note

The differential may also be removed and installed with the transmission remaining installed.
In this case, support transmission and undo transmission suspension (refer to removal and installation of transmission on page 37 - 201).

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page

Front wheel suspension

The following topics of Repair group 40 are described in the Repair Manual Type 944, vol. 3:

Rear wheel suspension, drive shaft

The following topics of Repair group 42 are described in the Repair Manual Type 944, vol. 3:

Wheels, tires, alignment

Anti-lock braking system

The following topics of Repair group 45 are described in the Repair Manual Type 944, vol. 3:

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Brakes, mechanical

The following topics of Repair group 46 are described in the Repair Manual Type 944, vol. 3:

Brake, hydraulics, regulator, booster

The following topics of Repair group 47 are described in the Repair Manual Type 944, vol. 3:

Steering

The following topics of Repair group 48 are described in the Repair Manual Type 944, vol. 3:

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page

Body, general

Body, Front

Body, Center

Body, Rear

Lids

Doors

Convertible top

Bumpers

Glasses, window control

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Exterior equipment

Interior equipment / Airbag

Seats

Diagnosis airbag

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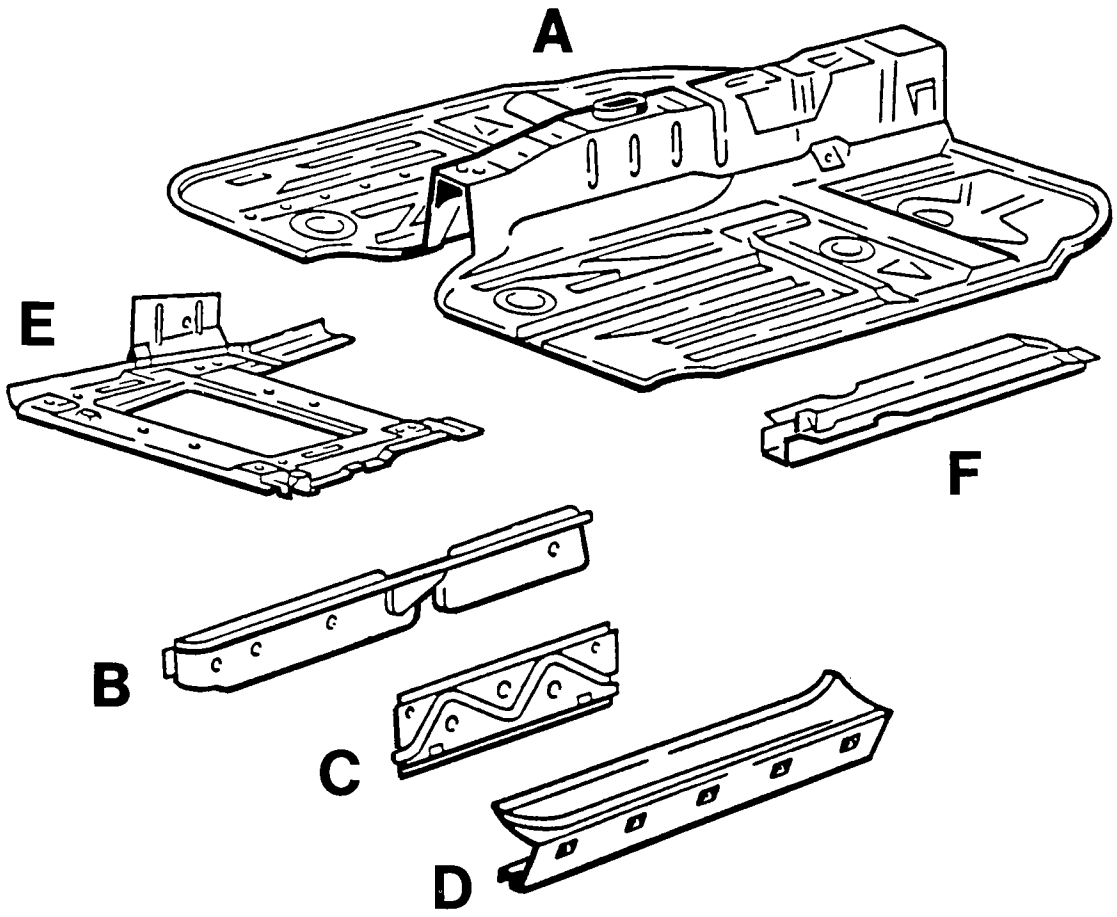
Replacing part of door sill with side member and floor pan

The following body spare parts are required for this sectional repair:



A = Floor pan center
B = Side member center
C = Web panel
D = Door sill
E = Seat base
F = Side member floor

1328-51

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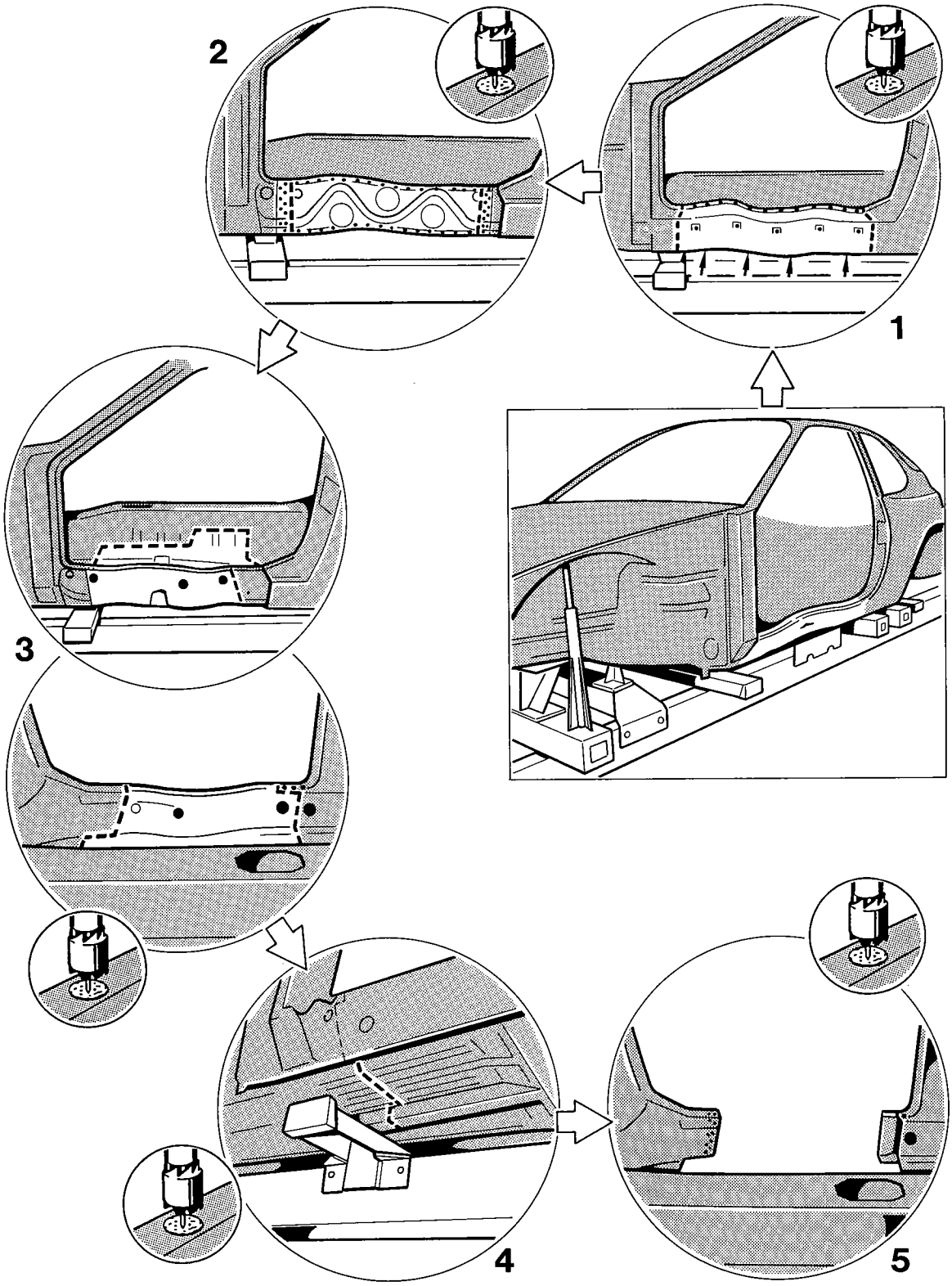
Replacing part of door sill with side member and floor pan

Cutting part of door sill with side member and floor pan out of body



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Replacing part of door sill with side member and floor pan

Cutting part of door sill with side member and floor pan out of body

Remove all ancillaries and accessories, including the interior, from center body area and front fender area!

No.	Operation	Instructions
	Place vehicle on alignment bench	Place vehicle without ancillaries onto attachment set.
1	Cut through door sill and separate spotwelds	Using a body saw, cut through door sill ahead of outer side panel and ahead of outer hinge post area. Use a spotweld cutter to separate spotwelds between door sill and center of side member, floor pan center and hinge post.
2	Cut through web panel and separate spotwelds	Using a body saw, cut through web panel ahead of rear inner side panel and ahead of front inner side panel. Use a spotweld cutter to separate spotwelds between web panel and center of side member, floor pan center, rear inner side member and front inner side member.
3	Cut through center of side member, floor pan center and tunnel	Cut through side member center ahead of rear side member and ahead of hinge post, floor center behind seat base and ahead of hinge post as well as along tunnel using a body saw.
4	Cut through floor side member and separate spotwelds	Cut though floor side member at an offset to floor pan, using a body saw. Separate spotwelds between floor side member and floor pan using a spotweld cutter.
5	Separate spotwelds between center side member / rear side member	Use a spotweld cutter to separate spotwelds between center side member and rear side member.

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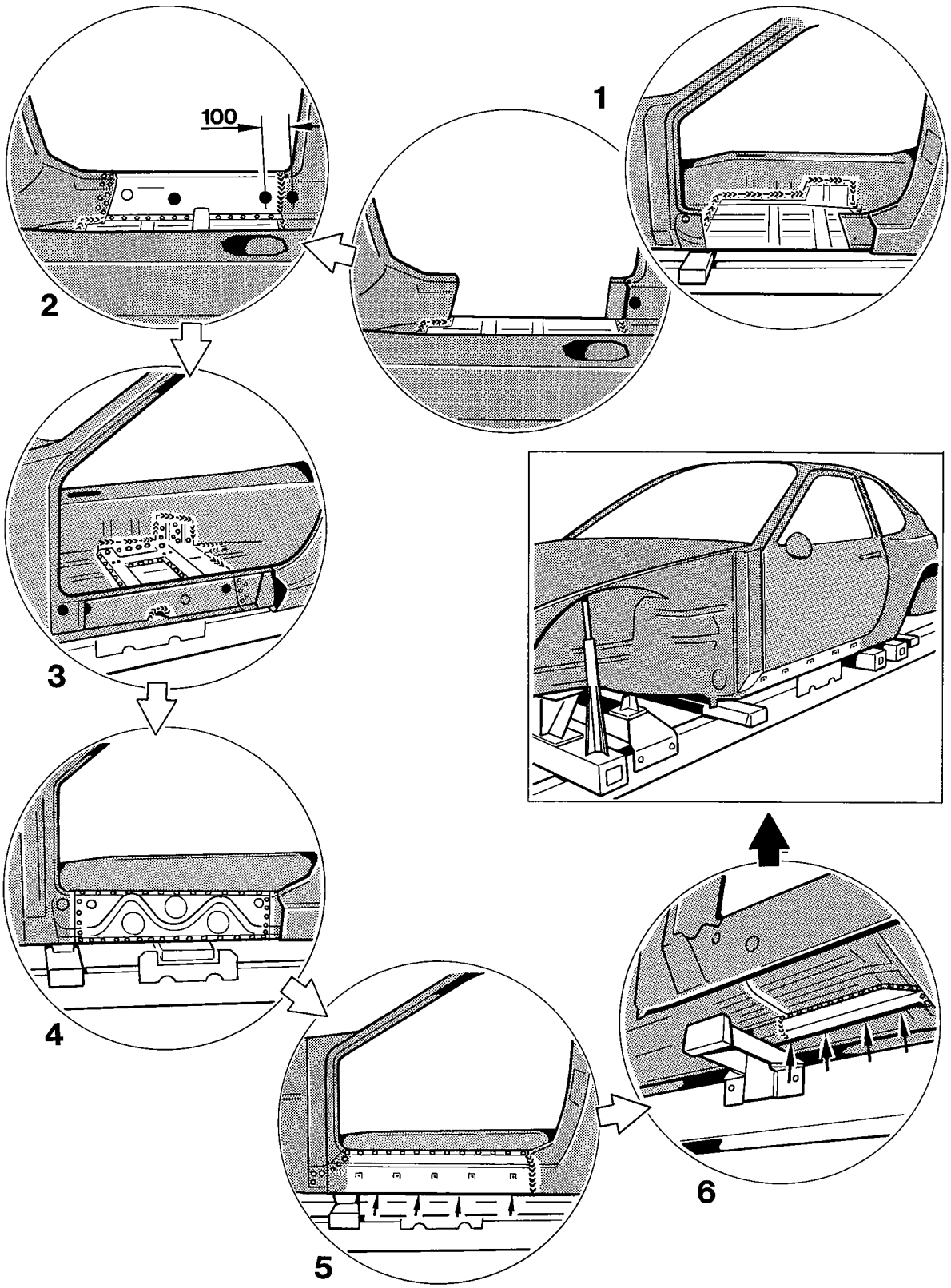
Replacing part of door sill and floor pan

