Workshop Manual

Avant RS2 1994 ▶

Edition 03.1994

Service.

Assembly and Repair Group Index to Workshop Manual

Avant RS2 1994 ► Edition 03.94

All the assemblies of the RS2 are listed in the repair group index.
The current flow diagrams and repair procedures of the relevant assemblies and repair groups which differ are all described in this manual ⇒ Contents.
Where the repair procedures are identical reference is made to the relevant assembly of the Audi 80 1992► and Audi 100 1991 ► respectively.
This binder is issued as a loose leaf system.
Updating
Revisions and additions appear as supplements; in this case, the relevant pages should then be replaced.

Assembly	⇒ Workshop Manual
Electrical System	Audi 80 1992 ► Electrical System
Heating, Air Conditioning	Audi 80 1992 ► Heating, Air Conditioning
General Body Work	Audi 80 1992 ► General Body Work
Body Repairs	Body Repairs
6-speed Manual Transmission 01E 4WD	Audi 100 1991 ► 5- and 6-speed Manual Transmission 01E 4WD

Assembly		⇒ Workshop Manual
Current Flow Diagrams Avant RS2		⇒ Contents
Running Gear 4WD		Audi 80 1992 Running Gear 4WD
Repair Group		Repair Group ►
01	Self-diagnosis	01 Self-diagnosis
46	Steering	46 Steering
All Other Repair Groups		⇒ Contents
5 Cyl. Engine (4-valve Turbo) Mechanics		⇒ Contents
Motronic		
Injection and Ignition System (5-Cylinder)		⇒ Contents
Repair Group		Repair Group
		01 Self-diagnosis
		24 Mixture Preparation, Injection
28	Ignition System	⇒ Workshop Manual
		Audi 80 1992 ► Motronic Injection and Ignition System (5-Cylinder)
		28 Ignition System

Technical information should always be available to all foremen and mechanics because compliance with the instructions given is essential to ensure vehicle road worthiness and safety. In addition, the normal safety precautions to be observed when working on motor vehicles are also applicable.

Printed in Germany
000.5483.59.20

Supplement Index to Workshop Manual

Avant RS2 1994 ►

Please enter the date of issue of the Supplement. This enables you to see whether all the Supplements have been filed and that the Workshop Manual is thus up-to-date.

Supplement	Edition	**Article Number**
1		000.5463.31.20
2		000.5463.32.20
3		000.5463.33.20
4		000.5463.34.20
5		000.5463.35.20
6		000.5463.36.20
7		000.5463.37.20
8		000.5463.38.20
9		000.5463.39.20
10		000.5463.40.20
11		000.5463.41.20
12		000.5463.42.20
13		000.5463.43.20
14		000.5463.44.20
15		000.5463.45.20
16		000.5463.46.20
17		000.5463.47.20
18		000.5463.48.20
19		000.5463.49.20
20		000.5463.50.20

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000.5463.50.20

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Current Flow Diagrams Avant RS2

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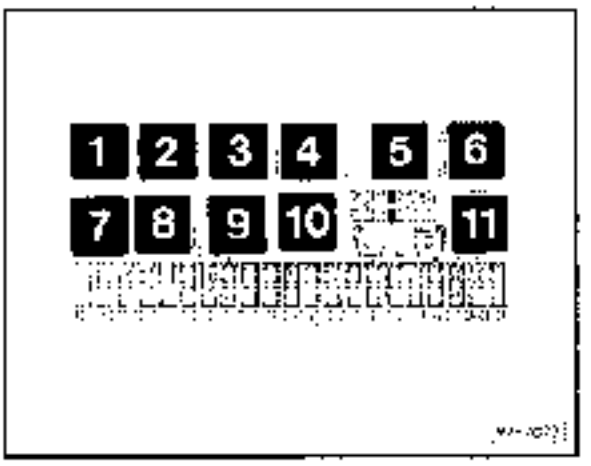
45 Anti-locking Brake System

46 Brakes, Brake Mechanics

47 Brakes, Brake Hydraulics

Relay position assignment
: Section "Fitting Locations"

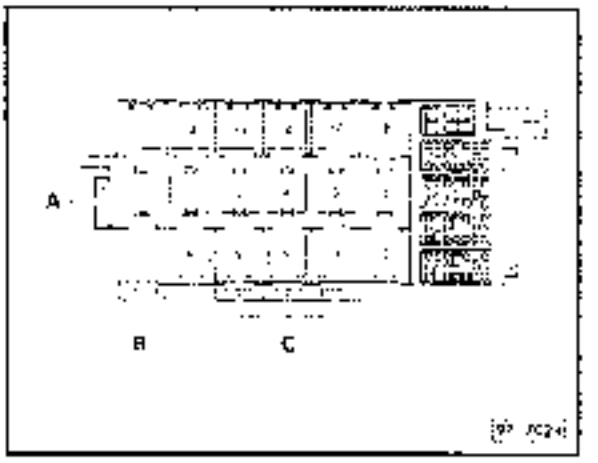
Relay position with fuse holder:



Relay position assignment:

9	Relay [illegible]
10	Relay [illegible]

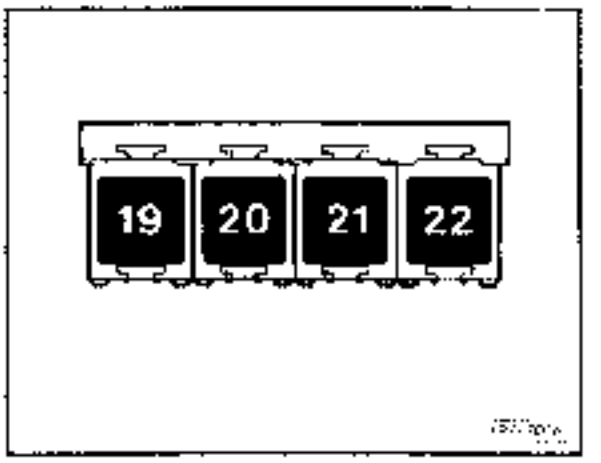
Front auxiliary relay carrier
(below dash panel on left)



Relay position assignment:

15	Bulb monitoring device
16	Control unit for trailer recognition

Rear auxiliary relay carrier
(below rear seat on left)



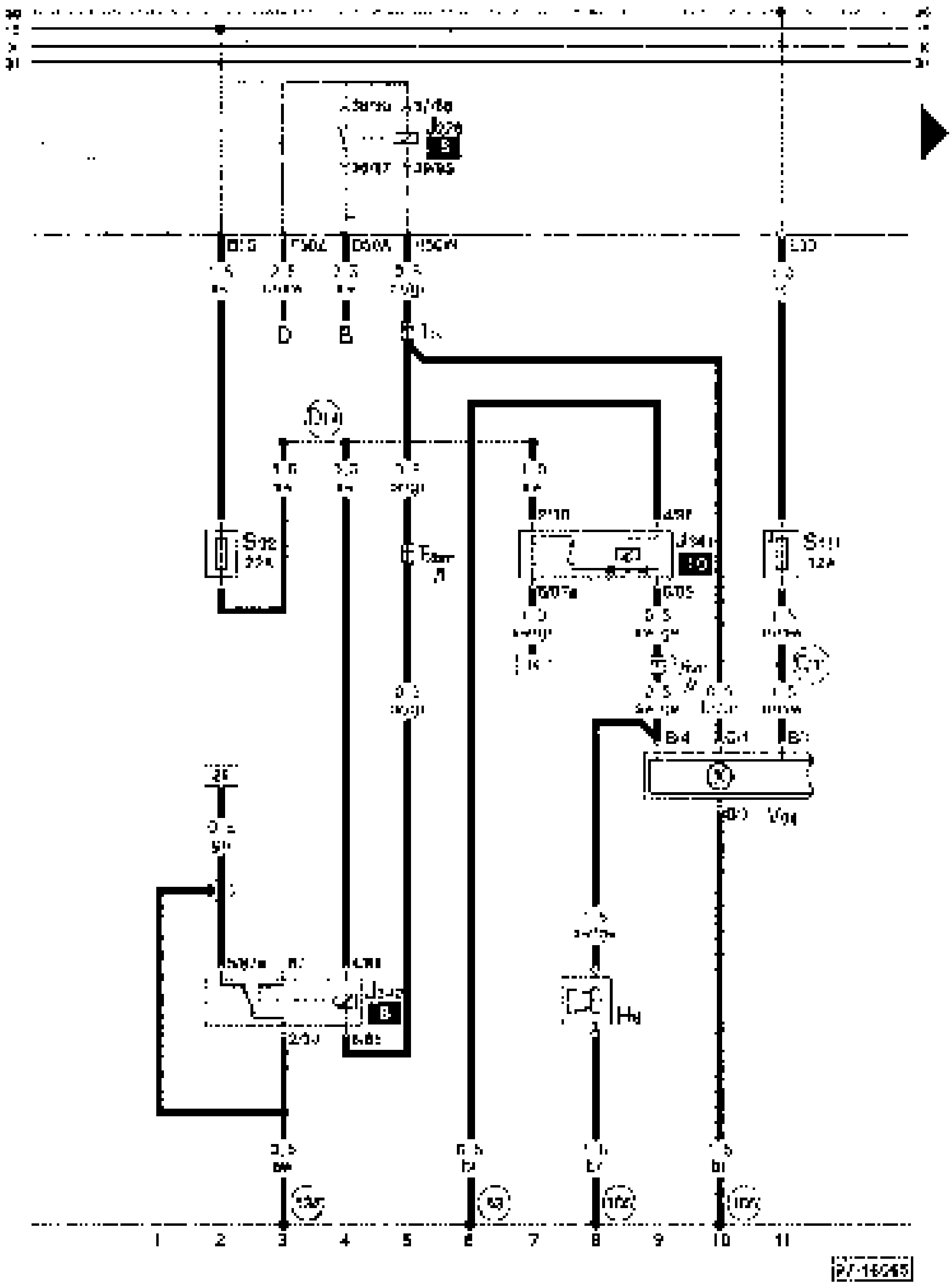
Relay position assignment:

30	Relay for switching off rear fog lamp (for towing trailer)

Colours of fuses

30 A		green
25 A		white
20 A	-	yellow
15 A		blue
10 A		red
5 A		beige

Immobilizer



bl = blue
br = brown
ge = yellow
gn = green
gr = grey
li = lilac
ro = red
sw = black
ws = white

27-16045

B - Starter
D - Ignition starter switch
H8 - Horn for anti-theft warning system
J226 - Relay for starter inhibitor and reversing light
J341 - Relay I for immobilizer
J342 - Relay II for immobilizer
S07 - Fuse for engine management I and ignition coil, electric cutoff valve on auxiliary fuse holder
S111 - Fuse for anti-theft warning system and immobilizer
T1v - Plug connector, 1-pin, black, below centre of rear seat
T2bm - Plug connector, 2-pin, violet, below dash panel on left
V94 - Motor for central locking system with control unit for interior lamp time delay and anti-theft warning system

(23) - Earth connection -1-, in front right wiring loom

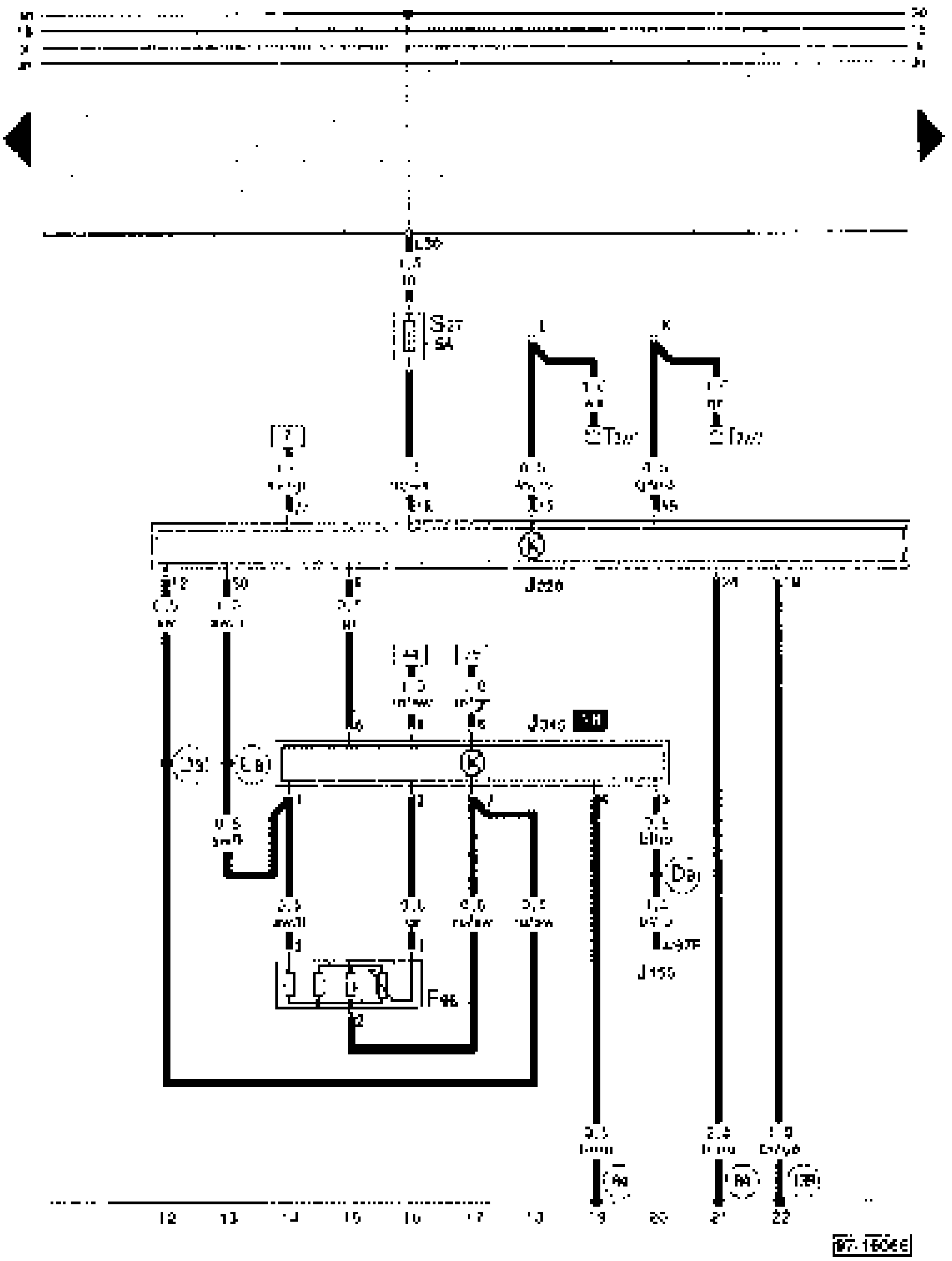
(35) - Earth connection -1-, in central locking system wiring loom

(34) - Earth connection (connector grey), in Motronic wiring loom

(D11) - Connection (ignition/starter switch), in front right wiring loom

(Q11) - Positive connection (wiring), in window lifter, central locking system and door contact switch wiring loom

Motronic control unit, trailer recognition



bl	=	blue
br	=	brown
ge	=	yellow
gn	=	green
gr	=	grey
li	=	lilac
ro	=	red
sw	=	black
ws	=	white

F96 - Altitude sender

J255 - Control unit for coolant pump exhaust gas turbocharger

J220 - Motronic control unit

J345 - Control unit for trailer recognition

S27 - Fuse for engine management (in auxiliary fuse holder)

T2z - Plug connection, 2-pin, white, in plenum chamber close to relay plate (diagnostic connector)

(31) - Earth connection, engine earth, in front right wiring loom

(119) - Earth connection [illegible] in Motronic wiring loom

(D3) - Connection [illegible] in front right wiring loom

(D2) - Positive connection [illegible] in front right wiring loom

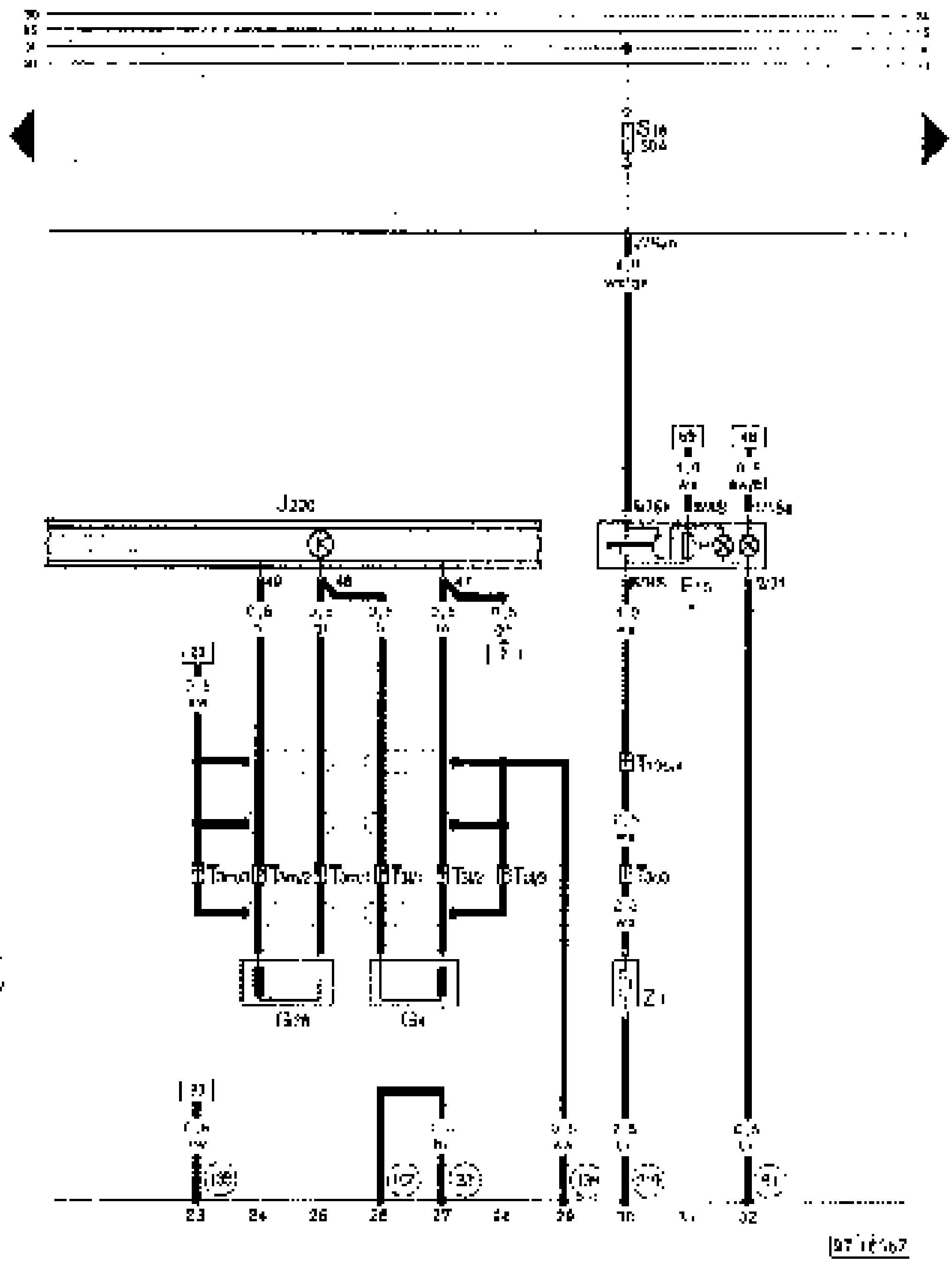
(E2) - Connection [illegible] in Motronic wiring loom

K - Cable junction for [illegible]

L - Cable junction for [illegible]

Note: [illegible]

Motronic control unit, heated rear window



- bl = blue
- br = brown
- ge = yellow
- gn = green
- gr = grey
- li = lilac
- ro = red
- sw = black
- ws = white

E15 - Switch for heated rear window
G4 - Ignition timing sender
G28 - Engine speed sender
J220 - Motronic control unit
T3l - Plug connection, 3-pin, black, for ignition timing sender
T3m - Plug connection, 3-pin, grey, for engine speed sender
T3r - Plug connection, 3-pin, white, in electrics box
T10b - Plug connection, 10-pin, black, connector panel in auxiliary relay carrier
Z1 - Heated rear window

(32) - Earth point behind dash panel on left

(81) - Earth connection -1-, in dash panel wiring loom

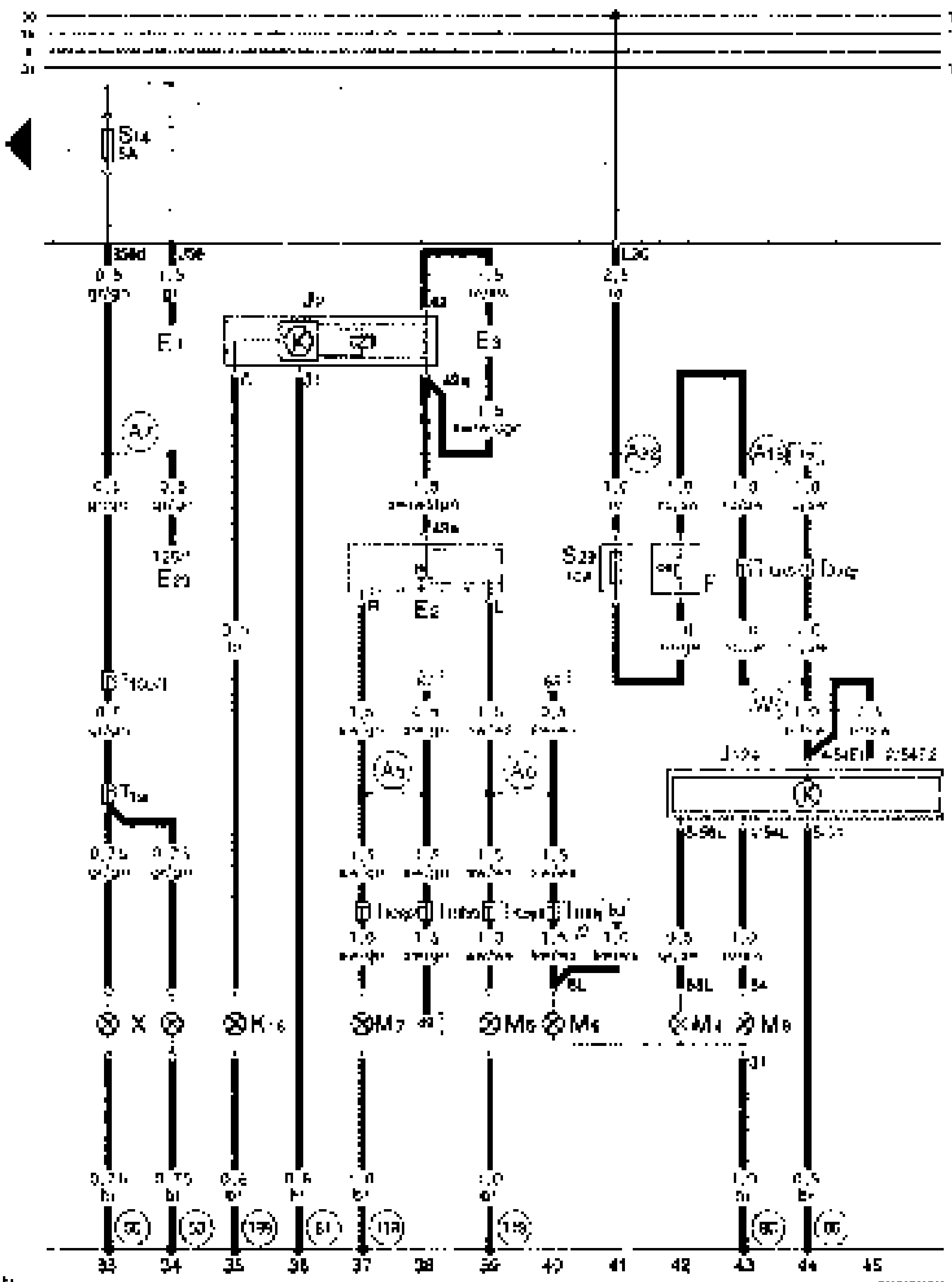
(127) - Earth connection, in exterior mirror wiring loom

(128) - Earth connection (sender earth), in Motronic wiring loom

(219) - Earth connection -2-, in tailgate wiring loom

* Switch only on vehicles without air conditioner
* Switch on vehicles with air conditioner → Current Flow Diagram No. 69, model year 1993

