

Index

Steering column

- assembly 48.3
- ★ ■ lock washers/spring 48.6
- removing/installing 48.4

Steering wheel

- assembly 48.2

Power steering pump

- mounting, 4-cylinder 48.27
- mounting, 5-cylinder 48.31

Pump pressure

- checking, 4-cylinder 48.28
- checking, 5-cylinder 48.32

Pressure/return hoses

- replacing 48.20

Reservoir

- assembly 48.34

Steering gear

- assembly 48.19
- assembly (up to 89 JA 413 627) 48.21
- assembly (from 89 JA 413 628) 48.25
- rack seal, installing 48.22

Steering play

- adjusting 48.26

Steering system

- bleeding/filling 48.35
- checking for leaks 48.35

Valve housing seal

- driving out/in 48.22

V-belt

- adjusting, 4-cylinder 48.30
- adjusting, 5-cylinder 48.33

Hydraulic cooling line

- assembly 48.39

Power steering pump

- assembly 48.36
- housing seal 48.37
- limiting valve, checking 48.37
- rotor, removing 48.38
- ★ ■ Vickers, installing 48.51

Steering gear

- ★ ■ assembly (from 8A MA 054 850) 48.44A

Coupe**Power steering pump**

- ★ ■ Vickers, installing 48.51

Steering gear

- assembly 48.41
- ★ ■ assembly (from 8B MA 002 645) 48.44A

Tandem hydraulic pump

- mounting 48.42

Technical data

- chart 48.40

Vane pump flow pressure

- checking 48.43

V-belt

- tightening/replacing 48.44

Vehicles with Airbag**Airbag unit**

- removing/installing 48.10
- ★ ■ disposal of active unit 48.11a

Connector

- airbag voltage supply 48.9

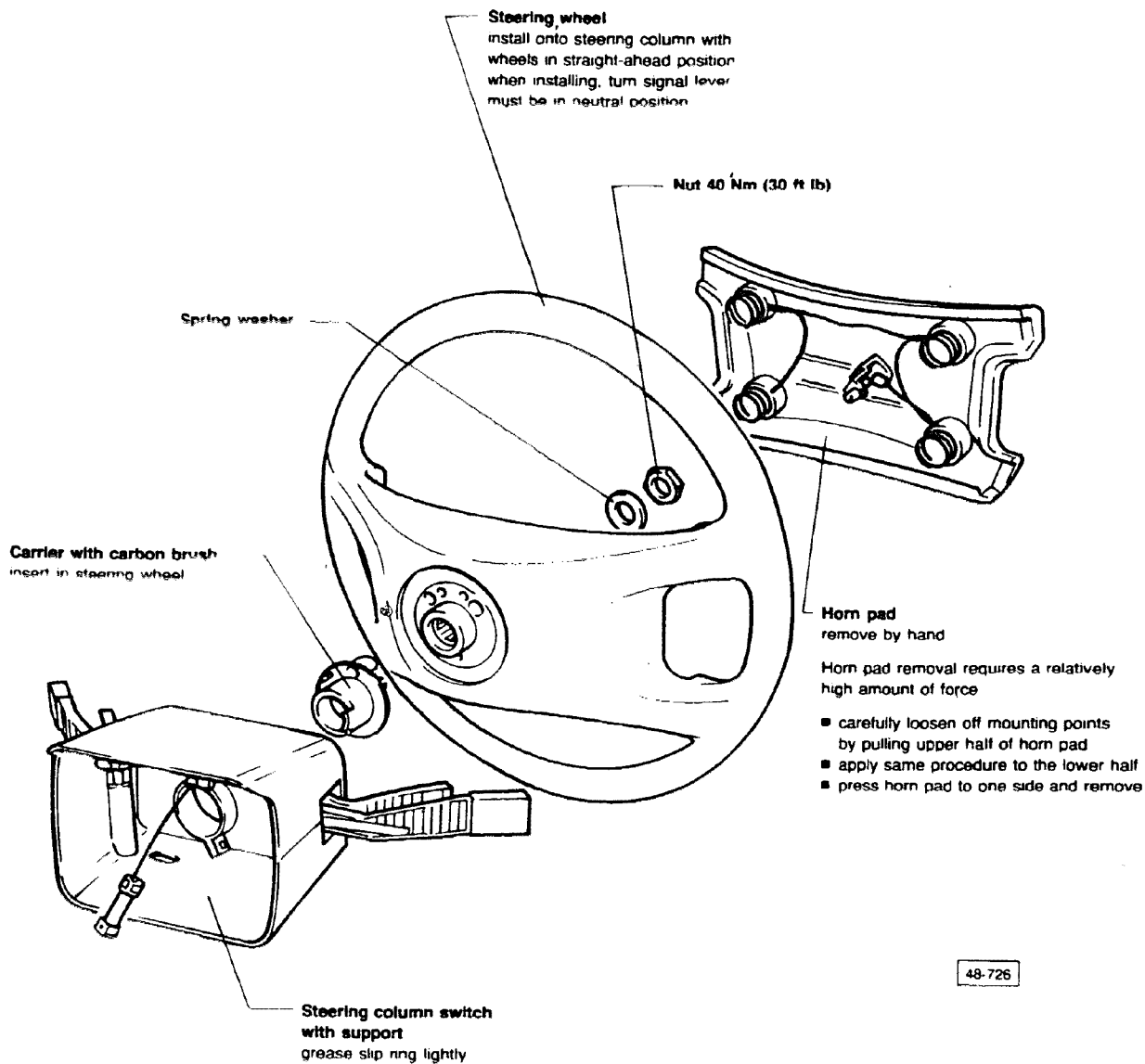
Steering column, collapsible

- assembly 48.12
- lock washers/spring 48.18
- removing/installing 48.14

Steering wheel

- assembly 48.7

★ **NEW INFORMATION** since last filming



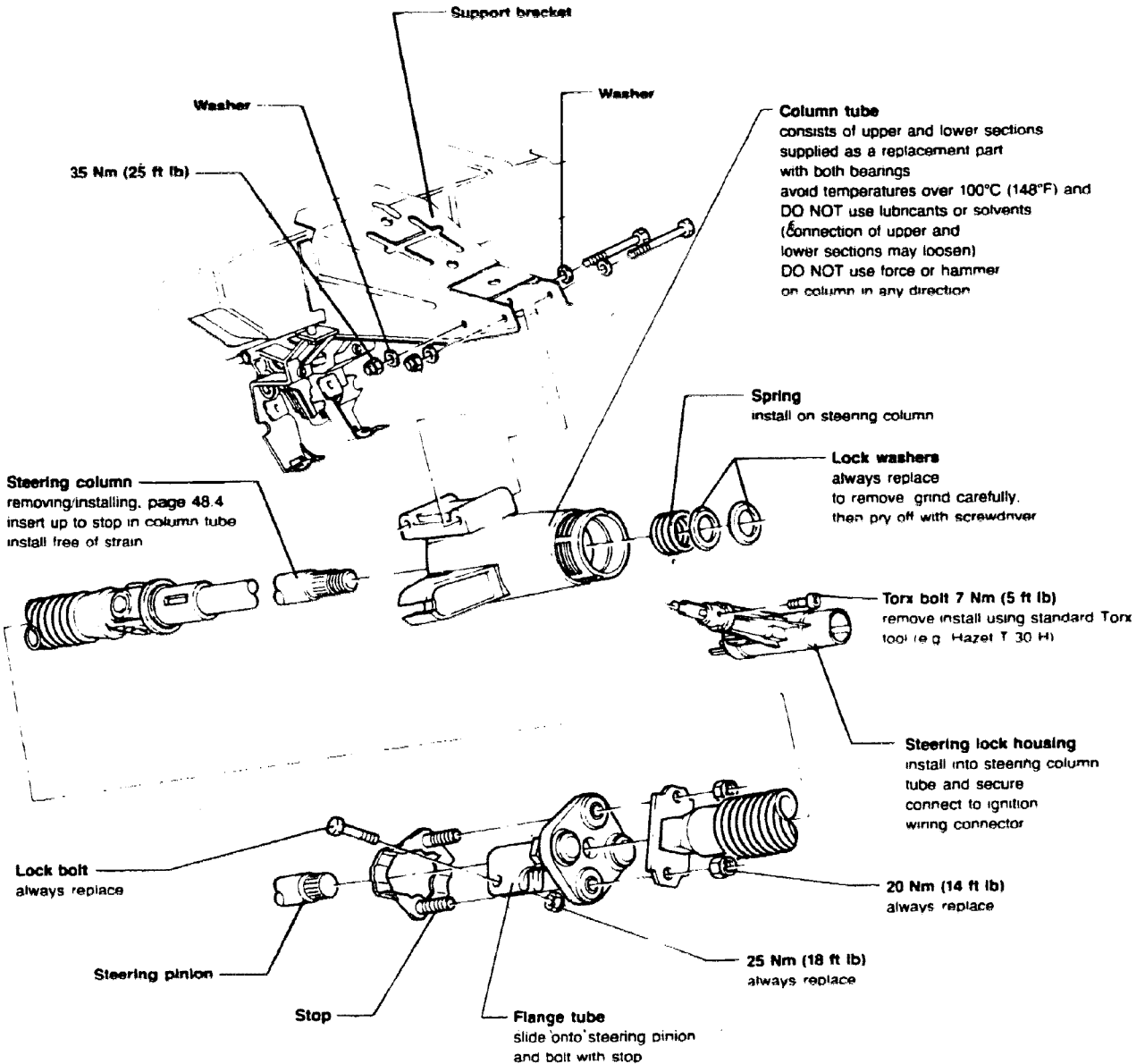
CAUTION

Washers are pre-tensioned

Be careful of flying sparks when grinding. If necessary, cover instrument panel and windshield.

Note

Upper and lower parts of column tube have a red dot. Always replace the column tube if the red dot is worn or sheared off

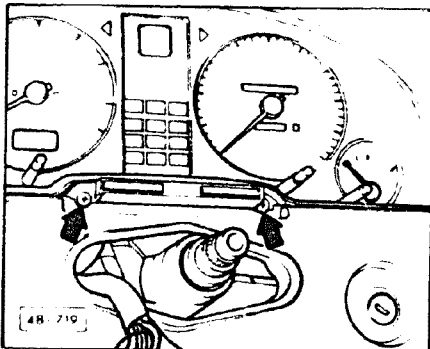
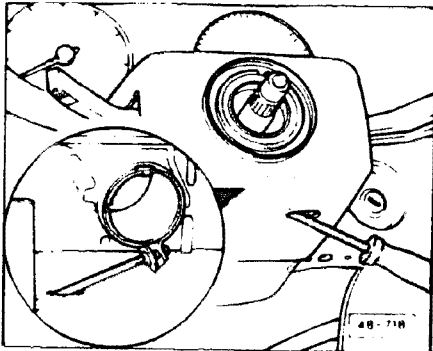


U:48 714

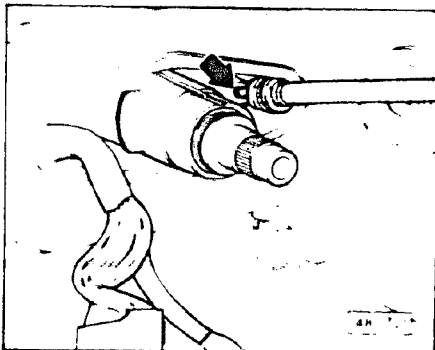
Steering column and column tube, removing/installing

Removing

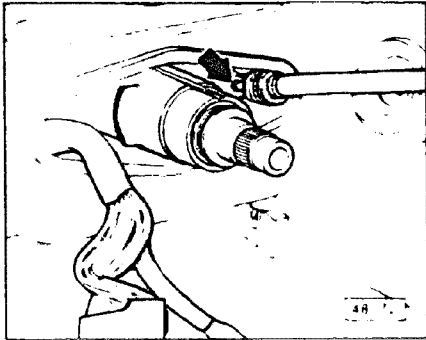
- disconnect battery ground strap
- remove lower left-hand section of instrument panel
- remove steering wheel (see page 48.2)
- remove steering column switch with trim



- remove instrument cluster screws (arrows)
- disconnect wiring connector at ignition switch



- remove Torx bolt
- unbolt column tube from support bracket mounting
- remove steering lock housing from column tube (arrows)
- push steering column and column tube downward until they can be taken out under the instrument panel



Installing

- install steering column in column tube
- guide steering column under instrument panel and then push it upwards
- install steering lock housing in column tube
- install Torx bolt (arrow)
- insert ignition key in ignition lock for steering column
- unlock steering column lock so that column can be turned as required
- install bolt in support mounting and column tube
- bolt together stop, flange tube and steering column
- center column tube by sliding it up and down in support mounting so that coupling disc (on flange tube) is free of strain when steering wheel is turned
- fasten column tube to support bracket
- connect wiring connector at ignition switch

Note

For procedure to install new spring and lock washers on column, see page 48.6

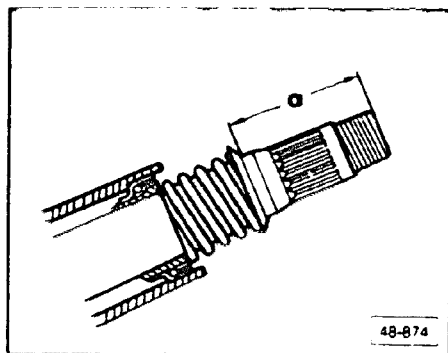
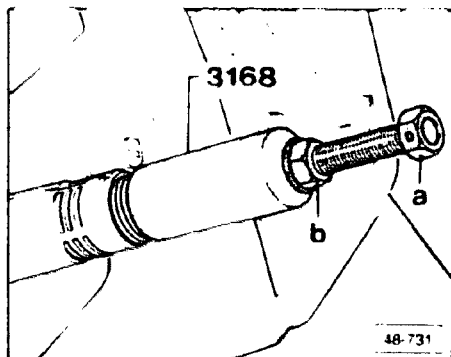
- install instrument cluster
- install steering column switch
- install steering wheel
- connect battery ground strap
- check function of steering column switch

Note

Steering wheel spoke must be horizontal with wheels in straight-ahead position.

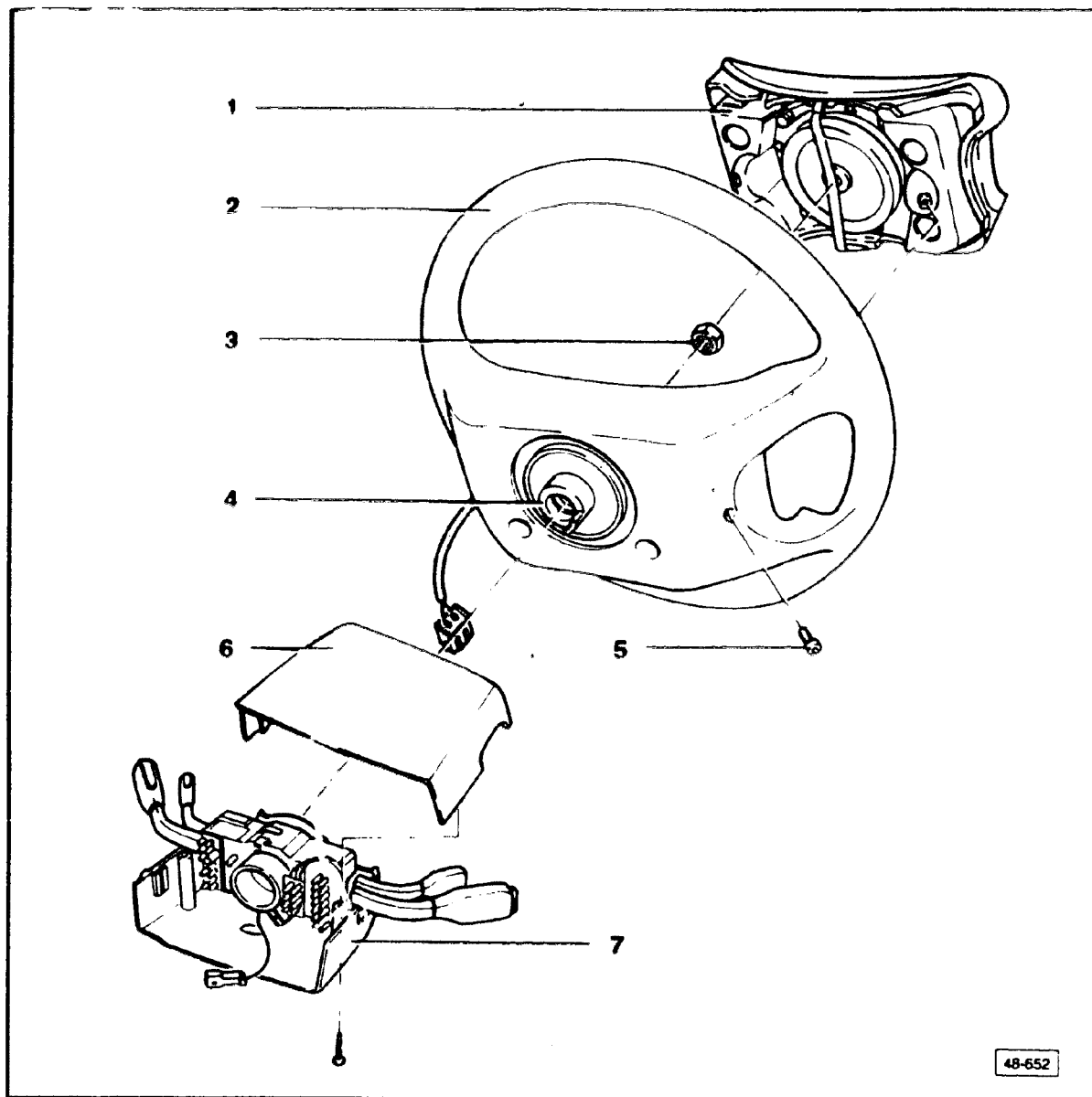
Lock washers/spring, pressing onto steering column

- install spring onto steering column
- install new lock washers onto steering column
- thread tensioner 3168 onto steering column up to stop (i.e. nut b threaded down)
- hold spindle a and tighten nut b until dimension a (in illustration 48-874) is attained
 - a = 54.5 to 55.5 mm
- loosen nut b
- remove tensioner from steering column



THIS FRAME INTENTIONALLY LEFT

BLANK



48-652

WARNING

Airbag System

To prevent personal injury or airbag system failure, **ONLY TRAINED PERSONNEL** should disassemble, assemble, or service the airbag system.