Fitting part of door sill with side member and floor pan into body



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Replacing part of door sill with side member and floor pan

Fitting part of door sill with side member and floor section into body

No.	Operation	Instructions
	Perform straightening operations and adjust body with attachment set	Perform all straightening operations on the bodywork. Adjust body with attachment brackets. Trial-fit door into body aperture. The door gap between door and body must be uniform along the entire surround.
	Clean welding areas	Using a hot air gun or rotary wire brush, remove undersealing, paint etc. from welding areas of body. Remove factory primer from weldings areas of spare panels with a rotary wire brush.
	Fit floor pan into body and prepare for welding	Fit spare floor panel into body, making an overlap fit in the floor and tunnel areas. Joddle spare floor panel to the inside in those areas. Drill spare floor panel for plug welding.
1	Weld floor panel into body	Clamp spare floor panel with clamping tools. Plug weld spare floor panel with rear floor, front floor and tunnel using MIG equipment. MIG-weld overlapping areas between spare floor panel and floor pan, running an intermittent full seam.
	Prepare center side member for fitting into body	Prepare center side member along front side member mating flange for full-seam MIG welding and along floor pan flange for MIG plug welding.
2	Fit center side member into body and MIG-weld	Fit center side member into body and adjust according to door and seat base contours. Plug-weld center side member to rear side member and floor pan using MIG equipment.

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No.	Operation	Instructions
3	Prepare seat base for fitting and weld into place	Drill seat base along spotweld flanges for plug welding. Plug weld seat base to center floor panel and tunnel, using MIG equipment. MIG-weld seat base to center side member running an intermittent full seam.
4	Fit web panel and weld into place	Drill web panel along front and rear spotweld flanges for plug welding. Fit web panel to center side member and center floor using clamping tools and spotweld into place. Plug weld web panel to rear inner side panel and front side panel, using MIG equipment.
5	Fit door sill and weld into place	Adjust rear end of spare door sill to body sill, making a butt joint. Drill door sill in hinge post mating area for plug welding. Fit door sill into body and adjust according to door contours. Fit door sill to center floor pan and center side member using clamping tools. MIG-weld spare door sill to body door sill running a full seam, making a butt-joint. Spotweld door sill to center floor pan, center side member and web panel. Plug-weld door sill to hinge post using MIG equipment.
6	Fit floor side member and weld into place	Fit spare floor side member to body flor side member, making a butt joint. Drill floor side member along spotweld flanges for plug welding. MIG-weld spare floor side member to body side member, making a butt joint. Plug weld floor side member to floor pan, using MIG equipment.

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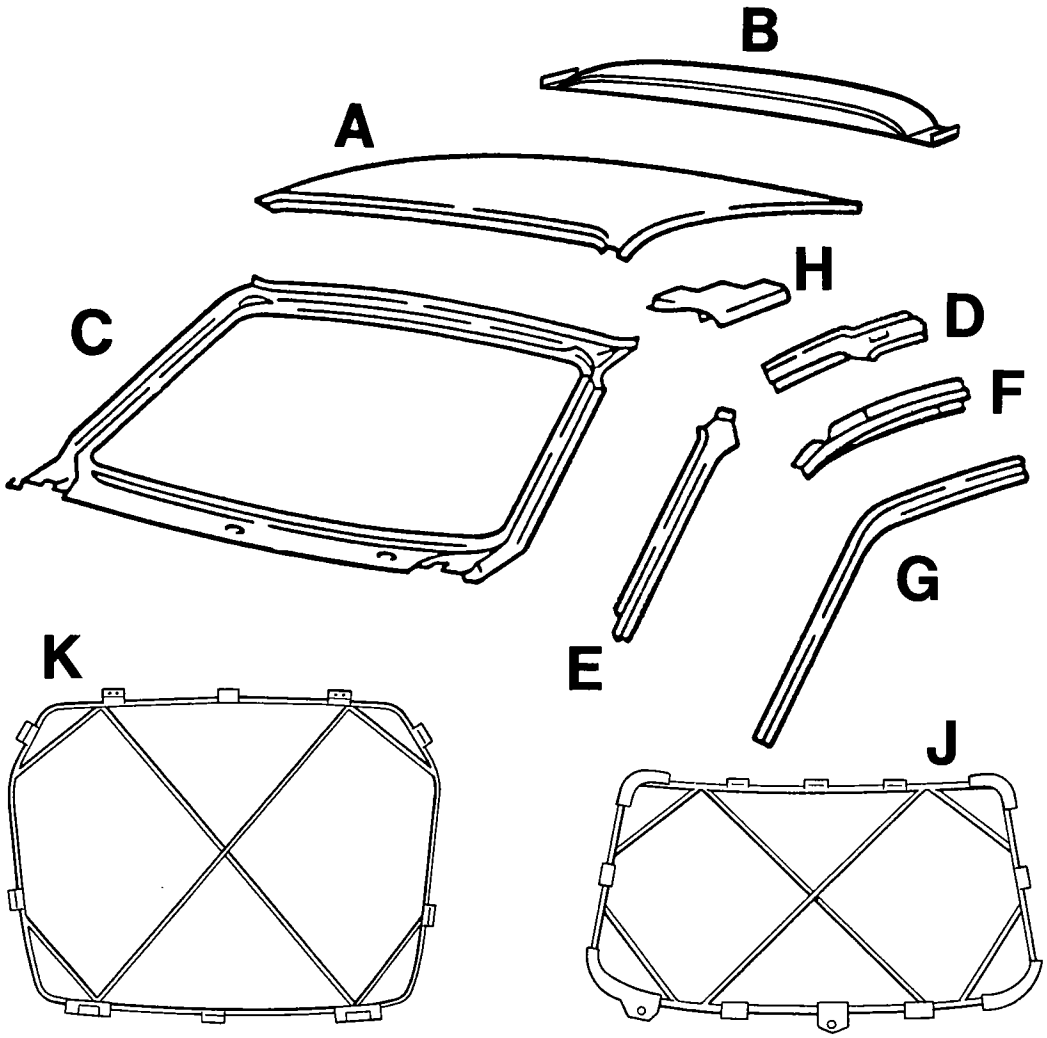
Replacing complete roof

The following body spare parts and special tools are required when the complete roof is to be replaced:



1346-51

A = Outer roof panel
B = Rear roof rail
C = Windshield frame
D = Upper side panel
E = Inner side panel
F = Lock panel
G = Roof rail
H = Reinforcement
J = Special Tool P 9120
K = Special Tool P 9121

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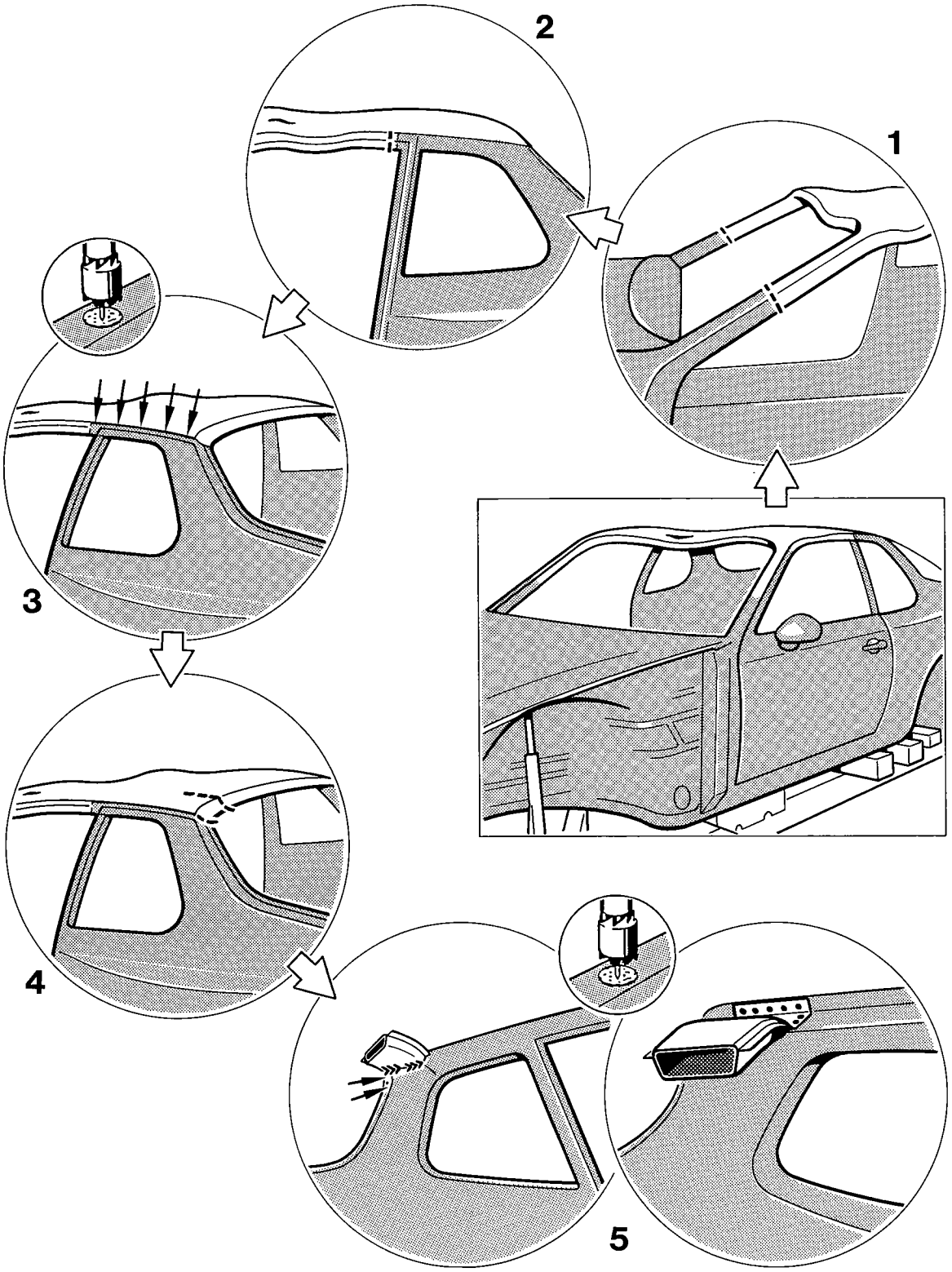
Replacing complete roof

Cutting roof panel and roof rail out of body



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Replacing complete roof

Cutting roof panel and roof rail out of body.

Remove all ancillaries and accessories and the entire interior including all window glass!

All straightening operations must be completed before the roof is replaced!

No.	Operation	Instructions
	Place vehicle onto straightening equipment	Place vehicle without ancillaries onto attachment set and tie down vehicle.
1	Cut through A-pillars	Cut A-pillars using a body saw.
2	Cut through roof rail and roof panel	Cut through roof rail and roof panel ahead of B-pillar using a body saw.
3	Separate welds of roof	Separate spotwelds between roof and rear side panel using a spotweld cutter
4	Cut through rear roof rail and roof panel	Cut through rear roof rail and roof panel using a body saw. Cut through welds of roof to outer and inner rear side panel using a body saw.
	Lift complete roof off the body	
5	Separate spotwelds of rear roof rail	Grind off welds between rear roof rail and inner side panel and separate with spotweld cutter. Separate spotwelds between rear roof rail and roof rail with a spotweld cutter.