Turn signal and hazard warning flasher system, licence plate light



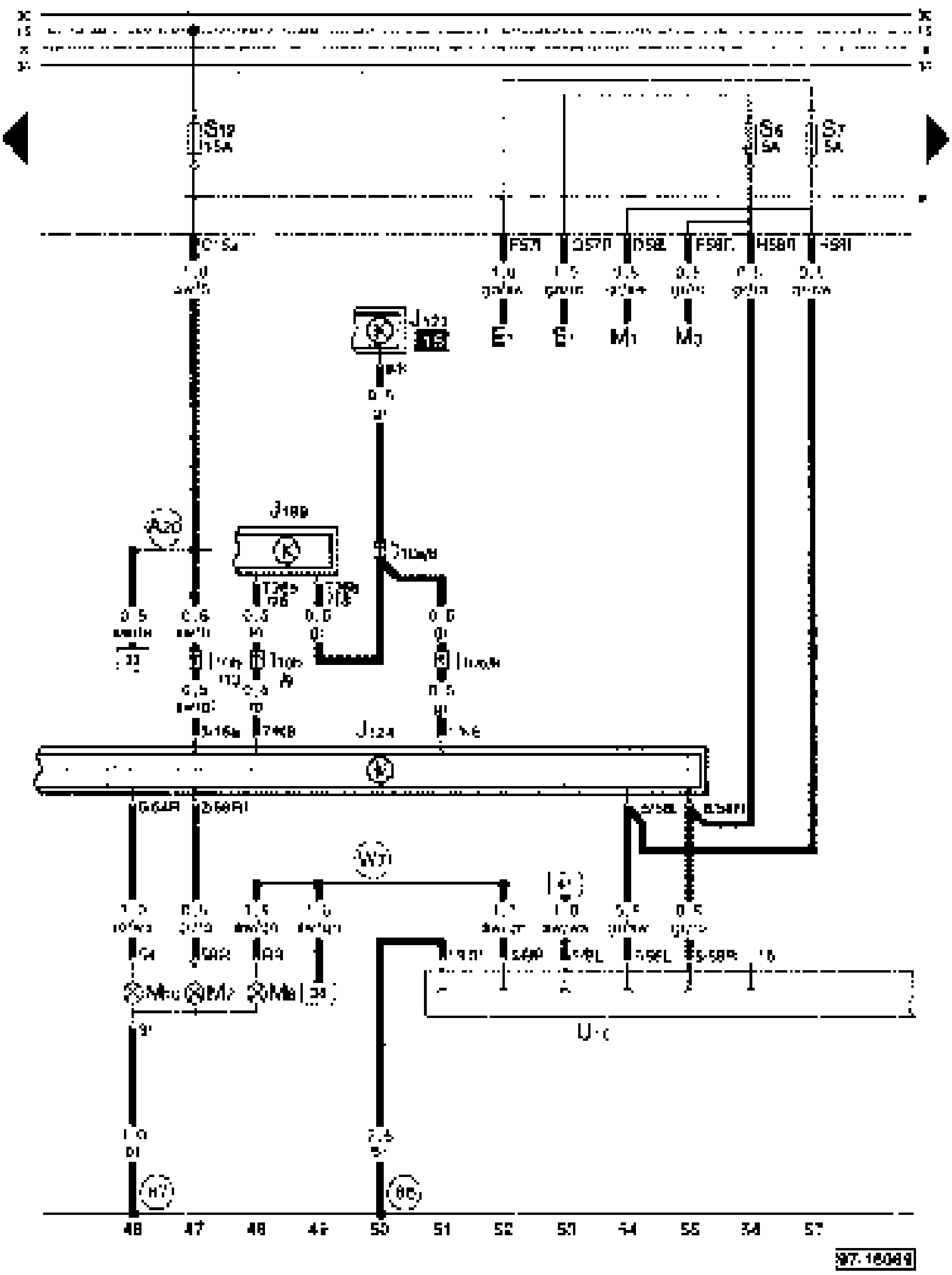
bl	=	blue
br	=	brown
ge	=	yellow
gn	=	green
gr	=	grey
li	=	lilac
ro	=	red
sw	=	black
ws	=	white

97-16068

E1 - Light switch
E2 - Turn signal switch
E3 - Hazard warning light switch
E20 - Switch and instrument lighting regulator
F - Brake light switch
J2 - Hazard warning flasher relay
J394 - Rear light monitoring device
K18 - Indicator lamp for trailer operation
M4 - Bulb for left tail light
M5 - Bulb for front left turn signal light
M6 - Bulb for rear left turn signal light
M7 - Bulb for front right turn signal light
M9 - Bulb for left stop light
S29 - Fuse for stop lights on auxiliary fuse holder
T1a - Plug connection, 1-pin, at left of boot
T3ag - Plug connection, 3-pin, behind dash panel centre
T10e - Plug connection, 10-pin, yellow, connector panel in auxiliary relay carrier
T10b - Plug connection, 10-pin, brown, connector panel in auxiliary relay carrier
T29 - Plug connection, 29-pin, yellow, at dash panel insert

X - Licence plate light
(50) - Earth point, in left of boot
(81) - Earth connection -1-, in dash panel wiring loom
(86) - Earth connection -1-, in rear wiring loom
(199) - Earth connection -3-, in dash panel wiring loom
(A5) - Positive connection (right turn signal), in dash panel wiring loom
(A6) - Positive connection (left turn signal), in dash panel wiring loom
(A7) - Positive connection (58d), in dash panel wiring loom
(A19) - Connection (54), in dash panel wiring loom
(A23) - Positive connection (30), in dash panel wiring loom
(W5) - Connection (54) (brake signal), in rear wiring loom

Bulb monitoring device, trailer coupling



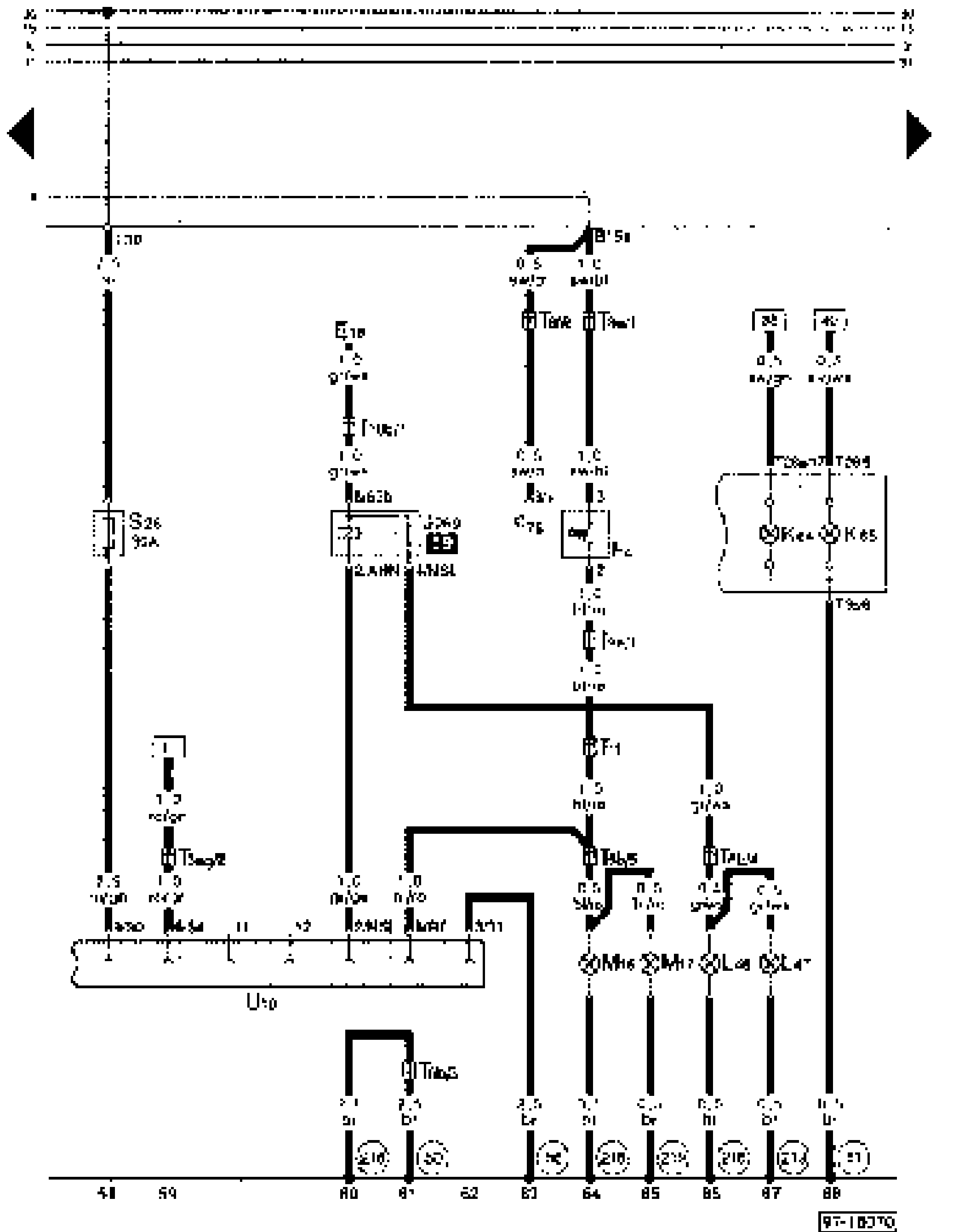
bl	=	blue
br	=	brown
ge	=	yellow
gn	=	green
gr	=	grey
li	=	lilac
ro	=	red
sw	=	black
ws	=	white

97-16069

- E1 - Light switch
- J120 - Front bulb monitoring device
- J124 - Rear bulb monitoring device
- J163 - Auto Check system
- M1 - Bulb for left side light
- M2 - Bulb for right tail light
- M3 - Bulb for right side light
- M8 - Bulb for rear right turn signal light
- M10 - Bulb for right side light
- T10a - Plug connection, 10-pin, yellow, connector panel in auxiliary relay carrier
- T10b - Plug connection, 10-pin, brown, connector panel in auxiliary relay carrier
- U10 - Socket for trailer operation

- (86) - Earth connection 1, in rear wiring loom
- (87) - Earth connection 2, in rear wiring loom
- (A20) - Connection (15a) in dash panel wiring loom
- (W7) - Connection (right turn signal) in rear wiring loom

Trailer coupling, rear fog light

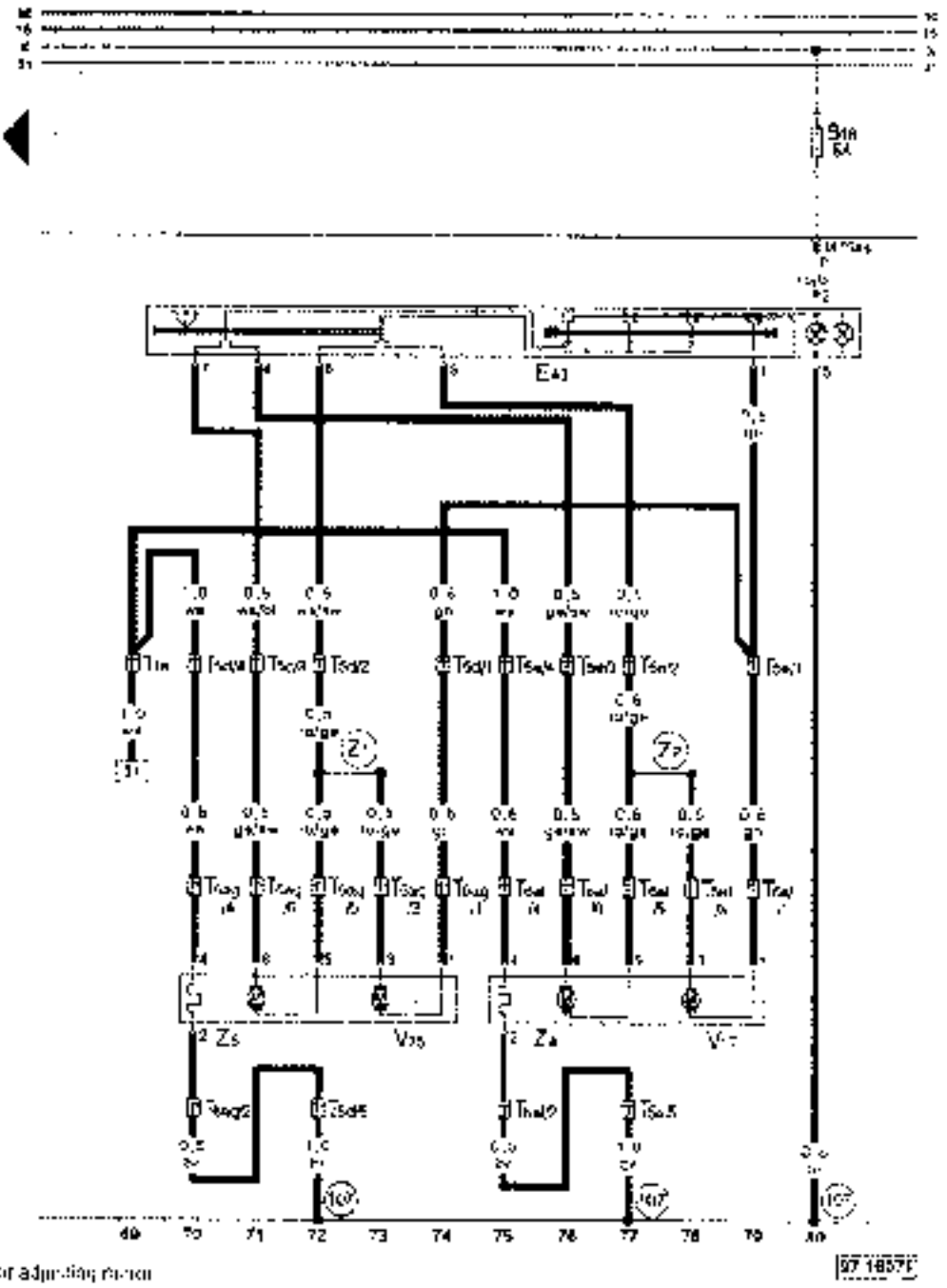


bl - blue
br - brown
ge - yellow
gn - green
gr - grey
li - lilac
ro - red
sw - black
ws - white

E18 - Switch for rear fog light
F4 - Switch for reversing lights
F26 - Radiator thermoswitch
J259 - Rear fog light cut-out relay (trailer operation)
K64 - Indicator lamp for hazard warning system and right turn signal
K65 - Indicator lamp for left turn signal
L46 - Bulb for left rear fog light
L47 - Bulb for right rear fog light
M16 - Bulb for left reversing light
M17 - Bulb for right reversing light
S26 - Fuse for trailer socket in auxiliary fuse holder
T1i - Plug connector, 1 pin, black, behind dash panel on left
T3 - Plug connector, 3 pin, behind dash panel on left
T6 - Plug connector, 6 pin, black, in rear of boot
T8c - Plug connector, 8 pin, in right of engine compartment
T8 - Plug connector, 8 pin, in right of engine compartment
T10h - Plug connection, 10 pin, brown, connector panel in ...
T26 - Plug connection, 26 pin, behind dash panel insert
T26a - Plug connection, 26 pin, blue, on dashboard insert
U10 - Socket for trailer coupling

(50) - Earth point, in left of boot
(81) - Earth connection -1-, in dash panel wiring loom
(86) - Earth connection -1-, in rear wiring loom
(218) - Earth connection -1-, in tailgate wiring loom
(219) - Earth connection -2-, in tailgate wiring loom

Electrically adjustable driver and front passenger mirror



bl	=	blue
br	=	brown
ge	=	yellow
gn	=	green
gr	=	grey
li	=	lilac
ro	=	red
sw	=	black
ws	=	white

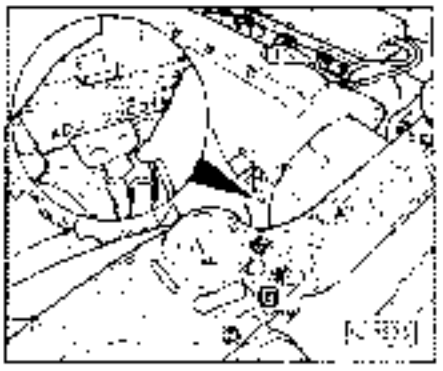
E43 Switch for adjusting mirror
T1c Plug connection, 1-pin, green, behind dash panel, on left
T5d Plug connection, 5-pin, at bottom right of A-pillar
T6k – Plug connection, 6-pin, at bottom, left of A-pillar
T6al – Plug connection, 6-pin, on left of driver's door
T6ag – Plug connection, 6-pin, on right of driver's door
V17 Motor for adjusting mirror (driver's side)
V25 Motor for adjusting mirror (front passenger side)
Z4 – Heated rear view mirror (driver's side)
Z5 Heated rear view mirror (front passenger side)

(37) – Earth connection, in rear view mirror wiring loom

(Z1) Connection 1, in mirror adjustment/heater wiring loom

(Z2) Connection 2, in mirror adjustment/heater wiring loom

Engine number



➡ The engine number ("engine code letters" and "serial number") is stamped on the front right of the cylinder head

In addition, a sticker with "engine code letters" and "serial number" is affixed to the toothed belt guard

The engine code letters are additionally listed on the vehicle data plate

Engine features

Code letters		ADU	Code letters	ADU
Manufactured from		01.94 ▶		
Displacement	ltr	2.226	Valve timing	
Engine output	kW at rpm	92/6000	at 1 mm valve lift and 0 mm valve clearance	
Torque	Nm at rpm	190/2400	Inlet opens ATDC	13°
Bore dia	mm	81	Inlet closes ABDC	35°
Stroke	mm	86.4	Exhaust opens BBDC	24°
Compression		9.3	Exhaust closes ATDC	1°
RON/MON 88-90 recommended min.	RON	91		
Injection system		Motronic		
Ignition system		Motronic		
Knock control		yes		
Self-diagnosis		yes		
Lambda control		yes		
Catalytic converter		yes		
Charging		yes		

Motronic self-diagnosis

Fault table

- The differences from engine code ABY are described below; all other faults ⇒ Audi 80 1992 Motronic Fuel Injection and Ignition System (5-Cylinder)

Output on printer of V.A.G 1551	Possible cause of fault	Possible effects	Rectifying fault
00543 Maximum engine speed exceeded [1] Signal too large	- Engine over-revs as a result of incorrect gear shift (engine speed greater than 7440 rpm)	- Possible engine damage	- Rectify mechanical damage

[1] This fault type is displayed in addition to the component.

Basic setting of the engine with V.A.G 1551

- The differences from engine code ABY are described below; the remaining procedure for the basic setting ⇒ Audi 80 1992 Motronic Fuel Injection and Ignition System (5 Cylinder).

Explanation of readouts in display fields 1 to 10

Display field	Specified readout	Corresponds to measured value	Designation	Remarks
1	194 ... 215	85 ... 105 °C	Coolant temperature	Requirement for all other readouts, specifications
2	15 ... 24		Engine load	With air conditioner off, without ancillaries
3	76 ... 84	760 ... 840 rpm	Engine speed	With air conditioner off, without ancillaries
4	121 ... 135		Idle speed stabilization operating range	Change in air flow caused by N71
5	70 ... 125		Idle speed stabilization map zero point	Internal computed value
6	120 ... 137		Idle speed stabilization load adaptation	Change in air flow caused by N71
7	41 ... 61		Idle speed stabilization map correction	Internal computed value
8	120 ... 133		Lambda control	After about 1.5 minutes
9	100 ... 150		Programmed value for lambda control	If readout is high, perform road test again
10	35 ... 37	8 ... 12° BTDC	Ignition angle when idling	Ignition angle computed by J220

Display group number 03

Display field	Readout on V.A.G 1551	Cause of fault	Rectifying fault
1	750 ... 840 rpm	⇒ Display group number 01, display field 1	
2	25 ... 35 %	o.k.	
	greater than 35 %	Air conditioner on Electrical components on AC compressor running, although air conditioner off Air mass meter –G70 faulty Central hydraulic pump faulty Unmetered air between turbocharger and throttle valve	– Switch off air conditioner – Switch off ancillaries – Test air conditioner ⇒ Repair Group 87 – Test –G70 ⇒ Repair Group 24 Test central hydraulic pump ⇒ Repair Group 46 Rectify cause of fault
	less than 25 %	Unmetered air between air mass meter –G70 and turbocharger or downstream of throttle valve Vacuum hose dropped off Crankcase ventilation leaking Fuel tank ventilation Solenoid valve 1 for activated charcoal filter jamming Air mass meter –G70	– Rectify cause of fault Check vacuum system – Check crankcase ventilation Check fuel tank ventilation system – Perform final control diagnosis ⇒ Repair Group 01 – Test –G70 ⇒ Repair Group 24

01–3

Display field	Readout on V.A.G 1551	Cause of fault	Rectifying fault
3	5 ... 10 °	o.k.	
3	greater than 10 °	Throttle valve potentiometer –G69 faulty or incorrectly set Throttle valve incorrectly set Throttle valve jamming	– Test throttle valve potentiometer –G69 ⇒ Repair Group 24 – Adjust throttle cable ⇒ Repair Group 27 – Test throttle valve
	less than 5 °	Throttle valve potentiometer –G69 faulty or incorrectly set	– Test throttle valve potentiometer –G69 ⇒ Repair Group 24
4	°C	Dependent on ambient temperature; no specification	

01–4

Display field	Readout on V.A.G 1551	Cause of fault	Rectifying fault
1	760 ... 840 rpm	-> Display group number 01, display field 1	
2	25 ... 35 %	-> Display group number 03, display field 2	
3	4 km/h	o.k. (if speed less than 4 km/h a constant 4 km/h is displayed)	
4	00040	o.k. (only when idling)	
	00002	idle speed switch -F60 faulty	Test -F60 => Repair Group 24

Coding variants of Motronic control unit -J220

The control unit identification and the coding are displayed when the fault memory is interrogated.

The coding is performed through the wiring loom.

Only coding 4 is permissible.

Coding 4:

- Road speed limited to 270 km/h
- Contact 36 of Motronic control unit is permanently connected to earth

If coding 1 is displayed for the control unit identification, service cable connection between contact 36 and earth

Important!

If the earth connection is removed, the road speed limit is cancelled. It is not permitted to perform such a modification.

Removing and installing engine

⇒ Workshop Manual
Audi 100 1991 ▶
Engine code AAN
5-Cyl. Injection Engine (4-Valve, Turbo),
Mechanics Edition 07.91
Bulletin No. 4
Edition 09.93
as of page 10-1

Modifications

Note, Information:

Coolant pipe to expansion tank modified.

10-?

Crankshaft group

-- Workshop Manual
Audi 100 1991 ►◄
Engine code AAN
5-Cyl. Injection Engine (4-Valve, Turbo).
Mechanics Edition 07.91
Bulletin No. 4
Edition 09.93

Modifications

-- Page 13--1-

Note, information.