CAUTION

Always disconnect the voltage supply to the airbag system when doing repairs requiring the removal of airbag components.

Note

Beginning with model year 1990, all Audi 80/90 Coupe vehicles are equipped with a driver airbag housed in the steering wheel assembly.

Repair Group 48 contains steering-related airbag procedures and safety precautions. For airbag system diagnosis and service, refer to Repair Group 96.

Do not weld or straighten steering components.

Replace all self-locking fasteners.

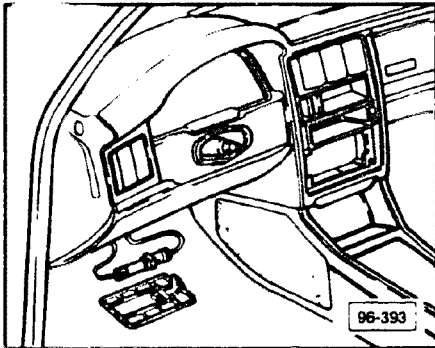
- 1 — **Airbag unit**
 - removing/installing, page 48 10
- 2 — **Steering wheel**
 - install in centered position, with turn signal lever in Neutral and front road wheels straight ahead
 - replacement steering wheel must be factory-released, and equipped with canceling ring and contact ring

CAUTION

Do not place any stickers or covering on a steering wheel equipped with an airbag.

- 3 — **Hex nut — 40 Nm (30 ft lb)**
- 4 — **Canceling ring/contact ring assembly**
 - can be replaced separately from wheel
- 5 — **Mounting bolt for airbag unit — 6 Nm (53 in. lb)**
- 6 — **Cover, steering column switch**
- 7 — **Steering column switch in mount**

Connector for voltage supply, installed position



- connector color: red
- "airbag" marked on connector

CAUTION

Always disconnect the voltage supply connector when doing repairs requiring removal of parts of the airbag system.

Airbag unit, removing/Installing

CAUTION

Testing, assembly and repair work on the airbag system must only be conducted by trained Service Department personnel.

The airbag is an explosive device.

- Disconnect the negative battery cable and cover the battery terminal during all work on the airbag system. Also, separate the red, single-pin connector (marked with the word "airbag") for the power supply behind the instrument panel
- Do not leave undeployed airbag units unattended if work is interrupted.
- Always place a removed airbag unit so the horn pad is facing upwards.
- The airbag unit must not be exposed to grease or cleaned with any type of cleaning agent.

Disposal of airbag and triggering units

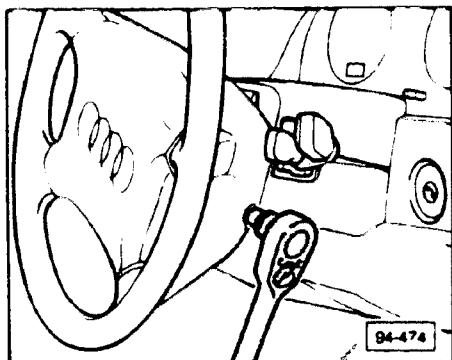
- active airbag gas generators: Remove an active (unit which has not been deployed) airbag gas generator carefully from the vehicle, and return to the Warranty Parts Test Center for proper disposal. **DO NOT deploy in vehicle**
- deployed airbag gas generators do not have to be disposed of as a "hazardous waste" but can be disposed of with other trash, although it is recommended that for conservation reasons it be sent out with automotive metal scrap for recycling
- triggering units contain a mercury switch and must be disposed of in an approved manner

CAUTION

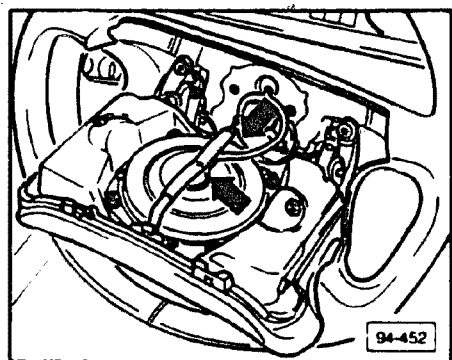
- Do not expose airbag units to temperatures above 100°C (212°F) even for brief periods while handling them during the repair process. Keep the airbag unit clear of heat sources such as heating plates, soldering irons, heat lamps, welding equipment and the like.
- if the airbag has been deployed during an accident, replace the triggering unit, the airbag, and the spiral spring. Check all other components for damage and replace if necessary
- the storage, transportation and disposal of airbag units are subject to the laws for flammable solids

Airbag unit, removing/installing

Removing



- disconnect voltage supply connector. See page 48.9
- unscrew Torx-head retaining bolts on either side of steering wheel
 - use standard Torx 30 bit



- detach airbag unit from steering wheel, carefully, and tilt downward
- lift up safety clamp (top arrow)
- disconnect wiring terminal (lower arrow) from airbag unit

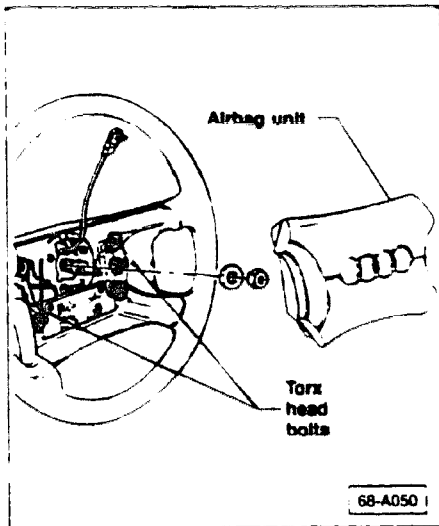
CAUTION

DO NOT place removed airbag unit face down on vinyl horn pad side. Audi rings must be facing upward.

Installing

- connect wiring terminal to airbag unit
- position airbag unit in steering wheel
- fasten clamp securing airbag wiring terminal
- tighten Torx-head bolts
 - tightening torque: 6 Nm (53 in. lb)
- connect voltage supply connector

Disposal of active airbag unit



Active airbag gas generators present a potential danger. The units are classified as "Hazardous Materials" and must be disposed of in accordance with applicable regulations.

Remove an active (unit which has not been deployed) airbag gas generator carefully from the vehicle, and return to the Warranty Parts Test Center for proper disposal. For removal instructions, refer to Section 48 and 68 of the applicable Repair Manuals.

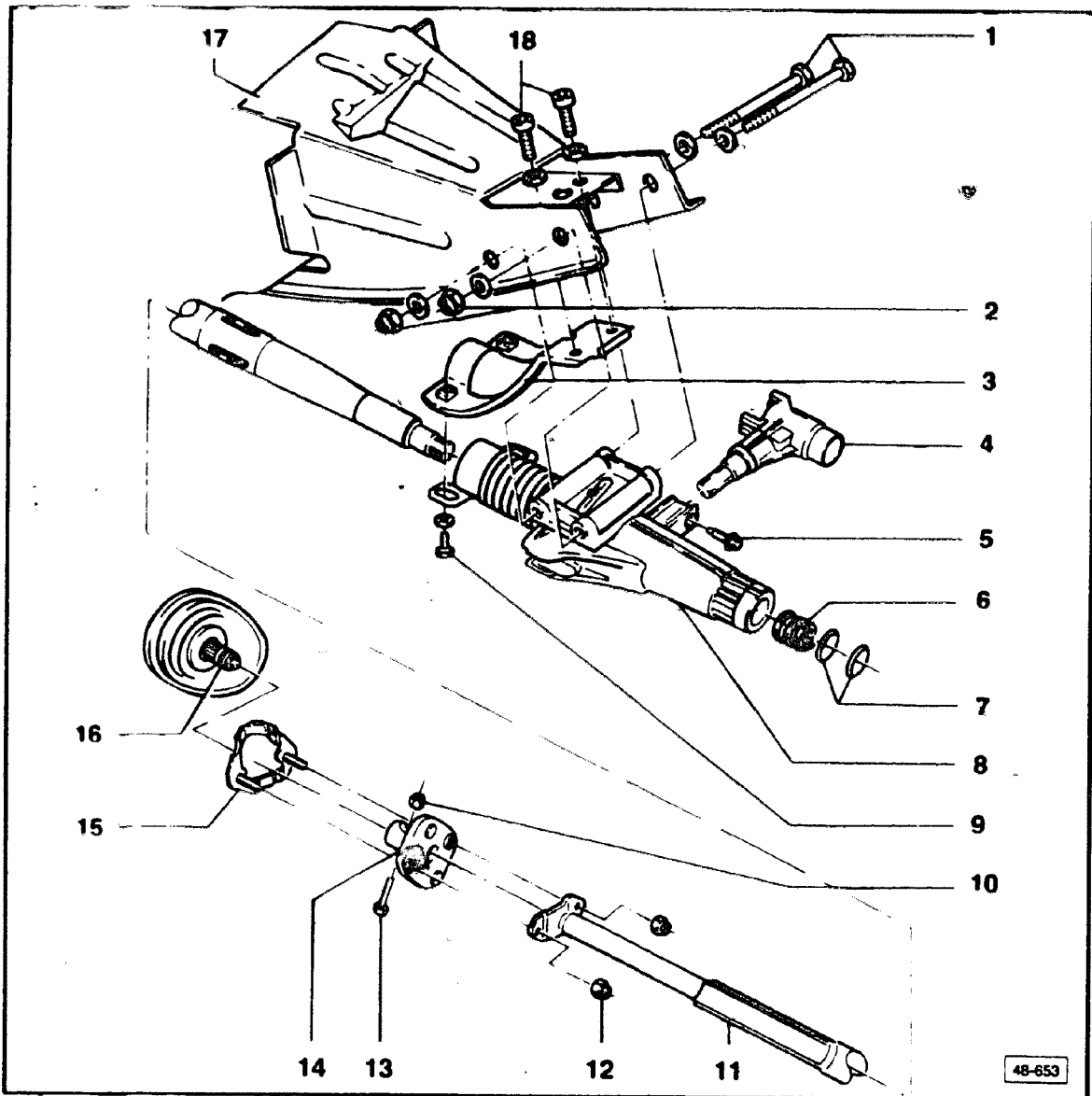
In situations where the airbag unit cannot be safely removed from the vehicle, contact your DSM.

Shipment of active airbag gas generators must be in accordance with 49 CFR 107.113 and 107.105 of the Department of Transportation (DOT) Hazardous Materials Regulations. In addition, a copy of the DOT exemption must be attached to the unit being shipped.

Note

A copy of the Department of Transportation (DOT) exemption is included with the replacement airbag unit supplied to the dealer from the Parts Depot. If exemption paper is missing, contact the Parts Depot.

Always use original box for shipping airbag unit to the Warranty Parts Testing Center.



48-653

CAUTION

Always disconnect the voltage supply to the airbag system when doing repairs requiring the removal of airbag components.

Note

Beginning with the 1990 model year, all Audi 89-90 Coupe vehicles are equipped with a collapsible steering column, as well as an airbag system.

- 1 — Hex head bolts
- 2 — Self-locking nuts — 35 Nm (26 ft lb)
- 3 — Mounting plate
install to the support bracket (top) and to steering column tube (bottom)
- 4 — Steering lock housing
 - position at steering column tube and fasten
 - connect to ignition wiring connector
 - see Repair Group 94
- 5 — Torx bolt — 7 Nm (62 in. lb)
- 6 — Spring
install on steering column (see page 48 18)

7 — Lock washers

- removing: grind down (carefully), then pry out with screwdriver

CAUTION

Grinding may create sparks. Protect instrument panel and windshield.

Note during removal that washers are pre-tensioned.

- installing, page 48.18

8 — Steering column tube

- consists of upper and lower sections

CAUTION

Upper and lower sections of column tube have a red dot. Always replace the column tube if the red dot is worn or sheared off.

If any play exists between upper/lower sections, replace column tube. Inspect for play, when repairing accident damage.

- the following may loosen upper/lower section connection:
lubricants, solvents, temperatures over 100°C (212°F)
- do not hammer any part of the steering column
- bearing included as replacement part

9 — Hex head bolt — 25 Nm (18 ft lb)

10 — Self-locking nut — 25 Nm (18 ft lb) always replace

11 — Steering column, collapsible

- removing/installing, page 48.14
- install up to stop, on column tube
- install free of strain

12 — Self-locking nut — 25 Nm (18 ft lb)

13 — Bolt always replace

14 — Flange tube

- to install, slide onto steering pinion and bolt to steering column and retaining bracket
- as replacement part, has coupling disc riveted on

15 — Retaining bracket

16 — Steering pinion

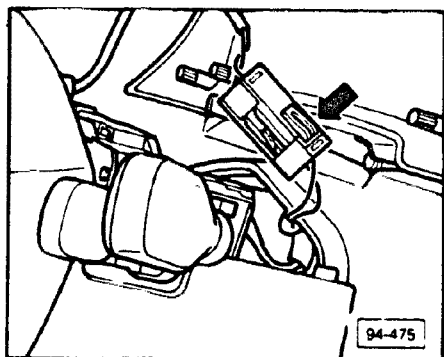
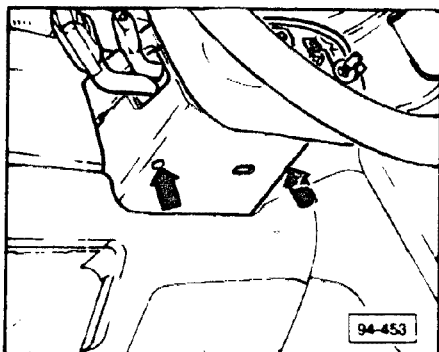
17 — Support bracket

18 — 25 Nm (18 ft lb)

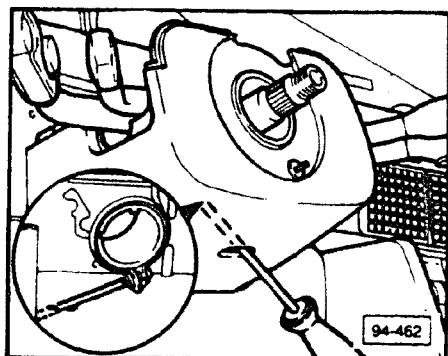
Steering column, collapsible, removing/installing

Removing

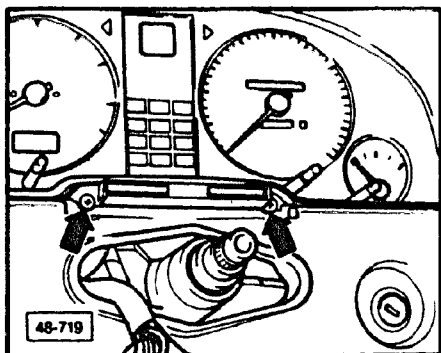
- disconnect battery ground cable to disable airbag system
- place front road wheels in straight-ahead position
- remove airbag unit. See page 48.10
- remove fasteners (arrows) retaining cover for steering column switch assembly