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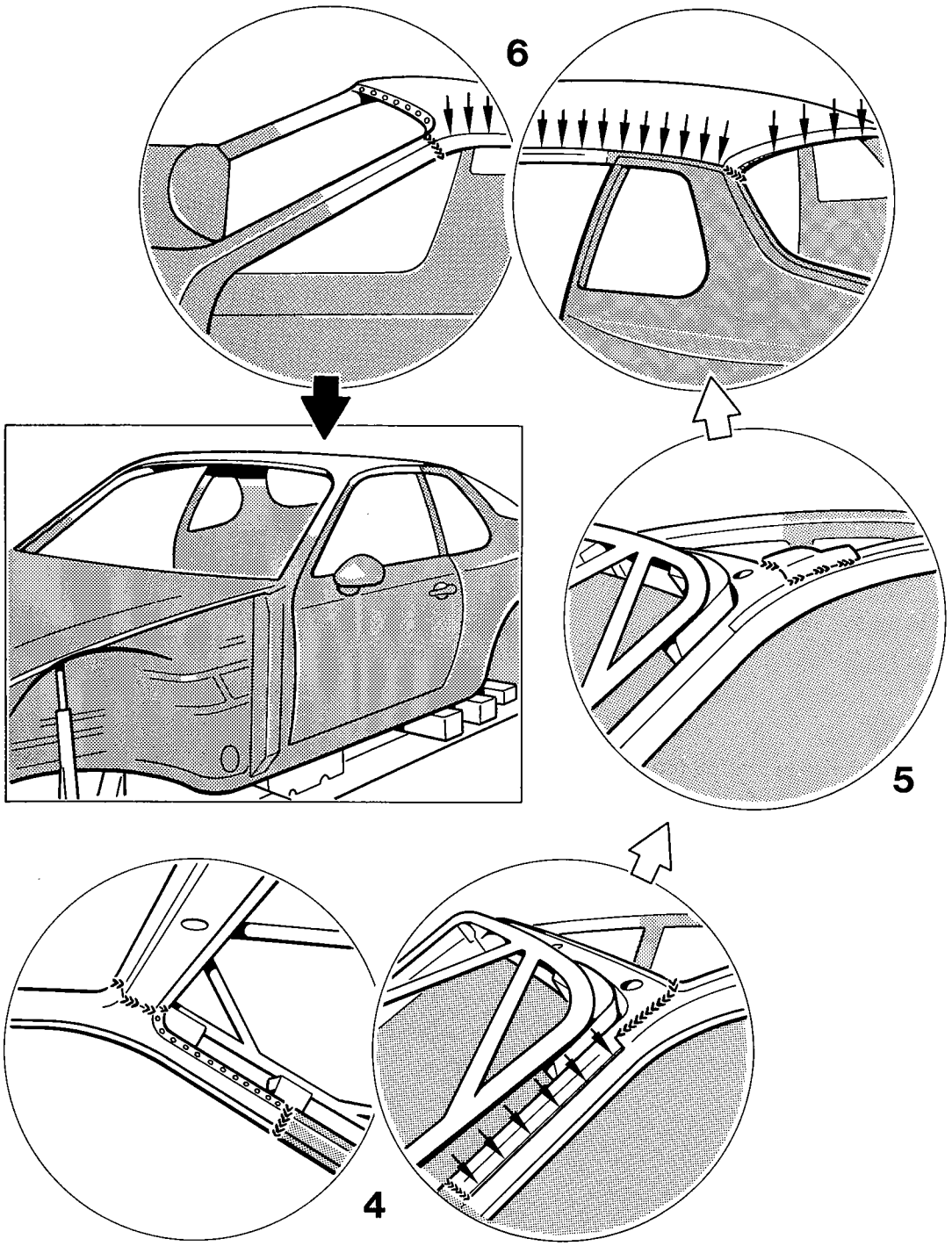

Replacing complete roof

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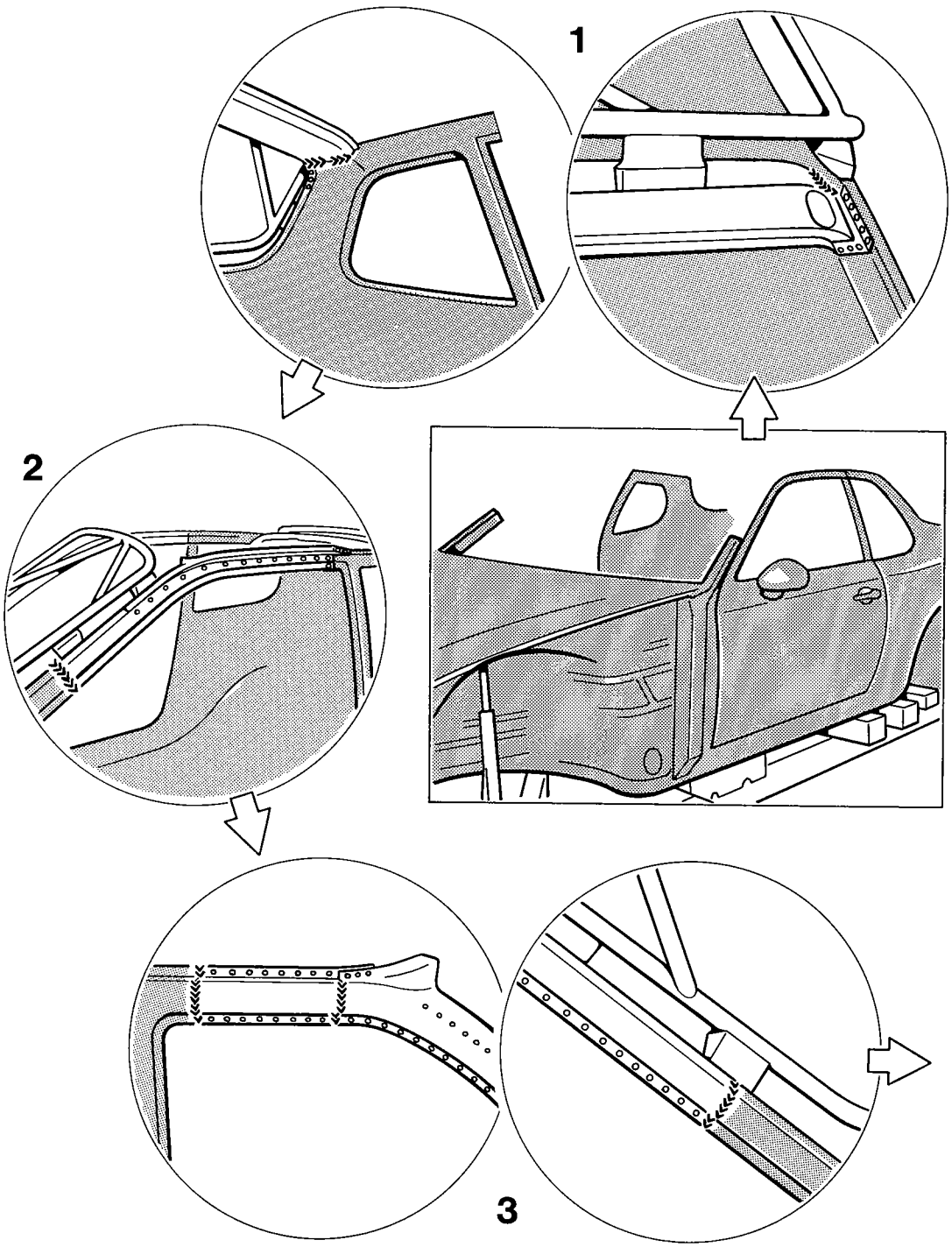
Replacing complete roof

Fitting roof panel and roof rail into body



Replacing complete roof

Fitting roof panel and roof rail into body

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Replacing complete roof

Fitting roof panel and roof rail into body

No.	Operation	Instructions
	Clean welding areas	Using a hot air gun or a rotary wire brush, remove sealant residue, paint etc. from welding areas of body. Remove factory primer from welding areas of spare panels.
1	Fit rear roof rail to body and weld into place	Fit rear roof rail to body using Special Tool **P 9121** and attach with clamps. MIG-weld rear roof rail to outer rear side panel, running a full seam. Spotweld rear roof rail to roof rail. MIG-weld and spotweld rear roof rail to rear inner side panel, running an intermittent full seam.
2	Fit closing panel, roof rail and inner side panel to body and weld into place	Fit closing panel, roof rail and inner side panel to body according to door contours, using Special Tool **P 9120**, and clamp into place with suitable clamps. Tack-weld closing panel and roof rail to body. Remove inner side panel from body. Spotweld closing panel, roof rail and B-pillar. MIG-weld roof rail of body A-pillar to spare roof rail, running an intermittent full seam.
3	Fit upper side panel and inner side panel to body and weld into place	Fit upper side panel and inner side panel to body, using Special Tool **P 9160**, and clamp into place with suitable clamps. Spotweld upper side panel and inner side panel to roof rail and closing panel. MIG-weld upper spare side panel to body side panel and inner side panel, running a full seam. MIG-weld inner spare side panel to inner body side panel, running a full seam.

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No.	Operation	Instructions
4	Fit windshield frame to body and weld into place	Fit windshield frame into body, using Special Tool **P 9120**, and attach with clamps. MIG-weld windshield frame to closing panel, running a full seam. MIG-weld spare windshield frame panel to body windshield frame, running a full seam. MIG-weld windshield frame to inner side panel, running an intermittent full seam. Spotweld windshield frame to inner side panel and roof rail.
5	Fit reinforcement to body and weld into place	Fit reinforcement into roof rail and MIG-weld from **outside** and **inside**, running an intermittent full seam.
6	Fit roof outer panel to body and weld into place	Fit roof outer panel into body, using Special Tools **P 9120** and **P 9121**, and attach with clamps. Spotweld roof outer panel to roof rail. MIG-weld roof outer panel to windshield frame and rear outer side panel, running a full seam.

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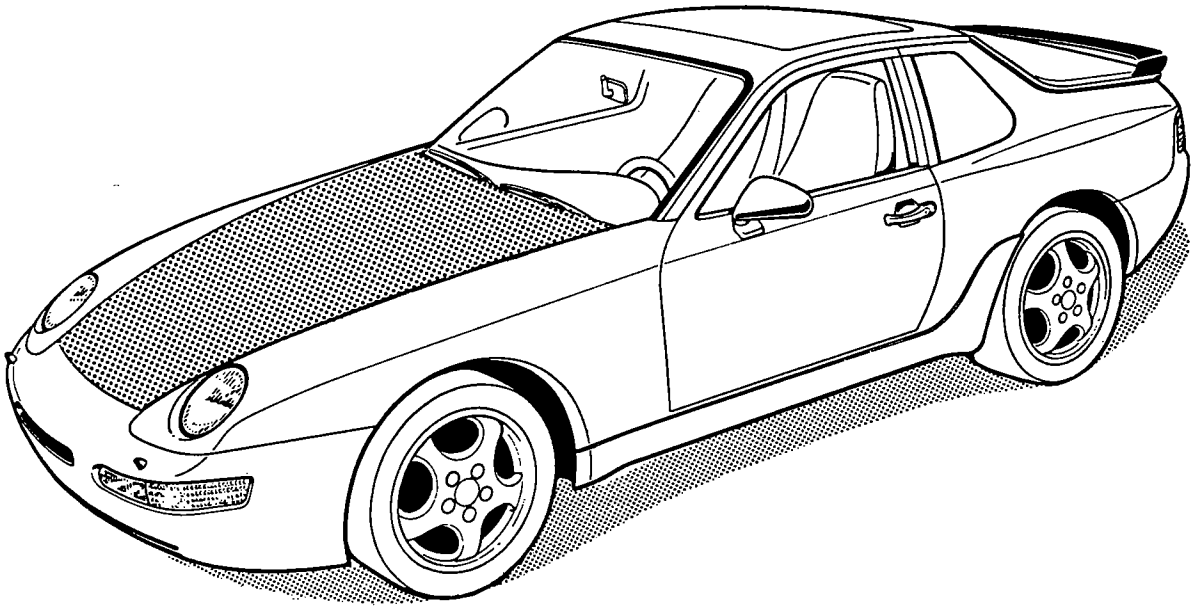
Dismantling and assembling front cover