- *Rolled main bearings on crankshaft*
- *Crankshaft main bearing shells with 45° groove*

Cylinder head, valve gear

=> Workshop Manual
Audi 100 '91 ►
Engine code AAN
5-Cyl. Injection Engine (4-Valve, Turbo),
Mechanics

Modifications

-- Page 15-1

Note, information:

- *"Metal" cylinder head gasket, installation as before*

15-1

15-2

Lubrication system

- - Workshop Manual
Audi 80 1987 ⇤, Audi 90 1987 ⇤
Engine code 3B
5-Cyl. Injection Engine
(4-Valve, Turbo); Mechanics

Note, information:

- *If considerable quantities of metal swarf or abrasion – caused by seizure damage such as crankshaft and conrod bearing damage - are found in the engine oil when performing repairs to the engine, it is necessary not only to carefully clean the oil passages but also to replace the oil cooler in order to avoid consequential damage*

- *The oil level must not exceed the max. marking - risk of damage to catalytic converter!*

Modifications:

– None

Cooling system

.= Workshop Manual
Audi 60 1987 ►, Audi 90 1987 ►
Engine code 3B
5-Cyl. Injection Engine
(4-Valve, Turbo), Mechanics
Edition 01.91

Modifications

Page 19- 1

Note, information:

- *Modified coolant pipe connection Fig. 19-340/2 from coolant thermostat housing to heat exchanger, additional outlet for coolant expansion tank.*
- *Moulded part (seal) below coolant thermostat*
- *Drive gear for coolant pump, No. of teeth was 29 is now 26.*

'9 1

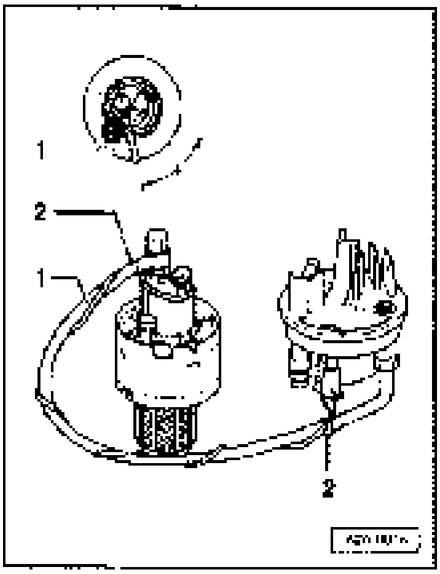
19–2

Fuel supply system

⇒ Workshop Manual
Audi 100 1991 ▸
Engine code AAN
5 Cyl. injection Engine (4-Valve, Turbo),
Mechanics Edition 07.91
Technical Bulletin No. 4
Edition 08.93

Modifications

- Page 20-16



Dismantling and assembling fuel pump

➡ – Bolt feed pipe –1– tight to the fuel pump, as shown in the plan view (top part of Fig.) α = 50°

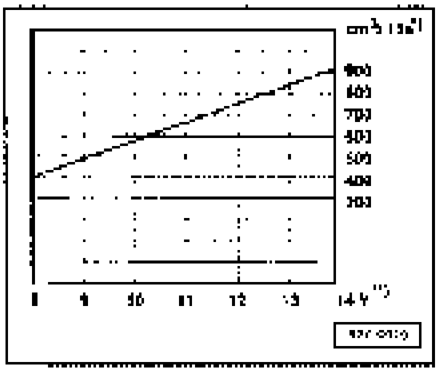
- Attach electrical wiring to the fuel feed pipe, as shown in the Fig.

- After tightening the cable ties –2–, cut off excess length.

Page 20-21

Testing delivery of fuel pump

Test delivery by switching on switch of remote control V.A.G 1348/3A for 15 seconds (press button and hold)



➡ – Refer to the diagram for the specifications for testing minimum delivery

■ Minimum delivery measured in cm³/15 seconds at the return pipe.

■ *) Voltage at fuel pump when engine switched off and pump running about 2 volts less than battery voltage

Charging

⇒ Workshop Manual
Audi 100 1991 ►
Engine code AAN
5-Cyl. Injection Engine (4-Valve, Turbo),
Mechanics Edition 07.91
Technical Bulletin No. 4
Edition 09.93

Modifications

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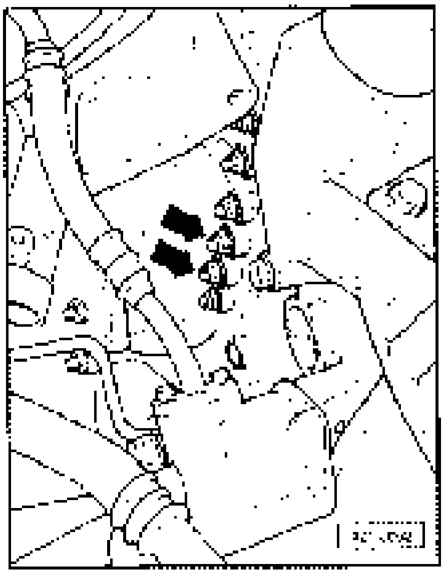
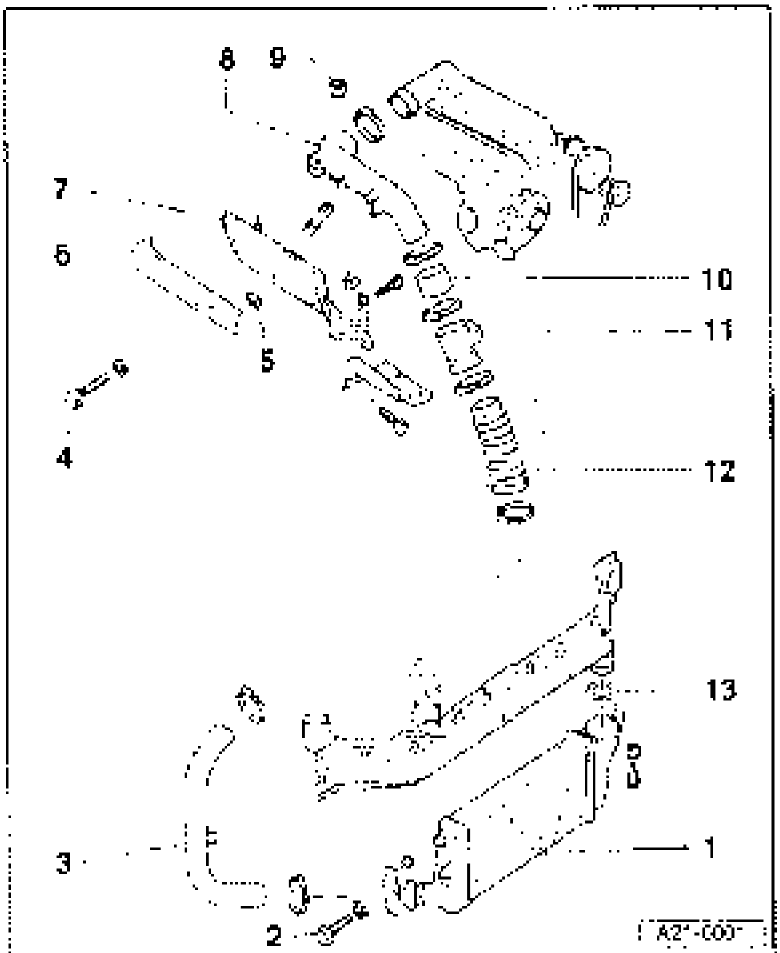
 Hexagon nut Fig. 21-100/12



⇒ The hexagon nuts (arrows) can only be slackened with a 12 mm ring wrench which has been ground flat at both sides of the ring

- Remove coolant pipe to the turbocharger and bracket for oil filter in order to improve access
- It may be necessary in certain instances to use an open-end wrench



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Removing and installing parts of charge air cooler

1 – Charge air cooler

2 – Hexagon bolt, 22 Nm

3 – Pressure pipe

4 – Hexagon bolt, 22 Nm

5 – Hexagon nut, 22 Nm

6 – Shield

7 – Shield

8 – Pressure pipe

9 – Hexagon nut, 22 Nm

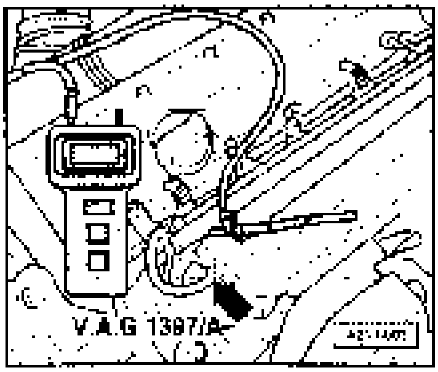
10 – Pressure hose

11 – Pressure pipe

12 – Pressure hose

13 – O-ring seal
 • Replace

Testing exhaust gas turbocharger and blow-off valve



- Connect turbocharger tester V.A.G 1397/A between the vacuum hose -arrow- and the intake manifold.
- Fit connector coupling of vacuum hose to connection -B- of the turbocharger tester.

  Run test hose along the rear edge of the bonnet and through the opening of the right window into the interior of the car.
- Switch on turbocharger tester. Set range switch to position -I-. Fit test hose onto connection fitting -I-.
- Accelerate car in 4th gear from about 50 km/h and full throttle and keep a check on rev counter.
- At 3000 rpm, press memory button M on turbocharger tester V.A.G 1397/A.

Charge air temperature in °C	10°	25°	45°	55°
Height above MSL	*Boost pressure in bar at full load*			
0 to 1600 m	2300 up to 2400 mbar			
at 2300 m	2200 up to 2300 mbar			

Note:

- *The hose pipes must be absolutely free of leaks otherwise incorrect measurements may occur.*
- *Ensure that the test hose is not jammed at the bonnet and side window.*
- *When the memory button M on the turbocharger tester is pressed, the last reading is stored and retained until the memory button M is again pressed or until the tester is switched off.*
- *Storage of the reading is indicated by the comma in the display panel flashing.*
- *If the battery voltage of the turbocharger tester drops below the specified level, an arrow appears in the top left corner of the display. An incorrect readout may be shown.*
- *Before testing the car, drive at a brisk speed for at least 2 km (without stopping at traffic lights or similar).*
- *As the boost pressure is measured when driving, a second person is required for operating the turbocharger tester for safety reasons.*
- *Perform at least three measurements and calculate an average figure.*

Technical data

System pressure (gauge pressure in bar) with engine running (idling) without vacuum: 3.8 ...4.0 with vacuum: 3.2 ...3.7	
Holding pressure for 10 minutes (minimum pressure in bar) when engine cold: 3.0 when engine hot: 3.6	
Injectors Quantity injected in ml/20 s: 130 ...140	
Idle speed test	Engine speed: 770 ...830 rpm
	CO content upstream of CAT: 0.5...0.9 % vol

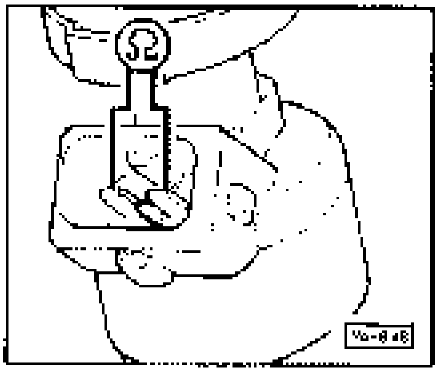
Servicing Motronic injection system

Testing system pressure and holding pressure

Specified pressures for pressure test:

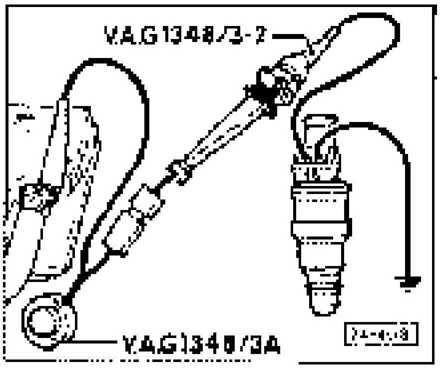
- 3.8...4.2 bar when pump running
- 3.3...3.5 bar immediately after switching off fuel pump

For procedures as well as connection of pressure measuring device ⇒ Audi 80 1992 Motronic Fuel Injection and Ignition System (5-Cylinder).



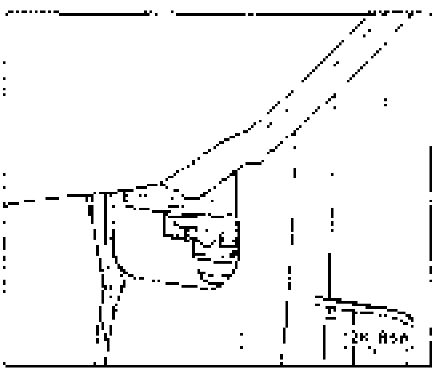
Testing injectors

- Resistance of injector.
  - 13.5 ... 15.5 Ω.



- Quantity injected per injector in 20 sec.
  - 130 ... 140 ml.

  Procedures ⇒ Audi 80 1992 Motronic Fuel Injection and Ignition System (5-Cylinder).



Testing altitude sender –F96

(Models without trailer coupling or not towing a trailer)

Notes:

- On models with a trailer coupling, the altitude sender signal passes through the trailer recognition control unit –J345 to the Motronic control unit –J220.
- If vehicle is not fitted with trailer coupling, a bridge is provided at the relay position for –J345 which passes the signal of the altitude sender to the Motronic control unit –J220 instead of through the control unit for trailer detection.
- The trailer recognition control unit is located in the auxiliary relay carrier below the dash panel on the left, relay position 15 (⇒ Current Flow Diagrams).
- Testing trailer recognition control unit –J345 ⇒ Reducing engine output when towing a trailer, page 24-10.

The altitude sender is located in the front passenger footwell below the trim panel in a recess of pillar A.

Read measured value block	2	3
2	3	4

– Read measured value block and select display group 02 ⇒ Repair Group 01

➡ Read out 1 display

– Check readout in display field 4

The current atmospheric pressure in mbar is displayed

Notes:

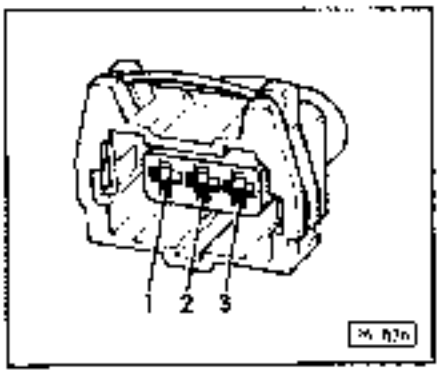
- *The current atmospheric pressure is dependent on the altitude and pressure fluctuations resulting from meteorological conditions*
- *The atmospheric pressure at sea level is about 1013 mbar when meteorological conditions are normal and decreases by about 100 mbar for each 1000 m altitude.*
- *The weather-related pressure fluctuations (ignoring extreme weather conditions and tropical countries) are generally less than ± 50 mbar.*
- If a constant 958 mbar is displayed instead of the current atmospheric pressure (fault 00528 in fault memory), the figure displayed differs greatly from the figure which would be normal as a result of altitude and weather conditions ⇒ Testing voltage supply of altitude sender and cable connections

24 - 5

Notes:

- *If the altitude sender fails, the control unit assumes a substitute altitude of about 3000 m and a constant 968 mbar.*
- *After rectifying the cause, the fault is classified as a sporadic fault and normal control is resumed*

Testing voltage supply of altitude sender



– Unplug connector from altitude sender

– Switch on ignition

➡ – Connect hand-held multimeter V.A.G 1526 with auxiliary cables from V.A.G 1594 for voltage measurement in turn between contacts 1 and 3 as well as 2 and 3.

Specification in each case: 4.5 - 5.5 V

If one of the specifications is not achieved, test cable connections to the Motronic control unit

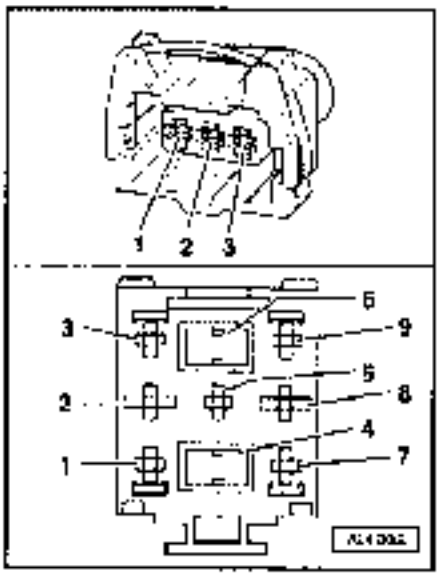
24 - 6

Testing cable connection of altitude sender

Switch off ignition.

Connect test box V.A.G 1598 with adapter cable V.A.G 1598/5 only to the wiring loom to the Motronic control unit ⇒ Repair Group 01.

– Remove bridge or unplug control unit for trailer recognition -J345 at the auxiliary relay carrier, relay position 16



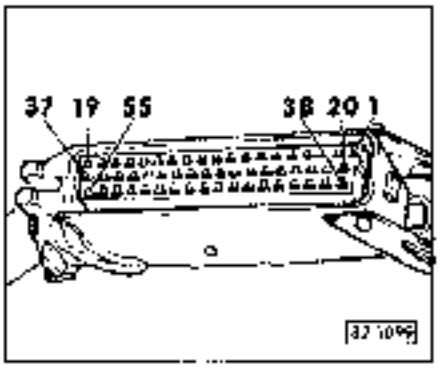
➡ – Test the following cables for open circuit or short circuit on the basis of the current flow diagram

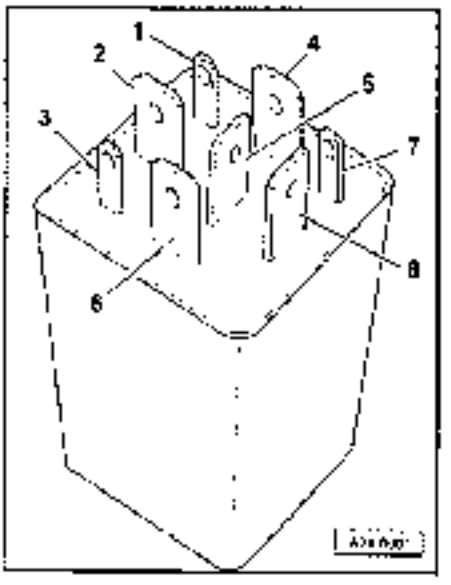
- From contact 1 at connector for -F96 to contact 2 at relay base for -J345.
- From contact 5 at relay base for -J345 to socket 9 of the test box.
- From contact 2 at connector for -F96 to socket 12 of the test box.
- From contact 3 at connector for -F96 to socket 30 of the test box.

Specification: max. 1.0 Ω

24–7

➡ – Rectify any open circuit or short circuit in wiring.





➡ – If vehicle fitted with trailer coupling, test control unit for trailer recognition contact 2 to contact 6 for continuity

Specification: approx. 1 Ω

– Re-insert bridge or plug in trailer recognition control unit -J345 at auxiliary relay carrier, relay position 16.

24–8

– Connect adapter cable V.A.G 1598/9 to the Motronic control unit.

– Switch on ignition.

– Connect hand-held multimeter V.A.G 1526 in turn between sockets 12 and 30 as well as 9 and 30.

Specification for socket 12 and 30: 4.5 ... 5.5 V.

Specification for socket 9 and 30: 0.5 ... 5.0 V.

– If one of the specifications is not achieved, replace Motronic control unit.

– After rectifying all the faults, interrogate and erase fault memory.

Reduction in engine output when towing a trailer

(Models with trailer coupling when towing a trailer)

Notes:

- *When towing a trailer, the engine output is reduced to about 169 kW (230 HP). This is done by the trailer recognition control unit -J345 interrupting the signal of the altitude sender -F96 and supplying a fixed value of about 0.5 V in its place to the Motronic control unit -J220.*
- *The fixed value of 0.5 V corresponds to a pressure level of 600 mbar (about 4200 m above MSL).*
- *The trailer recognition control unit -J345 is located in the auxiliary relay carrier below the dash panel on the left, relay position 16 (⇒ current flow diagrams).*
- *Either a trailer or a separate light unit (e.g. test facility for trailer socket) must be used for the test.*

Read measured value block	2		
1	2	3	4

Test requirements:

- *Altitude sender F96 o.k. (no fault in fault memory).*
- *Trailer lighting operates*

Unplug trailer connector.

– Read measured value block and select display group 02 ⇒ Repair Group 01

⇒ Readout in display.

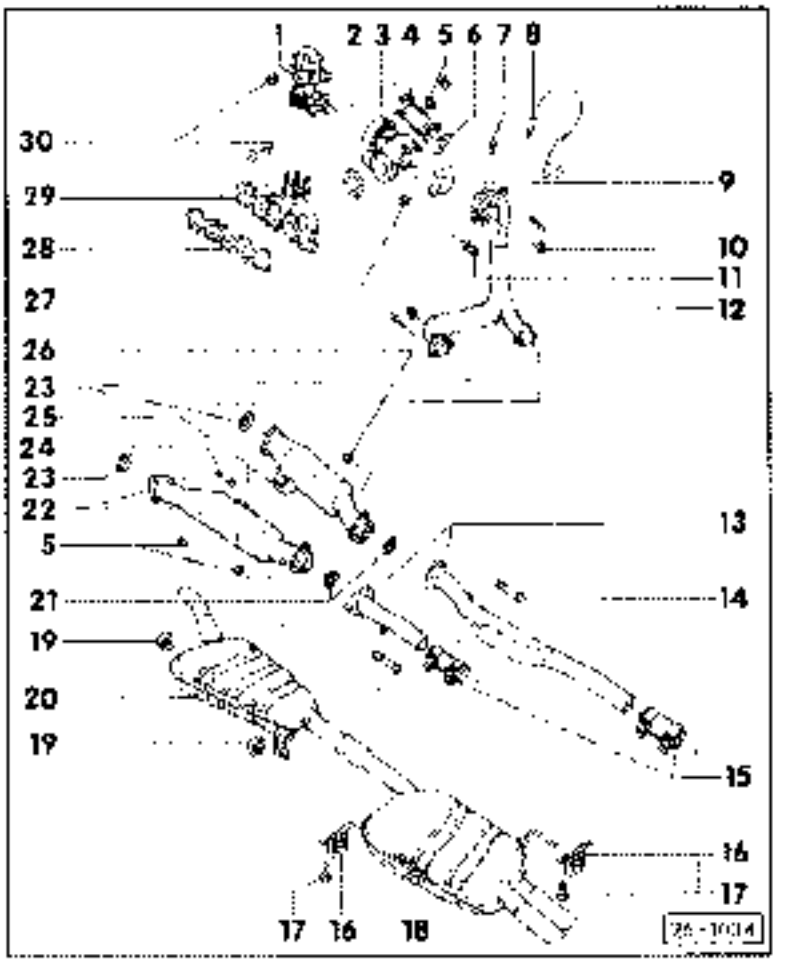
– Check readout in display field 4.

The current atmospheric pressure is displayed in mbar

– Plug in trailer lighting.