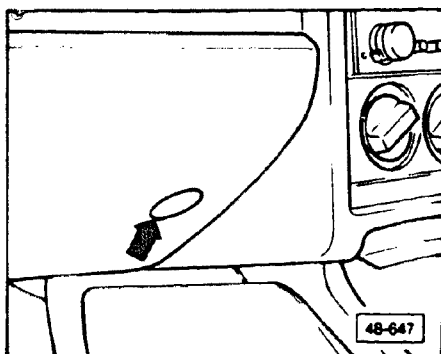
- disconnect airbag connector
 - located behind steering column switch cover
 - using screwdriver, press tab (arrow) on edge of casing
- remove steering wheel. See page 48.7



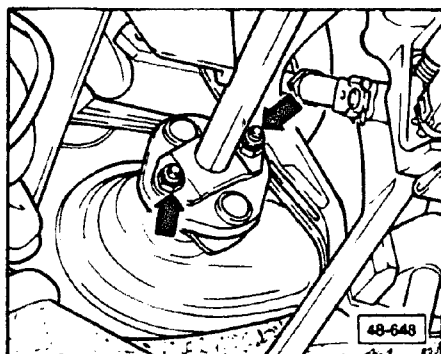
- loosen clamp on steering column switch and remove switch



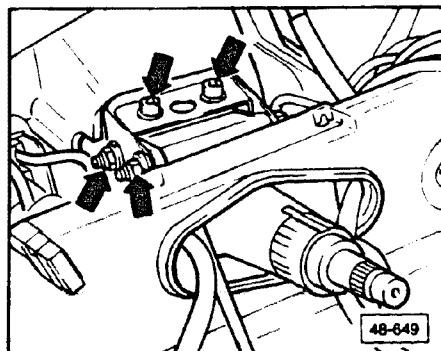
- remove screws (arrows) retaining instrument cluster
- disconnect and remove cluster assembly. See Repair Group 90
- disconnect ignition wiring terminal from lock assembly



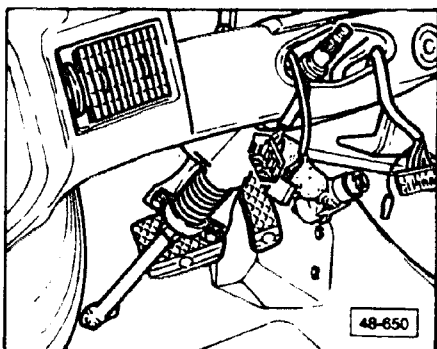
- unfasten knee bar (four bolts)
 - pry out capping (arrow)
- unclip diagnostic connectors from knee bar
 - position connectors aside
- remove knee bar



- detach base of steering column (arrows) from retaining bracket
- pry steering column away from boot, carefully
 - using screwdriver (approximately 15 mm)



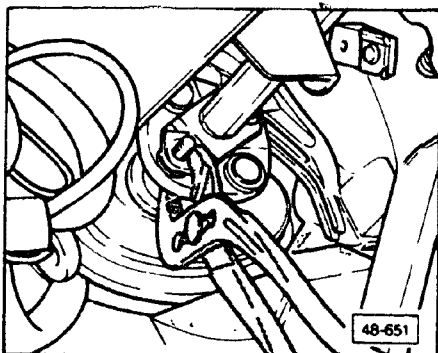
- remove fasteners (arrows) securing column tube mounting plate to mounting bracket



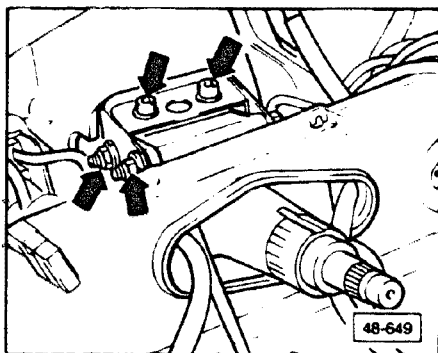
- push steering column downward, turning assembly until it can be removed from beneath instrument panel

Installing

- insert column assembly, from below, up through instrument panel
- position column assembly/mounting plate at mounting bracket. Insert bolts
- insert ignition key in ignition lock for steering column
- unlock steering column lock so that column can be turned as needed
- clamp base of steering column against flange tube and retaining bracket, using pliers. Bolt together



- tighten mounting hardware (**arrows**) for column assembly and bracket
- connect ignition wiring terminal to steering lock assembly



Note

For procedures to install spring and new lock washers, see page 48.18.

- install instrument cluster
- connect airbag wiring
- install steering column switch and cover
- install steering wheel. See page 48.7

CAUTION

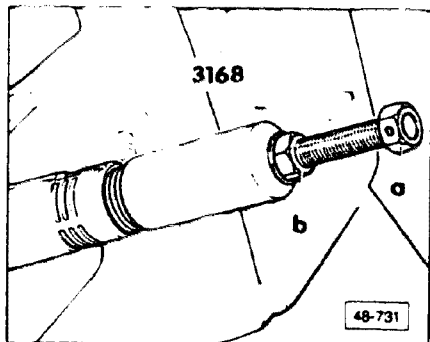
Do not place any stickers or covering on a steering wheel equipped with an airbag.

Note

Steering wheel must be centered, when front wheels are in a straight-ahead position

- connect battery ground cable
- check function of steering column switch
- position wiring behind knee bar panel and install panel

Lock washers/spring for collapsible steering column, pressing on



- install spring onto steering column
- place new lock washers on column
- install tensioner **3168** onto steering column up to stop (i.e. nut **b** threaded down)
- hold spindle **a** while tightening nut **b** until spring is compressed

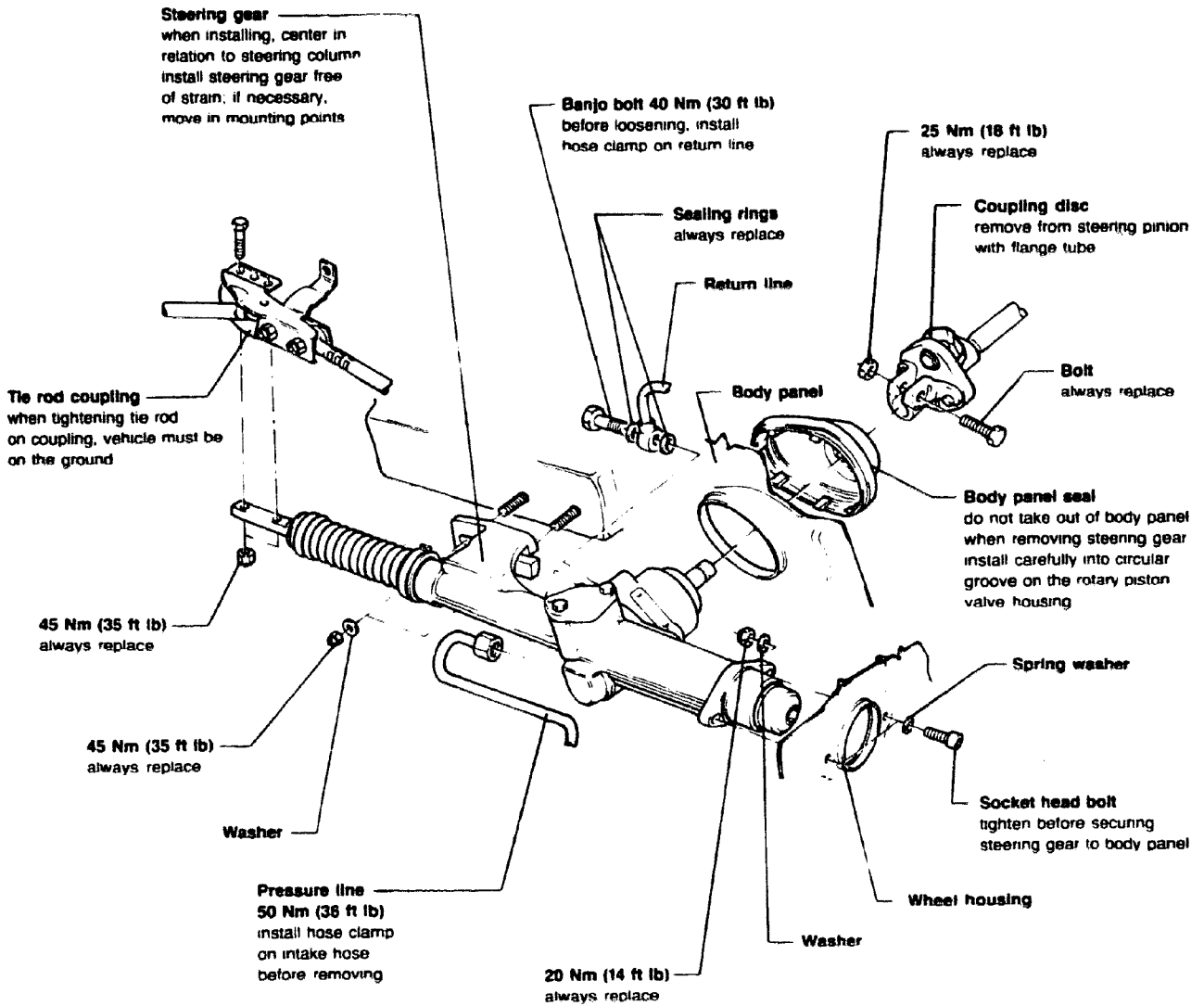
CAUTION

Do not over-tighten spring, or bearing damage could result.

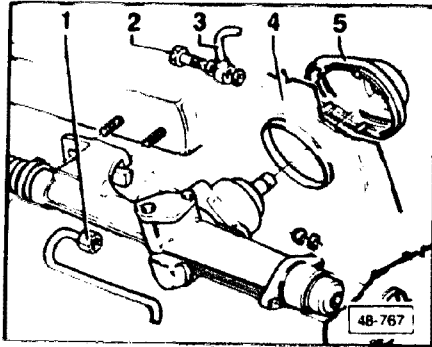
- loosen nut **b**
- remove tool from steering column

Note

Do not attempt to weld or straighten steering components



U 48-729



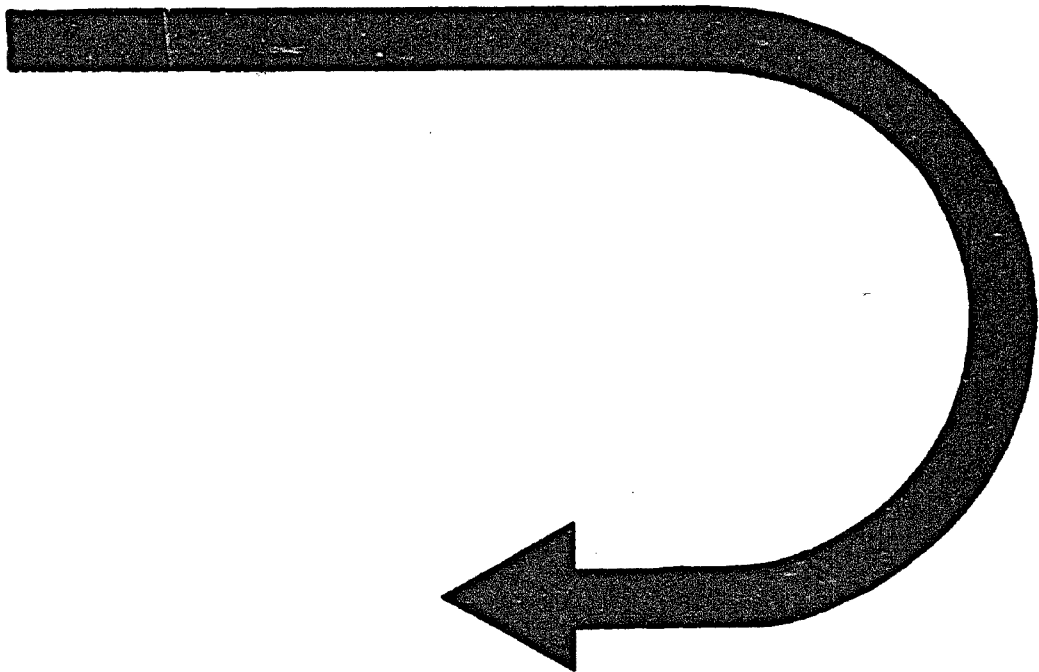
Pressure/return hoses, replacing (vehicles with automatic seat belt tensioning system)

Note

This procedure must also be used when removing/installing steering gear

- pry off dash panel boot 5 and push into passenger compartment
- remove lower left trim from instrument panel
- move dash panel boot 5 to allow access to banjo bolt 2, return line hose 3, and pressure hose connection 1
- remove and attach pressure/return line connections as necessary
- check connections for leakage on reassembly
- install dash panel boot

CONTINUED IN THE
BEGINNING OF NEXT ROW



Note

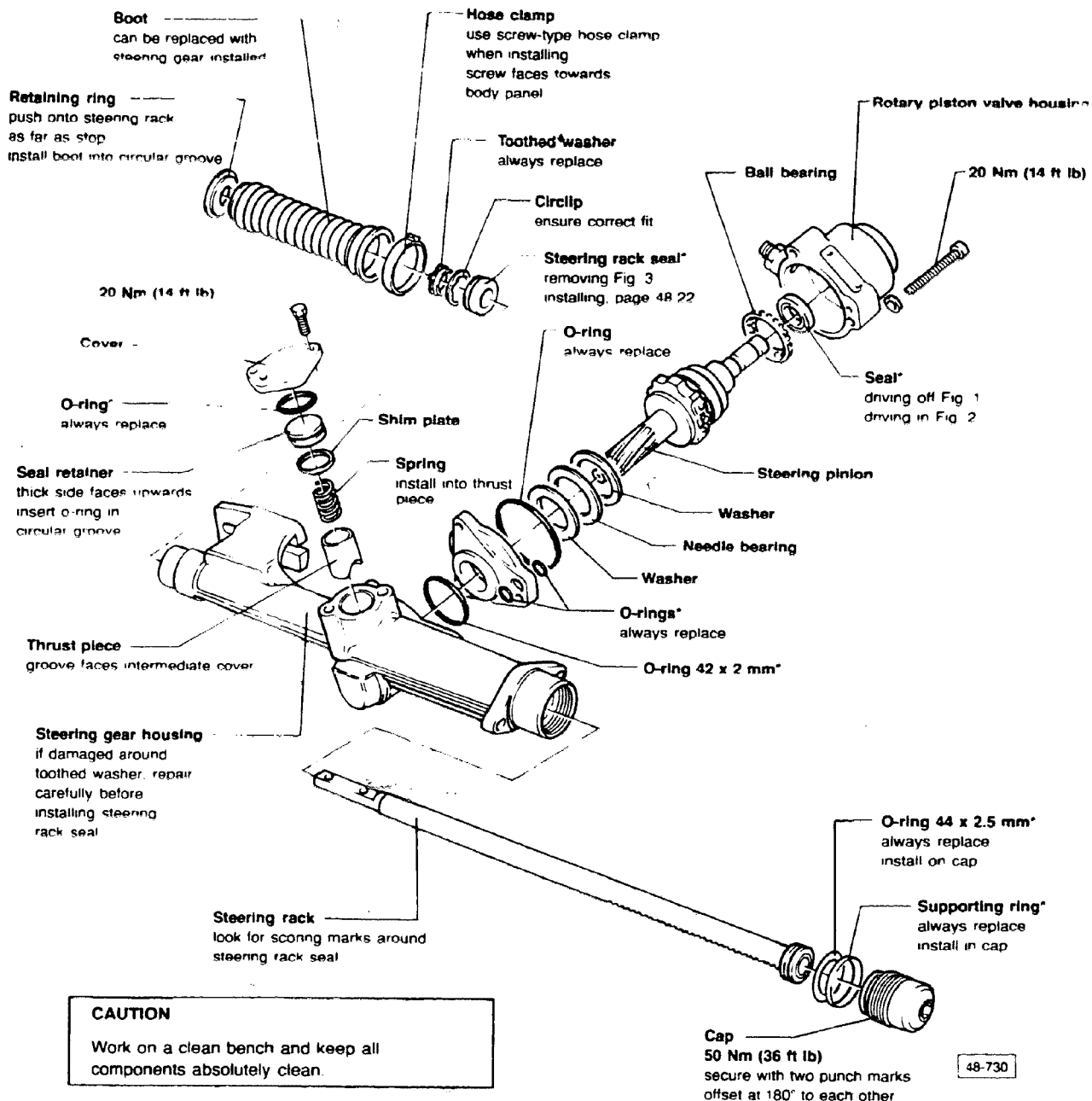
The power steering system is filled with hydraulic oil Part No. G 002 000

All components marked with an asterisk are included in the repair kit and should be renewed in the course of repair work

CAUTION

Moisten all seals with hydraulic oil before installing

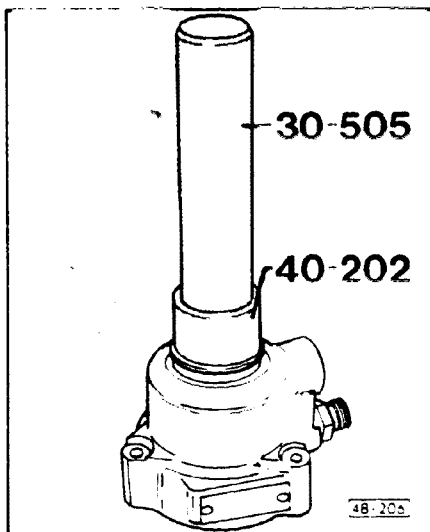
Do not attempt to weld or straighten steering components.