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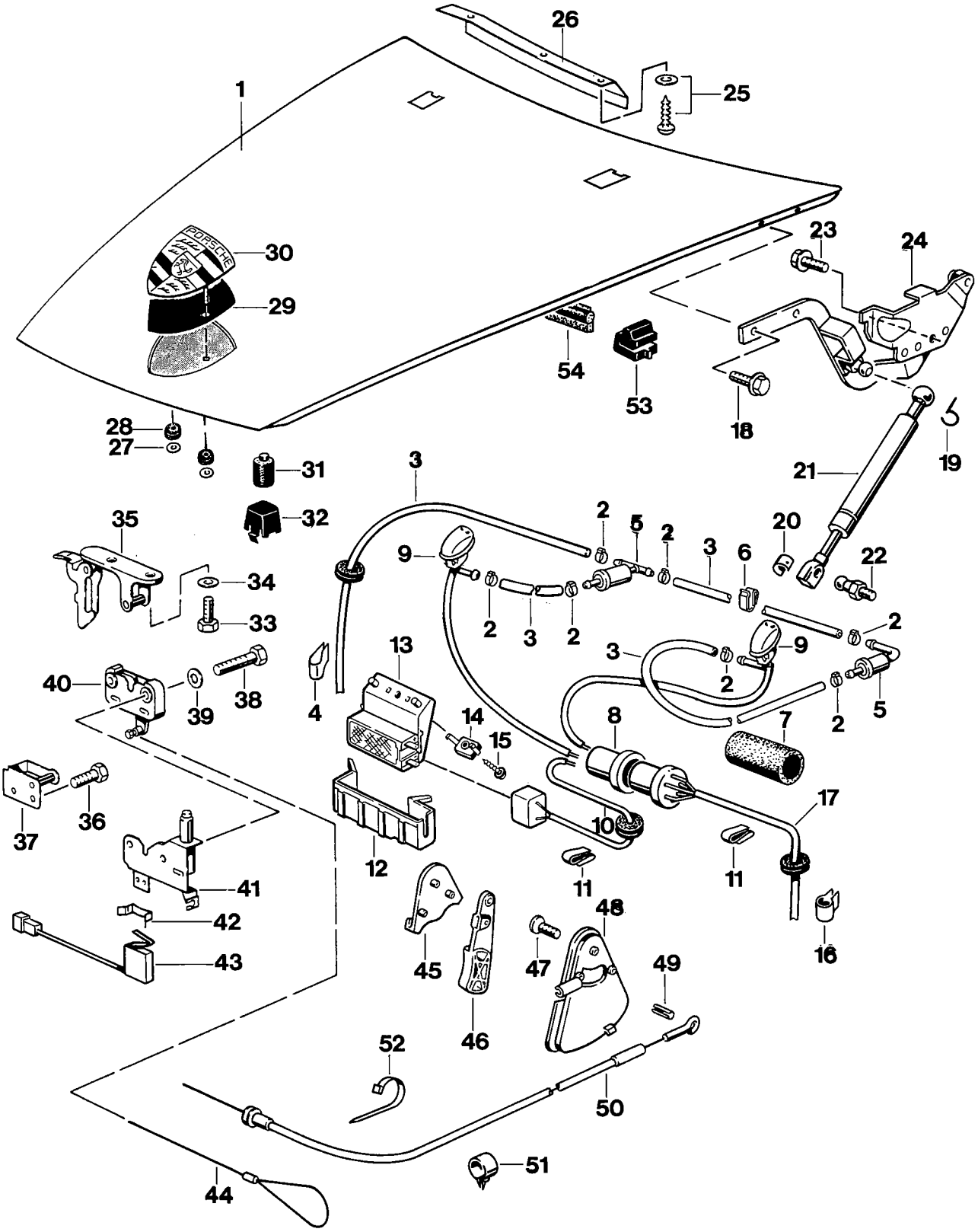
Dismantling and assembling front cover



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Dismantling and assembling front cover

No.	Designation	Qty.	Note: Removal	Installation
1	Cover	1		Adjust cover at hinges according to fender contours and front spoiler
2	Ear clamp 10/6	8	Remove	Replace
3	Hose	1	Separate from valve and pull out of cover frame complete with grommet	Push through cover frame complete with grommet, push onto valve and fit with ear clamp
4	Retaining clip	2	Unclip from cover hinge and separate from hose	Push onto hose and clip into cover hinge
5	Valve	2		Check, replace if required
6	Retaining clip	9	Unclip from cover frame and hose	Clip onto hose and cover frame
7	Damper	1	Push off the connector	Push onto the connector
8	Connector	1	Unclip wire	Clip wire into place according to wiring diagram
9	Heated windshield washer nozzle	2	Unclip from cover in upward direction	Clip into cover from above
10	Wiring harness	1	Remove from engine compartment light and pull out of cover frame complete with grommet	Route in cover frame and clip to engine compartment light
11	Retaining lip	9	Unclip from cover frame and wiring harness	Clip into wiring harness and cover frame
12	Protective cap	1	Pull off engine compartment light	Push onto engine compartment light
13	Engine compartment light	1		
14	Cap	1		

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No.	Designation	Qty.	Note: Removal	Installation
15	Combination screw 4.2 x 13	1		
16	Retaining clip	2	Unclip from cover hinge and pull off the wiring harness	Push onto wiring harness and clip onto cover hinge
17	Wiring harness	1	Pull out of cover frame complete with grommet	Engage into cover frame complete with grommet
18	Hexagon head bolt M 8 x 18	4		
19	Retainer	2	Unclip from ball socket of gas strut and pull out	Engage into ball socket of gas strut and clip into place
20	Retainer	2	Push down on ball socket of gas strut	Push up on ball socket of gas strut
21	Gas strut	2	Unclip from ball pin	Clip back into ball pins
22	Ball pin	2		
23	Hexagon head bolts	4		
24	Cover hinge	2		
25	Combination screw 4.2 x 13	4		
26	Tab washer	1		
27	Tapping nut	2		Replace
28	Grommet	2		Replace
29	Backing	1		Check, replace if required
30	Ornament	1		
31	Rubber buffer	2	Remove from cover frame with a rotary motion	Turn back into cover frame and adjust in such a manner that the cover is flush with the fender contours and the front spoiler
32	Bracket	2	Unclip	Clip into place

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No.	Designation	Qty.	Note: Removal	Note: Installation
33	Hexagon head bolt M 6 x 12	2		
34	Washer A 6.4	2		
35	Cover lock upper section	1		Adjust to allow the catch to engage correctly in the support and to engage the riveted pin correctly into the cover lock
36	Hexagon head bolt M 6 x 16	2		
37	Support	1		Adjust to allow the catch to engage correctly
38	Hexagon head bolt M 6 x 35	2		
39	Washer A 6.4	2		
40	Cover lock lower section	1		Adjust to allow the riveted pin to engage correctly
41	Support	1		Fit with lower cover lock section to body
42	Spring clip	1	Unclip from seat	Clip back into seat
43	Bimetallic-element switch	1	Unclip spring clip and disconnect connector	Clip spring clip into place and reconnect connector
44	Emergency operation	1	Remove lateral front trim (carpet) in the cover and bearing cup area	Refit lateral front trim (carpet) in the cover and bearing cup area
45	Cover	1	Unclip from bearing cup in upward direction	Clip into bearing cup from above
46	Pull handle	1	Remove from bearing cup complete with bowden cable	Insert into bearing cup complete with bowden cable
47	Countersunk head bolt M 6 x 15	2		

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No.	Designation	Qty.	Note: Removal	Installation
48	Bearing cup	1	Unscrew countersunk head bolts and unclip from below	Clip into body from below and tighten with countersunk head bolts
49	Roll pin 4 x 12	1	Drive out	Replace
50	Bowden cable	1	Drive out roll pin, unclip clamp and bracket and open tie-wrap. Undo clamping screw from cover lock. Unclip from support	Insert roll pin, clip stay, retainer clip and bracket back into place. Clip into support. Tighten clamping screw on cover lock
51	Retainer clip	1	Unclip	Clip into place (replace if required)
52	Tie-wrap	1	Open	Replace, close
53	Filler pad	2	Remove	Bond into place
54	Gasket	1	Lift off in upward direction	Push into place

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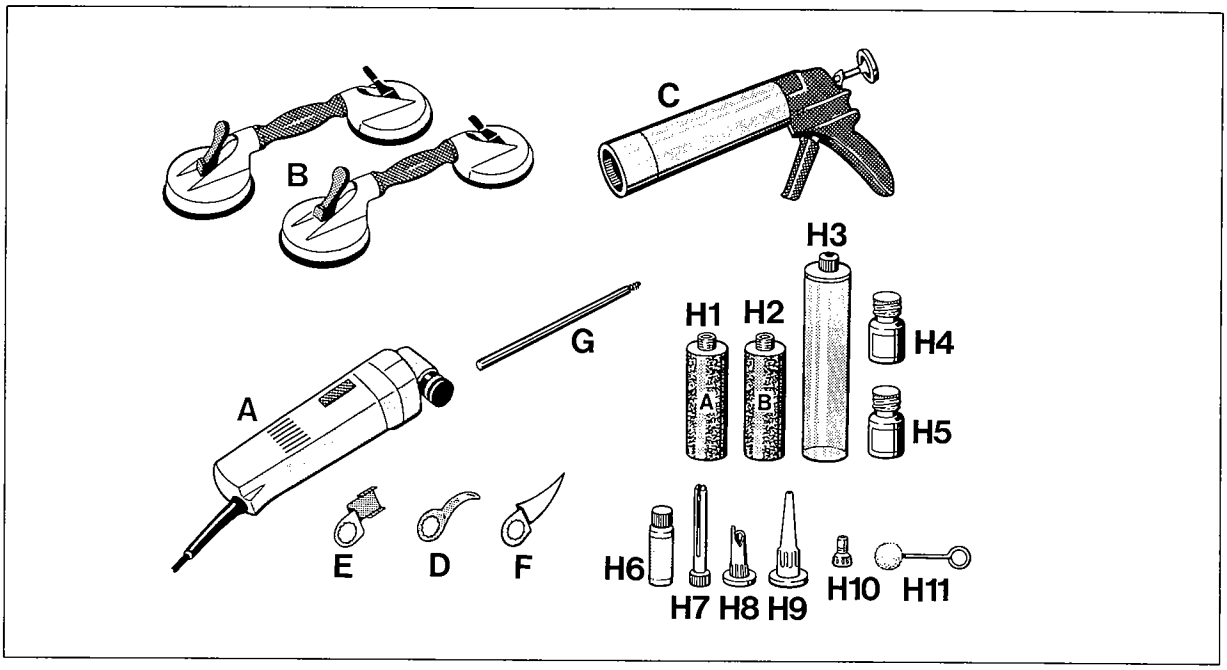
Removing and installing rear side window — 2-pack adhesive

The following tools and materials are required for removal and installation of the rear side window using 2-pack adhesive:



1266 - 64

A	Cutter	VAG 1561	e.g. VW Werk AG
B	Twin-cup suction puller	VAG 1344	Service equipment supply
C	Bonding gun	VAG 1628	
D	Cutting knife, curved	639.031.030.17	e.g. C & E FEIN GmbH & Co.
E	Flashing knife	639.031.130.22	P.O. Box 172
F	Cutting knife, cranked	639.030.720.17	7000 Stuttgart 1
G	Mixing rod 9528	000.721.952.80	Porsche Parts Department
H	Adhesive set	599.915.509.40	

Contents of adhesive set:

H 1 = Cartridge component A
H 2 = Cartridge component B
H 3 = Mixing cartridge
H 4 = Primer
H 5 = Activator
H 6 = Cleaning solution
H 7 = Injector nozzle
H 8 = Application nozzle
H 9 = Application nozzle
H 10 = Filling nozzle
H 11 = Touch-in tool