The fixed value of 600 mbar supplied by J345 is displayed

– If no change occurs from the current reading to the fixed value for trailer operation when the trailer lighting is plugged in, or if the constant value of 968 mbar is displayed instead of the current value (and fault 00578 is then stored), replace trailer recognition control unit



Removing and installing exhaust system

Notes:

- *Aligning exhaust system free of tension ⇒ page 26–7*
- *Checking exhaust system for leaks ⇒ page 26–11*
- *Separation point between centre silencer and tail silencer ⇒ page 26–5 Fig. 1*
- *Always fit new gaskets and hexagon nuts*

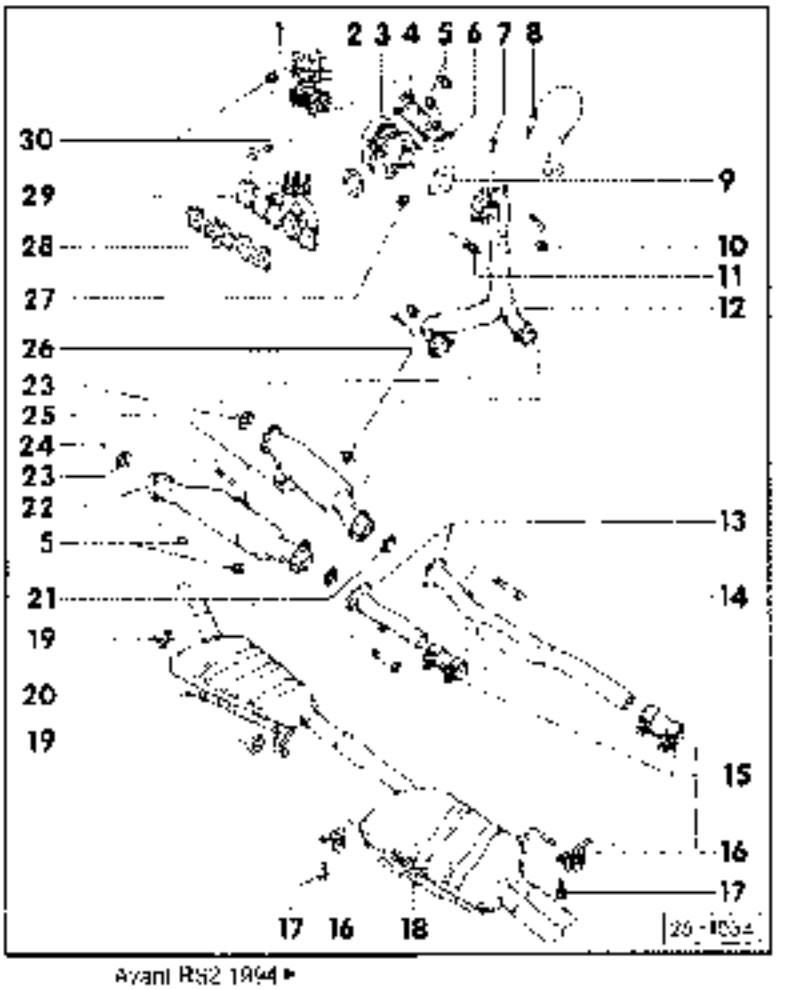
1 – **Blow-off valve**

2 – **Gasket**

3 – **Turbocharger**
- Removing and installing

→ Workshop Manual Audi 100 1991 ◄
Engine Code AAN
5-Cyl. Injection Engine (4-Valve)
Engine, Edition 07.91
Technical Bulletin No. 4
Edition 09.93

26–1



4 – **Corrugated tube**
- Fitting location ⇒ page 26-6 Fig. 2

5 – **Hexagon nuts, 25 Nm**

6 – **Gasket**

7 – **Screw plug, 27 Nm**

8 – **Lambda probe, 50 Nm**
- Testing

⇒ Repair Group 24
- Grease thread with G5; grease must not get into the slot area of probe body

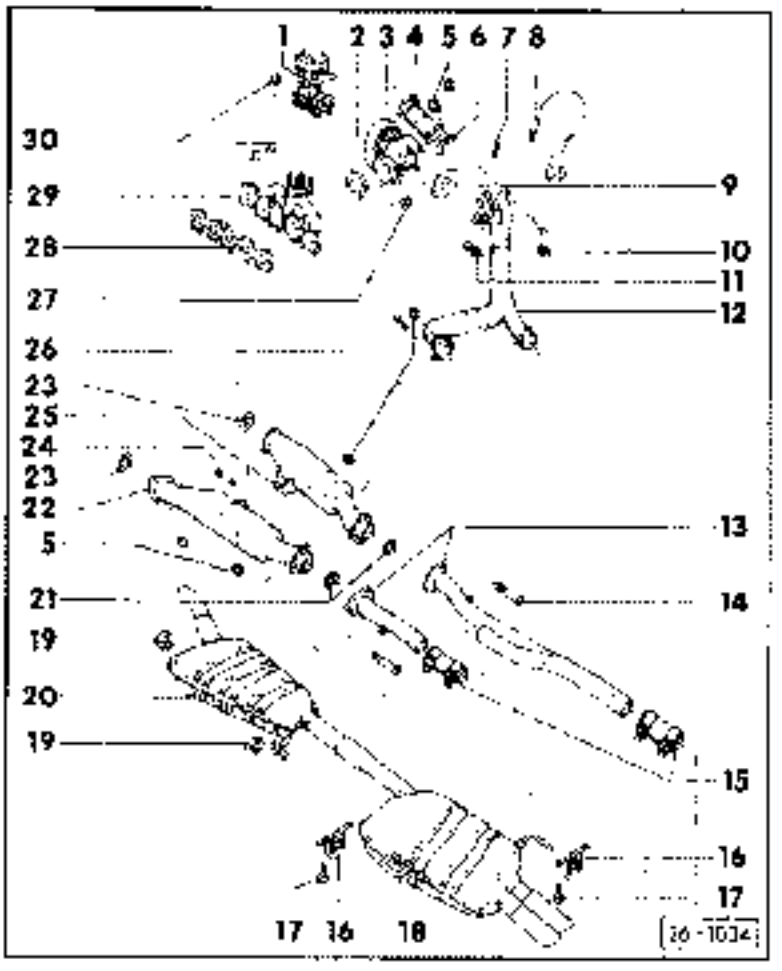
9 – **Gasket**

10 – **Hexagon nut, 30 Nm**

11 – **Hexagon nut, 30 Nm**
- Width across flats 18

12 – **Front exhaust pipe**
- Clearance to heat shield of left drive shaft about 16 mm

26–2



13 – **Intermediate pipes**
- Lock nut, CO sampling 25 Nm
- Aligning ⇒ page 26–10

14 – **Hexagon bolt, 25 Nm**

15 – **Double clips**
- Fitting location ⇒ page 26–10
- Tighten evenly 40 Nm
- Replace each time after slackening the screw union

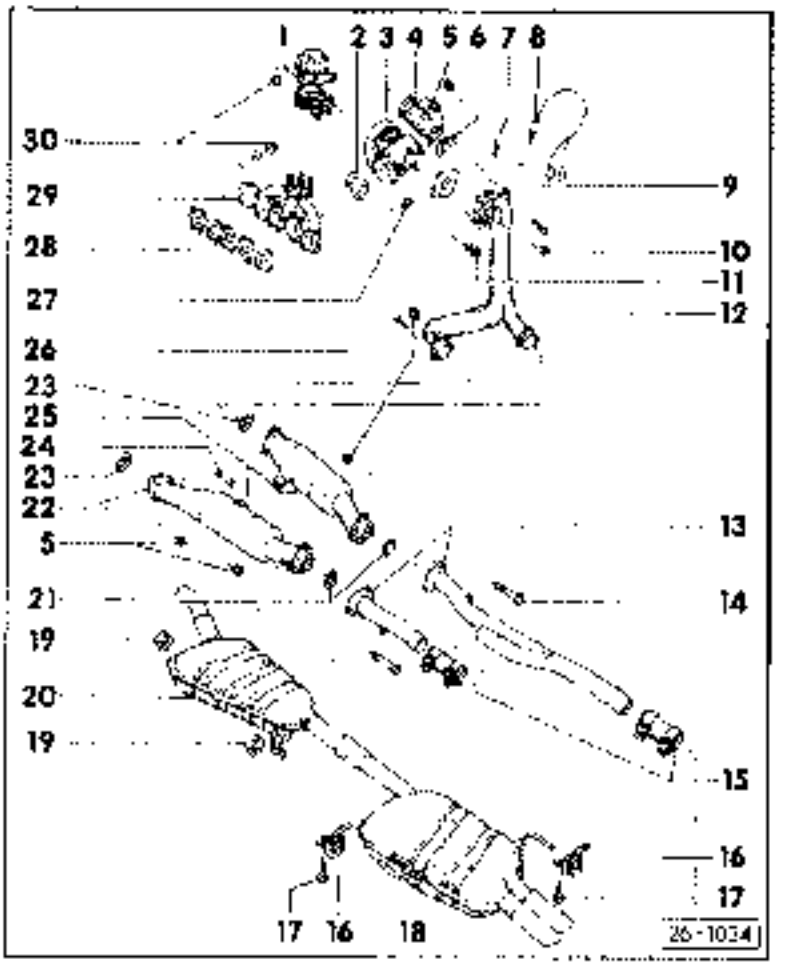
16 – **Bracket**
- Align ⇒ page 26–8

17 – **Hexagon bolt, 25 Nm**

18 – **Tail silencer**
- Align tail pipes ⇒ page 26–9
- Adjust protension of exhaust system ⇒ page 26–8

19 – **Suspension loop**

20 – **Centre silencer**
- Align when performing repairs ⇒ page 26–9



21 – **Seals**

22 – **Catalytic converter**
- Ensure adequate clearance between catalytic converter input pipe and heat shield for transmission bearing ⇒ page 26–7

23 – **Seal**

24 – **Hexagon bolt, 25 Nm**

25 – **Catalytic converter suspension**
- Location of parts ⇒ page 26–6 Fig. 3

26 – **Hexagon nuts**
- Welded in place, replace if damaged

27 – **Hexagon nut, 60 Nm**

28 – **Gasket for exhaust manifold**

29 – **Exhaust manifold**

30 – **Hexagon nut, 25 Nm**

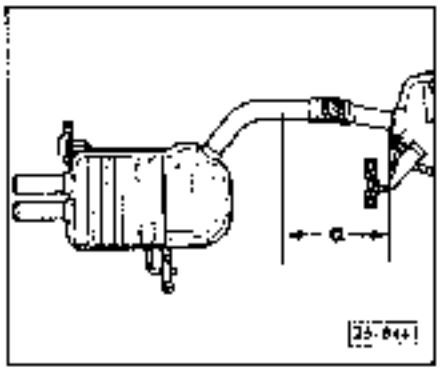


Fig. 1 Separation point between centre silencer and tail silencer

- A separation point is provided for replacing the centre silencer or tail silencer, respectively.
- Separate exhaust pipe between centre silencer and tail silencer at the point marked by a groove.

→ Size -a- about 300 mm.

- A short double clip is provided for connecting centre silencer and tail silencer when performing repairs, 40 Nm.
- Align centre silencer when performing repairs ⇒ page 26-9.
- The double clip should be installed horizontally.
- The screw union of the double clip must be located on the right side of the exhaust pipe.

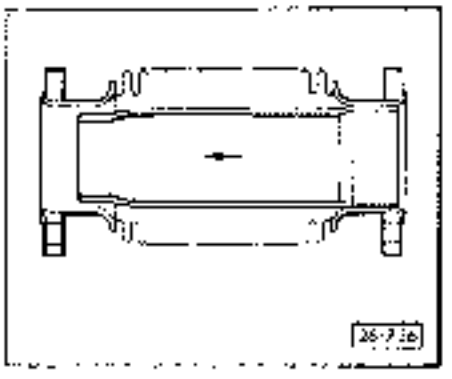


Fig. 2 Installation position of corrugated tube

→ - Flow direction -arrow- from exhaust manifold to exhaust system

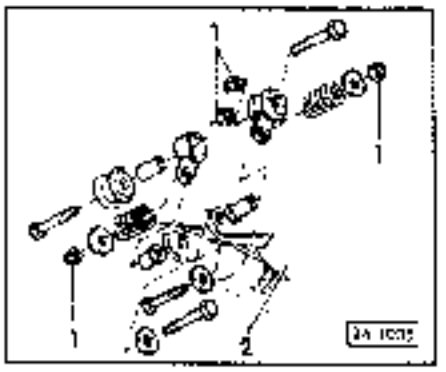


Fig. 3 Suspension of catalytic converter

→ Location of parts

1 Hexagon nut, 25 Nm

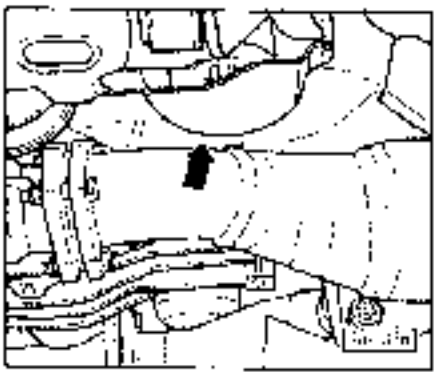
2 Catalytic converters

Aligning exhaust system free of tension

The exhaust system should be aligned free of tension as described below in order to avoid noises and stresses in the exhaust system.

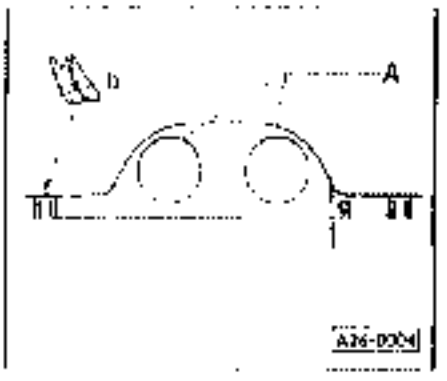
Notes:

- *Slacken all the bolted joints of the exhaust system including the suspension of the catalytic converter.*
- *The dimensions stated in the Fig. are a guide.*
- *The exhaust system is aligned when cold.*
- *The procedure described below must be performed in the order stated.*



The clearance between front exhaust pipe and heat shield of the left drive shaft must be at least 10 mm.

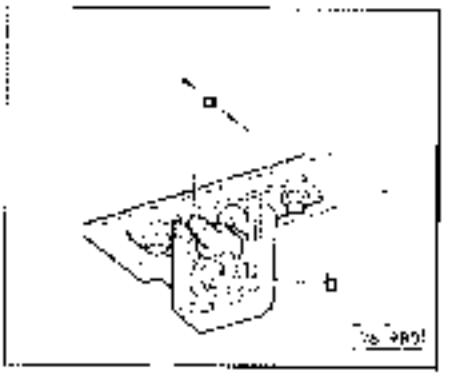
➡ Align catalytic converter: It is important to ensure that an adequate clearance of at least 10 mm exists between catalytic converter input pipe and heat shield for transmission bearing (arrow).



➡ – The catalytic converters –A– must be positioned at least 2 mm higher than the catalytic converter collision guard, as shown in the figure (size –a–).

Notes:

- *The catalytic converters are shown from the rear (viewed in direction of travel).*
- *The size –a– must be measured from the centre –b– of the catalytic converter crash guard.*



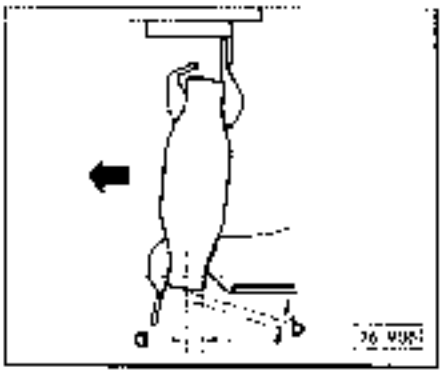
– Tighten flanged joint between front exhaust pipe and catalytic converter on left and right. The screwed joints of the flanges of the pre-exhaust pipe, catalytic converter must be tightened in such a way that the flanges have the same distance to each other all round: 25 Nm.

Tighten suspension of catalytic converter free of tension, 25 Nm.

➡ Adjust pressure on all the left mounting bracket of the tail silencer. Size –a– at least 1[illegible]mm should be obtained by moving in the double clip.

Notes:

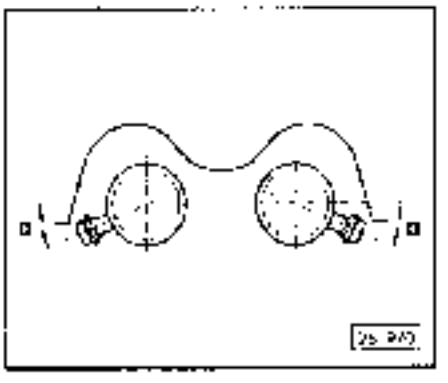
- *After tightening the bracket, the opening "b" must not be blocked.*
- *Brackets which are permanently deformed or damaged must be replaced.*
- Align tail pipes so that sufficient clearance to the pump cards in all directions is
- Align center silencer when performing repairs



Note:

The illustration shows the front hanger of the center silencer.

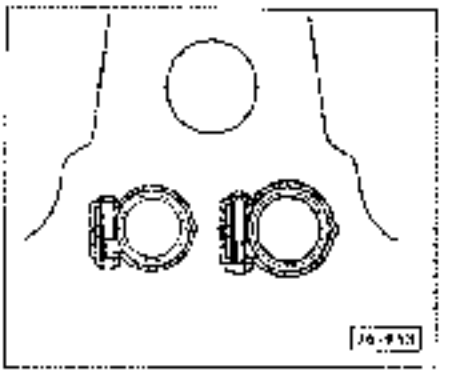
- The pretension "a" of 7 mm should be obtained by moving it in the double clip.
- The clearance "b" between the loop and the securing straps must be at least 2 mm at both hangers.



- Align intermediate pipes as shown in the Fig. Size "a" about 20

Note:

The intermediate pipes are shown from behind, viewed in direction of travel.



- Align screw unions of the double clips as shown in the Fig., and tighten, 40 Nm.

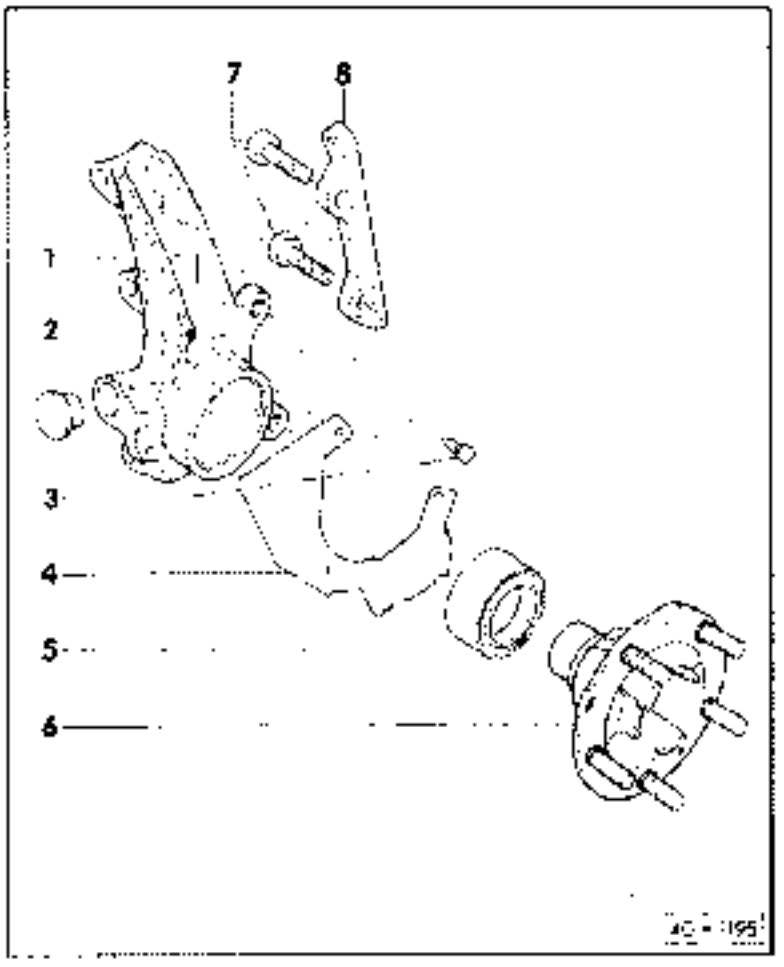
Notes:

- *Double clips are shown from the rear, viewed in direction of travel.*
- *After slackening the screw union, the double clips must be replaced.*
- Tighten bolted connection of flanged joint of catalytic converter/intermediate pipes. The bolted connection of the flanges of the catalytic converter/intermediate pipes must be tightened in such a way that the flanges have the same clearance to each other around. 25 Nm

The exhaust system should be checked for leaks by adopting the following procedure:

- Run engine
- Seal tail pipes for the duration of the leak test e.g with rags or plugs.
- Check the following joints by listening for leaks: Cylinder head / manifold, manifold - front exhaust pipe etc.
- Rectify any leaks found

96-11



Replacing wheel bearing housing

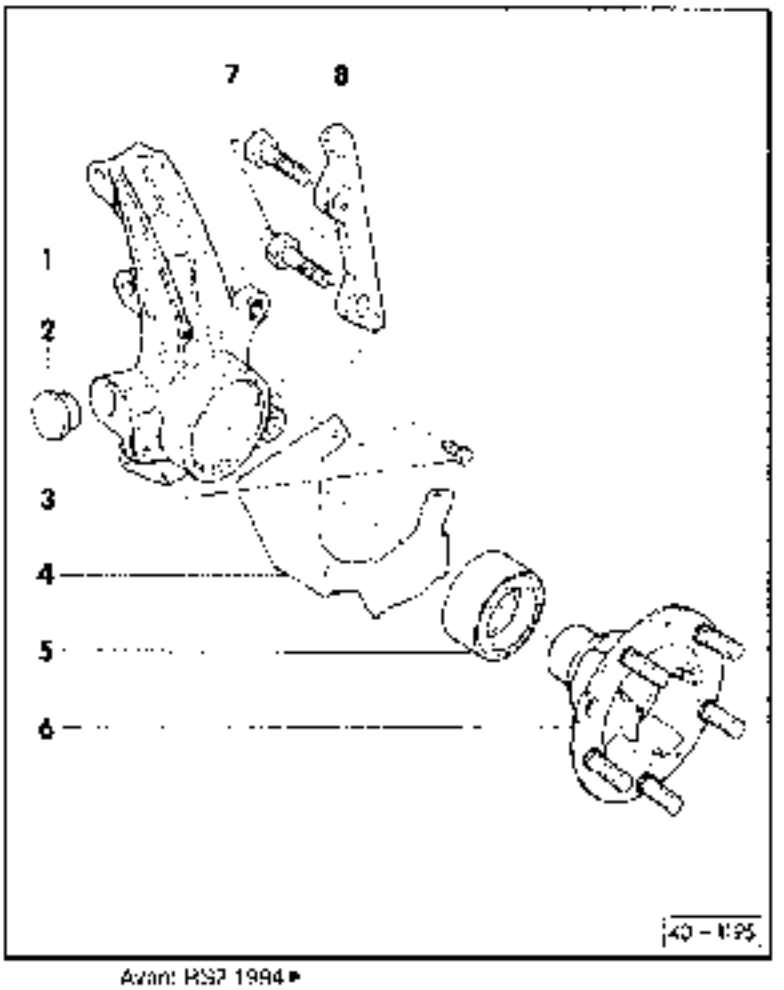
1 – **Wheel bearing housing**
- With Ø 82 mm bearing bore
- Do not grease bearing seat in wheel bearing housing before pressing in wheel bearing
- In order to press out the pivot journal, on no account widen slot in wheel bearing housing/seat for pivot journal)
- After installing and removing or replacing, check front side alignment

2 – **Plug**
- On vehicles fitted with anti-locking brake system, a spring sleeve for mounting the speed sensor is in some cases instead of the plug

3 – **Hexagon bolt, 10 Nm**

4 – **Splash guard**

40-1



5 – **Wheel bearing**

Important!

Pay attention to installation position; Large inner diameter of wheel bearing faces wheel hub.

- Is destroyed when pressing out
- Pressing out ⇒ Fig. 2
- Inserting ⇒ Fig. 3

6 – **Wheel hub**
- Pressing out ⇒ Fig. 1
- Inserting ⇒ Fig. 4
- Pressing off bearing inner race ⇒ Figs. 5 and 6

7 – **Hexagon bolt, 85 Nm**

8 – **Adapter for brake caliper**
- For attaching the four-piston brake caliper

40-2

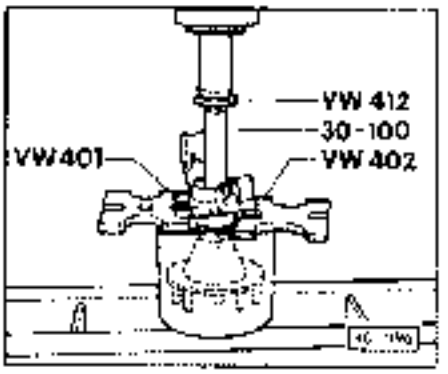


Fig. 1 Pressing wheel hub out of wheel bearing housing

Note:

Use a Ø200 x 180 x 4 mm ring which is closed at one end for pressing out the wheel hub

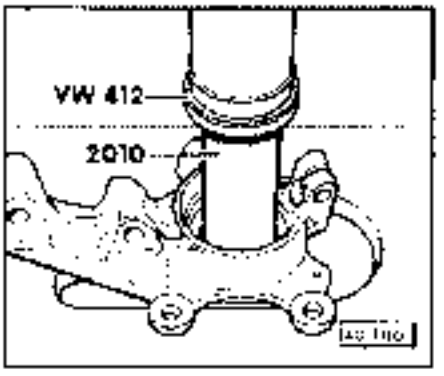


Fig. 2 Pressing out wheel bearing

40-2

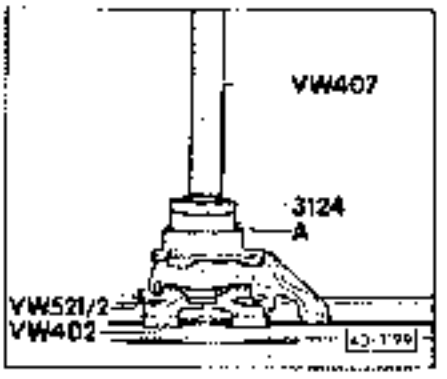


Fig. 3 Pressing wheel bearing -A- in until fully home

– Large inner diameter of wheel bearing faces wheel hut.