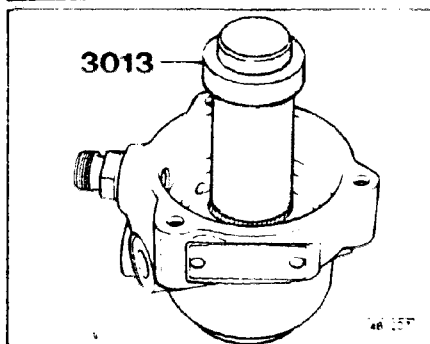
CAUTION

Work on a clean bench and keep all components absolutely clean.

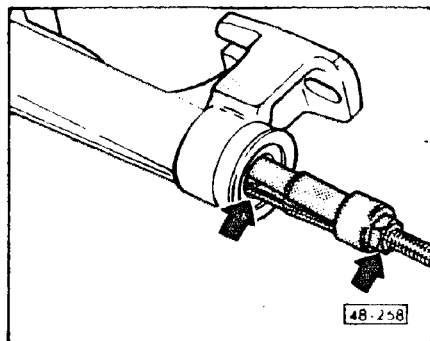
48-730



▶ Fig. 1 Valve housing seal, driving out



▶ Fig. 2 Valve housing seal, driving in
 • sealing lip faces steering pinion

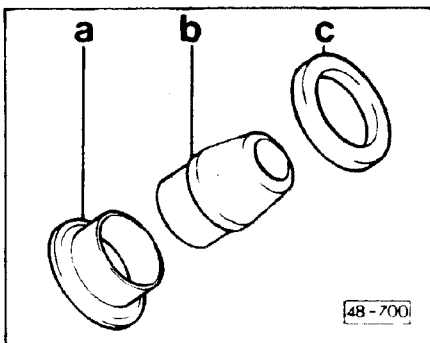


▶ Fig. 3 Steering rack seal, removing
 Use internal puller US 1088 (Kukko 21'3)

- install puller in sealing lip

Note

After pulling out the rack seal, repair any damage to the steering gear housing caused when removing the toothed washer.

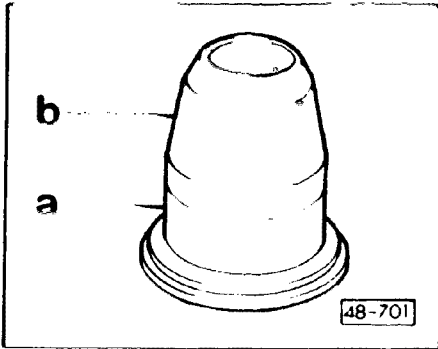


Steering rack seal, installing

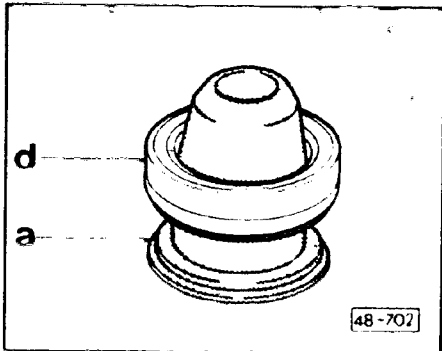
▶ **Note**

Before installing, moisten all parts of mounting sleeve and steering rack seal with hydraulic oil. Every new repair kit is supplied with a mounting sleeve.

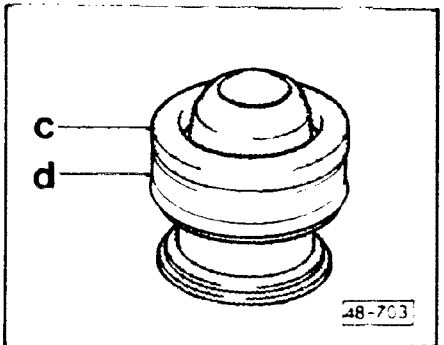
The mounting sleeve consists of the parts a, b and c.



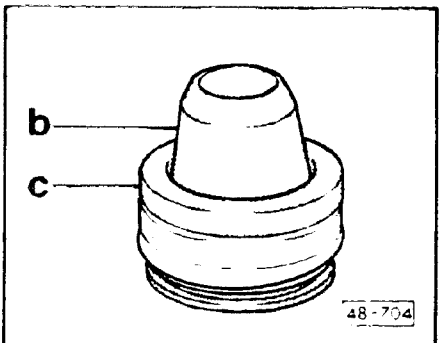
- insert part **b** of mounting sleeve into part **a**
(put parts on a flat surface)



- slide steering rack seal **d** onto mounting sleeve. (The metal side faces towards the collar of the mounting sleeve **a**)



- fit part **c** of mounting sleeve onto steering rack seal
- press steering rack seal **d** fully down with part **c** of mounting sleeve



- remove parts **c** and **b** of mounting sleeve

- clean end of steering rack thoroughly before pushing on the seal (use a polishing cloth)

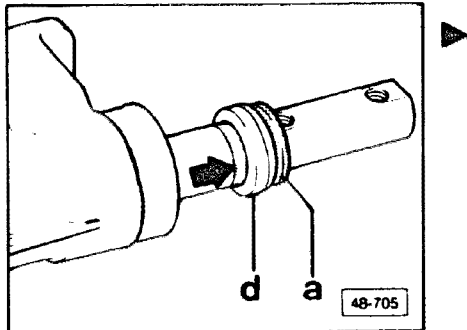
- moisten steering rack with hydraulic oil

- only apply pressure to mounting sleeve

The excess length of the mounting sleeve (a) in relation to the steering rack seal (d) must be visible (arrow)

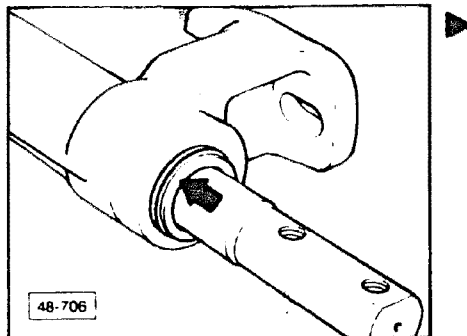
- grease steering rack seal lightly on the outside with multi-purpose grease

- use mounting sleeve a to push steering rack seal onto steering rack



- remove mounting sleeve a

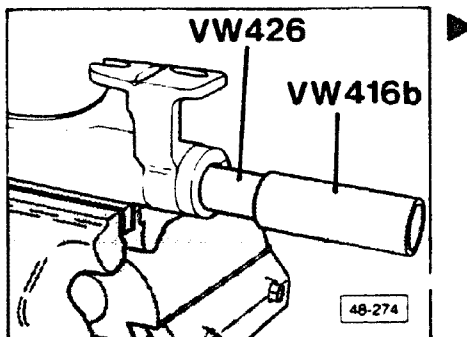
- push steering rack seal onto steering gear housing



- drive steering rack seal into steering housing to stop

- install circlip

- install toothed washer with the teeth facing outward

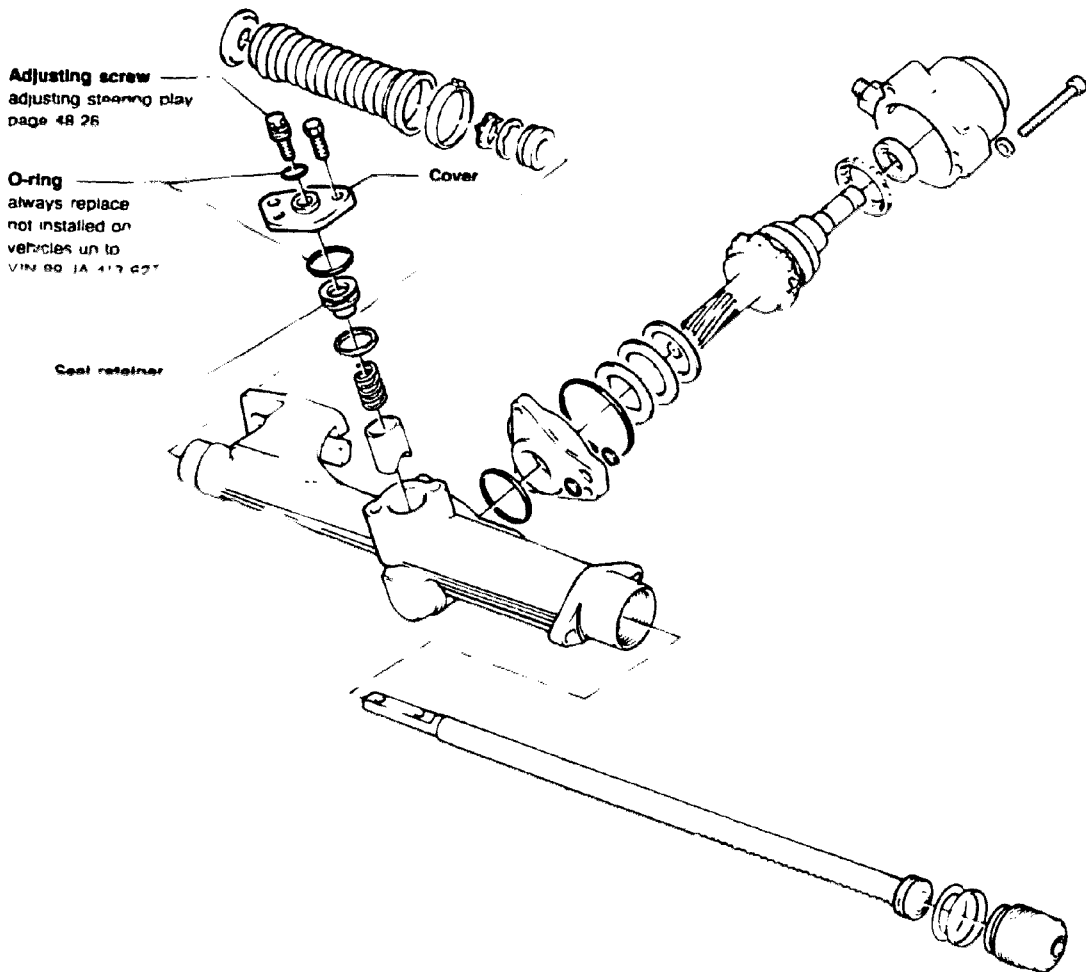


Note

Beginning with vehicle VIN 89 JA 413 628 an adjustable steering gear is installed

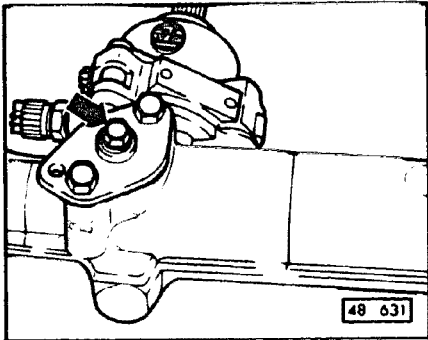
Beginning with vehicle VIN 89 JA 413 628 use repair kit Part No 811 498 020 B

When repairing steering gears on vehicles up to VIN 89 JA 413 627 O rings for valve housing are not used



48-630

Steering play, adjusting

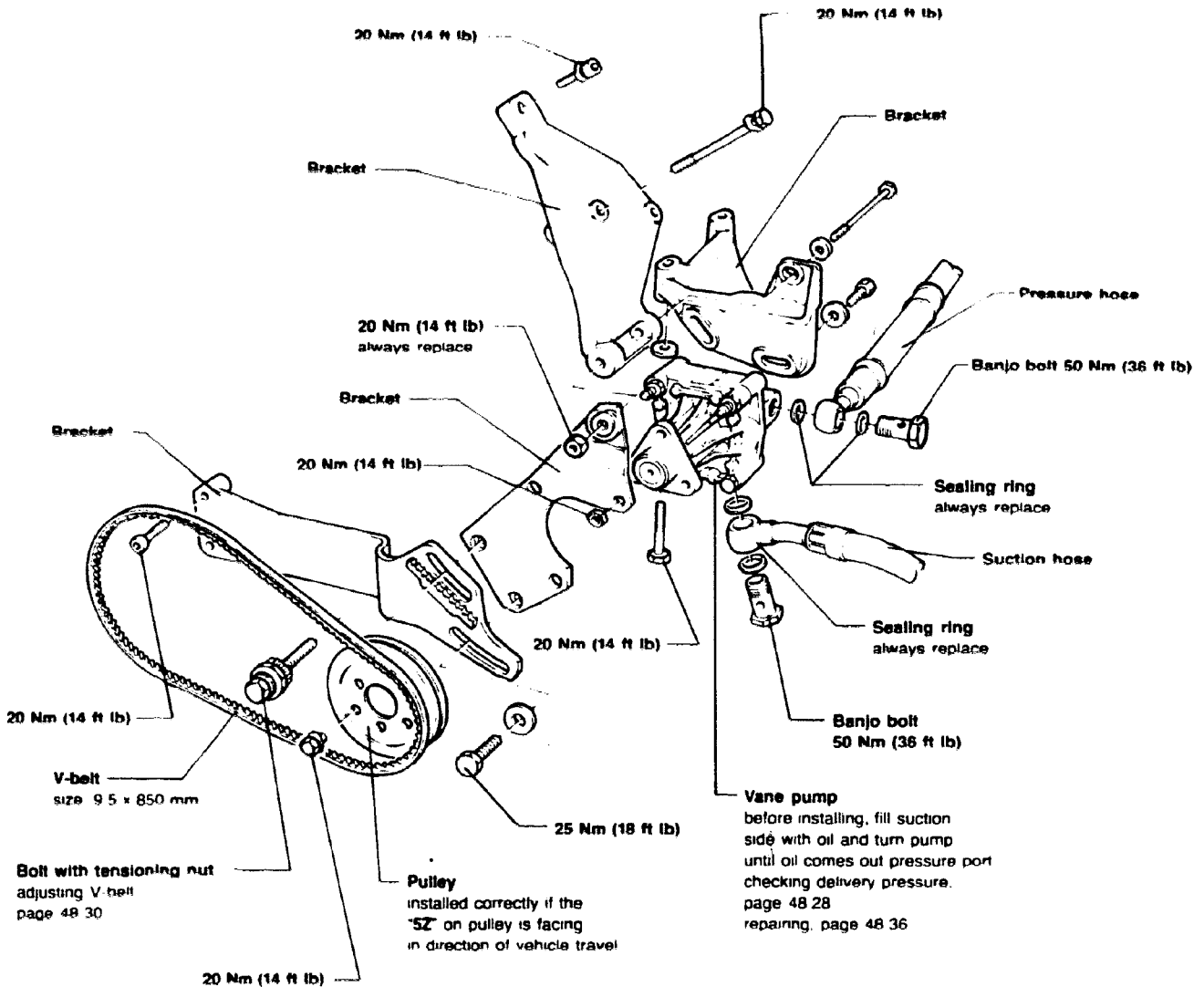


Two mechanics are necessary to do the following adjustment. Adjust the steering play with the engine off and the vehicle on the ground. The wheels must be in the straight-ahead position.