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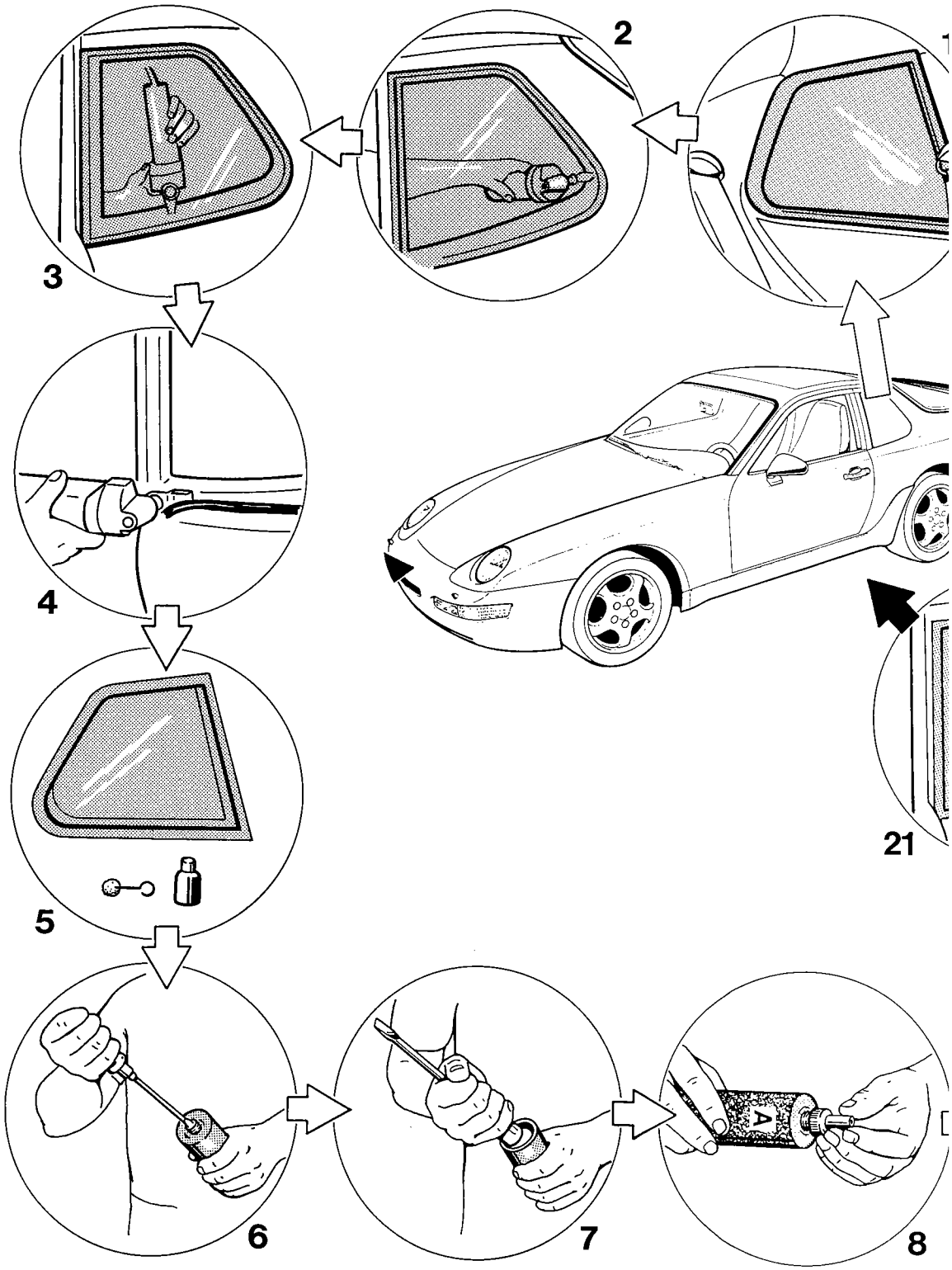
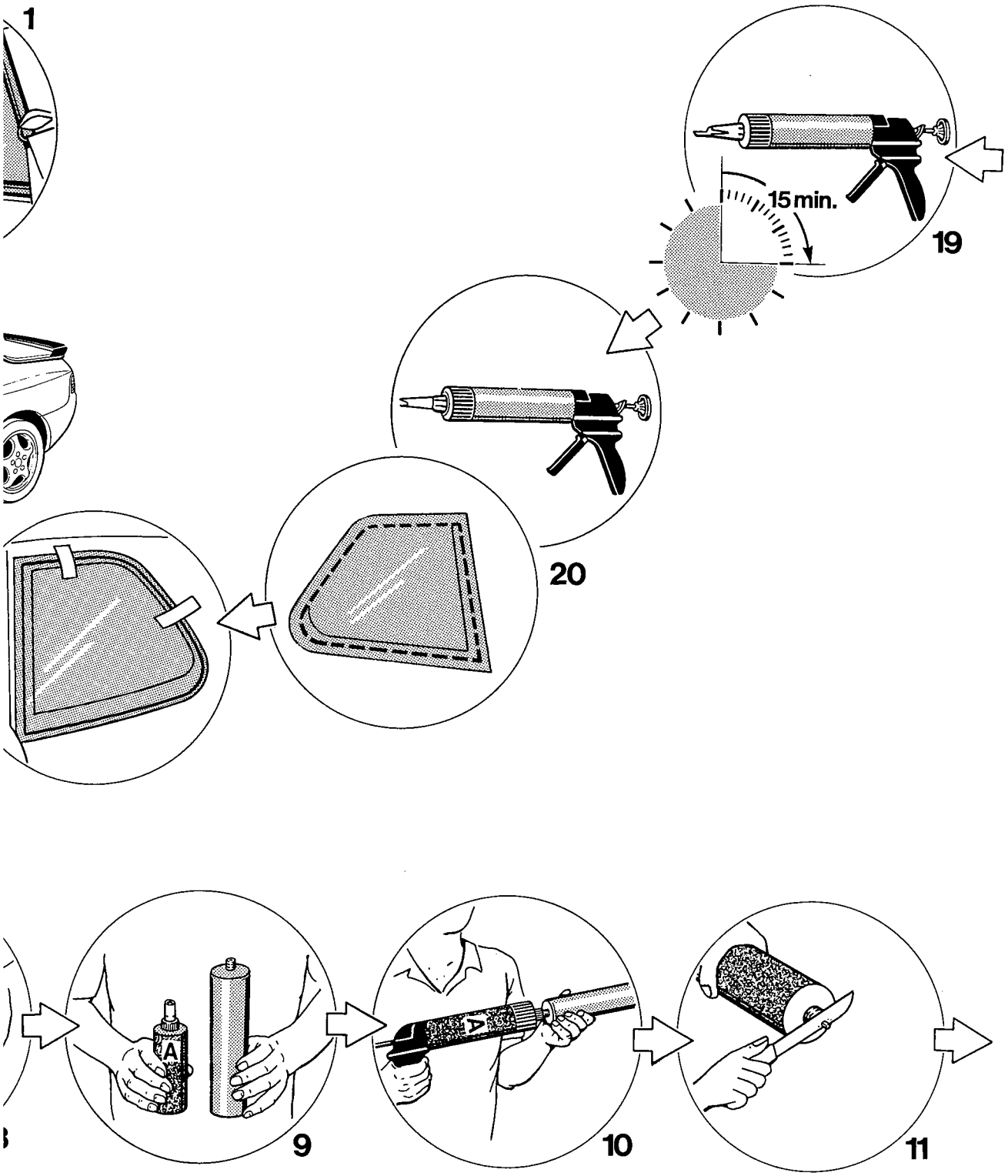
Removing and installing rear side window — 2-pack adhesive





Removing and installing rear side window — 2-pack adhesive

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Removing and installing rear side window — 2-pack adhesive

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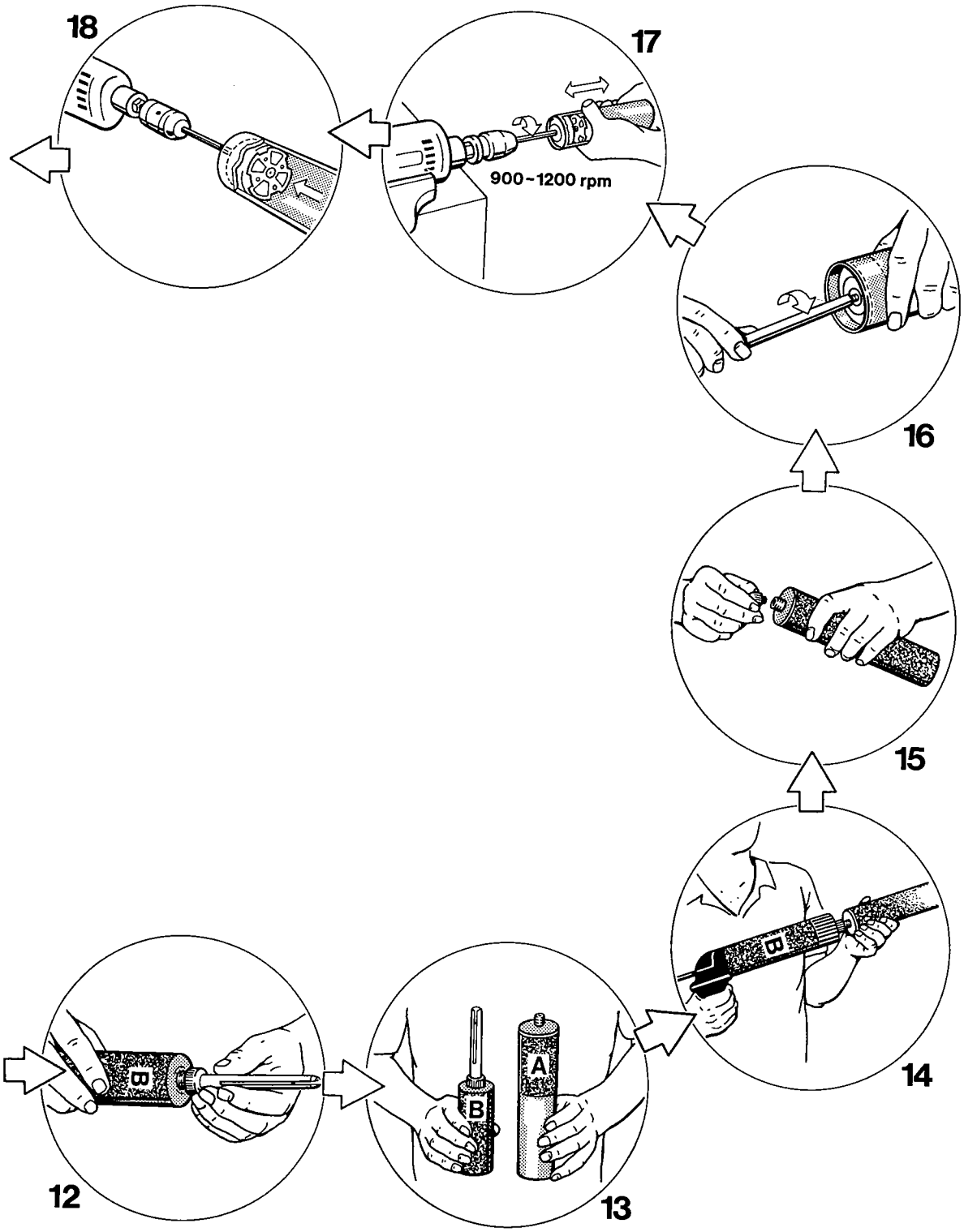
Removing and installing rear side window — 2-pack adhesive



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Removing and installing rear side window — 2-pack adhesive

Removing rear side window

No.	Operation	Instructions
1	Remove interior in rear side window area	Remove cover strip of rear side window for side trim, B-pillar and roof rail.
	Fit cover to rear side panel	Cover rear side panel to avoid staining or damage.
	Open door window	**Caution: The door windows may only be closed after the curing time has elapsed.**
2	Cut out rear side window in roof rail and B-pillar area	Insert U-shaped knife (D) into cutter (A). Set vibration regulator to stage 3. Cut bonding between rear side window and body from inside (passenger compartment) along B-pillar and roof rail.
3	Cut out rear side window in side trim panel area	Insert cranked knife (F) into cutter (A). Set vibration regulator to stage 3. Cut bonding between rear side window and body from inside (passenger compartment) along side trim panel.
	Lift out rear side window	
4	Remove adhesive from body	Insert flashing knife (E) into cutter (A) and use flashing knife to remove adhesive from body only to the extent that the remaining adhesive covers the whole area in a uniform manner.