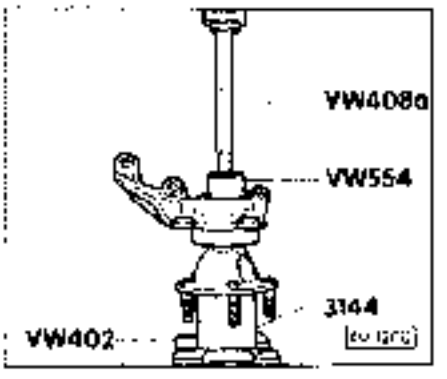
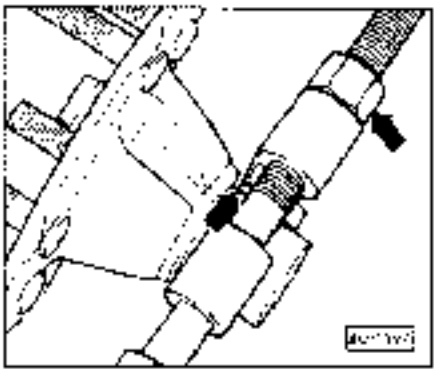


Fig. 4 Pressing wheel hub into wheel bearing

Notes:

- *When pressing in, the tool VW 541 must be supported only at the bearing inner race*
- *Tool 3144 with angled side facing up*

40-4

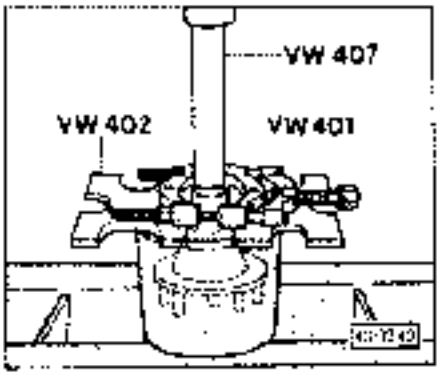


→ Fig. 5 Inserting separating device

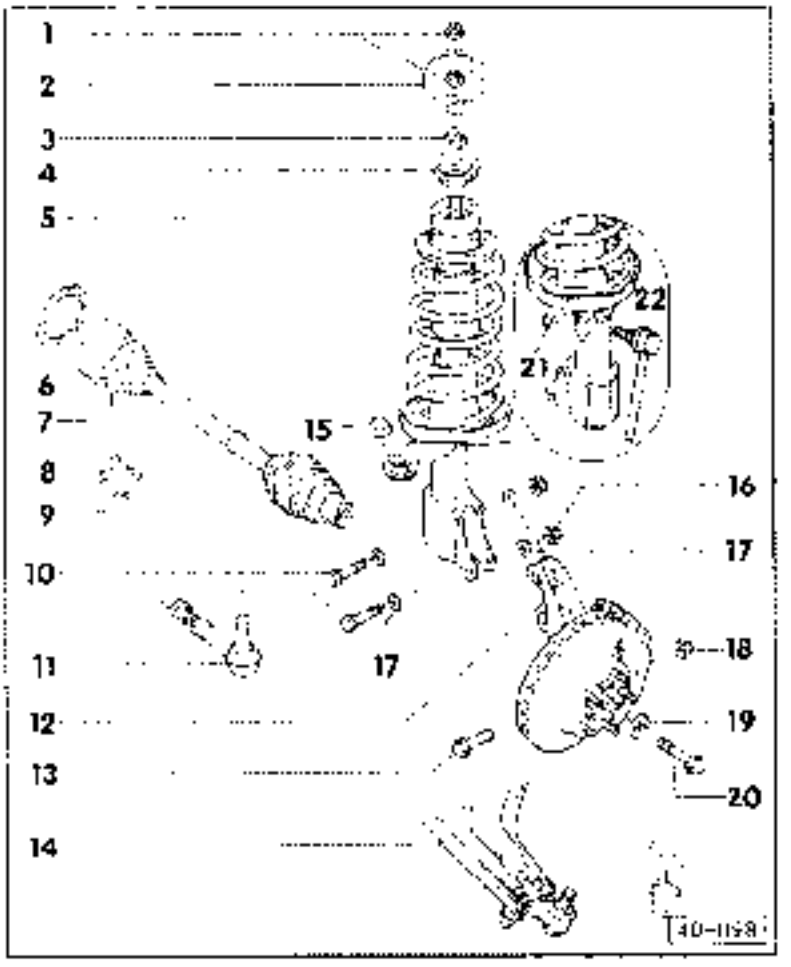
Insert separating device into the annular groove of the bearing inner race and pre-tension appropriately with spindle.

Note:

Use commercially available separating device, e.g. KUKKO 15/17.



→ Fig. 6 Pressing bearing inner race off wheel hub



Removing and installing suspension strut and drive shaft

1 – **Plastic nut**

2 – **Cap**
- Screw onto wheelhouse

3 – **Self-locking nut, 60 Nm**
- Always replace
- Tighten with torque wrench ⇒ page 40–11 Fig. 2

4 – **Dished stop plate**

5 – **Suspension strut**
- Do not unbolt from wheel bearing housing in order to replace shock absorber, coil spring and wheel bearing, but remove complete and install (camber setting)

6 – **Gasket**
- Replace; put off protective strip and stick into the joint

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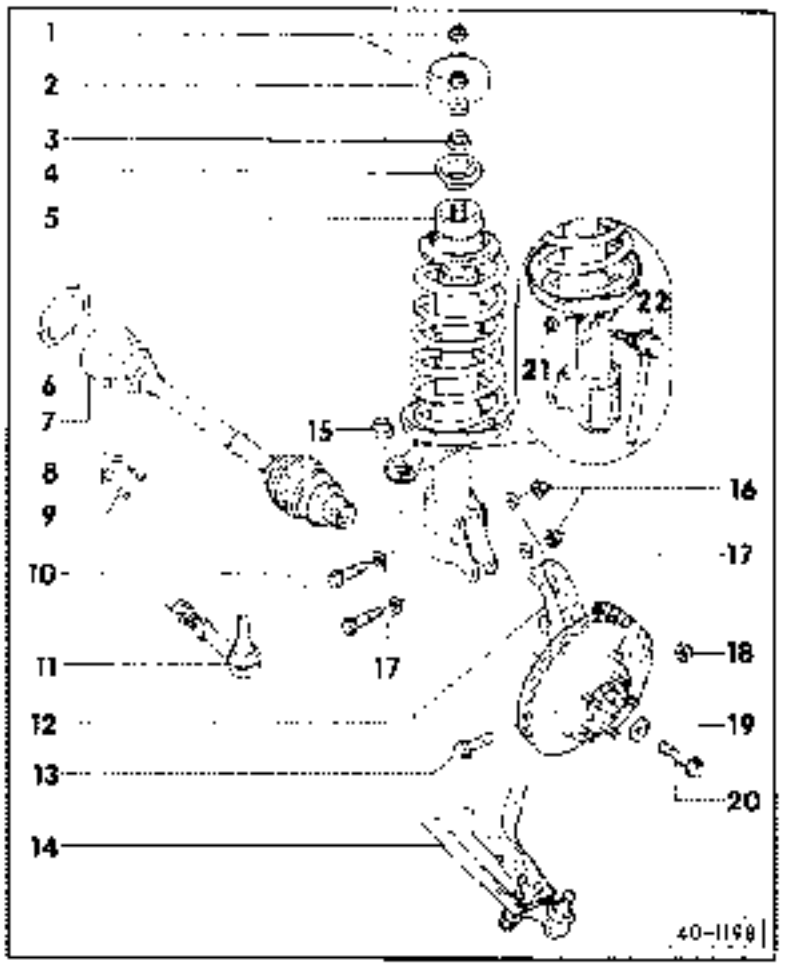


7 – Drive shaft

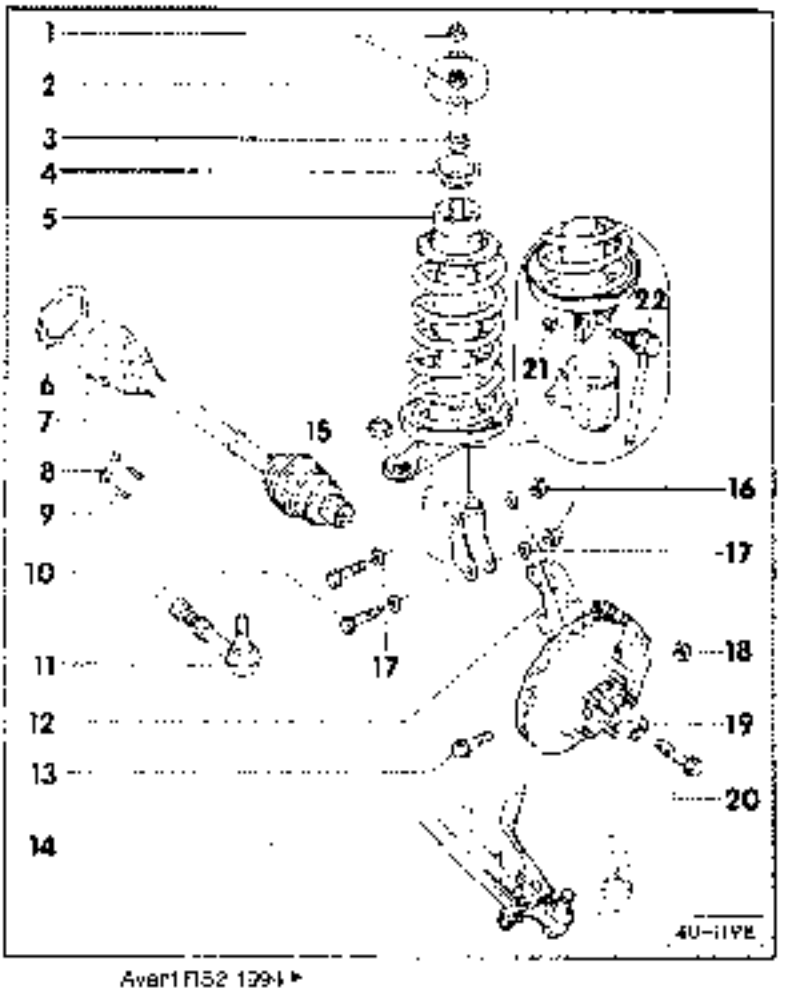
- To remove, unbolt coupling rods at both sides of suspension strut and push anti-roll bar up. Unbolt from the flanged shaft and also remove hexagon bolt - washer.

Important!

If it is necessary to remove vehicles on which the drive shaft has been removed, an outer joint must be installed first of all in place of the drive shaft otherwise the wheel bearing will be damaged.

- Pay attention to different lengths on left and right.
- When removing the drive shaft, push back ABS speed sensor slightly first of all, press in until fully home when installing.

40-7



8 – Backing plate

9 – Cylindrical bolt, 80 Nm

10 – Hexagon bolt

- Always replace.

11 – Track rod

- Prize off steering arm with two-leg gear puller › page 40-11 Fig. 1

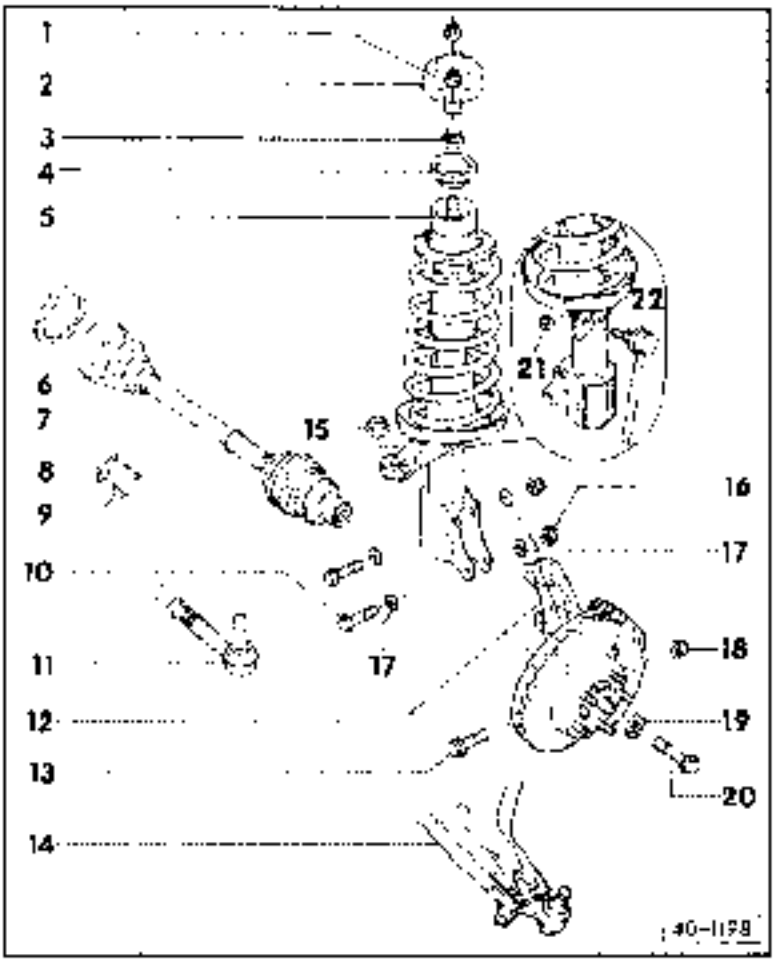
12 – Wheel bearing housing with wheel hub

- To press off the pivot journal, unscrew account when slotted wheel bearing housing (seat for pivot journal).
- After installing, check front axle alignment.

13 – Hexagon bolt

- Always replace.
- Bolt head faces in direction of travel.

40-8



14 – **Axle link with axle joint**
- When removing from wheel bearing housing, do not widen slot in wheel bearing housing
- Limit journal diameter 19.0 mm
- Only as forged version

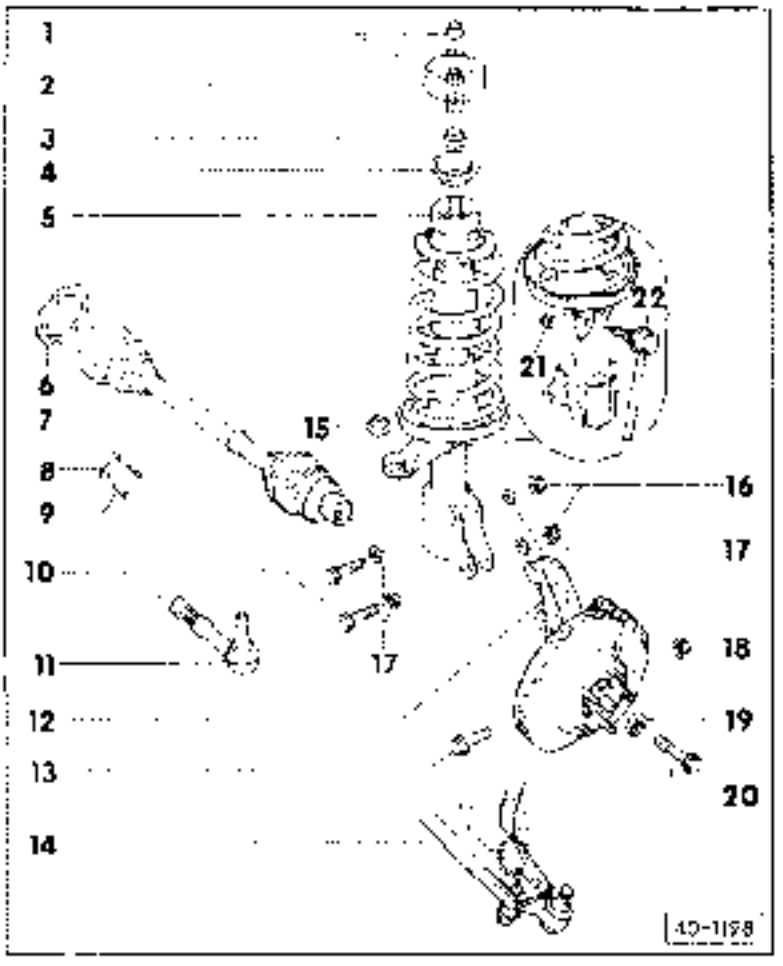
15 – **Self-locking nut, 30 Nm**
- Always replace

16 – **Self-locking nut**
- Always replace
- Tighten to 110 Nm and then tighten a further 90°

17 – **Washer**

18 – **Self-locking nut, 50 Nm**
- Always replace

19 **Spacer**



20 – **Hexagon collar bolt**
- Always replace
- Tighten M16 x 1.5 bolt to 200 Nm and then tighten a further 90°
- Slacken and tighten only when vehicle standing on its wheels (risk of injury!)

21 – **Self-locking nut, 40 Nm**
- Always replace

22 – **Coupling rod**

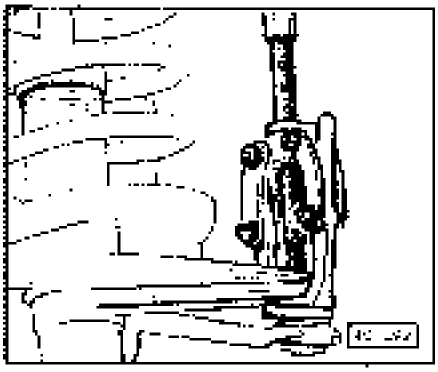


Fig. 1 Pressing off track rod joint

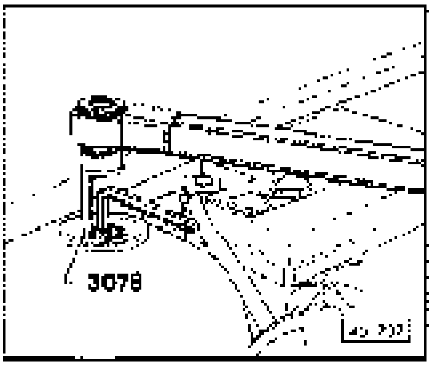
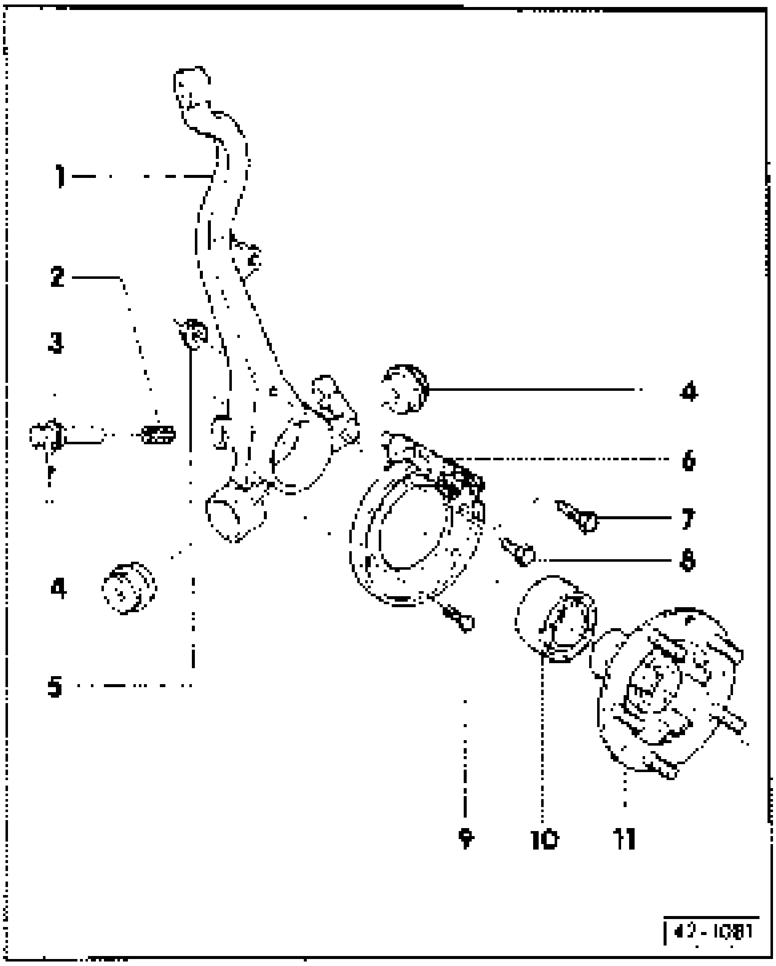


Fig. 2 Tightening nut with torque wrench

- Counter-hold coupling rod with hexagon socket wrench.



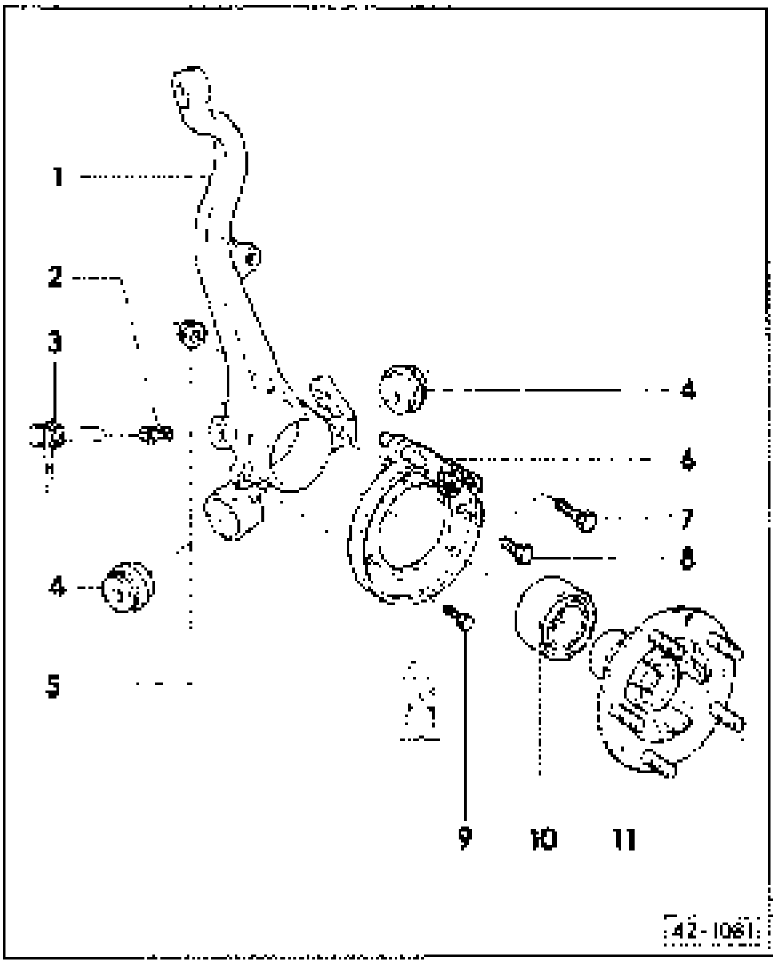
Replacing wheel bearing housing

Note:

Before removing the wheel bearing housing, remove rear wheel parking brake ⇒ Servicing rear wheel parking brake, page 45-3

1 – **Wheel bearing housing**
- Do not grease bearing seat in wheel bearing housing before pressing in wheel bearing
- After replacing the wheel bearing housing, check rear axle alignment
- Is supplied as replacement part with hole for mounting the clamping sleeve or the speed sensor

2 – **Clamping sleeve**
- Grease all round with brake cylinder paste before inserting into wheel bearing housing
- Press into wheel bearing housing until fully home



3 – **Speed sensor**
- Pull out to remove
- To install, press in by hand until fully home

4 – **Bonded rubber bush**
- Removing and installing ⇒ Workshop Manual

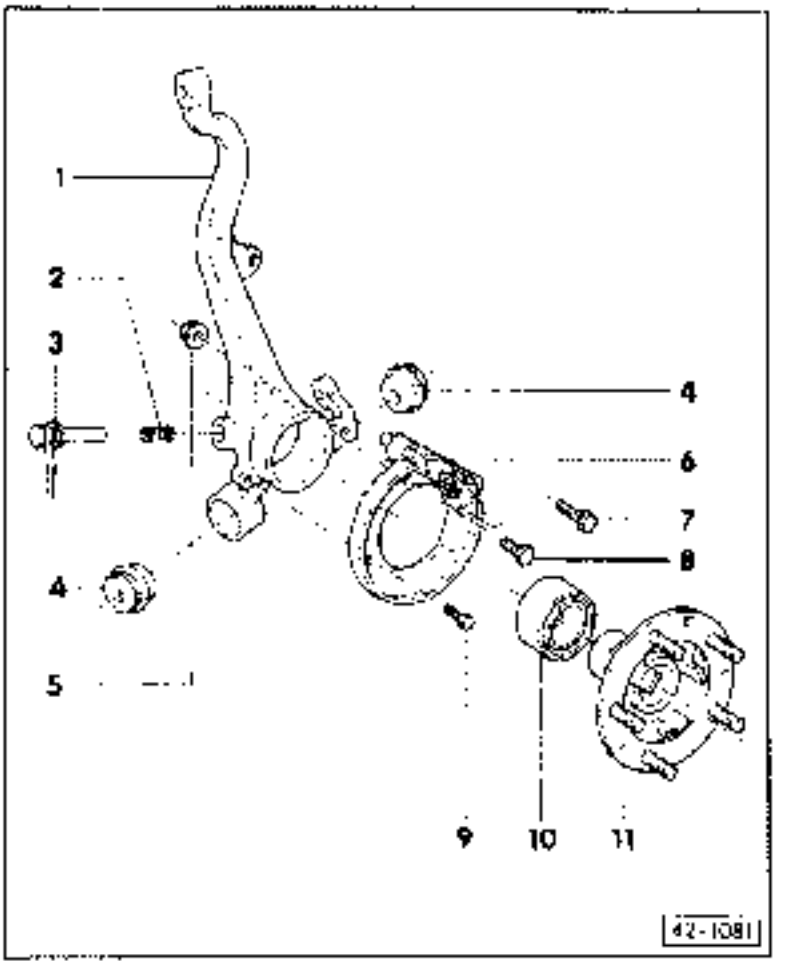
5 – **Self-locking nut, 46 Nm**
- Always replace