- move steering wheel back and forth approx. 30° from center position and listen for rattling and popping noises from steering gear
- second mechanic turns adjusting screw (**arrow**) clockwise until rattling and popping noises are not heard inside vehicle
- conduct test drive and readjust if necessary

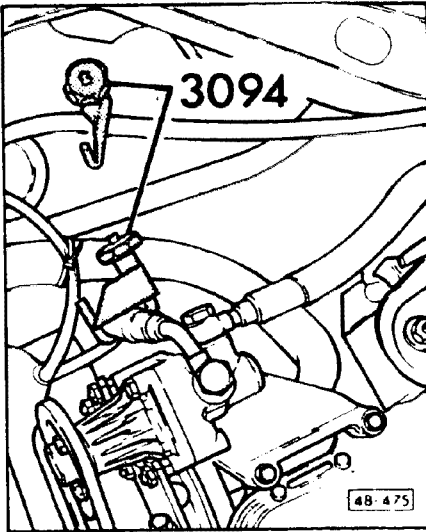
Note

The power steering system is filled with hydraulic oil Part No. 3 002 000



48-732

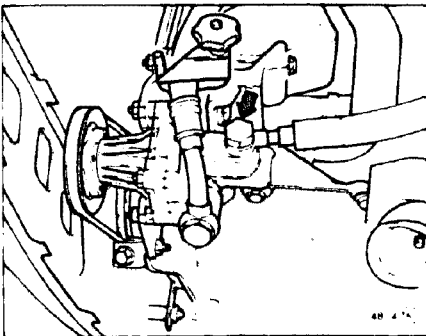
Pump delivery pressure, checking (4-cylinder engine)



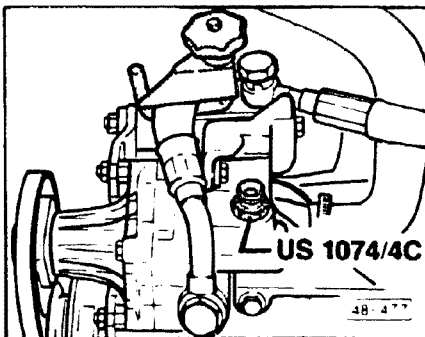
- install hose clamps 3094 to return and suction hoses

Note

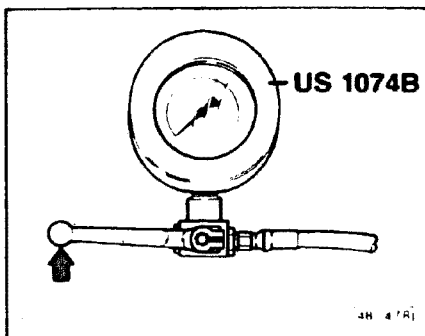
Use clamping pliers and carefully close off lines if hose clamps 3094 are unavailable



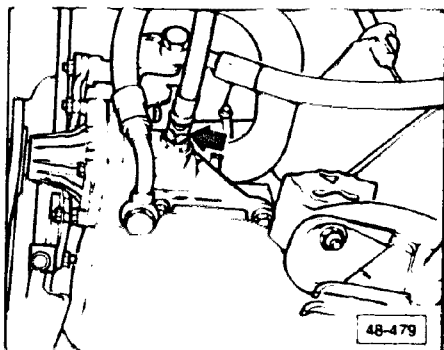
- remove pressure hose from pump (arrow)



- remove copper sealing ring from banjo bolt and install onto adaptor US 1074/4C
- thread adaptor into pump



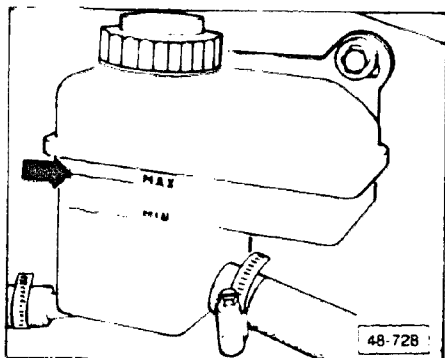
- close valve of pressure gauge (arrow)
- route hose of pressure gauge downward to pump



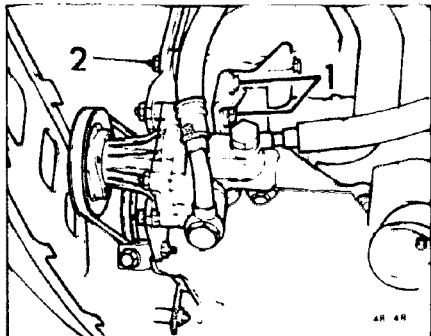
- thread hose of pressure gauge onto adapter (**arrow**)
- remove hose clamps from suction and return hoses
- start engine
- at idle, read pump pressure at pressure gauge (measure not longer than 10 seconds)
 - 100-110 bar (1450-1595 psi)
- turn off engine

Note

If the specified reading is not obtained, check pressure and flow limiting valve, page 48.38

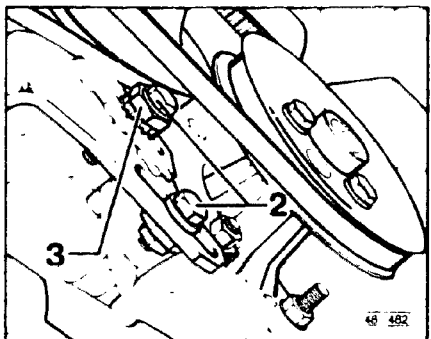


- install hose clamps **3094** (or clamping pliers) on suction and return hoses
- remove hose of pressure gauge from adapter and put pressure gauge to one side
- remove adapter from pump
- install pressure hose with banjo bolt and new sealing rings on pump
- remove hose clamps from return and intake hoses
- run engine at idle with front wheels in straight-ahead position for approximately 2 minutes
- turn engine **OFF** and immediately check level of fluid in reservoir; if necessary, top up with hydraulic oil to **MAX** mark
- check steering system for leaks



V-belt, adjusting

- loosen bolts 1



- loosen bolts 2
- turn nut 3 on tensioner to tighten belt

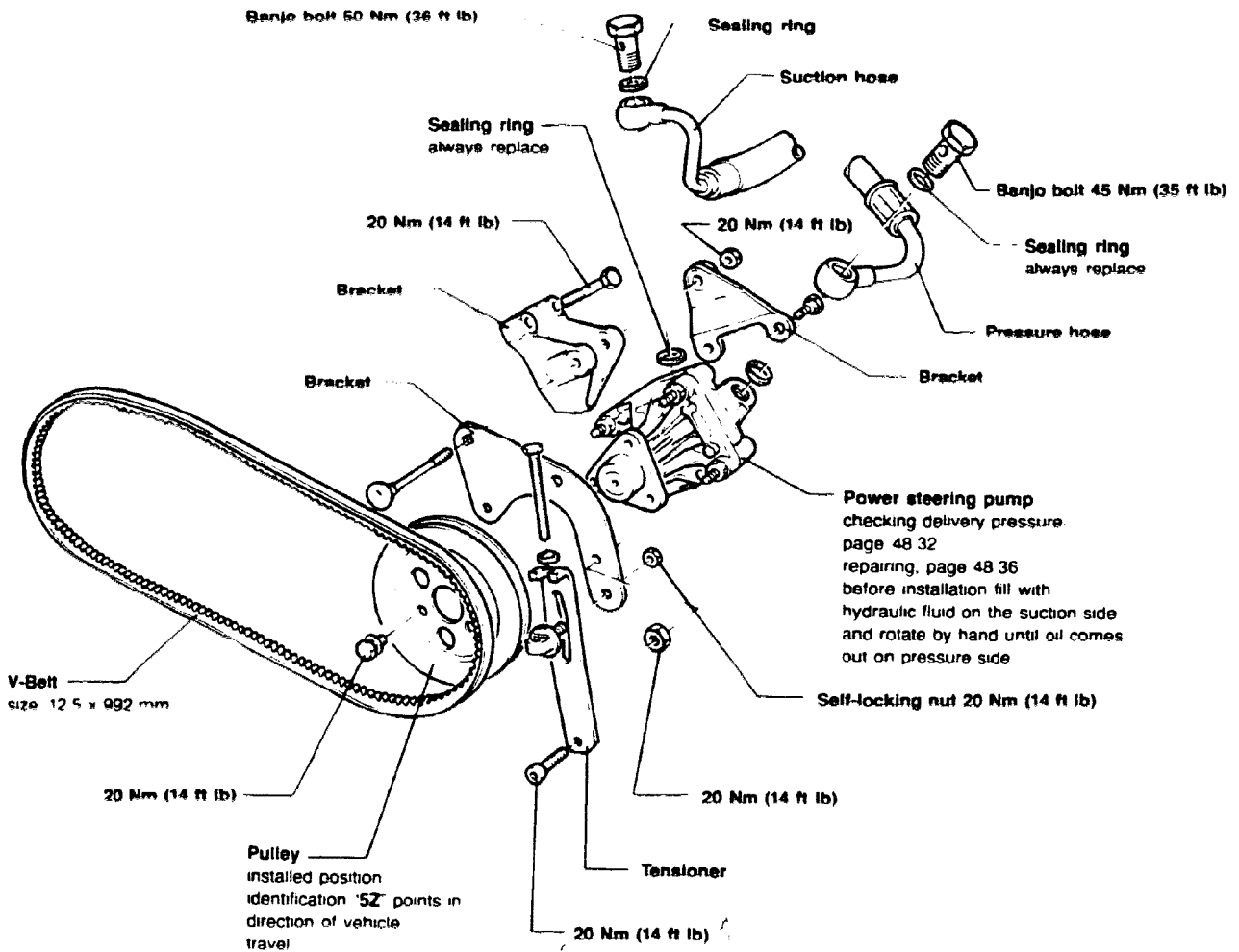
Note

Belt tension is correct if the belt can be depressed about 10 mm (3/8 in) half way between the two pulleys

- tighten bolts

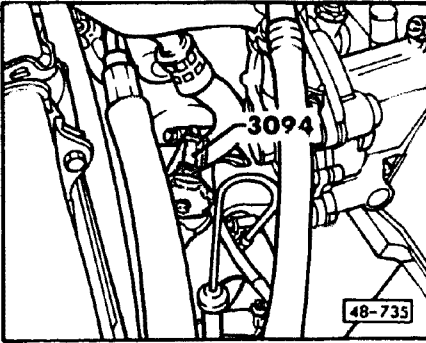
Note

The power steering system is filled with hydraulic oil
Part No. 1 002 000



48-733

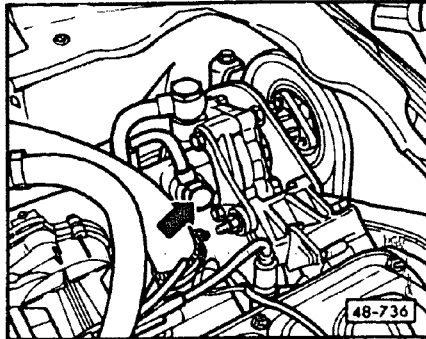
Pump pressure, checking (5-cylinder engine)



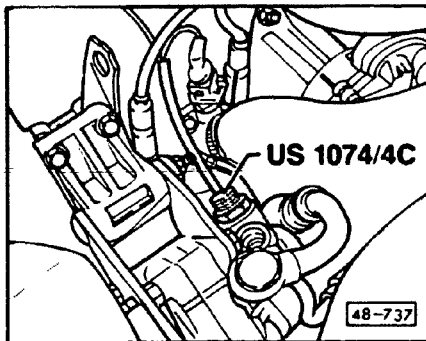
- ▶ ■ install hose clamp 3094 to suction hose

Note

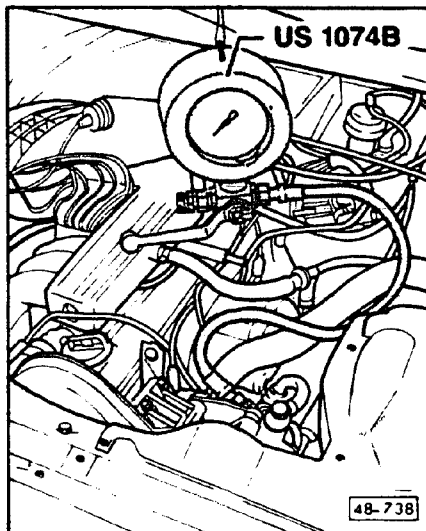
Use clamping pliers to carefully close off hose if clamp 3094 is unavailable



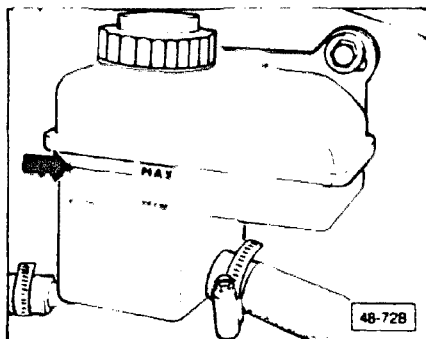
- ▶ ■ remove pressure hose from pump (arrow)
- remove copper sealing ring from banjo bolt and place onto adaptor US 1074/4C



- ▶ ■ thread adaptor into pump



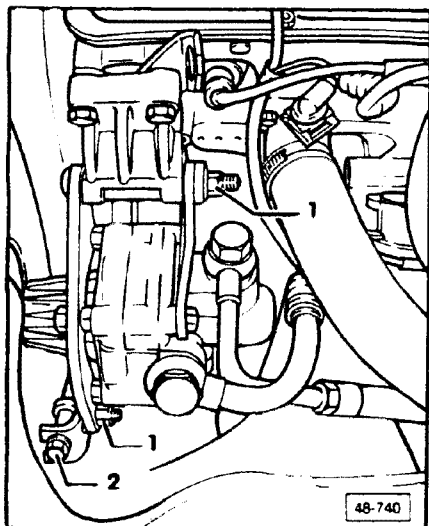
- ▶ ■ close shut-off valve of pressure gauge
- attach pressure hose to gauge
- remove hose clamp from suction hose
- start engine
- at idle speed read pump pressure on gauge (keep valve closed with engine running no longer than 10 seconds)
 - specification: 100-110 bar (1450-1595 psi)
- turn off engine



Note

If the specified pressure is not attained, check pressure and flow limiting valve, page 48.38.

- place hose clamp 3094 (or clamping pliers) on suction hose
- remove pressure gauge from pump
- install pressure hose to pump using banjo bolt with new sealing rings
- remove hose clamp from suction hose
- run engine at idle with front wheels in straight-ahead position for approximately 2 minutes
- turn engine **OFF** and immediately check fluid level in reservoir; if necessary top up with hydraulic oil to **MAX** mark
- check steering system for leaks

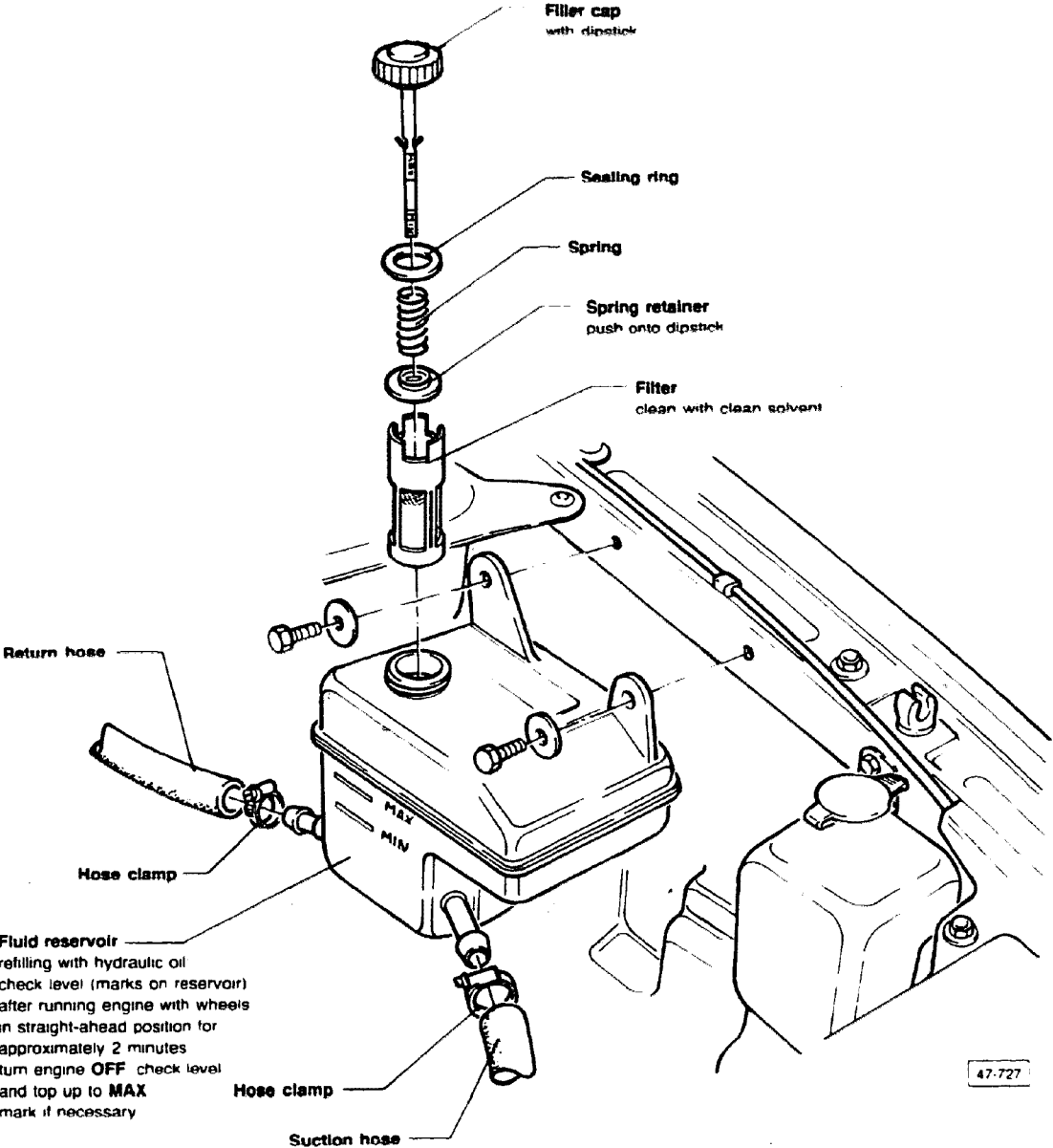


V-belt, replacing/tightening (5-cylinder engine)

- loosen nuts 1
- turn bolt 2 of adjuster as required
- belt tension is correct if the belt deflects about 10 mm (3/8 in.) when pressed with thumb half-way between the two pulleys
- tighten nuts 1

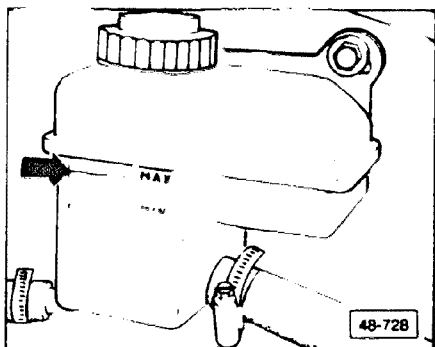
Note

The power steering system is filled with hydraulic oil
Part No G 002 000



Fluid reservoir
refilling with hydraulic oil
check level (marks on reservoir)
after running engine with wheels
in straight-ahead position for
approximately 2 minutes
turn engine **OFF** check level
and top up to **MAX**
mark if necessary

47-727



Steering system, bleeding/filling

CAUTION

Do not reuse drained hydraulic oil.