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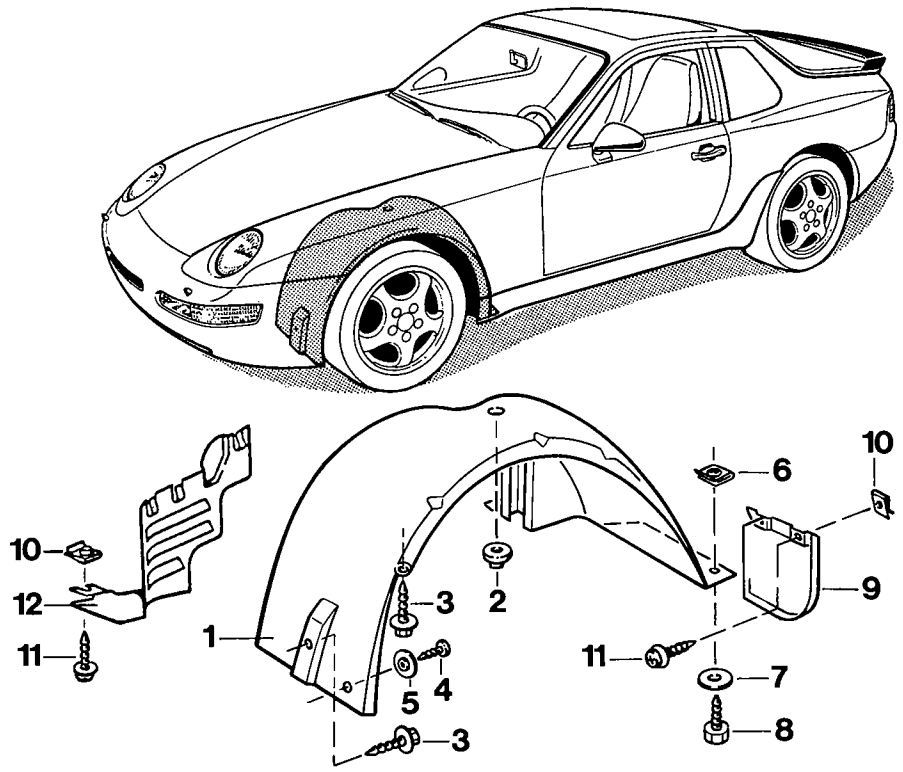
Removing and installing wheel housing liner



1400 - 66

No.	Designation	Qty.	Note: Removal	Note: Installation
1	Wheel housing liner	2		
2	DRK button T5	8		Replace
3	Combin. screw M 6 x 16	4		
4	Sheetmetal scr. B 4.2 x 16	4		
5	Spacer	4		
6	Sheetmetal nut 6.3	4		Adjust to center of hole
7	Washer B 6.4	4		
8	Sheetmetal screw 6.3	4		
9	Cap	2		
10	Sheetmetal nut B 4.8	10		Adjust to center of hole
11	Combination sheetmetal screw 4.8 x 19	10		
12	Extension	2		

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Safety Precautions for Working on Cars with Airbag

Airbag units are pyrotechnical items of Danger Class T 1. Handling, transportation and stor-age are subjected to the legislation for explo-sives.

The mentioned legislative measures refer to the Federal Republic of Germany. Always conform with the pertinent legislation in other countries.

The beginning of work on pyrotechnical items must be reported to the Trade Supervisory Office (official authorities) 14 days in advance.

Shipping

The shipment of airbag units may only take place in the officially approved packaging for transportation. Airbag units may not be transported together with other dangerous items.

Within a company transportation is only permitted in the trunk or cargo room of a vehicle with use of the above mentioned packaging for transportation. Transportation in the passenger compartment is forbidden.

Storage

Storage of airbag units must be in conformance with the second ordinance of the legisation for explosives. According to this ordinance small amounts of substances and items may be stored at certain locations without a special storage permit. For pyrotechnical items of Danger Class T 1 this would be max. 20 kg (gross) in a workroom or max. 200 kg (gross) in a storeroom. Airbag units must be stored locked.

When storing airbag units it is very important to make sure that the padded sides face up (danger of injury from an ejected airbag unit in case of accidental ignition).

Airbag units may not be stored together with other products in danger classification (paint, etc.).

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Installation and Repairs

Testing and installing may only be carried out by qualified personnel.

The following precautionary measures are always mandatory prior to working on the airbag system as well as work on neighboring parts, where there is danger that power supplying parts could get too close to the airbag system.
1. Turn off ignition
2. Disconnect and cover battery ground pole.

After disconnecting the battery installation or repairs on the vehicle with use of a hammer or similar tools may first be begun after **waiting 20 minutes**. This is necessary to interrupt power supply of the airbag system and to guarantee that accidental ignition is not possible.

Installation of airbag units must commence immediately after removal from the location of storage. Under no circumstances may they be left unattended. Airbag units must be placed under lock immediately when installing procedures are interrupted.

Airbag units must never have contact with grease, oil, cleaning solutions or similar products.

Airbag units must never be subjected to temperatures above 90° C (195° F), not even briefly.

Airbag units, crash sensors and control units, which have fallen from a height of more than 0.5 meter (1.5 feet), may no longer be installed.

Additional trim, labels or anything similar may not be installed on the steering wheel or in the area of the front passenger's airbag.

No modifications or changes may be made on the wiring and components of the airbag system.

The battery must always be disconnected before beginning with straightening and welding work with use of an electric welder.

If welding is required in the immediate vicinity of crash sensors and control, these parts must be removed first.

Airbag components may never be repaired; they must always be replaced.

Note

Hands must always be washed thoroughly after touching triggered airbag units.

Scrapping Airbag Units

Non-ignited airbag units are a source of danger, even for the environment. Non-ignited airbag units may not be scrapped. They must be sent to Porsche or a responsible importer (see page 68 - 61).

Shipment of airbag units is permitted only in the officially approved packaging for transportation.

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Checking Airbag System Operation

1. **Functional check of airbag warning lamp.**
   Turn on ignition. The airbag warning lamp must light up for approx. 5 seconds*. If the warning lamp remains dim, check bulb and/or supply voltage.

2. **Functional check of error memory.**
   Turn on ignition and pull off fuse for instrument voltage supply for approx. 30 seconds. The airbag warning lamp must indicate an error.
   Read off error and check if error code 30 (airbag warning lamp: signal implausible error not present) is displayed.

Note

The central warning lamp must light along with the airbag warning lamp if an error is stored in the error memory.

3. Erase error memory.

4. Make sure that no covers, decals or similar items are fitted at the steering wheel and in the passenger airbag area.

5. Check components visually for damage and modifications.

6. After checking the system, confirm the check in the appropriate fields of the warranty and service booklet.

* As of manufacturing date 2 - 06 - 92: approx. 2.5 sec

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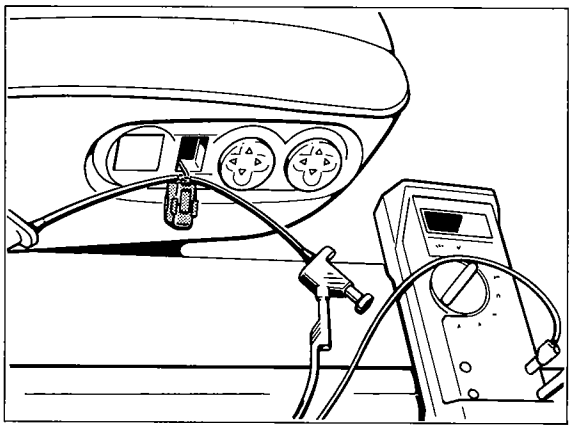
Checking seat heating

1. Remove switch cover (4 screws).

2. Disengage seat heating switch and pull out switch (take care not to damage the wire).

3. Switch on ignition.

4. Connect voltmeter to term. 1 (positive) and term. 2 (negative).



1343 - 72

Display: approx. 5 V

Note

If no voltage is displayed, check power supply according to wiring diagram.

5. Connect voltmeter to term. 2 (negative) and term. 3 (positive).
   Display, depending on potentiometer setting: approx. 2 - 3 V

6. Push tip switch into "on" position and keep it in this position.
   Display: approx. 5 V

7. Push tip switch into "off" position and keep it in this position.
   Display: approx. 0 V

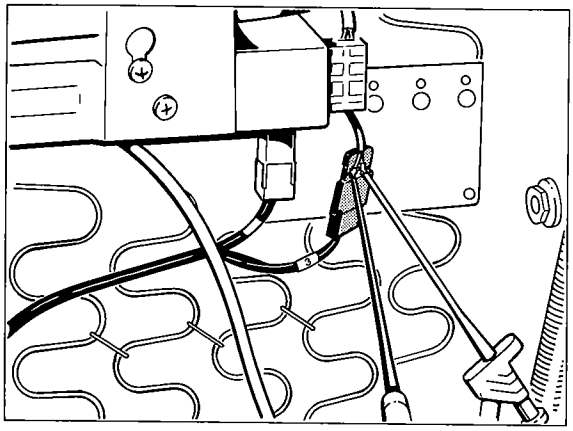
8. Turn knurled wheel of potentiometer all the way up.
   Display: approx. 3 V

9. Turn knurled wheel of potentiometer all the way down. The voltage must then drop to approx. 2 V.

10. Remove seat and connect to Special Tool 9269.

11. Switch on seat heating and set to maximum heating output.

12. Measure voltage at 2-pin connector marked with digit 3.



1344 - 72

When the seat heating is switched on, the voltage oscillates between 0 V and approx. 12 V (clocked voltage).

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Checking resistance of heater elements

Note

Use a digital ohmmeter for the measurements.

1. Disconnect connector marked with digit 3.

2. Zero out ohmmeter.

3. Connect ohmmeter on pin side.
   Display at 20° C ambient temperature:
   1.5 to 1.8 Ω

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Calibrating controllable seat heating

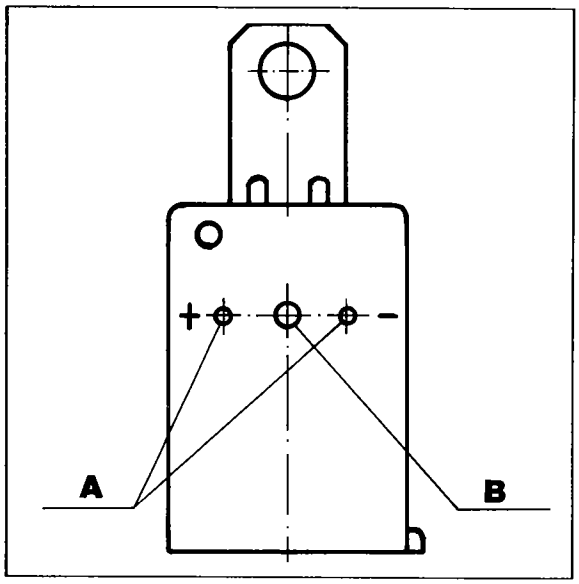
Control units

Note

The seat heating must be calibrated after the control unit or heating elements have been replaced.

Installation position

At the bottom of the seat



165 - 72

Control unit for seat heating

A - measuring point (V)
B - calibration potentiometer

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Tools

1. Digital–voltmeter with an internal resistance (Ri) ≥1 MΩ.
2. Two measuring probes with a maximum diameter of 2 mm.
3. Thermometer (as recommended in the Workshop Handbook).
4. 2 mm wrench.
5. Two auxiliary cables to supply voltage to the removed seat (terminals15 and 31). Use adapter cable 9269 for seat-position control.

Calibration procedure

1. Store the seat to be calibrated in the working area until it has assumed the ambient temperature.
2. Provide power supply.

Note

Do not switch on the seat heating. If switched on unintentionally, the seat must cool down until the heating elements have again adopted the ambient temperature.

3. Measure the ambient temperature and refer to the table for the relevant voltage value.
4. Connect the voltmeter to the control unit (A).
5. Set the voltage value on the calibration potentiometer (B) so that it corresponds to the appropriate value for the ambient temperature.

Table

Ambient temperature in°C	Voltage in V
0	1.50
2	1.55
4	1.60
6	1.65
8	1.70
10	1.75
12	1.80
14	1.85
16	1.90
18	1.95
20	2.00
22	2.05
24	2.10
26	2.15
28	2.20
30	2.25
32	2.30
34	2.35
36	2.40
38	2.45
40	2.50
42	2.55
44	2.60
46	2.65
48	2.70

Functional check

Switch on seat heating for approx. 10 sec. with maximum heating power. After switching off, measure the voltage at the control unit. The value measured now must be considerably higher.