6 – **Brake mounting plate**
- Mounting plate of parking brake and of brake caliper

7 – **Hexagon bolt**

8 – **Hexagon bolt, 46 Nm**

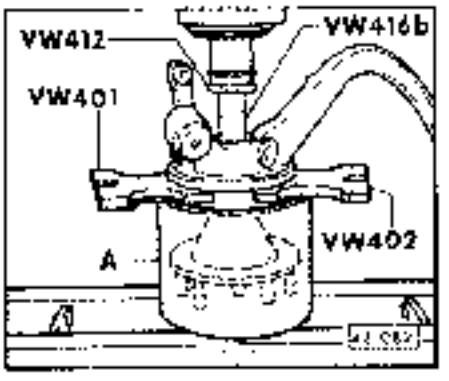
9 – **Hexagon bolt, 30 Nm**



10 – Wheel bearing
- Inner diameter as stepped design
- Pay attention to installation position (larger inner diameter of wheel bearing faces wheel hub)
- Is destroyed when pressing out
- Pressing out ⇒ Fig. 2
- Inserting ⇒ Fig. 4

11 – Wheel hub
- Pressing out ⇒ Fig. 1
- Inserting ⇒ Fig. 3
- Pressing off bearing inner race ⇒ Fig. 5 and Fig. 6

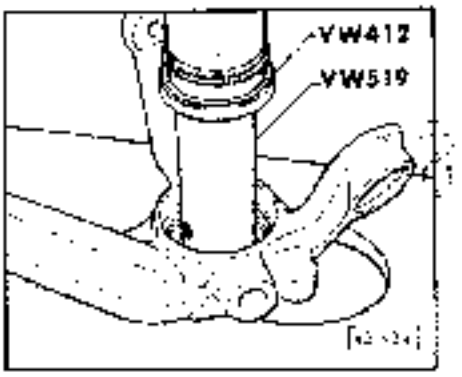
42–3



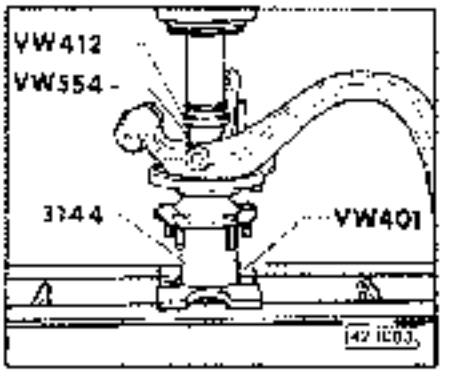
⇒ **Fig. 1 Pressing out wheel hub**

Note:

Use a Ø 200 x 190 x 4 mm ring –A– which is closed at one end for pressing out the wheel hub



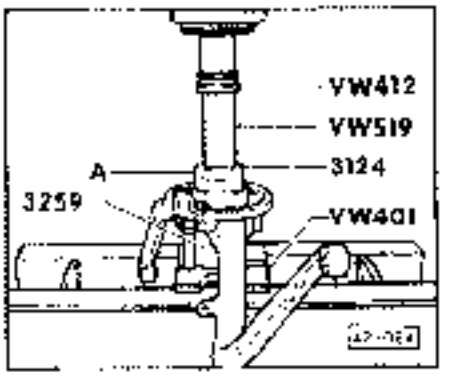
⇒ **Fig. 2 Pressing out wheel bearing**



→ Fig. 3 Pressing in wheel hub

Note:

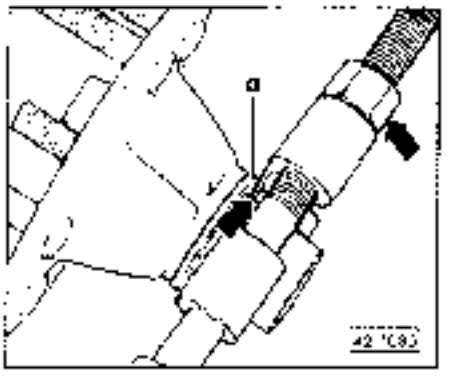
When pressing in, the tool VW 554 must be supported only at the bearing inner race



→ Fig. 4 Pressing in wheel bearing - A- until fully home

* Large inner diameter of wheel bearing faces wheel hub

42-5



→ Fig. 5 Inserting separating device

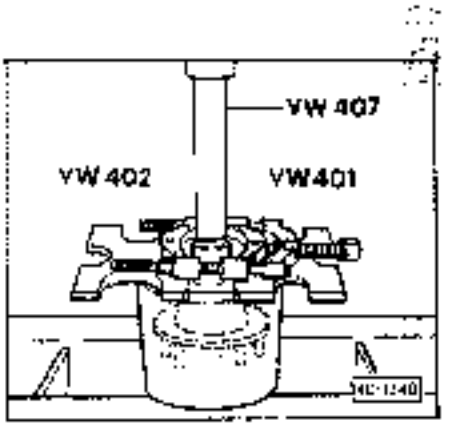
Important!

When pressing off bearing inner race, ensure that the spacer shim -A- is not also pressed off.

* Insert separating device into the annular groove of the bearing inner race and pre tension appropriately with spindle

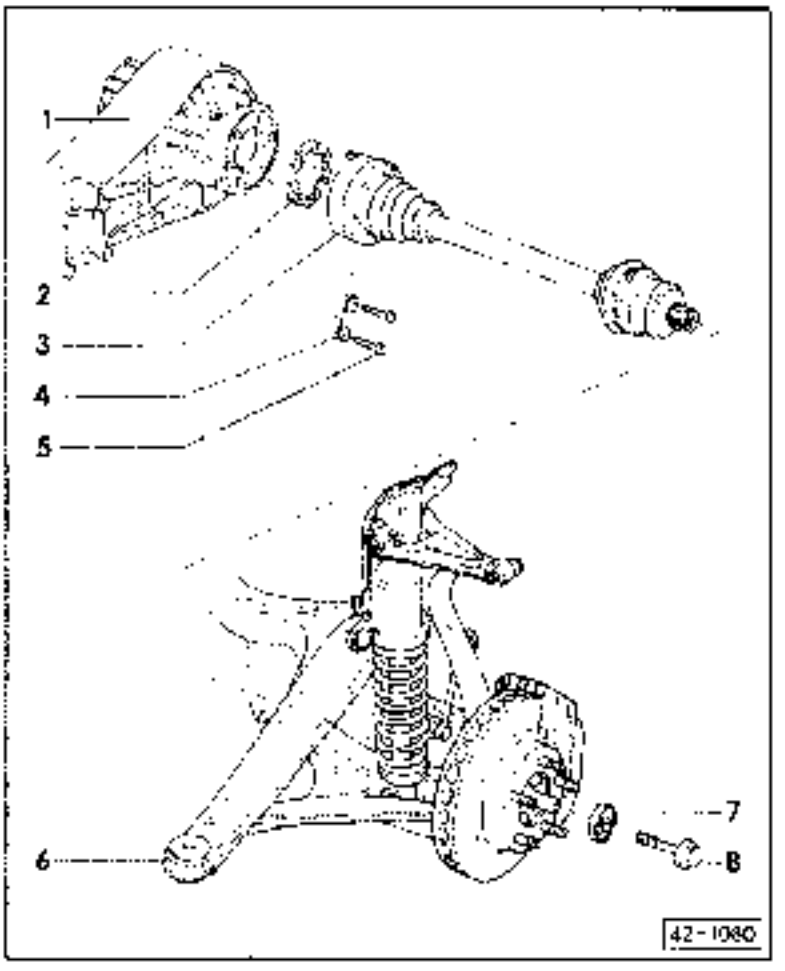
Note:

Use commercially available separating device, e.g. KUKKO 15-17.



→ Fig. 6 Pressing bearing inner race off wheel hub

42-6



Removing and installing drive shaft

1 – **Differential**

2 – **Gasket**
- Pull off protective sheet and slide into the joint

3 – **Drive shaft**
- Service > Workshop Manual

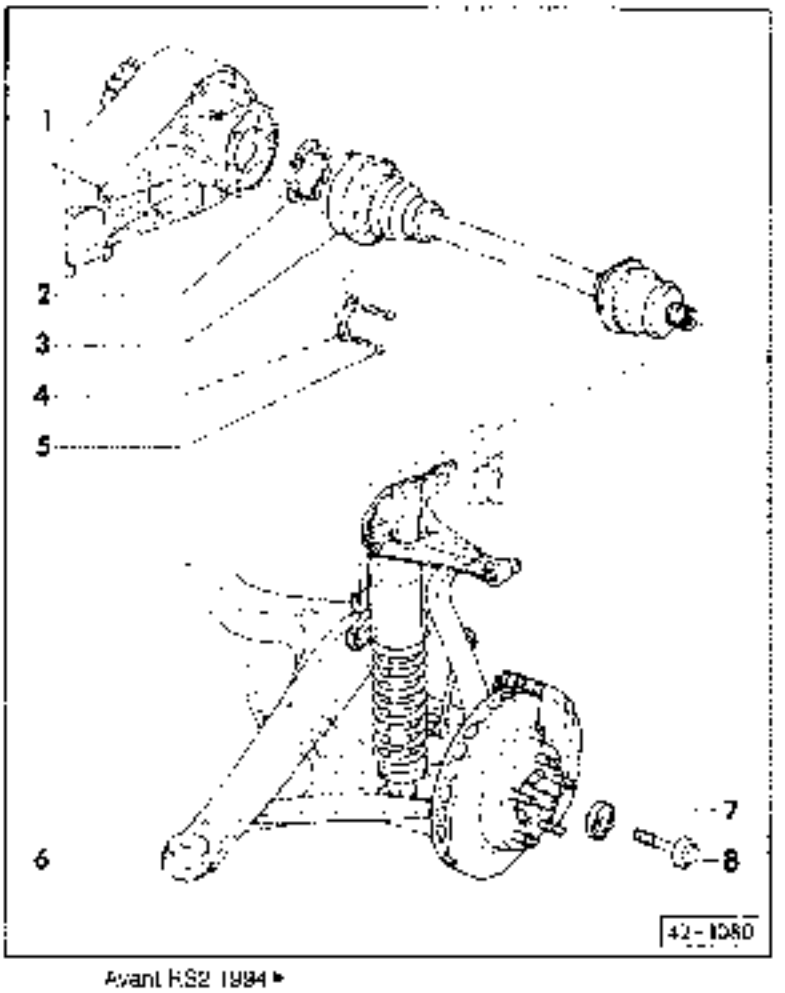
Important!

Should it be necessary to move the vehicle on which the drive shaft has been removed, an outer joint should be installed first of all in place of the drive shaft otherwise the wheel bearing will be damaged.

4 – **Backing plate**

5 – **Cylindrical bolt, 80 Nm**

42-7



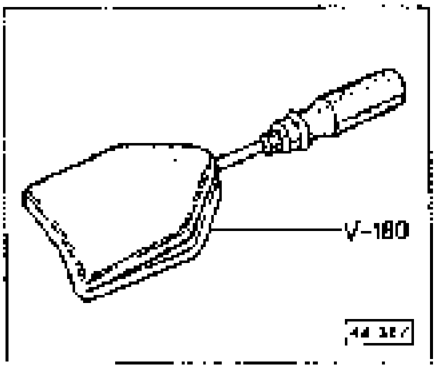
6 – **Subframe**

7 – **Spacer**

8 – **Hexagon bolt + washer**
- Always renew
- Tighten M16 bolt to 200 Nm and then tighten a further 90°
- Slacken and tighten only when vehicle standing on its wheels (risk of injury)

42-8

Fitting on tyres

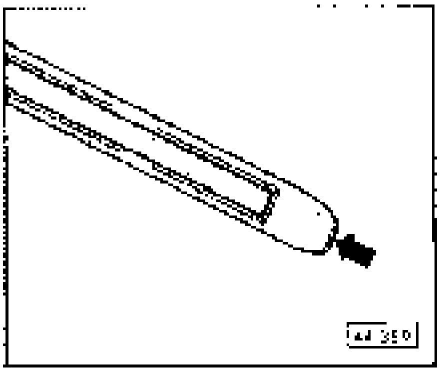


The tyre fitting and removal instructions relate to 17" cup design wheels with asymmetric hump.

Note:

Avoid damaging the paintwork of the wheel.

- Use a Matra presser V–180 for removing and fitting on the tyres.



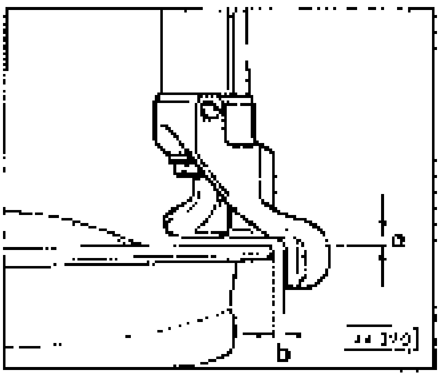
- In addition, the assembly lever should be flattened at its lace end and then rounded (arrow).

  Fit on the first tyre bead in the usual manner.

Note:

The asymmetrical hump alters its shape over the circumference of the tyre.

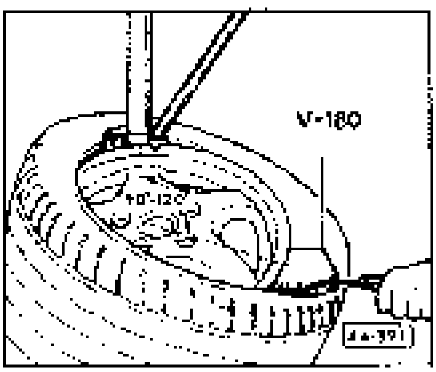
For this reason, pay strict attention to the following points when fitting on and removing the tyres.



- Clamp on wheel and coat inside of wheel as well as both tyre beads with assembly paste.

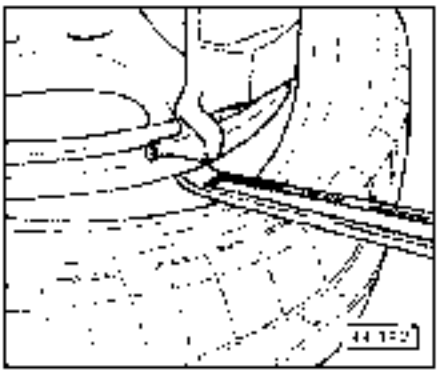
  Replace the valve each time before fitting on the tyre.

- Adjust assembly tool to the correct distance.
  a = 4 – 5 mm
  b = 8 – 10 mm



When starting to fit on the second bead, the assembly arm should be positioned opposite the valve. Then fit the second tyre bead onto the wheel as flat as possible, guide over the assembly head and hold down offset about 90 – 120° using special tool 9539.

- When turning the wheel and fitting on the second bead, the bead of the tyre must be held in the deep bed of the wheel with a second assembly lever and ? a special tool Matra V–180.

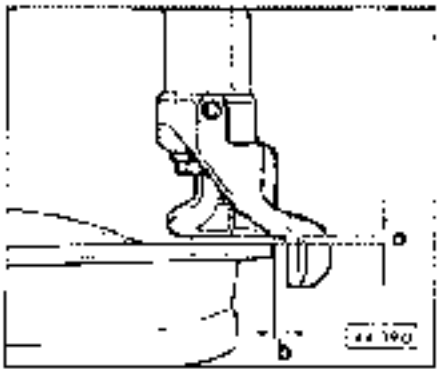


– To make it easier to fit on the tyre, the additional assembly lever should be positioned below the hump.

– When inflating the tyre, the beads must jump across the hump – no later than at pressure of 4.5 bar.

– When inflating the tyre, therefore, the bead which is still in the deep bed must be positioned opposite the valve (flatter hump profile). It may be necessary to turn the tyre accordingly and re-coat with assembly paste.

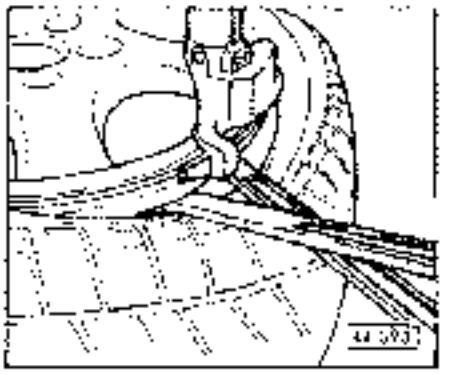
Removing tyres



Set assembly tool to the correct distance
- a = 4 – 5 mm
- b = 6 – 10 mm

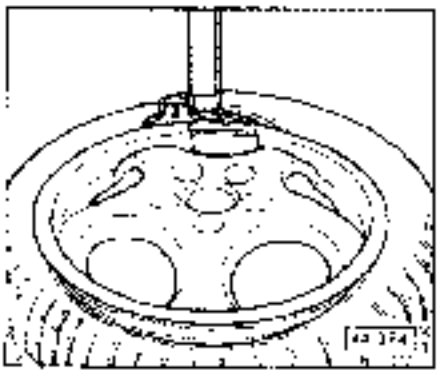
– Begin pressing off the tyre at the valve as the force required here is slightly less. Then press off the tyre on both sides, coating the rim flange with assembly paste when doing this.

44-01



– Lift the first side of the tyre over the assembly head.

– Place a rag or a chamois leather between wheel and assembly lever as an aid when performing this step.



– In addition, ensure that the tyre is held in the deep bed opposite the removal head.

– Use the special tool Matra V– 180 for this purpose.

– Remove the second side of the tyre in the usual manner.

44-1

Wheels and tyres

Engine output / kW	Tyre size	Wheel size	Wheel offset and hole circle Ø mm
232	245 / 40 ZR 17	7 J x 17	55 / 130

* Spare wheel with regular tyre

■ Only Dunlop SP Sport 8000 tyres may be fitted as summer tyres

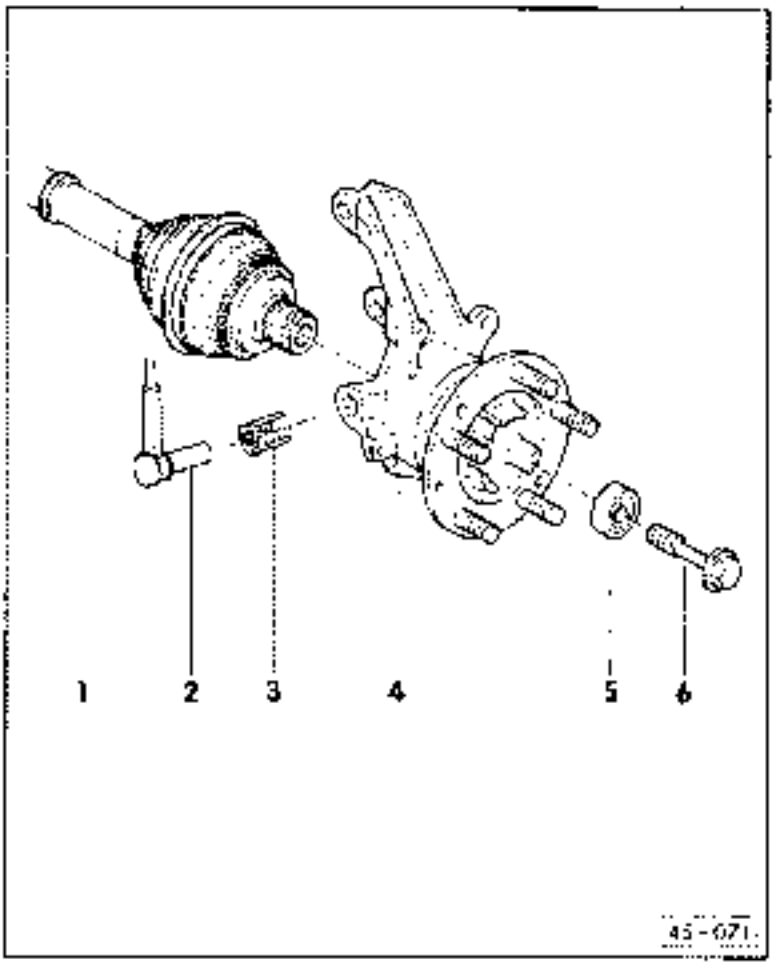
Winter tyres

Engine output / kW	Tyre size	Wheel size	Wheel offset and hole circle Ø mm
232	225 / 45 R 16 89 T / H	6 J x 16	51 / 4 / 130

* It is a regulation (in Germany) that a visible sticker is affixed in the driver's field of view on vehicles which have a top speed in excess of the maximum permissible speed for winter tyres. This sticker is available from the tyre trade.