- top up hydraulic oil to **MAX** mark
- with vehicle jacked up and engine off, turn steering wheel sharply from lock to lock several times to enable air to escape
- top up hydraulic oil to **MAX** marking
- start engine and let idle for approximately 2 minutes with wheels in straight-ahead position
- watch fluid level
- as soon as there are no rising bubbles in reservoir, turn engine **OFF** and immediately check oil level; if necessary top up with hydraulic oil to **MAX** mark

Note

The steering system will bleed itself after some time once the engine is running

Steering system, checking for leaks (with engine running)

Note

If the fluid level in the reservoir is low, the complete system must always be checked for leaks.

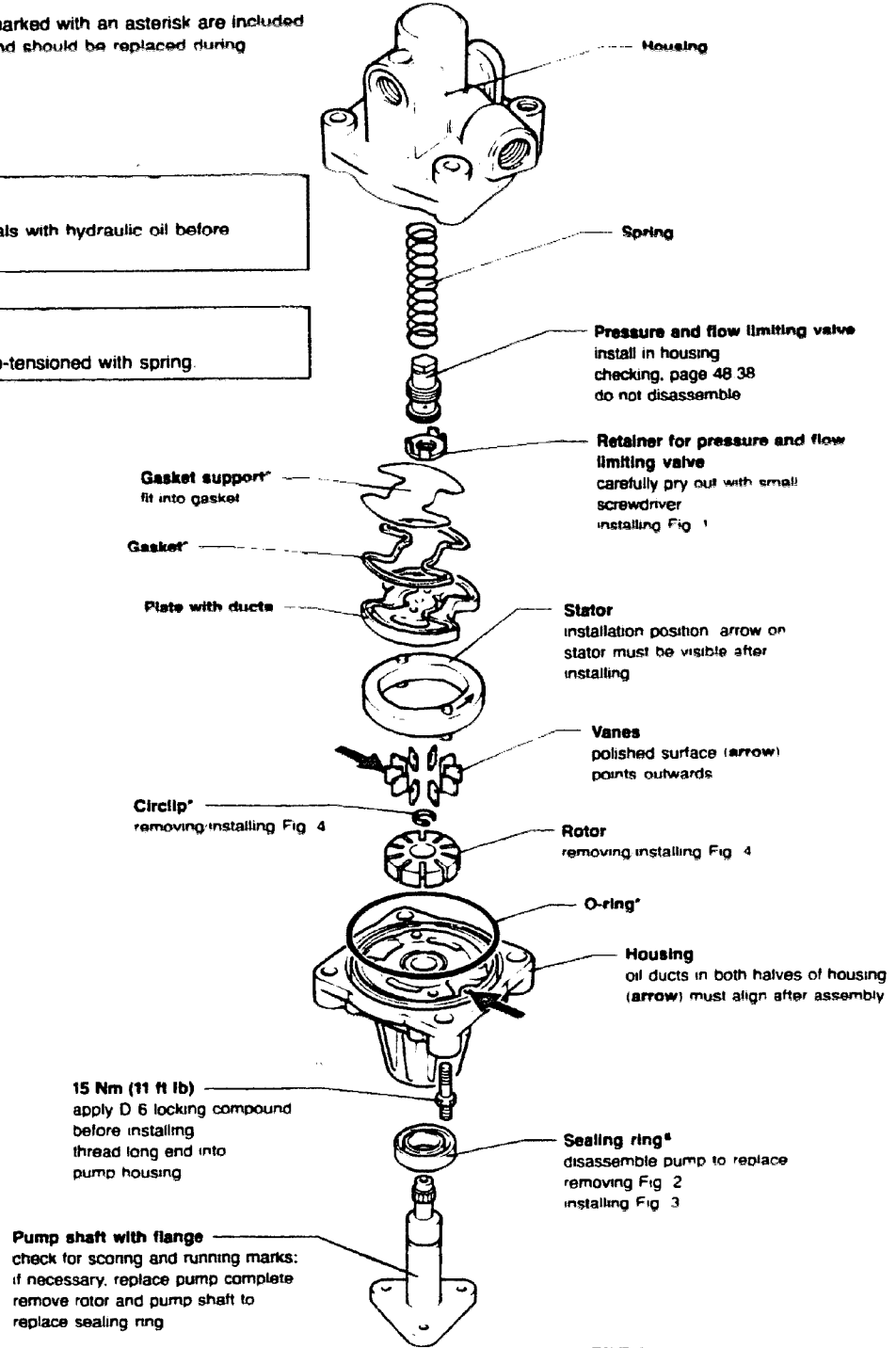
- turn the steering wheel to full lock in each direction and hold briefly in this position in order to build up maximum pressure in the connecting lines
- with the steering wheel at full lock carry out the following visual checks for leaks:
 - rotary piston valve
 - steering rack seal (remove hose clamp on boot and push boot to one side)
 - pump
 - hose connections

Note

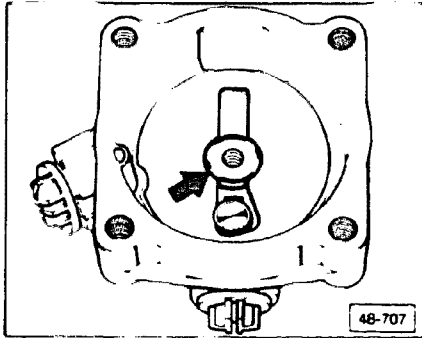
All components marked with an asterisk are included in the repair kit and should be replaced during repairs

CAUTION
Moisten all seals with hydraulic oil before installation.

CAUTION
Retainer is pre-tensioned with spring.

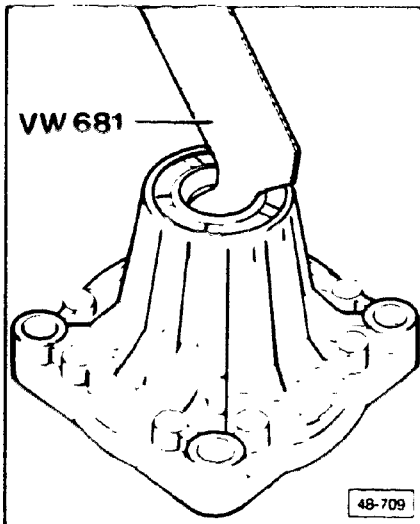


48-483

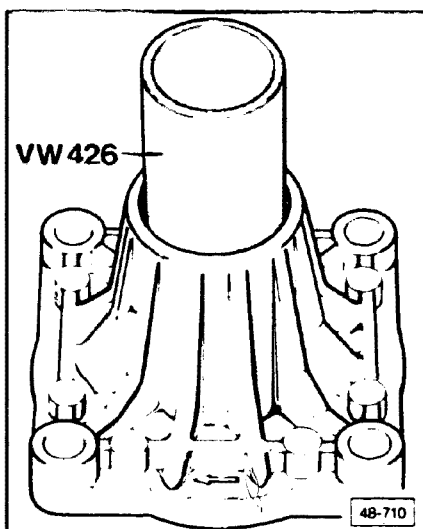


► Fig. 1 Retainer for pressure and flow limiting valve, installing

- press in flush to edge of hole in housing

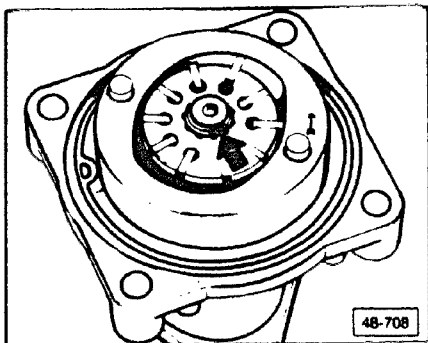


► Fig. 2 Sealing ring, removing



► Fig. 3 Sealing ring, installing

- fill space between sealing lips with multi-purpose grease



► Fig. 4 Rotor, removing/installing

- use long-nosed pliers to remove circlip from groove
- remove rotor

Pressure and flow limiting valve, checking

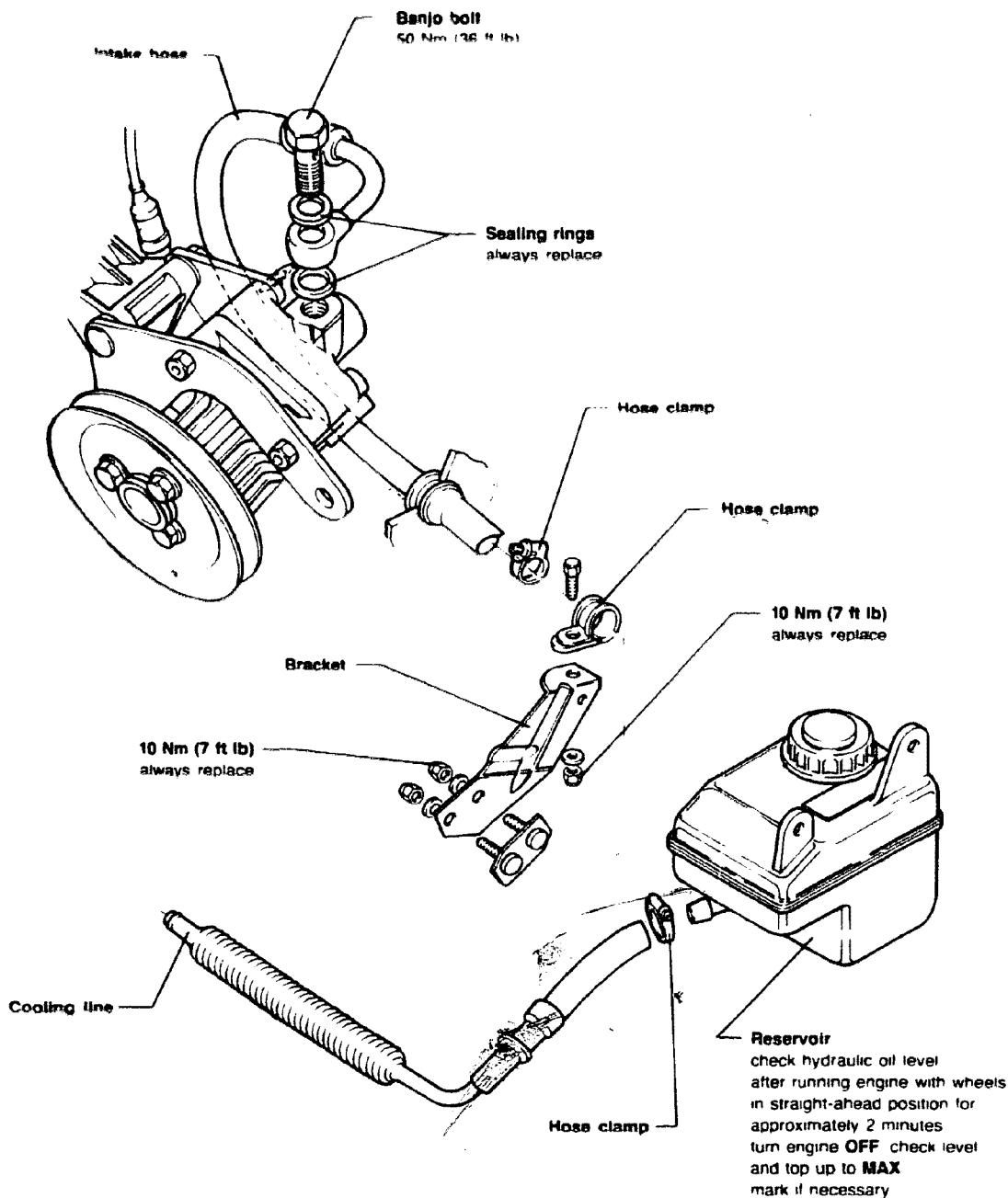
CAUTION

If the pressure and flow limiting valve is not working properly, this will cause intermittent failure of the power steering.

- check valve piston and bore in pump housing for wear
 - holes in valve piston must not be obstructed by dirt
 - piston must move freely in bore

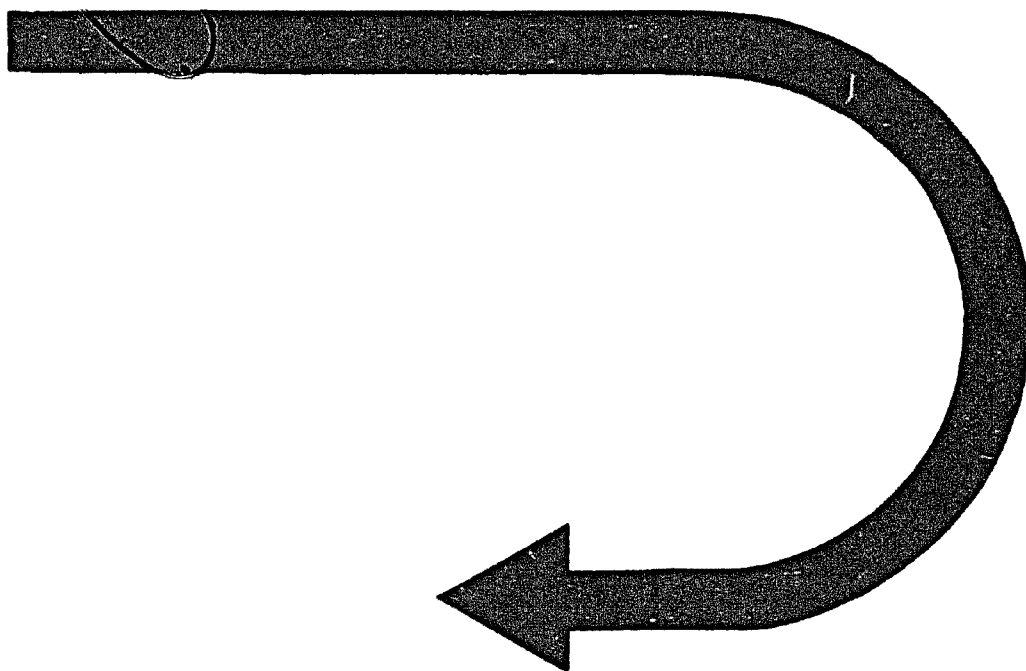
Note

If maximum pump pressure still cannot be obtained after this test, the pump must be replaced