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1. Fault memory

Fault code table

Fault code	Designation of fault	
10	Ignition circuits	– closed once
		– closed several times
		– permanently closed
		– contact resistance to U_B
		– contact resistance to ground
		– coupled 1/3 or 2/3
11	Left front sensor	– resistance too high
12	Right front sensor	– resistance too high
21	Ignition pill circuit 1	– resistance too high / too low
22	Ignition pill circuit 2	– resistance too high / too low
23	Ignition pill circuit 3	– resistance too high / too low
30	Warning light airbag	– Signal implausible
31		– Control unit defective
40 to 47		– Control unit defective
50 to 54		– Control unit defective
60 to 62		– Control unit defective
70	Crash entry	– only if airbag has been triggered

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Fault, Fault Code	Possible Causes, Elimination, Remarks

Note

After an airbag system fault has been detected and rectified, the fault memory **must** be erased.

Test point 1

Ignition circuits
closed once
Fault code 10

- Replace both front impact sensors.
- Check wiring harness for squeezed sections or chafing and replace if required.

Test point 2

Ignition circuits
closed several times
Fault code 10

- Refer to test point 1.

Test point 3

Ignition circuits
closed permanently
Fault code 10

- Refer to test point 1.

Test point 4

Ignition circuits
Contact resistance
to U_B
Fault code 10

- Check wiring harness to front impact sensors and ignition pills for squeezed sections and chafing. Replace if required.
- Using Special Tool 9541, check wiring to front impact sensors for short to positive terminal, replace if required.
- Check front impact sensors for short to positive terminal.
- If no fault can be detected at the front impact sensors and at the wiring, the control unit must be replaced.

Test point 5

Ignition circuits
Contact resistance
to ground
Fault code 10

- Check wiring harness to front impact sensors and ignition pills for squeezed sections and chafing. Replace if required.
- Using Special Tool 9541, check wiring harness to front impact sensors for short to ground.
- Check front impact sensors for short to ground.
- If no fault can be detected at the front impact sensors and at the wiring harness, replace the control unit.

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page

Air Conditioning

Radio, Telephone, In-board Computer

Exterior Lights, Lamps, Switches, outside

Instruments, Fuel Gauge, Alarm System

Printed in Germany – VIII, 1993

Technical data of air conditioning system

As of MY '93

Refrigerant charge 860 g refrigerant **R 134a**

Refrigerant oil in compressor 120 ± 20 c.c. ND 8

Tightening torques for refrigerant lines

Outside thread dia.	TPI	Tightening torque, Nm (ftlb.)
5/8"	18 UNF	17 ± 3 (13 ± 2)
3/4"	16 UNF	24 ± 4 (18 ± 3)

Hexagon head bolts	Thread	Tightening torque, Nm (ftlb.)
Evaporator	M 6	6 (4)
Compressor	M 8	28 (21)

Pressure switch to refrigerant line 3 Nm (2 ftlb.)

Note

When fitting the refrigerant line, coat the fittings and O-rings lightly with refrigerant oil.

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Pressure and temperature specifications

Refrigerant R 134 a

General testing requirements:

– V-belt tensioned correctly.

– Magnetic clutch energized.

– Condenser clean.

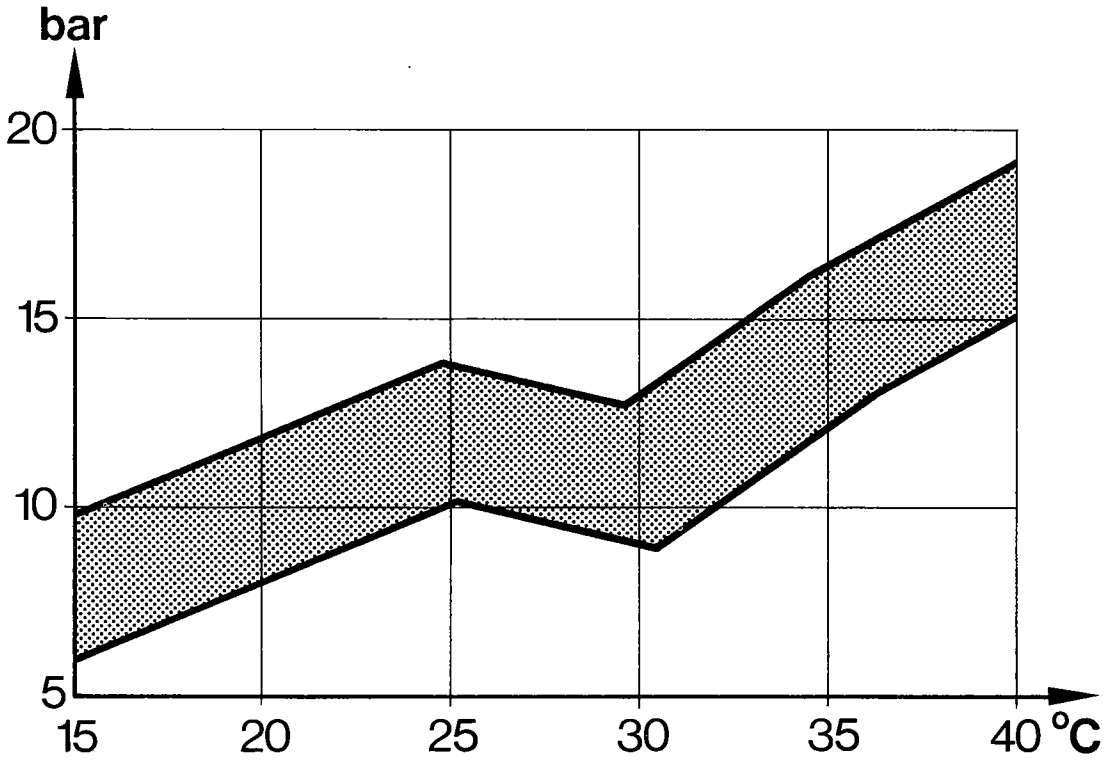
– Sunroof, doors and windows closed

1. Switch on A/C system.

2. Set temperature selector to max. cooling.

3. Set fresh-air blower to stage 4.

The pressures and temperatures indicated in the below diagrams must be reached after a running time of approx. 10 min and at a speed of 2,000 rpm with the compressor switched on.



High pressure in refrigerant circuit vs. ambient temperature

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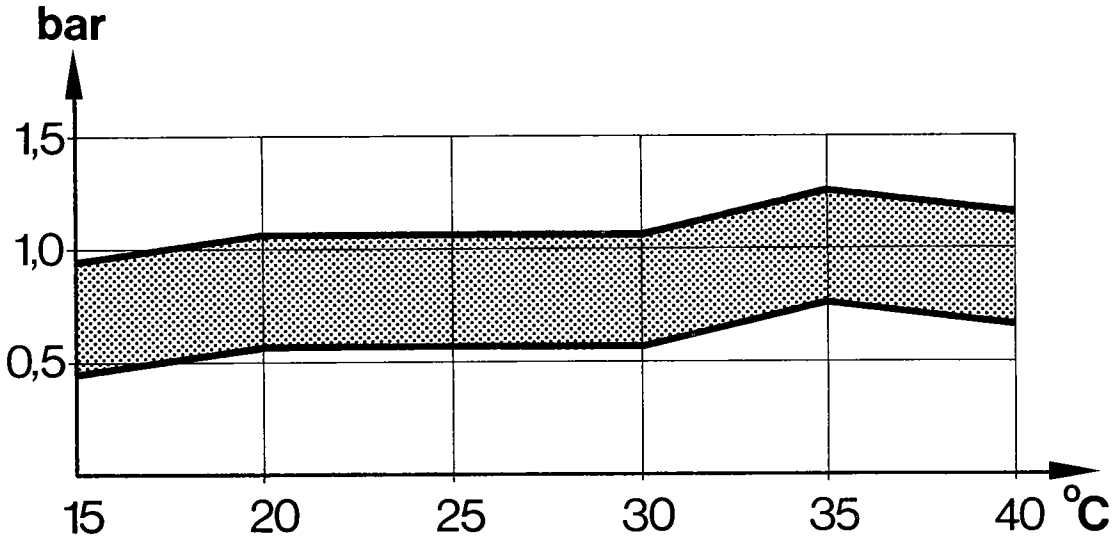
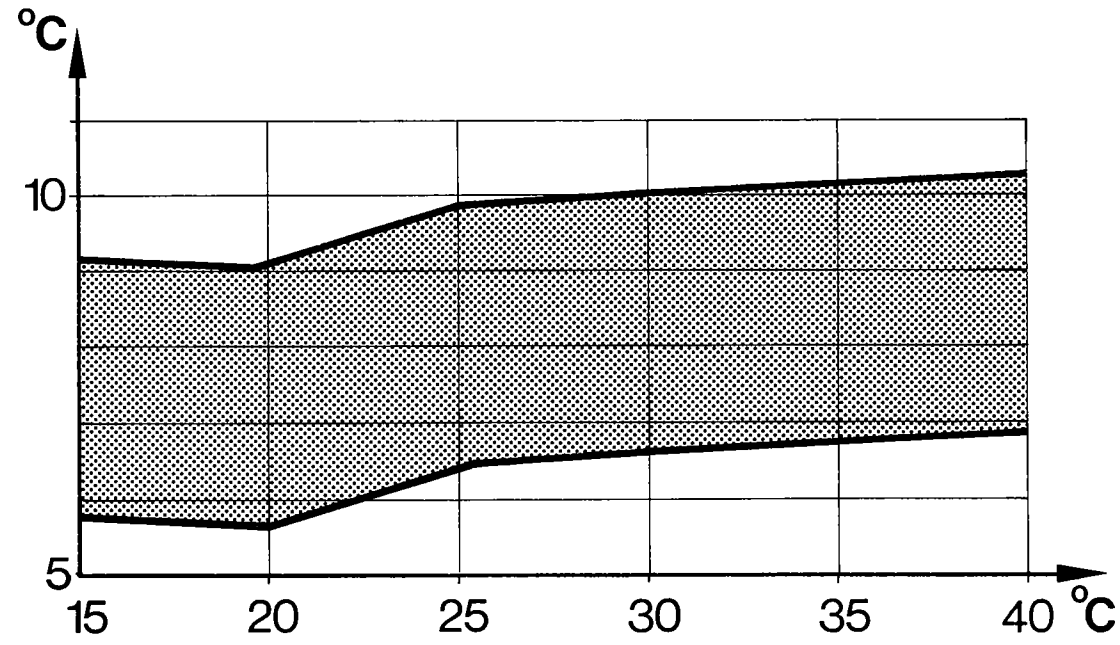


Low pressure in refrigerant circuit vs. ambient temperature

Temperature at center nozzle



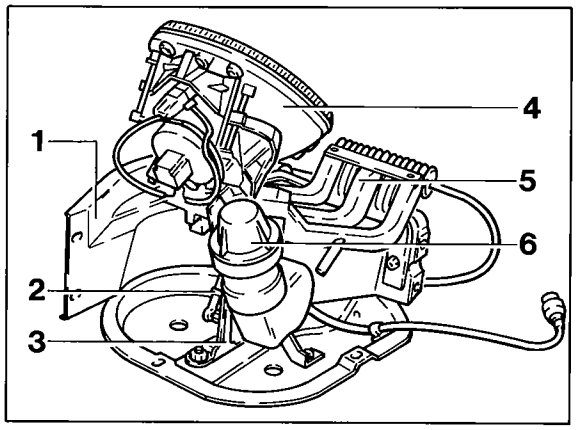
Air temperature at center nozzle vs. ambient temperature

Adjusting the pop-up headlight mechanical system

Note

The installed pop-up headlight assembly is comprised of:

1. Sheetmetal console; fitted to body
2. Joint rod; provides link between return lever and rotary support
3. Mounting saddle of electric motor
4. Headlights with hood
5. Rotary support
6. Electric motor with deflection lever
7. Cover ring

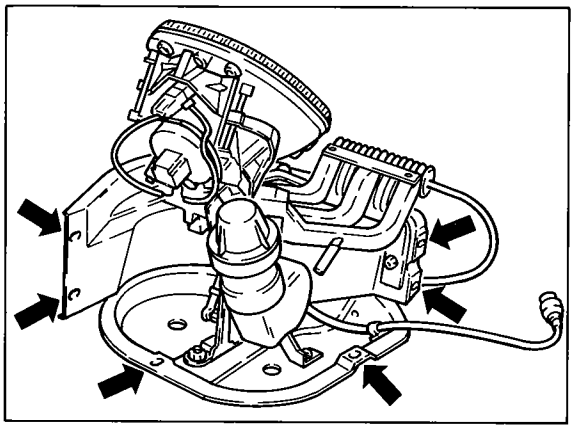


824-94A

Adjust the headlight in such a manner that the upper edge of the headlight does not protrude above the fender contours and that the headlight is centered with regard to the fender aperture. Make sure the left-hand and right-hand headlights are adjusted in the same way.