44 5

44 0

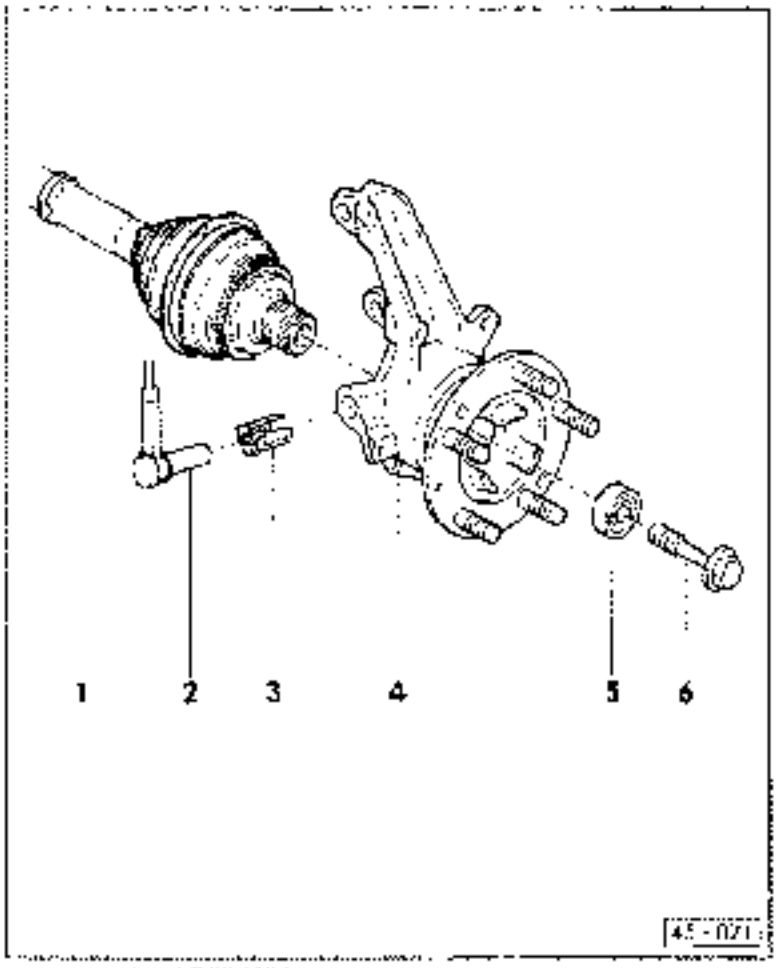


Removing and installing ABS components on front axle

1 – **Drive shaft with rotor**
- Or outer CV joint, is supplied as replacement part with rotor
- Before removing, pull back speed sensor slightly
- After installing, press in speed sensor by hand until fully home

2 – **Speed sensor**
- Identical part on left and right
- Pull out of wheel bearing housing in order to remove
- To install, press in by hand until fully home
- Plug plug connection for speed sensor, front left ⇒ Fig. 1, front right ⇒ Fig. 2
- Routing of wiring for speed sensor ⇒ Fig. 3 and ⇒ Fig. 4

45-1



3 – **Clamping sleeve**
- Grease circumference with brake cylinder paste before inserting into wheel bearing housing
- Press into wheel bearing housing until fully home

4 – **Wheel bearing housing**
- Is supplied as insulation repair part with holes for mounting the clamping sleeve or the speed sensor

5 – **Spacer**

6 – **Hexagon collar bolt**
- Always renew
- Tighten M 5 x 1.5 bolt to 200 Nm and then tighten a further 90°
- Slacken and tighten only when vehicle standing on its wheels (risk of injury)

45-2

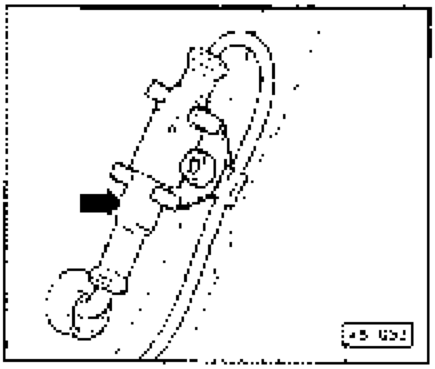


Fig. 1 Plug connection of front left speed sensor

- Unbolt coolant expansion tank and place to the side.
- Release plug connection from holder and then separate

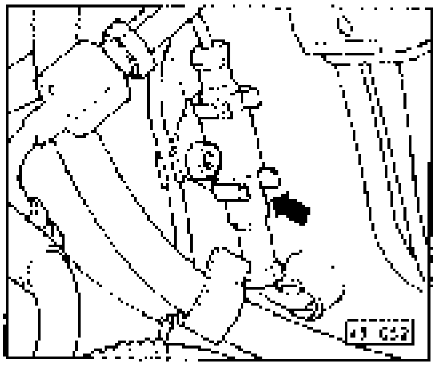


Fig. 2 Plug connection of front right speed sensor

- Release plug connection from holder and then separate

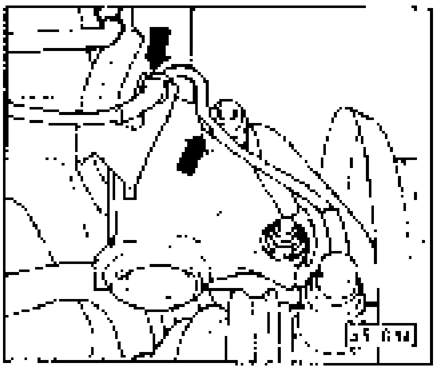


Fig 3 Routing of wiring for speed sensor at suspension strut

- Insert cable with the grommet into the angle bracket at the suspension strut
- Insert cable into the clip

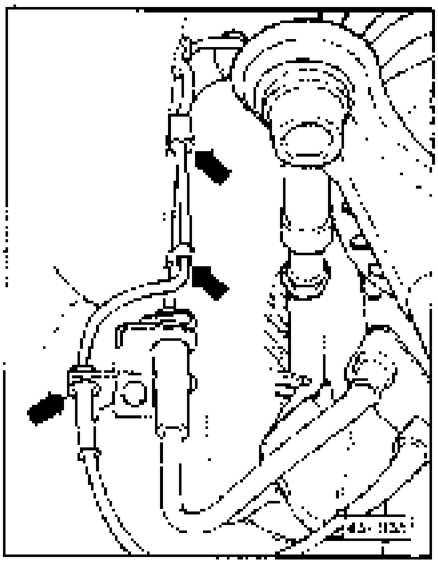
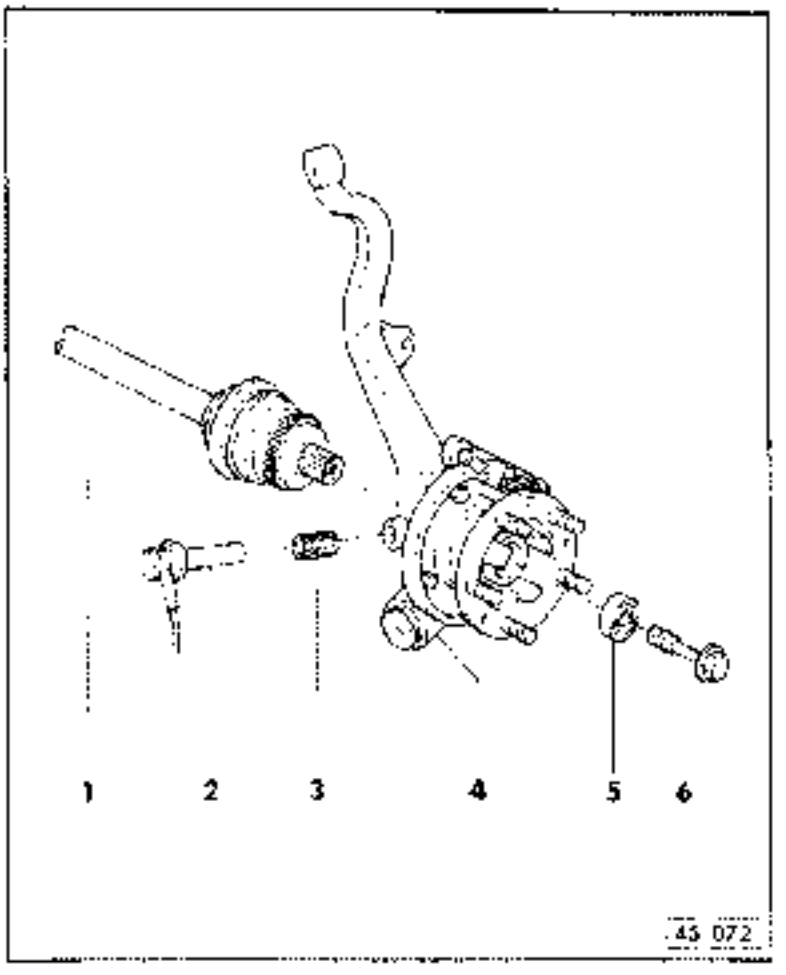


Fig 4 Routing of wiring for speed sensor at wheelhouse

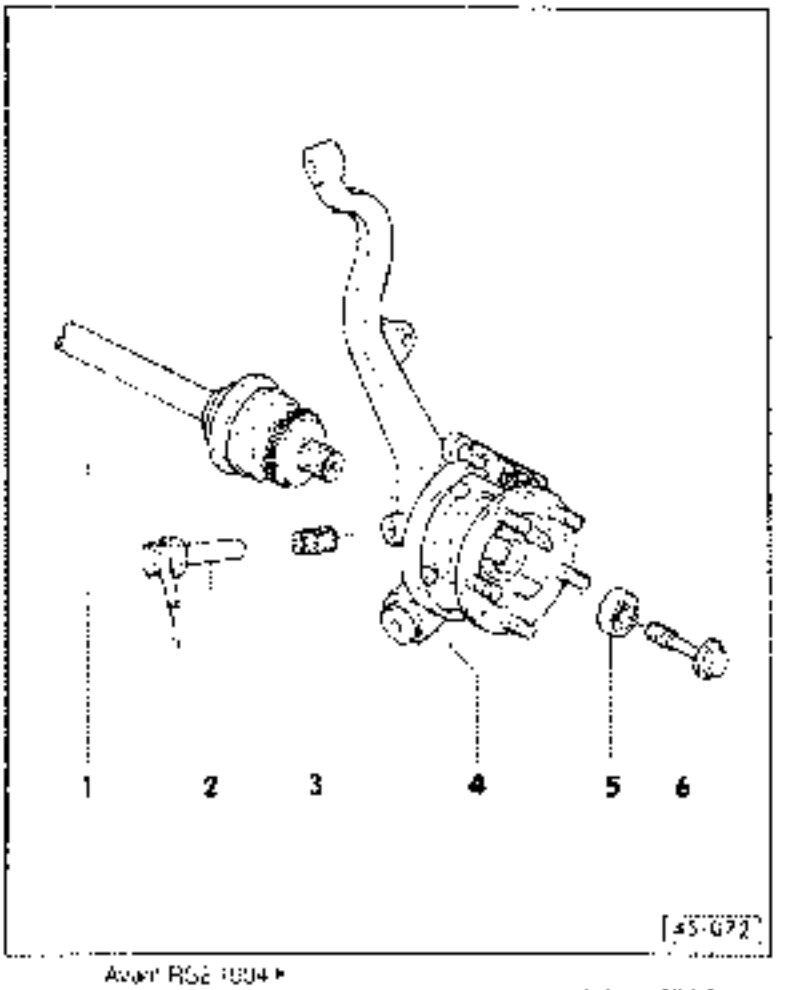
- Insert cable with grommet into angle bracket
- Insert cable into the clips along the brake pipe



Removing and installing ABS components at rear axle

1 – **Drive shaft with rotor**
- On outer CV joint, is supplied with rotor as replacement part
- Pull back speed sensor slightly before removing
- After installing, press in speed sensor by hand until fully home

2 – **Speed sensor**
- Identical part on left and right
- Pull out in order to remove
- To install, press in by hand until fully home
- Routing of wiring ⇒ Fig. 1 and 2

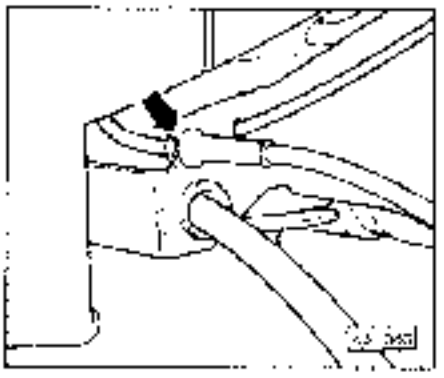


3 – **Clamping sleeve**
- Grease all round with brake cylinder paste before inserting into wheel bearing housing
- Press into wheel bearing housing until fully home

4 – **Wheel bearing housing**
- Is supplied as replacement part with hole for mounting the clamping sleeve of the speed sensor
- Grease hole all round with brake cylinder paste before inserting the clamping sleeve ⇒2⇐

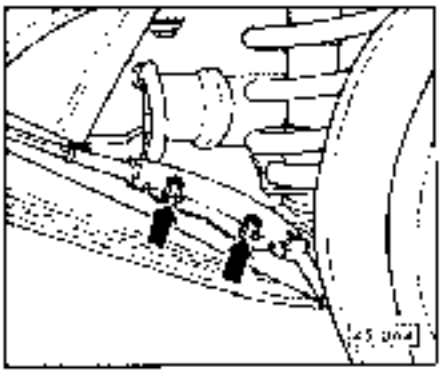
5 – **Spacer**

6 – **Hexagon collar bolt**
- Always renew
- ⇒ Tighten M 16 x 1.5 bolt to 200 Nm and then tighten a further 90°
- ⇒ Slacken or tighten only when vehicle is standing on its wheels



→ **Fig. 1 Routing of wiring for speed sensor**

– Insert cable with rubber grommet into bracket provided at the subframe as well as at the floor assembly

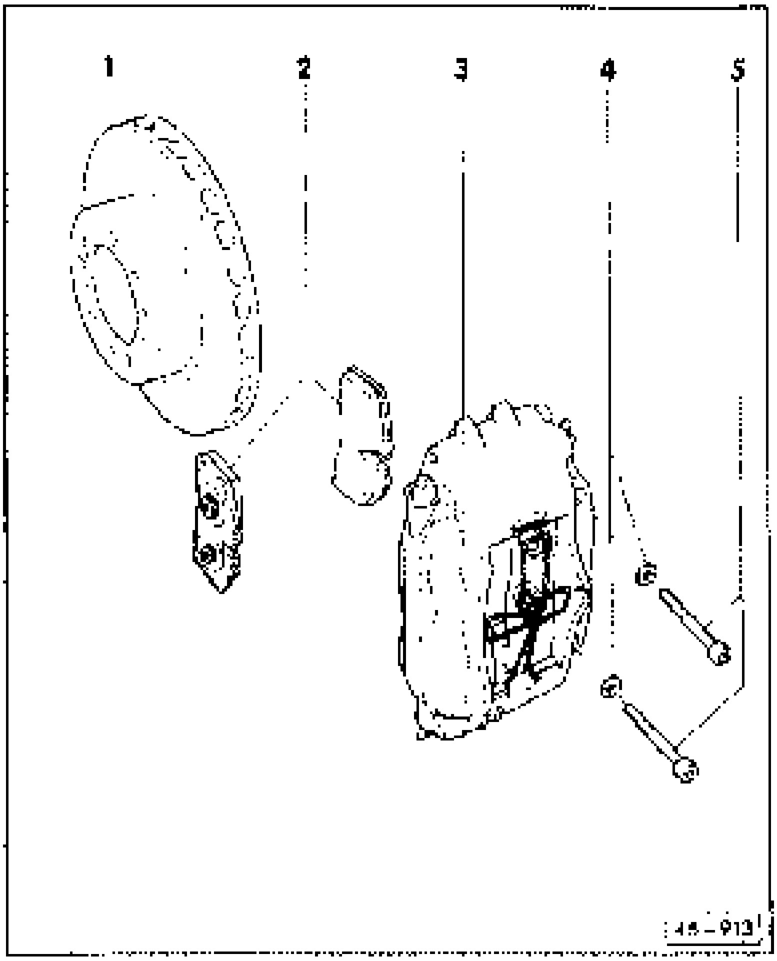


→ **Fig. 2 Routing of wiring for speed sensor at the subframe**

– Bolt cable tight with retaining plate to subframe

Note:

The two plug connections for the rear speed sensors are located below the rear seat.

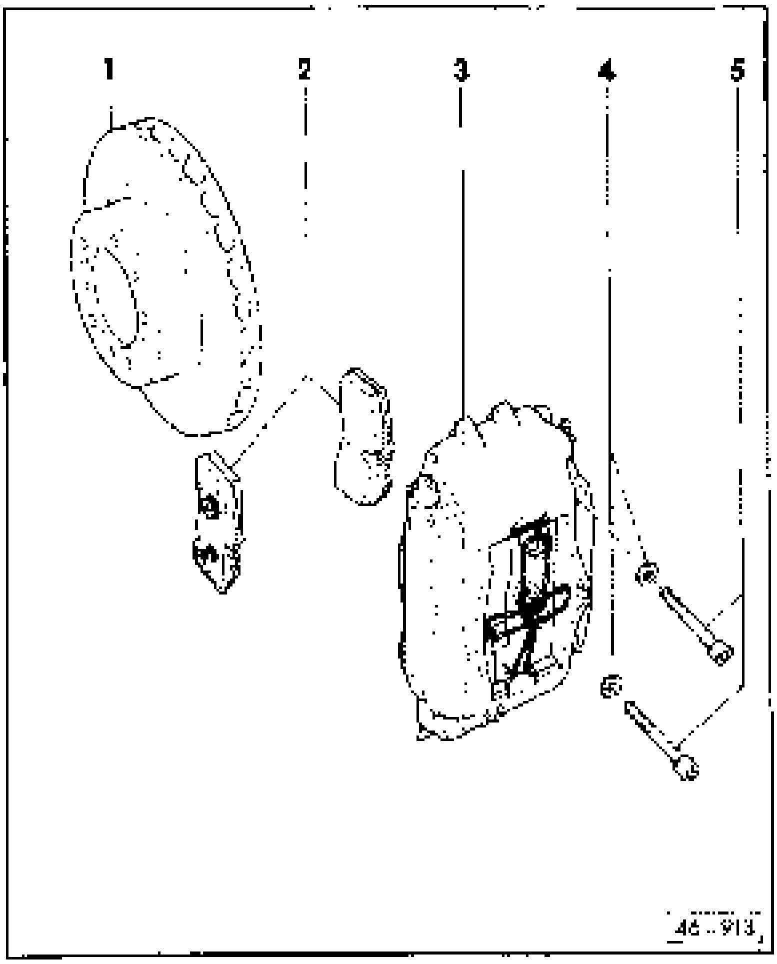


Servicing front brakes

Brembo four-piston brake calipers

> *Important!*
>
> - *Install all the parts of the repair kit.*
> - *The brakes can be tested on all commercially available brake testers provided the driving speed of the two driving rollers of the tester is not greater than 5.5 km/h.*

1 – **Brake disc**
- Always replace left and right discs
- To remove, unbolt brake caliper first of all
- Turn disc to size evenly on both sides, starting from the thickness when new
- Diameter of brake disc 304 mm
- Wear limit 30 mm



2 – **Brake pads**
- Always replace on both sides ⇒ page 46-3
- Thickness of brake pads when new 17.5 mm
- Checking brake pad thickness ⇒ page 46-2
- If pad thickness including backing plate is 8 mm, the brake pads have reached their wear limit and should be replaced

3 – **Brake caliper housing**
- Do not unbolt brake hose and brake caliper for changing brake pads

4 – **Washers**

5 – **Cylinder bolts, 85 Nm**

Note:

Each time when replacing or removing the brake pads, the damper plates must also be replaced.

Checking thickness of brake pads

- Take off the rear wheels to check the rear brake pads.
- The front brake pads can be inspected with the wheels fitted.

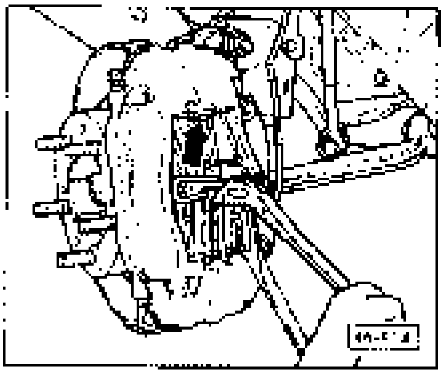
  Check the brake pads visually for signs of wear.

- If the pad thickness including backing plate is 8 mm, the brake pads have reached their wear limit and should be replaced.

Replacing brake pads

Take off wheels.

Mark brake pads which have to be re-used when removing. It is not permitted to switch the pads from the outside to the inside or vice versa or also from the right to the left wheel as this may result in the car being pulled to one side when braked.



- Compress expanding spring in the middle and release from its mount.

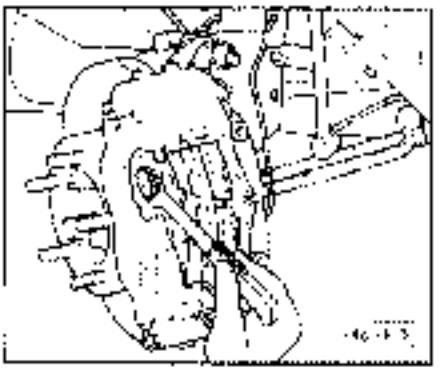
Note:

At the same time or before starting to compress the spring, press the spring toward the brake disc in the area of the retaining plate (release tension). This prevents damage to the retaining plate.

Important!

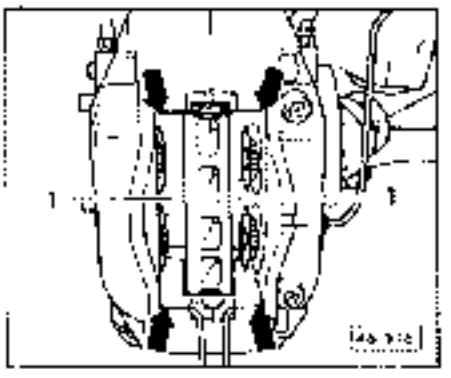
Before turning back the pistons, extract part of the brake fluid from the brake fluid reservoir. If this is not done, brake fluid may flow out and cause damage - especially if it has been topped up in the meantime. Extract the brake fluid only with a bleeder bottle or a plastic bottle which is used for brake fluid. Brake fluid is poisonous and must on no account be extracted by sucking out through a hose.

- Pull out the brake pads with the brake pad impact extractor. Pay attention to the following points in the case of brake pads with damping plates or vibration dampers with an adhesive layer:

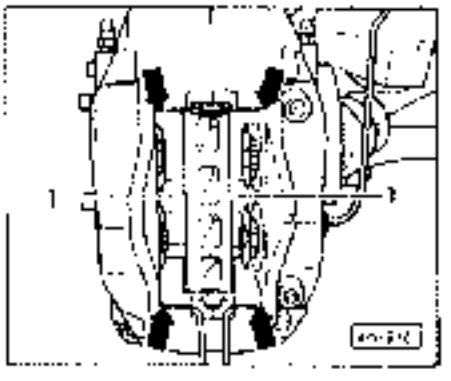


- Pull out brake pads together with the damping plates or vibration dampers. Should this not be possible (depending on state of wear of brake pads) detach the damping plates/vibration damper from the brake mounting plate with a spatula before removing the pads. In both cases turn back the brake pads as far as possible with the piston resetting device.

- The spatula must be positioned exactly between brake pad and damping plate/vibration damper in order to avoid damage to the brake piston seals.



- As the damping plates - 1 - are provided with an adhesive coating, the damping plates must be replaced each time the brake pads are removed or renewed.

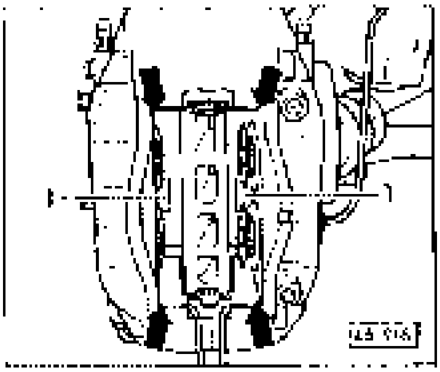


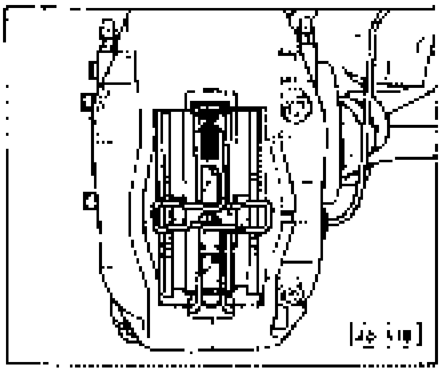
Installing

Turn back pistons into starting position with resetting device if necessary.

- Clean seal and guide surface of the brake carrier in the brake caliper with methylated spirits, a cylinder or special brush to ensure that the brake pads operate freely in the channel. It is essential to ensure that the brake piston seals (dust caps) are not damaged when performing this operation.

- Check that the brake calipers are correctly installed. The small pistons must face the brake disc leading side. This can also be recognized by the arrow shown on the Porsche logo which indicates the direction of rotation of the brake disc.





- Insert new damping plates –1– or vibration dampers into the pistons. As the damping plates or vibration dampers are provided with an adhesive and protective sheeting, the protective sheeting must be pulled off before installing.

– Insert brake pads. Check that the brake pads are of the correct grade.

Notes:

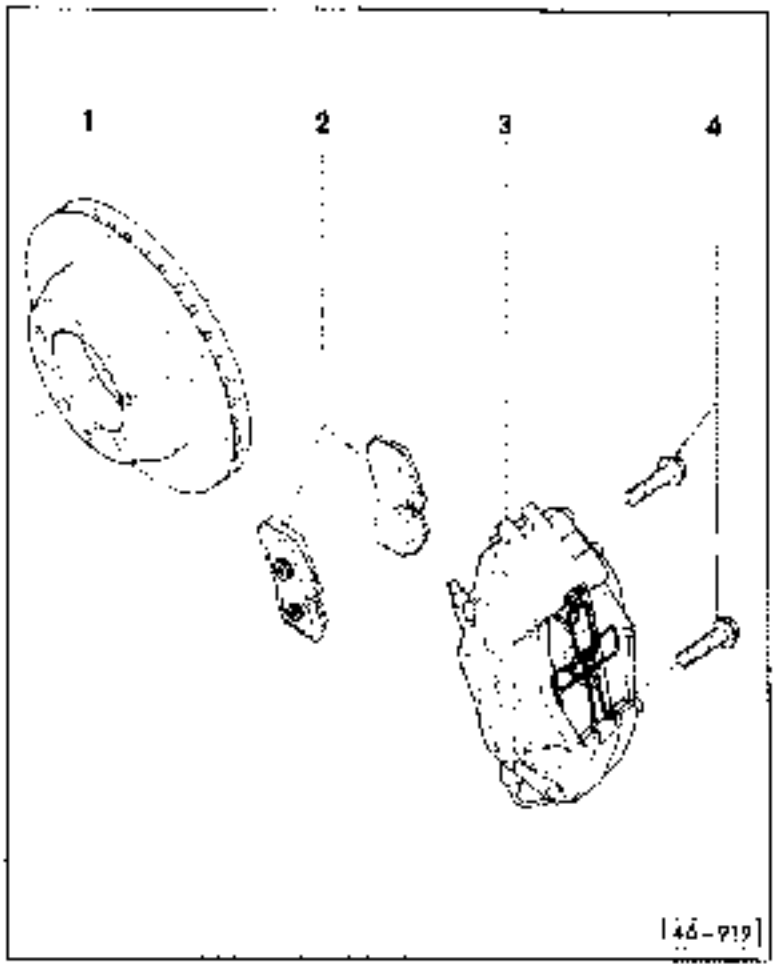
- *The brake mounting plates (rear of brake pads) must not be greased.*

- *Coat the seal and guide surfaces with a thin film of grease, however, to prevent the brake pads sticking in the brake caliper as a result of corrosion.*

- *Use Optimoly HT (Cu paste) or Plastilube (Schilling, 73407 Aalen) for this operation.*

- Ensure that the expanding spring engages properly (arrow). Do not use force to engage spring (risk of damage to mounting plate).