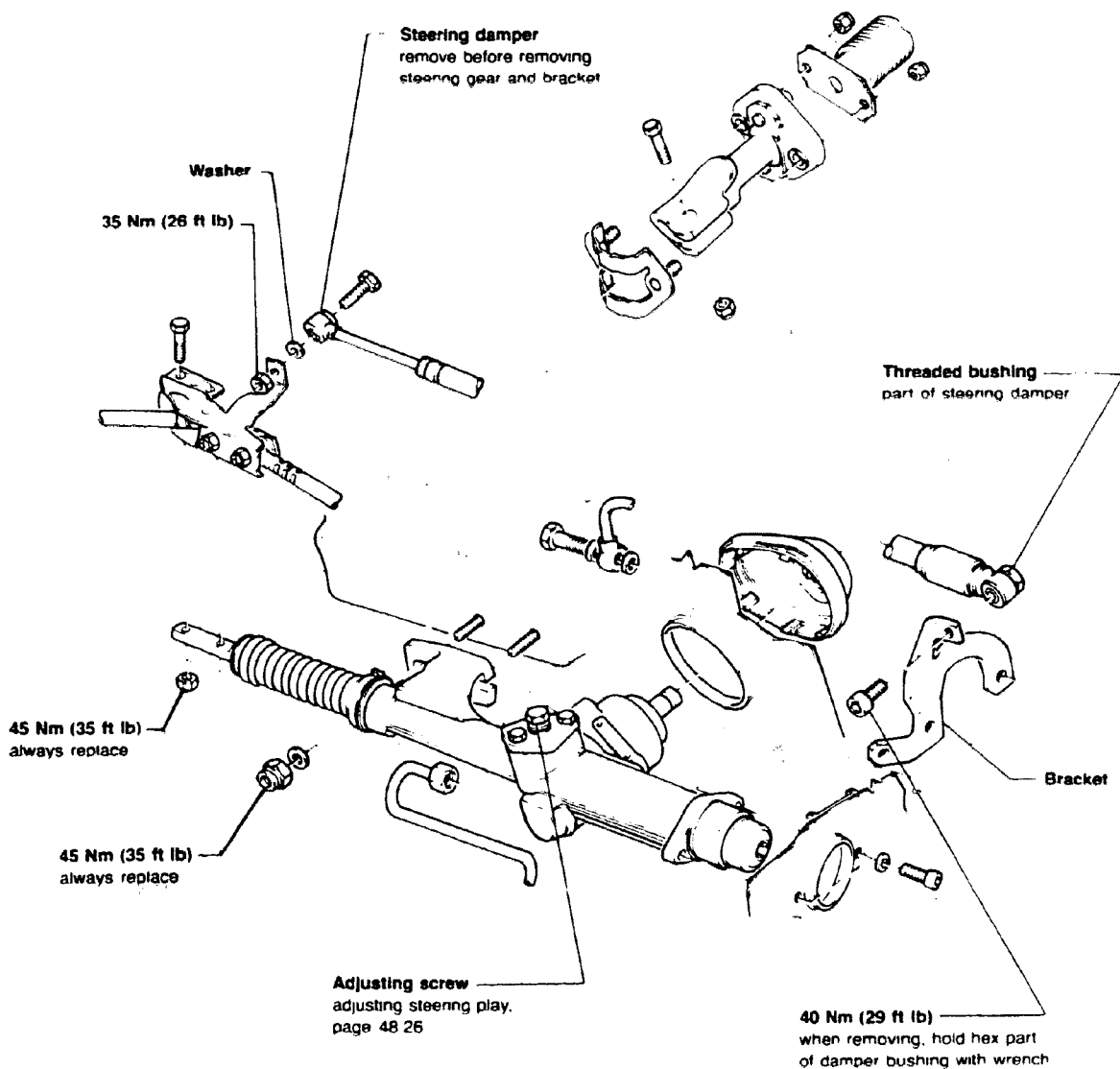
U 48-734

**CONTINUED IN THE
BEGINNING OF NEXT ROW**

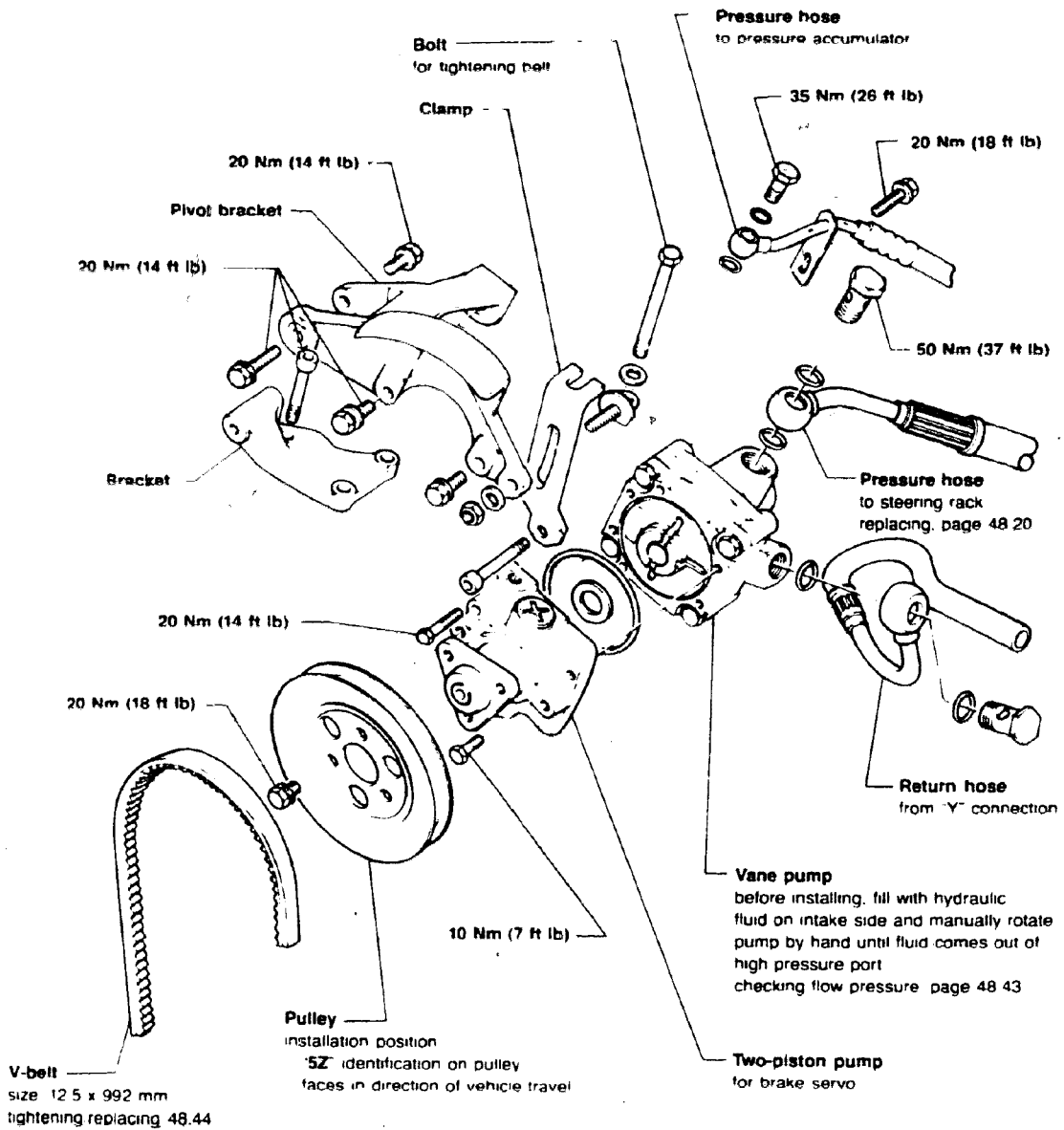


Technical data

Vehicle	Audi Coupe
Wheelbase	2548.5 mm (100.335 in.)
Track at curb weight front/rear	1453 mm (57.204 in.)/ 1437 mm (56.575 in.)
Wheel lock angle, inner, at curb weight	37° 20'
Wheel lock angle, outer, at curb weight	33° 25'
Steering wheel turns lock to lock	3.2
Total steering ratio	16.8:1
Power steering fluid capacity	approximately 1.9 liters (2.0 US qt)

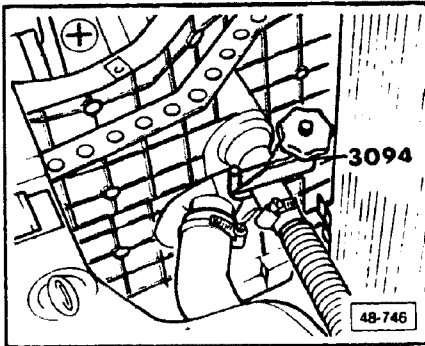


48-768

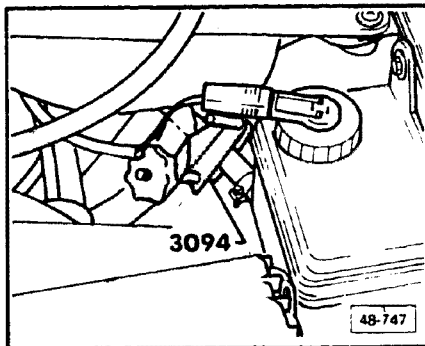


48-739

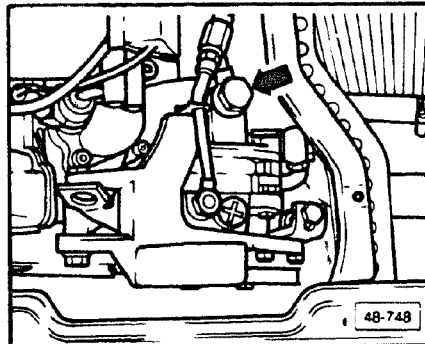
Vane pump flow pressure, checking



- remove covering for air shroud
- install clamp 3094 or equivalent on suction hose

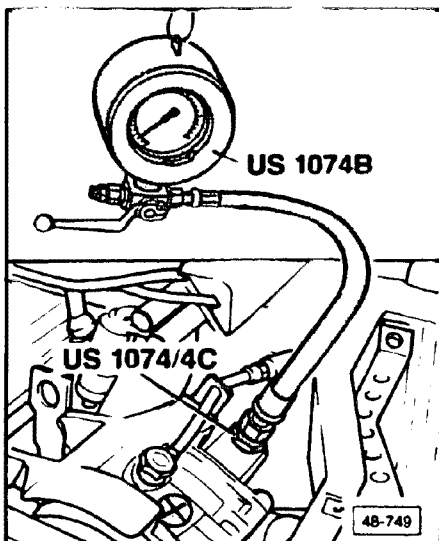


- install clamp 3094 or equivalent on return hose at reservoir



- remove pressure hose connection at vane pump (arrow)
- remove sealing ring from banjo bolt and install on adaptor US 1074/4C

more

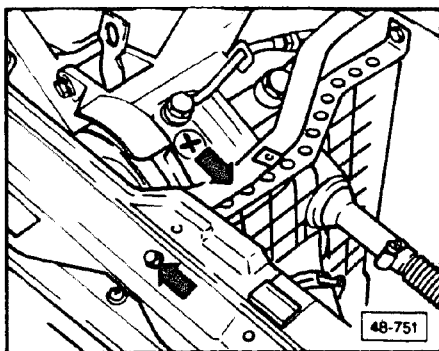


- install **US 1074/4C** to vane pump at pressure hose connection
- close shut-off valve of gauge **US 1074B** (lever to left) and connect gauge to adaptor
- remove clamps from suction and return hoses
- start engine and read pump pressure on gauge at idle
 - must be 100-110 bar (1450-1595 psi) if **NO.** replace vane pump

Note

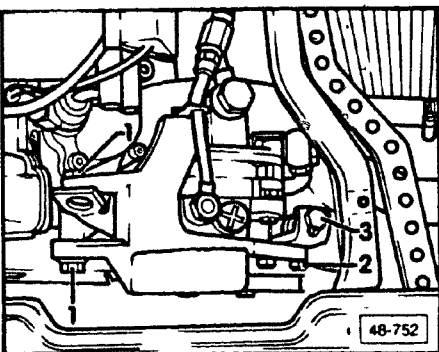
Do not exceed 10 seconds for pressure test.

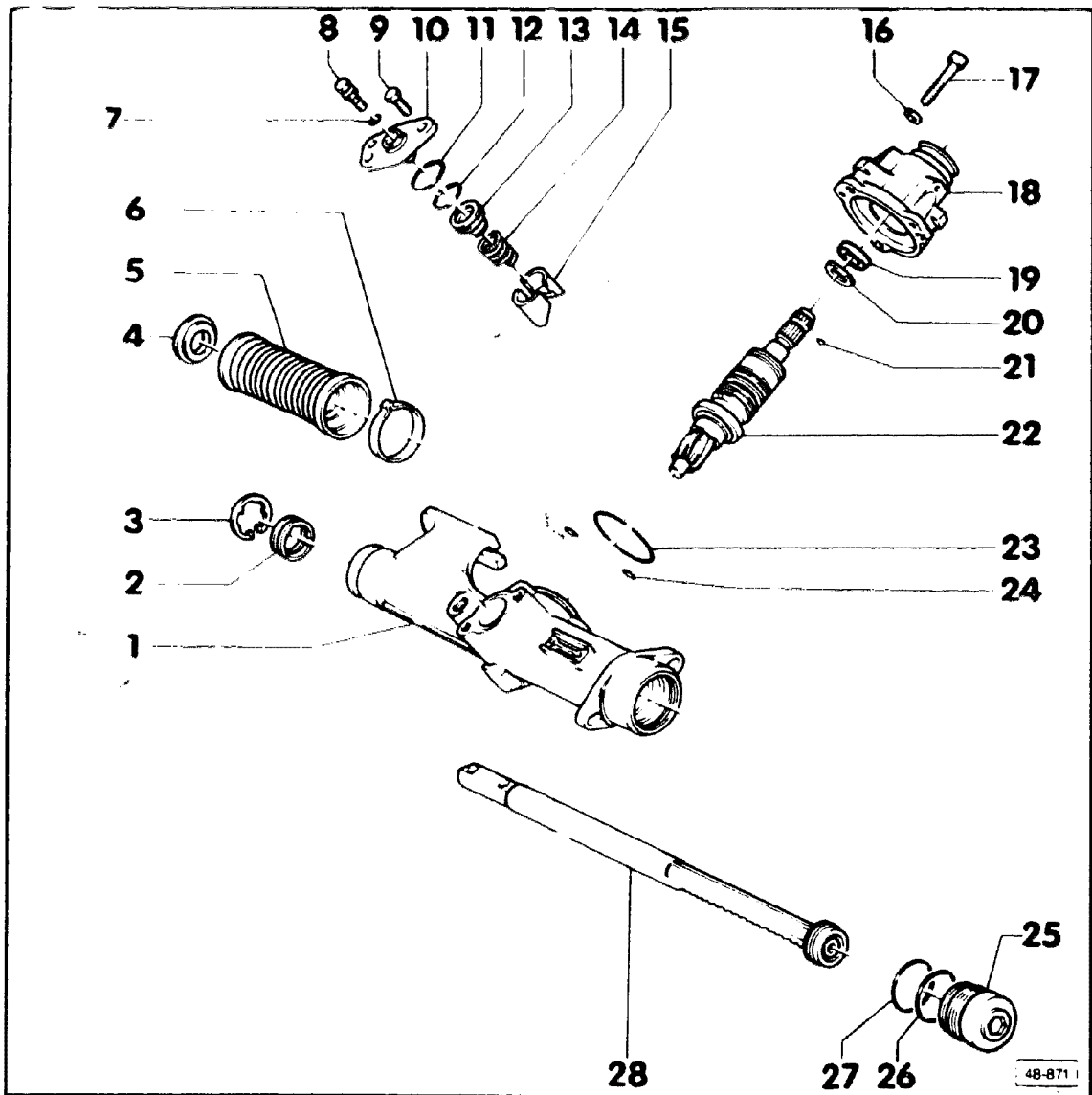
- turn engine **OFF**
- install clamp on suction hose
- remove gauge and adaptor
- connect suction hose to pump using new sealing rings
- remove clamp from suction hose
- start engine and let idle for two minutes with front wheels in straight-ahead position
- turn engine **OFF** and immediately check hydraulic oil level in reservoir; if necessary top up to **MAX** mark
- check system for leaks



V-belt, tightening/replacing

- remove covering for air shroud
- remove mounting bolt for bracket of air shroud on cow! (**lower arrow**)
- push air shroud to side
- loosen bolts **1**
- loosen nut **2**
- turn bolt **3** of tensioning bracket accordingly
 - v-belt is tensioned properly when deflection is approximately 10 mm (3/8 in.)
- tighten bolts **1** and nut **2**
- replace air shroud, mounting bolt and cover





Note

All components marked with an asterisk (*) are included in the repair kit and must be replaced when repairing

CAUTION

The power steering system uses only hydraulic oil.
Part No G 002 000

Always keep the work area and all components absolutely clean.