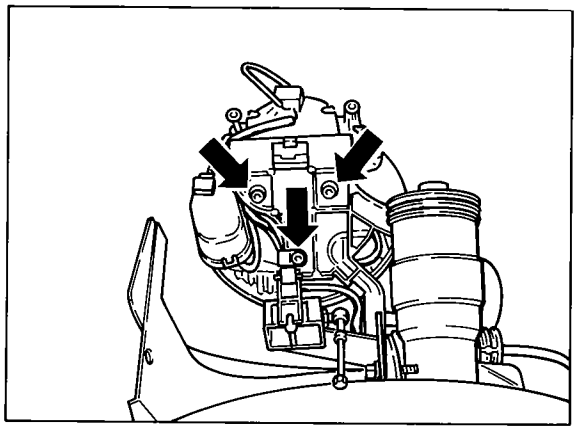
The headlight position with regard to the fender aperture is adjusted with the headlight folded down:

1. In longitudinal axis of the vehicle: at the console.



Headlight assembly is removed 824-94B

2. In lateral axis of the vehicle: across the headlight.



Headlight assembly removed 825-94

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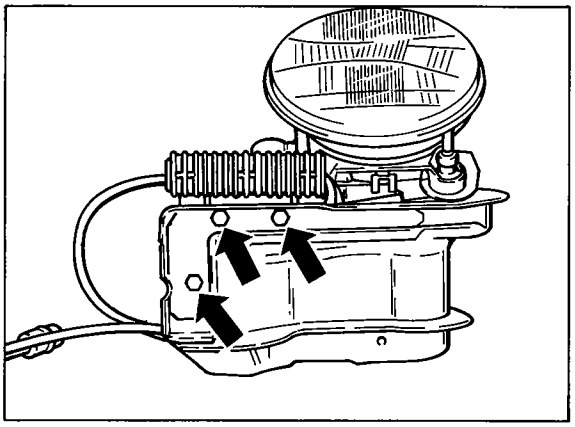
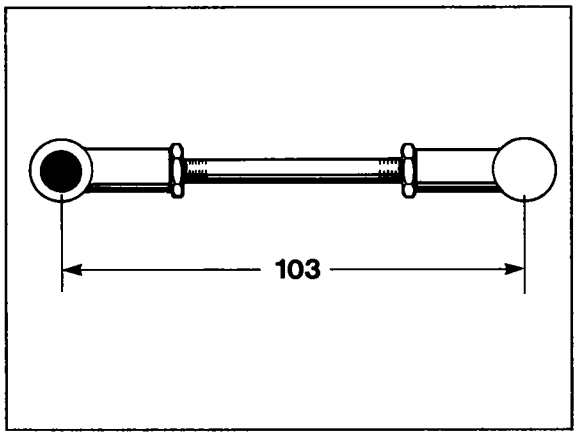
3. In vertical direction: across the rotary support.



Headlight assembly removed 826-94

Basic adjustment of joint rod

The basic adjustment dimension of the joint rod is 103 mm.



827-94

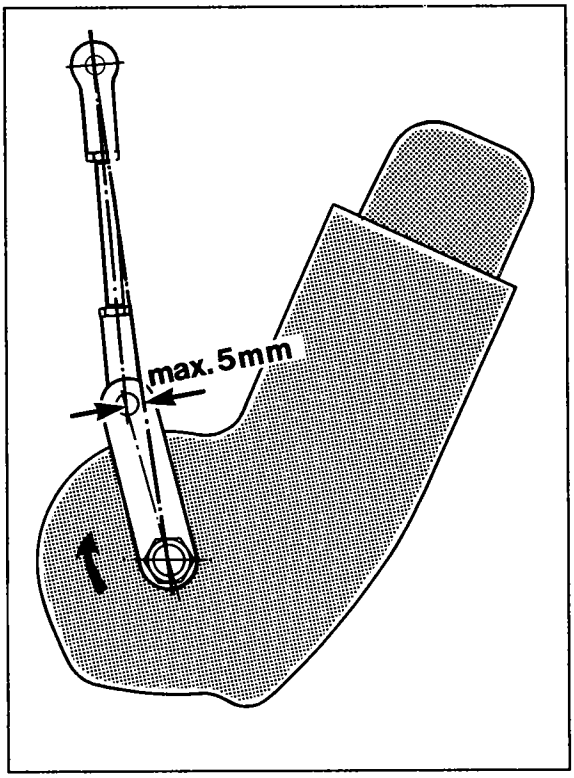
Note

The ball joints are offset by 180°.
If required, the joint rod length may be adjusted from approx. 97 mm to max. 111 mm.

Adusting the deflection lever and joint rod

Note

The headlight motor must be in the "pop-up headlights raised" position. Move motor electrically in this position.
Tighten the deflection lever to the motor in such a manner that it forms a straight line with the joint rod and is in the position just ahead of the top dead center.
Tightening torque: 10 Nm (7 ftlb)



828-94

Note

The pop-up headlight motors rotate in different directions:

– The left-hand motor rotates clockwise

– The left-hand motor rotates counter-clockwise

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Checking headlight beam adjuster

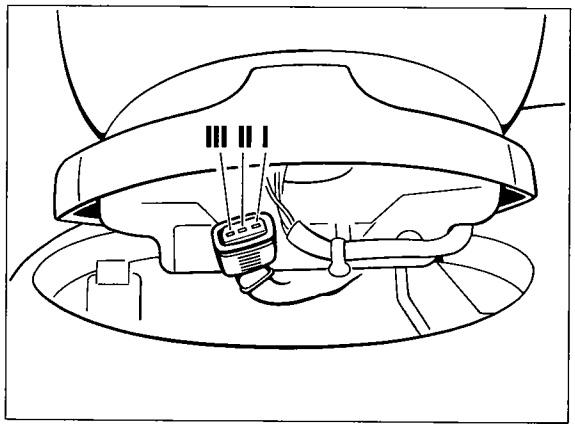
1. Switch on headlights.

2. Unlatch headlights and turn into fitting position.

3. Disconnect both connectors from actuators.

4. Measure voltage between term. No. 1 (positive) and term. No. 3 (negative).

Display: Battery voltage



1397 - 94

If no voltage is present at the terminals, check power supply according to wiring diagram.

Note

The battery voltage must be between 11 V and 13 V when the check is made. If the voltage reading is lower, recharge battery.

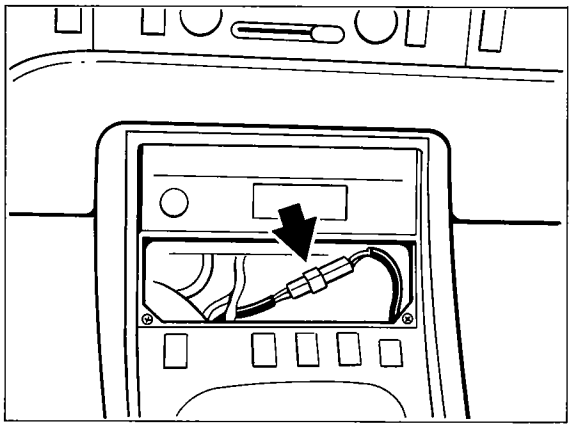
5. Voltmeter to term. 1 (positive) and term. 2 (negative).

Display:
Potentiometer in position 0: approx. 0 V

Potentiometer in position 1: 2.5 V to 3.0 V

Potentiometer in position 2: 4.2 V to 5.0 V

If the values are not reached, check directly at the connector to the potentiometer.



1398 - 94

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Adjustment of headlights fitted with headlight beam adjuster

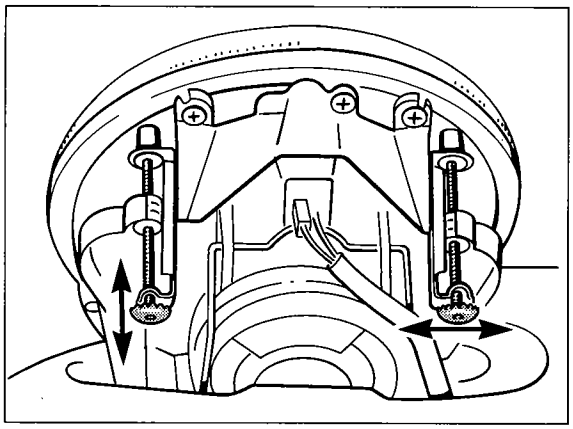
Note

Basic headlight adjustment is carried out in position 0.

1. Switch on headlights.

2. Adjust headlights with the vehicle in roadworthy condition using a headlight aimer.

- Fuel tank full.
- Driver's seat loaded with one person or 75 kgs.
- The tire pressure must meet the specifications.



842 - 03

Lowering in position 0:
10 cm on 10 m

Lowering in position 1:
15 cm ± 1 cm on 10 m

Lowering in position 2:
25 cm ± 1 cm on 10 m

Potentiometer position of headlight adjuster relative to load state

968

Position 0:
1 or 2 persons without luggage.

Position 1:
3 or 4 persons without/with luggage.

Position 2:
1 or 2 persons with luggage.

968 CS

Position 0:
1 or 2 persons without luggage.

Position 1:
2 persons with luggage.

Position 2:
1 person with luggage.

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Fault, Fault Code	Possible Causes, Elimination, Remarks

Test Point 9

Input 2 to ground during activation

Note

The fault display may appear if auxiliary systems (e.g. interior monitor) have been fitted.

- Check auxiliary system of input 2.
- Check wire from alarm control unit plug II, terminal 8, to auxiliary system for short to ground, using Special Tool 9540.

Test Point 10

Central lock button closed during activation

- Check central locking system button.
- Check wire from alarm control unit plug II, terminal 11, to button for short to ground, using Special Tool 9540.

Test Point 11

Input 1 to ground during activation

- Check auxiliary system of input 1.
- Check wire from alarm control unit plug II, terminal 7, to auxiliary system for short to ground using Special Tool 9540.

Test Point 12

Input 3 to ground during activation to positive

- Check auxiliary system of input 3.
- Check wire from alarm control unit plug II, terminal 17, to auxiliary system for short to ground using Special Tool 9540.

Test Point 13

Position switch on drive closed during activation

- Check triggering of actuators.
  Ground must be present at connectors T27 and T28, terminals 1 and 7, in the quiescent state.

  Note

  Positive voltage must be present at terminal 7 when the actuator is triggered in "open" direction.
  Positive voltage must be present at terminal 1 when the actuator is triggered in "closed" direction.
  Check directly at actuators if required.

  Note

  The actuators are only triggered for several milliseconds.

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Fault, fault code	Possible causes, remedies, notes
	– Check wires from alarm control unit plug I, terminals 11 and 12, to the acutators for continuity. – Check position switch at actuator (refer to Test Point 4).
Test Point 14 Position switch on drive open during activation	– Refer to Test Point 13.
Test Point 15 Radio (closed loop) interrupted during activation	– On radios that do not have this contact, radio 1 input is wired to ground. Check wire from alarm control unit plug II, terminal 13, for continuity to ground.
Test Point 16 Radio contact to ground during activation	– Check insulating strip on radio. – Check wire from alarm control unit plug II, terminal 9, to radio plug, terminal 6, for short to ground. – Check alarm contact at radio or bracket, respectively.
Test Point 17 Tailgate lock switch closed during activation	– Check rear cover unlocking switch. – Check lock switch for rear cover unlocking mechanism. – Check wiring from connector II, terminal 19, of alarm control unit to rear unlocking mechanism or lock switch of rear cover unlocking mechanism for short to positive.

Printed in Germany – VII, 1992

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Wiring

Printed in Germany – VIII, 1993

Passenger compartment wiring harness for 968 CS

When replacing the passenger compartment wiring harness, the spare wiring harness must be modified as only the harness for the 968 is supplied by the spares department.
Modifications are required at the clock connector.

1. Open 7-pin coupling housing (outside temperature indicator on 968) and remove wire.

2. Cut off terminal sockets of brown/blue and blue/green wires. Insulate wires and tie them aside.

3. Fit the remaining wires into 4-pin housing according to wiring diagram or below table (may be removed from old wiring harness).

   1 - green (Term. 15)
   2 - grey/green (Term. 58)
   3 - red/green (Term. 30)
   4 - brown (Term. 31)

4. Tie back wire for analog clock (center console).

Printed in Germany – VIII, 1993