  Install new expanding spring if necessary; ensure that the flat side is facing the brake disc.



Servicing rear brakes

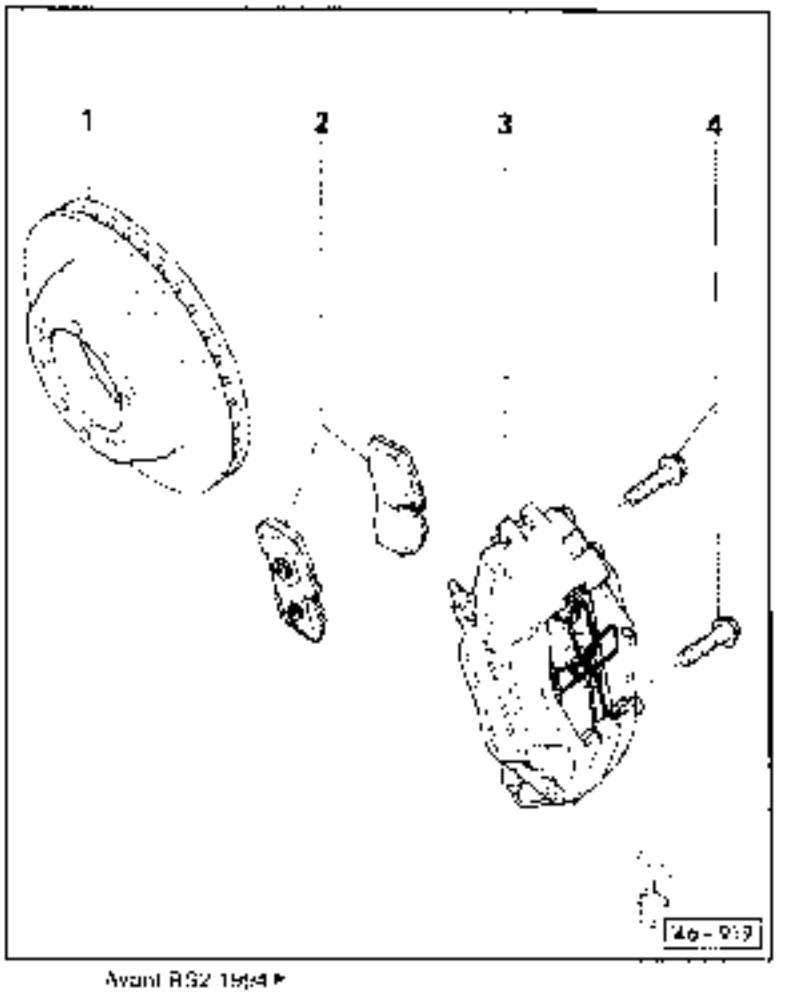
Important!

The brakes can be tested on all commercially available brake testers provided the driving speed of the two driving rollers of the tester is not greater than 5.5 km/h.

1 – Brake disc

- Replace on both sides ⇒ Replacing front brake pads, page 46-1
- To remove, unbolt brake caliper first of all and also turn back brake shoes for handbrake
- Turn cast to suit evenly, on both sides, starting from the thickness when new
- Ensure that an adequate wear limit remains

46-8

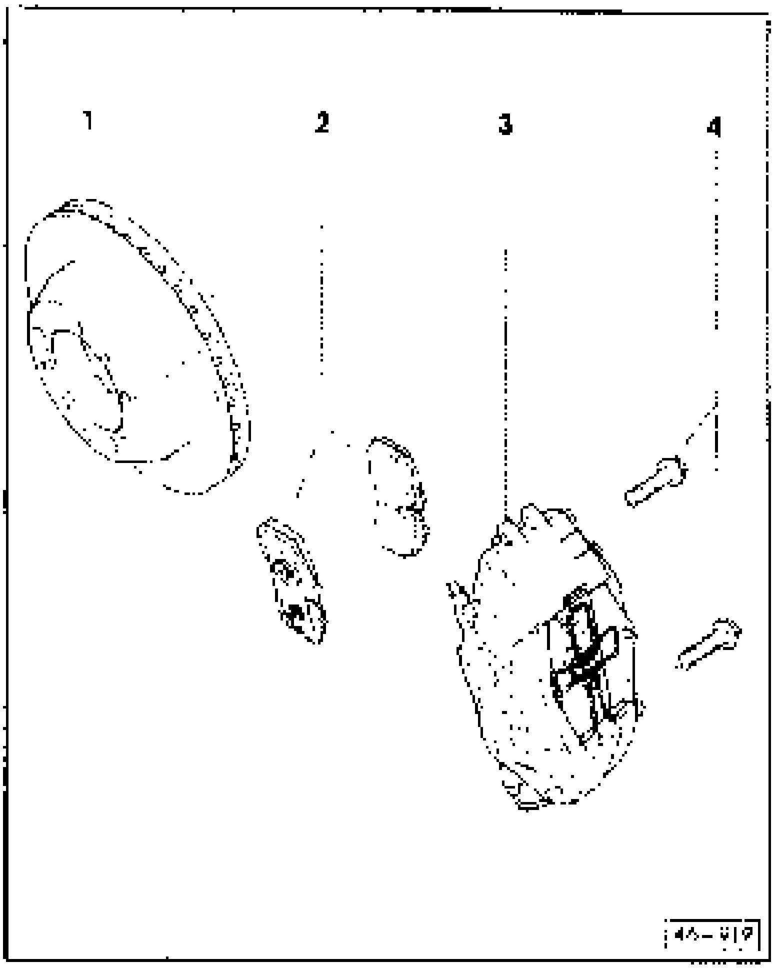


- Diameter of brake discs 256 mm
- Thickness of brake discs 24 mm
- Wear limit 22 mm
- Adjusting handbrake ⇒ page 46-19

2 – Brake pads

- Replace on both sides ⇒ Replacing front brake pads, page 46-3
- Thickness of brake pads when new 17.5 mm
- Wear limit of brake pads 8 mm
- Checking thickness of brake pads ⇒ page 46-3

46-10



* If the pad thickness including backing plate is 8 mm, the brake pads have reached their wear limit and should be replaced

Note:

Replace the damping plates each time the brake pads are renewed or removed

3 – **Brake caliper housing**
* Do not unbolt brake hose and brake caliper

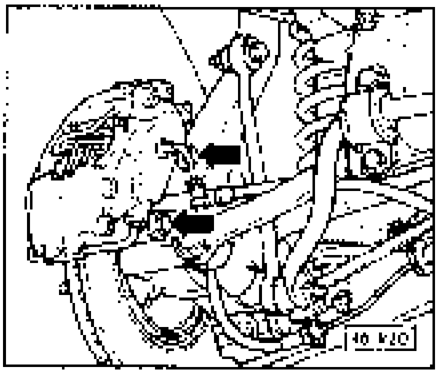
4 **Hexagon bolt, 85 Nm**

46-11

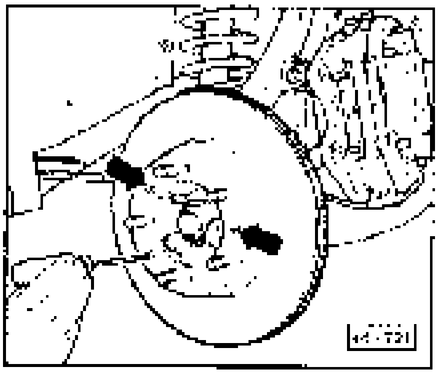
Servicing handbrake

Removing:

- Raise vehicle and take off wheels.
- Release handbrake.



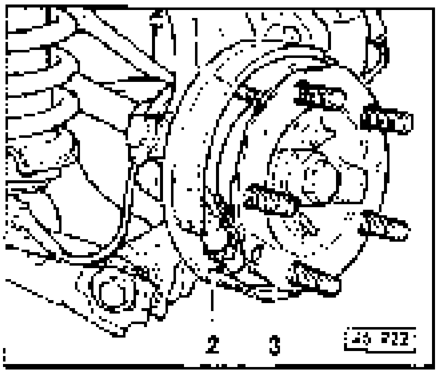
➡ – Unbolt brake caliper (arrow) and attach at a suitable point (do not detach brake hose or brake pipe).



➡ – Remove counter-sunk screws (arrow).

➡ – Insert a screwdriver through the hole of the brake disc and alter the position of the adjusting device until the brake disc can be taken off.

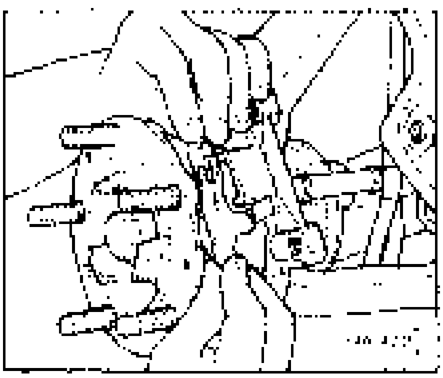
- Take off brake disc.



➡ – Remove compression spring -1- (second [illegible]), adjusting device -2- and bottom return spring.

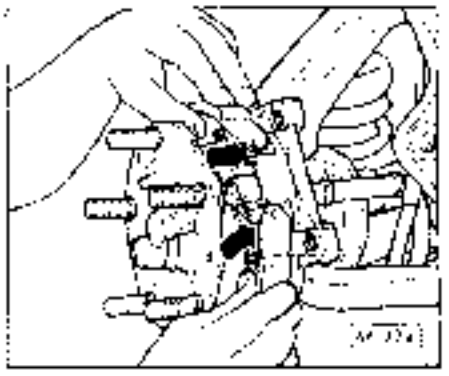
- Take out handbrake shoes.

Installing:

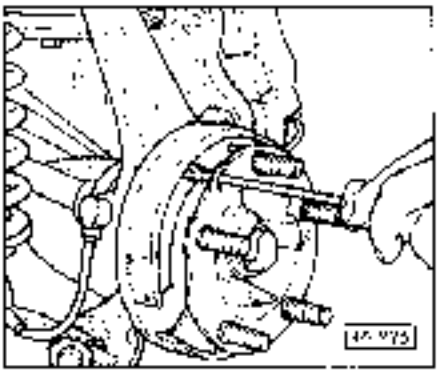


- Apply a light coating of grease to adjusting device pin or expanding lever and contact surfaces of handbrake shoes.

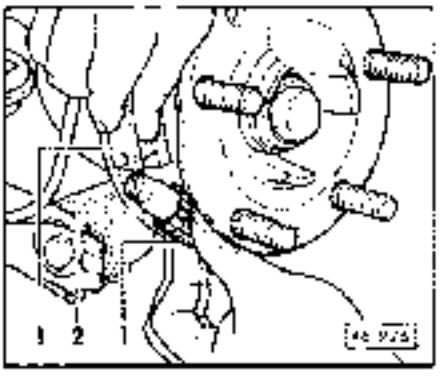
➡ – Fit together expanding lever.



- Install top long return spring onto handbrake shoes, fit on handbrake shoes and insert into the expanding lever.



- Install compression springs with screwdriver.



- Pull apart handbrake shoes -1- and insert assembled adjusting device -2-.

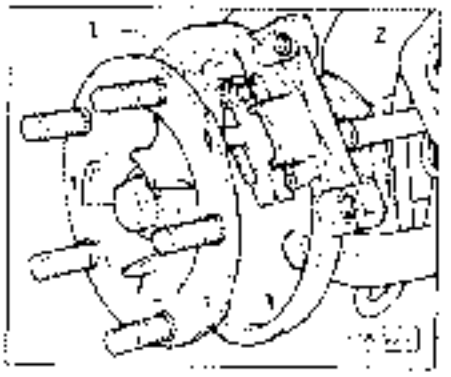
  Attach bottom return spring.

- Centre handbrake shoes.
- Install brake disc.

  Insert countersunk screws.

- Install brake caliper.
- Adjust handbrake -> page 46-19

Removing and installing handbrake cables



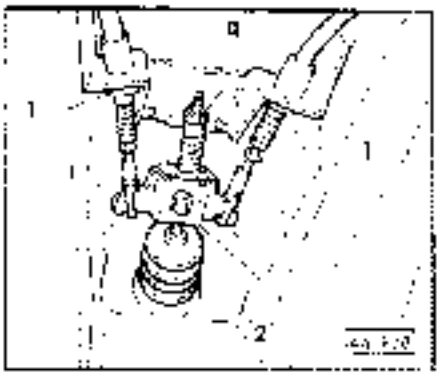
Removing:

Note:

To remove the handbrake cables, first of all remove brake shoes → page 46–13 Servicing handbrake

- Remove expanding lever -1-
- Push handbrake cable to the rear and pull out of the guide sleeve -2-

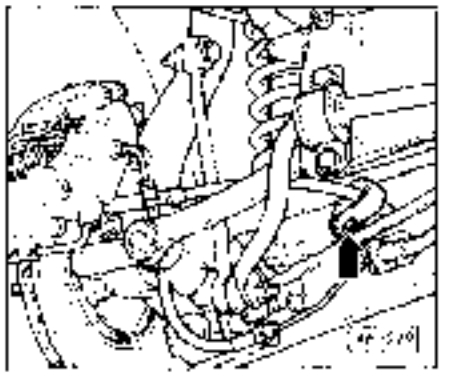
  Unbolt rear shield for the exhaust system.



- Detach handbrake cables from the compensating bracket -2-
- Pull out securing clips -1-

  Detach mounting plate for handbrake cable at the floor assembly

  Take out handbrake cable to the rear through plate at bottom axle link



- The retaining strap (arrow) must be filled as shown in the figure.

Note:

If performing partial replacement of bottom axle link, make hole for mounting the strap of the handbrake cable → Fig. 46-929 (pay attention to corrosion protection)

Installing:

Installation of the handbrake cables is performed in the reverse order

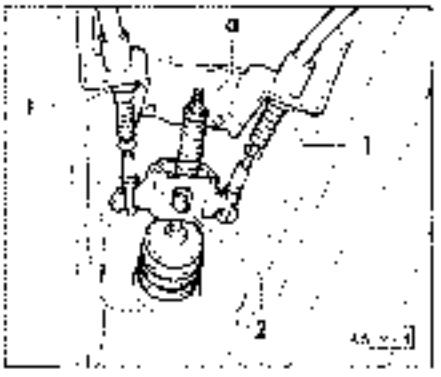
Important!

After installing the handbrake cables, adjust handbrake → page 46–19.

Adjusting handbrake

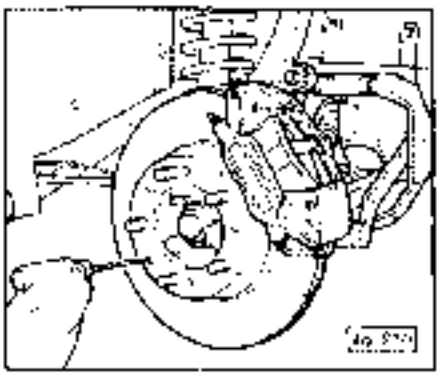
Note:

The handbrake must be adjusted if the handbrake lever can be pulled up more than 2 detents with moderate force without the brakes being applied.



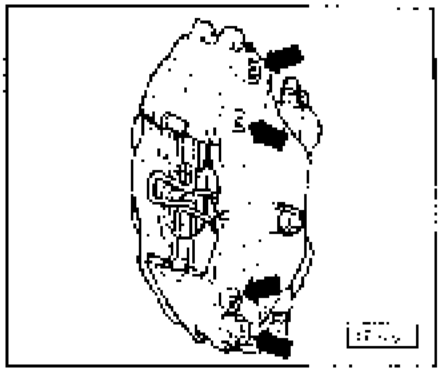
- Raise vehicle and take off rear wheels.
- Release handbrake and press back disc brake pads of rear axle until the brake disc rotates freely.
- Remove rear shield for the exhaust system (figure is shown with drive shaft removed to simplify the illustration).

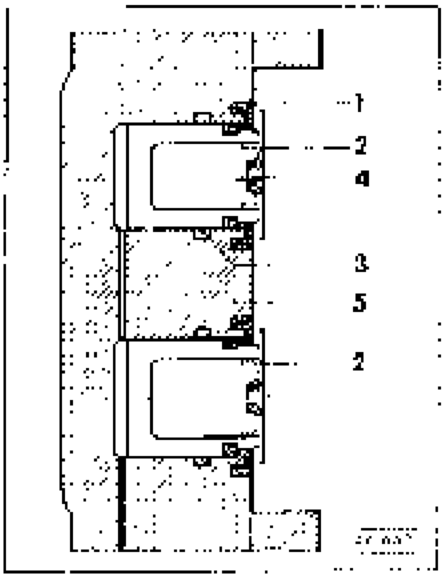
➡ Slacken adjusting nut of handbrake cable (1) far enough, if necessary until the handbrake cables are slackened.



➡ - Insert a screwdriver through the hole of the brake disc and turn the adjusting device until the wheel can no longer be turned. Then, turn back adjusting device again until the wheel rotates freely, then turn back a further 7 detents (slacken).

- Apply handbrake over 2 detents and turn adjusting nut sufficiently until both wheels can no longer be rotated easily by hand (when handbrake lever applied 4 detents, wheels must be locked).
- Slacken handbrake lever sufficiently and check whether both wheels now rotate freely.





Servicing four-piston fixed caliper brake system

> *Important!*
>
> ***The brake caliper halves must not be separated.***

➡ On no account open or tighten the bolts marked with an arrow.

The piston ring seals, dust caps and damping plates can be replaced with the fixed caliper assembled.

1 – Dust cap

2 – Damping plate

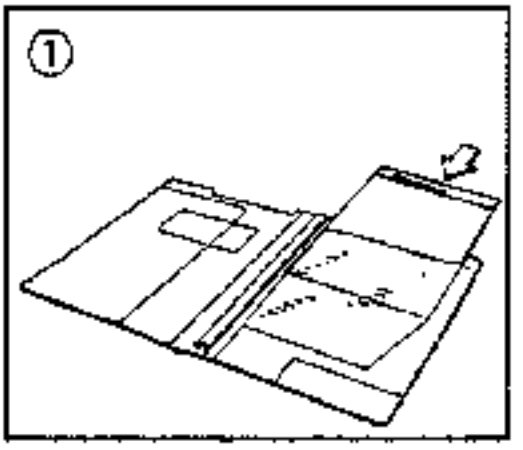
3 – Rubber seal (rectangular ring)

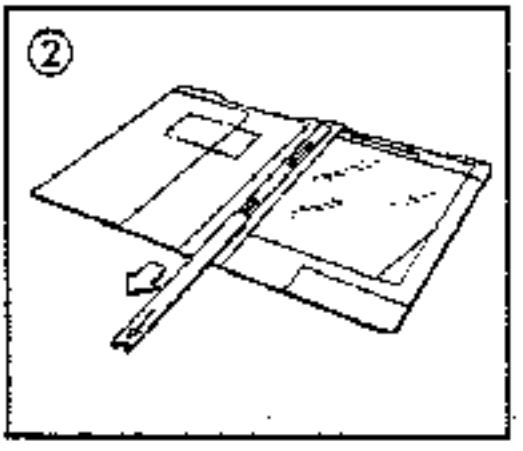
4 – Piston

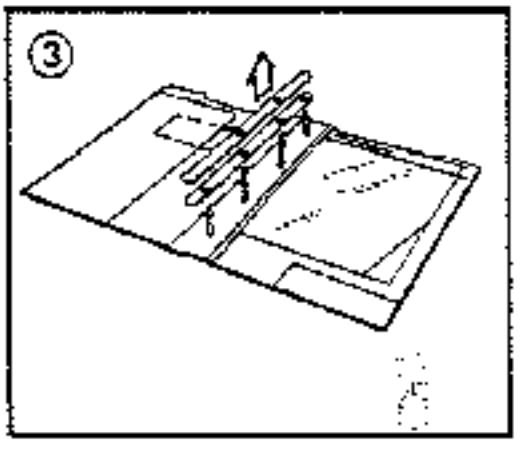
5 – Brake caliper housing

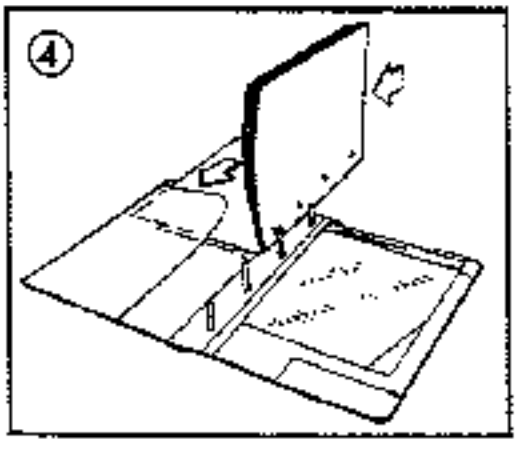
Note:

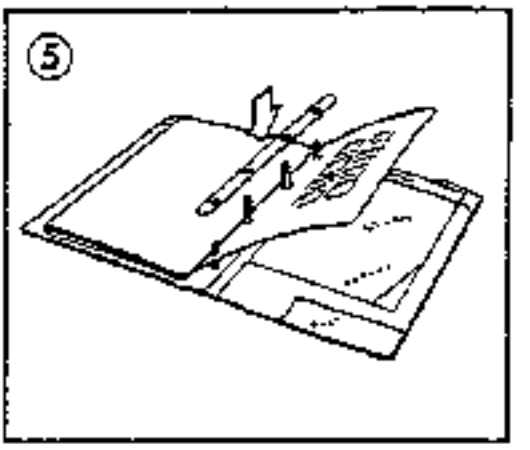
Proceed as described in the Workshop Manual for servicing.

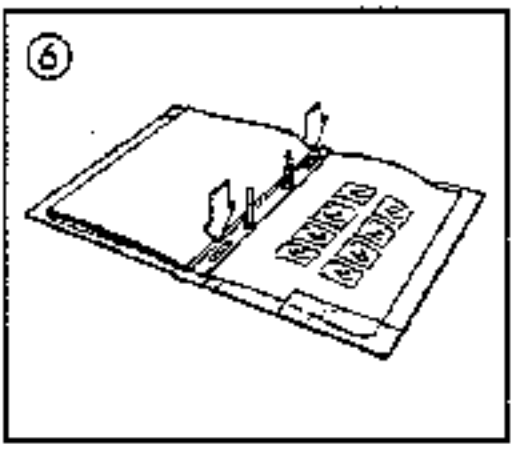


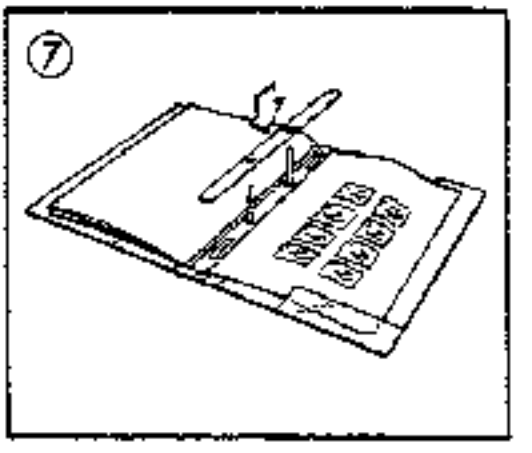


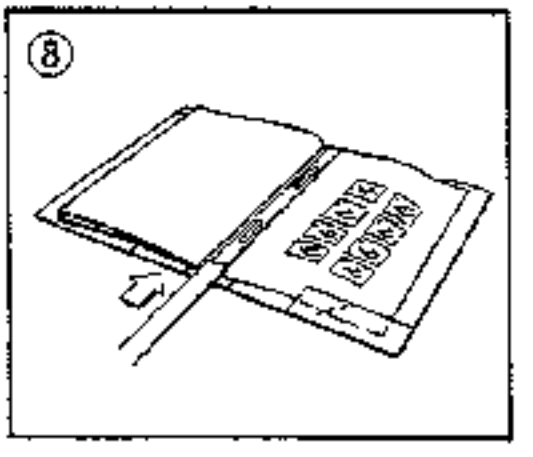












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