- 1 — Steering gear housing
- 2 — Steering rack seal*
removing Fig 3

- 3 — Lock ring
can only be removed installed with steering gear removed
- 4 — Retaining ring
 - push up to stop on gear rack
 - install boot in groove
- 5 — Boot
can be replaced with steering gear installed
- 6 — Clamp
use screw-type hose clamp when installing
(screw facing toward body panel)
- 7 — O-ring*
always replace

THIS FRAME INTENTIONALLY LEFT

BLANK

- 8 — **Adjusting screw**
adjusting steering play Fig 7
- 9 — **20 Nm (15 ft lb)**
- 10 — **Cover**
- 11 — **O-ring***
 - 35 x 2 mm
 - always replace
 - install in groove in housing
- 12 — **O-ring***
 - 27 x 2.5 mm
 - always replace
 - install in groove of seal retainer
- 13 — **Seal retainer**
removing Fig 5
- 14 — **Compression spring**
install into thrust piece
- 15 — **Thrust piece**
- 16 — **Washer**
- 17 — **20 Nm (15 ft lb)**
- 18 — **Valve housing**
- 19 — **Valve housing seal***
 - always replace
 - removing Fig 1
 - installing Fig 2
- 20 — **Washer**
- 21 — **Pin***
 - 25 x 6 mm
 - always replace
 - pull pin with pliers before removing valve housing
- 22 — **Steering pinion/rotary valve**
removing Fig 6
- 23 — **O-ring***
60 x 2 mm
- 24 — **O-ring***
9 x 2 mm
- 25 — **Cap**
 - 50 Nm (37 ft lb)
 - secured with 2 punch marks 180° apart
- 26 — **Support ring**
 - always replace
 - installed position Fig 8
- 27 — **O-ring***
 - 44 x 2.5 mm
 - always replace
- 28 — **Steering rack**
 - to remove unscrew cap and slide gear rack to left out of housing
 - note any scoring in area of steering rack seal
 - installing, page 48 49

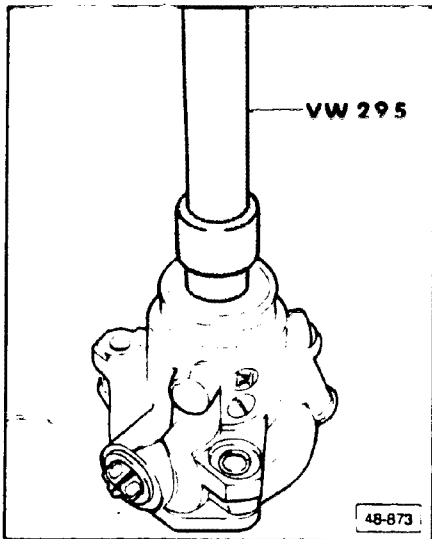


Fig. 1 Valve housing seal, removing

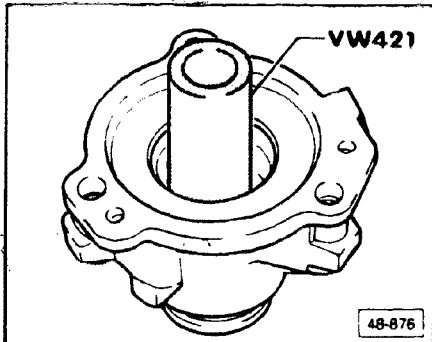


Fig. 2 Valve housing seal, installing

- sealing lip faces steering pinion

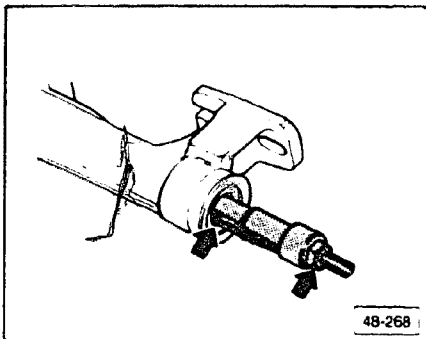


Fig. 3 Steering rack seal, removing

- install internal puller (e.g., Kukko 21/3)
- tighten inside seal (left arrow) with nut (right arrow)
- see Fig. 4

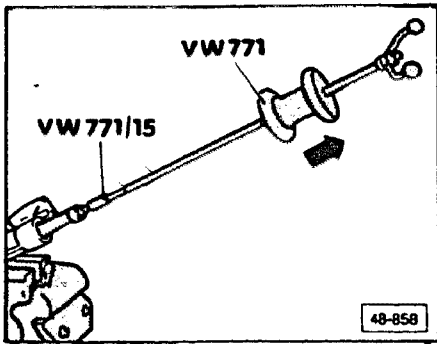


Fig. 4 Steering rack seal, removing

- clamp steering housing in vise
- attach **VW 771** and **VW 771/15** to internal puller and remove seal

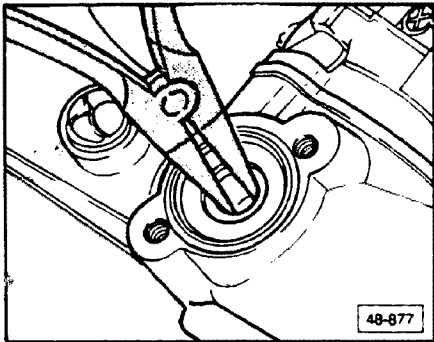


Fig. 5 Seal retainer, removing

- remove with pliers

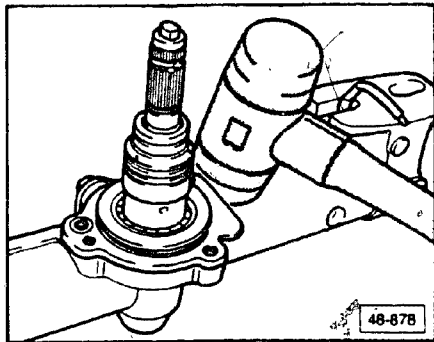


Fig. 6 Steering pinion, removing

- hold pinion by hand while striking housing forcefully with rubber hammer

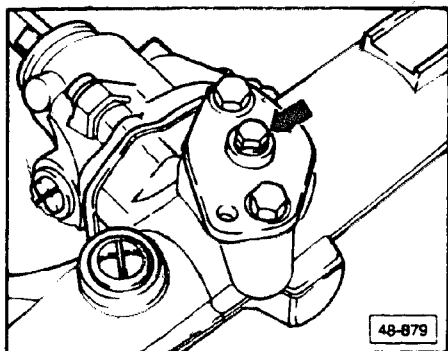


Fig. 7 Steering play, adjusting

Two mechanics are necessary to do the following adjustment. Adjust the steering play with the engine off and the vehicle on the ground. The wheels must be in the straight-ahead position.

- move steering wheel back and forth approximately 30° from center position and listen for rattling and popping noises from steering gear
- second mechanic turns adjusting screw (arrow) clockwise until rattling and popping noises are not heard inside vehicle
- conduct test drive and readjust if necessary

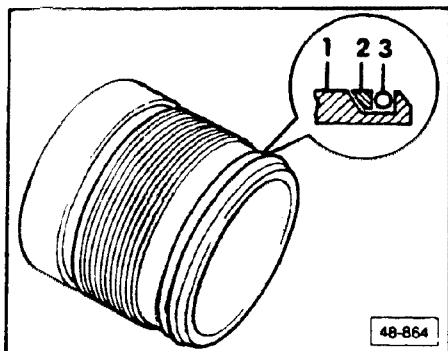


Fig. 8 Support ring, installed position

- 1 Cap
- 2 Support ring
- 3 O-ring

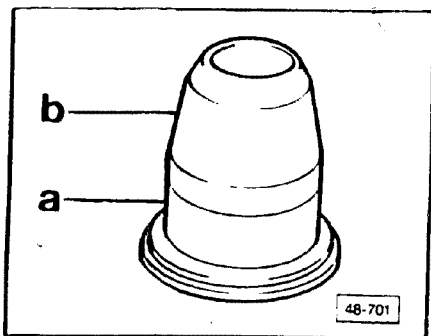
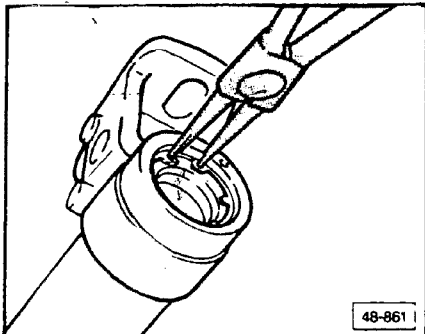
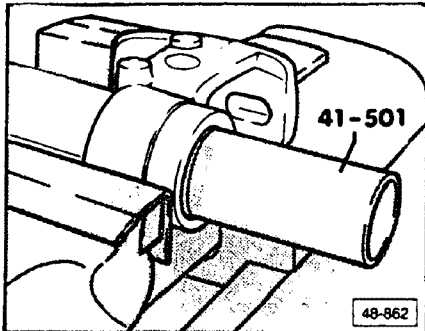
Steering rack, installing

- wash housing out thoroughly with cleaning solvent and blow out with compressed air
- coat steering rack and installation sleeve with hydraulic oil

Note

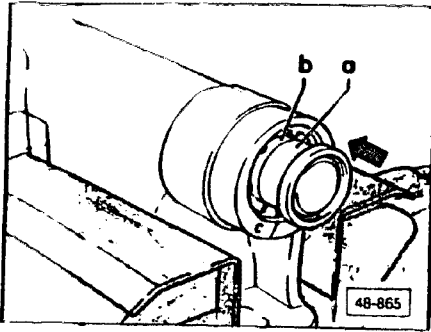
Each repair kit is supplied with an installation sleeve.

- insert steering rack seal in housing and drive in up to stop

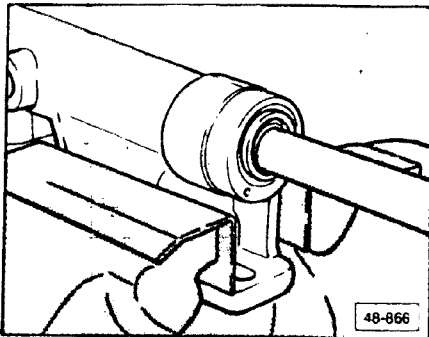


- install lock ring

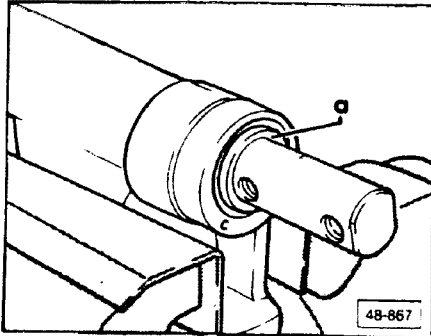
- insert part **b** of installation sleeve into part **a**



- push sleeves **a** and **b** into steering rack housing up to stop



- drive sleeve **b** through housing and out other end with mandrel of appropriate size



- install steering rack from side opposite seal and push through installation sleeve **a** until flattened portion of rack is through seal
- remove installation sleeve **a**
- thread on cap to prevent rack from sliding out of housing and damaging seal

Power steering pump (Vickers), installing

Beginning with the following VINs vehicles with a 5-cylinder engine will have a power steering pump manufactured by either ZF or Vickers

80/90: 8A LA 163 899

Coupe/Quattro: 8B LA 011 092

The Vickers pump comes complete with pulleys and front and rear brackets. The pump is not repairable.

When replacing a power steering pump, always use one from the same manufacturer if possible. If a ZF pump is installed instead of a Vickers pump, the front and rear brackets must be ordered also.

The Part number of the pump differs depending on the VIN:

80/90

up to 8A MA 054 849 =
Part No. **034 145 159 J**

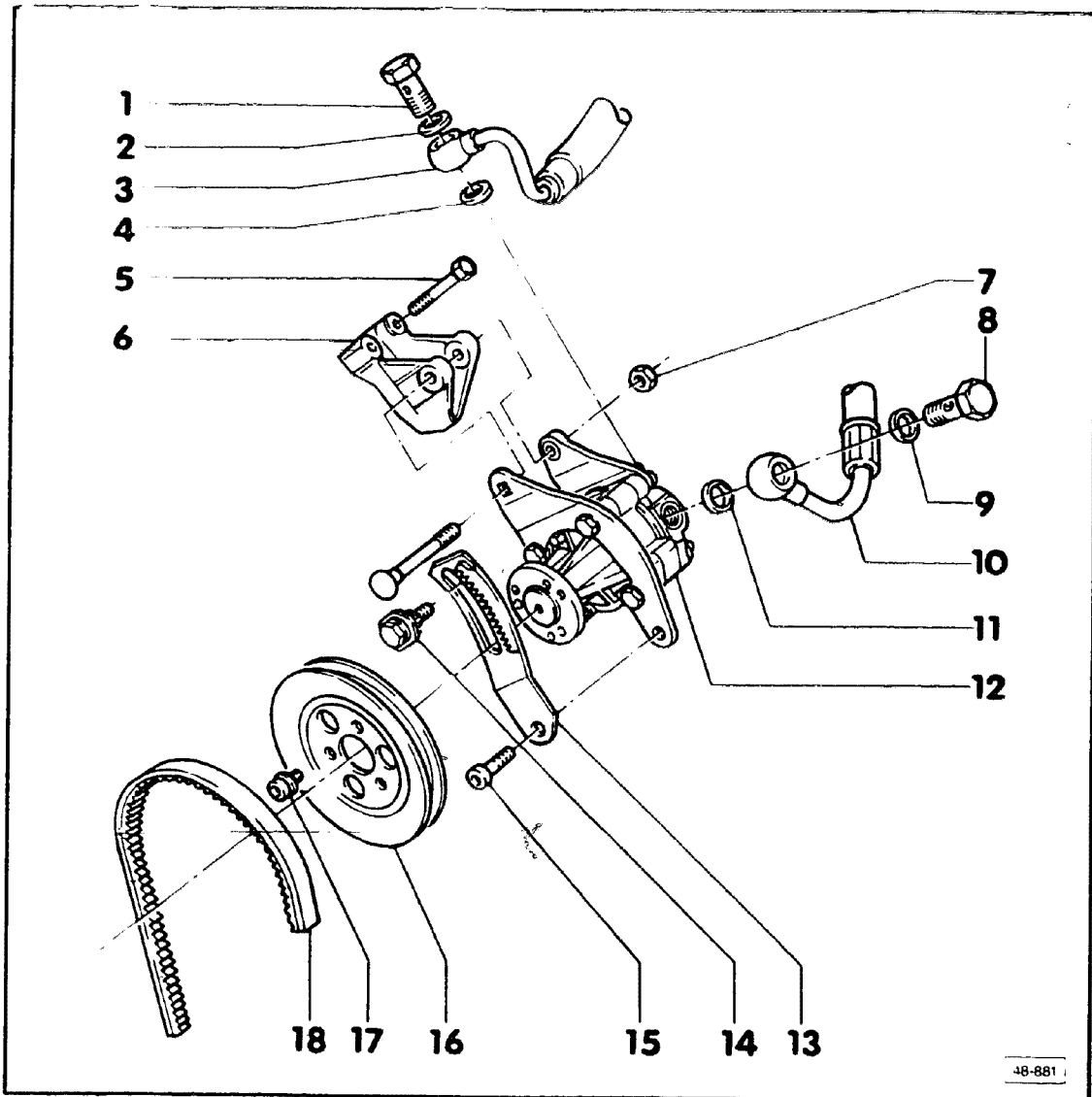
from 8A MA 054 850 =
Part No. **034 145 159 L**

Coupe Quattro

up to 8B MA 002 644 =
Part No. **034 145 159 J**

from 8B MA 002 645 =
Part No. **034 145 159 L**

Removal/installation information is shown on the following pages.



48-881

CAUTION

The power steering system uses only hydraulic oil Part No G 002 000.

- 1 — 45 Nm (33 ft lb)
- 2 — Sealing ring
always replace
- 3 — Pressure hose
45 Nm (33 ft lb)
- 4 — Sealing ring
always replace

- 5 — 20 Nm (15 ft lb)
- 6 — Bracket
- 7 — 20 Nm (15 ft lb)
- 8 — 50 Nm (37 ft lb)
- 9 — Sealing ring
always replace
- 10 — Suction hose
- 11 — Sealing ring

12 -- Vane pump

- note different types
- before installing, fill with hydraulic fluid on intake side and manually rotate pump by hand until fluid comes out of pressure port
- checking flow pressure see repair manual page 48 32

13 -- Tensioning clamp

14 -- Tensioning bolt/nut

15 -- 20 Nm (15 ft lb)

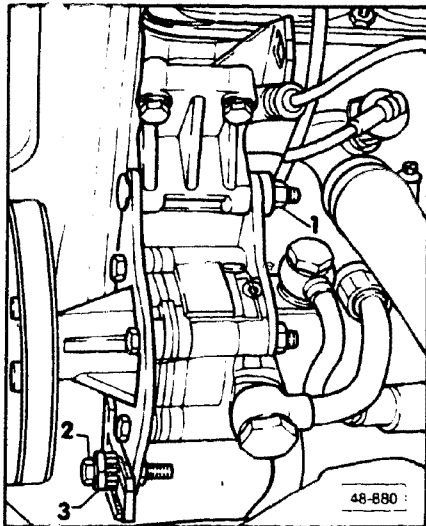
16 -- V-belt pulley

with pulley installed "4Z" must be visible from front

17 -- 25 Nm (18 ft lb)

18 -- V-belt

12.5 x 992 mm



Power steering pump (Vickers), tensioning V-belt

- loosen nut 1
- loosen bolt 2
- turn tension nut 3 to adjust belt tension
 - belt tension is correct if belt deflects approximately 10 mm (3.8 in.) when pressed with thumb half way between the two pulleys
- tighten bolt 2
- tighten nut 1